

Eggborough CCGT Project

**The Eggborough CCGT (Generating Station) Order
Land within and adjacent to the Eggborough Power Station site,
Goole, East Yorkshire DN14 0BS**

Environmental Impact Assessment: Preliminary Environmental Information Report – Volume I

The Planning Act 2008

The Infrastructure Planning (Environmental Impact Assessment)

Regulations 2009 (as amended)

Regulations – 6(1)(b) and 8(1)



Applicant: Eggborough Power Limited

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GLOSSARY OF ABBREVIATIONS AND DEFINITIONS

Abbreviation	Description
AADT	Annual Average Daily Traffic Flow – a measure of the total volume of vehicle traffic of a highway or road for a year divided by 365 days.
AD	Anaerobic Digestion – a series of biological processes in which microorganisms break down biodegradable material in the absence of oxygen.
ADMS	Atmospheric Dispersion Monitoring System – a proprietary model for the assessment of effect of emissions to air from point sources and road sources
AGI	Above Ground Installation – installations used to support the safe and efficient operation of the pipeline; above ground installations are needed at the start and end of a cross-country pipeline and at intervals along the route.
ALC	Agricultural Land Classification – part of the planning system in England and Wales which classifies agricultural land in five categories according to versatility and suitability for growing crops.
AND	Atmospheric Nitrogen Deposition – the input of reactive nitrogen from the atmosphere to the biosphere both as gases, dry deposition and in precipitation as wet deposition.
AOD	Above Ordinance Datum – A spot height (an exact point on a map) with an elevation recorded beside it that represents its height above a given datum.
AQAP	Air Quality Action Plan – A comprehensive series of measures that will help improve air quality and work towards achieving the national objectives for nitrogen dioxide and particles.
AQMA	Air Quality Management Area – an area designated by the local authority to be managed, through the implementation of a Local Air Quality Management Area, to ensure that it meets national air quality objectives.
APIS	Air Pollution Information System - provides a comprehensive source of information on air pollution and the effects on habitats and species. It supports the assessment of potential effects of air pollutants on habitats and species.
Applicant	Eggborough Power Limited (EPL) – a subsidiary of Energetický A Průmyslový Holding and the current owners of Eggborough coal-fired Power Station
Application	The Application for a Development Consent Order made to the Secretary of State under Section 37 of the Planning Act 2008 in respect of the Proposed Development, required pursuant to Section 31 of the Planning Act 2008

	because the Proposed Development is a Nationally Significant Infrastructure Project under Section 14(1)(a) and Section 15 of the Planning Act 2008 by virtue of being an onshore generating station in England or Wales of 50 Megawatts electrical capacity or more.
Application Site	The land corresponding to the Order Limits that is required for the construction; operation and maintenance of the Proposed Development.
ATC	Automatic Traffic Count – a count of vehicular or pedestrian traffic conducted along a particular road, path or intersection.
BAP	Biodiversity Action Plan – an internationally recognised program addressing threatened species and habitats, designed to protect and restore biological systems.
BAT	Best Available Techniques – the available techniques which are the best for preventing or minimising emissions and impacts on the environment. BAT is required for operations involving the installation of a facility that carries out industrial processes.
BAT-AELs	BAT-Achievable Emission Values. Achievable emissions values following the implementation of the best available techniques for preventing or minimising emissions and impacts on the environment.
BEIS	The Department for Business, Energy & Industrial Strategy.
BGL	Below Ground Level
BGS	British Geological Survey – provider of objective and authoritative geoscientific data, information and knowledge for the UK.
BMV	Best and most versatile agricultural land – the most flexible land in terms of the range of crops that can be grown, the level and consistency of yield and the cost of obtaining it.
BREFs	Best Available Techniques (BAT) reference documents (BREFs) - a series of reference documents covering industrial processes, their respective operating conditions and emission rates.
BRES	Business Register and Employment Survey – the official source of employee and employment estimates by detailed geography and industry.
BRP	Bat Roost Potential – An assessment to determine the potential for a bat roost at a site.
BS	British Standard – business standards based upon the principles of standardisation recognised inter alia in European Policy.
BTEX	An acronym that stands for benzene, toluene, ethylbenzene and xylenes. These compounds are some of the volatile organic compounds found in petroleum derivatives such as petrol.
CAA	Civil Aviation Authority – the UK's specialist aviation regulator.
CABE	The Chartered Association of Building Engineers – professional body for building engineers in the United Kingdom and overseas.
CC	Climate Change
CCCW	Closed Cycle Cooling Water System – a technology used to provide the necessary heat rejection for steam electric power plants.
CCGT	Combined Cycle Gas Turbine – a highly efficient form of energy generation technology. An assembly of heat engines work in tandem using the same source of heat to convert it into mechanical energy which drives electrical generators and consequently generates electricity.
CCR	Carbon Capture Ready - A power station is Carbon Capture Ready where it has

	been demonstrated that: sufficient space is available on or near the site to accommodate carbon capture equipment in the future; retrofitting carbon capture technology is technically feasible; that a suitable area of deep geological storage exists for the storage of captured CO ₂ ; transporting CO ₂ to the storage location is technically feasible and CCS is likely to be economically feasible.
CCS	Carbon Capture and Storage. An emerging technology that enables carbon dioxide produced by burning fossil fuels to be captured and permanently stored, usually in deep geological formations, removing up to 90% of the carbon dioxide that would otherwise be released to the atmosphere.
CCS	The Considerate Construction Scheme – a non-profit making, independent organisation founded in 1997 by the construction industry to improve its image.
CCTV	Closed-circuit television – use of video cameras to monitor a certain area.
CD&E	Construction, Demolition and Excavation.
CDM	Construction (Design and Management) Regulations 2007 – legal duties for safe operation of UK construction sites, including health and safety plans.
CEGB	Central Electricity Generating Board – Former British electricity industry regulator, from 1957 to privatisation in the 1990s.
CEMP	Construction Environmental Management Plan – a plan to outline how a construction project will avoid, minimise or mitigate effects on the environment and surrounding area.
CEMS	Continuous Emission Monitoring System – a tool to monitor flue gas for oxygen, carbon monoxide and carbon dioxide to provide information for combustion control in industrial settings.
CHP	Combined Heat and Power. A technology that puts to use the residual heat of the combustion process after generation of electricity that would otherwise be lost to the environment.
CIEEM	Institute of Ecology and Environmental Management – professional body for ecologists and environmental managers in the United Kingdom.
CifA	Chartered Institute for Archaeologists – a professional organisation for archaeologists working in the United Kingdom.
CIRIA	Construction Industry Research and Information Association – a member-based research and information organisation dedicated to improvement in all aspects of the construction industry.
CL	Critical Levels – the atmospheric concentrations of pollutants in the atmosphere above which adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge.
CLEA	Contaminated Land Exposure Assessment – a computer based application that combines information on the toxicity of soil contaminants with estimates of potential exposure by adults and children living, working and/or playing on land affected by contamination over long periods of time.
CLR	Contaminated Land Research – research surrounding contaminated land and its impacts.
CMS	Construction Method Statement – a means of controlling specific health and safety risks to help manage work and ensure the necessary precautions have been communicated to those involved.
CO	Carbon Monoxide – a colourless, odourless and tasteless gas slightly less

	dense than air.
CO ₂	Carbon Dioxide – an inorganic chemical compound with a wide range of commercial uses.
COMAH	Control of Major Accident Hazards – Regulations to ensure that businesses take all necessary measures to prevent major accidents involving dangerous substances.
COPA	Control of Pollution Act 1974 – an act to deal with a variety of environmental issues including waste on land, water pollution, abandoned mines, noise pollution and the prevention of atmospheric pollution.
COSHH	Control of Substances Hazardous to Health – a United Kingdom Statutory Instrument stating general requirements on employers to protect employees and other persons from the hazards of substances used at work by risk assessment.
CRCE	Centre for Radiation, Chemicals and Environmental Hazards – provider of radiological protection advice, services and training.
CROW	Countryside and Rights of Way Act – a United Kingdom Act of Parliament in England and Wales regarding public access to land.
CRT	Canals and River Trust
CRTN	Calculation of Road Traffic Noise – The statutory method for determining entitlement to sound insulation. Eligible schemes are put forward for consideration in accordance with set criteria.
DCLG	Department of Communities and Local Government – the UK department for communities and local government in England.
DCO	A Development Consent Order made by the relevant Secretary of State pursuant to The Planning Act 2008 to authorise a Nationally Significant Infrastructure Project. A DCO can incorporate or remove the need for a range of consents which would otherwise be required for a development. A DCO can also include rights of compulsory acquisition.
DCO Site	The site for which the DCO is sought. The Application Site.
DECC	Department for Energy and Climate Change – the UK government department responsible for issues regarding energy supply and climate change. This was replaced by the Department for Business, Energy & Industrial Strategy in July 2016.
DEFRA	Department of Food and Rural Affairs – government department responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the United Kingdom.
DEONI	Department of the Environment (Northern Ireland) – a devolved Northern Irish government department in the Northern Ireland Executive responsible for promoting sustainable development and seeking to secure a better and safer environment for everyone.
DETR	Department of the Environment, Transport and the Region – a government department created in 1997 and dissolved in 2001, replaced by the Department for Communities and Local Government.
DMBC	Doncaster Metropolitan Borough Council
DMRB	Design Manual for Roads and Bridges - a series of 15 volumes that provide standards, advice notes and other documents relating to the design, assessment and operation of trunk roads in the United Kingdom.
DO	Dissolved Oxygen – the amount of gaseous oxygen dissolved in an aqueous

	solution.
DTM	Digital Terrain Model - a topographic model of the bare Earth – terrain relief that can be manipulated by computer programs.
DWPA	Drinking Water Protected Area – areas of water abstraction (reservoirs/rivers/the ground) to provide water for people to drink.
EA	Environment Agency – a non-departmental public body sponsored by the United Kingdom government’s Department for Environment, Food and Rural Affairs (DEFRA), with responsibilities relating to the protection and enhancement of the environment in England.
EAL	Environmental Assessment Levels
EFT	Emissions Factor Toolkit –published by Defra and the Devolved Administrations to assist local authorities in carrying out Review and Assessment of local air quality.
EH	English Heritage (now Historic England) – a non-departmental public body of the British Government responsible for heritage protection and management of a range of historic properties.
EHO	Environmental Health Officer – practitioners responsible for carrying out measures for protecting public health, including administering and enforcing legislation related to environmental health.
EIA	Environmental Impact Assessment – a term used for the assessment of environmental consequences (positive or negative) of a plan, policy, program or project prior to the decision to move forward with the proposed action.
ELVs	Emission Limit Values – emission limit values based on the Best Available Techniques.
EMF	Electromagnetic fields – a physical field produced by electrically charged objects.
EMR	Electricity Market Reform - a government policy to incentivise investment in secure, low-carbon electricity. It aims to improve the security of Great Britain’s electricity supply and improve affordability of this supply for consumers.
EMS	Environmental Management System – the management of an organization’s environmental programs in a comprehensive, systematic, planned and documented manner.
EPH	Energetický A Průmyslový Holding (EPH) – the holding company of EP UK. EPH owns and operates assets in the Czech Republic, Slovak Republic, Germany, Italy, Hungary, Poland and the United Kingdom.
EPL	Eggborough Power Limited (The Applicant).
EPR	Environmental Permitting Regulations (EPR) – Regulations that came into force in 2008 combining Pollution Prevention and Control and Waste Management Licensing regulations.
EPS	Emissions Performance Standard – a way of setting a benchmark for the maximum amount of greenhouse gas emissions that can be emitted for a certain amount of electricity generated.
EPSM	European Protected Species Mitigation – in instances where projects are likely to have an impact on European Protected Species, mitigation must be undertaken and a licence granted by Natural England to provide a derogation to the law.
EP UK	EP UK Investments Ltd – a subsidiary company of EPH which acquired EPL in

	late 2014.
ERYC	East Riding of Yorkshire Council
ES	Environmental Statement – A report in which the process and results of an Environment Impact Assessment are documented.
ESA	Environmental Site Assessment - a report identifying potential or existing environmental contamination liabilities.
FGD	Flue Gas Desulphurisation – a set of technologies used to remove sulphur dioxide from exhaust flue gases of fossil-fuel power plants.
FGT	Flue Gas Treatment – treatment of flue gases to reduce or eliminate toxic and noxious emissions from all combustion-related processes.
Flood Zone 1	Land with an Annual Exceedance Probability of less than 0.1% risk from fluvial flooding.
Flood Zone 2	Land with an Annual Exceedance Probability of between 0.1% and 1% risk from fluvial flooding.
Flood Zone 3b	An area defined as the functional floodplain, that the area where water has to flow or be stored in the event of a flood. Land which would flood with a 1 in 20 (5%) annual probability or greater in any year, or is designed to flood in a 0.1% event should provide the starting point for designation of Flood Zone 3b.
FRA	Flood Risk Assessment - The formal assessment of flood risk issues relating to the Proposed Development. The findings are presented in an appendix to the Environmental Statement.
FWMA	The Flood and Water Management Act 2010 – guidance and information on flood risk management and surface water management.
Gas Connection Search Area	The area within which the gas connection for the Proposed Development is anticipated to be located – see Figure 2
GI	Green Infrastructure – a network contributing to solving urban and climatic challenges by building with nature, including storm water management, climate adaptation, less heat stress, more biodiversity, food production, better air quality, sustainable energy production, along with clean water and healthy soils.
GPA	Good Practice Advice – provision of information on good practice to assist local authorities, planning and other consultants, owners, applicants and other interest parties in implementing historic environmental policy in the National Planning Policy Framework (NPPF) and the related guidance given in the National Planning Policy Guidance (PPG).
GT	Gas Turbines – a type of internal combustion engine, featuring an upstream rotating compressor coupled to a downstream turbine, and a combustion chamber in between.
GW	Gigawatts – unit of power.
ha	Hectare – unit of measurement
HA	Highways Agency (now known as Highways England) – government owned company responsible for managing the road network in England.
HC	Hydrocarbons – an organic compound consisting entirely of hydrogen and carbon.
HCA	Homes and Communities Agency – non-departmental public body that funds new affordable housing in England.
HE	Historic England – an executive non-departmental body of the British Government tasked with protecting the historical environment of England.

HER	Historic Environment Record – information services that provide access to comprehensive and dynamic resources relating to the archaeology and historic built environment of a defined geographic area.
HGV	Heavy Goods Vehicle - Vehicles with a gross weight in excess of 3.5 tonnes.
HHRA	Human Health Risk Assessment – process to estimate the nature and probability of adverse health effects in humans who may be exposed to chemicals.
HIA	Health Impact Assessment – a process to evaluate the potential health effects of a plan, project or policy before its built or implemented.
HMSO	Her Majesty's Stationary Office – publisher of official documents and legislation.
HRA	Habitats Regulations Assessment – the assessment of the impacts of implementing a plan or policy on a Natura 2000 site.
HRSG	Heat Recovery Steam Generator – an energy recovery heat exchanger that recovers heat from a hot gas stream. It produces steam that can be used in a process (cogeneration) or used to drive a steam turbine (combined cycle).
HSI	Habitat Suitability Index – A scoring system developed as a means of evaluating habitat quality and quantity. It is a numerical index between 0 and 1 with 0 indicating an unsuitable habitat and 1 representing optimal habitat.
IAQM	Institute of Air Quality Management – the professional body for air quality experts in the UK.
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IDBs	Internal Drainage Boards – a type of operating authority with permissive powers to undertake work to secure clean water drainage and water level management within drainage districts.
IED	Industrial Emissions Directive, EU Directive 2010/75/EU – European Union Directive committing member states to control and reduce the impact of industrial emissions on the environment.
IEMA	Institute of Environmental Management and Assessment – professional body for environmental practitioners in the United Kingdom.
IMD	Index of Multiple Deprivation – UK government qualitative study of deprived areas in English local councils.
IPC	Infrastructure Planning Commission - A non-departmental public body responsible for the examining and in certain circumstances the decision making body for proposed nationally significant infrastructure projects (NSIPs) in England and Wales.
ISO	International Organization for Standardization – an international standard setting body composed of representatives for various national standards organisations.
JEP	Joint Environmental Programme – a programme of research into the environmental impacts of electricity generation funded by nine of the leading producers in the United Kingdom.
JSNA	Joint Strategic Needs Assessment – produced by the health and well-being board for the local authority area to determine the health and well-being needs of the local population.
km	Kilometre – unit of distance.
LAQM	Local Air Quality Management – the review and assessment of air quality by local authorities in the UK.

LCA	Landscape Character Area - Areas of homogenous landscape or townscape character. Typical components defining character include landform, land cover, settlement pattern, form and enclosure.
LCC	Leeds City Council
LCP	Large Combustion Plant – a combustion plant with a thermal capacity of 50 MW or greater.
LCT	Landscape Character Type – a form of landscape classification based on characteristics of the land.
LE	Life Expectancy – a statistical measure of the average time an organism is expected to live.
Limits of deviation	The lateral limits shown on the Works Plan(s) and the vertical limits (upwards and downwards) determined by reference to the section plan(s) submitted as part of the Application and within which the Proposed Development may occur.
LLFA	Lead Local Flood Authorities – authorities responsible for maintaining a register of structures and features likely to have a significant effect on flood risk in their area.
Local Nature Reserve (LNR)	A non-statutory site of local importance for wildlife, geology, education or public enjoyment.
LRF	Local Resilience Forum
LSOA	Lower Super Output Area – part of a set of geographies designed specifically for statistical purposes. They set boundaries to allow data monitoring over time. LSOAs have a smaller population than Middle Super Output Areas.
LTP	Local Transport Plan – A statutory transport plan for a local area covering a number of years (typically 5 years).
m	Metres – unit of distance.
Main Site	The proposed boundary of the land required for the Proposed Development (excluding the gas connection at this stage) – see Figure 2
MCZ	Marine Conservation Zone – A type of marine nature reserve in UK waters. They are areas designated with the aim to protect nationally important, rare or threatened habitats and species.
MOC	Minimum Offtake Connection.
MW	Megawatts – unit of energy.
NATA	New Approach to Appraisal
NAQS	National Air Quality Strategy Objectives – national air quality objectives and policy options to further improve air quality in the UK.
NCA	National Character Area – a natural subdivision of England based on a combination of landscape, biodiversity, geodiversity and economic activity.
NERC	Natural Environment and Rural Communities Act – act designed to help achieve a rich and diverse natural environment.
NEYEDC	North and East Yorkshire Ecological Data Centre
NHLE	National Heritage List for England – official and up-to-date database of all listed and designated heritage sites.
NO ₂	Nitrogen Dioxide – one of several nitrogen oxides.
NPPF	The National Planning Policy Framework – Policy Framework which came into effect on 27 March 2012 (with some transitional arrangements) replacing the majority of national planning policy other than NPSs. The NPPF is part of the Government's reform of the planning system intended to make it less

	complex, to protect the environment and to promote sustainable growth. It does not contain any specific policies on Nationally Significant Infrastructure Projects but its policies may be taken into account in decisions on DCOs if the Secretary of State considers them to be both important and relevant.
NPPF-TG	The National Planning Policy Framework – Technical Guidance
NPPG	National Planning Policy Guidance – guidance designed to supplement the NPPF. It includes statements of policy on nationally important land use and other planning matters and is thus a material consideration in planning decisions.
NPS	National Policy Statement – Statement produced by Government under the Planning Act 2008 providing the policy framework for Nationally Significant Infrastructure Projects. They include the Government’s view of the need for and objectives for the development of Nationally Significant Infrastructure Projects in a particular sector such as energy and are used to determine applications for such development.
NRMM	Non-Road Mobile Machinery - machinery typically used off the road, such as construction machinery.
NSIP	Nationally Significant Infrastructure Projects - Defined by the Planning Act 2008 and cover projects relating to energy (including generating stations, electric lines and pipelines); transport (including trunk roads and motorways, airports, harbour facilities, railways and rail freight interchanges); water (dams and reservoirs, and the transfer of water resources); waste water treatment plants and hazardous waste facilities. These projects are only defined as nationally significant if they satisfy a statutory threshold in terms of their scale or effect.
NTS	Non-Technical Summary – a summary of the Environmental Statement written in non-technical language for ease of understanding.
NYCC	North Yorkshire County Council
OCGT	Open Cycle Gas Turbine – a combustion turbine plant fired by liquid fuel to turn a generator rotor that produces electricity.
ODPM	Office of the Deputy Prime Minister
ONS	Office for National Statistics – UK’s largest independent producer of official statistics.
OS	Ordnance Survey – the national mapping agency for Great Britain.
PAH	Polycyclic aromatic hydrocarbons – hydrocarbons that are organic compounds containing only carbon and hydrogen.
PC	Process Contribution – represents the change caused by the Proposed Development.
PCBs	Polychlorinated Biphenyls – an organic chlorine compound.
PEA	Preliminary Ecological Appraisal (PEA) Report – report establishing baseline conditions and evaluating the importance of any ecological features present.
PEC	Predicted Environmental Concentration – PC plus background concentration.
PEI	Preliminary Environmental Information – an initial statement of the main environmental information available for a study area.
PEIR	Preliminary Environmental Information Report – a report outlining the preliminary environmental information.
PFA	Pulverised Fuel Ash – a by-product of pulverised fuel fired power stations.
PFRA	Preliminary Flood Risk Assessment – a high level screening exercise to identify

	potential flood risk locations.
PHE	Public Health England – an executive agency, sponsored by the Department of Health, to protect and improve the nation’s health and wellbeing and reduce health inequalities.
PIA	Personal Injury Accident – an incident to the body, mind or emotions.
PIG	Pipe Inline Gauging
PINS	Planning Inspectorate – executive agency of the Department for Communities and Local Government of the United Kingdom Government. It is responsible for determining final outcomes of town planning.
PLU	Primary Landscape Unit
PM2.5	Fine particulate matter
PM10	Particulate matter
Power Station site	The existing Eggborough Power Station site, comprising the land owned by EPL
PPE	Personal Protective Equipment
PPG	Planning Practice Guidance – guidance expanding upon and supporting the NPPF.
PPGN	Pollution Prevention Guidance Notes
PRoW	Public Right of Way
PWMS	Precautionary Working Method Statement
RBMP	River Basin Management Plan – sets out how organisations, stakeholders and communities will work together to improve the water environment.
RFC	Ratio of flow to capacity
ROV	Remotely Operated Valve – a valve designed, installed and maintained for the primary purpose of achieving rapid isolation of plant items containing hazardous substances in the event of a failure of the primary containment system.
RSS	Regional Spatial Strategy – provides regional level planning frameworks for the regions of England outside London.
SAC	Special Area of Conservation – High quality conservation sites that are protected under the European Union Habitats Directive, due to their contribution to conserving those habitat types that are considered to be most in need of conservation.
SBR	Supplemental Balancing Reserve – contracts established to ensure there are reserve power stations to be used in the unlikely event of a shortfall in generating capacity. These reserve power stations are usually those that would be otherwise be closed or mothballed.
SCR	Selective Catalytic Reduction – a means of converting nitrogen oxides with the aid of a catalyst into diatomic nitrogen and water.
SDC	Selby District Council
SFRA	Strategic Flood Risk Assessment
SGVs	Soil guideline values – developed by DEFRA and the Environment Agency as indicators of potential unacceptable risk.
SINCs	Sites of Nature Conservation Interest
SO ₂	Sulphur Dioxide
SoCC	Statement of Community Consultation
SoS	The Secretary of State. The decision maker for DCO applications and head of Government department. In this case the SoS for the Department for

	Business, Energy & Industrial Strategy (formerly the Department for Energy and Climate Change).
SPA	Special Protection Area – strictly protected sites classified in accordance with Article 4 of the EC Birds Directive. Special Protection Areas are Natura sites which are internationally important sites for the protection of threatened habitats and species.
SPZ	Source Protection Zone – a protected area, usually in relation to groundwater abstraction.
SSSI	Site of Special Scientific Interest - nationally designated Sites of Special Scientific Interest, an area designated for protection under the Wildlife and Countryside Act 1981 (as amended), due to its value as a wildlife and/or geological site.
SVOCs	Semi Volatile Organic Compounds – a subgroup of volatile organic compounds.
SWMP	Site Waste Management Plan (SWMP)
TA	Transport Assessment
TEMPRO	Trip End Model Presentation Program
TPH	Total Petroleum Hydrocarbons – a term used to describe hydrocarbon compounds derived from Petroleum Sources.
TS	Transport Statement – comprehensive review of all the potential transport impacts of a proposed development.
TTRO	Temporary Traffic Regulation Order – legal documents to allow the police or local authorities to temporarily enforce road restrictions to help traffic flow.
TTWA	Travel to Work Area – statistical tool used by UK Government agencies and local authorities to indicate an area where the population would generally commute to a larger town or city for employment purposes.
VOCs	Volatile Organic Compounds – chemicals that have a high vapour pressure at ordinary room temperature.
WCA	Wildlife Countryside Act – legislation for the protection of animals, plants and certain habitats in the UK.
WEEE	Waste Electrical and Electronic Equipment - a complex mixture of materials and components that because of their hazardous content, and if not properly managed, can cause major environmental and health problems.
WFD	Water Framework Directive – European Union directive which commits member states to achieve good qualitative and quantitative status of all water bodies.
WMDC	Wakefield Metropolitan District Council
WRAP	Waste and Resources Action Programme – a registered charity working with businesses, individuals and communities to help them reduce waste, develop sustainable products and use resources in an efficient way.
YW	Yorkshire Water
ZTV	Zone of Theoretical Visibility - a computer generated tool to identify the likely (or theoretical) extent of visibility of a development.

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1.0 INTRODUCTION

1.1 Background

- 1.1.1 This Preliminary Environmental Information (PEI) Report has been prepared on behalf of Eggborough Power Limited (EPL) (the Applicant) in relation to a proposed application (the Application) to be made to the Secretary of State (SoS) pursuant to the Planning Act 2008 (the Act), seeking an 'Order' granting development consent (a Development Consent Order, or DCO) for the construction and operation of a gas-fired power station, to be constructed on the site of the existing Eggborough coal-fired power station near Eggborough, North Yorkshire. The PEI Report presents the initial findings of an ongoing Environmental Impact Assessment (EIA) and is presented to inform the statutory (Stage 2) consultation process that EPL is carrying out.
- 1.1.1 The DCO would provide the necessary authorisations and consents for the construction, operation and maintenance of a new gas-fired power station of up to 2.5 gigawatts (GW) electrical output and associated development (together defined as the Proposed Development). The Proposed Development would be located on land largely within the existing Eggborough coal-fired power station site (and associated land within the ownership of EPL), although additional land will be required for the proposed cooling water and gas pipeline connections to the north of the existing coal-fired power station site. All the land required for the Proposed Development is referred to in the PEI Report as 'the Site'. All elements of the Proposed Development are entirely within the administrative boundary of Selby District Council, within North Yorkshire County.
- 1.1.2 This chapter is supported by Figure 1.1, provided in PEI Volume II, which illustrates the Site location.

1.2 The Applicant

- 1.2.1 EPL owns and operates the existing 2 GW coal-fired power station at Eggborough, and owns a significant proportion of the land required for the Proposed Development.
- 1.2.2 EPL was acquired by EP UK Investments Ltd (EP UK) in late 2014; a subsidiary of Energetický A Průmyslový Holding (EPH). EPH owns and operates energy generation assets in the Czech Republic, Slovak Republic, Germany, Italy, Hungary, Poland and the United Kingdom.

1.3 The Proposed Development

- 1.3.1 The Proposed Development comprises the construction and operation of a CCGT power station with a total capacity of circa 2.5 GW; comprising up to three high efficiency combined cycle gas turbines (CCGT) and associated steam turbines; and a gas-fired peaking plant and black start facility with a combined output capacity of up to 299 MW to be installed on the same Site. Subject to obtaining the necessary consents, construction is anticipated to start in early 2019 and be completed in 2022.
- 1.3.2 The Proposed Development will be located largely within the existing coal-fired power station site (and associated land within the ownership of EPL), with additional land required for the installation of an underground gas pipeline and associated Above Ground Installation (AGI) to connect the proposed power plant to the National Grid gas transmission network, and for part

of the underground pipeline for the cooling water connection to the River Aire. The Site extends to approximately 157 hectares (ha) and comprises land within the existing coal-fired power station site and land to the north associated with the cooling water and gas connections.

- 1.3.3 The location of the Site is shown in Figure 1.1 (PEI Report Volume II). The Site and its surroundings are described in Chapter 3: Description of the Site. A detailed description of the Proposed Development is provided in Chapter 4: The Proposed Development.
- 1.3.4 The Proposed Development will provide vital new energy infrastructure required to ensure security of electricity supply to the UK. High efficiency CCGTs, alongside a number of renewables technologies, will form part of a diverse energy mix that will replace ageing coal and nuclear power stations which are due to close over the next five to ten years (including the existing Eggborough coal-fired power station). The need that exists for the Proposed Development is outlined in Chapter 6: Need, Alternatives and Design Evolution of this PEI Report, which also describes the alternatives that have been considered during the evolution of the Proposed Development.
- 1.3.5 Environmental impacts arising from the Proposed Development are being studied systematically as part of the EIA process, and the initial results are presented within this PEI Report. The baseline for the assessment has been derived from measurements and studies in and around the Site. This is explained further in Chapter 2: Assessment Methodology, and in the methodology section of each technical assessment chapter.
- 1.3.6 The ongoing EIA process is considering impacts resulting from the enabling, construction, operation and decommissioning phases of the Proposed Development, and considers measures to eliminate, reduce or mitigate any significant adverse effects on the environment. It also identifies 'residual' impacts, defined as impacts remaining following the implementation of mitigation measures.
- 1.3.7 The EIA is also considering the potential cumulative impacts of the Proposed Development with other relevant known proposed or consented schemes, as outlined in Chapter 20: Cumulative and Combined Effects. An important scheme which is being considered within the cumulative effects assessment is the eventual demolition of the coal-fired power station. This is likely to take place while the Proposed Development is under construction and/or operational. Further details are set out in Chapter 20.

1.4 The DCO Process

- 1.4.1 The Proposed Development falls within the definition of a 'Nationally Significant Infrastructure Project' (NSIP) under Section 14(1)(a) and Sections 15 (1) and (2) of the Act as it is an onshore generating station (not generating electricity from wind) in England that will have a generating capacity greater than 50 MWe output. As such, a DCO is required to authorise the Proposed Development in accordance with Section 31 of the Act.
- 1.4.2 Consent for the Proposed Development will be granted by the SoS by way of a DCO. A DCO has the effect of granting consent for a development in addition to a range of other consents and authorisations, as well as removing the need for some consents (such as planning permission). Section 115 of the Act also provides that a DCO can include consent for '*associated development*', that is, development that is not part of but is associated with the NSIP. This may be development that supports the construction or operation of the NSIP, which helps to

address the impacts of the NSIP or is of a type normally brought forward with the particular type of NSIP (here the generating station).

- 1.4.3 An application for development consent is submitted to the Planning Inspectorate, acting on behalf of the SoS. Subject to the application being accepted, which will be determined within a period of 28 days following receipt of the application, the Planning Inspectorate will then examine it and make a recommendation to the relevant SoS, who then decides whether to grant a DCO.

1.5 The Purpose of the Preliminary Environmental Information (PEI) Report

- 1.5.1 This PEI Report has been prepared to satisfy the requirement of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended) ('the EIA Regulations'). 'Preliminary environmental information' is defined in the EIA Regulations as "*information referred to in Part 1 of Schedule 4 (information for inclusion in environmental statements) which (a) has been compiled by the applicant; and (b) is reasonably required to assess the environmental effects of the development (and of any associated development)*".
- 1.5.2 Planning Inspectorate Advice Note Seven (Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping) (Planning Inspectorate, March 2015) notes "*A good PEI document is one that enables consultees (both specialist and non-specialist) to understand the likely environmental effects of the proposed development and helps to inform their consultation responses on the proposed development.*"
- 1.5.3 In order to enable consultees to understand the likely environmental effects of the Proposed Development, this PEI Report presents preliminary findings of the environmental assessments undertaken to date. This allows consultees the opportunity to provide informed comment on the Proposed Development, the assessment process and preliminary findings prior to the finalisation of the DCO application and the Environmental Statement (ES). EPL is seeking the views of consultees on the information contained within this report, and there is opportunity within the process up to submission of the DCO application for both the EIA and the project design to have regard to comments received.
- 1.5.4 It should be noted that this PEI Report does not constitute a full ES, but rather presents the assessments completed as part of the EIA process to date. The various assessments are at differing stages of completion; however it is considered that the information presents sufficient preliminary environmental information to enable consultees to develop an informed view of the Proposed Development. Following statutory consultation on the preliminary environmental information and once the design is further developed; this PEI Report will be developed into a final ES taking into consideration comments raised during the consultation. The ES will be submitted as part of the suite of DCO application materials.
- 1.5.5 The information presented in this PEI Report describes the extent of the environmental assessment work undertaken to date based upon the information available. The design of the Proposed Development will continue to be refined and some baseline data are not yet available, although this is not material to understanding the potential impacts and effects of the Proposed Development at this stage. This PEI Report adopts a robust worst case assessment basis. As such it is not possible to present a complete impact assessment on each environmental topic, but instead this report depicts what the likely impacts are, based upon current information, and what work will be undertaken in the future to complete the

individual assessments for the final ES. Presentation of preliminary environmental information in this way also allows the EIA process to take account of comments received during the statutory consultation process.

- 1.5.6 Table 1.1 below summarises where the requirements of Part 1 of Schedule 4 of the EIA Regulations have been addressed in the PEI Report.

Table 1.1: Requirements of Part 1 of Schedule 4 of the EIA Regulations

Requirement	Where information is provided
A description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases.	Chapter 3: Description of the Site, Chapter 4: The Proposed Development and Chapter 5: Construction Programme and Management
A description of the main characteristics of the production processes, for instance, nature and quantity of the materials used.	Chapter 4: The Proposed Development
An estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc) resulting from the operation of the proposed development.	Chapter 4: The Proposed Development, Chapter 8: Air Quality, Chapter 9: Noise and Vibration, Chapter 11: Water Resources, Flood Risk and Drainage, and Chapter 12: Geology, Hydrogeology and Land Contamination
An outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant's choice, taking into account the environmental effects.	Chapter 6: Need, Alternatives and Design Evolution
A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.	Chapters 8-20 (technical assessments) Baseline Conditions sections
A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from: (a) the existence of the development; (b) the use of natural resources; (c) the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant of the	Chapters 8-20 (technical assessments) Likely Impacts and Effects sections

Requirement	Where information is provided
forecasting methods used to assess the effects on the environment.	
A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.	Chapters 8-20 (technical assessments) Development Design and Impact Avoidance and Mitigation and Enhancement Measures sections
A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.	Non Technical Summary
An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.	Chapters 8-20 (technical assessments) Limitations or Difficulties sections

1.6 The EIA Scoping Exercise

- 1.6.1 The Proposed Development falls within Schedule 1 of the EIA Regulations, and therefore constitutes 'EIA development'. As such an EIA is being undertaken and this PEI Report summarises the EIA work completed to date.
- 1.6.2 The issues that EPL considered the EIA needed to address were identified in the EIA Scoping Report submitted to the Planning Inspectorate in August 2016 (Appendix 1A (PEI Report Volume III)). The EIA Scoping Report was developed following initial consultation with a number of statutory consultees and was informed by the EIA team's experience working on a number of other power station projects, including those in the vicinity of the Site. The SoS' Scoping Opinion was received on 28th September 2016, including the formal responses received by the Planning Inspectorate from consultees (Appendix 1B (PEI Report Volume III)). Key issues raised in the Scoping Opinion are summarised at the start of each technical chapter of the PEI, and all issues are being considered during the EIA process.

1.7 Consultation

- 1.7.1 Consultation is integral to the preparation of DCO applications and to the EIA process. The views of consultation bodies and the local community serve to focus the environmental studies and to identify specific issues that require further investigation, as well as to inform aspects of the design of the Proposed Development. Consultation is an on-going process and the publication of this PEI forms an important part of that process.
- 1.7.2 The Act requires applicants for development consent to carry out formal (statutory) pre-application consultation on their proposals. There are a number of requirements as to how this consultation must be undertaken that are set out in the Act and related regulations:
- Section 42 of the Act requires the applicant to consult with 'prescribed persons', which includes certain consultation bodies such as the Environment Agency and Natural England, relevant statutory undertakers, relevant local authorities, those with an interest in the land, as well as those who may be affected by the development;
 - Section 47 of the Act requires the applicant to consult with the local community on the development. Prior to this, the applicant must agree a Statement of Community

Consultation (SoCC) with the relevant local authorities. The SoCC must set out the proposed community consultation and, once agreed with the relevant local authorities, a SoCC Notice must be published in local newspapers circulating within the vicinity of the land in question. The consultation must then be carried out in accordance with the final SoCC;

- Section 48 of the Act places a duty on the applicant to publicise the proposed application in the 'prescribed manner' in a national newspaper, The London Gazette, local newspapers circulating within the vicinity of the land and certain marine publications; and
- Section 49 places a duty on the applicant to take account of any relevant responses received to the consultation and publicity that is required by Sections 42, 47 and 48.

1.7.3 EPL is adopting a two stage approach to pre-application consultation on the Proposed Development. Stage 1 consultation (non-statutory consultation) was carried out during September / October 2016, and Stage 2 (statutory) consultation, which will commence at the same time as the publication of this PEI Report (in January 2017).

1.7.4 The issues that have been raised through consultation and how these have been considered and addressed within the design evolution of the Proposed Development and the EIA will be set out in the ES.

1.7.5 The pre-application consultation undertaken by EPL will also be documented within the Consultation Report that will form part of the DCO application. This will include a separate section on EIA related consultation as recommended within the PINS Advice Note (Advice Note 14) on the preparation of consultation reports.

1.8 References

Planning Inspectorate (2015) *Planning Inspectorate Advice Note Seven (Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping)*. Version 5, March 2015.

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3.0 DESCRIPTION OF THE SITE

3.1 Site Location

- 3.1.1 The Site (the proposed limits of the land to which the DCO would apply) comprises for the most part land within the boundary of the existing Eggborough coal-fired Power Station site at Eggborough, North Yorkshire, DN14 OBS (and associated land within the ownership of Eggborough Power Limited (EPL) (the Applicant)). The location of the Site is shown in Figure 1.1 (PEI Report Volume II).
- 3.1.2 This chapter is supported by Figures 3.1 and 3.2, provided in PEI Report Volume II, which illustrate the Site boundary and areas within the Site.

3.2 The Proposed Development Site

- 3.2.1 The Site extends to circa 157 ha in area. The full extent of the Site is shown on Figure 3.1 (PEI Report Volume II).
- 3.2.2 The Site lies entirely within the administrative areas of Selby District Council (SDC) and North Yorkshire County Council (NYCC).
- 3.2.3 As there are multiple components which together make up the Site, for ease of reference, the different areas of the Site are described as follows (see Figure 3.2), and discussed in turn below:
- Proposed Power Plant Site - the CCGT, peaking plant, black start facility and associated infrastructure within the existing coal stockyard area, and a small area to the north-east of the coal stockyard area;
 - Proposed Cooling Water Connections - from the Proposed Power Plant Site to the existing abstraction point located upstream of the weir at Chapel Haddlesey (non tidal) and to the existing outfall point located within the tidal section of the River at a meander known as Eggborough Ings;
 - Proposed Borehole Water Connections - there are two existing groundwater abstraction boreholes that are proposed to be used, one adjacent to the Eggborough Sports and Leisure Complex and one further south near the A19/ A645 Weeland Road roundabout, which would require new connections to the Proposed Development (although these would be partly along the routes of the existing pipelines to the existing coal-fired power station) (note that a towns main water connection (re-routed from the existing coal-fired power station's towns main water supply) is also proposed as back up in the event of failure of supply from the Proposed Borehole Water Connection, and this will be routed along the access road from Hensall Gate to the Proposed Power Plant Site);
 - Proposed Electricity Connection - from the Proposed Power Plant Site to the existing National Grid sub station within the existing coal-fired power station site;
 - Proposed Gas Connection and AGI - from the Proposed Power Plant Site to Feeder 29, the National Grid Transmission network, to the north of the Site at a point south-west of Burn village;
 - Proposed Construction Laydown area – within part of the existing coal-fired power station site; and
 - Proposed Carbon Capture and Storage Readiness (CCR) Land - land is required to be set aside for a potential future carbon capture plant, as per Section 4.7 of the Overarching

National Policy Statement (NPS) (EN-1) (Department of Energy and Climate Change, 2011). This is also within the part of the existing coal-fired power station site.

3.2.4 There are three potential access points to the Proposed Power Plant Site, which are referred to as:

- existing main entrance (off the A19 to the west of the Proposed Power Plant Site);
- Tranmore Lane entrance (off the A19 to the south of the existing main entrance, which crosses the existing private railway line, to the west of the Proposed Power Plant Site); and
- Hensall Gate entrance (off Wand Lane to the north of the Proposed Power Plant Site).

3.2.5 Whilst all three accesses may be required for the construction and operation of the Proposed Development, for the purposes of the assessments presented in this PEI Report it is assumed that HGV traffic during construction will use the Tranmore Lane entrance, while workers during construction will use the Hensall Gate entrance. This would leave the existing main entrance to the existing coal-fired power station available for traffic associated with other activities in the wider power station site (including decommissioning and demolition of the existing coal-fired power station). The Tranmore Lane and Hensall Gate entrances are also anticipated to be used during operation of the Proposed Development.

3.2.6 A number of points of access to the Proposed Gas Connection corridor (for construction) have also been identified:

- West Lane;
- the A19 in the vicinity of Burn Lodge Farm;
- the A19 at Whitings Lane (opposite Burn Lodge Farm);
- the A19 at Fox Lane;
- Millfield Road east of Chapel Haddlesey; and
- Wand Lane via existing tracks.

3.2.7 Access to the Proposed AGI during operation will be via West Lane.

3.3 Proposed Power Plant Site

3.3.1 The Proposed Power Plant Site currently comprises the existing coal-fired power station's main coal stockyard and associated rail loop. The Proposed Power Plant Site also includes a small area to the north-east of rail loop (see Figure 3.2 (PEI Report Volume II)). This land is all within EPL's land ownership.

3.3.2 Vegetation within the Proposed Power Plant Site is limited to a small area of trees at the north-east corner of the area, with the majority of the Proposed Power Plant Site comprising hardstanding, buildings/ structures associated with coal handling and bare ground. There are areas of tree planting around the Power Plant Site boundaries that help to screen the Site from off-site neighbours.

3.3.3 The Proposed Power Plant Site is bounded:

- to the north and north-west by the existing coal-fired power station buildings and structures;

- to the east and south by an earth embankment with existing tree planting (within the existing coal-fired power station site) and agricultural fields beyond (some of which, i.e. those immediately to the south and north-east of the existing coal-fired power station, are in the ownership of EPL);
- to the south-west by the Saint Gobain glass factory; and
- to the west by an agricultural field (Tranmore Farm, which is within the ownership of EPL).

3.3.4 Existing structures within the footprint of development within the Proposed Power Plant Site will be removed at the start of construction, including the majority of the railway loop and the coal handling equipment. The railway line into the Site will be retained to facilitate delivery of construction materials by rail if feasible. This will be discussed further in the final ES to support the DCO application.

3.4 Proposed Cooling Water Connections

3.4.1 The Proposed Cooling Water Connections will be via the existing coal-fired power station's abstraction and discharge points on the River Aire to the north of the Proposed Power Plant Site.

3.4.2 The abstraction point is located upstream of the weir at Chapel Haddlesey (non tidal) and the outfall point is located within the tidal section of the River at a meander known as Eggborough Ings (see Figure 3.2 (PEI Report Volume II)).

3.4.3 The existing pipework connecting the abstraction and discharge points to the current coal-fired power station is more than 50 years old and consequently will need to be replaced or upgraded for the Proposed Development. Where possible, the new water pipeline from the Proposed Power Plant Site will broadly follow the route of the existing pipework, through an agricultural field north of Wand Lane. It will then be directed across (and possibly along or alongside) Wand Lane to enter the existing coal-fired power station site in the vicinity of the Hensall Gate entrance (exact options in this area remain under consideration and the final routing will be determined prior to the DCO submission). Part of this route (where the pipeline crosses Wand Lane and potentially part of route in the field north of Wand Lane, depending on the final route selected) falls outside EPL's land ownership.

3.4.4 As outlined in Chapter 4: The Proposed Development, some works may be required within the River Aire to enable the abstraction point to meet ongoing legislative requirements (including the Eels (England and Wales) Regulations 2009) and also to replace and maintain the condition of the discharge point.

3.5 Proposed Borehole and Towns Main Water Connections

3.5.1 Raw water supply will be abstracted from existing boreholes within the existing Eggborough Power Station Golf Course and/ or near the A19/ A645 Weeland Road roundabout (both within EPL's land ownership). As a back-up towns main water will also be supplied to the Site as it is for the existing coal-fired power station.

3.5.2 The new pipework required to link these to the Proposed Power Plant Site will be routed through the existing Power Station to the Proposed Power Plant Site on land within EPL's ownership, following the route of the existing pipelines where possible (see Figure 3.2 (PEI Report Volume II)).

3.6 Proposed Electricity Connection

- 3.6.1 The Proposed Development will connect to the existing National Grid 400 kV sub station to the north-west of the Proposed Power Plant Site via below ground cables (see Figure 3.2 (PEI Report Volume II)), on land within EPL's ownership. A new sub station may be required within the Proposed Power Plant Site as part of this connection.

3.7 Proposed Gas Connection

- 3.7.1 The gas supply for the Proposed Development will be via a new connection to the National Grid Transmission gas network (Feeder 29) approximately 3.1 km to the north of the existing coal-fired power station site (note the pipeline length is longer, as it is not a straight line – see paragraph 3.7.3 below).
- 3.7.2 The Proposed Gas Connection route will connect to Feeder 29 at a new Above Ground Installation (AGI) to the south-west of Burn in the vicinity of West Lane, which will require a new access off West Lane.
- 3.7.3 From the AGI site the Proposed Gas Connection pipeline will be routed south-east across agricultural fields, crossing beneath the A19 south of the East Coast Main Line and north of Burn Lodge Farm, before heading south through agricultural land. The gas pipeline will cross Millfield Road to the east of Chapel Haddlesey, then cross more agricultural land (avoiding the archaeological feature at Hall Garths) heading south-west to cross beneath the River Aire at Eggborough Ings, to the west of the cooling water outfall point. The gas pipeline will then head south-west across another agricultural field, to the east of the cooling water connection pipelines, before reaching Wand Lane. The total pipeline length is approximately 4.7 km from the Proposed Power Plant Site to the Proposed AGI location.
- 3.7.4 There are currently two options for the route immediately north of Wand Lane under consideration (see Figure 3.1 (PEI Report Volume II) which shows a 'triangular' area of land north of Wand Lane). One option would be 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 alternative option (which is currently preferred for technical reasons as it would avoid right-angle bends in the pipeline (with less impact on gas pressure), minimise work within Wand Lane and minimise loss of trees north of Wand Lane) would be 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.
- 3.7.5 The land required for the Proposed Gas Connection AGI and gas pipeline is not within EPL's ownership, with the exception of a small section of land north of Wand Lane and the land within the existing coal-fired power station site.

3.8 Proposed Construction Laydown Area

- 3.8.1 The construction laydown area and contractors' compounds will be located within the existing coal-fired power station site to the north of the Proposed Power Plant Site (see Figure 3.2 (PEI Report Volume II)), on land within EPL's ownership. This land currently comprises a large

lagoon for back-up cooling water storage for the existing coal-fired power station, temporary offices, strategic (emergency) coal stockyard, access roads and open storage areas.

- 3.8.2 The existing Yorkshire Water waste water treatment works and Air Liquide air separation unit to the north are outside the Site boundary.

3.9 Proposed Carbon Capture and Storage Readiness Land

- 3.9.1 Some of the land required for CCGT construction laydown (and wholly within EPL's ownership) will be set aside following the completion of construction for a potential future carbon capture plant, as required by the CCR obligations for new generating stations. The footprint required for this facility will be determined based on Department for Energy and Climate Change (DECC) (now Department for Business, Energy and Industrial Strategy (BEIS)) guidance as amended by the Imperial College paper on space requirements for CCS (Imperial College Consultants/ Florin and Fennell, 2010), and this will be reported in the Carbon Capture Readiness Report that will accompany the DCO application. This land will remain in EPL's ownership and be managed such that it can be cleared and free to accommodate a carbon capture plant within two years of the capture equipment being required to be installed, as required by the DECC CCR Guidance (DECC, 2010).

3.10 The Surrounding Area

- 3.10.1 The area surrounding the existing coal-fired power station is generally rural, characterised by arable fields bounded by hedgerows, punctuated by a network of B and C roads and interspersed with small villages and farms. This is intersected north-south by the A19 (which lies to the west of the existing coal-fired power station) and by the East Coast Main Line (to the east of the existing coal-fired power station), and intersected east-west by the A645, Goole to Knottingley railway line, Knottingley and Goole Canal, and M62 (which all lie to the south of the existing coal-fired power station), and by the River Aire (to the north of the existing coal-fired power station).
- 3.10.2 The River Aire flows in a roughly north-west, south-east direction. At its closest point it is located approximately 650 m north/ north-east of the Proposed Construction Laydown Area and approximately 1.1 km north/ north-east of the Proposed Power Plant Site, at a meander known as Eggborough Ings. The Proposed Gas Connection passes under the River at this point, and the cooling water abstraction and outfall points are located on the River to the west and east respectively.
- 3.10.3 The village of Eggborough is located west of the A19, approximately 750 m south-west of the Proposed Power Plant Site, on the opposite side of the A19 to the existing A19/A645 Weeland Road borehole.
- 3.10.4 Gallows Hill is located approximately 350 m to the east of the Proposed Power Plant Site and the neighbouring village of Hensall is located approximately 940 m to the east/ south-east of the Proposed Power Plant Site (approximately 700 m to the east/ south-east of the Proposed Construction Laydown area).
- 3.10.5 Chapel Haddlesey is located on the opposite bank of the River Aire to the existing cooling water abstraction point and the westernmost property in Chapel Haddlesey is located approximately 80 m to the west of the Proposed Gas Connection corridor.

- 3.10.6 The village of Burn is located approximately 600 m to the north-east of the Proposed Gas Connection corridor and approximately 750 m east/ north-east of the Proposed AGI.
- 3.10.7 There are a number of other industrial developments in the vicinity of the existing coal-fired power station site, including Saint Gobain glass and insulation factory to the south-west, a car auctioning centre and several light industrial units on the west side of the A19 to the west and south-west.
- 3.10.8 Eggborough Power Station Golf Course, Sports and Social Club, cricket ground and model steam railway are located to the west of the existing coal-fired power station.
- 3.10.9 Given the Site's location, the nature and scale of the Proposed Development and the character of the surrounding area, no transboundary effects are predicted to arise from the Proposed Development that would affect any other European Economic Area state. No further consideration is therefore made in this PEI Report to transboundary effects.

3.11 Site History

- 3.11.1 There is a long history of power generation at the Site, extending back over 50 years. The existing coal-fired power station was consented in 1961 and construction started in 1962. It first began supplying electricity to the National Grid in 1967, with an official opening in September 1970.
- 3.11.2 The existing coal-fired power station was initially operated by the Central Electricity Generating Board (CEGB) but passed ownership onto a newly created company, National Power, in March 1991. It was then bought by British Energy in March 2000, which was subsequently bought out by EDF Energy in January 2009. As part of the EDF purchase process, Eggborough divested from EDF and became an independent business (Eggborough Power Limited) on 1st April 2010.
- 3.11.3 Historic Ordnance Survey (OS) maps have been studied to determine the previous land uses within the existing coal fired power station site and surrounding land as detailed in Table 3.1 below.

Table 3.1: Review of historical maps relating to the Site within the existing coal-fired power station site

Date	Onsite Land Use	Offsite Land Use
1852-1855	Agricultural land use.	Agricultural land use.
1891-1894	No significant changes.	Railway line approximately 750 m south of the Site; and Gravel pits approximately 750 – 900 m south of the Site.
1905-1908	No significant changes.	Gravel pit located approximately 500 m east of the Site; and Water works located adjacent to the west of the Site.

Date	Onsite Land Use	Offsite Land Use
1948-1950	Numerous sand and gravel pits located on site.	Water works adjacent to the eastern corner of the Site; and Additional sand and gravel pits from approximately 300 m south of the Site.
1955-1957	No significant changes.	No significant changes.
1973	Eggborough Power Station has been constructed, including railway line, ash tip, tanks, lagoons etc. Sewage works present in north-eastern corner.	The majority of previous sand and gravel pits are no longer shown.
1983	No significant changes.	No significant changes.
2002	No significant changes.	A works complex has been constructed adjacent to the southwest of the site (inferred to be the current glassworks and business park); Reservoir approximately 250 m south of the Site; and Depot and works approximately 600 m south of the Site.
2010	No significant changes.	No significant changes.
2014	No significant changes.	No significant changes.

3.11.4 The Proposed Cooling Water and Gas Connection routes are located primarily on agricultural land.

3.12 Potential Environmental Sensitivities/ Receptors

3.12.1 When undertaking an EIA it is important to understand which receptors will be considered as part of the assessment.

3.12.2 Key receptors for each topic area have been identified as part of the assessment process and details are included in the relevant technical chapters (Chapters 8-20). A summary is also provided below.

3.12.3 Where distances are quoted in this PEI Report the distance is defined (unless otherwise stated) as the shortest distance between two described locations, for example from the closest point of the Site boundary to the closest point of a designated site boundary.

3.12.4 The EIA Scoping Report figures (Appendix 1A (PEI Report Volume III)) illustrate the key environmental considerations within the study area (the Site and surrounding areas).

Residential Receptors

3.12.5 The villages of:

- Gallows Hill and Hensall approximately 350 m and 940 m to the east of the Proposed Power Plant Site, respectively;
- Eggborough on the opposite side of the A19 to the borehole at the A19/ Weeland Road junction at the Site's south-western extent;
- Kellington approximately 1.7 km to the west of the existing coal-fired power station main entrance;
- Chapel Haddlesey, immediately north of the Proposed Cooling Water Connections abstraction point on the River Aire;
- West Haddlesey approximately 1.3 km to the west of the Proposed Cooling Water Connections abstraction point on the River Aire;
- East Haddlesey approximately 470 m to the east of the Proposed Gas Connection corridor; and
- Burn, approximately 600 m to the north-east of the Proposed Gas Connection corridor.

3.12.6 In addition, there are a small number of individual residential properties in close proximity to the Site, including:

- several properties surrounding the Hazel Old Lane/ Weeland Road junction, including Springfield Farm and Hazelgrove Farm and caravan park, all located approximately 500 m to the south of the Proposed Power Plant Site;
- a residential property at the Eggborough Sports and Leisure Complex, adjacent to one of the Proposed Borehole Connection points;
- two properties off the A19 near Roall Water Works opposite the Tranmore Lane entrance;
- Roall Hall Farm approximately 490 m to the north of the existing coal-fired power station main entrance;
- Haddlesey Manor approximately 110 m to the east of the Proposed Gas Connection corridor;
- Lodge Farm adjacent to a proposed temporary construction access point from the A19 and Fox Lane to the Proposed Gas Connection corridor;
- Burn Lodge Farm between the two potential temporary construction access points from the A19 to the Proposed Gas Connection corridor and 90 m to the south and south-west of the Proposed Gas Connection corridor; and
- Gateforth Grange approximately 350 m to the south-west of the Proposed Gas Connection corridor

3.12.7 Tranmore Farm farmhouse located immediately west of the Proposed Power Plant Site is within the ownership of EPL and is not currently occupied.

Designated Nature Conservation Sites

3.12.8 There are no Sites of Special Scientific Interest (SSSIs) within 5 km of the Site, the closest being Burn Closes SSSI approximately 6 km to the north of the Site and Forlorn Hope Meadows SSSI approximately 7 km south of the Site.

3.12.9 The River Derwent Special Area of Conservation (SAC) is located 9.5 km to the east of the Site. There are no Special Protection Areas (SPAs) or Ramsar sites within 10 km of the Site. Indirect

effects on the Humber Estuary SPA/ SAC/ Ramsar/ SSSI via the River Aire are considered in Chapter 10: Ecology and Nature Conservation.

Traffic and Transport Receptors

- 3.12.10 The A19 runs north-south along the western boundary of the existing coal-fired power station, linking to the M62 to the south and A63 to the north.
- 3.12.11 There are three Public Rights of Way (PRoW) within the Site:
- a short (less than 150 m long) footpath heading east off the A19 along the north side of the Tranmore Lane entrance (North Yorkshire County Council reference 35.27/6/1)
 - a footpath linking Chapel Haddlesey Weir to Gallows Hill to the south-east crossed by the Proposed Gas Connection and Cooling Water Connections corridors (North Yorkshire County Council reference 35.27/1/1); and
 - a bridleway east of the A19 opposite Burn Lodge Farm, which crosses the railway line and loops back to the A19 at Blossom Hill, south of Burn, which is crossed by the Proposed Gas Connection corridor (North Yorkshire County Council reference 35.14/4/1).
- 3.12.12 The Proposed Gas Connection corridor crosses Wand Lane, Millfield Road to the east of Chapel Haddlesey, the A19 to the east of Burn Lodge Farm, and West Lane to the south-west of Burn.

Hydrology/ Flood Risk, Geology and Hydrogeology

- 3.12.13 The River Aire is located adjacent to the Cooling Water Connection points, is crossed by the Proposed Gas Connection at Eggborough Ings and is approximately 650 m north/ north-east of the Proposed Construction Laydown Area.
- 3.12.14 Ings and Tetherings Drain is located approximately 360 m to the north of the Proposed Construction Laydown area and is crossed by the Proposed Cooling Water Connections and Proposed Gas Connection corridor south of Eggborough Ings.
- 3.12.15 The Calder Navigation (canal) is located approximately 1 km to the south of the Proposed Borehole Water Connection point at the A19/ A645 Weeland Road junction.
- 3.12.16 Selby Canal is located approximately 800 m to the west of the Proposed Cooling Water Connection abstraction point, and approximately 300 m west of the Proposed AGI.
- 3.12.17 Hensall Dyke is located immediately to the south-east of the Proposed Power Plant Site.
- 3.12.18 The Proposed Power Plant Site is located within Flood Zone 1. A small section of the Proposed Construction Laydown and Proposed CCR Land (currently within the emergency coal stockpile area) is located within an area identified as Flood Zone 3 on Environment Agency mapping. However recent Environment Agency flood modelling for the River Aire supported by topographical survey data shows that the location and extent of this Flood Zone 3 area are incorrectly identified on the Environment Agency mapping (the area at high risk of flooding is further north in the northern part of the Proposed Construction Laydown area and smaller in area). This is discussed further in Chapter 11: Water Resources, Flood Risk and Drainage and Appendix 11A (Flood Risk Assessment in PEI Report Volume III).

- 3.12.19 The Proposed Gas Connection passes through Flood Zones 1, 2 and 3, and the Proposed AGI is located in Flood Zone 2.
- 3.12.20 The Site is located within a nitrate vulnerable zone.
- 3.12.21 There are five historic and three authorised landfill sites within 500 m of the Site. Three of the historic landfills are located within the Site, which accepted inert and industrial waste. Further details are provided in Appendix 12A (PEI Report Volume III).
- 3.12.22 The Proposed Power Plant Site is located in a Groundwater Source Protection Zone three.

Cultural Heritage

- 3.12.23 A scheduled monument (Roman fort) is located approximately 600 m to the north-west of the existing coal-fired power station's main entrance on the A19.
- 3.12.24 A number of listed buildings/ structures are located in the vicinity of the Site, including:
- two Grade II structures to the east of the existing coal-fired power station – Pair Of Gate Piers To Roall House 250 m to the north-west of the existing coal-fired power station's main entrance on the A19, and a milestone 320 m north-east of the existing coal-fired power station's main entrance on the A19;
 - three Grade II and two Grade II* buildings in Hensall between 1 km and 1.5 km to south-east/ east of the Proposed Power Plant Site;
 - Grade II Temple Manor located approximately 1 km east of the Proposed Gas Connection corridor;
 - Grade II Tankards Bridge, Paper House Bridge and Selby Canal Paper House Bridge, which are all bridges over the Selby Canal, between 660 m and 1 km from the Proposed Gas Connection corridor.
- 3.12.25 There are no Conservation Areas within 5 km of the Site.
- 3.12.26 There are a number of non-designated heritage assets within and around the Site, including the existing coal-fired power station itself, and Hall Garth (a medieval moated site which is of schedulable quality) to the east of the Proposed Gas Connection corridor near Haddlesey Manor. The route of the Proposed Gas Connection has been routed and refined to avoid heritage assets where possible. Further details are provided in Chapter 13: Cultural Heritage.

Landscape

- 3.12.27 The Site is located entirely within the Humberhead Levels National Landscape Character Area, which is a *"flat, low-lying and large scale agricultural landscape"* (Natural England, 2014a). More details of the landscape surrounding the Site are provided in Chapter 16: Landscape and Visual Amenity.

3.13 References

Department of Energy and Climate Change (2009) *Carbon Capture Readiness (CCR) A guidance note for Section 36 Electricity Act 1989 consent applications*

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

Imperial College Consultants/ Florin and Fennell (2010) *Assessment of the validity of "Approximate minimum land footprint for some types of CO₂ capture plant" provided as a guide to the Environment Agency assessment of Carbon Capture Readiness in DECC's CCR Guide for applications under Section 36 of the Electricity Act 1989*.

Natural England (2014a) *National Character Area 39 – Humberhead Levels*. Natural England, Worcester.

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4.0 THE PROPOSED DEVELOPMENT

4.1 Introduction

- 4.1.1 The Proposed Development comprises a gas-fired power station which will generate up to 2.5 gigawatts (GW) of electrical output, including a Combined Cycle Gas Turbine (CCGT) Power Station and a 'fast response' gas-fired peaking plant of up to 299 MW electrical output.
- 4.1.2 The design of the Proposed Development incorporates a degree of flexibility in the dimensions and configuration of buildings to allow for the selection of the preferred technology and contractor.
- 4.1.3 In order to ensure a robust assessment of the likely significant environmental effects of the Proposed Development, the Environmental Impact Assessment (EIA) has been undertaken adopting the principles of the 'Rochdale Envelope' where appropriate, as described in the PINS advice note 9 (Planning Inspectorate, April 2012). This involves assessing the maximum (and where relevant, minimum) parameters for the elements where flexibility needs to be retained. Where this approach is applied to the specific aspects of the EIA, this has been confirmed within the relevant chapters of this Preliminary Environmental Information (PEI) Report. Justification for the need to retain flexibility in certain parameters is also outlined.
- 4.1.4 Figure 3.2 (PEI Report Volume II) shows the areas within which each element of the Proposed Development is anticipated to be constructed. It is likely that the stack will remain positioned in the location indicated, to allow appropriate assessment.
- 4.1.5 Outline timescales for the construction and operation of the Proposed Development assumed for the purposes of assessment are as follows:
- it is currently anticipated that (subject to consents being granted, and an investment decision being made) work on site could commence in early 2019 and will consist of approximately three years of construction work. The construction phase is therefore anticipated to be completed in 2022; and
 - the Proposed Development is expected to commence commercial operation in 2022.
- 4.1.6 Construction of the Proposed Development is detailed in Chapter 5: Construction Programme and Management, which also includes information on the potential timing of (the separate) demolition activities on the existing coal-fired power station.
- 4.1.7 It is envisaged that the Proposed Development will have a design and operational life of at least 25 years and so eventual decommissioning of the CCGT is currently anticipated to commence after 2047.
- 4.1.8 This chapter is supported by Figures 4.1a and 4.1b, provided in PEI Report Volume II.

4.2 Components of the Proposed Development

- 4.2.1 This section provides further detail on the components of the Proposed Development within the DCO application boundary, referred to in this PEI Report as 'the Site'.
- 4.2.2 The Proposed Development will comprise a CCGT power station with electrical output capacity of 2.5 GW and associated buildings, structures and plant, including:

- up to three CCGT units each comprising a turbine hall, heat recovery steam generator (HRSG) and auxiliary buildings and enclosures, co-located exhaust stacks, deaerator and feed water pump building, air intake filter, electrical building(s), generator transformer(s), unit transformer(s), station transformer(s), chemical sampling/ dosing plant;
- cooling towers and cooling water pump house, cooling water treatment plant, storage basins and pipework;
- peaking plant housed in a dedicated building, comprising either open cycle gas turbines or around ten gas-fired reciprocating engines and associated exhaust stack(s) and generator transformer, as well as 'black start' gas turbine or gas engines, diesel generator, distillate (diesel fuel) storage tank and distillate unloading area, with a combined electrical output capacity of up to 299 MW;
- gas receiving area and gas compressor building;
- demineralised water treatment plant;
- demineralised water storage tank;
- fire fighting equipment and building;
- fire/ raw water storage tanks;
- emergency diesel generators;
- administration/ control building;
- gatehouse;
- car parking and cycle storage facilities;
- workshop and stores building;
- permanent plant laydown area;
- internal roadways;
- surface water drainage and storm water attenuation system
- security fencing;
- landscaping works;
- a new gas-insulated sub station adjacent to the CCGT and electrical cables to connect to the existing on-site National Grid 400 kV sub station;
- construction laydown area and contractors' temporary site compound, including construction workforce welfare facilities;
- gas supply pipeline and infrastructure to connect to the National Grid Transmission gas network;
- Above Ground Installation (AGI) at the gas connection point north of the Site, and associated maintenance building, gas metering, telemetry, dehydration and pressure reduction equipment, electrical cables, water supply and sewerage, security fencing, car parking and access;
- water pipelines and infrastructure to/from the River Aire (for cooling water supply and discharge);
- water pipelines from existing groundwater boreholes within the existing coal-fired power station site;
- towns water supply infrastructure;
- sewerage and drains; and
- alterations to the existing rail infrastructure within the Site to enable potential delivery of construction materials.

4.2.3 In accordance with the requirements of the Overarching National Policy Statement for Energy (NPS EN-1) (Department of Energy and Climate Change (DECC, 2011a) and NPS for Fossil Fuel Electricity Generating Infrastructure (NPS EN-2) (DECC, 2011b), the plant is being designed to be both Carbon Capture Ready and CHP Ready.

- 4.2.4 Land must be set aside for future carbon capture and compression equipment in order to meet the requirements set out in the EU Directive on the geological storage of carbon dioxide 2009/31/EC (European Commission, 2009) for the Proposed Development to be Carbon Capture Ready. Carbon capture plant will not form part of the DCO application, since its deployment is currently not viable in the UK, but an area of land has been allocated for it, which will be retained by Eggborough Power Limited (EPL) (the Applicant) as required. A Carbon Capture Readiness (CCR) report will be prepared for the Proposed Development and submitted to support the DCO application. The area set aside for CCR will initially be used for construction laydown for the Proposed Development.
- 4.2.5 A CHP Readiness assessment will be provided to support the DCO application. This will consider potential heat users in the vicinity and also the potential envelope for provision of CHP from the Proposed Development. At this stage no additional infrastructure is anticipated to be required although space has been retained within the indicative concept layouts to ensure the Proposed Development is CHP Ready.
- 4.2.6 Each part of the Proposed Development is described in further detail below. The maximum dimensions of each component are provided in Section 4.3 Design Parameters.

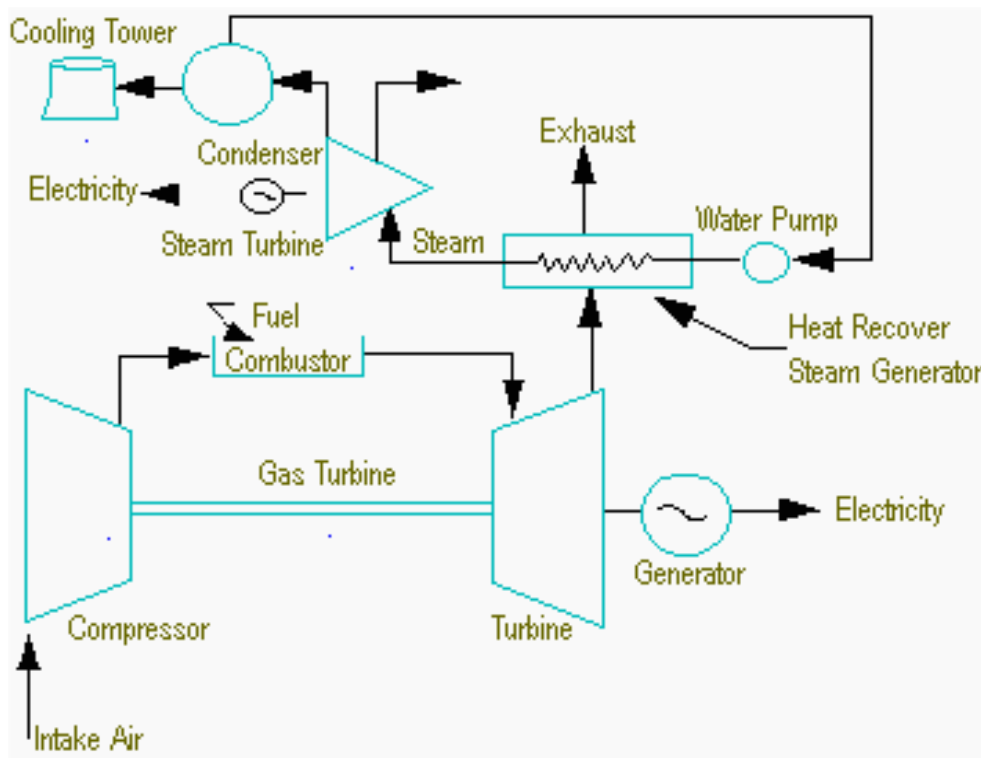
CCGT Power Generation Plant

- 4.2.7 In a CCGT power station natural gas fuel is fired in the gas turbine, which is connected to a generator producing electricity. An amount of heat remains in the gas turbine exhaust, and this is passed into an HRSG (a type of boiler) to make steam to generate additional electricity via a steam turbine. The exhaust steam from the steam turbine is condensed back into water which is returned to the HRSG to continue the process. The steam turbine may share the same generator as the gas turbine (termed 'single shaft' design), or the steam turbine may have its own generator (termed 'multi shaft' design).
- 4.2.8 The electrical efficiency of a modern CCGT power station is greater than 60%, which is considerably higher than that for a conventional coal, biomass or oil-fired generating plant.
- 4.2.9 The fuel source proposed for the turbines will be natural gas supplied via a new dedicated pipeline to the north, connecting to the National Grid gas transmission network.
- 4.2.10 The CCGT power station is anticipated to consist of up to three CCGT trains (gas turbines and associated HRSGs and steam turbine(s)).
- 4.2.11 There are some aspects of the Proposed Development design that have yet to be fixed. It will not be possible to fix these elements in advance of a contract being awarded for the detailed design and construction of the Proposed Development. For example, the scale of the buildings within the Proposed Development may vary depending upon the contractor appointed and their specific selection and configuration of the plant and process equipment. The design of the Proposed Development therefore needs to incorporate a degree of flexibility to allow for such circumstances.
- 4.2.12 In the gas turbine (within the turbine hall), gas will be mixed and combusted with compressed air and the hot combustion gases will expand, rotating the turbine blades at high speed. This will drive the generators to produce electricity for export to the National Grid electricity transmission system.

- 4.2.13 The hot exhaust gases from the gas turbine will then be passed through a heat recovery boiler (HRSG) to produce high pressure steam. This will in turn be used to drive a steam turbine connected to the generator; thereby maximising electricity generation from the fuel being combusted. The waste gases from the HRSG will be released into the atmosphere via exhaust stacks, following appropriate treatment.
- 4.2.14 The use of natural gas means that emissions of sulphur dioxide (SO₂) and particulates from the CCGT will be negligible. Emissions of nitrogen oxides (NO_x) will be controlled by primary means and the use of dry low NO_x burners operated and controlled through an automated process control system in accordance with Best Available Techniques (BAT). In this way, emissions will be controlled to meet the requirements of the Industrial Emissions Directive (IED). It is recognised that a revision to the European Large Combustion Plant BAT Reference document is being finalised and that this may affect determination of BAT and what emission levels are achievable from a new plant. The plant layout is therefore being designed to accommodate space for the future retrofit of secondary abatement of nitrogen oxide emissions to air (i.e. SCR) should that be necessary to be installed in the future.
- 4.2.15 Each generating module will have an individual stack, and the stacks from each unit are to be grouped together in one location (co-located). This potentially improves dispersion of the emissions from each unit. The height of each stack has been determined based on the findings of the air quality assessment. It is considered that stack heights of up to 90 m above the finished ground level will be used; it is proposed that the referenced height in mAOD will be fixed in the Draft DCO.
- 4.2.16 As the final technology selection has not been made, there are two potential plant configurations that could be utilised for the Proposed Development, termed 'single shaft' or 'multi-shaft'. Although they result in comparable electrical output, they do result in a slightly different mode of operation and appearance (see Figures 4.1a and 4.1b). It is proposed that the Rochdale Envelope approach is used to retain the flexibility to build either plant configuration. Both configurations have therefore been assessed in this PEI Report. In this way, the assessment of the worst case configuration is presented in each technical chapter, whichever configuration gives rise to that worst case predicted effect.
- 4.2.17 A single-shaft configuration (Figure 4.1a) consists of only one gas turbine, steam turbine, generator and HRSG per CCGT unit, with the gas turbine and steam turbine coupled to the same generator. The multi-shaft configuration (Figure 4.1b) includes two gas turbines and generators, but steam from both HRSGs is fed to a separate single steam turbine (with its own generator). Figures 4.1a and 4.1b presents an indicative concept layout for each option to illustrate the differences between these arrangements. For the CCGT, up to three single shaft trains would be installed (Figure 4.1a) or, alternatively, one multi-shaft unit and one single shaft unit (Figure 4.1b).
- 4.2.18 As outlined in the previous paragraph, the key environmental difference between the two configurations is their visual appearance, as a number of buildings are combined for the multi-shaft arrangement and there are differing numbers of generators and transformers, resulting in a slightly smaller footprint for the multi-shaft configuration.
- 4.2.19 Irrespective of plant configuration, the tallest structures on site will be the stacks associated with the CCGT units, which will be up to 90 m high. The tallest buildings will be the HRSG buildings, up to 50 m above the finished ground level.

- 4.2.20 A schematic of the power generation process associated with the Proposed Development is provided below in Plate 4.1.
- 4.2.21 To support the operation of the CCGT units, a number of ancillary operations are also required, including demineralised water treatment plant, water storage tanks, feed water pumps, air intake filters, generator transformers, unit transformer(s), station transformer(s), deaerator and feed water pump building, chemical sampling/ dosing plant. These are located close to the CCGT units as indicated in Figures 4.1a and 4.1b, noting that the concept layout is only indicative at this stage.

Plate 4.1: Power generation process (for a single shaft generating module) (taken from www.electrical-engineering-portal.com)



Cooling System

- 4.2.22 A cooling system is required to condense/ cool the steam used in the power generation process once it has been exhausted through the steam turbine, and before it is returned to the boiler for re-use.
- 4.2.23 Three types of methods for cooling are theoretically available for this type of plant – dry cooling, direct wet cooling, and hybrid cooling.
- 4.2.24 Dry-cooling technology consists of a system of air-cooled condenser fans situated in fan banks. The heat transfer characteristics of the air-cooled heat exchangers, and the fact that the air temperature is normally higher than water-cooled options, means that this arrangement is the least favourable arrangement from a generation efficiency point of view; this is particularly marked at higher ambient air temperatures. The fans also give rise to higher levels of noise than other cooling technologies. For these reasons, air cooling is not proposed for this plant. The loss of efficiency plus the availability of water from the River Aire – as used by the coal-

fired power station for 50 years – means that air cooling is not considered to represent Best Available Techniques (BAT).

- 4.2.25 Direct wet-cooling technology consists of high efficiency water-cooled condensers. It requires the abstraction of large quantities of water from an accessible water source and the discharge of warmer water back into the water source after it has been used for cooling. This method of cooling requires the use of (or construction of) an intake and outfall structure within an appropriate controlled water body. The main advantage of this cooling method is that it uses a colder cooling medium (river water as opposed to air) and avoids the electrical consumption of the fans used in air cooled condensers thereby improving the thermal efficiency of the fuel used. However, the abstraction and discharge of water can only be undertaken in locations and in a way that would not give rise to significant impacts on the water body and the environment.
- 4.2.26 Wet cooling towers can also be used for the plant. These take the water from a source such as the river in the same way as above, except that the heated water is cooled within a set of cooling towers before being returned to the water body. However some evaporation of the water also occurs, giving rise to visible plumes of water vapour while the CCGT is operational. The volume of water required to cool the CCGT in this way would be considerably lower than the current water abstractions for the existing coal-fired power station (less than half).
- 4.2.27 Hybrid-cooling technology is essentially a combination of dry-cooling and wet-cooling. Water must still be abstracted from a controlled water source but by using a bank of low height cooling cells a smaller volume of water needs to be abstracted than for direct water cooling or wet cooling towers. While the use of hybrid cooling cells can also give rise to visible water plume emissions to air under certain meteorological conditions, the system is designed to minimise visible plume formation. Hybrid cooling has a marginally lower plant thermal efficiency than direct water cooling, but is comparable to the use of wet cooling.
- 4.2.28 At this stage in the project design, the final cooling technology selection for the Proposed Development has not been made, but initial studies indicate that hybrid cooling or use of wet cooling towers represent the use of Best Available Techniques (BAT) for the installation, as these balance the environmental effects of the water abstraction and discharge against the efficiency improvements over the use of air cooling. This position has been discussed and agreed with the Environment Agency.
- 4.2.29 A cooling water dosing plant is required for direct wet or hybrid cooling to ensure cooling water abstracted from the River Aire meets the required quality standards for the system. A pump house with associated pipework will be required to pump the cooling water to the condenser and also to pump the purge water back to the River Aire.
- 4.2.30 The proposed cooling tower cells are indicated in Figures 4.1a and 4.1b. They are orientated in a line to maximise the effectiveness of the cooling.

Peaking Plant

- 4.2.31 A fast response peaking plant with a generating capacity of up to 299 MW is included as part of the Proposed Development. Fast response peaking plants are used to quickly increase or 'top up' the generating capacity of a generating station during periods of increased need by the National Grid. It is normally dormant and can be fired up at short notice to help cope with

periods of high demand or low supply nationally (for example, when the wind is not blowing to enable sufficient output to be achieved from the increasing number of wind farms in the UK).

- 4.2.32 There are two types of gas-fired peaking plant technologies that could be used – open cycle gas turbines (OCGTs) or reciprocating engines. Both are fast response units but each has its own advantages. At this stage of the design, the choice of technology for the peaking plant (between OCGT or reciprocating gas engines) cannot be fixed, however the peaking plant will be located within a dedicated building with a single stack (or several co-located stacks). For the purposes of the air quality and noise assessments, both technologies have been evaluated and the worst case potential environmental effects are reported in this PEI Report.
- 4.2.33 The largest commercially available reciprocating engine being considered is of the order of approximately 18 MWe, which would mean up to 15 engines may need to be installed to achieve the 299 MWe output; however no more than ten of these largest engines can be accommodated within the proposed peaking plant building. The exhaust flues from each engine would be ducted into a single co-located stack location.
- 4.2.34 If OCGT(s) are installed, the 299 MW capacity could be delivered by one or more units within the building, with one or more (co-located) stack(s). If the theoretical capacity of the OCGT units exceeds 299 MW, output will be restricted to that limit.
- 4.2.35 The combined installed capacity of the CCGT and the peaking plant may exceed the current export grid capacity limit of 2,136 MW. This is to allow flexibility to meet demand on the National Grid. The export capacity will be determined through agreement with National Grid, and it will not be possible to operate the combined CCGT and peaking plant to exceed the agreed export capacity (currently envisaged to be up to 2.5 GW).

Black Start

- 4.2.36 A black start gas turbine (or reciprocating gas engines) is also included as part of the Proposed Development. This will provide the capability of being able to start the CCGT units without any assistance from the National Grid electricity transmission system in the event of a total or partial shutdown of the UK transmission system (so called 'black-start' capability). Thereby the Proposed Development could then be used to help restart the UK transmission system, as power stations without black start capability need to draw power from the transmission system to start operation.
- 4.2.37 The inclusion of black start capability requires the use and storage of a small amount of distillate (diesel fuel) local to the black start building in addition to the use of natural gas during normal plant operation. Distillate will be stored in above ground tanks of less than 2 m³ capacity, and with an associated unloading area.
- 4.2.38 A black start event would be an infrequent event, during which time the black start facility would start operating on distillate fuel and then switch to natural gas firing. This process is estimated to take less than half an hour and would therefore be a short-term, infrequent event.

Gas Reception Facility

- 4.2.39 A gas receiving station will be installed on the Proposed Power Plant site. This is required to receive the natural gas fuel from the Proposed Gas Connection pipeline and to treat and

depressurise it in advance of using it as fuel in the Proposed Development. Treatment will include dehydration, filtering and odourising of the natural gas. A 'pigging' facility will also be included, which allows a 'Pipeline Inline Gauge' (PIG) to be passed along the pipeline for periodic cleaning and maintenance checks.

Water Treatment Plant and Demineralised Water Storage Tank

- 4.2.40 The water abstracted from the groundwater boreholes, and also the towns water, will need to be treated onsite in a water treatment plant to demineralise the water suitable for use in the boiler and for other uses. There are various treatment plant possibilities, the choice being made by the chosen Contractor.

Fire Fighting Equipment and Fire/ Raw Water Storage Tanks

- 4.2.41 The fire protection strategy for the Proposed Development will be developed to comply with the requirements of the Building Regulations 2010 and the Building Regulations and Fire Safety Procedural Guidelines (Department of Communities and Local Government, 2007). Appropriate standards will also be referenced to provide the necessary fire safety design. Additional fire protection will be provided with reference to British Standards.
- 4.2.42 Fire fighting equipment will be housed in a dedicated building/ container. In case of a fire, the connection to the surface water drainage system will be closed and surface run-off (fire fighting and rain water) will be contained within the Site. Water from the fire water tank will be used to suppress the fire until the arrival of the emergency services.

Emergency Diesel Generators

- 4.2.43 Diesel generators will be required to ensure power is available in the event of fuel supply interruption and power failure to the site and to enable safe shut-down of the plant in such a scenario. Up to three emergency diesel generators will be included, one for each CCGT unit. The capacity of these generators is expected to be relatively small, of the order of 2-10 MW, and will only be required as backup during a power failure onsite.
- 4.2.44 Distillate (diesel fuel) will be stored locally to the emergency diesel generators in above ground bunded tanks of less than 10 m³ total storage capacity.

Administration/ Control Building(s)

- 4.2.45 The administration/ control building(s) will contain the main reception, offices, control room, station electrical equipment and staff welfare facilities.

Gatehouse

- 4.2.46 Gatehouses will be located at the entrances to the Proposed Power Plant Site. The existing gatehouses may be re-used.

Car Parking and Cycle Storage

- 4.2.47 The Proposed Development parking arrangements consist of dedicated staff/ visitor and operatives car parks accessed via the Tranmore Lane or Hensall Gate entrances. Car parks will be surfaced and provided with oil interceptors.

Workshop and Stores Building(s)

- 4.2.48 Workshop and stores building(s) will be required for operation and maintenance activities and storage of materials.

Permanent Plant Laydown

- 4.2.49 A permanent laydown area will be required for operation and maintenance activities.

Internal Roadways

- 4.2.50 Internal roadways will be required for access within the Site. These will be hard surfaced with appropriate drainage systems to manage surface water runoff and pollution risk.

Surface Water Drainage and Stormwater Attenuation

- 4.2.51 An Outline Drainage Strategy is included as Annex 5 to the Flood Risk Assessment (Appendix 11A in PEI Report Volume III).

Security Fencing

- 4.2.52 Security systems will be provided in respect of the Proposed Power Plant Site and Proposed AGI Site. This will include paladin (or similar) fencing, intruder alarms and turnstiles for the Proposed Power Plant Site to manage people access.

Landscaping

- 4.2.53 A Biodiversity and Landscape Strategy will accompany the DCO application. This document will set out the principles of habitat creation, management and enhancement and landscape design that will be adopted in the detailed design process, as well as the areas of the Site retained for landscaping purposes.

Electricity Sub Station and Grid Connection

- 4.2.54 The Proposed Development will connect to the existing National Grid 400 kV sub station within the Eggborough Power Station site.
- 4.2.55 The connection between the CCGT plant and National Grid sub station will comprise below ground cables, currently anticipated to be within the route corridors indicated in Figure 3.2 (PEI Report Volume II).
- 4.2.56 A new gas-insulated sub station is included as part of the Proposed Development to connect the output from the proposed CCGT units and the peaking plant into the bays of the existing National Grid sub-station.

Construction Laydown Area and Contractors' Compound

- 4.2.57 Figure 3.2 (PEI Report Volume II) shows the area of land to be used for construction laydown and the contractors' compound. This area will be used for the unloading and storage of construction materials, site offices and welfare facilities, and parking. Some pre-fabrication of materials and components will also be undertaken.

- 4.2.58 The area will be underlain by crushed aggregate such that it is a level surface that allows surface water and rainwater to percolate through it; no hazardous materials will be stored unbunded within the laydown area.

Gas Supply Infrastructure and Above Ground Installation (AGI)

- 4.2.59 The gas supply for the Proposed Development will be via a new c. 4.7 km underground pipeline connection to the National Grid transmission gas network (proposed to connect to Feeder 29) approximately 3.1 km to the north of the existing coal-fired power station site. The preferred route for the gas connection has been determined following the identification of technical and environmental constraints and appraisal of three potential route corridors (which were themselves derived from a similar initial exercise).
- 4.2.60 The pipeline will be less than 1 m in diameter. Routing of the pipeline is discussed in Chapter 3: Description of the Site and shown on Figure 3.2 (PEI Report Volume II). The pipeline will mainly be installed through an open cut method whereby a trench will be excavated and the pipe laid approximately 1.2m below ground. The route also includes a number of special crossings underneath the River Aire and the A19. Construction methods are outlined in Chapter 5: Construction Programme and Management. An easement of c. 15 m will be required for the pipeline to allow access for maintenance during operation.
- 4.2.61 At the connection point to Feeder 29 to the west of Burn, a National Grid 'Above Ground Installation' (AGI) compound of up to 60 x 60 m will be required and an equivalent compound will be required adjacent to National Grid AGI compound for EPL's metering and equipment.
- 4.2.62 The National Grid compound will comprise:
- a Remotely Operated Valve (ROV) – required for remote isolation of the feed to the Proposed Power Plant Site for operation, maintenance or emergency isolation. This valve is controlled by National Grid;
 - ROV by-pass – to allow maintenance removal of the ROV whilst maintaining supply to the Proposed Power Plant Site;
 - pressurisation bridle – to allow safe pressurisation of the downstream system during start-up and following maintenance activities. The bridle also provides above ground pipework for connection of pressure instrumentation and sampling point;
 - instrumentation and electrical kiosk – small kiosk housing switchgear and instrument cabinets for local instruments and control valves; and
 - telemetry equipment – either a satellite link or hardwired connection with associated instrument panels located with the kiosk. The equipment will be used to share information from the AGI compound and allow control of equipment by National Grid operations.
- 4.2.63 EPL's compound will comprise:
- an isolation valve – the primary means of isolating the Proposed Development from the National Grid gas transmission network, which will be locally operated with no remote functionality;
 - an emergency shutdown valve – an automatic valve that will shut in the event of sudden de-pressurisation of the pipeline. Its primary function is to prevent the continuous loss of gas in the unlikely event of a major leak in the downstream pipework;

- PIG launcher – a facility for installing pipeline cleaning and inspection equipment;
- instrumentation and electrical kiosk – a small kiosk housing switchgear and instrument cabinets for local instruments and control valves; and
- telemetry equipment – this will be either a satellite link or hardwired connection with associated instrument panels located with the kiosk. The equipment will be used to share information from the AGI compound with the power station operators.

Water Supply Infrastructure

Cooling Water Abstraction and Discharge

- 4.2.64 Cooling water will be abstracted from the River Aire at the existing abstraction point on the south side of the River at Chapel Haddlesey, and discharged at the existing discharge point on the south side of the River at Eggborough Ings. The existing pipework and associated infrastructure in the River is likely to need to be upgraded or replaced as part of the Proposed Development, due to the age and condition of it. Additional works will also be required at the abstraction point to fulfil the obligations of the Eels (England and Wales) Regulations 2009, which may require the installation of an eel screen. As a 'worst case' in terms of potential environmental impacts the EIA is assuming that a temporary coffer dam may need to be installed to enable construction works to take place in the River.
- 4.2.65 The volume of cooling water required for the Proposed Development will be less than half of the abstraction currently required for the existing coal-fired power station due to the increased efficiency of the CCGT plant.

Groundwater Abstraction

- 4.2.66 Groundwater is likely to be used for the supply of raw water to the plant. One of the two existing boreholes are likely to be used. Raw water will be stored in an above ground tank.

Towns Water Supply

- 4.2.67 In the event that there is an interruption to the groundwater supply, towns main water will be used as raw water.

Sewerage and Drains

- 4.2.68 Foul drainage will either be discharged to the Yorkshire Water waste water treatment plant (adjacent to the Site, to the north of the Proposed Construction Laydown area) or to a septic tank within the Site that will be emptied as required and tankered off site to a waste water treatment plant.
- 4.2.69 Alterations to Existing Rail Infrastructure
- 4.2.70 Although the majority of the existing rail loop will need to be removed to enable the Proposed Power Plant to be constructed, the Site will remain rail accessible for possible use during the construction period of the Proposed Development. The indicative concept layouts include space for a rail 'run around' to be created, which would allow trains to enter the Site via the existing private railway, load or unload materials and leave the Site via the same route.

- 4.2.71 For the purposes of the transport assessment (see Chapter 14: Traffic and Transportation) no allowance has been made for the delivery of construction materials by rail (in order to assess the 'worst case' construction road traffic impact), but the contractor will review options for the use of rail when sourcing construction materials.

Rights of Way and Access

- 4.2.72 It is anticipated at this stage that there will be up to three access points for vehicles during construction and operation: the existing access from Wand Lane; the existing main Power Station entrance from the A19; and the existing access from the A19 via Tranmore Lane (south of the main entrance). All three are capable of accommodating normal Heavy Goods Vehicle (HGV) traffic. Hensall Gate entrance is currently used by existing coal-fired power station contractors for maintenance and overhaul of the existing coal-fired power station.
- 4.2.73 Rail access into the Site will be maintained, but the majority of the railway loop will need to be removed to enable construction of the Proposed Development.
- 4.2.74 The pedestrian and cycle access to the Proposed Power Plant Site is anticipated to be via Tranmore Lane and Hensall Gate. The nearest bus stop is located on the A19, adjacent to the main site entrance.

Carbon Capture Readiness (CCR)

- 4.2.75 The carbon capture technology and transport of the CO₂ will not form part of the DCO application as the commercial deployment of carbon capture technology is not currently viable within the UK at this time. For the purposes of this DCO application and in accordance with legislative and policy requirements, carbon capture technology will be considered through preparation of a standalone supplementary report to the EIA that addresses the requirements of the DECC Carbon Capture Readiness (CCR) Guidance (DECC, 2009).
- 4.2.76 In accordance with CCR requirements, the Proposed Development will incorporate an area set aside for the potential future installation of carbon capture technology. It is recognised that technological progress and developments in the regulatory framework for the use of carbon capture technology are likely to occur within the lifetime of the Proposed Development. Therefore, the design of the Proposed Development will be developed with consideration for the possible future retrofitting of carbon capture technology at some future date.
- 4.2.77 The CCR requirement means that applicants must demonstrate that carbon capture technology (of which there are three key types: pre-combustion capture, post-combustion capture and oxy-fuel combustion) has been considered as part of the application and that there is sufficient land available for the future retrofit of that technology in the event that it is commercially proven at some point in the future, i.e. that the Proposed Development is considered Carbon Capture Ready (CCR).
- 4.2.78 CCR needs to be demonstrable for all new combustion generating stations with a generating capacity at or over 300 MW of the same type of technology (and of a type covered by the European Union Large Combustion Plant Directive (European Commission, 2010) as set out in Section 4.7 of the Overarching National Policy Statement (NPS) (EN-1)). It will therefore apply to the CCGT units but not to the proposed peaking plant units.

- 4.2.79 The CCR Report will outline the footprint required for the carbon capture and compression equipment, based on DECC guidance as amended by the Imperial College paper on space requirements for carbon capture technology (Imperial College Consultants/ Florin and Fennell, 2010). It is likely that the area to be used for CCGT construction laydown will (at least in part) be retained for CCR purposes.
- 4.2.80 An appropriate route for the transport of compressed CO₂ will be considered, as well as a potential geological storage site and the high level economics of the feasibility of future retrofit of carbon capture technology to the Proposed Development.

Lighting

- 4.2.81 Lighting will be required for the safe operation of the Proposed Development during hours of darkness. A Lighting Strategy will be included with the DCO application.

4.3 Design Parameters

- 4.3.1 The design of the Proposed Development is being development using an iterative process based on preliminary environmental assessments, consultation with statutory and non-statutory consultees and engagement with contractors and equipment providers. Chapter 6: Need, Alternatives and Design Evolution describes this process further, including options that have been considered and discounted or amendments made to the concept design to date.
- 4.3.2 A number of the design aspects and features of the Proposed Development cannot be confirmed until the tendering process for the Design and Build contract has been completed, as for example the building sizes may vary depending on the contractor selected and their specific configuration and selection of plant. Focussed use of the Rochdale Envelope approach is therefore being adopted to define appropriate parameters.
- 4.3.3 Table 4.1 sets out the maximum building parameters. The finished ground level is not known but the proposed limits of deviation are approximately 7.7 mAOD to 9.9 mAOD. Maximum building heights are given in mAOD based on the upper limit finished ground level. Maximum lengths and widths of buildings are also provided.

Table 4.1: Main building dimensions

Component	Maximum length (m)	Maximum width (m)	Maximum height (m)	Maximum referenced height (mAOD)	Maximum footprint (m ²)
Turbine hall	76	76	30	39.9	5,776
Heat recovery steam generator (HRSG)	63	28	50	59.9	1,764
Stack(s) (each)	9.6 (diameter)		90	99.9	72.3
Feedwater pump building	64	23	20	29.9	1,472

Component	Maximum length (m)	Maximum width (m)	Maximum height (m)	Maximum referenced height (mAOD)	Maximum footprint (m ²)
Electrical building near HRSG	30	27	10	19.9	810
Electrical building near air intake filter	39	16	10	19.9	624
Generator transformer	30	24	15	24.9	720
Hybrid cooling towers (each)	240	27	30	39.9	6,480
Cooling water pumps	30	15	8	17.9	450
Gas receiving area	65	52	5	14.9	3,380
Workshop and stores	51	20	12	21.9	1,020
Electrical, control room and admin building	85	24	20	29.9	2,040
Water treatment plant, fire pumps and laboratory	57	33	20	29.9	1,881
Raw and fire water tank	25 (diameter)		20	29.9	490.6
Demineralised water tank	25 (diameter)		20	29.9	490.6
Air intake filter	24	16	30	39.9	624
Gas-insulated sub station	35	15	15	24.9	525
Diesel generators	19	9	8	17.9	171
Gatehouse (existing)	10	6	5	14.9	60
Waste water treatment plant	55	28	20	29.9	1,540
Combined cycle cooling water (CCCW) coolers	15	10	10	19.9	150

Component	Maximum length (m)	Maximum width (m)	Maximum height (m)	Maximum referenced height (mAOD)	Maximum footprint (m ²)
Peaking plant building	93	65	30	39.9	6,045
Auxiliary boiler	30	15	20	29.9	450
Blackstart facility	65	43	30	39.9	2,795
Cooling water dosing	7	6	8	17.9	42
Gas compressors	50	20	10	19.9	1,000
Cooling water electrical module	15	6	10	19.9	90
Continuous Emission Monitoring System (CEMS) container	10	3	3	12.9	30
Kiosks within AGI compounds	7	5	3	TBC	35

- 4.3.4 The location(s) and height of the CCGT stack(s) will be fixed in the draft DCO to ensure that the air quality assessment is robust and conservative. The proposed fixed parameters are shown in Table 4.2 below.

Table 4.2: Proposed fixed design parameters

Design aspect	Point that is fixed	Proposed fixed parameter
CCGT stack locations (co-located)	Centre point of each stack	Grid references 457600 423933 457593 423944 457587 423933
Stack height	Top of stack in mAOD	99.9 mAOD

4.4 Proposed Development Operation

Process Inputs

- 4.4.1 The Proposed Development will use a number of chemicals during operation. These are anticipated to include:

- water treatment chemicals (including sodium hypochlorite, hydrochloric acid, sodium hydroxide and trisodium phosphate);
- distillate fuel;
- ammonia or ammonia-based materials (if SCR is installed);
- cleaning chemicals;
- lubricating oils; and
- hydrogen for generator cooling.

Hours of Operation

- 4.4.2 The facility will be designed to operate 24 hours per day, 7 days per week with programmed offline periods for maintenance. The peaking plant is not envisaged to operate all the time; it is expected to operate for less than 20% of the year and only at peak times of national electricity demand.

Site Staff

- 4.4.3 It is anticipated that during the operational phase, the Proposed Development will generate approximately 70 full-time permanent jobs for the operation of the power station. This will be comprised of approximately 40 people that will be required on a shift basis to be spread over a 24 hour period, as well as around 30 corporate staff based at the site.
- 4.4.4 Temporary and contractor employees associated with maintenance activities will also be employed at the site as required.

Maintenance

- 4.4.5 Routine maintenance will be undertaken annually with major overhauls occurring approximately once every five years on each unit. These maintenance activities will require additional contractors to work on Site, in a similar way to the current maintenance of the exiting coal-fired power station. The contractors will access the Site via Hensall Gate or Tranmore Lane.

Hazard Prevention and Emergency Planning

- 4.4.6 EPL aims to protect human health by safely and responsibly managing site activity. A Health and Safety Plan covering the works, commissioning and operation of the Proposed Development will be written. Competent and adequately resourced Construction (Design and Management) (CDM) Coordinator and Principal Contractor will be appointed. EPL will ensure that its own staff, its designers and contractors follow the Approved Code of Practice (ACoP) laid down by the CDM Regulations 2015.
- 4.4.7 Written procedures clearly describing responsibilities, actions and communication channels will be available for operational personnel dealing with emergencies. Procedures will be externally audited and contingency plans written in preparation for any unexpected complications.
- 4.4.8 Depending on the volumes of hazardous materials stored on Site, a Hazardous Substances Consent (and if necessary a lower tier Control of Major Accidents and Hazards (COMAH)

licence) will be obtained. This will introduce additional hazard prevention and emergency planning procedures.

Environmental Management

- 4.4.9 The Proposed Development will comply with the Industrial Emissions Directive (IED) (European Commission, 2010) so that the impact of emissions to air, soil, surface and ground water, to the environment and human health will be minimised. Specific details regarding control of air emissions and a summary of emission limit values for the Proposed Development are set out in Chapter 8: Air Quality.
- 4.4.10 Sampling and analysis of pollutants will be carried out to appropriate standards (e.g. ISO, national, or international standards). Exhaust emission levels will be monitored by a Continuous Emissions Monitoring System (CEMS) and discharged through the stacks.
- 4.4.11 Noise levels will be regulated as defined in Section 72 of the Control of Pollution Act 1974 (amended 1989) and will conform to British Standard ISO 16283-1:2014 (British Standard Institute, 2014). A noise assessment for the Proposed Development is presented in Chapter 9: Noise and Vibration.

4.5 Decommissioning

- 4.5.1 The Proposed Development is expected to have a design life and operating life of 25+ years. At the end of its design life it is expected that the Proposed Development will have some residual life remaining and an investment decision would then be made based on the market conditions prevailing at that time. If the operating life were to be extended the Proposed Development would be upgraded and re-permitted in line with the legislative requirements at that time.
- 4.5.2 At the end of its operating life, the most likely scenario is that all above-ground equipment associated with the Proposed Development would be shut down and removed from the Site. Prior to removing the plant and equipment, all residues and operating chemicals would be cleaned out from the plant and disposed of in an appropriate manner.
- 4.5.3 The bulk of the plant and equipment would have some limited residual value as scrap or recyclable materials, and the contractor will be encouraged to use materials that could be recycled.
- 4.5.4 Prohibited materials such as asbestos, polychlorinated biphenyls (PCBs), ozone depleting substances and carcinogenic materials, will not be allowed within the Proposed Development, and other materials recognised to pose a risk to health (but which are not prohibited) will be subject to detailed risk assessment.
- 4.5.5 Prevention of contamination is a specific requirement of the Environmental Permit for the operation of the Proposed Power Plant Site and therefore it is being designed such that it will not create any new areas of ground contamination or pathways to receptors as a result of construction or operation. Once the plant and equipment have been removed to ground level, it is expected that the hard standing and sealed concrete areas will be left in place. Any areas of the Proposed Power Plant Site that are below ground level will be backfilled to ground level to leave a levelled area.

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- 4.5.6 A Decommissioning Plan (including Decommissioning Environmental Management Plan) would be produced and agreed with the Environment Agency as part of the environmental permitting and site surrender process. The Decommissioning Environmental Management Plan would consider in detail all potential environmental risks on the site and contain guidance on how risks can be removed or mitigated. This would include details of how surface water drainage should be managed on the Site during the decommissioning and demolition.
- 4.5.7 The Decommissioning Plan would include an outline programme of works. It is anticipated that it would take nine to twelve months to decommission the site, with demolition following thereafter.
- 4.5.8 During decommissioning and demolition, there would be an electrical demand, as well as requirement for office, accommodation and welfare facilities.
- 4.5.9 The Site closure sequence will be devised with reference to the following points:
- decommissioning and making safe: the sequence would consider how each part of the Proposed Development is isolated and the physical disconnection of feeds and services, including drainage. Careful thought would be given to the handling and management of materials and fluids that have a potential to present an environmental hazard. A permit to work system would be employed to ensure safe hand over of systems;
 - service re-routing: services may traverse decommissioned areas. If so, these would require an appropriate diversion. All redundant cabling would be removed and redundant drains and ducts filled;
 - management and monitoring of assets: access to decommissioned areas would be controlled to ensure that no unauthorised entry is gained. Access would only be granted for inspections and, where diversions are not possible, emergency egress. A programme of inspections would be prepared to ensure that the integrity of the decommissioned areas are maintained until final demolition is achieved;
 - demolition: specialist demolition may be required, e.g. the stack; and
 - remediation: if surveys indicate that the land quality has deteriorated because of operational activities then steps would be required to restore the land to its original condition as far as practicable.
- 4.5.10 The contractor (to be appointed by EPL) will have a legal obligation to consider decommissioning and demolition under the CDM Regulations 2015.
- 4.5.11 Decommissioning activities would be conducted in accordance with the appropriate guidance and legislation at the time of site closure. All decommissioning activities will be carried out in accordance with the waste hierarchy and materials and waste produced during site closure would be stored in segregated areas to maximise reuse and recycling. All materials that cannot be reused or recycled would be removed from site and transferred to suitably licensed waste recovery/ disposal facilities. It is anticipated that a large proportion of the materials resulting from the demolition will be recycled and a record will be kept to demonstrate that the maximum level of recycling and reuse has been achieved.
- 4.5.12 Upon completion of the decommissioning programme, including any remediation works that might be required, the Environment Agency will be invited to witness a post-decommissioning inspection by site staff. All records from the decommissioning process will be made available for inspection by the Environment Agency and other relevant statutory bodies.

4.6 References

British Standards Institute (2014) *BS EN ISO 16283-1:2014 - Acoustics. Field measurement of sound insulation in buildings and of building elements. Airborne sound insulation*. BSI. London.

Department of Communities and Local Government (2007) *Building Regulations and Fire Safety Procedural Guidelines*. DCLG, London.

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

European Commission (2010) *European Directive on Industrial Emissions 2010/75/EU*.

Imperial College Consultants/ Florin and Fennell (2010) *Assessment of the validity of "Approximate minimum land footprint for some types of CO₂ capture plant" provided as a guide to the Environment Agency assessment of Carbon Capture Readiness in DECC's CCR Guide for applications under Section 36 of the Electricity Act 1989*.

Planning Inspectorate (2013) *Advice Note 9 – Using the 'Rochdale Envelope'*. PINS. Bristol.

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5.0 CONSTRUCTION PROGRAMME AND MANAGEMENT

5.1 Introduction

- 5.1.1 This Chapter describes the approach to construction of the Proposed Development. Some details cannot be finalised until a contractor has been appointed, so estimates have been made based on experience of similar developments.

5.2 Construction Programme and Methods

- 5.2.1 Eggborough Power Limited (EPL) (the Applicant) will appoint a contractor for the main works phase. That contractor is then likely to appoint subcontractors to undertake all of the associated civil works. EPL is committed to ensure the safe working environment for all employees and contractors. A Construction Environmental Management Plan (CEMP) will be prepared by the contractor (a framework CEMP will also be prepared as part of the final ES to support the DCO application). This CEMP will set out the key measures to be employed during the main works phase to control and minimise the impacts on the environment.
- 5.2.2 The entire site preparation and construction programme is anticipated to take approximately 40 months from commencement to commissioning. The following diagram (Table 5.1) gives an indicative construction programme.

Table 5.1: Indicative construction programme

	2019				2020				2021				2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Demolition of ancillary structures																
Earthworks																
Main civil works																
Process works																
Gas connection/ AGI construction																
Commissioning																

Demolition and Earthworks

- 5.2.3 A small number of structures and buildings associated with the existing coal-fired power station are located within the footprint of the Proposed Power Plant Site and Proposed Construction Laydown area. Where possible, buildings within the Proposed Construction Laydown area will be re-used for the construction period, but all other buildings and structures, including the majority of the existing railway loop around the coal stockyard, will need to be demolished/ removed prior to the main civil and process works.
- 5.2.4 Earthworks may also be required to reprofile the Site, remove the coal layer, fill in the lagoon on the laydown area, excavate foundations and/or remove or remediate contaminated soils.

Construction Laydown Area

- 5.2.5 The contractor will provide temporary site facilities within the designated part of the Site (the Proposed Construction Laydown area) as shown on Figure 3.2. It is envisaged that the laydown area will be cleared, levelled and covered with hardstanding; it is likely that a permeable surfacing will be used that can accommodate storage of materials and placement of contractor cabins, but allows uncontaminated rain water to percolate to ground. Any hazardous or polluting materials or chemicals will be stored in separate bunded and controlled areas.

Spoil Storage

- 5.2.6 Excess spoil material generated during construction will be stored temporarily within the Site. If necessary suitable measures will be put in place to prevent sediment being washed off site, and the stockpiles will be monitored/ measured for wash away.
- 5.2.7 Soils will be managed in accordance with the Defra *Construction Code of Practice for the Sustainable Use of Soil on Development Sites* (Defra, 2009) to minimise impacts on soil structure and quality, and appropriate measures to minimise short term and long term impacts on land drainage will be discussed and agreed with each landowner (where relevant, principally the Proposed Gas Connection). These measures will be included in the Construction Environmental Management Plan (CEMP), a framework for which will be included as part of the DCO application.
- 5.2.8 The CEMP will incorporate measures to prevent an increase in flood risk during the construction works. For example, topsoil and other construction materials will be stored outside of the 1 in 100 year floodplain extent and only moved to the temporary works area immediately prior to use.

Main Civil and Process Works

- 5.2.9 The contractor will prepare and level the Proposed Power Plant Site, followed by piling and excavation for main foundations, e.g. stack, HRSG and turbine hall. The lighter buildings may be piled or have raft foundations.
- 5.2.10 Once the buildings are erected the contractor will commence the erection of plant, e.g. turbine hall crane(s), gas turbine, generator, steam turbine, HRSG, stack etc, with a stagger in between the units of approximately two months.

Construction of Gas Connection and Above Ground Installation

- 5.2.11 The gas connection and Above Ground Installation (AGI) will be constructed by EPL's contractor, coordinated with National Grid. The construction of the Minimum Offtake Connection from Feeder 29 and the National Grid AGI will be undertaken by a National Grid approved contractor.
- 5.2.12 The construction of the MOC will require stripping and storing topsoil and excavation to approximately 1 m below the depth of the existing gas main (Feeder 29) along a length of approximately 12 m (6 m either side of the connection point). A concrete pad and supports for the existing gas main either side of the connection point will then be installed together with a new 'tee' piece and construction valve. The existing gas main will then be drilled using

specialist pressure drilling equipment (whilst the gas main is in operation), and the construction valve will be closed until the new connection pipeline is completed.

- 5.2.13 The construction of the National Grid AGI will involve excavating (and shuttering where necessary) areas for installation of valve trains and connections between valve trains and the MOC and EPL compounds, installing valves and pipework, electrical and telemetry equipment. Following installation of below ground infrastructure, the area will be backfilled and excess soils will be used in the landscaping of the compound perimeter.
- 5.2.14 The construction of EPL's compound adjacent to the National Grid AGI will require excavation of a trench up to the interface with the National Grid AGI compound to allow installation of a swan neck to bring the pipework above ground for the Applicant's compound, and installation of valves and pipework, the Pipeline Inline Gauging (PIG) trap, and electrical and telemetry equipment. Following installation of below ground infrastructure, the area will be backfilled and excess soils will be used in the landscaping of the compound perimeter.
- 5.2.15 The construction of the National Grid and EPL compounds is expected to take approximately 9 months.
- 5.2.16 The majority of the gas pipeline connecting the AGI/ EPL's compound to the Proposed Power Plant Site will be constructed using an open cut method. A trench will be excavated and the pipe laid approximately 1.2 m below ground level. This will involve fencing off the works area, stripping and storing topsoil, excavating a trench and storing subsoil, laying and welding pipe sections together at grade level (pipe stringing), laying pipe in the trench, re-instating land drainage, and then backfilling subsoil, reinstating topsoil and re-planting to the original state as required.
- 5.2.17 The corridor width required for open cut pipeline construction is 36 m. This is the minimum working width that is required to facilitate ease of construction. This width allows topsoil and spoil to be excavated and stored adjacent to point of generation, stringing and welding of sections of pipe, access along the route, and laying of the pipe within the trench prior to backfilling.
- 5.2.18 Overall construction of the pipeline is likely to take circa 9 months although each section of the pipeline will only take around 3 months to install.
- 5.2.19 For special crossings, such as the crossing under the River Aire and the A19, 'no dig' construction techniques will be employed. Details of the method to be employed will be determined by the contractor, but it is considered most likely that horizontal directional drilling will be used to cross beneath the River Aire and auger boring will be used to cross beneath the A19. Additional land will temporarily be required either side of crossing points to allow for movement of additional plant; this land has been accounted for in the pipeline corridor shown in Figure 3.2.
- 5.2.20 The River Aire crossing is likely to take approximately 8 to 12 weeks to construct. A temporary works compound of approximately 100 x 70 m will be required at the drilling launch site and a temporary works compound of approximately 100 x 40 m will be required at the drilling exit site.

- 5.2.21 The A19 crossing is likely to take approximately 2 weeks to construct. A temporary works compound of approximately 75 x 50 m will be required at the boring launch site and a temporary works compound of approximately 75 x 25 m will be required at the exit site.

Construction of Water Connections

- 5.2.22 The Proposed Cooling Water Connections abstraction and discharge points are at the existing coal-fired power station cooling water abstraction and discharge points on the River Aire. The existing pipework and associated infrastructure in the River is likely to need to be upgraded or replaced as part of the Proposed Development, due to the age and condition of it (and also because the volume of water required to be abstracted and discharged for the Proposed Development will be much less than for the existing coal-fired power station, so infrastructure will need to be appropriately sized). Additional works will also be required at the abstraction point to fulfil the obligations of the Eels (England and Wales) Regulations 2009, which may require the installation of an eel screen. As a 'worst case' in terms of potential environmental impacts the EIA is assuming that a temporary coffer dam may need to be installed to enable construction works to take place in the River. Pipelines will be constructed using open cut methods.
- 5.2.23 Similarly the Proposed Borehole Connections utilise the existing groundwater abstraction borehole locations for the existing coal-fired power station, but due to the age and condition of the existing pipework and associated infrastructure it is likely to need to be upgraded or replaced as part of the Proposed Development. Pipelines will be constructed using open cut methods.
- 5.2.24 The towns water supply will be diverted within the Site from the existing coal-fired power station water supply. New pipelines will be constructed using open cut methods.

Construction Staff

- 5.2.25 On average, it is estimated that there will be around 500 construction personnel on the Site in any one day. It is estimated that there will be up to 1,200 personnel contracted to work on the Site at the peak of construction. This estimate is slightly higher than the estimate presented in the Stage 1 consultation material in September 2016 (which indicated around 800 construction staff at the peak of construction), and has been revised upwards based on experience of other similar developments and to ensure the traffic transport assessment (see Chapter 14 (Traffic and Transport)) is robust. The peak of construction activity is anticipated to be in around month 18.
- 5.2.26 Construction staff are anticipated to travel to the Site via the existing trunk road and local networks. EPL will seek to maximise sustainable transport options such as public transport, cycling and car share in accordance with its current practice and policy and this will be outlined in the Framework Construction Travel Plan that will be accompany the DCO application and secured through a Requirement in the DCO. (DCO Requirements are similar to planning conditions for planning applications.)

Construction Hours of Work

- 5.2.27 Construction working hours will generally be Monday to Friday 07:00 to 19:00 and Saturday 07:00 to 13:00, however it is likely that some construction activities will be required to be 24

hours at certain times. This is principally certain construction activities that cannot be stopped, such as concrete slip forming. Where on-site works are to be conducted outside the core hours they will comply with any restrictions agreed with the planning authorities, in particular regarding control of noise and traffic. 24 hour working for certain activities has therefore been assessed in Chapter 9: Noise and Vibration. It is also proposed that work may be carried out through the night so long as it does not cause existing ambient noise levels at sensitive receptors to be exceeded. Chapter 9: Noise and Vibration sets out specific mitigation and control measures required to prevent disturbance from night time construction activities.

- 5.2.28 Given the above, activities that could generate a noise nuisance will not be carried out at night, including but not limited to sheet piling, piling, use of impact wrenches, concrete scabbling, use of reversing sirens, and concrete jack hammering. A noise monitor will be installed at the boundary of the Site, with a night time noise limit to be used at this monitor during construction (limit to be agreed with Selby District Council). Lighting for night time working will be designed so as not to cause a nuisance outside of the site in relation to views from residential receptors or light disturbance to ecological receptors.

Construction Traffic/ Site Access

- 5.2.29 It is anticipated at this stage that there will be up to three access points to the Proposed Power Plant Site and Proposed Construction Laydown area for vehicles during construction: the existing access from Wand Lane (Hensall Gate); the existing main Power Station entrance from the A19; and the existing access from the A19 via Tranmore Lane (south of the main entrance). All three are capable of accommodating normal Heavy Goods Vehicle (HGV) traffic. The Hensall Gate entrance is currently used by power station contractors and maintenance staff especially during shutdowns of the existing coal-fired power station.
- 5.2.30 It is envisaged that HGV traffic during construction will use the Tranmore Lane entrance, while workers during construction are expected to use the Hensall Gate entrance. This would leave the existing main entrance to the existing coal-fired power station available for traffic associated with other activities in the wider power station site (including decommissioning and demolition of the existing coal-fired power station).
- 5.2.31 Access for construction of the Proposed Gas Connection and AGI will be via Wand Lane, Millfield Road (east of Chapel Haddlesey), Fox Lane (near Lodge Farm), the A19 (in the vicinity of Burn Lodge Farm, both east and west of the A19) and West Lane.

Storage of Construction Plant and Materials

- 5.2.32 There will be gravelled laydown areas positioned close to access roads on the Site where any materials will be unloaded and then transported to the area of works. It is not envisaged that these will be for long term storage of materials (storage will be for six months or less).
- 5.2.33 At the end of the shift, mobile plant will be returned to a secure overnight plant storage area where drip trays can be utilised under the various types of plant if needed.
- 5.2.34 Storage areas for flammable/ toxic/ corrosive materials will be located in a separate, locked, bunded and fenced off area. Material data sheets will be available for all these materials and the COSHH (Control of Substances Hazardous to Health) assessments kept within the relevant Risk Assessment for the task, all subject to EPL's approval.

Lighting

- 5.2.35 Construction temporary site lighting is proposed to enable safe working on the construction site in hours of darkness. Construction temporary lighting will be arranged so that glare is minimised outside the construction site. A Lighting Strategy will be prepared to support the DCO application, and will be secured through a Requirement in the DCO.

Wheel Wash Facilities

- 5.2.36 A self-contained wheel wash will be installed to be used by vehicles prior to exiting the Site onto the public highway.
- 5.2.37 For loads unable to use the fixed wheel wash, a localised wheel washing will be set up to cater for these individually and as required to ensure no detrimental effect to the highway.

Construction Environmental Management Plan (CEMP) and Site Waste Management Plan (SWMP)

- 5.2.38 EPL will require that the contractor produces and maintains a CEMP to control site activities to minimise any impact on the environment. This will include industry best practice measures, and specific measures set out in this document. A framework for the CEMP will accompany the Environmental Statement to support the DCO application.
- 5.2.39 In order to manage and monitor waste generated on Site, a framework Site Waste Management Plan (SWMP) will be developed as part of the framework CEMP, which will allow for waste streams to be estimated and monitored and goals set with regards to the waste produced. The CEMP and SWMP will be secured through a requirement in the DCO.
- 5.2.40 EPL will require that the contractor separates the waste streams on Site, prior to them being taken to a waste facility for recycling. All waste removal from Site will be undertaken by fully licensed waste carriers and taken to licensed waste facilities.

Commissioning

- 5.2.41 Commissioning of the Proposed Development will include testing and commissioning of the process equipment. This will involve both cold and hot commissioning.

5.3 Demolition

- 5.3.1 The existing coal-fired power station is anticipated to cease generation between 2017 and 2019, and demolition is anticipated to take approximately three years (starting 2018 at the earliest), so it is likely that the decommissioning and demolition of the existing coal-fired power station will take place at the same time as construction of the Proposed Development and/or the start of the Proposed Development's operational phase.
- 5.3.2 There is potential for cumulative effects associated with decommissioning and demolition to interact with the predicted effects of construction of the Proposed Development and these are assessed within this PEI Report.
- 5.3.3 Separate construction working zones in accordance with the Construction (Design and Management) Regulations 2015 will be defined for the Proposed Development construction

and existing coal-fired power station demolition in order to manage health and safety appropriately, and where one contractor needs to enter the other zone for set pieces of work, this will only be done with agreement between both contractors for the agreed tasks at an agreed time.

5.4 References

Department for Environment, Food and Rural Affairs (2009) *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites*

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6.0 NEED, ALTERNATIVES AND DESIGN EVOLUTION

6.1 Introduction

6.1.1 This chapter of the Preliminary Environmental Information Report (PEI) sets out the need for the Proposed Development and the alternatives considered for the Proposed Development as the design is evolving. 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 will continue to evolve to the point of the DCO application in response to consultation feedback and with reference to ongoing surveys and technical studies, and beyond the DCO application (within the design parameters set by the DCO).

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. Mitigation measures by design that have been included within 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 Environmental Statement (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 the EIA Regulations there is currently 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 PEI Report 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..."* 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 2017.
- 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, 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 (PEIR 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 hybrid 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.

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 (PEIR 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 PEI Report;
- 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' to enable rail access to the Site for the purposes of construction, and minor relocation of water tanks to allow space for this facility;
- small movement of the water treatment tank
- refinement of the layout to allow easier routing of exhaust ducts to the possible future carbon capture plant within the Proposed CCR Land.

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 (PEIR 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 has subsequently been refined to a width of circa 100 m (wider at crossing points), which includes temporary land requirements for construction access (see Figure 3.2 (PEIR Volume II)). This route is undergoing further evaluation with the intention to narrow the final construction corridor to around 36 m in working width for the DCO application.

As discussed in Chapter 3: Description of the Site, there are currently two options for the route between the River Aire and Hensall Gate. One option would be 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 alternative option (which is currently preferred for technical reasons as it would avoid right-angle bends in the pipeline (with less impact on gas pressure), minimise work within Wand Lane and minimise loss of trees north of Wand Lane) would be 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.

6.6 Consideration of Alternative Technologies

6.6.1 Although natural gas is proposed to 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.

- 6.6.2 At this stage, no option has been ruled out for the technology configuration, and further technical evaluation of the strengths of each option is under consideration. The intention remains to select the most efficient and flexible plant possible. Where the type of technology has the potential to materially change the environmental effects of the Proposed Development (i.e. air quality and noise emissions), the various options have been considered in this PEI Report and a worst case is presented – see Chapters 8: Air Quality and 9: Noise and Vibration.

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 already been determined include:

- the CCGT stacks will be co-located;
- the proposed co-located stack locations and height (see Chapter 4: The Proposed Development);
- up to three CCGT units will be installed;
- 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; giving a combined output capacity for peaking plant and black start of up to 299 MW.

- 6.7.3 Other aspects have not yet been determined so options have been included and assessed:

- whether a single shaft or multi-shaft configuration will be used;
- the manufacturer of the CCGT units and therefore the final dimensions of the proposed structures and buildings;
- the choice of peaking plant and black start plant technology (OCGT or reciprocating gas engines); and
- total output capacity of the CCGT and peaking plant units.

- 6.7.4 The Rochdale Envelope approach has been applied to address these options, which will need to be maintained within the DCO.

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.

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7.0 LEGISLATIVE CONTEXT AND PLANNING POLICY FRAMEWORK

7.1 Introduction

- 7.1.1 This chapter provides an overview of the legislative context for the Proposed Development and the planning policy framework against which it will be considered.

7.2 Legislative Context

- 7.2.1 The Planning Act 2008 (the 'Act') introduced a new system for consulting on, examining and determining 'nationally significant infrastructure projects' ('NSIPs') as defined by section 14 of the Act.
- 7.2.2 The main legislative and procedural requirements relating to NSIPs are set out within the following:
- The Act;
 - The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (the 'APFP Regulations'); and
 - The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (the 'EIA Regulations').
- 7.2.3 The Proposed Development falls within the definition of a NSIP under sections 14(1)(a) and 15(1) and (2) of the Act, being an onshore electricity generating station in England with a capacity exceeding 50 megawatts ('MW'). It also falls under Schedule 1 of the EIA Regulations, under the category of 'Thermal power stations and other combustion installations with a heat output of 300 megawatts or more'. As such, an Environmental Impact Assessment ('EIA') is required for the Proposed Development and an Environmental Statement ('ES') must be prepared in accordance with the EIA Regulations.
- 7.2.4 Before a NSIP can proceed, an application for a Development Consent Order ('DCO') must be submitted to The Planning Inspectorate ('PINS') pursuant to section 37 of the Act. PINS act on behalf of the relevant Secretary of State ('SoS'); in this case the SoS for Business, Energy and Industrial Strategy ('BEIS'). The PINS is responsible for examining the application and making a recommendation to the SoS who then makes the decision as to whether a DCO should be made authorising the construction and operation of the development in question. A DCO can provide for or remove the need to obtain a number of authorisations and consents (e.g. planning permission), meaning applicants do not need to make multiple consent applications. It can also provide powers of compulsory acquisition, enabling the acquisition of land or rights in land required to deliver the development.
- 7.2.5 In advance of an application for a DCO being submitted, the Act and related regulations require the applicant to consult widely. This includes consulting the local community - those living in the vicinity of the land to which the development relates; certain prescribed persons and bodies (including relevant technical consultees and statutory undertakers); relevant local authorities; and affected or potentially affected landownership interests and persons. The applicant must demonstrate how it has had regard to the responses received to the consultation in deciding the final form of development sought within the application for a DCO. This must be documented in a consultation report that is required to form part of the application under section 37 of the Act.

7.3 Planning Policy Framework

National Policy Statements

7.3.1 The Act grants the SoS power to designate statements as National Policy Statements ('NPSs') setting out policy relevant to the examination and determination of different types of NSIPs. Notably, where a NPS has effect in relation to a type of NSIP development (such as energy generation), section 104 of the Act requires the SoS to determine applications for NSIPs in accordance with the relevant NPSs, unless this would:

- lead to the UK being in breach of its international obligations;
- be in breach of any statutory duty that applies to the SoS;
- be unlawful;
- the adverse impacts of the development outweigh its benefits; or
- be contrary to any regulations that may be made prescribing other relevant conditions.

7.3.2 NPSs which have effect are therefore the primary (but not only) matter against which applications for NSIPs are judged. In taking decisions on applications for NSIPs, section 104 of the Act states that the SoS must also (in addition to the NPSs) have regard to appropriate marine policy documents, local impact reports (these are submitted by local authorities during the examination of DCO applications) and any other matters that the SoS considers to be both 'important and relevant' to their decision. Such matters can include local development plan documents.

7.3.3 In July 2011 the SoS for BEIS (then Energy and Climate Change) designated a number of statements as NPSs for energy infrastructure. These included an overarching NPS setting out general policies and assessment principles for energy infrastructure and a number of technology specific NPSs. Those NPS considered of most relevance to the Proposed Development are considered to be:

- the Overarching NPS for Energy (EN-1) ('EN-1') (Department for Energy and Climate Change (DECC), 2011a);
- the NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2) ('EN-2') (DECC, 2011b);
- the NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) ('EN-4') (DECC, 2011c); and
- the NPS for Electricity Networks Infrastructure (EN-5) ('EN-5') (DECC, 2011d).

7.3.4 Key policy in each of these is described below. Each technical topic chapter (Chapters 8 to 20 of this PEI Report) considers policy relevant to that topic, including that in the NPS.

The Overarching NPS for Energy (EN-1)

7.3.5 NPS EN-1 (DECC, 2011a), in conjunction with related technology specific NPSs, provides the primary basis for decisions by the SoS in relation to nationally significant energy infrastructure.

7.3.6 Part 2 of EN-1 sets out 'Government policy on energy and energy infrastructure development'. It confirms the following:

- the Government's commitment to meet its legally binding target to cut greenhouse gas emissions by at least 80% by 2050 compared to 1990 levels;

- the need to affect a transition to a low carbon economy so as to reduce greenhouse gas emissions; and
- the importance of maintaining secure and reliable energy supplies as older fossil fuel generating plant closes as a result of the European Union Emissions Trading System ('EU ETS') and the UK moves toward a low carbon economy.

- 7.3.7 Part 3 of EN-1 defines and sets out the need that exists for nationally significant energy infrastructure. Paragraph 3.1.1 states that the UK needs all the types of energy infrastructure covered by the NPS in order to achieve energy security at the same time as dramatically reducing greenhouse gas emissions. Paragraph 3.1.2 goes on to state 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.
- 7.3.8 Notably, paragraph 3.1.3 of EN-1 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 SoS should give substantial weight to the contribution that all projects would make toward satisfying this need when considering applications under the Act. As such, EN-1 is clear that the need that exists for new energy infrastructure is not open to debate or interpretation.
- 7.3.9 The urgency of the need for new electricity generating capacity is underlined by projections within EN-1 that indicate up to 22 gigawatts ('GW') of existing capacity will close over the period to 2020 in part due to the Industrial Emissions Direction but also as a result of some power station reaching the end of their operational lives (paragraph 3.3.7). In response to this, EN-1 identifies a minimum need for 59 GW of new generating capacity over the period to 2025 (paragraph 3.3.23).
- 7.3.10 Part 4 of EN-1 sets out a number of 'assessment principles' that must be taken into account by applicants, PINS and the SoS in (respectively) preparing, examining and determining applications for nationally significant energy infrastructure. General points include (paragraph 4.1.2), given the level and urgency of need for the infrastructure covered by the energy NPSs, the requirement for the SoS to start with a presumption in favour of granting consent for applications for energy NSIPs. This presumption applies unless any more specific and relevant policies set out in the relevant NPS clearly indicate that consent should be refused or any of the considerations referred to in Section 104 of the Act (noted above) apply.
- 7.3.11 Paragraph 4.1.3 goes on to state that in considering any application, and in particular, when weighing its adverse impacts against its benefits, the SoS should take into account:
- its potential benefits, including its contribution to meeting the need for energy infrastructure, job creation and any long-term or wider benefits; and
 - its potential adverse impacts, including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.
- 7.3.12 Paragraph 4.1.4 continues by stating that within this context the SoS should take into account environmental, social and economic benefits and adverse impacts, at national, regional and local levels.

- 7.3.13 Other assessment principles include the matters to be covered within the ES produced for the application; the Conservation of Habitats and Species Regulations 2010; the consideration of alternatives; criteria for 'good design'; consideration of the feasibility of combined heat and power; consideration of the requirements of the carbon capture readiness regulation; grid connection; climate change adaptation; pollution control and environmental regulatory regimes; safety; hazardous substances; health; common law and statutory nuisance and security, amongst others.
- 7.3.14 Part 5 of EN-1 lists a number of 'generic impacts' that relate to most types of energy infrastructure, which both applicants and the SoS should take into account when preparing and considering applications. These include land use; socio-economics; air quality and emissions; noise and vibration; dust, odour, artificial light, steam and smoke; traffic and transport; civil and military aviation; biodiversity and geological conservation; historic environment; landscape and visual; water quality and resources; flood risk and waste, amongst others. Paragraph 5.1.2 stresses that the list of impacts is not exhaustive and that applicants should identify the impacts of their projects in the ES in terms of both those covered by the NPSs and others that may be relevant. In relation to each of the generic impacts listed within Part 5 of EN-1, guidance is provided on how the applicant should assess these within their application and also the considerations that the SoS should take into account in decision-making.
- 7.3.15 In addition to a number of the assessment principles and generic impacts covered by EN-1, NPS EN-2, EN-4 and EN-5 set out the factors (e.g. those influencing site selection) and 'assessment and technology specific' considerations to be taken into account in the preparation and assessment of applications for fossil fuel generating stations, gas pipelines and electricity network infrastructure, including relevant environmental matters. These are considered briefly below.

The NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2)

- 7.3.16 Taken together with NPS EN-1 (DECC, 2011a), EN-2 (DECC, 2011b) provides the primary basis for decisions on applications for fossil fuels electricity generating stations, including gas-fired power stations (such as the 'Proposed Power Plant'). The document provides additional policy guidance against which to assess such proposals.
- 7.3.17 Section 2.2 outlines the factors influencing site selection for fossil fuel power stations. These include land use and size of site; transport infrastructure for the delivery and removal or construction materials, fuel, waste and equipment; and water resources, for example, some power station have very high water demands for cooling; and grid connection. However, in outlining such factors, paragraph 2.2.1 makes clear that *"...it is for energy companies to decide what application to bring forward and the Government does not seek to direct applicants to particular sites for fossil fuel generating stations."*
- 7.3.18 Technology specific considerations to be taken into account in the assessment of fossil fuel power stations (in addition to the assessment principles and generic impact set out in EN-1) include air emissions; landscape and visual; noise and vibration; release of dust (in respect of coal-fired stations); residue management (again in respect of coal stations); and water quality and resources.

The NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)

- 7.3.19 Section 2.19 of EN-4 (DECC, 2011c) provides guidance on the assessment of applications for new gas pipelines. The Proposed Development includes a new gas pipeline connection (the 'Proposed Gas Pipeline') between the Proposed Power Plant and the National Transmission System for gas. The pipeline does not represent a NSIP in its own right but it is included within the development for which development consent is sought as 'associated development' to the Proposed Power Plant.
- 7.3.20 Key technology specific considerations for gas pipelines include proximity to sensitive land uses (e.g. residential development and schools) when planning routes; pipeline safety; noise and vibration; biodiversity; landscape and visual; water quality and resources; and soils and geology.

The NPS for Electricity Networks Infrastructure (EN-5)

- 7.3.21 EN-5 (DECC, 2011d) outlines principles on which the SoS will apply to applications for new electricity transmission lines as well as associated infrastructure, such as substations. It should be noted that the Proposed Development will involve relatively small scale electricity grid connection works to the existing National Grid substation on site.
- 7.3.22 Technology specific considerations to be taken into account for such works include biodiversity and geological conservation, landscape and visual, noise and vibration and the impacts of electric and magnetic fields.

Marine Policy

- 7.3.23 As noted above, section 104 of the Act requires the SoS to have regard to "*...the appropriate marine policy documents...*" relevant to the NSIP. Whilst the Proposed Development is an onshore generating station, the Proposed Gas Connection route crosses the tidal section of the River Aire and upgrade works are also proposed to the water discharge point also within the tidal River.
- 7.3.24 The appropriate marine policy documents are defined at section 59 of the Marine and Coastal Access Act 2009. These include any marine policy statement which is in effect and to the extent that a decision relates to a marine plan area, any marine plan which is in effect for that area (section 59(3) and (5)).
- 7.3.25 The UK Marine Policy Statement ('MPS'), adopted in March 2011 (HM Government, 2011), provides the policy framework for preparing marine plans and taking decisions affecting the marine environment. It is intended to sit alongside terrestrial consenting regimes, including NSIP regime set by the Planning Act 2008.
- 7.3.26 Chapter 2 outlines the vision for the UK marine area, the high level approach to marine planning and general principles for decision making covering economic, social and environmental considerations.
- 7.3.27 Chapter 3 sets out the policy objectives for key activities that take place in the marine environment. Section 3.3 deals specifically with 'Energy production and infrastructure development'. Paragraph 3.3.1 notes that a secure, sustainable and affordable supply of energy is of central importance to the economic and social well-being of the UK. Paragraph

3.3.4 sets out issues for consideration for all energy infrastructure and states that decision makers should take into account a range of matters, including the national level of need for energy infrastructure set out in EN-1.

- 7.3.28 Paragraph 3.3.6 notes that the construction, operation or decommissioning of power stations may have impacts on the local marine environment through the construction of plants and associated development. There may also be impacts from abstraction and discharge of cooling water during operation. It refers to more detail on the impacts and specific measures and actions to avoid or minimise adverse impacts, including those on marine ecology, being contained within the NPSs, including EN-2 in respect of fossil fuel generating stations.
- 7.3.29 Marine plans are intended to set out detailed policy and spatial guidance for a particular area. The UK is divided into a number of marine planning regions with associated plan authorities that are responsible for preparing marine plans. In England the Marine Management Organisation is the plan authority.
- 7.3.30 The Proposed Development lies within the 'East Inshore Marine Plan Area'. The 'East Inshore and East Offshore Marine Plans' was published in April 2014 (HM Government, 2014). Paragraph 19 confirms that the Plan includes the area of sea stretching from Flamborough Head to Felixstowe and extends out to the seaward limit of the territorial sea (approximately 12 nautical miles). It also includes:
- any area submerged at mean high water spring tide; and
 - the waters of any estuary, river or channel, so far as the tide flows at mean high water spring tide.
- 7.3.31 The East Inshore Marine Plan therefore encompasses the tidal River Aire, within which works are proposed as part of the Proposed Development.
- 7.3.32 Chapter 3 sets out the Plan policies. There are no specific policies relating to fossil fuel generating stations, however, the policies set out relating to economic, social and cultural, environmental and climate change considerations are of some relevance. These are consistent with policy set out in the relevant NPSs, notably EN-1 and EN-2.

Other Matters that may be 'Important and Relevant'

- 7.3.33 As noted above, in making decisions on applications for NSIPs, section 104 of the Act states that the SoS must also (in addition to the NPSs) have regard to any other matters that they consider to be both 'important and relevant' to their decision. Paragraph 4.1.5 of EN-1 provides some clarification on such matters, stating that these may include development plan documents or other documents in the local development framework.
- 7.3.34 EN-1 is clear (reflecting the terms of the Act), however, that in the event of any conflict between a NPS and development plan documents, the NPS prevails for the purposes of SoS decision-making given the national significance of the infrastructure concerned.

National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG)

- 7.3.35 The National Planning Policy Framework ('NPPF') was adopted in March 2012 (Department for Communities and Local Government (DCLG), 2012) and replaced the majority of Planning Policy Statements and Planning Policy Guidance Notes. The policies contained within the NPPF

are expanded upon and supported by the 'Planning Practice Guidance', which was published in March 2014.

- 7.3.36 The NPPF sets out the Government's planning policies for England and how these are to be applied. It is a material consideration in planning decisions. Paragraph 3 of the NPPF makes it clear that the document does not contain specific policies for NSIPs and that applications in relation to NSIPs are to be determined in accordance with the decision making framework set out in the Act and relevant NPSs, as well as any other matters that are considered both important and relevant. However, paragraph 3 goes on to confirm that the NPPF may be considered to be a matter that is both important and relevant for the purposes of assessing DCO applications. The EIA undertaken for the Proposed Development will therefore have regard to the relevant policies of the NPPF as part of the overall framework of national policy.
- 7.3.37 Paragraph 6 of the NPPF is clear that the purpose of the planning system is to contribute to the achievement of sustainable development and that the policies that are set out in the NPPF, taken as a whole, constitute the Government's view of what sustainable development in England means in practice. Paragraph 7 goes on to identify three dimensions to sustainable development: economic, social and environmental. It states that these dimensions give rise to the need for the planning system to perform a number of key roles as follows:
- **an economic role** - contributing to a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development, including the provision of infrastructure;
 - **a social role** - supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generation and by creating a high quality built environment, with accessible local services that reflect communities needs and support their health, social and cultural well-being; and
 - **an environmental role** - contributing to protecting and enhancing our natural, built and historic environment, and as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change, including moving to a low carbon economy.
- 7.3.38 Paragraph 8 emphasises that these roles should not be undertaken in isolation, because they are mutually dependent. For example, economic growth can secure higher social and environmental standards, while well designed buildings and places can improve the lives of people and communities.
- 7.3.39 Central to the NPPF is 'a presumption in favour of sustainable development'. This is highlighted at Paragraph 14. For decision-making, this means approving applications that accord with the development plan without delay.
- 7.3.40 Paragraph 17 sets out a number of core land-use planning principles that should underpin decision making. Those of particular relevance to the Proposed Development include to:
- proactively drive and support sustainable economic development to deliver the infrastructure that the country needs;
 - always seek to secure high quality design and a good standard of amenity for all existing and future occupants of land and buildings;

- support the transition to a low carbon future in a changing climate, taking full account of flood risk and encouraging the reuse of existing resources and the use of renewable energy sources (for example, by the development of renewable energy);
- contribute to conserving and enhancing the natural environment and reducing pollution;
- encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value; and
- actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable.

7.3.41 NPPF policies of particular relevance include promoting sustainable transport; requiring good design; promoting healthy communities; conserving and enhancing the natural and historic environment; and meeting the challenge of climate change and mitigating its effects.

The Statutory Development Plan

7.3.42 The Proposed Development lies entirely within the administrative areas of Selby District Council ('SDC') and North Yorkshire County Council ('NYCC').

7.3.43 The statutory development plan for the area currently comprises the following documents:

- the Selby District Core Strategy Local Plan - adopted October 2013 (SDC, 2013);
- the 'saved' policies of the Selby District Local Plan - adopted February 2005 (SDC, 2005);
- the 'saved' policies of the North Yorkshire Waste Local Plan - adopted 2006 (NYCC, 2006); and
- the 'saved' policies of the North Yorkshire Minerals Local Plan - adopted 1997 (NYCC, 1997).

7.3.44 While the Core Strategy (2013) Proposals Maps shows the land to which the Proposed Development relates (including the existing Eggborough Power Station site) as lying within the 'open countryside', both the Core Strategy and the Selby District Local Plan (2005) recognise the importance of the location for power generation and are supportive of power generation and related development.

7.3.45 Paragraph 6.61 of the Selby District Local Plan (SDC, 2005) states that the local planning authority will continue to support the existing power generation industries within the district where there is no insurmountable conflict with established planning policies. Policy EM10 goes on to states that additional industrial/business development may be permitted at or close to the existing Power Station site provided that it is directly related to the process of generating electricity; would be suitably linked to the highway and rail networks; would not affect residential amenity; create environmental problems; would be well screened; and would not harm nature conservation interests or archaeology.

7.3.46 The Core Strategy (SDC, 2013) states, at paragraph 6.32, that the energy sector will continue to be important to the economy of the district, and identifies Eggborough Power Station as a major employer, which contributes to national energy infrastructure as well as the local economy. It also highlights the potential of the existing power stations in the district for the future development. It goes on to note that there is a need for further investment in energy infrastructure in line with national policy and that supporting the energy sector will assist in reinvigorating, expanding, and modernising the district's economy.

7.3.47 Both the Selby District Local Plan (2005) and the Core Strategy (2013) contain a number of other policies that would be of relevance to the examination and determination of the DCO application for the Proposed Development. These include:

- Core Strategy (2013):
 - SP 1 'Presumption in Favour of Sustainable Development';
 - SP2 'Spatial Development Strategy';
 - SP13 'Scale and Distribution of Economic Growth';
 - SP 15 'Sustainable Development and Climate Change';
 - SP 16 'Improving Resource Efficiency';
 - SP17 'Low-Carbon and Renewable Energy';
 - SP 18 'Protecting and Enhancing the Environment'; and
 - SP 19 'Design Quality';
- Local Plan (2005):
 - ENV 1 'Control of Development';
 - ENV 2 'Environmental Pollution and Contamination';
 - ENV 3 'Light Pollution';
 - ENV 4 'Hazardous Substances';
 - ENV 9 'Sites of Importance for Nature Conservation Importance';
 - ENV27 'Scheduled Monuments and Important Archaeological Sites';
 - ENV28 'Other Archaeological Sites';
 - EMP10 'Additional Industrial Development at Drax and Eggborough Power Stations';
 - T 1 'Development in Relation to the Highway Network';
 - T2 'Access to Roads'; and
 - T8 'Public Rights of Way'.

7.3.48 In undertaking the EIA for the Proposed Development, the applicant will have regard to the above policies.

7.3.49 None of the saved policies contained in the North Yorkshire Minerals Local Plan (NYCC, 1997) are considered to be of direct relevance to the Proposed Development. Policy 3/7 'Mineral Sterilisation' is considered to be of some limited relevance given the deep coal deposits within the surrounding area and the proximity of the recently closed Kellingley colliery and its mined seams. The Policy states that in considering applications for non-mineral development, mineral resources will be protected from sterilisation unless there is an overriding need for the development and that prior extraction of minerals that would otherwise be sterilised by the development will be permitted, provide this is practicable and environmentally acceptable.

7.3.50 The majority of the saved policies of the North Yorkshire Waste Local Plan (NYCC, 2006) relate to waste management facilities and are of limited relevance, with the exception of Policy 5/1 'Waste Minimisation', which covers waste arisings from major new development proposals.

7.3.51 SDC is currently preparing a 'Sites and Policies Local Plan' to deliver the strategic vision outlined in the Core Strategy (2013), which is intended to supersede the remaining saved policies in the Selby District Local Plan (2005). However, the document is yet to go through an examination and is not proposed for adoption until well into 2017.

- 7.3.52 NYCC (along with the City of York and the North York Moors National Park Authority) is preparing a Minerals and Waste Joint Plan. This is now at publication stage and will shortly be submitted to the SoS for examination.
- 7.3.53 Much of the Proposed Development Site lies within the areas identified for minerals safeguarding on the Policies Map of the publication draft of the Minerals and Waste Joint Plan. In addition, the existing rail head at the Eggborough coal-fired Power Station site is safeguarded under Policy S04 'Transport infrastructure safeguarding'.

7.4 Summary

- 7.4.1 The NPSs form the primary basis for decisions by the SoS on applications for NSIPs. In addition to setting out the strong need for new energy infrastructure, they provide detailed guidance on the matters to take into account when both preparing and assessing applications for NSIPs. They also confirm that the SoS must have regard to any other matters that he/she considers are both 'important and relevant', which can include the NPPF and local development plan policy. Both the NPS and NPPF are clear, however, that in the event of any conflict between a NPS and another document, the NPS prevails.
- 7.4.2 The DCO application will include a detailed assessment of the Proposed Development, taking account of the findings of the EIA as reported within the ES, against the relevant NPSs and other relevant policy documents such as the NPPF and local development plan.

7.5 References

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

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

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

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

Department for Energy and Climate Change (2011d) *National Policy Statement for Electricity Networks: EN-5*.

HM Government (2011) *The UK Marine Policy Statement*

HM Government (2014) *The East Inshore and East Offshore Marine Plans*

North Yorkshire County Council (1997) *North Yorkshire Minerals Local Plan*

North Yorkshire County Council (2006) *North Yorkshire Waste Local Plan*

Selby District Council (2005) *Selby District Local Plan*

Selby District Council (2013) *Selby District Core Strategy Local Plan, adopted October 2013*

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8.0 AIR QUALITY

8.1 Introduction

- 1.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential effects of the proposed Combined Cycle Gas Turbine (CCGT) power station on the site of the Eggborough coal-fired power station, North Yorkshire (hereafter referred to as the 'Proposed Development') on air quality.
- 1.1.2 The assessment considers:
- the present-day and future baseline conditions during construction and at opening;
 - the effects of construction of the Proposed Development on air quality for human health and ecosystems, with respect to associated construction traffic, construction plant emissions and construction dust;
 - the effects of operational process emissions associated with the Proposed Development on air quality for human health and ecosystems; and,
 - the cumulative effects of emissions associated with the Proposed Development and other committed developments in the vicinity.
- 1.1.3 This chapter is supported by Figures 8.1-8.3, provided in PEI Report Volume II and Appendix 8A provided in PEI Report Volume III.

8.2 Legislation and Planning Policy Context

Legislative Background

Air Quality Legislation

- 8.2.1 The principal air quality legislation within the United Kingdom is the Air Quality Standards Regulations 2010, which transposes the requirements of the European Ambient Air Quality Directive 2008 (European Commission, 2008) and the 2004 fourth Air Quality Daughter Directive (European Commission, 2004). The Regulations set air quality limits for a number of major air pollutants that have the potential to impact public health, such as nitrogen dioxide (NO₂), sulphur dioxide (SO₂), carbon monoxide (CO) and particulate matter (PM₁₀, which is particulate matter of 10µm diameter or less). The Regulations also include an exposure reduction objective for PM_{2.5} in urban areas and a national target value for PM_{2.5} (PM_{2.5} is particulate matter of 2.5µm diameter or less).
- 8.2.2 The Environment Act 1995 requires the UK Government to produce a national air quality strategy (NAQS), last reviewed in 2007 (Department for Environment, Food and Rural Affairs (Defra), 2007)), containing air quality objectives and timescales to meet those objectives. These objectives apply to outdoor locations where people are regularly present and do not apply to occupational, indoor or in-vehicle exposure. It requires Local Authorities to undertake an assessment of local air quality to establish whether the objectives are being achieved, and to designate air quality management areas (AQMA) if improvements are necessary to meet the objectives. Where an AQMA has been designated, the Local Authority must draw up an air quality action plan (AQAP) describing the measures that will be put in place to assist in achieving the objectives. Defra has responsibility for coordinating assessments and AQAPs for the UK as a whole. The current objectives and assessment criteria applicable in this

assessment for the protection of human health are presented in Table 8.1. Concentrations are expressed in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$), unless otherwise stated.

Table 8.1: Air Quality Strategy Objectives (NAQS) – protection of human health

Pollutant	Objective ($\mu\text{g}/\text{m}^3$)	Averaging period	Percentile	To be met by
Nitrogen dioxide (NO_2)	200	1 hour mean	99.79 th (or not to be exceeded more than 18 times/year)	31 Dec 05
	40	Annual mean	-	31 Dec 05
Particulate matter (PM_{10})	50	24 hour mean	90.4 th (or not to be exceeded more than 35 times/ year)	31 Dec 04
	40	Annual mean	-	31 Dec 04
Particulate matter ($\text{PM}_{2.5}$)	25	Annual mean	-	2020
Carbon monoxide (CO)	10,000	8 hour, daily running mean	-	31 Dec 03

- 8.2.3 For the protection of vegetation and ecosystems, a number of Critical Levels (CLs) have been developed; the CLs applicable to this assessment are shown in Table 8.2 below.

Table 8.2: Critical Levels (CL) for the protection of vegetation and ecosystems

Pollutant	Objective ($\mu\text{g}/\text{m}^3$)	Averaging period	Notes
Oxides of nitrogen (NO_x)	75	Daily mean	-
	30*	Annual mean	-
Ammonia (NH_3)	1 ¹ 3 ²	Annual mean	¹ For lichens and bryophytes ² For all higher plants

* denotes objective set in Air Quality Standards Regulations 2010

- 8.2.4 In addition, while not legislative limits, CLs have been derived for different habitats covering the deposition of nitrogen and acidifying species. These are discussed further in Section 8.3 and habitat-specific CLs are presented in Appendix 8A (PEI Report Volume III).

Environmental Permitting Regulations

- 8.2.5 The Environmental Permitting (England and Wales) Regulations 2016 (EPR) apply to all new installations transpose the requirements of the EU Industrial Emissions Directive (IED) (European Commission, 2010). Under the IED and EPR, the operator of an installation covered by the IED is required to employ Best Available Techniques (BAT) to ensure a high level of protection of the environment as a whole. Generating stations exceeding 50 MW thermal input rating (50 MWth) (such as the Proposed Development) are covered by the IED and EPR.
- 8.2.6 Where legislative limits are not specified for the pollutant species potentially released from the Proposed Development, Environmental Assessment Levels (EALs), published in the Environment Agency's (EA) Risk Assessments for Specific Activities: Environmental Permits guidance (Defra and EA, 2016) can be used to assess potential health effects on the general

population. The EALs applicable in this assessment for the protection of human health are presented in Table 8.3. Concentrations are expressed in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$), unless otherwise stated.

Table 8.3: Environmental Assessment Levels (EAL) – protection of human health

Pollutant	Objective ($\mu\text{g}/\text{m}^3$)	Averaging period
Ammonia (NH_3)	2,500	Hourly mean
	180	Annual mean
Carbon monoxide (CO)	30,000	Hourly mean

Industrial Emissions Directive

- 8.2.7 The IED (European Commission, 2010) provides operational limits and controls to which plant must comply, including Emission Limit Values (ELVs) for pollutant releases to air. The operational power station at the Proposed Development will fall under the Large Combustion Plant (LCP) requirements (Chapter III) of the IED, since it will be greater than 50 MWth in capacity.
- 8.2.8 In addition, BAT reference documents (BRefs) are published for each industrial sector under IED, and they include BAT-Achievable Emission Values (BAT-AELs) which are expected to be met through the application of BAT. These values may be the same as those published in the IED, or they may be more stringent. The current version of the LCP BRef has been in use since July 2006. However, this BRef is currently undergoing revision and a final draft of the revised LCP BRef was issued in June 2016 (European Commission, 2016), with the final version expected to be published around September 2017. As the BAT-AELs to be published in the final version are not known at this stage, the IED ELVs and current BRef performance levels have been applied in this assessment.
- 8.2.9 The proposed high efficiency new gas turbines for the Proposed Development are able to comply with the current IED requirements without the need for secondary abatement; primary combustion control measures and burner designs mean that emissions of nitrogen oxides and carbon monoxide can meet the IED emission limits, while emissions of sulphur dioxide and particulates are expected to be negligible based on the use of natural gas fuel.
- 8.2.10 Subject to the outcome of the revised BRef and the UK interpretation of the application of that BRef, tighter nitrogen oxide emission limits may be required for plant built post the publication of the revised BRef; this could therefore apply to this Proposed Development, as that would not be constructed before 2019. Whilst unknown at this stage, this could include the need for secondary abatement for controlling nitrogen oxide emissions, such as the use of Selective Catalytic Reduction (SCR) to meet ELVs more stringent than those required under IED. However the design and use of such abatement would be subject to the outcome of a Best Available Techniques (BAT) assessment for the plant, in accordance with EA guidance. At this stage, space has been allowed within the plant layout design to accommodate the future installation of SCR, should that be required. For the purposes of this air quality impact assessment, conservatively it is assumed that emissions will be at the current IED limits.

Planning Policy Context

National Planning Policy

- 8.2.11 National Policy Statements (NPS) are, where in place, the primary basis for the assessment and determination of applications for nationally significant infrastructure projects (NSIPs), such as the Proposed Development. The Overarching National Policy Statement on Energy EN-1 (Department of Energy and Climate Change, 2011)) states that:

“The planning and pollution control systems are separate but complementary. The planning system controls the development and use of land in the public interest... Pollution control is concerned with preventing pollution through the use of measures to prohibit or limit the releases of substances to the environment from different sources to the lowest practicable level. It also ensures that ambient air and water quality meet standards that guard against impacts to the environment or human health.

In considering an application for development consent, the IPC [Secretary of State] should focus on whether the development itself is an acceptable use of the land, and on the impacts of that use, rather than the control of processes, emissions or discharges themselves. The IPC should work on the assumption that the relevant pollution control regime and other environmental regulatory regimes...will be properly applied and enforced by the relevant regulator” (paragraphs 4.10.2-4.10.3).

- 8.2.12 EN-1 requires the consideration of significant air emissions, their mitigation and any residual effects, the predicted absolute emission levels after application of mitigation, the relative change in air quality from existing concentrations and any potential eutrophication impacts as a result of the Proposed Development project stages, including contributions from additional road traffic. Where a project could result in deterioration in air quality in an area where national air quality limits are not being met, or may lead to a new area breaching national air quality limits, or where substantial changes in air quality concentrations are predicted, such effects would be expected to be given substantial weight in consideration of the acceptability of the proposal. Where a project is likely to lead to a breach of statutory air quality limits the developer should work with the relevant authorities to secure appropriate mitigation measures to allow the proposal to proceed.
- 8.2.13 The Overarching National Policy Statement on Fossil Fuel Electricity Generating Infrastructure EN-2 (Department of Energy and Climate Change, 2011)), section 2.5, states that *“Fossil fuel generating stations are likely to emit nitrogen oxides (NO_x) and sulphur oxides (SO_x), although SO_x emissions from gas-fired generating stations may be negligible. To meet the requirements of the Large Combustion Plant Directive (LCPD) and the Industrial Emissions Directive (IED) when it comes into force, fossil fuel generating stations must apply a range of mitigation to minimise NO_x and other emissions”*. The NPS goes on to state that *“Mitigation will depend on the type and design of a generating station. However...Selective Catalytic Reduction (SCR)... will have additional adverse impacts for noise and vibration, release of dust and handling of potentially hazardous materials, for example the ammonia used as a reagent. In line with Section 5.3 of EN-1 the PIC, in consultation with the EA, should be satisfied that any adverse impacts of mitigation measures for emissions proposed by the applicant have been described in the ES and taken into account in the assessments”*.

- 8.2.14 The National Planning Policy Framework (NPPF) was published in March 2012 (Department for Communities and Local Government (DCLG), 2012a); 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..."*
- 8.2.15 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"*.
- 8.2.16 There are both national and local policies for the control of air pollution and local action plans for the management of local air quality within the Selby District Council (SDC) area. The effect of the Proposed Development on the achievement of such policies and plans are matters that may be a material consideration by decision-making authorities, when determining individual planning and DCO 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."*
- 8.2.17 The NPPF is accompanied by Technical Guidance to the National Planning Policy Framework (NPPF-TG) (DCLG, 2012b). The NPPF does not include any specific guidance for the assessment of air quality impacts from combustion activities, but does provide some broader guidance on assessments of dust impacts from mineral extraction sites that have been cited in the construction methodology of this assessment. Paragraph 3 of the NPPF is clear that it does not contain specific policies for NSIPs and these are to be determined in accordance with the decision making framework set out in the Planning Act 2008 and relevant NPSs, as well as any other matters that are considered both important and relevant. The NPPF may be considered by the Secretary of State to be important and relevant, and hence this assessment has had regard to its policies.

Local Planning Policy

- 8.2.18 Similarly local planning policy may be something which the Secretary of State considers is both important and relevant to the determination of the application for the Proposed Development.
- 8.2.19 In 2013 SDC adopted the Selby District Core Strategy Local Plan (SDC, 2013), including the key environmental objective (Objective No. 16) which is *"Protecting against pollution, improving the quality of air, land and water resources"*, and Policy SP18: *Protecting and Enhancing the Environment*, states that: *"The high quality and local distinctiveness of the natural and man-made environment will be sustained by...Ensuring that new developments protects soil, air and water quality from all types of pollution"*.
- 8.2.20 SDC has also published its Air Quality and Planning Guidance Note (SDC, 2014)) which details air quality as a material planning consideration, and states that a *"full understanding of all emissions arising from development in the district is essential to help adequately mitigate the*

air quality impacts". The guidance note sets out the general requirements for an air quality impact assessment, including:

- *"Existing air quality in the vicinity of the proposed development"*
- *Likely impact on local air quality as a result of the proposed development (including the impact of additional traffic movements and/or the introduction of other new emissions sources)*
- *Available measures for mitigating the air quality impact associated with the development (traffic and other emission sources)*
- *Level of increased exposure to air pollutants by members of the public as a result of the development, taking into account all mitigation measures proposed"*

Other Guidance

- 8.2.21 The EA Risk Assessments for Specific Activities: Environmental Permits guidance (Defra and EA, 2016) provides guidance on the assessment of Best Available Techniques and of impacts from permitted installations, primarily for the purposes of Environmental Permitting.
- 8.2.22 Defra has also published technical guidance (Defra, 2016a) to assist local authorities in fulfilling their duties in relation to Local Air Quality Management. Parts of this guidance, and associated tools, are also useful in assessing the impacts of individual developments within the planning process.
- 8.2.23 The Highways Agency (HA) (now Highways England) publication the Design Manual for Roads and Bridges (DMRB) (HA, 2007) has been used to screen potential traffic air quality impacts to determine those impacts that may require more detailed assessment, and in the assessment of traffic air quality effects and the evaluation of significance.
- 8.2.24 The Institute of Air Quality Management (IAQM) has published several guidance documents relating to the potential effects of dust generation during construction works and development control (IAQM, 2014, 2015 and 2016).

8.3 Assessment Methodology and Significance Criteria

Consultation

- 8.3.1 The consultation undertaken with statutory consultees to inform this Chapter is summarised in Table 8.4 below.

Table 8.4: Consultation summary table

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
Selby District Council	5 th August 2016 (email)	<p>In relation to a draft scoping note issued for consultation:</p> <ul style="list-style-type: none"> • identified additional receptors at Roall water works; • further details for proposed 	<p>Identified receptors included within assessment scope.</p> <p>Monitoring discussed</p>

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		extent of diffusion tube monitoring requested	below
Secretary of State	September 2016 (scoping opinion)	Noting the proposed baseline air monitoring survey, it is suggested that the adequacy of the data is discussed with relevant consultees to ensure it is robust and representative. Noting the described worst-case scenario of combined emissions from the existing power stations and the Proposed Development, it is suggested that consideration be given to a greater relative effect if the existing power station is no longer operational.	<p>Scope of monitoring discussed and agreed with SDC.</p> <p>The significance of the predicted effect of emissions from the Proposed Development is evaluated against the air quality standards independently of current background levels.</p> <p>Consideration has been given to the cumulative effects of the Proposed Development and the existing coal-fired power station, although the two separate generating stations will not operate at the same time. Therefore cumulative effects have focussed on the timing of construction, operation and demolition activities.</p>
Selby District Council	10 th October 2016 (email) and subsequent discussions	Baseline monitoring locations and initial scope – may require particulates monitoring in addition to nitrogen dioxide.	The requirements for further monitoring will be identified and discussed with the relevant consultees to inform the final ES.

Impact Assessment and Significance Criteria

- 8.3.2 The potential emissions to air from construction and at time of opening of the Proposed Development have been determined or estimated, and key local receptors have been identified, together with the current local ambient air quality. The potential concentrations resulting from the projected emissions arising from the operational Proposed Development have been predicted using atmospheric dispersion modelling techniques, which has enabled the assessment of the impacts associated with the Proposed Development on the existing local

ambient air quality and in particular on the identified sensitive receptors. The assessment methodology for each type of emission is detailed below.

- 8.3.3 In particular the process and traffic emissions assessments have been made with reference to the national air quality standards (NAQs) and objectives laid out in the Air Quality Standards Regulations.

Assessment of Dust Emissions Generated During Construction Works

- 8.3.4 'Dust' is defined in British Standard (BS) 6069-2:1994 (BSI, 1994) as particulate matter in the size range $1\mu\text{m}$ - $75\mu\text{m}$ (microns) in diameter, and is primarily composed of mineral materials and soil particles. This definition is also referred to in NPPF technical guidance (DCLG, 2012b) in the context of dust impacts from mineral extraction operations and has been adopted in this assessment.
- 8.3.5 Respirable particulate matter (PM_{10}) is composed of material with an aerodynamic diameter of less than $10\mu\text{m}$, and includes the size fractions of greatest concern to impacts on human health. The majority of construction dust is larger than $10\mu\text{m}$ in diameter and, therefore are typically associated with material depositing onto property and potential amenity effects, although there is evidence that PM_{10} and $\text{PM}_{2.5}$ (material with an aerodynamic diameter of less than $2.5\mu\text{m}$) emissions may result from construction and demolition activities. Particulate matter may therefore have an effect whilst airborne, or as a result of its deposition onto a surface. Consequently the nature of the impact requiring assessment varies between different types of receptor.
- 8.3.6 SDC guidance (SDC, 2014) requires an air quality impact assessment where a development proposal will give rise to potentially significant impacts during construction for nearby sensitive locations, or those that would generate large HGV flows (>200 movements per day) over a period of a year or more. The movement and handling of soils and spoil during the Proposed Development construction activities is anticipated to lead to the generation of some short-term airborne dust. There is the potential for this to occur at the same time as dust generation from the demolition of the coal-fired power station. The occurrence and significance of dust generated by earth moving operations is difficult to estimate, and depends heavily upon the meteorological and ground conditions at the time and location of the work, and the nature of the actual activity being carried out.
- 8.3.7 At present, there are no statutory UK or EU standards relating to the assessment or control of dust. The NPPF Technical Guidance (DCLG, 2012b) provides an assessment framework for mineral extraction site, which indicates that where there are residential properties within 1km of site activity and the concentration of PM_{10} is not likely to exceed the NAQS then good practice measures should be employed. The IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning (IAQM, 2016) indicates that *"the level of dust deposition likely to lead to a change in vegetation is very high (over $1\text{ g/m}^2/\text{day}$) and the likelihood of a significant effect is therefore very low except on the sites with the highest dust release close to sensitive habitats"*.
- 8.3.8 The emphasis of the regulation and control of construction dust should similarly be the adoption of Best Practicable Means (BPM) of working on site. It is intended that significant adverse environmental effects are avoided at the design stage and through embedded

mitigation where possible, including the use of good working practices to minimise dust formation.

- 8.3.9 The IAQM provides guidance for good practice qualitative assessment of risk of dust emissions from construction and demolition activities (IAQM, 2014). The guidance considers the risk of dust emissions from unmitigated activities to cause human health (PM₁₀) impacts, dust soiling impacts, and ecological impacts (such as physical smothering, and chemical impacts for example from deposition of alkaline materials). The appraisal of risk is based on the scale and nature of activities and on the sensitivity of receptors, and the outcome of the appraisal is used to determine the level of good practice mitigation required for adequate control of dust.
- 8.3.10 The assessment undertaken for this chapter is consistent with the overarching approach to the assessment of the impacts of construction, and the application of example descriptors of impact and risk set out in IAQM guidance. It considered the significance of potential impacts with no mitigation, and recommends mitigation measures appropriate to the identified risks to receptors. The steps in the assessment are to:
- Identify receptors within the screening distance of the site boundary;
 - identify the magnitude of impact through consideration of the scale, duration and location of activities being carried out (including demolition, earthworks, construction and trackout);
 - establish the sensitivity of the area through determination of the sensitivity of receptors and their distance from construction activities;
 - determine the risk of significant impacts on receptors occurring as a result of the magnitude of impact and the sensitivity of the area, assuming no additional mitigation (beyond the identified development design and impact avoidance measures) is applied;
 - determine the level of mitigation required based on the level of risk, to reduce potential impacts at receptors to insignificant or negligible; and
 - summarise the potential residual effects of the mitigated works.
- 8.3.11 Consideration has also been given within the assessment to the potential cumulative dust emissions from the construction of the Proposed Development and the demolition of the existing coal-fired power station.
- 8.3.12 The criteria for assessment of magnitude, sensitivity and risk are summarised in Tables 8A.5-8A.9 in Appendix 8A (PEI Report, Volume III).

Assessment of Construction and Opening Road Traffic

- 8.3.13 The incomplete combustion of fuel in vehicle engines results in the presence of hydrocarbons (HC) such as benzene and 1,3-butadiene, as well as the typical combustion products of CO, PM₁₀, PM_{2.5} in exhaust emissions. In addition, at the high temperatures and pressures found within vehicle engines, some of the nitrogen in the air and the fuel is oxidised to form oxides of nitrogen, mainly in the form of nitric oxide (NO), which is then converted to nitrogen dioxide in the atmosphere. Nitrogen dioxide is associated with adverse effects on human health. Better emission control technology and fuel specifications are expected to reduce emissions per vehicle in the long term. Similarly but to a lesser extent, any sulphur in the fuel can be converted to sulphur dioxide (SO₂) that is then released to atmosphere.

- 8.3.14 Although SO₂, CO, benzene and 1,3-butadiene are present in motor vehicle exhaust emissions, detailed consideration of the associated impacts on local air quality is not considered relevant in the context of this Proposed Development. This is because the concentrations of release are not likely to give rise to significant effects. In particular, no areas within the administrative boundaries of SDC are considered to be at risk of exceeding the relevant objectives for these species, and the risks to achievement of the relevant air quality objectives from the Proposed Development are considered negligible. Emissions of SO₂, CO, benzene and 1, 3-butadiene from road traffic are therefore not considered further within this assessment.
- 8.3.15 Exhaust emissions from road vehicles may affect the concentrations of principal pollutants of concern, nitrogen dioxide, PM₁₀ and PM_{2.5}, at sensitive receptors in the vicinity of the development. Therefore, these pollutants are the focus of the assessment of the significance of road traffic impacts.
- 8.3.16 DMRB HA207/07 guidance (HA, 2007) and SDC guidance (SDC, 2014) set out criteria to establish the need for an air quality assessment. The guidance considers the changes in traffic anticipated as a result of a development, to identify the need for further evaluation or assessment; for example, in the DMRB guidance changes in Annual Average Daily Traffic (AADT) flows of more than 1,000 vehicles or 200 HGV movements are considered further through quantitative assessment; the SDC guidance requires an impact assessment where there will be changes in traffic composition on local roads, for example increase in the HGVs by 200 movements per day. For changes in traffic below these criteria, significant changes in air quality are not expected. This guidance has been utilised for both the construction and opening assessments.
- 8.3.17 Predicted HGV movements during the construction of the Proposed Development are shown in Table 8.6. The AADT is predicted to peak at 80 two-way HGV movements accessing the Site via Tranmore Lane per day. The AADT total vehicles is predicted to peak at 1,010 two-way movements on Wand Lane (west of Hensall Gate entrance), with other road links at less than 1,000 AADT flow; there are no identified residential receptors within 200 m of Wand Lane and therefore this link can be screened out. On this basis, further quantitative assessment of road traffic impacts has not been undertaken, as the above screening criteria have not been exceeded.
- 8.3.18 Traffic associated with the Proposed Development at time of Opening has also been screened out of the assessment as this will be below the criteria set out in the DMRB requiring an air quality assessment (the predicted AADT opening traffic is 123 cars arriving and departing the Site).
- 8.3.19 Consideration has been given within the assessment to the potential cumulative traffic emissions from the construction of the Proposed Development and the demolition of the existing coal-fired power station. This is discussed further in Section 8.9 (Residual Effects) and Chapter 20: Cumulative and Combined Effects.

Assessment of Emissions Generated from Construction Site Plant (Non-Road Mobile Machinery)

- 8.3.20 The construction phase for the Proposed Development is anticipated to last approximately three years, between 2019 and 2022.

- 8.3.21 There are likely to be emissions to air during construction activities arising from on-site construction plant or Non-Road Mobile Machinery (NRMM). The IAQM guidance (IAQM, 2015) states *“Experience of assessing the exhaust emissions from on-site plant ... and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed. For site plant and on-site traffic, consideration should be given to the number of plant/vehicles and their operating hours and locations to assess whether a significant effect is likely to occur”*. The screening criterion in the DMRB (HA, 2007), which states that only properties and habitat sites within 200 m of roads should be considered in traffic assessments, has also been considered in determining the potential for impacts from the Proposed Development NRMM on sensitive receptors. A qualitative assessment of the potential for impact from nitrogen dioxide and PM₁₀ emissions from NRMM on identified receptors has therefore been made based on the criteria outlined in the above guidance.

Assessment of Process Emissions from the Plant at Opening

- 8.3.22 The IED defines ELVs for gas turbines (including CCGT and OCGT) for oxides of nitrogen, SO₂, CO and PM₁₀, however emissions of SO₂ and PM₁₀ from gas-fired plant are at such low levels relative to the air quality objectives that they are considered trivial and the risk to the achievement of the PM₁₀ and SO₂ air quality objectives is considered negligible. These emissions have therefore been screened from further assessment.
- 8.3.23 Emissions of CO are not expected to be trivial, however based on project experience and professional judgment, emissions of CO at the IED limit do not drive the need for additional mitigation, such as the determination of stack height, and are very unlikely to present a risk to achievement of the NAQS objective or EAL. Emissions of CO have not been assessed at this stage within the PEI report but will be presented in the final ES.
- 8.3.24 As discussed in Section 8.2, subject to the outcome of the revised BREF and its interpretation, the use of SCR could be required to meet NO_x ELVs more stringent than those required under IED. Emissions of ammonia (NH₃) are typically associated with the use of SCR (NH₃ ‘slip’), however emissions of NH₃ from the Proposed Development have not been included at this stage within the PEI as the Original Equipment Manufacturers indicate that such technology will not be required to meet the IED legislative limit for NO_x and therefore use of SCR has not been explicitly included in this assessment.
- 8.3.25 The use of SCR will be considered subject to the outcome of a BAT assessment for the Proposed Power Plant. Preliminary modelling of NH₃ and NO_x emissions associated with the application of SCR (at published draft BAT-AELs) indicates that nutrient nitrogen deposition may be greater than that associated with the NO_x emission at IED. This will be evaluated in the final ES as part of the BAT justification for the proposed ELVs for the installation.
- 8.3.26 Emissions from the Proposed Development, assumed to be operational in 2022, have been assessed using the EA Risk assessment methodology (Defra and EA, 2016) in order to identify where proposed emissions can be screened as having a negligible impact. Detailed dispersion modelling using the atmospheric dispersion model ADMS5.1 has been used to calculate the concentrations of pollutants at identified receptors. These concentrations have been compared with the air quality assessment level for each pollutant species, as summarised in Table 8.1-8.3.

- 8.3.27 Dispersion modelling calculates the predicted concentrations arising from the emissions to atmosphere, based on Gaussian approximation techniques. The model employed has been developed for UK regulatory use.
- 8.3.28 The assessment has been based on the operational design parameters for the Proposed Development, including the alternative plant technologies and configurations under consideration for the Proposed Development, as described in paragraph 8.3.50. The worst-case operational scenarios, with respect to the potential air quality impacts, have been determined and are reported in this chapter. The determination of optimum stack height has been driven by the predicted impacts from oxides of nitrogen, as described in Section 8.5.
- 8.3.29 The first year of operation (referred to as opening) of the Proposed Development is assumed to be 2022 for the purpose of this assessment, which is the earliest date that the Proposed Development could conceivably start to export power.
- 8.3.30 The assessment of worst-case long-term and short-term emissions resulting from operation of the Proposed Development has been undertaken by comparison of the maximum process contributions at identified sensitive receptors with the NAQS annual mean and hourly mean objectives, and Critical Levels for ecological receptors, taking into consideration the baseline air quality, in accordance with EA risk assessment methodology (Defra and EA, 2016).
- 8.3.31 An assessment of nutrient nitrogen enrichment has been undertaken by applying published deposition velocities to the predicted annual average NO_x concentrations at the identified Statutory Habitat sites, determined through dispersion modelling, to calculate nitrogen deposition rates. These deposition rates have then been compared to the Critical Loads for nitrogen published by UK Air Pollution Information System (APIS) (Centre for Ecology and Hydrology and APIS, 2016) for the most sensitive species in each individual Habitat site, taking into consideration the baseline air quality.
- 8.3.32 Increases in acidity from deposition contributions of NO_x from the process contribution have been considered. In this assessment, the nitrogen kilo equivalent Keq/ha/yr, which are the units in which acidity Critical Loads are described, have been derived from nitrogen deposition modelling values using standard conversion factors. The acidity deposition rates and baseline deposition rates have been used within the Critical Load Function Tool (Centre for Ecology and Hydrology and APIS, 2016) to determine whether the contribution will result in exceedance of the defined critical levels for the most sensitive feature. Process contributions of SO₂ to the acidity deposition rate have been assumed to be zero as the emissions from the process are trivial. Non-statutory habitat sites have not been assessed as the sensitive species present at these receptors and their associated Critical Loads for nutrient and acid deposition are not on public records.

Evaluation of Significance – Construction Dust

- 8.3.33 For potential amenity effects, such those related to dust deposition, the aim is to bring forward a scheme, to include mitigation measures as necessary, that minimises the potential for complaints to be generated as a result of the Proposed Development construction works.
- 8.3.34 The IAQM guidance (IAQM, 2014) does not provide a method for the evaluation of impacts on receptors from construction dust, rather a means to determine the level of mitigation required to avoid significant impacts on receptors. The guidance indicates that application of appropriate mitigation should ensure that residual effects will normally be 'not significant'.

Evaluation of Significance – Traffic Emissions

- 8.3.35 The evaluation of the significance of road traffic air quality effects has been based on the criteria referenced in SDC guidance for air quality impacts (SDC, 2014), which are set out in the IAQM publication 'Land Use Planning & Development Control: Planning for Air Quality' (IAQM, 2015). There are three aspects of a potential effect caused by a development that must be taken into account when assessing its significance. These are:
- the magnitude of the change caused by the Proposed Development;
 - the absolute predicted environmental concentration in relation to the air quality objectives (baseline + Proposed Development scenario); and
 - the number and sensitivity of receptors exposed.
- 8.3.36 Particular significance should be given to a change that takes the concentration from below to above the NAQS objective or vice versa because of the importance ascribed to the objectives in assessing local air quality.
- 8.3.37 With regard to road traffic emissions, the change in pollutant concentrations with respect to baseline concentrations is described at receptors that are representative of exposure to impacts on local air quality within the study area. The absolute magnitude of pollutant concentrations in the baseline and 'With Development' scenario is also described and this is used to consider the risk of the air quality limit values being exceeded in each scenario.
- 8.3.38 For a change of a given magnitude, the IAQM (IAQM, 2015) has published recommendations for describing the magnitude of impacts at individual receptors and describing the significance (Table 8.3) of such impacts. This terminology has been changed where appropriate in order to maintain consistency with the rest of this PEI Report – where the IAQM uses 'substantial' this has been changed to 'major', and 'slight' has been changed to 'minor'.

Table 8.5: Air quality impact descriptor for changes in ambient pollutant concentrations of NO₂ and PM₁₀

Long term average concentration at receptor	Percentage change in annual mean concentration				
	Up to 0.5% Imperceptible	0.5-1% Very low	2-5% Low	6-10% Medium	>10% High
75% or less of AQAL	Negligible	Negligible	Negligible	Minor	Moderate
76-94% of AQAL	Negligible	Negligible	Minor	Moderate	Moderate
95-102% of AQAL	Negligible	Minor	Moderate	Moderate	Major
103-109% of AQAL	Negligible	Moderate	Moderate	Major	Major
110% or more of AQAL	Negligible	Moderate	Major	Major	Major

AQAL = Air Quality Assessment Level (NAQS objective or EU limit value or EAL)

- 8.3.39 Research undertaken on behalf of Defra (Defra, 2003) recommends that a trigger value of 60 µg/m³ nitrogen dioxide as an annual mean (150% of the AQAL or NAQS) should be used to consider the likelihood of traffic emissions exceeding the hourly mean nitrogen dioxide objective (200 µg/m³ nitrogen dioxide not more than 18 times per year). Where predicted concentrations are below this value, it can be concluded with confidence that the hourly mean nitrogen dioxide objective will be achieved; this assessment has followed this approach.

- 8.3.40 The IAQM guidance (IAQM, 2015) is not explicit in the identification of whether the above impact descriptor should be considered 'significant' or 'not significant' effects, rather it indicates that 'negligible' impacts are likely to lead to effects that are 'not significant' and 'major' impacts describe the potential for 'significant' effects. The judgement of significance of effects adopted within this assessment is discussed below.

Evaluation of Significance – Point Source Emissions

- 8.3.41 The Environment Agency EPR Risk Assessment (Defra and EA, 2016) screening criteria for comparison of process contributions with Air Quality Strategy objectives state that an emission may be considered insignificant (or negligible) where:

- short-term PC \leq 10% of the NAQS; and
- long-term PC \leq 1% of the NAQS.

- 8.3.42 The impact of point source emissions on ecological receptors, through deposition of nutrient nitrogen or acidity, has been evaluated using the Environment Agency insignificance criterion of 1% of the long term objective, as above.

- 8.3.43 Where emissions are not screened as negligible, the descriptive terms for the air quality effect outlined in Table 8.5 above have been applied.

Evaluation of Significance – Proposed Development as a whole

- 8.3.44 The significance of all of the reported impacts is then considered for the Proposed Development in overall terms. The potential for the scheme to contribute to or interfere with the successful implementation of policies and strategies for the management of local air quality are considered if relevant, but the principal focus is any change to the likelihood of future achievement of the air quality objective values set out in Table 8.1.

- 8.3.45 The achievement of local authority goals for local air quality management is directly linked to the achievement of the air quality objective values and as such this assessment focuses on the likelihood of future achievement of the air quality objective values.

- 8.3.46 In terms of the significance of the consequences of any adverse impacts, an effect is reported as being either 'not significant' or as being 'significant'. If the overall effect of the development on local air quality or on amenity is found to be 'moderate' or 'major' this is deemed to be 'significant'. Effects found to be 'minor' are considered to be 'not significant'; 'negligible' effects are considered to be 'not significant'.

Sources of Information/ Data

Construction Phase Data

- 8.3.47 The traffic data used within this assessment has been sourced from Chapter 14: Traffic and Transportation and is set out in Table 8.6.

Table 8.6: Peak traffic volumes associated with construction of Proposed Development

Location	Units	Proposed Development total vehicles (AADT)	Proposed Development HGVs	Speed (mph)
A19 (north of M62 Junction 34)	Total 2-way	894	80	51.8
Wand Lane (west of Hensall Gate entrance)	Total 2-way	1010	0	56.3
A19 (north of Wand Lane)	Total 2-way	154	0	52.3

Opening Phase Data

- 8.3.48 At this design stage, the technology providers and hence final layout and combustion emission parameters have not been fixed and the Rochdale Envelope is being applied for certain parameters where flexibility needs to be retained; these parameters are outlined in Chapter 4: The Proposed Development and Chapter 6: Need, Alternatives and Design Evolution. The air quality effects associated with alternatives for consideration within the design scheme have been fully explored and the worst case results are presented within this assessment. The design evolution will continue as the application progresses and any changes in design parameters will remain within the envelope evaluated in this assessment, in line with the Rochdale Envelope approach.
- 8.3.49 Opening point source emissions data has been determined from information supplied by four Original Equipment Manufacturers (OEMs) that would potentially supply the CCGT units for the Proposed Development.
- 8.3.50 Conservative assumptions have been made with regard to operational parameters, to determine the maximum potential effects of the operation of the Proposed Development on sensitive receptors; these assumptions include:
- worst case emissions from any of the four OEM-provided information;
 - maximum potential operational availability for the CCGT units;
 - operation of peaking plant throughout the year at the same time as operation of the main units, even though the peaking plant will run for less than 1,500 hours per year; and
 - maximum emission rates, at IED ELVs for all combustion units.
- 8.3.51 In practice, the operation at maximum load of all CCGT units simultaneously with the peaking plant is unlikely to occur for more than a few hours per year; therefore the results present the worst-case potential impact.
- 8.3.52 The actual hours of operation of the CCGTs or the peaking plant will be subject to the national demand for electricity and the economic viability of gas-fired generation. The likely operation of the peaking plant would be to meet short-term peak demand whilst CCGT(s) are brought on-line, with peaking plant units ramping down once CCGTs are nearing maximum load; therefore extended operation of the peaking plant and CCGTs at partial load (within the maximum output capacity) would be unlikely to occur. Furthermore the annual maintenance regime for the plant as a whole will reduce actual annual operation.

- 8.3.53 The above assumptions of 100% operability and emissions at IED ELVs will therefore overestimate the effect on local air quality.
- 8.3.54 There are a number of options for the makeup of the Proposed Development although the overall maximum export capacity will be no more than 2.5 GWe. The alternative design options that have considered for this assessment are summarised in Table 8.7 below; as outlined above, the technology suppliers are not yet fixed and four alternative OEM suppliers have been assessed, with the worst-case, in respect of potential impact, used in the assessment.

Table 8.7: Alternative design schemes for the combustion plant

Design scheme	Unit summary	CCGT Turbine layout	Stack configuration
A	Up to: 3 H-Class (2.2 GW) or 3 F-class CCGT (1.6 GW)	3 single-shaft (see Figure 4.1a in PEI Report Volume II)	Three co-located stacks
B	Up to: 3 H-Class (2.2 GW) or 3 F-class CCGT (1.6 GW)	1 multi-shaft (2 gas turbines) and 1 single-shaft (1 gas turbine) (see Figure 4.1b in PEI Report Volume II)	Three co-located stacks
A/ B	Above units with peaking plant (up to 299 MW), housed in a building, consisting of either: <ul style="list-style-type: none"> • one F-Class OCGT; or • up to 2 E-class OCGT; or • up to 10 reciprocating gas engines (maximum output of circa 100 MW) 	-	Co-located stacks

- 8.3.55 Abnormal operation of the plant includes the use of ‘black start’ gas turbines or engines to start the main CCGT plant units. The design of the black start plant is still to be finalised, however it is anticipated that similar, but lower rated, plant to that proposed for the peaking plant would be employed, with a maximum output of around 30 MW. The plant would be operational for less than 50 hours per year, and therefore the maximum short-term impacts from the abnormal operation can be assumed to be comparable to those from the use of the peaking plant and CCGT plant together (as assessed here); long-term impacts would be anticipated to be lower as a result of the limited operating hours. Maximum short-term impacts will be assessed once the ‘black start’ facility design parameters are known.
- 8.3.56 The modelled point source release parameters have been based on the technology option that results in worst-case impacts, as described above; the modelled emission parameters are summarised in Table 8.8 below.

Table 8.8: Modelled combustion plant atmospheric release parameters

Parameter	Worst-case CCGT unit (each)	Worst-case peaking plant OCGT unit (each)	Peaking plant reciprocating engine unit (each)	Black start unit
Stack height (m above finished ground level)	80.0*	45.0	45.0	45.0
Average efflux velocity (m/s)	20.0	20.0	26.9	tbc
Average emission temperature (°C)	75.0	536	355	tbc
Maximum volumetric flow (Nm ³ /hr) ¹	3,570,000	1,730,000	64,300	tbc
Maximum volumetric flow at stack exit parameters (Am ³ /s)	1,020	1,430	30.5	tbc
Approx. flue diameter (m)	8.0	9.53	1.2	tbc
Assumed maximum operating hours / year	8760	8760	8760	<50
Oxides of nitrogen (NO _x) ELV (IED, mg/Nm ³)	50.0	50.0	100.0	tbc
Oxides of nitrogen (NO _x) emission rate (g/s)	49.6	21.9	1.79	tbc
Approximate stack locations (OS Grid reference)	457600, 423934 (Stack 2 as an example)	457520, 423950	457520, 423950	457510, 423940

1. Reference conditions: 273 K, 0 % O₂, dry

* See paragraph 8.3.58 below

8.3.57 The dispersion modelling of opening point source emissions has taken into consideration the sensitivity of predicted results to model input variables, and to ultimately identify the realistic worst-case results for inclusion in the assessment. These variables include:

- meteorological data, for which five years' recent data from a representative meteorological station (Church Fenton) have been used; and
- buildings, structures and local topography that could affect dispersion from the source.

8.3.58 The worst-case results presented are for an 80 m CCGT plant stack; if a 90 m stack were to be installed the predicted results would be lower than those presented.

Extent of Study Area

- 8.3.59 The study area for the operational development point source emissions extends up to 10 km from the Proposed Power Plant Site, in order to assess the potential impacts on sensitive human health and ecological receptors, in line with EA Risk assessment methodology (Defra and EA, 2016). However, in practice the predicted impacts become negligible beyond a distance of around 3 km from the Proposed Power Plant Site.
- 8.3.60 The study area for construction dust and NRMM emissions has been applied, in line with IAQM guidance, extending:
- up to 350 m beyond the Site boundary and 50 m from the construction traffic route (up to 500 m from the Site entrances), for the identification of human health receptors; and
 - up to 50 m from the boundary or construction traffic route (up to 500 m from the Site entrances) for the identification of ecological receptors.

8.4 Baseline Conditions

Existing Baseline

Sensitive Receptors

- 8.4.2 During the construction phase, based on IAQM guidance (IAQM, 2014), receptors potentially affected by dust soiling and short term concentrations of PM₁₀ generated during construction activities are limited to those located within 350 m of the nearest construction activity, and/or within 50 m of a public road used by construction traffic that is within 500 m of the construction site entrances. Ecological receptors are limited to those located within 50 m of the nearest construction activity and/or within 50 m of a public road used by construction traffic that is within 500 m of the construction site entrances.
- 8.4.3 Receptors potentially affected by the exhaust emissions associated with construction phase vehicle movements are those located within 200 m of a public road used by construction traffic to access the Site. In this instance, it is assumed for the purposes of assessment that construction workers will use the A19 and Wand Lane, to access the Site via Hensall Gate entrance. As outlined in Section 8.3, the only road link for which traffic associated with the Proposed Development may exceed the DMRB screening criteria is Wand Lane to the site entrance and no receptors have been identified within 200 m of this road link, therefore Proposed Development traffic impacts on receptors have been screened out of further assessment.
- 8.4.4 Receptors potentially affected by operational emissions from the Proposed Development including local residential and amenity receptors have been identified through desk study of local mapping and consultation. Isopleth figures of pollutant dispersion have been examined to identify the receptors that will receive the highest point source contributions and the assessment of impact has been made at these receptors; the assessment also includes designated AQMAs, described below.
- 8.4.5 Ecological receptors potentially affected by operational emissions have been identified through desk study of Defra Magic mapping (Defra, 2016c) and consultation (see Chapter 10: Ecology and Nature Conservation). Statutory designated sites including Sites of Special

Scientific Interest (SSSIs) up to 2 km and Special Areas for Conservation (SACs) up to 10 km from the Site have been considered, and additional SACs beyond 10 km, identified through consultation with NYCC, have been included in the assessment. No national or local nature reserves have been identified within 2 km of the Site; however several non-statutory Sites of Importance for Nature Conservation (SINC) have been identified through consultation and included in the assessment. Details of the sites and reasons for designations are provided in Chapter 10: Ecology and Nature Conservation. Identified receptors are detailed in Table 8.9 below, for construction and opening phases.

Table 8.9: Identified receptors with potential for air quality impacts from construction and opening of the Proposed Development

ID	Receptor name	Receptor type	Grid Reference		Distance (km) ¹ and direction	Opening phase	Construction phase (dust)
			x	y			
1	Chapel Haddlesey	School	457632	426514	2.5 N	Y	N
2	Chapel Haddlesey	Residential	457933	426196	2.2 N	Y	Y
3	Eggborough	Residential	456745	423690	0.9 SW	Y	Y
4	Kellington	School, Residential	455360	424974	2.4 W	Y	N
5	West Haddlesey	Residential	456983	426567	2.6 NW	Y	N
6	Gallows Hill	Residential	458485	423783	0.9 E	Y	Y
7	Hensall	Residential	458887	423453	1.4 E	Y	N
8	Temple Hirst	School, Residential	460744	424682	3.2 E	Y	N
9	Springfield Farm	Residential	457435	423054	1.0 S	Y	N
10	Hazeltown Farm & caravan park	Residential	457620	423040	1.0 S	Y	N
11	Properties, Roall Lane	Residential	456923	424774	1.0 NW	Y	N
12	Properties, Roall Water Works	Residential	456965	424370	0.7 NW	Y	Y
13	Roall Hall Farm	Residential	457019	425065	1.2 NW	Y	N
14	Roall Manor Farm	Residential	456619	424893	1.3 NW	Y	N
15	EPL Sports & Social	Residential	457360	424728	0.8 N	Y	N
16	East Haddlesey	Residential	459333	425786	2.5 NE	Y	N
17	PRoW, A19-Tranmore Lane-cricket pitch	Transient	457076	424447	0.7 NW	Y	Y
18	PRoW, Gallows Hill-Eggborough Ings	Transient	458460	424185	1.2 NE	Y	Y
19	Gallows Hill (2)	Residential	458581	423727	1.0 E	Y	Y
20	Myrtle Grange Farm	Residential	459327	423541	1.8 E	Y	N
21	Temple Farm	Residential	459640	425130	2.3 NE	Y	N
22	PRoW Hazel Old Lane	Transient	458207	423937	0.6 E	Y	Y
23	AQMA, M62	AQMA	452980	422430	4.9 W	Y	N
24	AQMA, New Street, Selby	AQMA	461620	432340	9.3 NE	Y	N

ID	Receptor name	Receptor type	Grid Reference		Distance (km) ¹ and direction	Opening phase	Construction phase (dust)
			x	y			
E1	Burr Closes ²	SSSI	459650	433900	9.6 N	Y	N
E2	Eskamhorn Meadows ²	SSSI	466300	423766	8.3 E	Y	N
E3	Went Ings Meadows ²	SSSI	464800	418300	9.1 SE	Y	N
E4	Forlorn Hope Meadow ²	SSSI	454450	417190	8.0 SW	Y	N
E5	Brockadale ²	SSSI	450530	417690	10 SW	Y	N
E6	Humber Estuary ²	SAC	473400	426200	16 N	Y	N
E7	Skipwith Common ²	SAC	464900	436600	15 NE	Y	N
E8	Strensall Common ²	SAC	463600	458500	35 N	Y	N
E9	North York Moors ²	SAC	457600	488500	65 N	Y	N
E10	Hatfield Moor ²	SAC	469850	408350	20 SE	Y	N
E11	Thorne Moor ²	SAC	472350	470650	15 SE	Y	N
E12	Selby canal and towpath ²	SINC	457600	428300	4.4 N	Y	N
E13	Burn disused airfield ²	SINC	460000	427600	4.4 NE	Y	N
E14	Eggborough disused pit ²	SINC	458100	422800	1.2 S	Y	N

Notes:

1

Distance measured from receptor to Proposed Power Plant Site

2

Receptor beyond screening distance but identified for potential impacts through consultation

Existing Air Quality

- 8.4.6 Existing air quality conditions in the vicinity of the Site have been evaluated through a review of local authority air quality management reports, Defra published data and other sources. As described, the key pollutants of concern resulting from construction and operation of the Proposed Development are oxides of nitrogen, nitrogen dioxide, CO, PM₁₀ and PM_{2.5}, therefore the assessment of baseline conditions considers these pollutants only.
- 8.4.7 A small AQMA in Selby town (New Street/ The Crescent) was designated by SDC in February 2016 due to consistent elevated levels of nitrogen dioxide being recorded over a number of years, primarily as a result of traffic emissions. An AQAP is now being prepared by SDC. This AQMA is approximately 9 km to the north-east of the Proposed Power Plant Site.
- 8.4.8 There is also a larger AQMA along the M62 corridor through Wakefield District, designated by Wakefield Metropolitan District Council for elevated concentrations of nitrogen dioxide. The boundary of the AQMA is approximately 5 km to the west of the Proposed Power Plant Site.
- 8.4.9 SDC currently undertakes diffusion tube monitoring within Selby town to help characterise conditions in the AQMA by monitoring at roadside locations, and obtains automatic monitoring data for data validation from automatic monitors in Hull, Barnsley and York (SDC, 2015), the closest of which is 25 km from the Proposed Power Plant Site. The available data is therefore not considered representative of background air quality in the vicinity of the Site.
- 8.4.10 Background data has therefore been obtained from Defra published maps for the locations of likely maximum impact from point source emissions from the Proposed Development, and at identified sensitive receptor locations. The most recently available data is for 2013, which is conservatively assumed to be representative of the construction and opening baselines (2020 (peak construction) and 2022 (opening year), respectively). Background data assumed for the maximum impact location from the point source emissions is provided in Table 8.10 below and indicates nitrogen dioxide and PM₁₀ concentrations within the vicinity of the Proposed Development are consistently well below the NAQS annual mean objectives. Background data at sensitive receptors for point source and traffic emission impacts is provided in Table 8.11.

Table 8.10: Defra background air quality data – existing and assumed future year projections

Pollutant	Annual mean concentration (µg/m ³)	
	2013	2022 (assumed)
Nitrogen dioxide (NO ₂)	16.1	16.1
PM ₁₀	16.8	16.8
PM _{2.5}	11.9	11.9
CO (from 2001)	289	289

Notes: Grid reference (457500, 424500); based on 2013 base-mapping except where indicated

Table 8.11: Background concentrations at receptors – based on Defra background data

ID	Receptor name	Background air quality (2013)	
		Nitrogen dioxide ($\mu\text{g}/\text{m}^3$)	PM ₁₀ ($\mu\text{g}/\text{m}^3$)
1	Chapel Haddlesey	13.9	16.9
2	Chapel Haddlesey	13.9	16.9
3	Eggborough	17.7	21.5
4	Kellington	15.5	19.4
5	West Haddlesey	13.7	16.9
6	Gallows Hill	15.6	16.9
7	Hensall	15.6	16.9
8	Temple Hirst	15.5	17.4
9	Springfield Farm	16.3	18.2
10	Hazelgrove Farm & caravan park	16.3	18.2
11	Properties, Roall Lane	15.6	19.3
12	Properties, Roall Water Works	15.6	19.3
13	Roall Hall Farm	14.6	18.0
14	Roall Manor Farm	15.6	19.3
15	EPL Sports & Social	16.1	16.8
16	East Haddlesey	14.2	16.9
17 (T)	PRoW, A19-Tranmore Lane-cricket pitch	16.1	16.8
18 (T)	PRoW, Gallows Hill-Eggborough lngs	14.8	16.8
19	Gallows Hill (2)	15.6	16.9
20	Recreation ground / Myrtle Grange Farm	15.6	17.0
21	Temple Farm	14.2	16.9
22	PRoW, Hazel Old Lane	16.1	16.8
23	AQMA, M62	21.3	21.4
24	AQMA, New Street, Selby	17.1	17.3

(T) indicates transient receptor

- 8.4.11 Eggborough Power Limited (EPL) (the Applicant) previously undertook monitoring of the ambient air as part of the Aire Valley Power Stations Joint Environment Programme (JEP) for the coal-fired power stations in the area. The most recently reported data to the EA (2014) is presented in Table 8.12 below for the closest downwind monitoring site to the existing Eggborough coal-fired power station (5 km from the Proposed Power Plant Site), together with historic data from two previous reports.

Table 8.12: Existing coal-fired power station background monitoring (JEP, West Bank monitoring)

Pollutant	Annual mean concentration ($\mu\text{g}/\text{m}^3$)		
	2014	2012	2010
Nitrogen dioxide	12.1	16.3	15.9

Notes: Monitor located approximately 5 km east of the Proposed Power Plant Site

- 8.4.12 The JEP monitoring similarly indicates that background air quality in the vicinity of the Proposed Development is well below the NAQS annual mean objective for NO₂.
- 8.4.13 As there is limited ambient air monitoring data in the immediate vicinity of the Site, EPL is currently conducting a limited diffusion tube survey for nitrogen dioxide at key receptor locations, identified through this assessment, in order to supplement the baseline assessment and to review the verification factors assumed for any construction road traffic emissions assessment. The results of the diffusion tube survey will be used to review the baseline assessment in the final ES.
- 8.4.14 The existing air quality concentrations, acid and nutrient nitrogen deposition rates at the designated habitat sites have been obtained from APIS. This data is presented in Appendix 8A within Tables 8A.10-8A.13 (PEI Report Volume III).

Future Baseline

Construction Dust

- 8.4.15 The baseline for construction dust has not been quantified as the assessment uses a qualitative risk based approach, however the potential for additional sources of dust and cumulative effects from other developments is considered within the evaluation of the magnitude of effects, as discussed in Section 8.6.

Point Source Emissions

- 8.4.16 The future baseline (without the Proposed Development) will be beneficially lowered as a result of the planned closure of the existing coal-fired power station, resulting in lower ambient concentrations of criteria pollutants, including NO₂, nitrogen dioxide, SO₂, PM₁₀ and PM_{2.5}. The levels to which the ambient concentrations of pollutants in the vicinity of the Site will be reduced as a result of the cessation of existing coal-fired power station emissions are not easy to predict since the current contribution in the vicinity of the Site is unknown. As a worst-case, the existing baseline including the existing coal-fired power station emission contributions is assumed to also represent the future baseline to which the Proposed Development point source emissions are added; this therefore results in a conservative assessment and actual impacts are likely to be lower.
- 8.4.17 Based on the relative stack heights and stack locations of the existing coal-fired power station and the Proposed Development, the peak ground level process contributions from the two generating stations would occur in different locations and therefore the assumed future baseline (from existing Defra mapping data) would not be expected to be overly influenced by the contributions from the existing power station.
- 8.4.18 In accordance with EA risk assessment methodology (Defra and EA, 2016), the annual mean background pollutant concentrations have been obtained from Defra background mapping (2013) as described above, and the short-term background concentration is assumed to be twice the annual mean ambient concentration.

Receptors

- 8.4.19 Future additional receptors may be developed prior to construction of the Proposed Development as part of potentially planned housing developments south-west of A19/ A645

and between Selby Rd and the A19, as described in Chapter 20: Cumulative and Combined Effects, however these receptors are considered to be adequately represented by those receptors identified above.

8.5 Development Design and Impact Avoidance

Construction

Construction Environmental Management Plan

8.5.2 Emissions of dust and particulates from the construction phase of the Proposed Development will be controlled in accordance with industry best practice, through incorporation of appropriate control measures according to the risks posed by the activities undertaken, as determined through this assessment process. The management of dust and particulates and application of adequate mitigation measures will be enforced through the proposed Construction Environmental Management Plan (CEMP). The Considerate Constructors Scheme (CCS) will be adopted to assist in reducing pollution and nuisance from the Proposed Development.

8.5.3 Based on an initial assessment of the area of sensitivity to dust impacts and the likely risk of impacts arising from each of the key construction activities (demolition, earthworks, construction and trackout – see Appendix 8A, PEI Report Volume III), as described in Section 8.6 below, appropriate specific measures (beyond general good site techniques) identified are:

- avoid roughening of concrete surfaces during construction;
- store sand and aggregates in bunded areas;
- use water suppression and regular cleaning to minimise mud on roads;
- cover vehicles leaving the construction site;
- employ wheel wash systems at site exits;
- restrict unmade road access;
- use water suppression to control dust during demolition activities;
- avoid blasting where possible during demolition (use mechanical/ manual techniques where possible); and
- prohibit open fires on Site.

8.5.4 Best practice will also be employed for the siting and operation of NRMM to control associated emissions, including:

- minimise vehicle and plant idling;
- locate static plant away from sensitive boundaries or receptors; and
- minimise operating time outside of normal working hours/ daylight hours.

Opening

IED Emission Limit Value (ELV) Compliance

8.5.5 The Proposed Development will be designed such that process emissions to air comply with the ELV requirements specified in the IED. This will be regulated by the EA through the Environmental Permit required for the operation of the Proposed Power Plant Site.

- 8.5.6 The OEMs have all indicated that the current generation of CCGT technologies can meet IED ELVs without the use of secondary abatement techniques, such as Selective Catalytic Reduction (SCR) for the control of nitrogen oxide emissions. However, a revision to the LCP BRef Note is being drafted, which is due for finalisation and publication in mid 2017, as discussed in Section 8.2. This will specify emission levels that represent BAT for generating stations including gas-fired generating stations such as the Proposed Development.
- 8.5.7 The current draft of this document indicates that the BAT achievable emission levels for CCGTs may tighten such that the use of SCR may be required to achieve such levels. This is particularly the case for the latest generation of CCGT units, which achieve higher electrical efficiencies through the use of higher temperatures; higher temperatures lead to higher nitrogen oxide formation.
- 8.5.8 In light of this, the EA is in consultation as to whether to permit higher nitrogen oxide emissions from the most efficient CCGT units, which would still have to maintain compliance with the IED limits but may not be required to install SCR to meet the revised BRef levels; such units are under consideration for use as part of this Proposed Development. Consequently, space has been left within the plant layouts for the installation of SCR, should that be required. However, emissions have been conservatively assessed at IED limits as these are the current legislative standard that must be applied and may be applied under the permit for the proposed generating station.

Stack Height

- 8.5.9 The stack heights for the CCGT units and peaking plant have been optimised with consideration given to minimisation of ground-level air quality impacts, and the visual impacts of taller stacks. Dispersion modelling has been undertaken to determine the optimum stack height range for the main plant stacks (75-90 m) and the peaking plant stacks (45-50 m) through comparison of the maximum impacts at human health and ecological receptors. Further information on the determination of the stack heights is provided in Appendix 8A (PEI Report Volume III).
- 8.5.10 The selected stack height has been incorporated into the plant design and is based on a specified value of 80 m above the finished ground level (up to 89.9 mAOD) for the CCGT units, and 45 m (54.9 mAOD) for the peaking plant stacks. (Note the CCGT stack is stated elsewhere in this PEI Report to be up to 90 m and this greater height has been assessed as a worst case for the landscape and visual assessment presented in Chapter 16: Landscape and Visual Amenity).
- 8.5.11 All stacks for each technology type will be co-located as this is considered by the EA to improve dispersion over separately located stacks; it also reduces the visual impact of the stacks.

Visible Plumes

- 8.5.12 The potential for visible plumes from the CCGT stacks or peaking plant stacks is considered to be very low as a result of the water content and temperature of the flue gas.
- 8.5.13 Visible plumes from the potential use of hybrid cooling cells have not been assessed, as they are not expected to generate a visible plume under most meteorological conditions. The hybrid cooling water systems are also relatively low in height – up to 30 m above the finished ground level. Given the distances to sensitive receptors and the prevailing wind direction away

from the A19 and the main receptor areas, the risk of potential impacts from visible hybrid cooling water system plumes is considered negligible.

- 8.5.14 While the use of hybrid cooling towers is preferred based on current information, at this stage in the design, other potential cooling technologies have not yet been ruled out, such as the use of wet cooling towers. If wet cooling towers were to be used, these would likely result in more significant visible plumes being generated than the use of hybrid cells. At this stage no assessment of visible plumes has been undertaken. The choice of cooling technology will be subject to a BAT justification to be agreed with the EA.

8.6 Likely Impacts and Effects

Construction

Assessment of Demolition and Construction Dust

- 8.6.2 Identified sensitive receptors to dust soiling and PM₁₀ effects from construction works are detailed in Table 8.8; of these receptors, less than ten are located within 100 m of the Site boundary or site exits; and less than 100 are located within 350 m of the Site. The Proposed Borehole Connection running parallel to the A19 to the south is within 100 m of a number of sensitive receptors (Eggborough residential properties, R3), however these works are anticipated to be limited, with installation of each section of pipeline taking circa 3 months and therefore receptor sensitivity is judged to be low for these works.
- 8.6.3 No sensitive ecological receptors have been identified within the screening distance and therefore effects of demolition and construction dust on ecological receptors have been screened out.
- 8.6.4 The scale and nature of activities have been estimated to define the potential uncontrolled dust generation magnitude, according to the criteria outlined in Appendix 8A, Table 8A.1 (PEI Report Volume III). Construction of the Proposed Development is anticipated to commence in 2019 and to last approximately three years.
- 8.6.5 Whilst a detailed construction plan has yet to be developed for the Proposed Development, estimates of the likely scale of activities, with reference to the guidance magnitude definitions in Table 8A.5 (Appendix 8A, PEI Report Volume III), have been made for the purposes of mitigation definition:
- the facilitating works are expected to remove existing ancillary buildings of <20,000 m³ approximate volume, and of principally prefabricated design; some limited concrete removal is anticipated although on-site crushing and screening activities would not be proposed;
 - the earthworks would cover an area in excess of 10 hectares, and move more than 100,000 t materials, including potentially dusty materials from the existing coal stockyard, using approximately 5-10 heavy earth moving vehicles at the peak;
 - the total new building volume would be in excess of 50,000 m³ and an on-site concrete batching is likely to be employed for periods during the construction phase; and
 - HGV movements associated with excavation and earthworks would be more than 50 vehicles per day at peak.

- 8.6.6 The magnitude of effects for dust and NRMM emissions has been determined as 'small' for demolition works; and large for earthworks, construction and trackout activities.
- 8.6.7 In consideration of the potential for cumulative impacts from demolition of the existing coal-fired power station at the same time as the Proposed Development construction activities, there is the potential for greater impacts at sensitive receptors. Therefore whilst the magnitude of demolition activities associated with facilitating the Proposed Development is judged to be 'small', in order to account for potential increased impacts at the receptors from the cumulative effect of construction of the Proposed Development and demolition of the coal-fired power station, the magnitude of demolition activities has been increased to 'large'.
- 8.6.8 The area of sensitivity to the potential dust impacts (pre-mitigation) has been assessed based on the receptor sensitivity and distance criteria outlined in Tables 8A.2 - 8A.4 (Appendix 8A, PEI Report Volume III) using professional judgement. The area of sensitivity has been judged to be 'medium' for dust soiling impacts from trackout at the site exits and 'low' sensitivity for dust soiling impacts and human health impacts from PM₁₀ releases from all other activities, on account of the distance from the activity source to the receptors, and the existing low background concentration particulates (<24µg/m³).

Table 8.13: Area of sensitivity to dust soiling and human health impacts

Activity and effect type	Receptor sensitivity	Potential impact	Area sensitivity
Demolition	High sensitivity (1-10 receptors, within 100 m)	Dust soiling	Low
		Human health PM ₁₀	Low
Earthworks	High sensitivity (10-100 receptors within 100 m)	Dust soiling	Low
		Human health PM ₁₀	Low
Construction	High sensitivity (1-10 receptors, within 100 m)	Dust soiling	Low
		Human health PM ₁₀	Low
Trackout	High sensitivity (1-10 receptors, within 20 m of road, 500 m from site exits)	Dust soiling	Medium
		Human health PM ₁₀	Low

- 8.6.9 The potential risks from emissions from unmitigated demolition and construction activities (i.e. not taking into account the impact avoidance measures set out in Section 8.5 above) have been defined with reference to the magnitude of the potential emission and the sensitivity of the impact area, in accordance with the classification defined in Appendix 8A, Table 8A.5 (PEI Report Volume III); the results are shown in Table 8.14 below, for the Proposed Development (in isolation) and for potential cumulative activities with the existing coal-fired power station demolition, as described above.

Table 8.14: Risk of dust and particulates impacts (pre-mitigation)

Potential impact	Risk of impact from activity			
	Demolition	Earthworks	Construction	Trackout
Proposed Development in isolation				
Dust soiling	Negligible	Low risk	Low risk	Medium risk
Human health PM ₁₀	Negligible	Low risk	Low risk	Low risk

Risk with cumulative impacts from demolition of existing coal-fired power station				
Dust soiling	Medium risk	Low risk	Low risk	Medium risk
Human health PM ₁₀	Medium risk	Low risk	Low risk	Low risk

- 8.6.10 The level of mitigation required to reduce dust and particulates from the activities to avoid significant impacts on receptors has been determined based on the above risk assessment and indicative measures are outlined in Table 8.15 for the Proposed Development activities in isolation, and at the same time as demolition of the existing coal-fired power station. These were summarised in Section 8.5 above.

Table 8.15: Mitigation for dust and particulates during construction phase

Activity	Example mitigation based on risk level	Classification of residual risk of impact	Effect descriptor
Proposed Development in isolation			
Demolition	Negligible: apply good practice techniques	Negligible	Not significant
Earthworks	Low risk: apply good practice techniques	Negligible	Not significant
Construction	Low risk: avoid roughening of concrete surfaces; store sand and aggregates in bunded areas	Negligible	Not significant
Trackout	Medium risk: use water suppression and regular cleaning to minimise mud on road; cover vehicles leaving the site; employ wheel wash systems at site exits	Negligible	Not significant
Proposed Development with cumulative impacts from demolition of existing coal-fired power station			
Demolition	Medium risk: use of screening at sensitive boundaries; use of water suppression measures; avoidance of blasting (use mechanical/manual techniques); no open fires	Negligible	Not significant
Earthworks	Low risk: apply good practice techniques;	Negligible	Not significant
Construction	Low risk: avoid roughening of concrete surfaces; store sand and aggregates in bunded areas	Negligible	Not significant
Trackout	Medium risk: use water suppression and regular cleaning to minimise mud on road; cover vehicles leaving the site; employ wheel wash systems at site exits; restrict unmade road access	Negligible	Not significant

- 8.6.11 The aim is to apply mitigation measures as necessary, that minimise the potential for complaints to be generated as a result of the Proposed Development construction works. Therefore the application of industry best practice controls and mitigation, including consideration of the above identified example mitigation, is considered to reduce this potential such that effects at receptors will be not significant.

Assessment of Construction Traffic

As described in Sections 8.3 and 8.4 above, the peak construction traffic is below the DMRB screening criteria along all but one road link, for which there are no receptors within 200 m, and therefore significant changes in air quality at receptors are not expected. The change in AADT flow associated with construction traffic at the two identified AQMAs (M62; Selby town centre) is therefore also anticipated to be below the screening criteria and traffic composition at these sensitive locations is not anticipated to be significantly changed. The air quality effects from construction traffic are therefore not significant.

Assessment of Emissions Generated from Construction Site Plant (Non-Road Mobile Machinery)

- 8.6.12 At this stage of the design, the details for number and types of NRMM that would be employed in the construction on Site are not established, however the majority of the construction Site boundary is located more than 200 m from sensitive receptors, as described in the assessment of construction dust.
- 8.6.13 The areas of construction that are within 200 m of sensitive receptors include works associated with the Proposed Borehole Connection near to Eggborough residential properties (A19, R3), and works associated with the Proposed Cooling Water and/or Gas Connections near to Chapel Haddlesey properties, East Haddlesey properties and several farms to the north. None of these construction working areas are expected to employ NRMM for long periods of time; installation of each section of pipeline takes circa 3 months.
- 8.6.14 Therefore it is considered that the potential for significant effects from NO₂ and PM₁₀ emissions from NRMM on sensitive receptors is likely to be low. As described in Section 8.5 above, best practice will be employed for siting and operation of NRMM. The application of best practice mitigation and the inherent low risk to sensitive receptors from NRMM as a result of their distance or duration of use means that the NRMM emissions are considered to be not significant.
- 8.6.15 The effects of construction emissions, from demolition and construction dust, construction road traffic and onsite plant, have been determined to be minor or negligible adverse and therefore the construction air quality effects are considered to be not significant.

Opening

Assessment of Opening Point Source Emissions

- 8.6.16 The impact of point source emissions at human health receptors has been determined from isopleth figures of pollutant dispersion and maximum model output at discrete receptor locations. The maximum hourly, daily and annual mean predicted concentrations have been compared with the NAQS objectives, as summarised in Table 8.20 below; detailed concentrations are provide in Table 8A.9 in Appendix 8A (PEI Report Volume III).

- 8.6.17 These results represent the output from the worst-case modelled scenario described in Table 8.7 (design scheme B; one multi-shaft and one single-shaft H-Class CCGTs (up to 2.2 GW) and ten reciprocating gas engines (100 MW)); variation in the predicted results with alternative Rochdale Envelope scenarios is discussed in paragraph 8.6.29.
- 8.6.18 The assessment has been undertaken for the Proposed Development Opening year, likely to be around 2022. A separate Operational (2037) scenario has not been undertaken for the air emissions assessment; this is because Defra predicts a gradual trend of improving air quality over the UK over many years, although the scale of any such improvement is currently under review. By assessing the effects of the Proposed Development at the Opening year therefore, a worst case ambient air quality is assumed for the purposes of the operational impact assessment.
- 8.6.19 The dispersion modelling includes a number of conservative assumptions in combination, including:
- use of the worst-case year of meteorological data modelled;
 - maximum building sizes within the assessed Rochdale Envelope;
 - worst case CCGT configuration within the assessed Rochdale Envelope, other configurations resulted in lower predicted impacts as shown in Appendix 8A (PEI Report Volume III);
 - annual operation of 100% for both CCGT main plant units and peaking plant units;
 - operation of the plant at IED emission limits; and
 - conservative estimates of background concentrations at the sensitive receptors.
- 8.6.20 The following abbreviations are used in Tables 8.16-18:
- PC: this is the Process Contribution and represents the change caused by the Proposed Development;
 - headroom: this is the short term PC as a percentage of the available headroom between the background concentration and the NAQS objective; and
 - PEC: this is the Predicted Environmental Concentration and is PC plus background concentration. It is the concentration expected at a particular receptor once the effect of the Proposed Development is taken into account.

Table 8.16: Maximum long term nitrogen dioxide predicted concentrations at human health receptors

Receptor ID	Annual mean nitrogen dioxide PC PC/NAQS	Magnitude of change	Annual mean PEC/NAQS	Effect
1	0.6%	Very low	35%	Negligible adverse
2	0.9%	Very low	35%	Negligible adverse
3	0.5%	Imperceptible	44%	Negligible adverse
4	0.3%	Imperceptible	39%	Negligible adverse
5	0.4%	Imperceptible	35%	Negligible adverse
6	5.8%	Medium	45%	Minor adverse
7	2.0%	Very low	41%	Negligible adverse
8	1.7%	Very low	40%	Negligible adverse

Receptor ID	Annual mean nitrogen dioxide PC PC/NAQS	Magnitude of change	Annual mean PEC/NAQS	Effect
9	0.3%	Imperceptible	41%	Negligible adverse
10	0.3%	Imperceptible	41%	Negligible adverse
11	0.3%	Imperceptible	39%	Negligible adverse
12	0.4%	Imperceptible	39%	Negligible adverse
13	0.4%	Imperceptible	37%	Negligible adverse
14	0.2%	Imperceptible	39%	Negligible adverse
15	0.8%	Imperceptible	41%	Negligible adverse
16	1.2%	Very low	37%	Negligible adverse
17(T)	0.4%	Very Low	41%	Negligible adverse
18(T)	4.3%	Low	41%	Negligible adverse
19	4.7%	Low	44%	Negligible adverse
20	2.5%	Low	41%	Negligible adverse
21	2.1%	Low	38%	Negligible adverse
22(T)	9.7%	Medium	50%	Minor adverse
23 (AQMA)	0.1%	Imperceptible	53%	Negligible adverse
24 (AQMA)	0.4%	Imperceptible	43%	Negligible adverse

(T) indicates transient receptor

Table 8.17: Maximum predicted concentrations at worst affected human health receptors

Receptor	Pollutant	PC ($\mu\text{g}/\text{m}^3$)	PC/NAQS	PC as % of headroom	Effect
22 (T)	Nitrogen dioxide (1-hour mean, 99.79 th ile)	66	33%	39%	Minor adverse
6	Nitrogen dioxide (1-hour mean, 99.79 th ile)	44	22%	26%	Minor adverse

- 8.6.21 The maximum long term process contribution of nitrogen dioxide from any of the operational scenarios results in a medium magnitude of change in the annual mean concentration at several of the identified receptors, of which Gallows Hill receptors (6, 19) represent the worst affected residential receptors. The transient receptor (22) which represents users of the PRoW (Hazel Old Lane) is predicted to experience the highest change in annual mean concentration, with medium magnitude.
- 8.6.22 The annual mean baseline concentration at these receptors is well below the NAQS objective with the Proposed Development, therefore the effect of the Proposed Development emissions at these receptors is described as minor adverse (not significant). The magnitude of change in annual mean NO₂ at all other human health receptors is low or very low and the effect of the emissions is therefore described as negligible adverse (not significant) at these locations.
- 8.6.23 The magnitude of change in annual mean nitrogen dioxide concentration at the identified AQMAs (represented by receptors 23 and 24) from the Proposed Development is very low (M62 AQMA: 0.1% of the NAQS; Selby AQMA: 0.4% of the NAQS), therefore the effect from Proposed Development at the AQMAs is described as negligible adverse (not significant).

- 8.6.24 The maximum short-term predicted concentration of nitrogen dioxide at the worst affected receptor (22, PRoW Hazel Old Lane) represents 33% of the hourly mean NAQS objective and therefore is not negligible as defined by the EA criteria, however the Proposed Development short-term contribution combined with the baseline concentration is well below the NAQS and therefore the effect is described as minor adverse (not significant). The maximum short-term predicted concentration of nitrogen dioxide at the worst affected residential receptor (6, Gallows Hill) represents 22% of the hourly mean NAQS objective and therefore is not negligible as defined by the EA criteria, however the Proposed Development short-term contribution combined with the baseline concentration is well below the NAQS and therefore the effect is described as minor adverse (not significant).
- 8.6.25 The impact of process contributions of point source emissions at ecological receptors has been determined from isopleth figures of pollutant dispersion and maximum model output at discrete receptor locations. Annual mean NO_x process contributions have been compared with the annual mean Critical Level at each of the identified ecological receptors, are shown in Table 8.18 below.

Table 8.18: Maximum NO_x process contributions at ecological receptors

Receptor ID	Annual mean PC/NAQS	Magnitude of change	Annual mean PEC/NAQS	Effect
E1	0.8%	Very low	65%	Negligible adverse
E2	1.4%	Very low	74%	Negligible adverse
E3	0.4%	Imperceptible	68%	Negligible adverse
E4	0.3%	Imperceptible	75%	Negligible adverse
E5	0.2%	Imperceptible	76%	Negligible adverse
E6	0.8%	Very low	63%	Negligible adverse
E7	0.6%	Very low	52%	Negligible adverse
E8	0.3%	Imperceptible	47%	Negligible adverse
E9	0.2%	Imperceptible	28%	Negligible adverse
E10	0.2%	Imperceptible	65%	Negligible adverse
E11	0.7%	Very low	58%	Negligible adverse
E12	0.8%	Very low	67%	Negligible adverse
E13	1.0%	Very low	68%	Negligible adverse
E14	0.5%	Imperceptible	97%	Negligible adverse

- 8.6.26 The maximum process contribution of NO_x from any of the operational scenarios results in a very low magnitude of change in the annual mean concentration at the worst affected ecological receptor (E2), and very low or imperceptible change at the other identified receptors; the ambient concentration at these receptors is well below the objective with the Proposed Development, therefore the effect of the Proposed Development operational emissions at these receptors is described as negligible adverse (not significant).
- 8.6.27 In addition to the above assessment of ground level concentrations at the identified ecological receptors, an assessment of deposition impacts has also been undertaken as presented in Appendix 8A, Tables 8A.12-8A.13 (PEI Report Volume III). The identified statutory ecological receptors are all designated for species that may be sensitive to nutrient nitrogen deposition and acid deposition; non-statutory sites (SINCs) have not been assessed as Critical Loads are

not on public records. The maximum process contribution of nutrient nitrogen deposition at any of the identified receptors is less than 1% of the critical load published for the most sensitive habitat at each receptor. The process contribution of sulphur deposition at any of the ecological receptors is expected to be negligible as the emissions of SO₂ from natural gas combustion are trivial; therefore process contributions of only the nitrogen kilo equivalent deposition has been compared with the acidity critical loads, and the maximum nitrogen deposition process contribution to acid deposition at any of the identified receptors is less than <0.1% of the critical load published for the most sensitive habitat at each receptor; therefore the effect of nutrient nitrogen and acid deposition from the Proposed Development at these receptors is described as negligible adverse (not significant).

- 8.6.28 The opening point source emissions effects on identified receptors has been determined to have negligible adverse effect and therefore the operational effects are considered to be not significant.

Sensitivity Analysis

Rochdale Envelope Parameters

- 8.6.29 The alternative design schemes included within this assessment under the Rochdale Envelope approach have been modelled and the design scheme (see Table 8.7) resulting in the worst-case overall predicted concentrations has been used in the above assessment of effects significance. The maximum predicted concentrations at the worst affected human health and ecological receptors associated with the alternative design schemes are shown in Table 8.19 below as the percentage of reported values used in the effects significance assessment. So a reported result in Table 8.19 of 100% means that result is the same as was reported in the main assessment above, and therefore represents the worst case; if a result is less than 100% then this means that the result is not as great an impact as the worst case presented. Application of the below sensitivity results to process contributions does not adversely alter the predicted effects significance assessment and therefore the reported receptor effects can be considered worst-case.

Table 8.19: Rochdale Envelope – maximum process contributions at worst affected receptors (as % of reported values)

Design scheme (see Table 8.7)	Human health receptors		Ecological receptors	
	Annual mean NO ₂	Hourly mean NO ₂	Annual mean NO _x	Daily mean NO _x
A (3 x H-Class, single shaft, OCGT peaking plant)	77%	100% (reported)	98%	100% (reported)
B (3 x H-Class, Multi- & single shaft, OCGT peaking plant)	80%	88%	85%	87%
B (3 x F-Class, multi-shaft, OCGT peaking plant)	47%	45%	73%	71%
B (3x H-Class)+ reciprocating engines peaking plant	100% (reported)	94%	100% (reported)	98%

Decommissioning

- 8.6.30 The relevant best practice mitigation measures will be in place during any decommissioning works, and the surrounding environment and receptors at the time of decommissioning will be identified through due process and documented in a Demolition Environmental Management Plan; no additional mitigation for decommissioning of the Proposed Development beyond such best practice is foreseen to be required at this stage. The predicted air quality effects of eventual decommissioning of the Proposed Development are considered to be comparable to – or less than – those assessed for construction activities.

Summary of Evaluation of Effects for the Proposed Development as a Whole

- 8.6.31 The effects of construction emissions, from demolition and construction dust, construction road traffic and onsite plant, have been determined to be minor or negligible adverse and therefore the construction air quality effects are considered to be not significant. The opening point source emissions effects on identified receptors has been determined to have negligible adverse effect and therefore the operational effects are considered to be not significant. Sensitivity analysis has identified that the results presented are not adversely altered with the alternative design schemes presented and that the dispersion model variables present a realistic worst case. Therefore the air quality effects from the Proposed Development are considered to be not significant.

8.7 Mitigation and Enhancement Measures

- 8.7.1 As described earlier, the management of dust and particulates and application of adequate mitigation measures will be enforced through the CEMP, and through application of appropriate mitigation according to the risk of dust emissions from Site activities as identified in this assessment. A framework CEMP will be submitted with the final ES to support the DCO application, and a Requirement on the DCO will secure the submission and approval (prior to construction), and then implementation of a final CEMP.
- 8.7.2 The environmental effects from construction of the Proposed Development have been identified as not significant, therefore no specific additional mitigation has been identified as necessary for the construction phase of the Proposed Development.
- 8.7.3 The air quality assessment of operational impacts has assumed that the ELVs will be met for the operational plant as required under the IED and in accordance with use of BAT under the environmental permitting regime. The environmental effects from operation of the Proposed Development have been identified as not significant, therefore no specific additional mitigation has been identified as necessary for the operational phase of the Proposed Development. As identified in Section 8.5, the plant will be designed to be able to accommodate the future installation of SCR, should that be required.

8.8 Limitations or Difficulties

- 8.8.1 No technical limitations or difficulties that could have implications for the assessment were encountered. The assessment presented in this PEI Report takes the data available from OEMs and assesses worst case impacts; no further refinement of the assessment is expected to be required in the final ES unless effects are further reduced from those presented in this chapter,

through design changes, although the assessment in the final ES will be augmented by the inclusion of the results of the ongoing diffusion tube monitoring survey.

8.9 Residual Effects and Conclusions

Construction

- 8.9.1 The air quality assessment of construction impacts assumes that the measures outlined within the mitigation section would be incorporated into the design of the Proposed Development, as they are standard best practice measures that are routinely applied across UK construction sites. No specific additional mitigation has been identified as necessary for the construction phase of the Proposed Development. For this reason, the residual effects would be as reported within Section 8.6 of this chapter.
- 8.9.2 Whilst the potential air quality effects of construction traffic associated with the Proposed Development are negligible (with or without the addition of traffic associated with the demolition of the existing coal-fired power station), it is recognised that a number of cumulative schemes could be using the same road network at the time of construction. EPL are not in a position to influence the timing or routing of construction traffic to off-site developments but they do have the potential to influence the timing and routing of demolition traffic associated with the existing coal-fired power station. It is therefore proposed that, once the timing of the existing coal-fired power station demolition activities is known, EPL will prepare a Travel Plan for construction and demolition traffic accessing the site and will evaluate the need to coordinate traffic flows to the two activities, to avoid significant cumulative impacts.

Opening

- 8.9.3 The air quality assessment of impacts at opening has assumed that the ELVs will be met for the operational plant as required under the IED and in accordance with use of BAT under the environmental permitting regime. No specific additional mitigation has been identified as necessary for the opening phase of the Proposed Development. For this reason, the residual effects would be as reported within Section 8.6 of this chapter.

Decommissioning

Consistent with construction mitigation, it has been assumed that relevant best practice mitigation measures would be in place during any decommissioning works. No specific additional mitigation has been identified as necessary for the decommissioning phase of the Proposed Development.

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9 NOISE & VIBRATION

9.1 Introduction

- 9.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential noise and vibration effects of the proposed Combined Cycle Gas Turbine (CCGT) power station near Eggborough, North Yorkshire (hereafter referred to as the 'Proposed Development').
- 9.1.2 Impacts during the construction, operation and decommissioning phases of the Proposed Development are assessed. In particular, the chapter considers potential impacts on identified receptors in terms of:
- predicted noise and vibration levels during the site clearance and construction works associated with the Proposed Development;
 - predicted changes in road traffic noise levels on the local road network during the construction and operational phases; and
 - predicted noise and vibration resulting from operation of the Proposed Development.
- 9.1.3 This chapter is supported by the Figure 9.1 provided in PEI Report Volume II and Appendices 9A and 9B in PEI Report Volume III.

9.2 Legislation and Planning Policy Context

Legislative Background

Environmental Protection Act 1990

- 9.2.1 The Environmental Protection Act 1990 (EPA) Part 3 prescribes noise (and vibration) emitted from premises (including land) so as to be prejudicial to health or a nuisance as a statutory nuisance.
- 9.2.2 Local Authorities are required to investigate any public complaints of noise and if they are satisfied that a statutory nuisance exists, or is likely to occur or recur, they shall serve a noise abatement notice. A notice is served on the person responsible for the nuisance. It requires either simply the abatement of the nuisance or works to abate the nuisance to be carried out, or it prohibits or restricts the activity. Contravention of a notice without reasonable excuse is an offence. Right of appeal to the Magistrates Court exists within 21 days of the service of a noise abatement notice.
- 9.2.3 In determining if a noise complaint amounts to a statutory nuisance the Local Authority can take account of various guidance documents and existing case law; no statutory noise limits exist. Demonstrating the use of 'Best Practicable Means' (BPM) to minimise noise levels is an accepted defence against a noise abatement notice.

Control of Pollution Act 1974

- 9.2.4 Sections 60 and 61 of the Control of Pollution Act 1974 (CoPA) provide the main legislation regarding demolition and construction site noise and vibration. If noise complaints are received, a Section 60 notice may be issued by the local planning authority with instructions to cease work until specific conditions to reduce noise have been adopted.

- 9.2.5 Section 61 of the CoPA provides a means for applying for prior consent to carry out noise generating activities during construction. Once prior consent has been agreed under Section 61, a Section 60 notice cannot be served provided the agreed conditions are maintained on-site.
- 9.2.6 The CoPA requires that BPM (as defined in Section 72 of CoPA) be adopted for construction noise on any given site. CoPA makes reference to British Standard (BS) 5228 (British Standards Institute (BSI), 2014a and b) as BPM.

Environmental Permitting Regulations 2010

- 9.2.7 The Environmental Permitting Regulations 2010 require the application of Best Available Techniques (BAT) to activities performed within installations regulated by the legislation in order to manage the impact of these operations on the surrounding environment. This therefore just applies to the operational period, not construction.
- 9.2.8 In terms of noise specifically, the selection of BAT will have to be considered and balanced with releases to different environmental media (air, land and water) and to give due consideration to issues such as usage of energy and raw materials. Noise, therefore, cannot be considered in isolation from other impacts on the environment.
- 9.2.9 The definition of pollution includes “*emissions which may be harmful to human health or the quality of the environment, cause offence to human senses or impair or interfere with amenities and other legitimate uses of the environment*”. BAT is therefore likely to be similar, in practice, to the requirements of the Statutory Nuisance legislation which requires the use of BPM to prevent or minimise noise nuisance. In the case of noise, “*offence of any human senses*” may be judged by the likelihood of complaints. However, the lack of complaint should not necessarily imply the absence of a noise problem. In some cases it may be possible, and desirable, to reduce noise emissions still further at reasonable costs and this may therefore be BAT for noise emissions. Consequently, the aim of BAT should be to ensure that there is no reasonable cause for annoyance to persons beyond the installation boundary.
- 9.2.10 Guidance regarding Environmental Permitting and noise is available in the Environment Agency’s Integrated Pollution Prevention and Control (IPPC) H3 document ‘Horizontal Guidance for Noise Part 2 - Noise assessment and Control’ (Environment Agency, 2002a). However, ‘Horizontal Guidance for Noise Part 1 – Regulation and Permitting’ (Environment Agency, 2002b), which provided useful guidance relating to noise limits from industrial installations in terms of absolute rating levels and rating levels relative to background noise levels (as defined in BS 4142:1997 (now superseded)) was withdrawn in February 2016. Therefore industry wide noise limits no longer apply.

Planning Policy Context

National Planning Policy

National Policy Statements for Energy

- 9.2.11 Section 5.11 of the Overarching National Policy Statement (NPS) for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011a) refers to the Government’s policy on noise within the Noise Policy Statement for England (discussed further below) and sets out

requirements for noise and vibration assessment for Nationally Significant Infrastructure Projects such as the Proposed Development.

- 9.2.12 At paragraph 5.11.8, with regards decision making, NPS EN-1 states *“The project should demonstrate good design through selection of the quietest cost-effective plant available; containment of noise within buildings wherever possible; optimisation of plant layout to minimise noise emissions; and, where possible, the use of landscaping, bunds or noise barriers to reduce noise transmission.”* Section 9.5 describes the impact avoidance measures identified relevant to the Proposed Development.
- 9.2.13 The NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2) (DECC, 2011b) sets out policy specific to fossil fuel power stations. At paragraph 2.7.1, specific sources of noise identified that are relevant to the Proposed Development include *“the gas and steam turbines that operate continuously during normal operation”*. It reiterates at paragraph 2.7.5 the point made in NPS EN-1 that *“the primary mitigation for noise from fossil fuel generating stations is through good design, including enclosure of plant and machinery in noise-reducing buildings wherever possible and to minimise the potential for operations to create noise”* and goes on to state that *“Noise from gas turbines should be mitigated by attenuation of exhausts to reduce any risk of low-frequency noise transmission.”*
- 9.2.14 The NPS for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) (DECC, 2011c) states at paragraph 2.20.4 that *“A new gas pipeline may require an above ground installation such as a gas compression station on the route of the pipeline to boost transmission line pressure... These may be located in quiet rural areas, and therefore the control of noise from these facilities is likely to be an important consideration.”* The Above Ground Installation (AGI) at the northern end of the Proposed Gas Connection, which is located in a rural setting, will comprise valves and Pipeline Inline Gauging equipment (which are not significant sources of noise) and the compression equipment will be located within the Proposed Power Plant Site.

National Planning Policy Framework

- 9.2.15 The National Planning Policy Framework (NPPF) was introduced in March 2012 (Department for Communities and Local Government (DCLG), 2012). The document sets out the Government’s planning policies for England and how these are expected to be applied. The Framework supersedes the previous guidance document PPG 24 ‘Planning and Noise’ (Office of the Deputy Prime Minister (ODPM), 1994).
- 9.2.16 The NPPF is a matter which the Secretary of State is likely to consider “relevant and important” in determining an application for a development consent order (DCO).
- 9.2.17 The planning system is required to contribute to and enhance the natural and local environment. Consequently, the aim is to prevent both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution.
- 9.2.18 The NPPF states that planning policies and decisions should aim to:
- *“avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
 - *mitigate and reduce to a minimum other adverse impacts on quality of life arising from noise from new development, including through the use of conditions;*

- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established [subject to the provisions of the Environmental Protection Act 1990 and other relevant law]; and*
- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

9.2.19 With regards to 'adverse effects' and 'significant adverse effects' the NPPF refers to the noise Policy Statement for England Explanatory Note (NPSE) (Department for Environment, Food and Rural Affairs (Defra), 2010), which is described below.

Noise Policy Statement for England

9.2.20 The NPSE (Defra, 2010) seeks to clarify the underlying principles and aims in existing policy documents, legislation and guidance that relate to noise. The NPSE applies to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise.

9.2.21 The statement sets out the long term vision of the government's noise policy, which is to:

"promote good health and a good quality of life through the effective management of noise within the context of policy on sustainable development".

9.2.22 This long term vision is supported by three aims:

- *"avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvements of health and quality of life."*

9.2.23 The long term policy vision and aims are designed to enable decisions to be made regarding what is an acceptable noise burden to place on society.

9.2.24 The 'Explanatory Note' within the NPSE provides further guidance on defining 'significant adverse effects' and 'adverse effects' using the concepts:

- No Observed Effect Level (NOEL) - the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to noise can be established;
- Lowest Observable Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected; and
- Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur.

9.2.25 The three aims can therefore be interpreted as follows:

- the first aim is to avoid noise levels above the SOAEL;
- the second aim considers situations where noise levels are between the LOAEL and SOAEL. In such circumstances, all reasonable steps should be taken to mitigate and minimise the effects. However, this does not mean that such adverse effects cannot occur; and
- the third aim seeks, where possible, to positively improve the health and quality of life through the pro-active management of noise whilst also taking account of the guiding

principles of sustainable development. It is considered that the protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.

- 9.2.26 The NPSE recognises that it is not possible to have single objective noise-based measures that define the SOAEL, LOAEL and NOEL that are applicable to all sources of noise in all situations. The levels are likely to be different for different noise sources, receptors and at different times of the day.

Planning Practice Guidance

- 9.2.27 In March 2014, DCLG released its Planning Practice Guidance (PPG) web-based resource to support the NPPF (DCLG, 2014). The guidance advises that local planning authorities' should consider:

- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur; and
- whether or not a good standard of amenity can be achieved.

- 9.2.28 This guidance introduced the additional concepts of NOAEL (No Observed Adverse Effect Level), and UAEL (Unacceptable Adverse Effect Level). Full details of the PPG on effects are provided in Table 9.1.

- 9.2.29 Factors to be considered in determining if noise is a concern are identified including the absolute noise level of the source, the existing ambient noise climate, time of day, frequency of occurrence, duration, character of the noise and cumulative impacts.

- 9.2.30 With particular regard to mitigating noise impacts on residential development the guidance highlights that impacts may be partially off-set if residents have access to a relatively quiet façade as part of their dwelling or a relatively quiet amenity space (private, shared or public).

Table 9.1: Planning Practice Guidance

Perception	Examples of outcomes	Increasing effect level	Action
Not noticeable	No effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television;	Observed Adverse Effect	Mitigate and reduce to a minimum

Perception	Examples of outcomes	Increasing effect level	Action
	speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.		
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Local Planning Policy

9.2.31 As described in Chapter 7: Legislative Context and Planning Policy Framework, policy is provided by a range of local documents; the Core Strategy (Selby District Council, 2013) is the local plan which is to cover the period from 2011 to 2027, and is a key part of the development plan.

9.2.32 In the Core Strategy (2013), Section 3.5 - Objectives, Objective 16 States the that:

"[The protection] against pollution, improving the quality of air, land and water resources, and avoiding over-exploitation of water resources, and preventing noise/light/soil pollution and protecting development from noise/light/soil pollution."

9.2.33 In Policy SP19 – Design Quality within the Core Strategy it goes on to state that:

“Proposals for all new development will be expected to contribute to enhancing community cohesion by achieving high quality design and have regard to the local character, identity and context of its surroundings including historic townscapes, settlement patterns and the open countryside... Both residential and non-residential development should meet the following key requirements:

- *Preventing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water, light or noise pollution or land instability.”*

Other Guidance

British Standard 7445-1:2003 and 7445-2:1991

9.2.34 BS 7445 ‘Description and measurement of environmental noise’ (BSI, 1991 and 2003) defines parameters, procedures and instrumentation required for noise measurement and analysis.

British Standard 5228:2009+A1:2014

9.2.35 BS 5228-1 ‘Code of practice for noise and vibration control on construction and open sites. Noise’ (BSI, 2014a) provides a ‘best practice’ guide for noise control, and includes Sound Power Level (L_w) data for individual plant as well as a calculation method for noise from construction activities. BS 5228-2 ‘Code of practice for noise and vibration control on construction and open sites. Vibration’ (BSI, 2014b) provides comparable ‘best practice’ for vibration control, including guidance on the human response to vibration.

British Standard 6472:2008

9.2.36 BS 6472-1 ‘Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting’ (BSI, 2008) presents recommended frequency weighted vibration spectra (for continuous vibration) and vibration dose values (VDV) (for intermittent vibration) above which adverse comment is likely to occur in residential properties.

British Standard 7385:1993

9.2.37 BS 7385-2 ‘Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration’ (BSI, 1993) presents guide values for transient and continuous vibration, above which there is a likelihood of cosmetic damage. The standard establishes the basic principles for carrying out vibration measurements and processing the data, with regard to evaluating vibration effects on buildings.

British Standard 4142:2014

9.2.38 BS 4142 ‘Methods for rating and assessing industrial and commercial sound’ (BSI, 2014c) can be used for assessing the effect of noise of an industrial nature, including mechanical services plant noise. The method compares the difference between ‘rating level’ of the industrial noise, with the ‘background level’ at the receptor position.

World Health Organisation

- 9.2.39 The World Health Organisation's (WHO) 'Guidelines for Community Noise' (WHO, 1999) recommend external daytime and evening environmental noise limits, and internal night-time limits to avoid sleep disturbance.
- 9.2.40 The WHO 'Night Noise Guidelines for Europe' (WHO, 2009) recommend updated guidelines on night-time noise limits to avoid sleep disturbance.

Calculation of Road Traffic Noise

- 9.2.41 Department of Transport (DfT)/ Welsh Office Memorandum 'Calculation of Road Traffic Noise' (CRTN)' (DfT/ Welsh Office, 1998) describes procedures for traffic noise calculation, and is suitable for environmental assessments of schemes where road traffic noise may have an effect.

Design Manual for Road and Bridges

- 9.2.42 The Highways England '*Design Manual for Road and Bridges Volume 11 Section 3 Part 7 HD213/11 (Revision 1) Traffic Noise and Vibration*' (DMRB) (Highways Agency, 2011) provides guidance on the appropriate level of assessment to be used when assessing the noise and vibration effects arising from all road projects, including new construction, improvements and maintenance. The guidance can also be used for assessing changes in traffic noise levels as a result of non-road projects such as this.

9.3 Assessment Methodology and Significance Criteria

Determining Baseline Conditions and Noise Sensitive Receptors

Noise Monitoring Locations and Protocol

- 9.3.1 The location of potential noise sensitive receptors (NSRs) in proximity to the Site has been considered when assessing the effects associated with noise and vibration levels from the demolition, construction, operational and decommissioning phases of the Proposed Development.
- 9.3.2 NSR locations have been selected which are considered to be representative of the nearest and potentially most sensitive existing receptors to the Site. It is considered that if noise and vibration levels are suitably controlled at the key receptors identified, then noise and vibration levels will be suitably controlled at other sensitive receptors in the surrounding area.
- 9.3.3 In order to define existing noise conditions at NSRs, long-term ambient noise measurements have been undertaken at five representative residential NSR locations around the existing coal-fired power station site (within which the Proposed Power Plant Site, Proposed Construction Laydown area, Proposed Borehole and Electrical Connections and CCR Land are located), two at residential NSR locations along the Proposed Cooling Water and Gas Connection corridors to the north, and a further one at a residential NSR location closest to the Proposed AGI. Tranmore Farm house, located off Tranmore Lane to the west of the Proposed Development is vacant and under the control of Eggborough Power Limited so has not been considered as a NSR in this assessment. The noise monitoring locations and protocol were discussed in

advance and during the surveys with Selby District Council. The eight locations are shown in Table 9.2 and on Figure 9.1.

Table 9.2: Monitoring locations

Monitoring location	Address	Details
ML1	4 The Bungalows, Wand Lane, Gallows Hill	Located in the front garden of the residential property
ML2	Brimmond, Hazel Old Lane, Hensall	Located in the rear garden of the residential property
ML3	1 Roall Waterworks, Goole	Located in the rear garden of the residential property
ML4	Residential property at Eggborough Sports and Leisure Complex, adjacent to the existing coal-fired power station site	Approximately 30 m north of the leisure complex and east of the car park
ML5	Property on Millfield Road, Chapel Haddlesey	Located in the rear garden of the residential property
ML6	1 Manor Cottages, Chapel Haddlesey	Located in the field to the rear of the residential property
ML7	Burn Lodge Farm, off A19	Located in the garden to the north of the residential property
ML8	Gateforth Grange, West Lane	Located toward the front of the residential property, attached to a telegraph pole

9.3.4 Measurements were undertaken between Thursday 10th November and Thursday 17th November 2016 and between Thursday 24th November and Wednesday 7th December 2016.

9.3.5 Daytime relates to the period between 07:00 and 23:00 (with evening between 19:00 and 23:00), and night-time between 23:00 and 07:00.

9.3.6 All measurements were taken at approximately 1.2-1.5 m above ground level, and in accordance with the requirements of British Standard BS 7445 (BSI, 1991 and 2003). All monitoring locations were positioned at least 3.5 m from any reflecting surface, other than the ground (i.e. free-field). Details of ongoing activities and typical noise sources in the area were recorded during visits to the monitoring locations to set up and collect the measurement equipment.

Noise Survey Instrumentation

9.3.7 Details of the instrumentation (sound level meters (SLMs)) used during the surveys are presented in Table 9.3 below:

Table 9.3: Measurement equipment

Monitoring location	Manufacturer	SLM model	SLM serial number	Microphone model	Microphone serial number
ML1	Svantek	958	23420	Microtek	9759
ML2	B&K	2250	2827270	B&K 4189	2820205
ML3	B&K	2238	2201511	B&K 4188	2555151
ML4	Norsonic	Nor140	14003077	Nor1225	91924
ML5	Svantek	959	15606	GRAS 40AE	98114
ML6	Svantek	958	23420	Microtek	9759
ML7	Svantek	959	15606	GRAS 40AE	98114
ML8	B&K	2250	2827273	B&K 4189	2933689

- 9.3.8 All SLMs used were Class 1 precision instruments. Each was programmed to log a number of parameters including L_{Aeq} , L_{A90} , L_{A10} and L_{Amax} values, in 15-minute contiguous intervals.
- 9.3.9 The calibration levels were checked prior to and following all measurements with a Brüel & Kjær 4231 field calibrator (serial number 2217877). No significant drift, more than 0.2 dB occurred. Full calibration details are available upon request.

Meteorological Conditions

- 9.3.10 Observations regarding weather conditions were made whilst attending the site. In addition, weather data have been obtained for the nearest weather station, located at Doncaster Sheffield Airport, approximately 25 km from the Site.
- 9.3.11 At the start of the first survey period (Thursday 10th November 2016), weather conditions on-site were observed to be dry with patchy cloud; wind blowing from a southerly direction with an average speed of approximately 2 m/s and the road surfaces were noted to be dry. At the end of the survey on Thursday 17th November 2016 weather conditions were noted to be dry with an average wind speed of approximately 2 m/s. The weather station data indicated that no unfavourable weather conditions occurred during this survey period with the exception of some precipitation throughout the day on Saturday 12th November 2016.
- 9.3.12 During the third site visit to set out more measurement equipment on Thursday 24th November 2016, weather conditions were noted to be dry with patchy cloud coverage, with average wind speeds of approximately 2 m/s from an easterly direction and road surfaces were noted to be dry. During the final site visit to collect the final survey equipment on Wednesday 7th December 2016 weather conditions were observed to be dry with patchy cloud coverage and with average wind speeds of approximately 4 m/s from a southerly direction. Road surfaces were noted to be dry. The weather station data indicated that no unfavourable weather conditions occurred during this survey period with the exception of some elevated average wind speeds between 8 – 9 m/s between 08:00 – 12:00 hours on Wednesday 7th December 2016.

- 9.3.13 For the time periods where slight unfavourable weather conditions were recorded on the long-term weather data, no anomalous sound level data were recorded with this time period and so it is considered that the rain and higher than desirable winds (i.e. windspeeds of >5 m/s) did not have a significant effect on the sound level measurements.
- 9.3.14 Overall the meteorological conditions were in general within the limits considered suitable by relevant standards for collecting noise measurements, and the measured levels are considered representative of a range of conditions prevailing at NSRs within the study area.
- 9.3.15 The results of the noise monitoring are presented in Section 9.4 (Baseline Conditions).

Impact Assessment and Significance Criteria

- 9.3.16 Effects are classified based on the magnitude of the impact and the sensitivity or value of the affected receptor. The criteria for assigning the magnitude of impacts are outlined below for the various potential impacts during demolition, construction and operation, and these are followed by a scale of receptor sensitivity in Table 9.11 and overall classification of effects matrix in Table 9.12.

Assessment of Demolition and Construction Noise Effects

- 9.3.17 The existing coal-fired power station is expected to cease operation before the end of 2019. The timing of subsequent decommissioning and demolition activities is currently uncertain, but as a worst case it is assumed that the demolition of the existing coal-fired power station could occur concurrently with the construction of the Proposed Development, although the demolition of the main power station is outside the scope of the DCO as only minor demolition works are required to enable the construction of the Proposed Development. In order to present a robust, 'worst case' assessment of effects on nearby receptors, the impacts and effects associated with the demolition of the existing coal-fired power station are included in the assessment of the construction noise and vibration effects of the Proposed Development.
- 9.3.18 The main coal-fired power station demolition works are likely to be divided into a number of demolition and ground preparation phases, potentially including the use of explosives to remove the cooling towers and stack. It is envisaged that the majority of demolition works will be undertaken during similar working hours to the construction of the Proposed Development, namely Monday to Friday 07:00 to 19:00 and Saturday 07:00 to 13:00, although it is likely that some construction activities will be required to be 24 hours during the peak periods.
- 9.3.19 Before the appointment of a construction contractor, site specific details on the construction activities, programme and number or type of construction plant are not yet available. Therefore, detailed construction noise predictions at specific NSRs have not been undertaken. Nevertheless, indicative demolition and construction noise predictions have been undertaken using the calculation methods set out in BS 5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites' (BSI, 2014a), based upon construction information from other power stations and pipeline construction projects. In addition, indicative information on the expected works associated with the coal-fired power station demolition project have been provided by Eggborough Power Limited (EPL) (the Applicant) has been taken into account.
- 9.3.20 The calculation method provided in BS 5228 (2014a) takes account of factors including the number and types of equipment operating, their associated Sound Power Levels (SWLs), their

modes of operation (% on-times within the working period), the distance to NSRs, and the effects of any intervening ground cover or barrier/ topographical screening. This allows prediction of the magnitude of impact. The construction of the Proposed Borehole Water, Cooling Water and Gas Connections are assessed separately to the construction assessment for Proposed Power Plant Site because the types of plant and activities are different.

- 9.3.21 The subsequent assessment of construction noise 'effects' at residential NSRs considers the guidance in 'example method 1 – the ABC method' as defined in BS 5228-1:2009+A1:2014 (BSI, 2014a). Table 9.4 (reproduced from BS 5228) provides guidance in terms of appropriate threshold values for residential NSRs, based upon existing ambient noise levels.

Table 9.4: Construction noise thresholds at residential dwellings

Assessment category and threshold value period	Threshold Value $L_{Aeq,T}$ dB(A) – free-field		
	Category A (a)	Category B (b)	Category C (c)
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends (d)	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
<p>NOTE 1: A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.</p> <p>NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.</p> <p>NOTE 3: Applies to residential receptors only.</p> <p>(a) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.</p> <p>(b) Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values.</p> <p>(c) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.</p> <p>(d) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.</p>			

- 9.3.22 For the appropriate period (day, evening, night, weekend etc.), the ambient noise level is determined and rounded to the nearest 5 dB and the appropriate Threshold Value is then derived. The predicted construction noise level is then compared with this Threshold Value. Based upon this BS 5228 ABC method (BSI, 2014a), the criterion adopted in this assessment for the determination of potentially significant effects is the exceedance of the $L_{Aeq,T}$ threshold level for the category appropriate to the ambient noise level at each NSR. This is considered to be potentially equivalent to the SOAEL, although as stated in BS 5228, other project-specific factors, such as the number of NSRs affected and the duration and character of the impact, should also be considered by the assessor when determining if there is a potentially significant effect. Similarly, the criterion for the LOAEL for this assessment is a predicted construction noise level equal to the existing ambient noise level at each NSR, i.e. resulting in a 3 dB

increase in noise level when combined with the ambient noise level. Note that these criteria relate to residential NSRs only, in line with the ABC method.

- 9.3.23 In accordance with the NPPF (DCLG, 2012) and NPSE (Defra, 2010), it is important to identify NSRs that exceed the LOAEL and ensure adverse effects are mitigated and minimised. The assessment focuses on the impact at existing residential NSRs.
- 9.3.24 Based upon the above, the magnitude of the impact of construction noise is classified in accordance with the descriptors in Table 9.5.

Table 9.5: Magnitude of construction noise impacts

Magnitude of Impact	$L_{Aeq,T}$ dB (façade)
High	Exceedance of ABC Threshold Value by $\geq +5$ dB
Medium	Exceedance of ABC Threshold Value by up to +5 dB
Low	Equal to or below the ABC Threshold Value by up to -5 dB
Very low	Below the ABC Threshold Value by ≥ -5 dB

Assessment of Daytime Construction Works Traffic on the Public Highway

- 9.3.25 The Proposed Development will affect traffic flows on existing roads in the area surrounding the Site during construction. The assessment focuses on the impact at existing residential properties located alongside the local road network.
- 9.3.26 Construction traffic noise has been assessed by considering the increase in traffic flows during the construction works, following the guidance of CRTN (DfT/ Welsh Office, 1998) and DMRB (Highways Agency, 2011).
- 9.3.27 18-hour (06:00 – 24:00) Annual Average Weekday Traffic (AAWT) data have been obtained for the year 2020 ‘with’ and ‘without’ construction traffic during the peak construction period, in order to determine if any existing roads are predicted to be subject to a potentially significant change in 18-hour traffic flows. Basic Noise Level (BNL) calculations have been undertaken to predict the change in noise level between the ‘with’ and ‘without’ scenarios.
- 9.3.28 The criteria for the assessment of traffic noise changes arising from construction works have been taken from Table 3.1 of DMRB (Highways Agency, 2011) and are provided in Table 9.6 below.

Table 9.6: Traffic noise criteria

Magnitude of impact	Change in traffic noise level $L_{A10,18h}$ dB
High	≥ 5
Medium	3 to <5
Low	1 to <3
Very low	<1

- 9.3.29 DMRB (Highways Agency, 2011) advises that an increase in road traffic flows of 25% (where the traffic speed and composition remain consistent) equates to an increase in road traffic noise of 1 dB(A). A doubling of in traffic flow would be required for an increase in 3 dB(A).
- 9.3.30 It is generally accepted that changes in noise levels of 1 dB(A) or less are imperceptible, and changes of 1 to 3 dB(A) are not widely perceptible. Consequently, at the selected road traffic noise receptors the magnitude of the predicted change in noise levels uses the scale shown in Table 9.6 above with respect to construction traffic. The criteria are based on the current guidance on short-term changes in traffic noise levels in DMRB. The SOAEL is set at a change in traffic noise of +3 dB and the LOAEL at +1 dB.

Assessment of Demolition and Construction Vibration Effects

Effects on Humans – Annoyance

- 9.3.31 Vibration due to construction activities has the potential to result in adverse impacts at nearby NSRs. The transmission of ground-borne vibration is highly dependent on the nature of the intervening ground between the source and receiver and the activities being undertaken. BS 5228-2: 2009+A1: 2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites - Vibration' (BSI, 2014b) provides data on measured levels of vibration for various construction works, with particular emphasis on piling. Impacts are considered for both damage to buildings and annoyance to occupiers.
- 9.3.32 Table 9.7 details Peak Particle Velocity (PPV) vibration levels and provides a semantic scale for the description of demolition and construction vibration effects on human receptors, based on guidance contained in BS 5228-2 (BSI, 2014b).

Table 9.7: Construction vibration threshold at residential dwellings

Peak Particle Velocity (PPV) level	Description	Magnitude of impact
≥ 10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.	High
1.0 to < 10 mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.	Medium
0.3 to < 1 mm/s	Vibration might be just perceptible in residential environments.	Low
0.14 to < 0.3 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.	Very low

- 9.3.33 For residential receptors and other high sensitivity receptors, the LOAEL is defined as a PPV of 0.3 mm/s (millimetres per second), this being the point at which construction vibration is likely to become perceptible. The SOAEL is defined as a PPV of 1.0 mm/s, this being the level at which construction vibration can be tolerated with prior warning.

- 9.3.34 At receptors above the SOAEL, further consideration of whether an effect is significant is undertaken using professional judgement, taking account of the duration and frequency of the effect, as well as the time of evening/ night that the effect would be experienced.
- 9.3.35 In the absence of specific information on likely construction activities and plant, a qualitative assessment based upon professional judgement has been undertaken at this stage. Given the significant distance to residential receptors, no significant vibration (medium or high magnitude impacts) is expected to result from the proposed construction (or demolition) and therefore further assessment is scoped out. However, further consideration is given to the occupants of adjacent commercial buildings including those within the adjacent coal-fired power station site (assuming they could remain occupied during the early part of construction of the Proposed Development). This is also excluding the potential for very short term vibration due to demolition of the existing coal-fired power station's cooling towers and stack, possibly through the use of explosives, which is outside the scope of the DCO and will be considered separately by the demolition contractor.

Effects on Buildings

- 9.3.36 In addition to human annoyance, building structures may be damaged by high levels of vibration. The levels of vibration that may cause building damage are far in excess of those that may cause annoyance. Consequently, if vibration levels are controlled to those relating to annoyance (i.e. 1.0 mm/s), then it is highly unlikely that buildings will be damaged by demolition and construction vibration levels.
- 9.3.37 The criteria used in this assessment relate to the potential for cosmetic damage, not structural damage. The principal concern is generally transient vibration, for example due to piling.
- 9.3.38 BS 7385-2: 1993 'Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration' (BSI, 1993) provides guidance on vibration levels likely to result in cosmetic damage and is referenced in BS 5228-2: 2009+A1:2014 (BSI, 2014b). Guide values for transient vibration, above which cosmetic damage could occur, are given in Table 9.8.

Table 9.8: Transient vibration guide values for cosmetic damage

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings	50 mm s^{-1} at 4 Hz and above	
Unreinforced or light framed structures Residential or light commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
NOTE 1: Values referred to are at the base of the building. NOTE 2: For un-reinforced or light framed structures and residential or light commercial buildings, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded		

- 9.3.39 BS 7385-2:1993 (BSI, 1993) states that the probability of building damage tends to zero for transient vibration levels less than 12.5 mm/s PPV. For continuous vibration, such as from vibratory rollers, the threshold is around half this value.
- 9.3.40 It is also noted that these values refer to the likelihood of cosmetic damage. ISO 4866:2010 (ISO, 2010) defines three different categories of building damage:
- cosmetic – formation of hairline cracks in plaster or drywall surfaces and in mortar joints of brick/concrete block constructions;
 - minor – formation of large cracks or loosening and falling of plaster or drywall surfaces or cracks through brick/block; and
 - major – damage to structural elements, cracks in support columns, loosening of joints, splaying of masonry cracks.
- 9.3.41 BS 7385-2:1993 (BSI, 1993) defines that minor damage occurs at a vibration level twice that of cosmetic damage and major damage occurs at a vibration twice that of minor damage. Therefore, this guidance can be used to define the magnitude of impact identified in Table 9.9 below.

Table 9.9: Magnitude of impact – construction vibration building damage

Magnitude of impact	Damage risk	Continuous vibration level ppv mm/s
High	Major	30
Medium	Minor	15
Low	Cosmetic	6
Very low	Negligible	<6

- 9.3.42 In the absence of specific information on likely construction and demolition activities and plant, a qualitative assessment based upon professional judgement has been undertaken. Again given the significant distance to residential receptors, no significant vibration is expected to result from the proposed construction or demolition activities and therefore further assessment of the effects of vibration on buildings is scoped out. However, further consideration is given to the adjacent buildings within the adjacent coal-fired power station site (assuming they have not already been demolished).

Assessment of Operational Noise

- 9.3.43 A noise propagation model has been developed in the SoundPLAN suite of programs to assess the two current layout options for the Proposed Development. SoundPLAN implements the noise prediction method ISO 9613-2: 1996 'Attenuation of sound during propagation outdoors' (ISO, 1996), which has been employed to calculate noise levels at surrounding NSRs due to noise breakout from the proposed buildings and plant at the Proposed Power Plant Site. The AGI does not contain any significant noise emitting plant/ sources and has therefore not been included within the noise model.
- 9.3.44 The noise model consists of a detailed three-dimensional representation of the Proposed Power Plant Site and surroundings. Representative noise level data for the key noise emitting

plant/ buildings within the Proposed Development (turbine halls, Heat Recovery Steam Generator (HRSG), peaking plant) have been sourced from similar CCGT projects and noise level data for other principal buildings have been provided from Original Equipment Manufacturers (OEMs) based on the indicative concept designs for the Proposed Power Plant Site – see Figures 4.1a and 4.1b.

- 9.3.45 Significant topographical details and buildings that may influence the transmission of noise to NSRs are included in the noise model. A digital terrain model, created using ground elevation spot height data has been used to position buildings and other noise sources at the correct height. Local structures, including buildings that will remain after demolition of the existing coal-fired power station (e.g. the National Grid sub station) and off-site buildings, have also been included. The model assumes that the prevailing wind direction is always from source to receiver, which is likely to overestimate the noise effect associated with the Proposed Development. If the existing coal-fired power station was to remain standing at the start of operation of the Proposed Development (i.e. the Opening year scenario), the existing buildings would provide greater attenuation of operational noise from the Proposed Development, so the removal of all buildings except the sub station is a worst case scenario for the Opening year assessment.
- 9.3.46 Based upon the predicted noise levels from the noise model, an assessment of potential noise impact at nearby NSRs has been undertaken using the guidance in BS 4142: 2014 ‘Methods for rating and assessing industrial and commercial sound’ (BSI, 2014a).
- 9.3.47 A key aspect of the BS 4142 assessment procedure is a comparison between the Background Sound Level in the vicinity of residential locations and the Rating Level of the sound source under consideration. The relevant parameters in this instance are as follows:
- Background Sound Level – $L_{A90,T}$ – defined in the Standard as the “*A-weighted sound pressure level that is exceeded by the residual sound for 90% of a given time interval, T , measured using time weighting F and quoted to the nearest whole number of decibels*”;
 - Specific Sound Level – L_s ($L_{Aeq,Tr}$) – the “*equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r* ”; and
 - Rating Level – $L_{Ar,Tr}$ – the “*specific sound level plus any adjustment made for the characteristic features of the sound*”.
- 9.3.48 Whereas the previous version of BS 4142:1997 allowed for a single correction of +5 dB to be made to the Specific Noise Level if one or more of the distinguishable, impulsive or irregular features were considered to be present, BS 4142: 2014 allows for corrections to be applied based upon the presence or expected presence of the following:
- tonality: up to +6 dB penalty;
 - impulsivity: up to +9 dB penalty (this can be summed with tonality penalty); and
 - other sound characteristics (neither tonal or impulsive but still distinctive): + 3 dB penalty.
- 9.3.49 Once any adjustments have been made, the background sound level and the rating level are compared. The standard states that:
- “*Typically, the greater the difference, the greater the magnitude of impact.*”

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending upon the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending upon the context.
- The lower the rating level is to the measured background sound level, the less likely it is that the specific sound will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending upon the context."

9.3.50 Importantly, as suggested above, BS 4142:2014 (BSI, 2014a) requires that the rating level of the noise source under assessment be considered in the context of the environment when defining the overall significance of the impact.

9.3.51 BS 4142:2014 (BSI, 2014a) suggests that a one hour assessment period is considered during the day and a 15-minute assessment period at night.

9.3.52 Table 9.10 illustrates the adopted magnitude of impact scale used in this assessment based upon the numerical level difference. For BS 4142 assessment purposes the SOAEL is set at a rating level above the background sound level of +10 dB, and the LOAEL at +5 dB, although it should be remembered that the context assessment (including the absolute level of the sound under consideration) can vary the overall classification of effects.

Table 9.10: Magnitude of impact for industrial noise including building services

Magnitude of impact	BS 4142 descriptor	Rating level – background sound level (dB)
High	No BS 4142 descriptor for this magnitude level	>15
Medium	Indication of a significant adverse effect, depending upon context	+10 approx.
Low	Indication of an adverse effect, depending upon context	+5 approx.
Very low	Indication of low impact, depending upon context	≤ 0

Assessment of Operational Vibration

9.3.53 No causes of significant vibration associated with the Proposed Development are known and therefore further assessment of operational vibration is scoped out of this assessment.

Assessment of Operational Changes in Road Traffic Noise

9.3.54 The Proposed Development will have some limited effect on traffic flows on existing roads in the area surrounding the Site once operational, although significantly below the level expected during the peak construction period. Given the low levels of traffic that will be generated, assessment of operational road traffic has therefore been screened out of further assessment within the transport assessment.

- 9.3.55 Nevertheless, operational traffic movements have been considered against the 18-hour (06:00 – 24:00) AAWT data obtained for the year 2020 ‘without’ the Proposed Development in place. Indicative BNL calculations have again been undertaken to predict the change in noise level between the ‘with’ and ‘without’ development scenarios.
- 9.3.56 The assessment of impact magnitude and significance of effects is based upon the method set out in paragraphs 9.3.25 – 9.3.30 for construction traffic noise.

Receptor Sensitivity

- 9.3.57 In accordance with the principles of environmental impact assessment, the sensitivity of existing receptors to noise (or vibration) impacts during either construction or operational phases have been defined in Table 9.11.

Table 9.11: Sensitivity/ value of receptors

Sensitivity/ value of resource/ receptor	Description	Examples of receptor usage
Very high	Receptors where noise or vibration will significantly affect the function of a receptor	Auditoria/studios Specialist medical/teaching centres, or laboratories with highly sensitive equipment
High	Receptors where people or operations are particularly susceptible to noise or vibration. Sensitive ecological receptors known to be vulnerable to the effects of noise or vibration.	Residential Quiet outdoor areas used for recreation Conference facilities Schools/educational facilities in the daytime Hospitals/residential care homes Libraries Ecologically sensitive areas for example Special Protection Areas (SPAs)
Medium	Receptors moderately sensitive to noise or vibration where it may cause some distraction or disturbance	Offices Restaurants/retail Sports grounds when spectator or noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf)
Low	Receptors where distraction or disturbance of people from noise or vibration is minimal	Residences and other buildings not occupied during working hours Factories and working environments with existing high noise levels Sports grounds when spectator or noise is a normal part of the event

Significance of Effects

9.3.58 The following terminology has been used in the assessment to define effects:

- adverse – detrimental or negative effects to an environmental resource or receptor;
- neutral – effects to an environmental resource or receptor that are neither adverse nor beneficial; or
- beneficial – advantageous or positive effect to an environmental resource or receptor.

9.3.59 The effect resulting from each individual potential impact type above is classified according to the magnitude of the impact and the sensitivity or value of the affected receptor using the matrix presented in Table 9.12 below, but where necessary also considering the context of the acoustic environment.

Table 9.12: Classification of effects

Sensitivity/ value of resource/ receptor	Magnitude of impact			
	High	Medium	Low	Very low
Very high	Major	Major	Moderate	Minor
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible

9.3.60 Where adverse or beneficial effects have been identified, these have been assessed against the following significance scale, derived using the matrix presented at Table 9.12:

- negligible – imperceptible effect of no significant consequence;
- minor – slight, very short or highly localised effect of no significant consequence;
- moderate – limited effect (by extent, duration or magnitude), which may be considered significant; or
- major – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

9.3.61 For the purposes of this assessment, negligible and minor effects are considered to be not significant, whereas moderate and major effects are considered to be significant.

Extent of Study Area

9.3.62 The extent of the study area has been defined to include the nearest receptors/ communities in each direction from the Site and alongside the transport corridors that may be affected by changes in road traffic flows during the construction and operational phases of the Proposed Development. Representative NSRs within this study area in all directions from the Site have been identified for the purposes of assessment, to ensure all effects are appropriately considered.

Sources of Information/ Data

9.3.63 The following sources of information that define the Proposed Development have been reviewed and form the basis of the assessment of likely significant effects of noise and vibration:

- construction plant and equipment from similar power station and pipeline construction projects;
- construction noise data referenced from BS 5228 (BSI, 2014a);
- indicative concept layout plans for the Proposed Power Plant Site (see Figures 4.1a and 4.1b in PEI Report Volume II);
- schedule of buildings and plant for the Proposed Power Plant Site, including Sound Power Levels (SWLs) and internal reverberant sound pressure levels, provided by OEMs and also sourced from similar representative CCGT projects;
- AAWT traffic data from the TA for the Proposed Development (see Appendix 14A, PEI Report Volume III);
- Ordnance Survey mapping of the Site and surrounding area; and
- aerial photography.

Consultation

9.3.64 Consultation undertaken during the preparation this PEI Report Chapter is presented in Table 9.13 below.

Table 9.13: Consultation summary table

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
Diana Adamson Selby District Council – Environmental Health Officer SDC	10 th August 2016 (email received from SDC)	Comments received on the scoping briefing note (sent in advance of Scoping Report submission to the Planning Inspectorate): <ul style="list-style-type: none"> • identified additional residential receptors at Roall water works; and • stated that consideration should be given to sleep disturbance in terms of those levels laid down in the WHO guidance as well as BS4142:2014. 	Receptor at Roall waterworks included in baseline surveys and within impact assessment. Reference made to WHO guidance within impact assessment.
	31 st August (email received from SDC)	Following request for advice on BS 4142 rating level required by SDC, response confirmed that SDC do not at present have a rating level which would be acceptable and the levels are	AECOM has developed an appropriate significance of effect scale for the Proposed Development as set out in the Methodology section of

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		considered in regard to the individual circumstances of the area and development concerned.	this chapter.
	14 th October 2016 (email received from SDC)	Comments received regarding the selection of the most appropriate noise monitoring positions around the existing coal-fired power station site.	After consultation, five residential property locations around the existing coal-fired power station site were identified as being representative of potentially sensitive locations with respect to changes in noise levels. Subsequently five baseline noise monitoring positions were located within these most sensitive areas.
	28 th November 2016 (Email received from SDC)	Confirmation received that SDC content with the scope of the baseline noise monitoring surveys, including additional monitoring positions around the Proposed Gas Connection and AGI.	As a result of this consultation, a further three baseline noise monitoring positions were chosen near to the proposed pipeline and AGI.
The Planning Inspectorate	September 2016	Various comments with respect to the scope of assessment related to the construction and operation of the Proposed Development and the decommissioning of the existing power station.	Incorporated with the scope of assessment as appropriate.
Environmental Services at Doncaster Borough Council	19 th September 2016	If in the future gas pipelines or other ancillary works are required and located within the Doncaster area, this office would have concerns of noise associated with the construction works or plant equipment and therefore may seek to impose conditions to minimise the impact on residential dwellings	The Proposed Development is located entirely within Selby District.

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		once additional information has been submitted.	

9.4 Baseline Conditions

Existing Baseline

Noise Survey Results

- 9.4.1 The processed results from each long-term noise survey position are provided in Tables 9.14 to 9.21 below. The L_{A90} values presented are the 10th percentile of all 15-minute measurements within the time period. Observations regarding the general baseline noise environment at each monitoring location are detailed after the tables.

Table 9.14: ML1 – 4 The Bungalows, Wand Lane, Gallows Hill

Date (2016)	Time period	$L_{Aeq,T}$ dB	Highest $L_{Amax,15min}$ dB	$L_{A90,15min}$ dB
Thursday 10 th November	15:30 – 23:00*	45.2	72.4	38.0
Friday 11 th November	23:00 – 07:00	41.2	60.2	36.5
	07:00 – 23:00	51.2	88.8	42.5
Saturday 12 th November	23:00 – 07:00	47.7	61.7	39.7
	07:00 – 23:00	48.4	81.6	41.8
Sunday 13 th November	23:00 – 07:00	40.8	61.2	37.0
	07:00 – 23:00	45.9	80.7	38.4
Monday 14 th November	23:00 – 07:00	43.6	61.8	36.1
	07:00 – 23:00	48.1	79.6	41.2
Tuesday 15 th November	23:00 – 07:00	42.8	65.7	38.2
	07:00 – 23:00	48.2	77.7	41.5
Wednesday 16 th November	23:00 – 07:00	42.9	62.0	36.2
	07:00 – 23:00	49.0	77.7	41.7
Thursday 17 th November	23:00 – 07:00	45.3	61.2	36.7
	07:00 – 11:00*	48.4	73.8	37.2

* Note – this period does not cover the full 16-hr day or 8-hr night period and is therefore may not be directly comparable with other complete time periods.

Table 9.15: ML2 – Hazel Old Lane

Date (2016)	Time Period	$L_{Aeq,T}$ dB	Highest $L_{Amax,15min}$ dB	$L_{A90,15min}$ dB
Thursday 10th November	13:30 – 23:00*	51.8	78.7	38.0
Friday 11th November	23:00 – 07:00	46.8	74.0	34.6
	07:00 – 23:00	55.3	87.6	46.5
Saturday 12th November	23:00 – 05:00*	49.1	68.1	39.7
	13:30 – 23:00*	52.6	75.9	42.3
Sunday 13th November	23:00 – 07:00	44.7	71.6	36.6
	07:00 – 23:00	50.2	81.2	42.6
Monday 14th November	23:00 – 07:00	49.1	66.6	36.2
	07:00 – 23:00	53.1	78.1	42.3
Tuesday 15th November	23:00 – 07:00	47.3	70.8	35.4
	07:00 – 23:00	53.2	81.9	45.7
Wednesday 16th November	23:00 – 07:00	50.1	71.8	38.5
	07:00 – 23:00	55.3	80.0	44.3
Thursday 17th November	23:00 – 06:30*	49.2	72.9	37.4

* Note – this period does not cover the full 16-hr day or 8-hr night period and is therefore may not be directly comparable with other complete time periods.

Table 9.16: ML3 – 1 Roall Waterworks, Goole

Date (2016)	Time Period	$L_{Aeq,T}$ dB	Highest $L_{Amax,15min}$ dB	$L_{A90,15min}$ dB
Thursday 10th November	12:00 – 23:00*	59.4	77.5	38.5
Friday 11th November	23:00 – 07:00	55.4	80.4	30.0
	07:00 – 23:00	60.7	83.5	44.7
Saturday 12th November	23:00 – 07:00	54.8	73.5	42.0
	07:00 – 23:00	59.7	82.3	37.0
Sunday 13th November	23:00 – 07:00	53.0	77.8	32.0
	07:00 – 23:00	58.7	91.0	40.2
Monday 14th November	23:00 – 07:00	55.3	75.1	36.0
	07:00 – 23:00	62.7	91.4	38.2
Tuesday 15th November	23:00 – 07:00	53.5	78.3	35.5
	07:00 – 23:00	59.6	81.0	40.7
Wednesday 16th November	23:00 – 07:00	54.0	78.4	35.6
	07:00 – 23:00	60.0	89.5	42.0
Thursday 17th November	23:00 – 07:00	54.5	75.4	39.5
	07:00 – 11:15*	61.5	79.4	50.0

* Note – this period does not cover the full 16-hr day or 8-hr night period and is therefore may not be directly comparable with other complete time periods.

Table 9.17: ML4 – Eggborough Sports and Leisure Complex

Date (2016)	Time Period	$L_{Aeq,T}$ dB	Highest $L_{Amax,15min}$ dB	$L_{A90,15min}$ dB
Thursday 24th November	12:20 – 23:00*	56.6	86.1	46.9
Friday 25th November	23:00 – 07:00	56.6	62.9	55.0
	07:00 – 23:00	57.9	79.6	43.3
Saturday 26th November	23:00 – 07:00	54.9	84.4	37.2
	07:00 – 23:00	58.1	107.0	42.0
Sunday 27th November	23:00 – 07:00	44.7	60.6	36.2
	07:00 – 23:00	56.6	89.8	41.7
Monday 28th November	23:00 – 07:00	51.1	75.4	36.3
	07:00 – 23:00	54.7	75.6	45.1
Tuesday 29th November	23:00 – 07:00	46.6	60.4	39.7
	07:00 – 23:00	54.0	79.1	44.2
Wednesday 30th November	23:00 – 02:35*	41.8	57.1	35.9

* Note – this period does not cover the full 16-hr day or 8-hr night period and is therefore may not be directly comparable with other complete time periods.

Table 9.18: ML5 – Property on Millfield Road, Chapel Haddlesey

Date	Time Period	$L_{Aeq,T}$ dB	Highest $L_{Amax,15min}$ dB	$L_{A90,15min}$ dB
Thursday 10th November	11:45 – 23:00*	49.9	81.2	38.1
Friday 11th November	23:00 – 07:00	45.3	75.7	34.0
	07:00 – 23:00	49.2	80.7	44.1
Saturday 12th November	23:00 – 07:00	49.3	69.2	45.4
	07:00 – 23:00	48.4	72.3	40.7
Sunday 13th November	23:00 – 07:00	44.6	74.8	36.6
	07:00 – 23:00	47.3	81.8	39.2
Monday 14th November	23:00 – 07:00	46	69.0	38.1
	07:00 – 23:00	50.1	78.7	40.8
Tuesday 15th November	23:00 – 07:00	45.8	70.5	37.5
	07:00 – 23:00	59.1	89.5	44.2
Wednesday 16th November	23:00 – 07:00	64.6	86.3	55.2
	07:00 – 23:00	57.5	85.0	36.4
Thursday 17th November	23:00 – 07:00	62.2	86.7	42.1
	07:00 – 9:30*	62.2	85.8	51.9

* Note – this period does not cover the full 16-hr day or 8-hr night period and is therefore may not be directly comparable with other complete time periods.

Table 9.19: ML6 – 1 Manor Cottages, Chapel Haddlesey

Date	Time Period	$L_{Aeq,T}$ dB	Highest $L_{Amax,15min}$ dB	$L_{A90,15min}$ dB
Thursday 24th November	14:00 – 23:00*	44.1	79.2	34.2
Friday 25th November	23:00 – 07:00	40.9	58.6	32.4
	07:00 – 23:00	47.8	78.8	37.2
Saturday 26th November	23:00 – 07:00	43.1	73.9	36.0
	07:00 – 23:00	46.3	73.9	39.7
Sunday 27th November	23:00 – 07:00	42.1	66.7	34.0
	07:00 – 23:00	45.5	73.6	35.9
Monday 28th November	23:00 – 07:00	40.8	61.9	32.4
	07:00 – 23:00	45.7	82.4	37.3
Tuesday 29th November	23:00 – 07:00	44.8	59.3	37.2
	07:00 – 23:00	47.3	81.8	41.2
Wednesday 30th November	23:00 – 07:00	44.5	69.5	36.8
	07:00 – 23:00	50.0	85.2	41.4
Thursday 1st December	23:00 – 07:00	44.4	59.4	37.1
	07:00 – 12:45*	49.7	79.5	44.4

* Note – this period does not cover the full 16-hr day or 8-hr night period and is therefore may not be directly comparable with other complete time periods.

Table 9.20: ML7 - Burns Lodge Farm, off A19

Date	Time Period	$L_{Aeq,T}$ dB	Highest $L_{Amax,15min}$ dB	$L_{A90,15min}$ dB
Thursday 1st December	13:00 – 23:00*	54.1	76.6	45.0
Friday 2nd December	23:00 – 07:00	49.9	72.8	26.9
	07:00 – 23:00	55.0	78.1	42.4
Saturday 3rd December	23:00 – 07:00	50.0	78.2	26.0
	07:00 – 23:00	54.9	83.7	40.8
Sunday 4th December	23:00 – 07:00	62.7	85.5	39.7
	07:00 – 23:00	64.6	89.3	57.1
Monday 5th December	23:00 – 07:00	58.8	88.8	55.1
	07:00 – 23:00	55.5	95.1	42.6
Tuesday 6th December	23:00 – 02:15*	51.3	73.8	37.6

* Note – this period does not cover the full 16-hr day or 8-hr night period and is therefore may not be directly comparable with other complete time periods.

Table 9.21: ML8 - Gateforth Grange, West Lane

Date	Time Period	$L_{Aeq,T}$ dB	Highest $L_{Amax,15min}$ dB	$L_{A90,15min}$ dB
Thursday 1st December	11:30 – 23:00*	42.0	56.3	29.0
Friday 2nd December	23:00 – 07:00	35.3	64.2	23.0
	07:00 – 23:00	42.1	76.9	31.6
Saturday 3rd December	23:00 – 07:00	38.2	62.0	21.7
	07:00 – 23:00	45.7	74.0	36.4
Sunday 4th December	23:00 – 07:00	37.1	61.5	26.6
	07:00 – 23:00	44.7	70.0	37.1
Monday 5th December	23:00 – 07:00	42.7	64.7	30.6
	07:00 – 23:00	48.4	74.4	41.0
Tuesday 6th December	23:00 – 07:00	37.5	56.2	29.3
	07:00 – 23:00	44.6	78.5	37.8
Wednesday 7th December	23:00 – 07:00	39.3	59.5	31.2
	07:00 – 11:00*	46.9	76.8	42.4

* Note – this period does not cover the full 16-hr day or 8-hr night period and is therefore may not be directly comparable with other complete time periods.

Gallows Hill (ML1)

- 9.4.2 The dominant noise sources at this location during the daytime were noted to be road traffic noise from Wand Lane, commercial activity from the nearby Fairdeal Solutions (Motor Vehicle Retailer) and industrial noise from activity within the existing coal-fired power station site.

Henswell Village (ML2)

- 9.4.3 Noise within this area was observed to be generally dominated by road traffic noise, primarily from Weeland Road, but with further contribution from Hazel Old Lane. Noise from activity in neighbouring residential gardens was also noted, including dog barking which occurred for some of the time. Occasional train noise from the line into Hensall Train Station approximately 160 m to the south was also audible.

Residential property 1 Roall Waterworks (ML3)

- 9.4.4 Noise at this position was dominated by road traffic noise from the A19, approximately 25 m to the east of the measurement position.

Eggborough Sports and Leisure Complex (ML4)

- 9.4.5 Noise at this position was generally dominated by road traffic noise from the A19 to the west. However, some contribution was also made by car movements in the Sports and Leisure Complex's car park and from activity from the patrons moving between the club house and golf course. Post-processing of the measurement data at this location highlighted one 15-

minute interval on Saturday 26th November with a recorded L_{Amax} value of 107 dB. This resulted in an elevated $L_{Aeq,15min}$ value of 76 dB, approximately 25-30 dB higher than intervals either side of the event, which also affected the overall daytime noise level as presented in Table 9.18. Therefore, the data from this 15-minute interval have been excluded from the subsequent impact assessment as a conservative approach.

Chapel Haddlesey (ML5)

- 9.4.6 At this position the noise environment was observed to generally comprise road traffic noise from the A19 to the west and Millfield Road to the north.
- 9.4.7 On collection of the monitoring equipment, the surveyor was informed by local residents that construction activity on the southern bank of the River Aire, approximately 90 m from the measurement location, commenced on Tuesday 15th November, which has resulted in the significant increase in measured noise levels compared with the period prior to commencement of the works. Therefore, the data from the affected period have been excluded from the subsequent impact assessment.

Manor Cottages, east of Chapel Haddlesey (ML6)

- 9.4.8 Noise levels at this position were observed to predominantly comprise road traffic from the A19 to the west and Millfield Road to the north.

Burn Lodge Farm (ML7)

- 9.4.9 At this location noise levels were dominated by road traffic from the A19. In addition, trains using the East Coast Main Line approximately 320 m to the north, frequently and at high speeds, were also audible and contributed to the noise environment.
- 9.4.10 An initial survey was undertaken at this location from Thursday 24th November to Thursday 1st December, but on collection of the measurement equipment, the cable had become disconnected. The data from the period prior to this have been excluded from the subsequent impact assessment and not reported. The equipment was then reconfigured and recalibrated and the survey recommenced.
- 9.4.11 Post-processing of the measurement data from 1st December highlighted a further issue with the data collected from the early morning hours of Sunday 4th December, when noise levels increased sharply for a sustained period until late Monday morning, when they appear to return to levels similar to the period before the increase. The cause of the increase is unknown, however, as a conservative approach, the data from the affected period have been excluded from the subsequent impact assessment.

Gateforth Grange (ML8)

- 9.4.12 Noise levels at this location were noticeably generally low. The two main noise sources observed during the site visit were road traffic from the A19 and train noise from the East Coast Main Line running north/ north-east of the measurement position.

Representative Background Sound Levels

- 9.4.13 Representative background sound levels have been established for daytime and night-time periods based upon review and comparison of the modal and lowest 10th percentile of all 15-minute interval results throughout the daytime and night-time periods surveyed (other than those periods excluded as detailed above), together with a review of the graphical representation of the time history of all $L_{A90,15mins}$ data at each location.
- 9.4.14 Table 9.22 summarises the defined representative background sound levels taken forward for the NSR adjacent to each noise monitoring location within the BS 4142 assessment.

Table 9.22: Representative background sound levels

Receptor	NSR1	NSR2	NSR3	NSR4	NSR5	NSR6	NSR7	NSR8
Daytime L_{A90} dB (07:00-23:00 hrs)	41	43	41	43	40	37	45	30
Night-time L_{A90} dB (23:00-07:00 hrs)	37	35	32	36	34	33	27	24

Future Baseline

- 9.4.15 In the absence of the Proposed Development, future baseline noise levels at NSRs will depend largely on traffic flows on surrounding road/ rail networks and the future operations at other industrial and commercial premises. The existing coal-fired power station is expected to cease operation by the end of 2019, potentially resulting in a reduction in future baseline at properties within the vicinity compared with current periods when the existing coal-fired power station is in periods of operation.

9.5 Development Design and Impact Avoidance

Construction Noise

- 9.5.1 Construction activities will typically be undertaken during weekday daytime and Saturday mornings, although some works during peak construction may take place outside of normal working hours, provided that they do not give rise to unacceptable noise impacts. Measures to mitigate noise will be implemented during the construction phase of the Proposed Development in order to minimise impacts at local residential receptors, particularly with respect to activities required outside of normal working hours. Mitigation (to be included in a Construction Environmental Management Plan (CEMP)) shall include, but not be limited to:

- abiding by construction noise limits at nearby NSRs;
- ensuring that all processes are in place to minimise noise before works begin and ensuring that BPM are being achieved throughout the construction programme;
- ensuring that modern plant is used, complying with the latest European noise emission requirements. Selection of inherently quiet plant where possible;
- hydraulic techniques for breaking to be used in preference to percussive techniques where practical;

- use of rotary bored rather than the driven piling techniques (if required), where possible;
- off-site pre-fabrication, where practical;
- all plant and equipment being used for the works to be properly maintained, silenced where appropriate, operated to prevent excessive noise and switched off when not in use;
- all contractors to be made familiar with current legislation and the guidance in BS 5228 (Parts 1 and 2) (BSI, 2014a and b), which should form a prerequisite of their appointment;
- loading and unloading of vehicles, dismantling of site equipment such as scaffolding or moving equipment or materials around the Site to be conducted in such a manner as to minimise noise generation;
- appropriate routing of construction traffic on public roads and along access tracks, to minimise noise level increase (see Chapter 14: Traffic and Transportation);
- consultation with SDC and local residents to advise of potential noisy works that are due to take place; and
- noise complaints should be monitored, reported to the contractor and immediately investigated.

9.5.2 Method statements regarding construction management, traffic management, and overall site management will be prepared in accordance with best practice and relevant British Standards, to help to minimise impacts of construction works. One of the key aims of such method statements will be to minimise noise disruption to local residents during the construction phase.

9.5.3 Consultation and communication with the local community throughout the construction period will also serve to publicise the works schedule, giving notification to residents regarding periods when higher levels of noise may occur during specific operations, and providing lines of communication where complaints can be addressed.

9.5.4 As mentioned above, a Construction Environmental Management Plan (CEMP) will be prepared, including setting out provisions to ensure that the noise and vibration impacts relating to construction activities are minimised. A framework CEMP will be included in the final ES to support the DCO application. To assist in the preparation of the final CEMP, a detailed noise and vibration assessment will be carried out once the contractor is appointed in order to identify specific mitigation measures for the Proposed Development (including construction traffic).

9.5.5 In addition, it is recommended that the contractor should be a member of the 'Considerate Constructors Scheme' which is an initiative open to all contractors undertaking building work.

Operational Noise

9.5.6 The selection of the Proposed Power Plant Site and development of the indicative concept layout have included consideration of potential noise effects and proximity to NSRs. During the detailed design stage, potential significant residual noise effects will be mitigated by design (see Section 9.7 (Mitigation and Enhancement)). The generating station will be operated in accordance with an Environmental Permit, issued and regulated by the Environment Agency. This will require operational noise from the generating station to be controlled through the use of BAT, which will be determined through the Environmental Permit application.

9.6 Likely Impacts and Effects

Construction Noise and Vibration

- 9.6.1 This section discusses the potential noise and vibration effects on sensitive receptors arising during the construction phase of the Proposed Development, including effects due to demolition of the existing coal-fired power station which may occur concurrently.
- 9.6.2 Noise levels experienced by local receptors during such works depend upon a number of variables, the most significant of which are:
- the noise generated by plant or equipment used on site, generally expressed as Sound Power Levels (L_w) or the vibration generated by the plant;
 - the periods of use of the plant on site, known as its on-time;
 - the distance between the noise/ vibration source and the receptor;
 - the noise attenuation due to ground absorption, air absorption and barrier effects;
 - in some instances, the reflection of noise due to the presence of hard surfaces such as the sides of buildings; and
 - the time of day or night the works are undertaken.
- 9.6.3 Residential NSRs are located at distance in different directions around the Site. The closest residential NSRs to the existing power station site (which includes the Proposed Power Plant Site, Proposed Construction Laydown area, Proposed Borehole and Electrical Connections and CCR Land, as well as the existing coal-fired power station demolition works) include those located on Wand Lane in Gallows Hill approximately 210 m to the east of the Proposed Construction Laydown area, those located close to the junction of Hazel Old Lane and Weeland Road approximately 570 m to the south, and the Eggborough Sports and Leisure Complex located approximately 550 m to the west of the Proposed Power Plant Site.
- 9.6.4 With respect to the Proposed Gas Connection, the corridor passes approximately 80 m from NSRs at the eastern limit of Chapel Haddlesey, and approximately 90 m from Burn Lodge Farm (off the A19) north of Chapel Haddlesey before turning westwards and terminating at the AGI compound location west of West Lane, south-west of Burn. The closest NSR to the proposed location for the AGI is Gateforth Grange, located approximately 350 m to the south-west of the AGI.
- 9.6.5 The indicative construction programme for the Proposed Development is anticipated to span approximately three years, commencing in early 2019 and running through until early 2022. The majority of construction works will be undertaken during the period Monday to Friday 07:00 to 19:00 and Saturday 07:00 to 13:00, although it is likely that some construction activities will be required to be 24 hours during the peak periods, provided these do not give rise to unacceptable noise impacts.
- 9.6.6 As previously outlined, the timing and programme for the demolition of the existing coal-fired power station is currently uncertain. The existing power station is anticipated to cease operation by the end of 2019 although the earliest that decommissioning/ demolition could begin is 2017. Given the above, there is the potential for cumulative noise effects from the demolition of the existing coal-fired power station and construction of the Proposed Development within the existing power station site. Therefore, both demolition and

construction noise predictions have been carried out using noise data for plant and calculation methodologies from BS 5228 (2014a).

- 9.6.7 Predicted noise levels for demolition of the existing power station and construction of the Proposed Development within the existing power station site have been based upon construction methods used for other power stations in the UK, and supplemented by information about the potential worst case activity during demolition (concrete breaking) provided by EPL. No predictions have been undertaken for the use of explosives to raise the cooling towers or stack to the ground on the basis that it will occur for a very short time period. Predicted noise levels for construction of the Proposed Cooling Water and Gas Connections and AGI compound have been based upon construction methods assessed for another major underground pipeline project, including AGIs, in the UK. As a conservative approach, it is assumed that all plant and activities area taking place at the closest approach to each NSR, whereas in reality this will not occur for any significant duration if at all.
- 9.6.8 The predicted levels apply to normal weekday daytime (07:00 – 19:00) working, although they could approximate to other time periods where working at the same rate and intensity is proposed. Full details on the noise prediction methodology, including a full list of demolition/construction plant and associated sound power levels for each construction phase, are presented in Appendix 9A (PEI Report Volume III).
- 9.6.9 A summary of noise predictions at NSR locations around the Site (using the closest NSR to the proposed works in the vicinity of the baseline noise surveys) are presented in Table 9.23 to 9.25. Free-field noise levels have been predicted to allow subsequent comparison with the ABC categories derived from free-field baseline ambient noise levels at NSRs. With respect to prediction of pipeline construction noise levels, the presented values are for ‘pipe stringing, pipe bending and pipeline welding’, representing the highest noise levels predicted from 14 potential sub-activities considered for pipeline construction (see Appendix 9A, PEI Report Volume III). Given the potential for cumulative effects of demolition and construction noise, an additional column of cumulative demolition and construction noise is provided in Table 9.24, based upon the higher predicted construction phase noise levels at each NSR.

Table 9.23: Demolition noise predictions for the existing coal-fired power station (to inform assessment of potential cumulative effects with the Proposed Development)

Receptor	Predicted free-field noise level for daytime demolition activity dB L _{Aeq,12h}
NSR1 – Waterworks House, Wand Lane, Gallows Hill (west of ML1)	63
NSR2 – Residential property, Hazel Old Lane, Hensall (north of ML2)	50
NSR3 – 1 Roall Waterworks, Goole	54
NSR4 – Eggborough Sports and Leisure Complex	69
NSR5 – Property on Millfield Road, Chapel Haddlesey	57
NSR6 – 1 Manor Cottage, Chapel Haddlesey	57

Table 9.24: Construction noise predictions for the Proposed Development within the existing coal-fired power station site (note Proposed Borehole Connection is considered in Table 9.25 below)

Receptor	Predicted free-field noise level for daytime construction activity dB L _{Aeq,12h}					
	Site clearance	Piling and foundation	Building	Fit out	Landscaping	Demolition & construction
NSR1 – Waterworks House, Wand Lane, Gallows Hill (west of ML2)	62	65	63	61	43	67
NSR2 – Residential property, Hazel Old Lane, Hensall (north of ML2)	49	53	51	49	30	55
NSR3 – 1 Roall Waterworks, Goole	48	52	51	48	30	56
NSR4 – Eggborough Sports and Leisure Complex	49	53	51	49	30	69
NSR5 – Property on Millfield Road, Chapel Haddlesey	48	51	50	48	29	58
NSR6 – 1 Manor Cottage, Chapel Haddlesey	48	51	50	48	29	58

Table 9.25: Construction noise predictions for the Proposed Borehole Water, Cooling Water and Gas Connections and AGI

Receptor	Predicted free-field noise level for daytime construction activity dB L _{Aeq,12h}	
	Proposed Gas Connection/Cooling Water pipeline	AGI Construction
NSR4 – Eggborough Sports and Leisure Complex	68	n/a
NSR5 – Property on Millfield Road, Chapel Haddlesey	66	n/a
NSR6 – 1 Manor Cottage, Chapel Haddlesey	66	n/a
NSR7 – Burn Lodge Farm, off A19	65	57
NSR8 – Gateforth Grange, West Lane	57	60

Construction Noise Emission Criteria

- 9.6.10 Based upon the analysis and summary of the results of the existing free-field baseline ambient noise surveys undertaken for the project (excluding those periods when noise levels were elevated and not deemed representative), Table 9.26 sets out the BS 5228 'ABC' noise threshold categories (BSI, 2014a) at each monitoring location in the vicinity of each NSR for the time periods as set out in Table 9.4.

Table 9.26: Measured free-field $L_{Aeq,T}$ noise levels and associated 'ABC' assessment category

Receptor	Weekday daytime 07:00 – 19:00		Weekday evening 19:00 – 23:00		Night 23:00 – 07:00		Saturday 07:00 – 13:00		Saturday 13:00 – 23:00		Sunday 07:00 – 23:00	
	$L_{Aeq,T}$ dB	ABC	$L_{Aeq,T}$ dB	ABC	$L_{Aeq,T}$ dB	ABC	$L_{Aeq,T}$ dB	ABC	$L_{Aeq,T}$ dB	ABC	$L_{Aeq,T}$ dB	ABC
NSR1 – 4 The Bungalows/ Waterworks House, Wand Lane, Gallows Hill	50	A	46	A	44	B	50	A	47	A	46	A
NSR2 – Brimmond/ residential properties, Hazel Old Lane, Hensall	55	A	50	A	49	C	55	A	50	A	50	A
NSR3 – 1 Roall Waterworks, Goole	62	A	56	B	54	C	61	A	59	C	59	C
NSR4 – Eggborough Sports and Leisure Complex	56	A	55	B	53	C	51	A	47	A	57	B
NSR5 – Property on Millfield Road, Chapel Haddlesey	49	A	47	A	47	B	49	A	48	A	47	A
NSR6 – 1 Manor Cottage, Chapel Haddlesey	49	A	45	A	43	B	46	A	46	A	46	A
NSR7 – Burn Lodge Farm, off A19	56	A	53	B	50	C	55	A	55	B	-	-
NSR8 – Gateforth Grange, West Lane	46	A	43	A	39	A	48	A	44	A	45	A

- 9.6.11 Construction noise limits have been derived for each NSR in Table 9.27 below using the BS5228 ABC methodology (described in Table 9.4).

Table 9.27: Construction noise limits

Receptor	Construction noise limit $L_{Aeq,T}$ dB (Free-field)					
	Weekday daytime 07:00 – 19:00	Weekday evening 19:00 – 23:00	Night 23:00 – 07:00	Saturday 07:00 – 13:00	Saturday 13:00 – 23:00	Sunday 07:00 – 23:00
NSR1 – 4 The Bungalows/Water works House, Wand Lane, Gallows Hill	65	55	50	65	55	55
NSR2 – Brimmond / residential properties, Hazel Old Lane, Hensall	65	55	55	65	55	55
NSR3 – 1 Roall Waterworks, Goole	65	60	55	65	65	65
NSR4 – Eggborough Sports and Leisure Complex	65	60	55	65	55	60
NSR5 – Property on Millfield Road, Chapel Haddlesey	65	55	50	65	55	55
NSR6 – 1 Manor Cottage, Chapel Haddlesey	65	55	50	65	55	55
NSR7 – Burn Lodge Farm, off A19	65	60	55	65	60	55*
NSR8 – Gateforth Grange, West Lane	65	55	45	65	55	55

* Assigned based upon a conservative approach in the absence of representative baseline data.

Construction Noise Effects

- 9.6.12 The effects of the predicted daytime demolition and construction noise levels (as presented in Tables 9.23 – 9.25) have been classified by considering the daytime ABC noise limit values in Table 9.28, and using the semantic scales in Tables 9.5, 9.11 and 9.12. These effects are summarised in Table 9.28 below. Noise associated with demolition of the existing coal-fired

power station is assessed together with the noisiest construction activity associated with the Proposed Development (piling and foundations), as a worst case.

Table 9.28: Daytime construction noise effects (potentially significant effects in bold)

Receptor	Construction of the Proposed Power Plant					Demolition of existing coal-fired power station & piling and foundations	Proposed Borehole Water/ Gas Connection / Cooling Water pipelines	AGI
	Site clearance	Piling and foundations	Building	Fit out	Landscaping			
NSR1 – Waterworks House, Wand Lane, Gallows Hill (west of ML1)	Minor adverse	Minor adverse	Minor adverse	Minor adverse	Negligible adverse	Moderate adverse	n/a	n/a
NSR2 – Residential property, Hazel Old Lane, Hensall (north of ML2)	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	n/a	n/a
NSR3 – 1 Roall Waterworks, Goole	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	n/a	n/a
NSR4 – Eggborough Sports and Leisure Complex	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Moderate adverse	Moderate adverse	n/a
NSR5 – Property on Millfield Road, Chapel Haddlesey	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Minor adverse	Moderate adverse	n/a
NSR6 – 1 Manor Cottage, Chapel Haddlesey	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Minor adverse	Moderate adverse	Negligible adverse
NSR7 – Burn Lodge Farm, off A19	n/a	n/a	n/a	n/a	n/a	n/a	Minor adverse	Negligible adverse
NSR8 – Gateforth Grange, West Lane	n/a	n/a	n/a	n/a	n/a	n/a	Negligible adverse	Negligible adverse

- 9.6.13 Construction noise effects at all receptors during construction of the Proposed Power Plant Site in isolation (i.e. without concurrent demolition of the existing coal-fired power station) are predicted to be negligible or minor adverse (not significant) during the daytime period due largely to the distances between the works and NSRs, and the acoustic screening provided by the existing earth bund around the east, south and west of the Proposed Power Plant Site and screening to the east and south of the proposed laydown area. During worst predicted periods of the Proposed Borehole Water/ Cooling Water/ Gas Connections pipeline construction, short term potential effects of up to moderate adverse (significant) are predicted at the Eggborough Sports and Leisure Complex and at the NSRs assessed in Chapel Haddlesey when works are taking place at their closest approach. As the works progress and move further away, adverse effects will reduce.
- 9.6.14 The cumulative noise effect of the construction of the Proposed Development and demolition of the existing coal-fired power station at the Eggborough Sports and Leisure Complex is predicted to be moderate adverse (significant). It should be noted that the majority of this effect is due to the demolition rather than the construction of the Proposed Development.
- 9.6.15 It may be necessary for some construction activities to take place continuously over day, evening and night periods during peak construction times of the Proposed Development, although the exact nature of the works is unknown. Due to the potential sensitivity of NSRs to construction noise generated outside of normal working hours, the potential impact of construction activities at these times is considered to be potentially significant. Noise limits during non-weekday daytime periods have been defined in Table 9.27. Comparison of the predicted daytime noise levels against the lower limit values for evening, weekend and particularly night-time working indicate potential moderate/ major adverse effects (significant) could occur at some NSRs during these times if the same intensity of working as for the daytime is assumed. Therefore, construction activities taking place outside normal working hours will need to be planned, managed and mitigated appropriately so they do not exceed the limits for construction noise that have been defined in Table 9.27. Provided noise limits are not exceeded, construction activities outside of normal working hours can be considered as having a minor adverse effect or less (not significant). Potential measures to ensure that appropriate mitigation is in place during the works have already been discussed in Section 9.5 Development Design and Impact Avoidance.

Construction Traffic Noise

- 9.6.16 For the purposes of assessment, it is assumed that construction traffic access to the Proposed Construction Laydown area and Proposed Power Plant Site within the existing coal-fired power station will be via the A19 and either along Tranmore Lane, a private access road used for coal deliveries, or via the existing Hensall Gate entrance on Wand Lane. Data have been provided from the Transport Assessment (see Appendix 14A, PEI Report Volume III) for the traffic scenario 'without' and 'with' Proposed Development construction traffic in 2020 for the roads within the scope of the transport assessment, as follows:
- Scenario 1 - 'without' Proposed Development construction - 2020 Base (excluding demolition traffic for the existing coal-fired power station);
 - Scenario 2 - 'with' Proposed Development construction - 2020 Base + Proposed Development construction traffic (and including demolition traffic for the existing coal-fired power station).

- 9.6.17 The traffic data are presented in Table 9.29 below. For the purposes of assessment, these are based on the assumption that HGVs will access the construction site within the existing coal-fired power station via Tranmore Lane and cars/ light vehicles via Hensall Gate, although it should be noted that the details of construction access have not yet been fixed and there are three accesses to the Proposed Power Plant Site included within the Site (see Chapter 3: Description of the Site).

Table 9.29: Changes in road traffic as a result of the Proposed Development construction traffic

Link	Scenario 1 Without Proposed Development construction (excluding demolition)			Scenario 2 With Proposed Development construction (and including demolition)		
	AAWT	% HGV	Speed (kph)	AAWT	% HGV	Speed (kph)
A19 (north of M62 Junction 34)	14,678	4.7	83	15,672	5	83
Wand Lane (west of Hensall Gate entrance)	755	0	91	1,765	0	91
A19 (north of Wand Lane)	11,634	3.8	84	11,804	3.8	84

- 9.6.18 The potential changes in road traffic noise from these roads as a result of the Proposed Development have been considered by calculating the BNL at 10 m from the road and comparing the change. Table 9.30 presents the results of the BNL assessment.

Table 9.30: Changes in BNL as a result of the Proposed Development construction traffic

Link	Predicted BNL, $L_{A10, 18hr}$ dB		Change in BNL, dB (Scenario 2 minus Scenario 1)
	Scenario 1 Without Proposed Development construction (excluding demolition of existing coal-fired power station)	Scenario 2 With Proposed Development construction (and including demolition of existing coal-fired power station)	
A19 (north of M62 Junction 34)	71.7	72.1	+0.4
Wand Lane (west of Hensall Gate entrance)	58.5	62.2	+3.7
A19 (north of Wand Lane)	70.6	70.7	+0.1

- 9.6.19 Table 9.30 above shows either no change or very low magnitudes of noise impact are expected due to changes in traffic flows along the main A19 routes north and south of Wand Lane during construction of the Proposed Development (with additional demolition traffic). This will result in neutral or negligible adverse effects (not significant) at local residential NSRs. With respect to Wand Lane, the change in BNL is higher, but there are no local NSRs to be significantly impacted by this potential increase at source. In addition, noise from the A19, not Wand Lane, will be the dominant road traffic noise source at the closest properties to Wand Lane, thereby preventing any significant change in noise level. Based upon the above, no further specific mitigation measures are proposed in addition to those listed in Section 9.5 Development Design and Impact Avoidance section under construction noise.
- 9.6.20 In addition to the road traffic related to the Proposed Development construction, occasional rail transport may be used to import material to Site (subject to feasibility), using the existing railway line to the coal-fired power station site. Details regarding the number of trips will not be known until the contractor is appointed, but on the current understanding that this may be one movement per day on average along a route used for import of coal to the existing coal-fired power station, it is considered that any noise from this source in addition to noise from works already on-going will be negligible (not significant).
- 9.6.21 With respect to construction traffic related to the Proposed Gas Connection pipeline and AGI, indicative numbers of plant and consumable deliveries and site staff movements have been estimated for the Transport Assessment (Appendix 14A, PEI Report Volume III), as follows:
- access to AGI site - using West Lane –
 - 5 low loaders/ 10 HGV deliveries (average of 2 per day during first two weeks of construction site start-up only),
 - 30 site staff (at the peak of site works); and
 - access to pipeline (at different access points along the route as works progress – see Chapter 5: Construction Programme and Management) –

- 2 HGVs per day for site consumables (during first two weeks of construction site start-up only),
- 12 flatbed deliveries per day for delivery of pipes (during first two weeks of construction site start-up only),
- 15 low loaders for delivery of plant pipes (during first two weeks of construction site start-up only),
- 5 HGV trips per day for consumables (for the duration of the construction of the pipeline), and
- 60 site staff (at the peak of construction of the pipeline).

9.6.22 No baseline traffic data is available for West Lane against which to consider the construction traffic movements related to the AGI. However, total daily trip numbers are very low as set out above and therefore whilst individual vehicle movements may be noticeable at NSRs, overall it would be expected that the change in $L_{A10,18h}$ noise levels would be low or very low, and therefore the effect is predicted to be minor adverse at worst (not significant), and temporary in nature.

9.6.23 With respect to access to the Proposed Gas Connection corridor for pipeline construction, this is proposed to be provided at a number of locations, some of which are close to existing NSRs (including Lodge Farm and Burn Lodge Farm). Therefore, there is the potential for adverse effects to occur at NSRs (possibly minor/ moderate adverse (significant)), although the effects would be temporary and largely concentrated around the first two weeks of construction site start-up when the highest number of HGV movements are anticipated.

9.6.24 The construction noise management measures listed within the Section 9.5 Development Design and Impact Avoidance section under construction noise, which should be further developed as the project progresses, will assist in minimising adverse effects at nearby NSRs.

Construction Vibration

9.6.25 The level of impact at different receptors will be dependent upon a number of factors including distance between the works and receptors, ground conditions, the nature and method of works required close to receptors and the specific activities being undertaken at any given time.

9.6.26 There are no residential receptors within close proximity to the Site to be significantly affected by construction vibration. However, there is the potential for some vibration impacts upon commercial properties within the vicinity of the Site, primarily the existing buildings at the coal-fired power station (if they have not been demolished). Whilst it is considered unlikely that most typical construction working routines would generate levels of vibration above which building damage would be expected to be sustained (subject to final plant and working requirements), there is the potential that vibration impacts could cause annoyance to occupants and exceed the LOAEL and SOAEL set out in Section 9.3. The need for piling, and the type of any piling potentially required is not yet confirmed, but at this stage it is assumed that (as a worst case) driven piling will be necessary.

9.6.27 Where piling, heavy earthworks, vibratory rollers or other significant vibration producing operations are proposed in close proximity to any existing sensitive buildings within the existing coal-fired power station that remain in use at the time of these construction activities, further consideration will be given to potential impacts once the contractor is appointed and

the construction methods and requirements are developed. As both the construction of the Proposed Development and the use of many of the existing coal-fired power station buildings (with the exception of the National Grid 400 kV sub station) are both within the control of EPL, any identified issues can be effectively managed by EPL and their contractor. Potential measures to ensure that appropriate mitigation is in place during the works are discussed in Section 9.5 Development Design and Impact Avoidance.

Opening and Operation Noise

9.6.28 Operational noise modelling has been undertaken for the two indicative concept layouts (see Figures 4.1a and 4.1b in PEI Report Volume II). The assessment described below sets out first the impacts and effects associated with operation of the Proposed Development alone (the Operation assessment scenario which would be long-term), and then considers the potential impacts and effects if demolition of the existing coal-fired power station was to be taken place during the early stages of operation (the Opening assessment scenario which would be likely to be only short-term until coinciding demolition activities were complete).

9.6.29 The following assumptions have been made when undertaking the operational noise modelling:

- the Proposed Development will operate continually at full load, 24 hours a day (note this is a 'worst case' assumption for the purposes of the noise assessment and may not occur in practice – in particular the operation of the peaking plant will be very intermittent);
- noise levels provided by OEMs for all principal noise emitting buildings/ elements (air inlet filters, electrical buildings, transformers, workshops etc.) are understood to be external radiated Sound Power Levels (SWL);
- proposed cooling towers have been modelled as individual point sources, located 0.1 m above the top of each cooling tower;
- stacks have been modelled as individual point sources, located 0.1 m above the top of each stack; and
- corrections for tonality, impulsivity, and intermittency have not been applied on the assumption that these potential features will be designed out of the Proposed Development during the detailed design phase by the selection of appropriate plant, building cladding louvres and silencers/ attenuators. However, a +3dB correction has been applied to the specific noise levels predicted from the Proposed Power Plant Site on the basis that the noise emissions may be distinctive above the residual acoustic environment. This is considered conservative in the context of the prevailing noise environment which includes the existing coal-fired power station in operation.

9.6.30 Details of the noise source SWL data, the settings used in the noise modelling software and the list of assumptions used are presented in Appendix 9B (PEI Report Volume III).

Operation (Without Concurrent Demolition of the Existing Coal-Fired Power Station)

9.6.31 The predicted free-field operational specific sound levels at the NSRs around the Proposed Power Plant Site, for both indicative concept layouts, are presented in Table 9.31. The results presented are the highest predicted at any NSR within the vicinity of each monitoring location. Assuming continual 24-hr operation, the predicted noise levels could apply to 1-hour daytime or 15-minute night-time BS 4142 assessment periods.

Table 9.31: Predicted operational noise levels – Proposed Power Plant Site

Receptor	Predicted operational specific sound level $L_{Aeq,1h}$ dB	
	Indicative concept layout shown in Figure 4.1a (including 3 single shaft CCGT units)	Indicative concept layout shown in Figure 4.1b (including single + multi shaft CCGT units)
NSR1 – Waterworks House, Wand Lane, Gallows Hill (near ML1)	37	36
NSR2 – 168 Weeland Road, Hensall (near ML2)	37	36
NSR3 – 1 Roall Waterworks, Goole (at ML3)	37	36
NSR4 – Eggborough Sports and Leisure Complex (at ML4)	31	31
NSR5 – Property on Millfield Road, Chapel Haddlesey (at ML5)	27	27
NSR6 – 1 Manor Cottage, Chapel Haddlesey (at ML6)	28	27

9.6.32 The daytime BS4142 assessments for receptors NSR1 - 6 are presented in Tables 9.32 and 9.33 for the two indicative concept layouts. In addition, the magnitude of impact and effect classification has been included based upon the BS4142 assessment outcomes, with reference to the semantic scales in Tables 9.10, 9.11 and 9.12. The representative background sound levels used are those presented in Table 9.22, to present an assessment against existing baseline conditions.

Table 9.32: Daytime BS 4142 assessment – 3 single shaft CCGT units (as per Figure 4.1a)

Receptor	NSR1	NSR2	NSR3	NSR4	NSR5	NSR6
Specific Sound Level $L_s (L_{Aeq,Tr})$, dB	37	37	37	31	27	28
Acoustic feature correction, dB	+3	+3	+3	+3	+3	+3
Rating Level ($L_{Ar,Tr}$), dB	40	40	40	34	30	31
Representative Background Sound Level ($L_{A90,T}$), dB	41	43	41	43	40	37
Excess of rating level over background sound level ($L_{Ar,Tr} - L_{A90,T}$), dB	-1	-3	-1	-9	-10	-6
BS 4142:2014 assessment outcome	Low impact	Low Impact	Low impact	Low impact	Low impact	Low impact
Magnitude of impact (assigned from Table 9.10)	Very low	Very low	Very low	Very low	Very low	Very low
Classification of effect (assigned from Table 9.12)	Negligibl e adverse	Negligibl e adverse	Negligibl e adverse	Negligibl e adverse	Negligibl e adverse	Negligibl e adverse
<p>Uncertainty: Given the large extent of sound level data obtained during the surveys, significantly different 'representative' background sound level values can be obtained using different statistical analysis methods. The example analysis used in BS 4142 is the 'mode'. However, in this assessment the mode has been considered alongside the 10th percentile of the measured $L_{A90,15mins}$ values and the graphical representation of all of the $L_{A90,15mins}$ data at each location. As a result, background sound levels equal to or lower than the mode (lower by up to 13 dB during the daytime and 6 dB at night at some NSRs) have been assigned as 'representative' in this assessment. Therefore, conservative ('worst case') assessment results are provided.</p>						

Table 9.33: Daytime BS 4142 Assessment – single + multi shaft CCGT units (as per Figure 4b)

Receptor	NSR1	NSR2	NSR3	NSR4	NSR5	NSR6
Specific Sound Level $L_s (L_{Aeq,Tr})$, dB	36	36	36	31	27	27
Acoustic feature correction, dB	+3	+3	+3	+3	+3	+3
Rating Level ($L_{Ar,Tr}$), dB	39	39	39	34	30	30
Representative Background Sound Level ($L_{A90,T}$), dB	41	43	41	43	40	37
Excess of rating level over background sound level ($L_{Ar,Tr} - L_{A90,T}$), dB	-2	-4	-2	-9	-10	-7
BS 4142:2014 assessment outcome	Low impact	Low Impact	Low impact	Low impact	Low impact	Low impact
Magnitude of impact (assigned from Table 9.10)	Very low	Very low	Very low	Very low	Very low	Very low
Classification of effect (assigned from Table 9.12)	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse	Negligible adverse
<u>Uncertainty:</u> See Table 9.32.						

9.6.33 The night-time BS 4142 assessments for receptors NSR1 - 6 are presented in Tables 9.34 and 9.35 for the two indicative concept layouts.

Table 9.34: Night-time BS 4142 Assessment – 3 single shaft CCGT units (as per Figure 4.1a)

Receptor	NSR1	NSR2	NSR3	NSR4	NSR5	NSR6
Specific Sound Level $L_s (L_{Aeq,Tr})$, dB	37	37	37	31	27	28
Acoustic feature correction, dB	+3	+3	+3	+3	+3	+3
Rating Level ($L_{Ar,Tr}$), dB	40	40	40	34	30	31
Representative Background Sound Level ($L_{A90,T}$), dB	37	35	32	36	34	33
Excess of rating level over background sound level ($L_{Ar,Tr} - L_{A90,T}$), dB	+3	+5	+8	-2	-4	-2
BS 4142:2014 assessment outcome	Below adverse impact	Adverse impact	Adverse impact / Significant adverse impact	Low impact	Low impact	Low impact
Magnitude of impact (assigned from Table 9.10)	Very low/ low	Low	Low / medium	Very low	Very low	Very low
Classification of effect (assigned from Table 9.12)	Negligible / minor adverse	Minor adverse	Minor/ moderate adverse	Negligible adverse	Negligible adverse	Negligible adverse
<u>Uncertainty:</u> As Table 9.32.						

Table 9.35: Night-time BS 4142 Assessment – single + multi shaft CCGT units (as per Figure 4b)

Receptor	NSR1	NSR2	NSR3	NSR4	NSR5	NSR6
Specific Sound Level $L_s (L_{Aeq,Tr})$, dB	36	36	36	31	27	27
Acoustic feature correction, dB	+3	+3	+3	+3	+3	+3
Rating Level ($L_{Ar,Tr}$), dB	39	39	39	34	30	30
Representative Background Sound Level ($L_{A90,T}$), dB	37	35	32	36	34	33
Excess of rating level over background sound level ($L_{Ar,Tr} - L_{A90,T}$), dB	+2	+4	+7	-2	-4	-3
BS 4142:2014 assessment outcome	Below Adverse impact	Adverse impact	Adverse Impact / Significant adverse impact	Low impact	Low impact	Low impact
Magnitude of impact (assigned from Table 9.10)	Very low/ low	Low	Low/ medium	Very low	Very low	Very low
Classification of effect (assigned from Table 9.12)	Negligible / minor adverse	Minor adverse	Minor/ moderate adverse	Negligible adverse	Negligible adverse	Negligible adverse
<u>Uncertainty:</u> See Table 9.32.						

- 9.6.34 During the daytime, effects are categorised as negligible for both indicative concept layouts, with no specifically designed mitigation in place. However, due to lower measured background sound levels at night, the predicted night-time effects are higher with up to minor/moderate adverse effects predicted for both indicative concept layouts at the worst-case NSRs assessed. However, the predicted noise levels at NSRs remain below the LOAEL (+5 dB) at all NSRs assessed during the day for both indicative concept layouts, but increases at some NSRs to just meet and slightly exceed the LOAEL for the single shaft indicative concept layout and slightly exceed the LOAEL for the single + multi shaft indicative concept layout at night based upon the relative BS 4142 assessment comparison of rating levels and background sound levels.
- 9.6.35 SDC requested that the assessment consider recommendations of the WHO. The WHO 'Guidelines for Community Noise' (WHO, 1999) recommend external environmental daytime and evening limits of 55 dB L_{Aeq} or less over the 16-hour daytime period (07:00 to 23:00) "to avoid minimal serious annoyance", and 50 dB L_{Aeq} "to avoid minimal moderate annoyance".
- 9.6.36 For night-time sources the WHO Guidelines recommend a night-time (23:00 to 07:00) 8-hour noise level of 30 dB L_{Aeq} inside bedrooms (for a reasonably steady noise source) to avoid sleep

disturbance and that a criterion of 60 dB L_{AFmax} (façade) should not be regularly exceeded to avoid sleep disturbance, if windows are left partially open. The WHO assumes a 15 dB reduction for a partially open window therefore the corresponding internal criterion is 45 dB L_{AFmax} .

9.6.37 The WHO Night Noise Guidelines (WHO, 2009) for Europe consider the long term effect of night time noise on the population. The requirement for health-based guidelines originated from the European Union Directive 2002/49/EC relating to the assessment and management of environmental noise (known as the Environmental Noise Directive).

9.6.38 It is noted that the 2009 WHO Guidelines are intended to complement rather than replace the 1999 WHO Guidelines.

9.6.39 The 2009 WHO Guidelines assess the effect of noise during the night time using the $L_{night,outside}$ parameter. This considers the external noise level averaged over a complete year for the 8 hour night time period. The Guidelines state:

“There is no sufficient evidence that the biological effects observed at the level below 40 dB $L_{night,outside}$ are harmful to health. However, adverse health effects are observed at the level above 40 dB $L_{night,outside}$, such as self-reported sleep disturbance, environmental insomnia, and increased use of somnifacient drugs and sedatives. Therefore, 40 dB $L_{night,outside}$ is equivalent to the lowest observed adverse effect level (LOAEL) for night noise.”

9.6.40 The 2009 WHO Guidelines suggest a night time noise guideline of 40 dB $L_{night,outside}$ and an interim target of 55 dB $L_{night,outside}$ in situations where the achievement of the night time noise guideline is not feasible in the short term. With regard to the suggested night time noise guideline of 40 dB $L_{night,outside}$ the guidance states:

“The LOAEL of night noise, 40 dB $L_{night,outside}$, can be considered a health-based limit value of the night noise guidelines necessary to protect the public, including most of the vulnerable groups such as children, the chronically ill and the elderly, from the adverse health effects of night noise.”

9.6.41 Given that operation of the Proposed Development will be 24 hours, provided that noise levels are acceptable during night-time hours, they will automatically be acceptable during daytime period when existing ambient noise levels are higher. Data collected at the monitoring locations (and nearby NSRs) used within this assessment confirm that night-time noise levels already exceed the 40 dB $L_{night,outside}$ recommendation, as shown in summary of average night-time ambient noise levels in Table 9.26, whilst all summary levels are below the higher recommended interim value of 55 dB $L_{night,outside}$.

9.6.42 Summation of the predicted specific sound levels with the existing night-time summary noise levels in Table 9.26 would result in less than a 1 dB increase in existing ambient noise levels at worst (at Gallows Hill), which would not be perceptible and indeed negligible above existing average ambient $L_{Aeq,8h}$ night-time noise levels. Therefore, considering the BS 4142 assessment outcomes in the context of the existing environment, noise level increases would not be deemed significant.

9.6.43 However, on the basis that there may be a desire to reduce noise levels to the LOAEL (no greater than +5 dB excess of rating level over background sound level), potential options to reduce noise levels are discussed in Section 9.7 (Mitigation and Enhancement Measures).

Opening (With Concurrent Demolition of the Existing Coal-Fired Power Station)

- 9.6.44 In addition to the above assessment using existing ambient and background sound levels, it is also possible to consider the potential future ambient and background sound levels during ongoing demolition of the existing coal-fired power station, together with operational effects of the Proposed Development.
- 9.6.45 With respect to the BS 4142 (BSI, 2014c) assessment, it is not possible to accurately predict a future (temporary) background sound level at NSRs against which to reassess operational noise from the Proposed Development. However, it is not unreasonable to assume that background sound levels could be elevated during demolition works and therefore the BS 4142 assessments presented above should represent a conservative assessment.
- 9.6.46 With respect to future (temporary) elevated absolute ambient sound levels during ongoing daytime demolition works at the existing coal-fired power station and operation of the Proposed Development, addition of the predicted operational specific sound levels in Table 9.31 with the existing daytime noise levels in Table 9.26 and the indicative predicted demolition noise levels would result in just a 0.0 - 0.1 dB $L_{Aeq,12hr}$ increase in predicted future ambient daytime noise levels at all NSRs assessed around the Proposed Power Plant Site. Therefore, whilst the ambient level itself would at some NSRs be elevated due to demolition noise, the predicted change in noise due to operation of the Proposed Development would be imperceptible and therefore classified as neutral to negligible adverse (not significant). At other times during the demolition programme when noise emissions are lower, and the combined existing ambient and demolition noise gives rise to lower future ambient noise levels, the level of increase due to operational noise may be slightly higher, but would remain below 1 dB as stated in paragraph 9.6.42.

Operational Traffic

- 9.6.47 For the purposes of assessment (although this is not yet fixed) it is assumed that operational workforce traffic (cars) will use Wand Lane to access the Site via Hensall Gate towards the north-east corner of the existing coal-fired power station site. Data provided from the Transport Assessment (Appendix 14A, PEI Report Volume III) for the operational noise assessment for the following scenarios have been used to provide an indication of the potential noise level change upon opening of the Proposed Development:
- Scenario 1 - 'without' Proposed Development operation - 2020 Base (excluding existing operational traffic associated with the existing coal-fired power station and excluding demolition traffic);
 - Scenario 2 - 'with' Proposed Development operation (at Opening) - 2020 Base (excluding existing operational traffic associated with the existing coal-fired power station and including demolition traffic and Proposed Development operational traffic (AAWT flow of 126 cars using Wand Lane)).
- 9.6.48 It is assumed for the purposes of assessment that all 126 cars will arrive and depart Hensall Gate entrance from the west. Table 9.36 presents the traffic data considered.

Table 9.36: Changes in road traffic as a result of the Proposed Development operational traffic

Link	Scenario 1 Without Proposed Development operation (excluding demolition)			Scenario 2 With Proposed Development operation (and including demolition)		
	AAWT	% HGV	Speed (kph)	AAWT	% HGV	Speed (kph)
Wand Lane (west of Hensall Gate entrance)	755	0.0	91	881	0.0	91

- 9.6.49 The above flows are below the 1,000 vehicles AAWT lower limit of the CRTN calculation method (DfT/ Welsh Office, 1998) and therefore BNL values cannot be accurately predicted. However, indicative BNL values have been calculated as 58.5 dB and 59.2 dB for the two scenarios respectively. This would result in less than a 1 dB increase in noise from the road source and would be classified as a very low magnitude of impact resulting in a negligible effect (not significant). As mentioned previously, however, there are no NSRs within the close vicinity of Wand Lane to be affected by this potential increase, and due to existing significantly higher baseline flows on the A19, the addition of 126 vehicles would result in lower noise level increases at nearby NSRs.

Decommissioning

- 9.6.50 It is reasonable to assume that noise and vibration during decommissioning would result in broadly similar levels of impacts and effects to those presented for demolition of the existing coal-fired power station, albeit there could be some greater impacts at NSRs to the south and east (potentially up to minor/moderate adverse (significant)) where the distance to NSRs from the Proposed Power Plant compared with the existing coal-fired power station buildings is less. The potential impacts and effects would require further consideration at the decommissioning stage of the Proposed Development, but potential measures to ensure that appropriate mitigation is in place during the works have already been discussed in Section 9.5 Development Design and Impact Avoidance. The benefit to the Eggborough Sports and Leisure Complex will be that the Proposed Development will be slightly further away compared to the existing coal-fired power station, and therefore the predicted moderate adverse effects should be reduced, and may not be significant.

9.7 Mitigation and Enhancement Measures

Construction

- 9.7.1 There is the potential for moderate adverse effects at some NSRs at Gallows Hill, at the Eggborough Sports and Leisure Complex and at NSRs at Chapel Haddlesey during pipeline construction works or during demolition of the existing coal-fired power station, or due to the cumulative effects of demolition and construction. In addition, there is the potential for some vibration effects at buildings, primarily at the existing coal-fired power station during

construction of the Proposed Development depending upon the nature of piling and other vibration emitting activities required (and whether the existing power station buildings are still present at the time of these construction activities).

- 9.7.2 The preferred approach for controlling construction noise and vibration is to reduce levels at source where possible, but with due regard to practicality. Sometimes a greater noise or vibration level may be acceptable if the overall construction time, and therefore length of disruption, is reduced.
- 9.7.3 The list of noise control measures presented within Section 9.5 of this chapter provides a detailed but not exhaustive list of construction noise management measures. The measures listed will be implemented and supplemented as necessary with further bespoke measures identified through further detailed assessment once the contractor is appointed.
- 9.7.4 Residual effects after mitigation are described in Section 9.9 below, and are not considered to be significant.

Operational Noise

- 9.7.5 The assessment has assumed that potential noise of a tonal, impulsive or intermittent nature will be designed out of the Proposed Development during the detailed design phase by the selection of appropriate plant, building cladding, louvres and silencers/ attenuators as necessary. However, a +3 dB correction has been applied to the specific noise levels predicted from the Proposed Power Plant Site on the basis that the noise emissions may be distinctive above the residual acoustic environment.
- 9.7.6 Assessment has indicated that predicted noise levels at some NSRs just meet and slightly exceed the LOAEL for Option 1 and slightly exceed the LOAEL for Option 2 at night based upon the relative BS 4142 assessment comparison of rating levels and background sound levels, without specific mitigation in place.
- 9.7.7 Analysis of the noise source contributions from each modelled plant item/ building in the two indicative concept layouts indicates that there are a range of noise sources contributing to the predicted levels at NSRs, whilst the exact noise contribution from each building or plant item at each NSR is dependent upon the source and NSR position.
- 9.7.8 For example, reducing the breakout noise (by increasing the sound insulation/ attenuation or reducing the SWL of the source) from the following plant items/ buildings in Table 9.37 would be predicted to reduce rating levels to +5 dB or lower at all NSRs assessed for both indicative concept layouts (as per Figure 4.1a and Figure 4.1b, PEI Report Volume II).
- 9.7.9 Residual effects after mitigation are described in Section 9.9 below, and are not considered to be significant.

Table 9.37: Predicted operational noise levels – Proposed Power Plant Site

Indicative concept layout shown in Figure 4.1a (including 3 single shaft CCGT units)		Indicative concept layout shown in Figure 4.1b (including single + multi shaft CCGT units)	
Plant item/ building	Indicative sound reduction required dB(A)	Plant item/ building	Indicative sound reduction required dB(A)
HRSB (north) – south façade	-9	HRSB multi shaft (north) – north façade	-8
HRSB 3 (south) north façade	-9	HRSB single shaft – north façade	-6
HRSB (central) – north façade	-9	HRSB multi shaft (south) – north façade	-3
Peaking plant – west façade	-6	Peaking plant – west façade	-6
HRSB (north) – north façade	-6	HRSB (north) – north façade	-6

- 9.7.10 As the design progresses to the detailed design stage, the existing noise model will be refined and additional acoustic assessment will be undertaken in consultation with the designers to determine the most appropriate mitigation options. The findings of the further assessment would inform the design to ensure that rating levels meet with a target of no greater than +5 dB above the representative background sound level at each NSR.

Decommissioning

- 9.7.11 At this stage the requirements of decommissioning are unknown although mitigation measures are likely to be similar to those identified for demolition.

9.8 Limitations or Difficulties

Construction

- 9.8.1 Detailed demolition and construction information is not yet available and therefore this assessment draws upon the experience and assessments undertaken for other similar projects. The assessment is therefore indicative, but is considered to be robust. However, construction noise thresholds (limit values) have been provided in Table 9.27 based upon existing ambient sound levels at NSRs, and further assessment has been identified to ensure that appropriate mitigation is developed to achieve the limit values once the contractor is appointed. This and other mitigation measures detailed above, which will be secured by DCO Requirement as appropriate, will help to ensure that construction noise and vibration is minimised although it is inevitable as with most construction projects, particularly during demolition (and explosions), that some temporary adverse effects will be experienced.
- 9.8.2 It should be noted that the corridor required for the Proposed Gas Connection is to be further refined (from circa 100 m in width to circa 36 m in width) prior to submission of the DCO. At

present, construction effects are predicted on the assumption that construction activities may occur at the closest point on the corridor to each NSR (as a worst case), but the refinement of the corridor has the potential to increase the distance from the Site to some NSRs.

Operation

- 9.8.3 Lists of assumptions made during the noise modelling and assessment of the Proposed Development are as presented in paragraph 9.6.29 and in Appendix 9B (PEI Report Volume III). Further uncertainties are detailed in Tables 9.32 with respect to the defining of representative background sound levels. However, it is considered that the assumptions made will have led to a conservative ('worst case') assessment. Further assessment will be undertaken at the detailed design stage to ensure that appropriate noise limit values are achieved. Boundary noise levels will be proposed based on the noise limits required at the sensitive receptors.

9.9 Residual Effects and Conclusions

- 9.9.1 A summary of the residual effects, assuming the implementation of all appropriate mitigation to reduce noise and vibration during demolition/ construction and operational phases, is presented in Table 9.38 below.

Table 9.38: Summary of significant effects

Development stage	Environmental effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation	Nature of effect(s) (Lt/ Mt/ St and P/ T and D/ In)
Construction	Noise effect during concurrent demolition of the existing coal-fired power station and construction of the Proposed Development	Up to moderate adverse at the nearest residential NSRs (significant).	Further detailed assessment and CEMP once contractor appointed.	Minor adverse or less, on the basis that BS 5228 ABC noise limits are met (not significant).	St, T, D
Construction	Noise effects during construction of the Borehole Water, Cooling Water and Gas Connection pipelines	Up to moderate adverse at nearest residential NSRs during daytime (significant).	Further detailed assessment and CEMP once contractor appointed, particularly regarding working outside of daytime working hours.	Minor adverse or less, on the basis that BS 5228 ABC noise limits are met (not significant).	St, T, D
Operation	Operation of the Proposed Power Plant Site	Negligible to minor/ moderate adverse – night-time (significant).	Reduction of SWL/ breakout noise from key plant/ buildings. Further assessment as design progresses.	Minor adverse/ negligible, on the basis that the excess of the rating level over the background sound level is $\leq 5\text{dB}$ (not significant).	Lt, T, D
Decommissioning	Noise effects during decommissioning of	Up to moderate adverse at nearest	Further detailed assessment and CEMP,	Minor adverse or less, on the basis that BS	St, T, D

Development stage	Environmental effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation	Nature of effect(s) (Lt/ Mt/ St and P/ T and D/ In)
	the Proposed Power Plant	residential NSRs during daytime (significant).	particularly regarding working outside of daytime working hours.	5228 ABC noise limits are met (not significant).	

Note: Lt = long term, Mt = medium term, St = short term, P = permanent, T = temporary, D = direct and In = indirect.

9.10 References

- British Standards Institute (1991) *BS 7445-2 – Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use*
- British Standards Institute (1993) *BS 7385-2 – Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration*
- British Standards Institute (2003) *BS 7445-1 – Description and measurement of environmental noise. Guide to quantities and procedures*
- British Standards Institute (2008) *BS 6472-1 – Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting*
- British Standards Institute (2014a) *BS 5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Part 1: Noise.*
- British Standards Institute (2014b) *BS 5228-2:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Part 2:Vibration*
- British Standards Institute (2014c) *BS 4142 – Methods for rating and assessing industrial and commercial sound*
- Department for Communities and Local Government (2012) *National Planning Policy Framework*. DCLG, London
- Department for Communities and Local Government (2014) *Planning Practice Guidance*
- Department of Energy and Climate Change (2011a) *Overarching National Policy Statement for Energy EN-1*
- Department for Energy and Climate Change (2011b)
- Department for Environment, Food and Rural Affairs (2010) *Noise Policy Statement for England (NPSE)*
- Department of Transport/ Welsh Office (1998) *Calculation of Road Traffic Noise (CRTN)*
- Environment Agency (2002a) *Integrated Pollution Prevention and Control (IPPC) H3 document Horizontal Guidance for Noise Part 2 - Noise assessment and Control*
- Environment Agency (2002b) *Integrated Pollution Prevention and Control (IPPC) H3 document Horizontal Guidance for Noise Part 1 – Regulation and Permitting*
- Highways Agency (2011) *Design Manual for Road and Bridges Volume 11 Section 3 Part 7 HD213/11 (Revision 1) Traffic Noise and Vibration*
- International Standards Organisation (1996) *ISO 9613 Acoustics - Attenuation of sound during propagation outdoors.*
- International Standards Organisation (2010) *ISO 4866: 2010 Mechanical vibration and shock - Vibration of fixed structures - Guidelines for the measurement of vibrations and evaluation of their effects on structures]*

Office of the Deputy Prime Minister (1994) *Planning Policy Guidance (PPG) 24 - Planning and Noise*

Selby District Council (2013) *Selby District Council Core Strategy, adopted October 2013*

World Health Organisation (WHO) (1999) *Guidelines for Community Noise*

World Health Organisation (WHO) (2009) *Night Noise Guidelines for Europe*

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10.0 ECOLOGY

10.1 Introduction

10.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential effects of the proposed Combined Cycle Gas Turbine (CCGT) power station near Eggborough, North Yorkshire (hereafter referred to as the 'Proposed Development') on ecology.

10.1.2 This chapter is supported by the following technical appendices provided in PEI Report Volume III, with accompanying figures included with the relevant annexes:

- Appendix 10A – Legislation and Planning Policy;
- Appendix 10B – Ecological Impact Assessment Methodology;
- Appendix 10C – Preliminary Ecological Appraisal (PEA) Report;
- Appendix 10D – Mammal Survey Report;
- Appendix 10E – Great Crested Newt Survey Report;
- Appendix 10F – River Corridor and Aquatic Invertebrate Survey Report;
- Appendix 10G – Fish Survey Report; and
- Appendix 10H – Habitats Regulations Assessment (HRA) signposting.

10.2 Legislation and Planning Policy Context

10.2.1 The initial ecological impact assessment (EcIA) presented in this chapter has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. A summary is provided below and further details are provided in Appendix 10A.

Legislative Background

10.2.2 The following legislation is potentially relevant to the Proposed Development:

- Wildlife and Countryside Act (WCA) 1981 (as amended);
- Countryside and Rights of Way (CROW) Act 2000 (as amended);
- Natural Environment and Rural Communities (NERC) Act 2006 (as amended);
- The Conservation of Habitats and Species Regulations 2010 (as amended) (the Habitats Regulations);
- Protection of Badgers Act 1992 (as amended);
- The Hedgerow Regulations 1997 (as amended);
- Eels (England and Wales) Regulations 2009 (as amended);
- Salmon & Freshwater Fisheries Act 1975 (as amended);
- Animal Welfare Act 2006; and
- The Aquatic Animal Health (England and Wales) Regulations 2009 (as amended).

Planning Policy Context

10.2.3 The overarching National Policy Statement (NPS) for Energy (EN-1) (Department for Energy and Climate Change (DECC), 2011) sets out national policy for energy infrastructure. Part 5.3 relates to biodiversity and states that where development is subject to EIA, the ES should clearly set out the effects on internationally, nationally and locally designated nature conservation sites, on protected species and on habitats and other species identified as being

of principal importance for the conservation of biodiversity. It also requires that the applicant shows how the project has taken advantage of opportunities to conserve and enhance biodiversity. This assessment has taken this into account and is compliant with EN-1.

- 10.2.4 The UK Government has committed to halting the overall decline in biodiversity, and planning requirements in support of this are specified in the National Planning Policy Framework (NPPF) published on 27th March 2012 (Department for Communities and Local Government (DCLG), 2012). The NPPF specifies the obligations that the Local Authorities and the UK Government have regarding statutory designated sites and protected species under UK and international legislation, and how this is to be delivered in the planning system.
- 10.2.5 Local planning policy relevant to ecology and nature conservation is set out in the following documents:
- Selby District Core Strategy Local Plan (Selby District Council, adopted in 2013) - policy SP18 sets out the district's approach to promoting effective stewardship of wildlife by safeguarding international, national and local protected sites for nature conservation from inappropriate development. The policy also sets out the requirement for retaining, protecting and enhancing features of biological interest.
 - Selby District Local Plan (Selby District Council, adopted in 2005) – saved policies ENV9, 11, 12 and 13 set out the district's approach to assessing development proposals that have the potential to harm the wildlife value of local wildlife sites, ancient woodlands, rivers, streams and canal corridors, and ponds.

Other Guidance

- 10.2.6 In July 2012 the UK Post-2010 Biodiversity Framework was published (JNCC and Department for Environment, Food and Rural Affairs (Defra), 2012). This covers the period 2011 - 2020 and forms the UK Government's response to the UN Convention on Biological Diversity held in Nagoya in 2010. This contained five strategic goals ("Aichi" Goals). The Framework recognised that the UK Biodiversity Action Plan should now be delivered through strategies for each of the four countries comprising the United Kingdom and Northern Ireland. In England, this is embodied in "Biodiversity 2020, A strategy for England's wildlife and ecosystem services" (Defra, 2011). These country strategies replace the UK Biodiversity Action Plan (BAP) (JNCC, 1994), with the associated lists of priority habitats and species carried over into the newly defined lists of habitats and species of principal importance for nature conservation in England contained within Section 41 of the NERC Act. This latter list encompasses 56 habitats and 943 species.
- 10.2.7 The Selby BAP, published in 2004 (North Yorkshire County Council, Selby District Council and the Selby BAP Partnership, 2004), identifies priority habitats and species in the District and sets out the actions necessary to conserve these through a series of Habitat Action Plans (HAPs) and Species Action Plans (SAPs). See Appendix 10A (PEI Report Volume III) for further details, and screening of priority habitats and species of potential relevance to the Proposed Development.
- 10.2.8 Standing Advice has been published by Natural England and Defra to guide decision-makers on the determination of proposals with the potential to affect protected sites, species and habitats. The guidance sets out responsibilities and minimum requirements for survey and

mitigation, including the need to engage with objectives for no net loss and provision of net gain.

10.3 Assessment Methodology and Significance Criteria

Impact Assessment and Significance Criteria

10.3.1 The initial EcIA detailed in this chapter has been undertaken in accordance with best practice guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2016). Full details of the approach applied are provided in Appendix 10B (PEI Report Volume III), with an abridged over-view provided below. The aims of the ecology assessment are to:

- identify relevant ecological features (i.e. designated sites, habitats, species or ecosystems) which may be impacted;
- provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant effects of the Proposed Development. Impacts and effects may be beneficial (i.e. positive) or adverse (i.e. negative);
- facilitate scientifically rigorous and transparent determination of the consequences of the Proposed Development in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and
- set out what steps would be taken to adhere to legal requirements relating to the relevant ecological features concerned.

10.3.2 The principal steps involved in the CIEEM approach can be summarised as:

- ecological features that are both present and might be affected by the Proposed Development are identified (both those likely to be present at the time works begin, and for the sake of comparison, those predicted to be present at a set time in the future) through a combination of targeted desk-based study and field survey work to determine the relevant baseline conditions;
- the importance of the identified ecological features is evaluated to place their relative biodiversity and nature conservation value into geographic context, and this is used to define the relevant ecological features that need to be considered further within the EcIA process;
- the changes or perturbations predicted to result as a consequence of the Proposed Development (i.e. the potential impacts), and which could potentially affect relevant ecological features are identified and their nature described. Established best-practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are also described and are taken into account;
- the likely effects (beneficial or adverse) on relevant ecological features are then assessed, and where possible quantified;
- measures to avoid or reduce any predicted significant effects, if possible, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines). If necessary, measures to compensate for effects on features of nature conservation importance are also included;
- any residual effects of the proposed development are reported; and
- scope for ecological enhancement is considered.

- 10.3.3 It is not necessary in the assessment to address all habitats and species with potential to occur in the Study Area, and instead the focus should be on those that are “relevant”. CIEEM (2016) makes clear that is no need to “*carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable*”. This does not mean that efforts should not be made to safeguard wider biodiversity, and requirements for this have been considered. National policy documents emphasise the need to achieve no net loss of biodiversity and enhancement of biodiversity.
- 10.3.4 To support focussed EcIA there is a need to determine the scale at which the relevant ecological features identified through the desk studies and field surveys undertaken for the Proposed Development are of value. The value of each relevant ecological feature has been defined with reference to the geographical level at which it matters. The frames of reference used for this assessment, and based on CIEEM guidance, are:
- International (generally this is within a European context, reflecting the general availability of good data to allow cross-comparison);
 - National (Great Britain, but considering the potential for certain ecological features to be more notable (of higher value) in an England context relative to Great Britain as a whole);
 - Regional (Yorkshire);
 - County (North Yorkshire);
 - District (Selby);
 - Local (has value at the Site level and relevant to considerations of No Net Loss); and
 - Negligible (has a minor value at the Site level but if lost would not conflict with targets for No Net Loss).
- 10.3.5 In line with the CIEEM guidelines the terminology used within the EcIA draws a clear distinction between the terms ‘impact’ and ‘effect’. For the purposes of the EcIA these terms are defined as follows:
- impact – actions resulting in changes to an ecological feature. For example, demolition activities leading to the removal of a building utilised as a bat roost; and
 - effect – outcome resulting from an impact acting upon the conservation status or structure and function of an ecological feature. For example, killing/injury of bats and reducing the availability of breeding habitat as a result of the loss of a bat roost may lead to an adverse effect on the conservation status of the population concerned.
- 10.3.6 When describing potential impacts (and where relevant the resultant effects) consideration is given to the following characteristics likely to influence this:
- beneficial/ adverse - i.e. is the change likely to be in accordance with nature conservation objectives and policy:
 - Beneficial (i.e. positive) - a change that improves the quality of the environment, or halts or slows an existing decline in quality e.g. increasing the extent of a habitat of conservation value;
 - Adverse (i.e. negative) - a change that reduces the quality of the environment. e.g. destruction of habitat or increased noise disturbance.
 - magnitude - the ‘size’, ‘amount’ or ‘intensity’ of an impact - this is described on a quantitative basis where possible;

- spatial extent - the spatial or geographical area or distance over which the impact/effect occurs;
- duration - the time over which an impact is expected to last prior to recovery or replacement of the resource or feature. The likely duration of the impact should be quantified (e.g. 2 weeks duration; 5 to 10 years). Consideration has been given to how this duration relates to relevant ecological characteristics such as a species' lifecycle. However, it is not always appropriate to report the duration of impacts in these terms. The duration of an effect may be longer than the duration of an activity or impact;
- reversibility - i.e. is the impact temporary or permanent. A temporary impact is one from which recovery is possible or for which effective mitigation is both possible and an enforceable. A permanent effect is one from which recovery is either not possible, or cannot be achieved within a reasonable timescale (in the context of the feature being assessed); and
- timing and frequency - i.e. consideration of the point at which the impact occurs in relation to critical life-stages or seasons.

10.3.7 For each ecological feature only those characteristics relevant to understanding the ecological effect and determining the significance are described. The determination of the significance of effects has been made based on the predicted effect on the structure and function, or conservation status, of relevant ecological features, as follows:

- not significant - no effect on structure and function, or conservation status; and
- significant - structure and function, or conservation status is affected.

10.3.8 For significant effects (both adverse and beneficial) this is qualified with reference to the geographic scale at which the effect is significant (e.g. an adverse effect significant at a national level).

10.3.9 The CIEEM approach described in Appendix 10B broadly accords with the EIA methodology described in Chapter 2: Assessment Methodology. However, the matrix has not been used to classify effects as this deviates from CIEEM guidance. In order to provide consistency of terminology in the final assessment, the findings of the CIEEM assessment have been translated into the classification of effects scale used in other chapters of the PEI Report as outlined in Table 10.1.

Table 10.1: Relating CIEEM assessment terms to those used in other PEI Report chapters

Effect classification terminology used in other PEI Report chapters		Equivalent CIEEM assessment
Significant (beneficial)	Major beneficial	Beneficial effect on structure/ function or conservation status at regional, national or international level.
	Moderate beneficial	Beneficial effect on structure/ function or conservation status at County level.
Non-significant	Minor beneficial	Beneficial effect on structure/ function or conservation status at Site or Local level.
Non-significant	Negligible	No effect on structure/ function or conservation status.
Non-significant	Minor adverse	Adverse effect on structure/ function or conservation status at Site or Local level

Effect classification terminology used in other PEI Report chapters		Equivalent CIEEM assessment
Significant (adverse)	Moderate adverse	Adverse effect on structure/ function or conservation status at County level.
	Major adverse	Adverse effect on structure/ function or conservation status at Regional, National or International level

Extent of Study Area

- 10.3.10 The Study Areas used in this assessment were defined with reference to the likely zone of influence over which the Proposed Development may have potential to result in significant effects on relevant ecological features. It is important to recognise that the potential zone of influence of the Proposed Development may vary over time (e.g. the construction zone of influence may differ from the operational zone of influence) and/ or depending on the individual sensitivities of the relevant ecological features.
- 10.3.11 This was taken into account when defining relevant Study Areas, and these are sufficient to address the potential worst case zone of influence of the Proposed Development on the relevant ecological features concerned. The extent of the Study Areas applied during the desk study and field surveys are detailed within Tables 10.2 and 10.3. In many cases, the actual likely zone of influence of the Proposed Development as finally conceived and designed will be much less than the precautionary area taken into account when conducting the original desk studies and field surveys for the Proposed Development.

Sources of Information/Data

- 10.3.12 The ecological baseline has been determined through a combination of desk study and field survey, as summarised below.

Desk Study

- 10.3.13 A desk study was carried out to identify nature conservation designations, protected and notable habitats and species potentially relevant to the Proposed Development. The desk study was carried out using the data sources detailed in Table 10.2 and is reported in detail in the Preliminary Ecological Appraisal (PEA) report in Appendix 10C (PEI Report Volume III).
- 10.3.14 Protected and notable habitats and species include those listed under Schedules 1, 5 and 8 of the WCA; Schedules 2 and 4 of The Habitat Regulations; and species and habitats of principal importance for nature conservation in England listed under Section 41 (S41) of the NERC Act. Other habitats and species have also been considered and assessed on a case by case basis, e.g. those included in national Red Data Books and Lists but not protected by legislation. This is consistent with the requirements of relevant planning policy.
- 10.3.15 Records of non-native controlled weed species, as listed under Schedule 9 of the WCA, were also collated and have been taken into account when assessing the potential ecological effects of the Proposed Development. It would not be appropriate to attribute the same weight to these non-native weed species as has been applied to relevant ecological features when determining the likely significant effects of the Proposed Development, as the presence of such species is generally detrimental for ecology, and conversely the removal of such species would usually be considered desirable and beneficial for ecology. Requirements for control are

also driven by the WCA and related legislation. Therefore, while the weed species concerned are not relevant ecological features for the purposes of EclA, there is still a need to consider them in terms of their potential relevance to delivery of legislative compliance, for their potential to contribute to the amplification of any adverse effects arising from the Proposed Development, or their potential to conflict with objectives for ecological mitigation, compensation and enhancement.

Table 10.2: Desk study area and data sources

Ecological Feature	Study Area	Data Sources	Date Accessed
Statutory nature conservation designations	10 km	Multi-Agency Geographic Information for the Countryside (MAGIC) website. Natural England website	July 2016
Non-statutory nature conservation designations	1 km	North and East Yorkshire Ecological Data Centre (NEYEDC)	August 2016
Protected and notable habitats and species	1 km	NEYEDC	August 2016
Ponds	250 m	1:25,000 Ordnance Survey maps Aerial photographs (Google Earth) MAGIC website	June 2016

Field Surveys

- 10.3.16 The scope of works for necessary habitat and protected species surveys was determined following an initial Phase 1 Habitat survey of the existing coal-fired power station and accessible land within the Proposed Gas Connection and Proposed Cooling Water Connection areas in June 2016, as detailed within Appendix 10C (PEI Report Volume III). This was followed by additional habitat surveys to cover areas not previously accessible and to address the refined Proposed Gas Connection route. The extent of the area surveyed for the Proposed Gas Connection was much larger than the area now included within the Site, as it included the wider Gas Connection Search Areas described in the EIA Scoping Report (an approximately 500 m wide corridor, which has now been narrowed to c. 100 m).
- 10.3.17 The scope of field surveys undertaken to inform the EclA is summarised in Table 10.3 below. Full details of the scope and methodology for each survey are provided in the relevant technical appendices, which are cross referenced in Table 10.3 as appropriate.

Table 10.3: Ecological field surveys completed in 2016

Ecological survey	Technical appendix (PEI Report Volume III)	Study area	Survey date
Phase 1 Habitat	10C	Habitats within 50 m of the Site.	June –

Ecological survey	Technical appendix (PEI Report Volume III)	Study area	Survey date
Survey			November 2016
Badger survey	10D	Suitable habitat for badger within 50 m of the Site.	June - November 2016
Preliminary bat roost assessment (buildings and trees)	10D	All buildings and trees within or directly adjacent to the Site that may be directly impacted (demolition / felling) or indirectly impacted (significant noise / light disturbance) by the Proposed Development. This did not include all buildings and trees within the Site boundary as many of these will not be impacted by the Proposed Development. The majority of operational buildings within the existing coal-fired power station, and associated trees within areas of screening plantation woodland, will be retained and protected during construction.	June – November 2016
Bat activity surveys (transects and automated surveys)	10D	Suitable bat foraging and commuting habitat within the Site that is likely to be impacted by the Proposed Development.	June – September 2016
Otter and water vole survey	10D	Suitable riparian habitat within the Site that will be impacted. Surveys of watercourses extended up to 50 m outside the Site boundary.	September – October 2016
Great crested newt survey (Habitat Suitability Index and eDNA)	10E	All ponds and other potentially suitable water bodies within the Site and within 250 m.	June 2016
Aquatic macro-invertebrate survey	10F	Open water habitats to be directly impacted within the Site (River Aire, Ings and Tetherings Drain, lagoon within the existing coal-fired power station).	November 2016
River corridor survey, including consideration of	10F	River Aire between the existing abstraction and discharge points.	October 2016

Ecological survey	Technical appendix (PEI Report Volume III)	Study area	Survey date
aquatic flora			
Fish survey	10G	Suitable open water habitats to be impacted within the Site (River Aire and lagoon within the existing coal-fired power station).	November 2016

- 10.3.18 No further surveys were considered necessary in order to define the ecological baseline relevant to the Proposed Development. Information and rationale for surveys scoped out is provided in the PEA report provided as Appendix 10C (PEI Report Volume III).

Consultation

- 10.3.19 Consultation was undertaken prior to submission of the EIA Scoping Report, including a meeting with Natural England, and through the formal EIA Scoping stage. A summary of the consultation responses relevant to ecology and nature conservation is provided in Table 10.4.

Table 10.4: Consultation summary table

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
Natural England	5 th August 2016 (meeting)	The Proposed Development is not likely to have a significant effect on any internationally designated sites, due to the distance from the nearest sites and the absence of pathways for any impacts to occur.	Comment only, no response needed.
		Every effort should be made to locate waterbodies within the survey area, and to obtain access for survey. However, if access to any ponds is not possible during the preparation of the ES, or if any additional ponds are subsequently found, then it would be acceptable to append survey results for these to a Statement of Common Ground at a later stage	All water bodies within the Study Area were located and surveyed in 2016
		We would consider bat surveys starting during the summer to be acceptable in this case, and would not consider it essential to carry out surveys earlier in spring. Although some commuting routes during spring transition from hibernation to summer roosts may be missed, these are not likely to be significant as there are other commuting routes available in the local landscape.	Comment only, no response needed.
North Yorkshire County Council (NYCC)	11 th August 2016 (email)	Protected species surveys adequately scoped, and efficient use made of eDNA surveys for great crested newt.	Comment only, no response needed.
		Detailed surveys for grass snake have been scoped out but it should be noted that this species appears to be widespread in farmland south of Selby, so may well be found in association with ponds, ditches and hedgerows in the Proposed Gas Connection areas.	The potential for transitory presence of individual grass snakes has been considered. Precautionary mitigation for grass snake is included in

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
			Section 10.7 to address this.
		Several Sites of Importance for Nature Conservation (SINC) are located in relatively close proximity to the site (e.g. Beal Carrs 3 km to the north-west). Although it is unlikely that any of these will be impacted directly, possible effects should be considered as part of the EIA process.	SINCs within 1 km of the Site have been considered; those further afield have been scoped out of the assessment, as per Section 10.6.
		Impacts of emissions on statutory sites within 10 km and non-statutory sites within 2 km may be an unduly conservative approach given the wide-ranging impacts of Atmospheric Nitrogen Deposition (AND). Natural England estimates that more than 80% of the Special Areas of Conservation (SACs) in England are sensitive to nitrogen and receive levels of AND in excess of the 'Critical Load' for one or more of their protected features. This includes the North York Moors, Strensall and Skipwith Commons, the Humberhead Peatlands and Humber Estuary. Since Eggborough, Drax and Ferrybridge are all downwind of the North York Moors, they may be significant contributors. It is therefore important to provide information on the effects of emissions on sites and habitats in the wider region.	Additional statutory designated sites beyond 10 km have been scoped into the EIA.
		The EIA should consider opportunities for ecological enhancement in accordance with NPPF. Opportunities within the power station site are likely to be very limited and whilst the Aire floodplain is an obvious target, this is now predominantly under arable cultivation. However, the numerous former sand pits in the area east of the	Ecological enhancements proposals are provided in Section 10.7.

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		Eggborough may have significant biodiversity interest. Little ecological information is available (except for the sand pit east of Hensall). Therefore surveys, management plans and funding for practical works could provide a cost-effective, local focus for any ecological enhancement programme.	

10.4 Baseline Conditions

Existing Baseline

- 10.4.1 The ecological baseline relevant to the Proposed Development is summarised below. Full details of the findings of desk and field based studies, including evaluation of the relative nature conservation value of identified ecological features is provided in Appendices 10C – 10H (PEI Report Volume III).

Statutory International Nature Conservation Designations within 10 km

- 10.4.2 The River Derwent Special Area of Conservation (SAC) is located 9.5 km to the east of the Site.

Additional Statutory International Nature Conservation Designations Scoped into Assessment

- 10.4.3 Following comments received on the Scoping Report from NYCC, the Study Area for international nature conservation designations was extended beyond the 10 km search radius commonly applied as the cut-off for relevance to EclA. NYCC considered that the potential for impacts at a greater distance as a result of emissions to air from the new stacks needed to be specifically assessed. The following designations have been scoped into the assessment, as they are located downwind (of the prevailing wind) of the Proposed Development and have qualifying habitats that are sensitive to changes in air quality:

- Skipwith Common SAC – 10.5 km north-east of the Site;
- Thorne Moor SAC – 14 km south-east of the Site;
- Hatfield Moor SAC – 14 km south-east of the Site;
- Humber Estuary SPA/ SAC/ Ramsar/ SSSI – 15 km east of the Site;
- Strensall Common SAC – approximately 35 km north of the Site; and
- North York Moors National Park SAC – 60 km north of the Site.

Statutory National Nature Conservation Designations within 10 km

- 10.4.4 The following Sites of Special Scientific Interest (SSSI) were identified within the Study Area:

- Burr Closes, Selby SSSI – 6 km north of the Site;
- Forlorn Hope Meadow SSSI – 7 km south of the Site;
- Eskamhorn Meadows SSSI – 8 km east of the Site;
- Brockdale SSSI – 8 km south-west of the Site; and
- Went Ings Meadows SSSI – 9 km south-east of the Site.

Non-statutory Nature Conservation Designations within 1 km

- 10.4.5 Two non-statutory designations (Sites of Importance for Nature Conservation (SINC)) of county nature conservation value were identified within the Study Area as follows:

- Selby Canal and Towpath SINC - 300 m north-west of the Site; and
- Burn Disused Airfield SINC – 600 m east of the Site.

Habitats

- 10.4.6 The habitats associated with the Site are summarised below. The full results of the Phase 1 Habitat survey are provided in the PEA report, which also includes a habitat map (see Appendix 10C (PEI Report Volume III)). Information on freshwater habitats is also given in Appendix 10F, which provides supplementary information on the River Aire and Ings and Tetherings Drain.
- 10.4.7 The existing coal-fired power station is dominated by operational buildings, plant, infrastructure and associated hard standing and bare ground areas. Semi-natural habitats include blocks of plantation woodland on screening bunds around the periphery, as well as a large water storage reservoir (lagoon) and a pond to the east of the cooling towers. All of the semi-natural habitats associated with the existing coal-fired power station have established or been created since its construction in the 1960s. The surrounding area predominantly comprises intensively managed arable farmland with species poor hedgerows and drainage ditches along field boundaries.
- 10.4.8 The Proposed Cooling Water Connections cross intensively managed arable farmland and a drainage ditch (Ings and Tetherings Drain) between the existing coal-fired power station and the River Aire to the north.
- 10.4.9 The Proposed Gas Connection passes through an intensively managed arable landscape, characterised by large arable fields bounded by dry ditches. Species poor hedgerows and/or scattered trees occur locally.
- 10.4.10 No protected, rare or notable flora was identified during the surveys and none would be expected given the nature of the predominant habitats present, which comprises intensively managed arable farmland, hardstanding and built infrastructure, and dense landscape plantings of trees and shrubs and associated grassland and ruderal vegetation. None of the habitats associated with the existing coal-fired power station represent relicts of long-standing historic vegetation. Instead all of these habitats are of no more than 40 years age, having been planted or established after construction of the existing coal-fired power station. No notable aquatic plant species were recorded in association with the River Aire or Ings and Tetherings Drain (see Appendix 10F (PEI Report Volume III)).
- 10.4.11 Three invasive non-native plant species listed in Schedule 9 of the WCA 1981 were identified during field surveys. Himalayan balsam (*Impatiens glandulifera*) was found throughout the Site, in association with the River Aire, drains, plantation woodland and areas of bare ground within the existing coal-fired power station. A single stand of giant hogweed (*Heracleum mantegazzianum*) was located on the south bank of the River Aire near the existing cooling water discharge point. Nuttall's waterweed (*Elodea nuttallii*) was found to be abundant within Ings and Tetherings Drain.
- 10.4.12 The following habitats are considered to be of value at a Local level (as defined in Appendix 10B (PEI Report Volume III)) and will be taken forward in the impact assessment.
- semi-natural broad-leaved woodland;
 - plantation woodland (broad-leaved, coniferous and mixed);
 - pond within the existing coal-fired power station (Water body 2);
 - Ings and Tethering Drain;

- the River Aire; and
- hedgerows.

10.4.13 All of the other habitats within the potential zone of influence of the Proposed Development are considered to be of negligible value (as defined in Appendix 10B (PEI Report Volume III)) and therefore they are not relevant ecological features and do not require impact assessment.

Protected and Notable Species

10.4.14 Consideration of protected and notable plant species has been provided above, in the habitats section. The following protected or notable faunal species have been identified as present, or potentially present, within the Site. Full results of targeted species surveys, including the assessment of their relative nature conservation value, are provided in Appendices 10C – 10G (PEI Report Volume III).

- bats;
- great crested newt (*Triturus cristatus*);
- badger (*Meles meles*);
- otter (*Lutra lutra*);
- fish;
- grass snake (*Natrix natrix*); and
- breeding birds.

Bats

10.4.15 High levels of bat foraging activity were found in association with the lagoon (Water body 1) within the existing coal-fired power station. It was estimated that between 10 and 20 individual bats were foraging around the lagoon at any one time during bat activity surveys. The vast majority of activity was by common pipistrelle bats (*Pipistrellus pipistrellus*), but soprano pipistrelle (*Pipistrellus pygmaeus*) was also frequently recorded. Other species recorded very occasionally include noctule (*Nyctalus noctula*), leisler (*Nyctalus leisleri*) and unidentified bats within the *Myotis* genus (*Myotis* sp.). No activity by Daubenton's bat (*Myotis daubentonii*), which specialises in foraging over water, was observed or recorded at the lagoon.

10.4.16 The lagoon appears to be a focal point for bats within the existing coal-fired power station as low levels of foraging activity were recorded in association with all other suitable habitats (mainly plantation woodland).

10.4.17 The buildings that may be affected by the Proposed Development, mostly associated with the existing coal-fired power station, provide no suitable roosting opportunities for bats. Among the trees that will potentially be affected by the Proposed Development, eight were appraised to have low suitability for roosting bats. In accordance with best practice guidance (Collins, 2016), no further surveys were required on these trees to determine roosting status. All other trees to be potentially affected by the Proposed Development were appraised as having negligible suitability for roosting bats, due to an absence of suitable features, such as cavities.

10.4.18 The bat assemblage using the Site is assessed as being of Local nature conservation value (see Appendix 10D, PEI Report Volume III).

Great crested newt

- 10.4.19 Great crested newt is present in one pond (Water body 11) relevant to the Proposed Gas Connection and AGI at the north end of the Site. The great crested newt population within this pond is assessed as being of District nature conservation value (see Appendix 10E, PEI Report Volume III).
- 10.4.20 The pond is located within 250 m of the wide corridor that was being considered for the Proposed Gas Connection at the time of survey (known as the Gas Connection Search Area within the EIA Scoping Report). However, the design of the Proposed Development was subsequently modified to take account of this species (see Section 10.5), and the final location of the Proposed Gas Connection and AGI is now over 300 m from the pond. As explained in Appendix 10E (PEI Report Volume III), great crested newt is unlikely to be a relevant ecological feature at a distance of more than 250 m from the Proposed Development, and adverse effects are unlikely.

Badger

- 10.4.21 Badger setts are present within the plantation woodland on the screening bund to the south of the coal stockyard within the existing coal-fired power station. These are all located within areas of screening woodland that will be retained within the Proposed Development, but within close proximity (within 30 m) of the Proposed Power Plant Site. Badgers within the Site are assessed as being of Local nature conservation value.

Otter

- 10.4.22 Otter spraint (droppings) was found along Ings and Tetherings Drain within the Proposed Gas Connection area, indicating that the drain forms part of an otter territory. Otter are also likely to use the River Aire nearby to the north, although no field signs were found along the river. Within and in proximity to the Proposed Gas Connection area, otter activity is likely to be restricted to foraging only. Otters are unlikely to use habitats in association with or in proximity to the Proposed Gas Connection area for breeding or for refuge as the associated and adjacent river and drain banks are open and lack sufficient cover of trees or scrub to shelter otter. As the surrounding land is under intensive agricultural management there are no other habitats nearby that are suitable for establishment of holts or refuges. Otters typically have large home ranges, in the order of 11 to 18 km of a main river and its associated tributaries, so any activity associated with the Site is likely to be very transitory.
- 10.4.23 Given the Site is only likely to support transitory use by otters, and given it only represents a very small part of the likely extent of the relevant otter territory, the otter presence at the Site is assessed as being of Local nature conservation value.

Fish

- 10.4.24 The River Aire at the existing cooling water abstraction and discharge points was found to support a range of common coarse fish, including roach, perch, gudgeon, pike, three-spined stickleback, tench and bullhead. Dace and flounder were also found at the discharge point, which is within the tidal reach. Fish densities were low at both survey locations on the river.
- 10.4.25 Based on historical data of fish catches along the Aire (near the Site and in the wider area) the following notable species could also be present within the reach affected by the Proposed

Development: European eel, brown trout, Atlantic salmon, allis shad and twait shad. The relevance of these species may increase over time, as a fish pass is currently being installed that will facilitate movement of these species along the River Aire. Therefore, the characteristics of the fish assemblage present has potential to change (improve) over time and this is relevant to the potential impacts of the Proposed Development.

- 10.4.26 Currently, the resident fish populations associated with the Site are considered to be of no more than Local nature conservation value. This is on the basis of the low fish densities recorded, and consideration of the habitats present which are representative of the lower Aire Valley and uniform in character over long distances. Similar fish populations can be expected to occur more widely and beyond the zone of influence of the Proposed Development. Should there be an improvement in the assemblage of migratory fish following installation of the fish pass, as is the long-term objective, then the Site may be considered of functional importance for these species and this would merit application of a higher nature conservation value to the fish assemblage. However, even if such improvements are realised this will likely to take many years to establish. Given this, it would be inappropriate to pre-emptively over-value the fish assemblage present at this time, but this remains a consideration to address in the EclA that follows later in this chapter.
- 10.4.27 The lagoon within the existing coal-fired power station is stocked with coarse fish including rudd, tench, perch, crucian carp and common carp. Common carp is a non-native species and, outside the context of managed fisheries, its presence would be considered detrimental for ecology. Accordingly, this species is not a relevant ecological feature but legal considerations remain. All of the other species recorded are native to Great Britain but all are common and widespread, and none are subject to specific legal protection. Given the stocked origin of these fish, they are considered to be of negligible value and do not require specific impact assessment. Legal requirements remain and are identified later in this chapter.

Grass snake

- 10.4.28 This species has been recorded along Selby Canal within the desk study area and is thought to be widespread in farmland south of Selby, as noted in the NYCC consultation response. There is potential for transitory use of habitats to be impacted by the Proposed Development, such as drains crossed by the Proposed Gas Connection and the banks of the River Aire to be affected by the Proposed Cooling Water Connections. Any grass snakes present are unlikely to be dependent upon habitats within the Site for their survival or for maintenance of the wider local population. Accordingly, any grass snakes present are considered to be of negligible nature conservation value. Legal requirements remain and are identified later in this chapter.

Breeding birds

- 10.4.29 Habitats within the Site, such as river banks, woodland, scrub, grassland and arable farmland, have potential to be used by a range of bird species for nesting and as foraging habitat. No suitable breeding habitat for specially protected (Schedule 1) bird species, such as barn owl (*Tyto alba*) was identified within the Site.
- 10.4.30 The habitats present within the Site are all common in Selby District and are all of relatively recent origin. The limited availability of dead wood, lack of old trees, and relatively uniform structure of the plantations mean they are unlikely to support any notable assemblages of woodland birds. Other habitats, including recently planted hedges and dry ditches, are typical

of arable farmland locally and are not considered to be sufficiently diverse or extensive to support assemblages of importance at more than Site level. On this basis, the breeding bird assemblage associated with the Site is not likely to be of more than Local nature conservation value.

Future Baseline

Construction (2019-2022)

- 10.4.31 The ecological baseline in 2019-2022 is likely to be very similar to the existing baseline, although it is possible that demolition of the existing coal-fired power station will progress before 2019. If demolition progresses this will remove built infrastructure but this is unlikely to result in a substantive increase in semi-nature vegetation in the lead-in period to Construction, particularly if areas of hardstanding are not removed.
- 10.4.32 Habitats within the Site are all managed to a greater or lesser degree and this land management is unlikely to change in the short term. All existing habitats are likely to continue to be present, although some minor changes in habitat extent, composition and structure might occur as a result of ecological succession e.g. the gradual establishment of tree and shrub seedlings, or as a consequence of demolition of the existing coal-fired power station. Even if habitat management ends at demolition, the resultant gradual changes in vegetation structure are unlikely to materially alter the ecological baseline in the lead-in to Construction. Therefore the habitats and species present are very unlikely to undergo significant change prior to 2019.
- 10.4.33 Changes in the distribution of some species would be likely to occur in line with changes in habitats as a result of ecological succession or other natural processes, but over the short term any such changes would be relatively minor.

Operation (2037)

- 10.4.34 Based on available information, there are no grounds to expect that there would have been any marked change in local land management practice and the habitats associated with this at 2037. Habitats such as plantation woodland will be more mature, but are likely to support a broadly similar species assemblage. The nature conservation designations identified within the existing baseline are likely to still be present at 2037.
- 10.4.35 It is possible that after demolition of the existing coal-fired power station, the cleared footprint will be released for new development. The nature of the development would represent a change in land-use, but the built context would be unchanged. Implementation of planning policy may mean that future adjacent developments incorporate features of value for biodiversity, resulting in small to moderate improvements in the future baseline. Any new species and habitats would likely establish in the context of pre-existing Construction activities and disturbances. Accordingly, the influence of Operation on these species will be minimal, and likely less disturbing than Construction.

Decommissioning (2047)

- 10.4.36 The baseline conditions at 2047 are likely to be similar to those at 2037, though habitats such as plantation woodland would have matured further. Should decommissioning have potential to impact adjacent habitats, including those that have matured over the intervening years

since Construction, then there would be potential to disturb local populations of flora and fauna and these may represent constraints to the proposed works that would need to be dealt with in accordance with legal and planning policy relevant at that point in time. However, these are unlikely to prevent the required works, which would be temporary in nature and restricted to the footprint required for decommissioning which would largely be the built footprint of the Proposed Development.

10.5 Development Design and Impact Avoidance

10.5.1 The design process for the Proposed Development has included consideration of ecological constraints and has incorporated, where possible, measures to reduce the potential for adverse ecological effects in accordance with the 'mitigation hierarchy' and relevant planning policy. The measures identified and adopted include those that are inherent to the design of the Proposed Development, and those that can realistically be expected to be applied as part of construction environmental best practice, or as a result of legislative requirements.

10.5.2 The development design and impact avoidance and reduction measures that have been, or will be, adopted include:

- recognition that the design of the Proposed Development needs to deliver compliance with industry good practice and environmental protection legislation during both construction and operation e.g. prevention of surface and ground water pollution, fugitive dust management, noise prevention or amelioration. Potential for environmental pollution has been scoped out of the impact assessment because of the need to comply with relevant legislation that prohibits this;
- in support of the above, a commitment to prepare and agree a Construction Environmental Management Plan (CEMP) detailing all requirements for environmental protection and legal compliance. The CEMP will be secured through a requirement on the DCO;
- measures to comply with relevant legislation regarding fish welfare will be implemented prior to and during the draw-down of the lagoon, as well as during any necessary de-watering operations in the River Aire, during Construction. Health checks will be completed on fish in the lagoon, where necessary, and an appropriate receptor site will be sourced, subject to satisfactory health of the fish.
- fish screens will be installed on the new cooling water intake to prevent entrainment and comply with the Eels (England and Wales) Regulations 2009 and other relevant legislation;
- the Proposed Power Plant will be constructed largely within existing areas of bare ground/hard standing within operational areas of the existing coal-fired power station, thus minimising requirements for land take from semi-natural habitats of potential ecological value. Accordingly, the pond immediately to the east of the cooling towers (Water body 2) will be retained and requirements for loss of plantation woodland have been minimised;
- potential for disturbance of habitats and species associated with the River Aire has been reduced through a commitment to use directional drilling to allow the Proposed Gas Connection to cross beneath the river. Impacts to the river cannot be avoided during works associated with the Proposed Cooling Water Connections, but the new structures would coincide with the location of the existing abstraction and discharge structures reducing requirements for new land take and therefore the magnitude of the potential impact;
- the Proposed Gas Connection route will seek to avoid habitat boundary features, such as hedgerows and trees, wherever possible. Where the construction corridor affects

hedgerows or trees, their removal will be minimised as far as possible. Retained hedgerows and trees will be protected by clearly defined root protection areas to prevent damage/ compaction of roots by plant and other machinery. Any sections of hedgerow that must be removed will be replanted upon completion of construction works;

- precautionary working methods to avoid accidental killing or injury of grass snakes will be implemented during construction of the Proposed Gas Connection and Proposed Cooling Water Connections. These include initial clearance of potentially suitable vegetation down to a height of 30 cm, followed by dismantling of any suitable features, such as log piles, tree stumps) under ecological supervision. Vegetation will be cleared to ground level once no risk of grass snake presence remains. Vegetation within working areas will be kept short during construction to discourage grass snakes from entering the Site. A Precautionary Working Method Statement will be produced to guide the process;
- to ensure legislative compliance in relation to nesting birds, all clearance of suitable vegetation during site preparation will be undertaken outside the breeding season (typically March-August inclusive for most species), where possible. In situations where this is not possible, an ecologist would check the working area for nests before works commence. If nests were discovered, appropriate mitigation would be implemented to ensure that they are not disturbed or destroyed before any works can commence in that area. This would include imposing exclusion zones between the works and nest(s) and suspending vegetation clearance works within the area until any young had fledged.
- all habitats subject to temporary disturbance for the Proposed Development will be appropriately reinstated, and given the affected habitat is primarily arable farmland this can be delivered with certainty of success; and
- following the identification of a great crested newt pond within 250 m of Gas Connection Search Areas identified at the EIA Scoping stage, the location of the Above Ground Installation (AGI) at the northern end of the Proposed Gas Connection was moved further from the pond to provide increased confidence that there will be no adverse impact on great crested newt. The proposed location of the AGI is now over 300 m from the great crested newt pond, and therefore outside the 250 m distance within which an adverse effect on nature conservation status is likely based on Natural England guidance (Natural England, 2016).

10.6 Likely Impacts and Effects

- 10.6.1 This section describes the impacts and potential effects of the Proposed Development on relevant ecological features in the absence of any mitigation over and above that which is inherent to the design (as described in Section 10.5 above).
- 10.6.2 Relevant ecological features are those that are considered to be important, and have the potential to be affected by the Proposed Development (CIEEM, 2016). An initial screening of potential impacts and effects is provided below as Table 10.5, to set the requirements for the more detailed impact assessment that follows.

Table 10.5: Determination of relevant ecological features

Ecological feature	Value	Potential impacts / effects
International nature conservation	International	There is no reasonable likelihood of impacts during the construction phase (see Chapter 8: Air Quality).

Ecological feature	Value	Potential impacts / effects
designations		Potential adverse effects on interest features as a result of increased nitrogen and acid deposition from emissions to air during operation.
National nature conservation designations	National	There is no reasonable likelihood of impacts during the construction phase (see Chapter 8: Air Quality). Potential adverse effects on interest features as a result of increased nitrogen and acid deposition from emissions to air during operation.
Non-statutory nature conservation designations	County	With the implementation of standard environmental protection measures during construction, such as dust suppression and pollution prevention, there are no likely pathways by which the Proposed Development could adversely affect SINC's within or beyond the Study Area. There are no pathways which could result in operational effects. No further consideration is given to non-statutory nature conservation designations.
Semi-natural broad-leaved woodland	Local	Construction effects are unlikely. There is a single, small broad-leaved woodland copse (0.1 ha) adjacent to a proposed access track for the Proposed Gas Connection. Tree protection measures would be implemented in accordance with British Standard 5837:2012 Trees in relation to design, demolition and construction. Therefore there are no pathways for impact. There are no pathways which could result in operational effects. No further consideration is given to this habitat.
Plantation woodland	Local	Approximately 2 ha of semi-mature plantation woodland will be cleared to facilitate construction of the Proposed Power Plant and accommodate the Proposed Construction Laydown. There would be no adverse effects from operation, but landscaping implemented at the end of construction will mature and start to compensate for the loss of plantation at construction.
Pond (Water body 2)	Local	The pond within the existing coal-fired power station, located to the east of the cooling towers, together with its surrounding terrestrial habitat, will be retained during the Proposed Development. No further consideration is therefore given to this habitat.
River Aire	Local	Works associated with construction of the Proposed Cooling Water Connections will impact on the river and its banks. This may result in unavoidable release of sediments into the

Ecological feature	Value	Potential impacts / effects
		<p>river. Cofferdams may be needed to lower water levels in works areas, resulting in temporary impacts to channel form and function. There is potential for Schedule 9 weed species to be encountered and spread during bank works.</p> <p>The Proposed Gas Connection will not directly affect the river as the gas pipeline will be routed beneath the river channel by directional drilling.</p> <p>There would be no effects on the river from operation.</p>
Ings and Tetherings Drain	Local	<p>Works associated with construction of the Proposed Cooling Water Connections and the Proposed Gas Connection will impact on the drain and its banks at the crossing point. The works will involve a "cut and fill" approach, resulting in temporary ground and habitat disturbance. There is potential for Schedule 9 weed species to be encountered and spread during these works.</p> <p>There would be no effects on the drain from operation.</p>
Hedgerows	Local	<p>The route of the Proposed Gas Connection avoids hedgerows wherever possible. However, construction will require severance of up to two species poor hedgerows along the route to accommodate the construction corridor. Habitats would be reinstated on completion of works.</p> <p>There would be no effects on the hedgerows during operation.</p>
Bats	Local	<p>Loss of bat foraging habitat during construction as a result of the loss of the lagoon and 2 ha of plantation woodland.</p> <p>Temporary lighting during construction and permanent lighting during operation may disturb bats foraging within and adjacent to the Site and reduce the quality of foraging habitat.</p>
Great crested newt	District	<p>No likely adverse impacts from construction or operation due to sensitive siting of the Proposed Gas Connection as detailed in Section 10.5.</p>
Badger	Local	<p>There are three badger setts within the Site and all may be indirectly disturbed during construction of the Proposed Power Plant. This also represents a potential conflict with the requirements of the Protection of Badgers Act 1992.</p> <p>Operation would need to deliver legislative compliance so effects on badger are unlikely. Badger is known to use land within the existing coal-fired power station, so operation is not incompatible with badger presence.</p>
Otter	Local	<p>Construction of the Proposed Gas Connection and Proposed Cooling Water Connections might have a temporary disturbance impact on otter foraging and habitat use,</p>

Ecological feature	Value	Potential impacts / effects
		resulting in short-term exclusion from small areas of watercourse habitat.
Fish	Local	<p>No likely adverse impacts on fish as the Proposed Development would apply the impact avoidance measures outlined in Section 10.5 to deliver legislative compliance. This addresses fish welfare risks associated with:</p> <ul style="list-style-type: none"> • in-channel works in the River Aire associated with construction of the Proposed Cooling Water Connections; • requirements for rescue and rehoming of stocked fish necessitated by draw-down and infilling of the man-made lagoon; • operation of the cooling water abstraction on the River Aire. <p>In addition, no adverse impacts on fish spawning habitats within the River Aire are anticipated. The aquatic macro-invertebrate community (see Appendix 10F, PEI Report Volume III) along this section of the river is characteristic of silted river reaches, and therefore the fish assemblage will also be representative of such conditions. Even should there be minor releases of silts into the river during bank works for the Proposed Cooling Water Connections this would be unlikely to impact the quality of river bed substrates for fish along the affected reach.</p>
Grass snake	Local	There would be no impact on grass snake as the Proposed Development would apply the impact avoidance measures outlined in Section 10.5 to deliver legislative compliance. This addresses the potential for injury of grass snake during construction works for the Proposed Gas Connection and Proposed Cooling Water Connections.
Nesting birds	Local	There would be no impact on breeding birds as the Proposed Development would apply the impact avoidance measures outlined in Section 10.5 to deliver legislative compliance. This addresses the potential for impacts on birds and their nests from vegetation clearance and earth works during construction of the Proposed Development.

Construction

Impacts and Effects on Plantation Woodland

- 10.6.3 Approximately 2 ha of semi-mature plantation woodland would be cleared to allow construction of the Proposed Power Plant and to accommodate the Proposed Construction Laydown. This will include approximately 1.5 ha of broad-leaved plantation dominated by non-native tree species, and approximately 0.5 ha of non-native conifer plantation. The plantations are 30 to 40 years old, having been planted in the 1970's as part of landscaping works for the

existing coal-fired power station. The age and composition of the plantations mean that they could be readily substituted or replaced with habitats of greater ecological value. Plantation woodland of this age and composition is not of high nature conservation interest on its own merits. Instead its ecological value relates to the habitat that it provides for wildlife of local nature conservation value (foraging bats and badger, and nesting birds).

- 10.6.4 When viewed in the context of the wider extent of plantation woodland resource across the existing coal-fired power station, the proposed loss of plantation would be unlikely to impact the structure or function of the wider plantation woodland resource for wildlife. Currently, there is approximately 14 ha of plantation woodland within the existing coal-fired power station; the proposed removal of 2 ha represents a relatively small proportion (15%) of this. Furthermore, the plantation to be removed is not particularly functionally important within the context of the wider extent of plantation to be retained as it does not connect areas of woodland, or other habitats, and therefore there will be no habitat severance as a result of its removal.
- 10.6.5 No adverse effect on the structure/ function or conservation status of the wider resource of plantation woodland of local nature conservation value is predicted. The predicted permanent effect is therefore negligible adverse and not significant.

Impacts and Effects on River Aire

- 10.6.6 Works associated with the Proposed Cooling Water Connections will impact on the river and its southern bank. The north bank of the river would remain unimpacted. Existing structures will be replaced and there will be associated bank disturbances requiring additional temporary and permanent land take of adjacent species-poor grassland and ruderal vegetation. Cofferdams will be used to temporarily lower water levels in works areas, resulting in localised impacts on channel form and function through diversion of flows around the dam and exposure of sediments within the dam. In a river of this type, which has a relatively uniform morphology and modified un-natural channel and bank profiles, the consequence of such localised impacts are likely to be trivial and of short duration. Typical habitats and processes would reasonably be expected to re-establish quickly following restoration of flows and river banks.
- 10.6.7 Any very small new losses of river bank vegetation, even if not replaced, would have no impact on the structure and function of the river corridor for wildlife. None of the vegetation present is rare or specifically notable. Accordingly, there is also no conflict relevant local planning policy.
- 10.6.8 There is potential for seeds of giant hogweed to be disturbed and transferred to new sites as a result of construction activities. Transfer could be direct e.g. on vehicles and machinery, or indirect through release of soils containing seeds into the river which would transmit them downstream. This is primarily a matter for legal compliance, with the spread of the species being an offence. Any ecological consequences, while undesirable, would be unlikely to alter habitat structure and function. Giant hogweed would not materially exclude native vegetation or species.
- 10.6.9 No adverse effect on the structure/ function or conservation status of a section of the River Aire of local nature conservation value is predicted. The predicted temporary effect is therefore negligible adverse and not significant.

Impacts and Effects on Ings and Tetherings Drain

- 10.6.10 Works associated with the Proposed Cooling Water Connections and Proposed Gas Connection will impact on the drain and its banks, as open-cut techniques will be used when crossing the drain. Bank and channel substrates within the works area will be excavated, stored, and then reinstated on completion of works. Bank and channel vegetation will re-establish, probably within a maximum of 12 months. Therefore the required works are localised in extent, of short duration, and any resultant effect would be temporary.
- 10.6.11 The affected section of drain is representative of the wider Ings and Tetherings Drain, and the habitats and vegetation present is not of specific note. The proposed works are broadly comparable with routine drain maintenance works undertaken by the Internal Drainage Board, which involve periodic dredging and removal of channel substrates and associated bank and channel vegetation. In the case of the proposed works, the substrates will be excavated to greater depth, but the potential ecological consequences would be comparable to the existing baseline.
- 10.6.12 There is potential for propagules of Nuttall's waterweed to be transferred to new sites on construction vehicles and machinery. This is primarily a matter for legal compliance, with the spread of the species being an offence. Any ecological consequences are unlikely as this species is already very widespread and can be encountered in most watercourses. Nuttall's waterweed is abundant in Ings and Tetherings Drain, so even if construction results in downstream dispersal this would not constitute spread, as the species is already present. Given this species is already widespread and abundant there is no reasonable likelihood of dispersal materially impacting habitat structure/ function or conservation status. Legal requirements necessitate the application of measures to reduce the risk of spread, and with such measures impacts adverse effects are unlikely.
- 10.6.13 No adverse effect on the structure/ function or conservation status of a section of Ings and Tetherings Drain of local nature conservation value is predicted. The predicted temporary effect is therefore negligible adverse and not significant.

Impacts and Effects on Hedgerows

- 10.6.14 The Proposed Gas Connection route crosses two species-poor hedgerows and removal of sections of hedgerow may be required within the construction corridor, which will be 36 m wide. The total length of hedgerow to be affected will therefore be up to 72 m. However, the hedgerows that may be affected are not well maintained and contain frequent gaps. While the required works would result in hedgerow severance, this would be in the context of hedgerows that are already fragmented. Therefore, while increased habitat fragmentation is ecologically undesirable it is unlikely to substantively change the baseline integrity of these hedgerows.
- 10.6.15 Impact avoidance measures would be used to minimise requirements for hedgerow loss i.e. micro-siting towards existing gaps where possible. Wider impacts are not anticipated as the Proposed Development would need to comply with *British Standard 5837:2012 Trees in relation to design, demolition and construction*. There is a commitment to reinstate habitats subject to temporary disturbances, including hedgerows. Reinstatement could potentially be used to increase species-richness and this would be ecologically beneficial at the local level.

- 10.6.16 No adverse effect on the structure/ function or conservation status of two fragmented hedgerows of local nature conservation value is predicted. The predicted temporary effect is therefore negligible adverse and not significant.

Impacts and Effects on Bats

The Proposed Development is considered unlikely to result in an adverse effect on the conservation status of bat populations of local nature conservation value. The predicted temporary effect is therefore negligible adverse and not significant.

The rationale behind this assessment is presented below with reference to potential impacts that may arise from habitat loss, and reduction in habitat quality from light spill and glare.

Removal of Foraging Habitat

- 10.6.17 Construction of the Proposed Development will require the removal of the lagoon and associated coniferous plantation woodland within the Proposed Construction Laydown area. This habitat was found to support relatively high levels of foraging activity, predominantly by a moderate number of common pipistrelle bats, in a local context.
- 10.6.18 The attractant value of the lagoon for bats is considered in large part a function of the sheltered environment created by the surrounding plantation woodland. The sheltered conditions provide an optimal microclimate for flying invertebrates, which in turn attract and are exploited by foraging bats. This makes the lagoon a focal point for bats within the existing coal-fired power station as low levels of foraging activity were recorded in association with all other habitats. In isolation, and as evidenced by the data for the wider survey area, neither habitat would be likely to support the level of common pipistrelle bat activity recorded.
- 10.6.19 No activity by bats species dependent on open water for foraging (i.e. Daubenton's bat) was recorded either during transect surveys or static monitoring of the lagoon area. Therefore there will be no habitat loss for bats that are dependent on foraging habitats associated with open water for the maintenance of their population. This reduces the likely significance of the habitat loss for the local bat population and needs to be taken into account when assessing the potential consequences of the habitat loss.
- 10.6.20 A further 1.5 ha of broad-leaved plantation, dominated by non-native trees species, will be removed within the Proposed Power Plant Site. This habitat was found to support low levels of bat activity, predominantly by small numbers of common pipistrelle bats.
- 10.6.21 Common pipistrelle is a widespread and common species, and there is evidence that its population is increasing nationally. Therefore its current nature conservation status is favourable, and the localised habitat loss from the Proposed Development is not reasonably expected to have a meaningful effect on the local status or distribution of common pipistrelle. There will be no loss in wider habitat connectivity and accessibility to bats as a result of the localised habitat losses to the Proposed Development. The majority of the screening woodland around the power station will be retained and there will remain an abundance of suitable foraging habitat in the wider local area that will provide alternative foraging habitat for bats displaced from the Proposed Development site.

- 10.6.22 Habitat loss for the Proposed Development is considered unlikely to have an adverse effect on the conservation status of common pipistrelle bats, or any other bat species, of local nature conservation value.

Disturbance to Foraging Bats

- 10.6.23 Construction will commence after vegetation clearance works are complete, at which point there will be no habitats of likely specific attractant to bats within the construction footprint. However, bats will continue to use adjacent retained habitats for foraging and there will be potential for indirect adverse impacts on bat habitat use and habitat quality.
- 10.6.24 Construction lighting has the potential to disrupt bat foraging activity through light spill and glare if this falls onto habitats of value to bats. However, the baseline conditions of the existing coal-fired power station include existing lighting and the bat population is using the site despite this pre-existing lighting disturbance. The majority of areas within the existing coal-fired power station to be affected by construction of the Proposed Development are currently subject to light disturbance, including tall floodlighting columns around the coal stockyard area. Common pipistrelle bat, the main species using the site, is known to be a light tolerant species, and this was demonstrated during the surveys. In this context, any additional temporary lighting of the Proposed Development will not reasonably be considered to substantively change the existing nocturnal environment in the vicinity of the existing coal-fired power station.
- 10.6.25 The screening woodland around the coal stockyards will be retained, and this will screen habitats that may be used by foraging bats to the east and south of the Proposed Development.
- 10.6.26 Lighting associated with the Proposed Development is unlikely to have an adverse effect on the conservation status of bat populations of local nature conservation value.

Impacts and Effects on Badger

- 10.6.27 There are badger setts within close proximity (within 30 m) of the Proposed Power Plant Site, within the plantation woodland on the adjacent screening bund. This woodland will be retained within the Proposed Development and because the setts are elevated on the screening bunds, their tunnels will not extend into the area to be affected by construction of the Proposed Power Plant. Therefore, the setts will not be directly impacted by the Proposed Development.
- 10.6.28 However, due to their close proximity to the Proposed Power Plant Site, there is potential for indirect disturbance and/or damage to the setts during construction works. Vibration during piling may indirectly impact sett stability, and noise and vibration may disturb badgers occupying the sett. However as the setts present are all of types that are peripheral and supplementary to an off-site main sett, this reduces the potential consequences of any disturbing activities. Setts of the types present will be used less regularly and to a lesser extent than a main sett. Badgers would be able to retreat to the main sett during periods off disturbance, and would also have the option of digging new annex setts elsewhere within the existing coal-fired power station away from construction works. The long-term suitability of the Site for badger would remain.

- 10.6.29 The Proposed Development would be unlikely to result in an adverse effect on the conservation status of a badger clan of local nature conservation value. The predicted temporary effect is therefore negligible adverse and not significant.
- 10.6.30 It is acknowledged that while there would be no adverse effect on the conservation status of badger, this does not mean that the Proposed Development has no potential to result in legal offences. Mitigation would still be needed to deliver compliance with the Protection of Badgers Act 1992.

Impacts and Effects on Otter

- 10.6.31 Construction works associated with the intake and outfalls of the Proposed Cooling Water Connections have the potential to affect river and riparian habitats of value to otter for foraging and movement. However, in the context of a typical otter territory size of 11 to 18 km of main river plus connected tributaries, any habitat impact will be very small and localised.
- 10.6.32 The surveys undertaken for the Proposed Development have identified no high risk habitats suitable for otter holts or refuges, so habitat use in the vicinity of the Site will be largely transitory in nature. The required construction works will not obstruct the river, and will only affect localised stretches of the southern bank, so there will be no impact on the ability of otter to use the river as a movement corridor.
- 10.6.33 Disturbance of otters using the river is unlikely, as this species is largely nocturnal so will be active outside construction hours, so the construction works will not restrict otter movement or prevent them from accessing favoured foraging areas. Even if there was a minor deterrent effect from the construction works on otter, this would likely be of short duration, localised and temporary, and therefore would not impact the favourable conservation status of the species or the individual otters concerned.
- 10.6.34 The Proposed Development would be unlikely to result in an adverse effect on the conservation status of otter of local nature conservation value. The predicted temporary effect is therefore negligible adverse and not significant.

Operation

Impacts and Effects on Statutory Nature Conservation Designations

- 10.6.35 Chapter 8: Air Quality assesses potential effects on the identified statutory nature conservation designations. The impact of process emissions from the operational phase on ecological features has been assessed through comparison of the maximum predicted process contributions, at any of the identified sensitive habitat features. The Critical Levels used as the basis for assessment are derived from the Air Pollution Information System (APIS) database with respect to each designated site.
- 10.6.36 For the operational phase, the annual average NO_x and nutrient nitrogen deposition from process contributions are expected to be less than 1% of the Critical Load / Level for all relevant designations. The above changes to nutrient and emission deposition levels at all ecological features are predicted to result in very minor magnitude changes to the concentrations and acidity of the most sensitive receptors. For the most part they represent <=1% additional emissions which do not threaten to exceed CLPVE.

- 10.6.37 In assessing potential consequence for air quality, the planned closure of the existing coal-fired power station should be emphasised. This will result in a beneficial lowering of the emissions to air relative to the existing baseline. It is not expected that the Proposed Development would come on line before the existing coal-fired power station has ceased operation. Emissions to air from the Proposed Development would be less than those of the existing coal-fired power station, meaning that at worst the Proposed Development can be considered neutral to the existing air quality baseline, and in all likelihood would represent an improvement on the existing air quality baseline conditions.
- 10.6.38 No adverse effect on the conservation status of statutory nature conservation designations of national and international nature conservation value is predicted. The predicted permanent effect is therefore negligible adverse and not significant.

Impacts and Effects on Foraging Bats

- 10.6.39 Lighting disturbance during the operational phase of the Proposed Development has the potential to disrupt bat foraging activity. While the operational Site will represent poor habitat for bats, there will be potential for an impact on habitats outside the immediate footprint of the Proposed Development that may be of higher value to foraging bats.
- 10.6.40 Any lighting disturbance must be considered in context with the current lit environment within the existing coal-fired power station. The existing coal-fired power station is currently lit 24 hours a day, including the Proposed Power Plant Site (currently the coal stockyard), and therefore bats foraging in habitats outside the existing coal-fired power station footprint, but within close proximity, are present in the context of this current lighting regime. The baseline bat surveys indicated that usage within the power station site but outside the lagoon area was low. Further, any additional lighting in the Proposed Power Plant Site will not result in any substantive changes to the lighting regime in this area, and the installation of newer more efficient lighting columns will reasonably be expected to further minimise light spillages outside the Site.
- 10.6.41 The screening woodland around the coal stockyards will be retained, and therefore this will provide visual screening of new permanent lighting from habitats that may be used by foraging bats to the east and south of the Proposed Power Plant site.
- 10.6.42 Operational lighting of the Proposed Development is unlikely to result in an adverse effect on the conservation status of bat populations of local nature conservation value. The predicted permanent effect is therefore negligible adverse and not significant.

Decommissioning

- 10.6.43 Given that decommissioning activity is unlikely to take place within a timeframe that can be reasonably assessed by this EclA, it will be inappropriate to comment on this phase in detail. The ecology of the Site has the potential to change in the time period leading up to decommissioning, although this will be constrained to a large extent by the industrial context of the existing coal-fired power station site.
- 10.6.44 Decommissioning works will be undertaken in accordance with the requirements of an approved Decommissioning Method Statement, which will be agreed at a relevant point in time prior to Decommissioning. This will address all relevant ecological features present at the

time of these works, and will be prepared to ensure compliance with the legislation and planning policy relevant at that point in time.

- 10.6.45 Ecological effects of decommissioning are likely to be less significant than those during construction due to the presence of existing hardstanding and road networks which can be used as works areas. No adverse effects on the structure/ function and/ or conservation status of relevant ecological features is likely. Therefore the potential effects would be negligible adverse and not significant.

10.7 Mitigation and Enhancement Measures

- 10.7.1 In this section, mitigation measures are identified to address significant effects on ecology (i.e. major or moderate adverse effects) or otherwise to address specific protection afforded to relevant protected species. In addition, a summary of proposals for ecological enhancement is provided. A Landscape and Biodiversity Strategy will also be prepared to support the DCO application.

Construction

- 10.7.2 No significant adverse effects are predicted so there is no requirement for specific mitigation. However, good practice precautionary mitigation measures are still required on the grounds of animal welfare or to ensure works are undertaken in a manner that provides certainty of compliance with relevant legislation. These requirements are summarised below and will be specified in detail later as a standalone Ecological Mitigation and Enhancement Plan, with relevant requirements carried into the CEMP also.

General Animal Welfare during Construction

- 10.7.3 Construction excavations have potential to trap wildlife and may result in offences under animal welfare legislation. This will be avoided through implementation of simple precautionary mitigation. All excavations deeper than 1m will be covered overnight, or where this is not practicable a means of escape will be fitted e.g. battered soil slope or scaffold plank, to provide an escape route should any animals (e.g. badger, otter, hedgehog) stray into the construction site and fall into an excavation.

Great Crested Newt

- 10.7.4 A Precautionary Working Method Statement (PWMS) for great crested newt will be implemented during works associated with construction of the Proposed Gas Connection and AGI within 300 m of Water body 11, the only pond supporting this species. The PWMS is required to address the low residual risk of great crested newt being injured or disturbed during construction, although the potential for injury or disturbance is low and an offence is unlikely. Measures will include a pre-construction walkover by an ecologist prior to commencement of vegetation clearance and tool box talks for construction personnel. The preparation of a PWMS for great crested newts is considered sufficient to ensure compliance with the WCA and Habitats Regulations. Accordingly, there is no legal requirement for the Proposed Development to apply for a European Protected Species Mitigation Licence.

Badger

- 10.7.5 Measures to minimise disturbance of badger setts will be implemented during construction of the Proposed Power Plant. Protection zones will be established around any identified setts where possible, within which no construction traffic or works will be permitted. Where works with the potential to disturb a sett cannot be avoided, a badger development licence will be obtained from Natural England to comply with legislative requirements; this will include additional mitigation and compensation measures necessary to minimise the impact on badgers. An updated badger survey will be undertaken in advance of the commencement of construction to confirm whether any active badger setts are present and their current locations.

Water Vole

- 10.7.6 Although no water voles were identified on the stretches of ditch and River Aire to be directly impacted by the Proposed Gas Connection, this species is known to be widespread in this part of Yorkshire and may be present in the wider local area. Given the time between the granting of the DCO and the commencement of construction, the status of these ditches in respect of the presence/ absence of water vole may change. A precautionary pre-construction check for water voles will therefore be undertaken of the sections of ditch to be directly impacted. Should the presence of water voles be confirmed, a development licence would be obtained from Natural England and an appropriate mitigation strategy implemented for the temporary impacts on water vole habitat.

Fish

- 10.7.7 In order to comply with legislation protecting fish, the lagoon would not be drawn down and infilled until all fish have been captured and removed in accordance with legal requirements. This carries with it a number of specific requirements for animal welfare, licensing, fish health checks, and agreement of what to do with the removed fish. A Fish Management Plan will be prepared prior to the lagoon being drained and agreed with relevant stakeholders.
- 10.7.8 The Fish Management Plan will also identify working requirements during construction of the Proposed Cooling Water Connections, to protect the welfare of fish in the works area. Mitigation requirements will be less complex for these works, as there is not requirement to remove and relocate fish. Any fish trapped behind coffer dams would be returned to the main channel of the river.

Invasive Non-Native Plants

- 10.7.9 An invasive species management plan (ISMP) will be prepared to set out the measures that will be necessary during construction to prevent the spread of the invasive plants identified within the Site. This will include measures to address giant hogweed, Nuttall's waterweed and Himalayan balsam. A repeat survey will be made prior to Construction to determine the current location and extent of invasive plant stands.

Operation

- 10.7.10 No significant operational effects are predicted so there is no requirement for mitigation.

Decommissioning

- 10.7.11 There are no significant effects anticipated as a result of the decommissioning phase of the Proposed Development. Any necessary mitigation requirements would be determined and agreed at a future date prior to decommissioning. The Applicant will provide a Decommissioning Environmental Management Plan, prior to the commencement of decommissioning works. An ecological walkover will be undertaken to inform the development of the working method statement, to update the baseline ecology conditions. Necessary ecological mitigation would be detailed in the method statement.

Biodiversity Enhancement

- 10.7.12 A Landscape and Biodiversity Strategy will be prepared to support the DCO application, including setting out biodiversity enhancement and management prescriptions. This will include the provision of native trees and shrubs as part of the landscaping scheme and gapping up of hedgerows as part of works for the Proposed Gas Connection, and the management of retained areas of plantation woodland for the benefit of biodiversity. Woodland management will include measures such as planting of native understorey and ground flora, selective thinning of exotic trees and the creation of habitat piles with the arisings, and provision of wildlife features such as bird and bat boxes.

Limitations or Difficulties

- 10.7.13 There are no limitations to this EcIA. Baseline conditions and relevant ecological features have been determined using appropriate methods. Sufficient data has been collected to allow identification and assessment of the likely impacts and effects of the Proposed Development on ecology.

10.8 Residual Effects and Conclusions

- 10.8.1 The residual effects are those that will remain after the implementation of mitigation measures. As no significant adverse effects have been predicted in relation to the construction, operation or decommissioning phases, requirements for mitigation are minimal and relate primarily to requirements to comply with good practice and relevant legislation. Accordingly, no significant residual effects on ecological features are predicted.

10.9 References

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11.0 WATER RESOURCES, FLOOD RISK AND DRAINAGE

11.1 Introduction

- 11.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential effects of the proposed Combined Cycle Gas Turbine (CCGT) power station near Eggborough, North Yorkshire (hereafter referred to as the 'Proposed Development') on water resources, flood risk and drainage. It identifies key water resources and sensitivities and highlights potential direct and indirect impacts on them from the Proposed Development.
- 11.1.2 This chapter is supported by Figure 11.1 provided in PEI Report Volume II, and Appendix 11A (Flood Risk Assessment, including an Outline Drainage Strategy as Annex 5 (FRA)) provided in PEI Report Volume III.
- 11.1.3 The FRA details the existing levels of flood risk associated with the Site and the surrounding area, quantifies the volume of surface water on the Site and requiring management, identifies the impacts the Proposed Development will have upon these aspects, and suggests potential mitigation measures to reduce the impact and manage the risk.
- 11.1.4 The Outline Drainage Strategy for the Proposed Development (see Appendix 11A in PEI Report Volume 3) provides guidance and information with regards to the effective and safe drainage of surface water for the Site. The final drainage design will be completed as part of the detailed design stage.
- 11.1.5 It should be noted that some of the potential impacts and effects relating to the hydrogeology underlying the Proposed Development are also addressed within Chapter 12: Geology, Hydrogeology and Land Contamination of this PEI Report due to the considerable overlap between the two subject areas. Flood risk issues are also addressed in Chapter 18: Sustainability and Climate Change and waterbodies (as ecological habitats) are considered in Chapter 10: Ecology and Nature Conservation.

11.2 Legislation and Planning Policy Context

European Legislation

- 11.2.6 The European Union (EU) Water Framework Directive (WFD) (2000/60/EC) (Commission of the European Communities, 2000) is the primary European Directive setting the context for the requirements of this chapter. The purpose of the Directive is to establish a framework for the protection and improvement of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater.
- 11.2.7 The Directive requires the UK to classify the current condition of key waterbodies (giving a 'Status' or 'Potential') and to set objectives to either maintain the condition, or improve it where a waterbody is failing minimum targets. Any activities or developments that could cause deterioration within a nearby waterbody, or prevent the future ability of a waterbody to reach its target Status, must be mitigated so as to reduce the potential for harm and allow the aims of the WFD to be realised.

National Legislation

- 11.2.8 The Water Resources Act 1991 (as amended) sets out the relevant regulatory controls that provide protection to waterbodies and water resources (from abstraction pressures and pollution).
- 11.2.9 Other relevant national legislation which set out requirements related to control and protection of water resources and flood risk management includes:
- The Flood and Water Management Act 2010 (FWMA) – see paragraph 11.2.11 below;
 - The Water Act 2003 and 2014 governing the control of water abstraction, discharge to water bodies, water impoundment, conservation and drought provision;
 - The Environment Act 1995, which established the Environment Agency and its statutory role in water resource protection;
 - The Environmental Protection Act 1990, which provides for integrated pollution control; and
 - The Land Drainage Act (1991), which provides for drainage management related to non-main rivers.
- 11.2.10 A number of specific regulations have been enacted to implement the statutory European and national legislation into UK law. These regulations include:
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003. These Regulations are important to the assessment within this chapter as they set the WFD environment quality standards that need to be met and maintained in UK waterbodies;
 - The Anti-Pollution Works Regulations 1999;
 - The Control of Pollution (Oil Storage) (England) Regulations 2001;
 - The Groundwater Regulations (England and Wales) 2009;
 - The Environmental Damage Regulations 2009;
 - The Water Resources Act (Amendment) (England and Wales) Regulations 2009;
 - The Environmental Permitting (England and Wales) Regulations 2010, which control discharge of water to surface water and groundwater; and
 - The Water Supply (Water Quality) Regulations 2010.
- 11.2.11 The FWMA, enacted by Government in response to The Pitt Review in 2010 (Cabinet Office, 2008), designated unitary authorities, such as North Yorkshire County Council (NYCC), as Lead Local Flood Authorities (LLFAs). As a LLFA, NYCC has responsibilities to lead and co-ordinate local flood risk management. Local flood risk is defined as the risk of flooding from surface water runoff, groundwater and ditches and watercourses (collectively known as ordinary watercourses).
- 11.2.12 The FWMA also formalises the flood risk management roles and responsibilities for other organisations including the Environment Agency, water companies and highways authorities establishing them as Risk Management Authorities (RMAs). The responsibility to lead and co-ordinate the management of tidal and fluvial flood risk remains that of the Environment Agency.

National Planning Policy

11.2.13 The Overarching National Policy Statement (NPS) for Energy (EN-1) Section 5.7 (Flood Risk) (Department for Energy and Climate Change, 2011a) details that projects of 1 hectare (ha) or greater in Flood Zone 1 in England and all proposals for energy projects located in Flood Zones 2 and 3 in England should be accompanied by a FRA.

11.2.14 The requirements for FRAs are that they should:

- be proportionate to the risk and appropriate to the scale, nature and location of the project;
- consider the risk of flooding arising from the project in addition to the risk of flooding to the project;
- take the impacts of climate change into account, clearly stating the development lifetime over which the assessment has been made;
- be undertaken by competent people, as early as possible in the process of preparing the proposal;
- consider both the potential adverse and beneficial effects of flood risk management infrastructure, including raised defences, flow channels, flood storage areas and other artificial features, together with the consequences of their failure;
- consider the vulnerability of those using the Site, including arrangements for safe access;
- consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and identify flood risk reduction measures, so that assessments are fit for the purpose of the decisions being made;
- consider the effects of a range of flooding events including extreme events on people, property, the natural and historic environment and river and coastal processes;
- include the assessment of the remaining (known as 'residual') risk after risk reduction measures have been taken into account and demonstrate that this is acceptable for the particular project;
- consider how the ability of water to soak into the ground may change with development, along with how the proposed layout of the project may affect drainage systems;
- consider if there is a need to be safe and remain operational during a worst case flood event over the development's lifetime; and
- be supported by appropriate data and information, including historical information on previous events.

11.2.15 In determining an application for development consent, the Planning Inspectorate should be satisfied that where relevant:

- the application is supported by an appropriate FRA;
- the Sequential Test has been applied as part of site selection;
- a sequential approach has been applied at the site level to minimise risk by directing the most vulnerable uses to areas of lowest flood risk;
- the proposal is in line with any relevant national and local flood risk management strategy;
- priority has been given to the use of sustainable drainage systems (SuDs); and
- in flood risk areas the project is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed over the lifetime of the development.

- 11.2.16 Section 5.15 of NPS EN-1 details that where the project is likely to have effects on the water environment, the applicant for development consent should undertake an assessment of the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment as part of the ES or equivalent.
- 11.2.17 The ES should in particular describe:
- the existing quality of waters affected by the proposed project and the impacts of the proposed project on water quality, noting any relevant existing discharges, proposed new discharges and proposed changes to discharges;
 - existing water resources affected by the proposed project and the impacts of the proposed project on water resources, noting any relevant existing abstraction rates, proposed new abstraction rates and proposed changes to abstraction rates (including any impact on or use of mains supplies and reference to Catchment Abstraction Management Strategies);
 - existing physical characteristics of the water environment (including quantity and dynamics of flow) affected by the proposed project and any impact of physical modifications to these characteristics; and
 - any impacts of the proposed project on water bodies or protected areas under the Water Framework Directive and source protection zones (SPZs) around potable groundwater abstractions.
- 11.2.18 NPA EN-2 (Department for Energy and Climate Change, 2011b)) on Fossil Fuel Electricity Generating Infrastructure (NPS EN-2)) states that where a project is likely to have effects on water quality or resources the applicant for development consent should undertake an assessment which should particularly demonstrate that appropriate measures will be put in place to avoid or minimise adverse impacts of abstraction and discharge of cooling water. The applicant for development consent should demonstrate measures to minimise adverse impacts on water quality and resources.
- 11.2.19 The National Planning Policy Framework (NPPF) (DCLG, 2012) outlines the Government's economic, environmental and social planning policies for England. The NPPF supersedes and replaces a number of planning policy documents that are applicable to the water environment including Planning Policy Statement 25 (PPS25): Development and Flood Risk (DCLG, 2010) and PPS23: Planning and Pollution Control (DCLG, 2004).
- 11.2.20 The NPPF sets out 12 planning principles as guidance for local councils for the creation of their local plan; the following principle is directly applicable to flood risk:
- "10. Meeting the challenge of climate change, flooding and coastal change – support the transition to a low carbon future in a changing climate taking full account of (inter alia) flood risk and coastal change."*
- 11.2.21 On 6th March 2014 the National Planning Practice Guidance (NPPG) web-based resource was launched (DCLG, 2014), which includes greater emphasis on issuing more robust guidance with regards to flood risk. The purpose of the new online national planning guidance is to give simplicity and clarity to the planning system.
- 11.2.22 The NPPG contains guidance in relation to water supply, wastewater and water quality, and flood risk management. It also provides advice and information on how planning can and

should protect water quality; ensure the delivery of adequate water and wastewater infrastructure for new development and ensure development is protected from flood risk, and does not increase flood risk elsewhere.

- 11.2.23 The Non-statutory Technical Standards for Sustainable Drainage Systems (Defra, 2015) was published in March 2015 and is the current guidance for the design, maintenance and operation of Sustainable Drainage Systems (SuDS). The standards set out that the peak runoff rates should be as close as is reasonably practicable to the greenfield rate, but should never exceed the pre-development runoff rate.
- 11.2.24 The standards also set out that the drainage system should be designed so that flooding does not occur on any part of a development site for a 1 in 30 year rainfall event, and that no flooding of a building (including basement) would occur during a 1 in 100 year rainfall event.
- 11.2.25 It is also noted within the standards that pumping should only be used when it is not reasonably practicable to discharge by gravity.
- 11.2.26 The East Inshore and East Offshore Marine Plans (Marine Management Organisation, 2014) are guidance documents for developers to ensure the sustainable development of the marine area and protection of the marine ecosystem. These plans have been published in line with the Marine Policy Statement (Defra, 2011) and NPPF.
- 11.2.27 The East Inshore Marine Plan area includes the coastline stretching from Flamborough Head to Felixstowe, extending out to the seaward limit of the territorial sea (approximately 12 nautical miles), and the waters of any estuary, river or channel, so far as the mean high water spring tidal limit. This includes the tidal limits for the Humber Estuary, which incorporates areas of Selby District. The Proposed Gas Connection and the Proposed Cooling Water Connection (discharge point) are located within the tidal reach of the River Aire.

Local Planning Policy

- 11.2.28 The Site lies entirely within the administrative areas of Selby District Council (SDC) and NYCC. The local development plan for the area comprises the following documents:
- the 'saved' policies of the North Yorkshire Waste Local Plan (NYCC, 2006) – adopted 2006–these mostly relate to waste management facilities and are not relevant to the Proposed Development;
 - the 'saved' policies of the North Yorkshire Minerals Local Plan (NYCC, 1997) – adopted 1997 – not relevant to the Proposed Development; and
 - the Selby District Core Strategy Local Plan (Selby District Council, 2013) – adopted October 2013.
- 11.2.29 In addition to the local development plan, SDC and NYCC are currently in the early preparation stages of the following emerging documents:
- SDC is preparing a 'Sites and Policies Local Plan' to deliver the strategic vision outlined in the Core Strategy, which is intended to supersede the remaining saved policies in the Selby District Local Plan; and
 - NYCC is currently preparing a Joint Minerals and Waste Plan.

- 11.2.30 The majority of the ‘saved’ policies of the North Yorkshire Waste Local Plan relate to waste management facilities (defined in the Plan as “Facilities associated with the processing and disposals of waste materials”) and are not therefore considered relevant to the Proposed Development as it is not a waste management proposal.
- 11.2.31 None of the ‘Saved’ policies contained in the North Yorkshire Minerals Local Plan are considered to be of relevance to the Proposed Development.
- 11.2.32 The SDC Local Plan Core Strategy was adopted on 22nd October 2013. It forms the statutory guidance for land use and planning and defines the spatial vision for Selby and the surrounding area for the period to 2027.
- 11.2.33 Policy SP15 states that SDC will *“Ensure that development in areas of flood risk is avoided wherever possible through the application of the sequential test and exception test; and ensure that where development must be located within areas of flood risk that it can be made safe without increasing flood risk”*.
- 11.2.34 The policy also states that development should support sustainable flood management measures such as water storage areas and schemes promoted through local surface water management plans to provide protection from flooding; and biodiversity and amenity improvements. Developments should also incorporate water-efficient design and sustainable drainage systems which promote groundwater recharge.

North Yorkshire County Council SuDS Design Guidance

- 11.2.35 The NYCC SuDS design guidance note (NYCC, 2015) aims to provide direction to relevant design guidance for the successful implementation of SuDS and is the basis against which planning consultations from Local Planning Authorities will be assessed. It outlines the key design principles, different SuDS components, construction and maintenance methods, and lists the key information required by NYCC for planning applications.

Internal Drainage Board (IDB) Byelaws

- 11.2.36 The IDBs are responsible for managing water levels in the watercourses designated to each IDB and work in partnership with other authorities to actively manage and reduce the risk of flooding within the Board’s district. They have permissive powers under the Land Drainage Act 1991 (as amended by the 1994 Act) to undertake maintenance on any watercourse within their district other than ‘Main Rivers’ and to supervise all matters relating to the drainage of land within their districts. Permissive powers means that the IDBs are permitted to undertake works on ordinary watercourses but the responsibility remains with the riparian owner¹ as the IDBs are not obligated. IDBs can undertake works on watercourses outside their drainage district in order to benefit the district. IDBs may make byelaws, approved by the relevant Minister, for securing the efficient working of the drainage systems.

¹ The responsibility for managing and maintaining ordinary watercourses falls to riparian owners who typically own land on either bank and therefore are deemed to own the land to the centre of the watercourse. NYCC, as the LLFA, has permissive powers to manage the risk of flooding arising from the watercourses through engagement with riparian owners and enforcing maintenance responsibilities in accordance with the Land Drainage Act 1991, <http://www.legislation.gov.uk/ukpga/1991/59/contents>

- 11.2.37 There are two IDBs operating in the flood risk study area for the Proposed Development (as further defined at paragraph 11.3.[50] below): the Selby Area IDB (land to the north of the River Aire, including the Proposed Gas Connection corridor) and the Danvm Drainage Commissioners (land to the south of the River Aire including the existing Eggborough Power Station Site).
- 11.2.38 Any developer working in an IDB area should review the following byelaws (Defra, 2012):
- Byelaw 3: Control of introduction of water and increase in flow or volume of water;
 - Byelaw 4: Control of sluices etc;
 - Byelaw 6: Diversion or stopping up of watercourses;
 - Byelaw 10: No obstructions within 9 metres (7 metres for the Selby Area IDB) of the edge of the watercourse;
 - Byelaw 17: Fences, excavations, pipes etc.; and
 - Byelaw 18: Interference with Sluices.

Other Guidance

Environment Agency Pollution Prevention Guidance Notes

- 11.2.39 The Environment Agency Pollution Prevention Guidance (PPG) Notes provide advice on statutory responsibilities and good environmental practice. Although the PPGNs have been revoked they still provide relevant guidance. The Guidance Notes of particular relevance to the Proposed Development include:
- PPG 1 – General Guide to the Prevention of Pollution (EA, 2000a), provides an introduction to the prevention of pollution from a variety of sources.
 - PPG2 – Above Ground Oil Storage Tanks (EA, 2010a) offers advice on storage options, equipment and its maintenance and how to deal with spills.
 - PPG3 – Use and Design of Oil Separators in Surface Water Drainage Systems (EA, 2007a), provides guidance on when oil separators are appropriate and what size and type of separator are required.
 - PPG4 – Disposal of Sewage Where No Mains Drainage is Available (EA, 2006), offers advice if connection to the local sewage network is not possible and offers guidance on alternative means of wastewater disposal.
 - PPG5 – Works In, Near To, or Liable To Affect Watercourses (EA, 2007b) provides guidance on general precautions to take when working in the vicinity of, or immediately upstream of the site, to as far downstream as a potential impact may influence the quality or quantity of the watercourse.
 - PPG6 – Working at Construction or Demolition Sites (EA, 2010b) repeats much of what PPG5 presents but concentrates specifically on the situations likely to occur at demolition and construction sites.
 - PPG7 – Refuelling Activities (EA, 2004a), provides information on the correct delivery, storage and dispensing of fuel to help reduce the risk (EA, 2004b);
 - PPG 13 – Vehicle Washing and Cleaning (EA, 2007c);
 - PPG 18 – Managing Fire Water and Major Spillages (EA, 2000b); and
 - PPG 21 - Pollution Incident Response Planning (EA, 2009a), contains advice for those developing site specific pollution incident response plans to help prevent and mitigate damage to the environment caused by accidents such as spillage and fire.

Construction Industry Research and Information Association (CIRIA) Guidance

11.2.40 The CIRIA guidance of relevance to the Proposed Development includes:

- Guidance C532 - Control of Water Pollution from Construction Sites (CIRIA, 2001) brings together the Environment Agency guidance but goes into greater detail with regard to sources of water on construction sites, pollutants and pathways. In addition, it provides guidance on planning for the type and location of suitable control measures; and
- Guidance C697 - The SuDS Manual (CIRIA, 2007) provides best practice guidance on the planning, design, construction, operation and maintenance of SuDS to facilitate their effective implementation within developments.

11.3 Assessment Methodology and Significance Criteria

Impact Assessment and Significance Criteria

- 11.3.41 There is no standard methodology for assessing the magnitude of impacts and significance of effects of proposed developments on the water environment. Each project is evaluated according to its individual characteristics. A methodology for assessing the significance of any effect has therefore been developed for projects throughout the UK, based on relevant legislation.
- 11.3.42 The assessment criteria used in this chapter are based on the web-based DETR (Department of the Environment, Transport and the Regions) document 'Transport Analysis Guidance' (known as WebTAG) Unit 3.3.11 (DfT, 2003). This methodology provides an appraisal framework for taking the outputs of the environmental impact process and analysing the key information of relevance to the water environment. Although this guidance is intended for transport studies, it is commonly used for water resources impact assessment for other types of infrastructure, and is considered suitable for application to other development schemes in the absence of other suitable guidance.
- 11.3.43 For the purpose of this assessment, a number of modifications to the WebTAG criteria have been made to address relevant legislation (notably the WFD). These modifications are based on other more recent guidance, where appropriate, e.g. The Design Manual for Roads and Bridges (DMRB) (Highways Agency, 2009) and professional judgement.
- 11.3.44 The WebTAG methodology takes into account the importance and magnitude of predicted impacts on the water environment. Importance is based on the value of the feature or resource (see Table 11.1), while the magnitude of a potential impact is estimated based on the degree of impact and is independent of the importance of the feature (see Table 11.2).
- 11.3.45 The basic approach to assessing the impacts of the Proposed Development on water receptors is to consider how sensitive the receptors may be to changes in surface water or groundwater conditions, including flows and water quality. The indicators used in making a professional judgement on the importance of a water feature under consideration include quality, scale, rarity and substitutability where:
- quality is a measure of the physical condition of the attribute;
 - scale requires consideration of the geographical scale at which the attribute matters to both policy makers and stakeholders, at all levels;

- rarity requires consideration of whether the water feature is commonplace or scarce, at the scale at which it matters; and
- substitutability requires consideration of whether water attributes are replaceable over a given time frame.

Table 11.1: Importance of water feature or resource (modified from WebTAG Unit 3.3.11)

Importance	Criteria	Examples
Very high	Attribute with a high quality and rarity, regional or national scale and limited potential for substitution	<p>Water resources: Watercourse having a WFD classification as shown in a River Basin Management Plan (RBMP) and $Q95 \geq 1.0 \text{ m}^3/\text{s}$;</p> <p>Source Protection Zone (SPZ) 1 within a Principal Aquifer.</p> <p>Water abstraction: $>1,000 \text{ m}^3/\text{day}$</p> <p>Receptors to flood risk: essential infrastructure or highly vulnerable development*</p>
High	Attribute with a high quality and rarity, local scale and limited potential for substitution or attribute with a medium quality and rarity, regional or national scale and limited potential for substitution.	<p>Water resources: Watercourse having a WFD classification as shown in a RBMP, and $Q95 < 1.0 \text{ m}^3/\text{s}$;</p> <p>Principal Aquifer (not within SPZ 1).</p> <p>[Cyprinid or Salmonid fishery]</p> <p>Water abstraction: 500-$1,000 \text{ m}^3/\text{day}$</p> <p>Receptors to flood risk: more vulnerable development*</p>
Medium	Attribute with a medium quality and rarity, local scale and limited potential for substitution or attribute with a low quality and rarity, regional or national scale and limited potential for substitution	<p>Water resources: Watercourse detailed in the Digital River Network** but not having a WFD classification as shown in a RBMP; Secondary Aquifer.</p> <p>Water abstraction: 50-$499 \text{ m}^3/\text{day}$</p> <p>Receptors to flood risk: less vulnerable development*</p>
Low	Attribute with a low quality and rarity, local scale and limited potential for	<p>Water resources: Surface water sewer, agricultural drainage ditch; non-aquifer.</p>

Importance	Criteria	Examples
	substitution	Water abstraction: <50 m ³ /day Receptors to flood risk: water compatible development *

* As defined in Table 2 of the Flood Risk section of the PPG (Department for Communities and Local Government, 2014)

** Digital River Network is a dataset that comprises river centrelines which has been digitised from OS 1:50,000 mapping. It consists of rivers; canals; surface pipes (man-made channels for transporting water such as aqueducts and leats); and miscellaneous channels (including estuary and lake centrelines and some underground channels).

- 11.3.46 Impacts may be adverse or beneficial, depending on the circumstances. Impacts are quantified where practicable and the degree or magnitude of impact is assessed on a qualitative scale, to facilitate comparison with impacts on other environmental receptors. This is further described in Table 11.3.
- 11.3.47 For an impact on water quality to exist, it is necessary for a pollution linkage to be identified whereby a source of pollution, a sensitive receptor to that pollution and a pathway by which the two are linked is demonstrated to exist (Source-Pathway-Receptor model). This model identifies the potential sources or 'causes' of impact as well as the receptors (water resources) that could potentially be affected. However, the presence of a potential impact source and a potential receptor does not always infer an impact, as there needs to be a clear mechanism or 'pathway' via which the source can have an effect on the receptor. For example, sewer flooding does not necessarily increase the risk of flooding unless the sewer is local to the Site and ground levels encourage surcharged water to accumulate.
- 11.3.48 The first stage in applying the Source-Pathway-Receptor model is to identify the causes or 'sources' of potential impact from a development. The impact sources have been identified through a review of the details of the Proposed Development, including the size and nature of the development, potential construction methodologies and timescales. This has been undertaken in the context of local conditions relative to water resources near the application site, such as topography, geology, climatic conditions and potential sources of contamination.
- 11.3.49 The next step in the model is to undertake a review of the potential receptors, that is, the water resources themselves that have the potential to be affected. The identification of potential water resource receptors has been undertaken through:
- a review of baseline data in consultation with the Environment Agency; and
 - a walkover survey of the Site.
- 11.3.50 The last stage of the model is therefore to determine if there is a viable exposure pathway or a 'mechanism' linking the source to the receptor. The identification of sources and receptors is set out in the baseline section below and pathways are identified in the impact and effect section which highlights potential pathways that may lead to an impact on water quality.

Table 11.2: Magnitude of potential impacts

Magnitude	Impact	Description
High	Adverse: loss of an attribute and/or quality and integrity of an attribute	; Decrease in surface water ecological or chemical WFD status or groundwater qualitative or quantitative WFD status. Change in flood risk to receptor from low or medium to high risk.

Magnitude	Impact	Description
	Beneficial: creation of new attribute or major improvement in quality of an attribute	Increase in productivity or size of fishery; increase in surface water ecological or chemical WFD status; increase in groundwater quantitative or qualitative WFD status. Change in flood risk to receptor from high to low.
Medium	Adverse: loss of part of an attribute or decrease in integrity of an attribute	Measurable decrease in surface water ecological or chemical quality, or flow; reversible change in the yield or quality of an aquifer; such that existing users are affected, but not changing any WFD status. Change in flood risk to receptor from low to medium.
	Beneficial: moderate improvement in quality of an attribute	Measurable increase in surface water quality or in the yield or quality of aquifer benefiting existing users but not changing any WFD status. Change in flood risk to receptor from medium to low.
Low	Adverse: some measurable change to the integrity of an attribute	Measurable decrease in surface water ecological or chemical quality, or flow; decrease in yield or quality of aquifer; not affecting existing users or changing any WFD status. Change in flood risk to receptor from no risk to low risk.
	Beneficial: measurable increase, or reduced risk of negative effect to an attribute	Measurable increase in surface water ecological or chemical quality; increase in yield or quality of aquifer not affecting existing users or changing any WFD status. Change in flood risk to receptor from low risk to no risk.
Very low	No change to integrity of attribute	Negligible change discharges to watercourse or changes to an aquifer which lead to no change in the attribute's integrity.

11.3.51 Potential effects are classified by considering both the importance of the feature and the magnitude of the impact, using the matrix illustrated in Table 11.3.

Table 11.3: Classification of effects

Magnitude of impact	Sensitivity/ importance of receptor			
	Very high	High	Medium	Low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible

- 11.3.52 This chapter considers that major or moderate effects are significant for the purposes of the EIA Regulations, in accordance with standard EIA practice.

Extent of Study Area

- 11.3.53 This assessment considers water bodies that are hydrologically connected with the Site, based on available data. The water bodies included within the Study Area are set out below.
- 11.3.54 The main watercourses in the vicinity of the proposed Site are the River Aire, Ings and Tetherings Drain and Hensall Dyke. In addition, minor watercourses and other surface water features have also been identified to have hydrological connectivity with the Proposed Development. The assessment will consider these waterbodies within an area spanning from immediately upstream of the Site, to as far downstream as a potential impact may influence the quality or quantity of the waterbody.
- 11.3.55 Six further ponds/ standing water bodies are visible on OS maps/ aerial imagery within the Study Area (a 250 m radius of the Site).
- 11.3.56 The Site is located within a groundwater Total Catchment (Zone 3) Source Protection Zone (SPZ), and bedrock beneath the Site is designated as a Principal Aquifer. The study area for consideration of potential impacts on groundwater is larger than the surface water study area, in order to consider potential impacts on the Aquifer.
- 11.3.57 Many of the issues relating to the hydrogeology underlying the Site are also dealt with in Chapter 12: Geology, Hydrogeology and Land Contamination. This is due to the considerable overlap between the two subject areas.

Sources of Information/Data

- 11.3.58 In order to identify and characterise the surface water and groundwater receptors considered as part of this assessment, available data on surface water and groundwater quality and quantity within the vicinity of the Site have been obtained. A number of sources of information and websites have been consulted, including:
- Ordnance Survey maps;
 - Multi-Agency Geographical Information for the Countryside (MAGIC) website (MAGIC, 2016);
 - Environment Agency website (EA, 2016);
 - the Humber River Basin Management Plan (RBMP) (EA, 2009b);
 - Groundsure Report (available on request);
 - the Environment Agency was consulted and provided data on water, uses of groundwater, surface water features (potable water sources, fisheries, consented discharges etc.), groundwater quality and RBMP status and objectives;
 - SDC Strategic Flood Risk Assessment (SFRA) (AECOM, 2016a);
 - NYCC Preliminary Flood Risk Assessment (PFRA) (Jacobs, 2011); and
 - a walkover of the study area by ecologists (undertaken in June 2016) to identify, locate and describe water resource receptors.

Consultation

11.3.59 A summary of consultation undertaken to date relevant to this Chapter is given in Table 11.4.

Table 11.4: Consultation summary table

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
Secretary of State	September 2016 (Scoping Opinion)	A Flood Risk Assessment (FRA) should be prepared as a standalone document to be appended or otherwise cross referred as part of the ES, but that the ES chapter itself will also include an assessment of the environmental effects of the proposed development in terms of susceptibility to flooding and the potential for the proposed development to increase flood risk off site.	A standalone FRA has been prepared and is presented in Appendix 11A. Flood risk is summarised within this Chapter.
		The water resources and flood risk chapter of the ES (and the FRA) should fully consider the impacts associated with the chosen crossing methods as well as any culverts or diversion to watercourses that may be required.	The impacts associated with watercourse crossings are assessed in this Chapter. There are no anticipated culverts/ diversions required.
		In terms of both abstraction and discharge, there will need to be a clear description and assessment within the ES as to the reliance on existing infrastructure, quantities and licenses versus how these will vary in the context of the proposed development.	See Chapter 4: The Proposed Development; further details will be provided in the final ES.
		Cross reference should be made between the assessment of water resources and ecology, particularly in the context of inter-related effects.	Chapter 10: Ecology and Nature Conservation has been cross-referenced, where required, to inform this assessment, as

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
			has Chapter 12: Geology, Hydrogeology and Land Contamination.
		It is expected that a description of the proposed drainage design (incorporating sustainable drainage techniques) including any land take and attenuation features that may be required.	An outline drainage strategy for the Site is included in Appendix 11A (PEI Report Volume III)
		Reference should be made to the use of any established methods or guidance in terms of the impact assessment itself including reference to significance criteria. Where professional judgement is to be used, this should be clearly described and fully justified, particularly where there is any deviation from established guidance.	The Assessment Methodology and Significance Criteria is presented in Section 11.3 of this Chapter.
		The DCO application should be accompanied by a WFD assessment.	The impact of the proposed development in terms of the WFD is included as part of this assessment.
Canals and Rivers Trust	16 th September 2016 (e-mail to Planning Inspectorate)	Recommend that the ES provides more information on the proposed changes to the abstraction and discharge rates associated with the new power station for us to fully understand any impacts the scheme may have on the river.	See Chapter 4: The Proposed Development, which states that the cooling water abstraction volume will be less than half of that required for the existing coal-fired power station.
Environment Agency	16 th September 2016 (letter to Planning)	A WFD assessment should show how the application meets RBMP requirements. As a minimum, an	The impact of the proposed development in terms of the WFD is

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
	Inspectorate)	<p>assessment should include:</p> <ul style="list-style-type: none"> • The risk of deterioration - a proposed development must not cause any water body quality element to deteriorate to a lower status class. • Support for measures to achieve good status (or potential) - a proposed development must not prevent implementation of a measure in the RBMP to improve a surface water body or groundwater unless the applicant proposes an acceptable alternative to meet RBMP requirements. • The risk of harming any protected area - a proposed development must not harm a protected area in a RBMP. 	included as part of this assessment.
Environment Agency	20 th September 2016 (data request letter via email).	The Environment Agency provided Product 4 and Product 6 flood risk data and information with regards groundwater/ surface water abstractions/ discharges.	Data provided by the Environment Agency have been used to inform this assessment and the FRA.
North Yorkshire County Council	11th November 2016 (letter via email)	A response from North Yorkshire County Council has yet to be received.	
Selby Internal Drainage Board	15 th November 2016 (Letter via email)	A response from Selby Internal Drainage Board has yet to be received.	
Danvm Drainage Commissioners	15th November 2016 (Letter via email)	A response from Danvm Drainage Commissioners has yet to be received.	

11.4 Baseline Conditions

Existing Baseline

Topography

- 11.4.1 Based on available topographic data from surveys and LiDAR the existing coal-fired power station site (which includes the majority of the Site) is fairly flat with the highest areas being in the south-central portions, approximately 12.5 m Above Ordnance Datum (mAOD). It generally slopes from the centre towards the existing coal-fired power station site boundaries with the exception of the southern boundary (around the main coal stockyard), which features a large embankment. The lowest areas are generally in the north-east of the existing coal-fired power station site with levels between approximately 7.0 and 8.0 mAOD.
- 11.4.2 Ground levels along the Proposed Gas Connection corridor are generally level with ground levels falling to approximately 6 mAOD in the vicinity of Manor Cottages, to the south-east of Chapel Haddlesey. Further north and to the north-west, ground levels slightly increase with levels between approximately 6.0 and 7 mAOD.

Drainage

- 11.4.3 The existing Eggborough Power Station site drainage system collects surface water and pumps it to a concrete ash reservoir, where it is mixed with other process water and used to transport Pulverised Fuel Ash (PFA) to Gale Common. Within this drainage system there are three separate catchments associated with internal access roads, each connected to an oil interceptor prior to the connection to the ash reservoir. There are also separate catchments for the coal stockyard and existing contractor's hardstanding areas (in the vicinity of Hensall Gate), which also connect to the ash reservoir. The existing drainage catchments across the existing coal-fired power station site are broadly summarised as follows:
- the north-west part of the existing coal-fired power station site, including the area around the northern part of the National Grid 400 kV sub station and turbine hall, drain via pipes, drains and gullies to an oil interceptor located to the south-west of the existing cooling towers before reaching the ash reservoir;
 - the central north-east part of the existing coal-fired power station site, including the flue gas desulphurisation plant to the east of the main power station buildings (turbine hall and boiler house) drains via pipes, drains and gullies to an oil interceptor located to the south-east of the existing cooling towers before reaching the ash reservoir;
 - the west and southern parts of the existing coal-fired power station site, including the southern part of the National Grid 400 kV sub station and turbine hall, drain via pipes, drains and gullies to an oil interceptor located to the north-west of the existing rail loop;
 - the coal stockyard in the south of the existing coal-fired power station site has a perimeter drain which drains to a sump at the south-east of the coal stockyard, from where it is pumped to the ash reservoir;
 - the easternmost parts of the existing coal-fired power station site including the emergency coal stockyard to the north-east of the rail loop and gravelled storage/laydown areas drain via a combination of soakaways (although localised flooding is known to have occurred here) and a drainage system that is pumped to the ash reservoir.

- 11.4.4 The majority of land located within the route of the Proposed Gas Connection corridor comprises arable land and surface water drains naturally to ground via infiltration (with the assistance of land drains – see further description of these below). Surface water from local roads is assumed to drain to existing highway drainage infrastructure.

Surface Waterbodies

River Aire

- 11.4.5 The River Aire (Main River) flows from north-west to south-east and is located to the north of the existing coal-fired power station. At its closest point the River Aire is located approximately 650 m north/ north-east of the Proposed Construction Laydown Area and approximately 1.1 km north/ north-east of the Proposed Power Plant Site, at a meander known as Eggborough Ings (as shown in Figure 11.1 (PEI Report Volume II)).
- 11.4.6 The tidal extent of the River Aire is located at Chapel Haddlesey, which is approximately 1.2 km north of the existing power station site. Cooling water used by the existing coal-fired power station is drawn from the River Aire via a pumphouse in Chapel Haddlesey and discharged back to the River via an outfall approximately 1 km downstream of the intake. There is a large weir between the intake and outfall, and this coincides with the tidal limit of the River. A hydro-electric power scheme is currently being installed at the weir (see Chapter 20: Cumulative and Combined Effects).
- 11.4.7 The wetted river channel is approximately 25 - 30 m wide and appears to be several metres deep. The water is very turbid with suspended sediment and the flow is generally slack within the reach adjacent to the Site. Flood embankments are present on the south bank of the River and on the north bank downstream of properties within Chapel Haddlesey.
- 11.4.8 The River Aire will be crossed by the Proposed Gas Connection at Eggborough Ings and the existing and Proposed Cooling Water Connections link to the River Aire.

Ings and Tethering Drain

- 11.4.9 Ings and Tethering Drain (Ordinary Watercourse) is located approximately 360 m to the north of the Proposed Construction Laydown area. The watercourse flows from north-west to south-east through Eggborough Ings, situated on land between the existing power station site and the River Aire. In this location the wetted channel is approximately 2 m wide and up to 1 m deep, with no discernible flow. Ings and Tethering Drain is a tributary of the River Aire and falls under the jurisdiction of the Danvm Drainage Commissioners. The drain forms a confluence, via a pumped discharge, with the River Aire approximately 2.2 km to the east of the existing coal-fired power station site.
- 11.4.10 Ings and Tethering Drain will be crossed by the Proposed Cooling Water Connections and Proposed Gas Connection corridor south of Eggborough Ings.

Hensall Dyke

- 11.4.11 Hensall Dyke is located immediately to the south-east of the Proposed Power Plant Site. Historically, Hensall Dyke is believed to have flowed through the existing coal-fired power station site and been the point of natural drainage for much of the existing coal-fired power station site prior to development. A walkover survey identified an existing pipe/ culvert

present beneath the coal stockyard embankment that has been sealed to prevent surface water leaving the existing coal-fired power station site. Downstream of the existing coal-fired power station site, Hensall Dyke flows to the south-east towards the village of Hensall. The watercourse then turns north, becoming Beck Drain downstream of Hensall and forms a confluence with Ings and Tethering Drain approximately 780 m east of the Proposed Construction Laydown area.

Minor Watercourses/ Drainage Ditches

- 11.4.12 Drainage channels are frequent within arable land in the Proposed Gas Connection corridor, the majority of which held no standing water at the time of the ecological walkover survey (Appendix 10C – Preliminary Ecological Appraisal (PEA) Report). Most dry ditches/ drains have a channel width of 2 – 3 m and depth of 2 m. Ditch banks are generally steep and the bases of channels generally comprise bare earth or grassland. These drainage features are mostly associated with field boundaries.
- 11.4.13 There are also smaller field drains in places, with channels less than 1 m wide and deep.
- 11.4.14 Drainage channels are also present within the existing coal-fired power station site, including butyl lined drains adjacent to hard standing areas and concrete lined drains around coal stockyard areas. These were also dry at the time of the ecological survey.

Other Surface Water Features

- 11.4.15 Six ponds/ other areas of standing water (excluding wet ditches/ drains) were identified within the Site boundary by a combination of desk study and field survey. These are detailed in Table 11.5 below.

Table 11.5: Standing waterbodies within the Site boundary

Feature Number	Description
1	A large man-made, butyl lined reservoir (lagoon), 1.3 ha in size and stocked with coarse fish. The open water is relatively clear and up to 1 m deep. The lagoon is surrounded on all sides by earth banks, supporting grass coniferous screening woodland.
2	A man-made pond, 500 m ² in size, within a landscaped area adjacent to the existing coal-fired power station cooling towers. The open water is clear and up to 1 m deep. There are raised banks around the pond margins supporting dense scrub and coniferous woodland. Fish are known to have been stocked in the past.
3	A concrete lined surface water attenuation tank supporting no aquatic vegetation. The tank is regularly drained and has a thick layer of silt at the base.
4	Concrete tanks and channels associated with the existing coal-fired power station cooling water system. These do not support any aquatic vegetation and are regularly drained.
5	A small ornamental pond adjacent to office buildings within the

Feature Number	Description
	existing coal-fired power station site. The pond is stocked with goldfish and surrounded by hard standing.
6	An area of open water shown on OS maps to the north of the River Aire. This was found to be a dry depression on land between the top of the river bank and the adjacent flood embankment. The base of the depression supports species poor semi-improved grassland and no aquatic or marshy vegetation, indicating that it does not regularly hold water. It is only likely to be inundated if the river floods.

- 11.4.16 Six further ponds/ standing water bodies are visible on OS maps/ aerial imagery within a 250 m radius of the Site.

Canals

- 11.4.17 There are two canals located in the wider vicinity of the Site. The Selby Canal is located approximately 800 m to the west of the Proposed Cooling Water Connection abstraction point, and approximately 300 m west of the Proposed AGI.
- 11.4.18 The Calder Navigation (canal) is located approximately 1 km to the south of the Proposed Borehole Water Connection point at the A19/ A645 Weeland Road junction.
- 11.4.19 Information obtained during the desk study indicates no direct hydrological link exists between the canals and the Site therefore the canals are not considered further in this assessment.

Surface Water Quality

- 11.4.20 The Environment Agency surveys all main watercourses in England and Wales on a regular basis in order to analyse monitor and review status waterbodies against the WFD objectives set out for them. The WFD required all waterbodies to reach at least 'Good status' or 'Good potential' by 2015. However, provided that certain conditions are satisfied, in some cases the achievement of Good status may be delayed until 2021 or 2027.
- 11.4.21 For surface waters, Good status is a statement of 'overall status', which in turn consists of chemical and ecological components. Chemical status considers priority substances that present a significant risk to the water environment. Chemical status is classified 'good' or 'fail'. Ecological status is measured on a scale of 'high', 'good', 'moderate', 'poor' and 'bad'. The ecological status takes into account physico-chemical elements, biological elements, specific pollutants and hydromorphology.
- 11.4.22 Some waterbodies are designated 'artificial' or 'heavily modified' and are not able to achieve near natural conditions. For this reason, the classification of these waterbodies and the biology they represent are measured against 'ecological potential' rather than status.
- 11.4.23 For an artificial or heavily modified waterbody to achieve good ecological potential, its chemistry must be good. In addition, any modifications to the structural or physical nature of the waterbody that would harm its biology must be essential for its valid use. For an artificial or heavily modified waterbody to achieve good ecological potential, all other modifications must have been altered or managed to reduce or remove their adverse effects, so that there is

the potential for the biology of the waterbody to be as close as possible to that of a similar natural waterbody.

River Aire (includes Ings and Tetherings Drain)

- 11.4.24 The River Aire at this location (defined in the WFD as 'GB104027062760 - River Aire from River Calder to River Ouse' i.e. the reach between the confluences with the River Calder and the River Ouse) is classified as heavily modified due to the presence of flood defences and navigation modifications. The River Aire waterbody is currently of moderate ecological potential with regards to the WFD and is currently meeting good chemical potential (this section of the River Aire includes Ings and Tetherings Drain which flows from west to east approximately 500 m north the existing power station site). Good ecological potential and good chemical status is expected to be met in 2027. Overall, the River Aire is classified as having moderate potential.
- 11.4.25 There are a range of pressures on the River preventing it achieving good ecological potential, including discharges upstream and direct to the Humber Estuary, recreation and commercial uses of the river, dredging etc.
- 11.4.26 Tables 11.6 to 11.9 below provide an overview of the biological elements, supporting elements, conditions, ecological potential assessment and the chemical elements for the River Aire.

Table 11.6: Biological elements

Element	Current status (2015) and certainty of less than good	Predicted status in 2021	Predicted status in 2027	Justification for not achieving good status in 2015
Invertebrates	Poor (very certain)	Poor	Good	Disproportionately expensive
Macrophytes and phytobenthos	Moderate (quite certain)	Moderate	Good	Disproportionately expensive

Table 11.7: River Aire supporting elements

Element	Current status (2015) and certainty of less than good	Predicted status in 2021	Predicted status in 2027	Justification for not achieving good status in 2015
Dissolved oxygen	High	High	High	N/A
2,4-dichlorophenol	High	High	High	N/A
2,4-dichlorophenoxyacetic	High	High	High	N/A
Arsenic	High	High	High	N/A
Copper	High	High	High	N/A

Element	Current status (2015) and certainty of less than good	Predicted status in 2021	Predicted status in 2027	Justification for not achieving good status in 2015
Cyanide	High	High	High	N/A
Iron	High	High	High	N/A
Mecoprop	High	High	High	N/A
Permethrin	High	High	High	N/A
Un-ionised ammonia	Good	Good	Good	N/A
Zinc	High	High	High	N/A

Table 11.8: River Aire ecological assessment

Element	Current status (2015) and certainty of less than good	Predicted status in 2021	Predicted status in 2027	Justification for not achieving good status in 2015
Mitigation measures assessment	Moderate or less	Moderate or less	Good	Disproportionately expensive

Table 11.9: River Aire chemical elements

Element	Current status (2015) and certainty of less than good	Predicted status in 2021	Predicted status in 2027	Justification for not achieving good status in 2015
1,2-dichloroethane	Good	Good	Good	N/A
Atrazine	Good	Good	Good	N/A
Benzene	High	-	-	-
Benzo (ghi) perylene and indeno (123-cd) pyrene	Good	Good	Good	N/A
Cadmium and its compounds	Good	Good	Good	N/A
Hexachlorobenzene	Good	-	-	-
Hexachlorobutadiene	Good	-	-	-
Hexachlorocyclohexane	Good	Good	Good	N/A
Lead and its compounds	Good	Good	Good	N/A

Element	Current status (2015) and certainty of less than good	Predicted status in 2021	Predicted status in 2027	Justification for not achieving good status in 2015
Mercury and its compounds	Good	Good	Good	N/A
Napthalene	Good	Good	Good	N/A
Nickel and its compounds	Good	Good	Good	N/A
Nonylphenol	Good	Good	Good	N/A
Pentachlorophenol	Good	Good	Good	N/A
Simazine	Good	Good	Good	N/A
Tributyltin compounds	Fail (very certain)	-	-	-
Trichlorobenzenes	Good	Good	Good	N/A
Trichloromethane	Good	Good	Good	N/A
Trifluralin	Good	-	-	-
Aldrin, dieldrin, endrin and isodrin	Good	Good	Good	N/A
Carbon tetrachloride	Good	Good	Good	N/A
DDT total	Good	Good	Good	N/A
Para – para DDT	Good	Good	Good	N/A
Tetrachloroethylene	Good	Good	Good	N/A
Trichloroethylene	Good	Good	Good	N/A

- 11.4.27 Proposed mitigation measures (within the RBMP) for the River Aire to achieve good ecological potential include the preservation of marginal aquatic habitat, banks and the riparian zone, improving floodplain connectivity, appropriate vegetation control, set back and the removal of obsolete structures.
- 11.4.28 Mitigation measures already in place on the River Aire include the strategic management of sediment, bank rehabilitation, a reduction in the impact of dredging and sediment suspension.
- 11.4.29 The River Aire is considered to be a water resource receptor of very high importance with respect to water quality, as it has water quality objectives under the WFD and, given the size of the river channel, has a $Q_{95} \geq 1.0 \text{ m}^3/\text{s}$.
- 11.4.30 The Ings and Tethering Drain is considered to be a water resource receptor of high importance with respect to water quality objectives under the WFD, and given the nature of the watercourse, has a $Q_{95} < 1.0 \text{ m}^3/\text{s}$.

Hensall Dyke

- 11.4.31 Hensall Dyke is not designated under the WFD and therefore has no designation in the RBMP and the Environment Agency has no water quality data for the watercourse. Hensall Dyke is a tributary of the Ings and Tethering Drain, therefore for the purpose of this assessment, it is inferred that the water quality classification for Hensall Dyke is likely to be the same as that of the Ings and Tethering Drain, as outlined above.
- 11.4.32 Hensall Dyke is considered to be a water resource receptor of medium importance with respect to water quality because the watercourse is detailed in the Digital River Network but does not have a WFD classification.

Minor Watercourses/ Drainage Ditches

- 11.4.33 The identified minor watercourses and drainage ditches identified within the study area have no WFD designation and there is no water quality data available.
- 11.4.34 The minor watercourses and drainage ditches are considered to be a water resource receptor of low importance with respect to water quality due to their functions as surface water or agricultural drainage.

Other Surface Water Features

- 11.4.35 All other surface water features identified within the study area have no WFD designation and there is no water quality data available.
- 11.4.36 The other surface water features are considered to be a water resource receptor of low importance with respect to water quality due to their functions as ornamental use, surface water or agricultural drainage.

Surface Water Abstractions and Discharges

- 11.4.37 The Groundsure report (available on request) records three currently licenced surface water abstractions on site for the purpose of irrigation, evaporative cooling and potable water supply, all located on the northern offshoot corridor.
- 11.4.38 The combined Maximum Daily Volume of the licenced site surface water abstractions from the River Aire is approximately 235,284 m³. Of this 231,280 m³ is used by the existing coal-fired power station for evaporative and non-evaporative cooling.
- 11.4.39 There are a further ten surface water abstraction licenses recorded within a 1 km radius of the Site for hydroelectric power generation, evaporative cooling and irrigation. There are no surface water abstraction licenses within the gas connection corridor.
- 11.4.40 Data from the Groundsure Report (available on request) indicates that there are eight active discharge licenses within 500 m of the Site. Of the identified discharge licenses there are three located within 20 m of the Site.
- 11.4.41 Two of the discharges, located on-site and approximately 4 m to the south-east, are for trade discharge – site drainage. One discharge approximately 14 m to the west is for process effluent, one discharge approximately 207 m to the north-west is for final treated effluent.

Two discharge licences are registered to Eggborough Waste Water Treatment Works, approximately 208 m north-east of the existing coal-fired power station site and are for storm water overflows. The final two discharges are located approximately 303 m to the north-east and are for final treated effluent.

- 11.4.42 The River Aire is considered to be a water resource receptor of very high importance with respect to water supply due to the Maximum Daily Volume water abstraction: >1,000 m³.

Point Source Pollutants

- 11.4.43 Pollution incidents are classified by the Environment Agency on the degree of Environment Agency manpower deployed (i.e. large, small) and likely environmental impact with regard to air, water and land. Incidents are classified as category 1 (major), 2 (significant), 3 (minor) or 4 (insignificant).
- 11.4.44 There have been six pollution incidents within 1 km of the Site since November 2001. Of those incidents two were category 4 (insignificant) incidents to water and three were category 3 (minor) incidents to water. One of the incidents was classified as a category 2 (significant) incident to water, located approximately 309 m to the north-east of the Site and from other sewage material. The incident was in 2001 and unlikely to have impacted on water quality and therefore is not anticipated to have any implications for the Proposed Development.

Non-Point Source Pollutants

- 11.4.45 Upstream of the Site urban, commercial/ industrial and agricultural runoff may enter the watercourses identified below, and this may affect the status of the watercourses.

Recreation

- 11.4.46 The study area is crossed with Public Rights of Way (PRoW) which allow access to the River Aire, Ings and Tethering Drain and a number of the minor watercourses/ drainage ditches.
- 11.4.47 Recreational use within the study area will include horse riding, walking, bird watching, fishing and boating, with the River Aire used for general navigation, providing access to the Selby Canal and Calder Navigation upstream of the Site.
- 11.4.48 The River Aire is considered to be a water resource receptor of high importance with respect to the recreation uses outlined above.
- 11.4.49 Due to the limited public access to the waterbodies via PRoWs, Ings and Tetherings Drain, Hensall Dyke, the minor watercourses and other identified water features are considered to be water resource receptors of low importance with respect to recreation.

Biodiversity

- 11.4.50 The River Aire and the Ings and Tetherings Drain, as defined in the RBMP, are designated under the Freshwater Fish Directive and Nitrates Directive.
- 11.4.51 There are no Sites of Special Scientific Interest (SSSIs) within 5 km of the Site.

- 11.4.52 The River Derwent Special Area of Conservation (SAC) is located 9.5 km to the east of the Site. There are no Special Protection Areas (SPAs) or Ramsar sites within 10 km of the Site. However, the Humber Estuary SPA/ SAC/ Ramsar/ Site of Special Scientific Interest (SSSI), located approximately 15 km downstream from the Site, is in connectivity with the River Aire, which is crossed by the Proposed Gas Connection and into which the Cooling Water Connections are linked. Given the distance from the Site and the level of dilution provided within the both the River Aire and the Humber Estuary these are not considered as receptors within this assessment.
- 11.4.53 Indirect effects on the Humber Estuary SPA/ SAC/ Ramsar/ SSSI via the River Aire, are considered in Chapter 10: Ecology and Nature Conservation.
- 11.4.54 There are two non-statutory nature conservations designations within 1 km of the Site, the closest being Selby Canal and Towpath Site of Importance for Nature Conservation (SINC) located approximately 300 m to the north-west of the Site.
- 11.4.55 In line with the examples provided in Table 11.1, both the River Aire and the Ings and Tetherings Drain are considered to be water resource receptors of high importance with respect to biodiversity due to ecological objectives under the WFD and designation under the Freshwater Fish Directive.
- 11.4.56 All other waterbodies identified in the assessment are considered to be water receptors of low importance with regards biodiversity as they are not designated for nature conservation value, but may provide habitat to fauna and flora.

Superficial Geology

- 11.4.57 A review of the Groundsure reports (available on request), British Geological Survey (BGS) 1:50,000 solid and drift geology sheet 79 for Goole, existing site investigation records and publically available BGS borehole records indicates the following superficial deposits may be present beneath the Site:
- Alluvium – recent alluvium, present in a narrow corridor along the River Aire;
 - Lacustrine beach deposits – shingle, sand, silt and clay; present at the north-western corner of the Proposed Power Plant Site;
 - Brighton sand formation – dominantly yellow, slightly clayey sand to silty, which appears to be absent beneath the Proposed Power Plant Site, but present in a narrow strip beneath the
 - Hemingbrough glacio-lacustrine formation – laminated clays, silts and sands present at the south-eastern limit of the Proposed Power Plant Site; and
 - Glacial till – typically sandy and gravelly clays, with cobbles and boulders. The geological map indicates that these deposits may encroach onto the extreme south-western corner of the Proposed Power Plant Site.
- 11.4.58 Further details on the geology are found within Chapter 12: Geology, Hydrogeology and Land Contamination.

Bedrock Geology

- 11.4.59 The geological map and GroundSure report indicate that the Site (including both Proposed Power Plant Site and Proposed Cooling Water and Gas Connections) is underlain by Sherwood Sandstone.

Hydrogeology

- 11.4.60 The Environment Agency aquifer classifications for the identified superficial deposits underlying the site, as detailed above, is summarised in Table 11.10 below.

Table 11.10: Summary of Environment Agency aquifer classifications for superficial deposits

Formation	EA aquifer classification	Aquifer definition
Superficial deposits		
Lacustrine Beach Deposits	Secondary A Aquifer	Defined by the EA as ‘permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers’.
Alluvium	Secondary A Aquifer	
Brighton Sand	Secondary A Aquifer	
Glacial Till (clay)	Secondary Undifferentiated Aquifer	Defined by the EA as ‘an aquifer where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.’
Hemingbrough Formation	Unproductive Strata	Defined by the EA as ‘rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow’.
Bedrock		
Sherwood Sandstone	Principal Aquifer	Defined by the EA as ‘layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer’.

Groundwater Quality

- 11.4.61 The entire Site, with the exception of the southern Proposed Borehole Water Connection and the northern end of the Proposed Gas Connection, is located in a groundwater Source Protection Zone (SPZ) 3 (total catchment).
- 11.4.62 WFD status for groundwater consists of two components: quantitative and chemical status. These two components result in a single final classification of Good or Poor status.

Shallow Groundwater

- 11.4.63 The underlying superficial geology comprises a Minor Aquifer. It is likely that groundwater quality in the superficial strata in the vicinity of the Site is poor, due to historical industrial and mining activity.
- 11.4.64 Soils at the Site (except those associated with glaciolacustrine superficial deposits) are classified as being of a high leaching potential, meaning that they readily transmit liquid discharges and pollutants.
- 11.4.65 Using the examples presented in Table 11.1 the shallow groundwater is considered to be a water resource of medium importance with respect to water quality (i.e. no WFD designation and designated Secondary Aquifer).

Deep Groundwater

- 11.4.66 The underlying bedrock geology is classified as a Principal Aquifer with high permeability. These are highly permeable formations usually with a known or probable presence of significant fracturing.
- 11.4.67 The groundwater is designated as a Drinking Water Protected Area and under the Nitrates Directive.
- 11.4.68 The WFD status of the local groundwater (GB40401G701000 – Aire and Don Sherwood Sandstone) is currently failing chemical status, but is predicted to achieve Good chemical status by 2027, and the quantitative status is currently good and is expected to remain as Good in 2027. The current overall status of the aquifer unit is Poor with the objective to meet Good overall status by 2027.
- 11.4.69 The Aire and Don Sherwood Sandstone waterbody is considered to be a water resource receptor of high importance with respect to water quality having a WFD classification as shown in a RBMP, and the designation as a Principal Aquifer (not within SPZ 1).

Groundwater Abstractions

- 11.4.70 The Sherwood Sandstone, as a Principal Aquifer, is extensively utilised in the region. Principal Aquifers may be highly productive and able to support large abstractions for public water supply and other purposes.
- 11.4.71 As noted above, the Aire and Don Sherwood Sandstone is designated as a Drinking Water Protected Area.

- 11.4.72 The Groundsure report (available on request) records three active groundwater abstractions on the Proposed Power Plant Site; one for EPL (within the Eggborough Sports and Leisure Complex) for the abstraction of a maximum of 4,800 m³ per day for use as a boiler feed; one for EPL (at the southern limit of the Site near the junction of the A19 and Weeland Road) for the abstraction of a maximum of 4,800 m³ per day for use as a boiler feed; and one for The Hambleton Abstraction Partnership for the abstraction of a maximum of 900 m³ per day for use in irrigation. These abstractions are from the Sherwood Sandstone Principal Aquifer. There are also a further thirty-eight historical groundwater abstraction licences recorded 2 km of the Site including for potable water, farming and domestic use.
- 11.4.73 There are no groundwater abstractions recorded within the Proposed Gas Connection corridor.
- 11.4.74 The Aire and Don Sherwood Sandstone waterbody is considered to be a water resource receptor of very high importance with regard to water supply with licenced water abstractions >1,000 m³/day and having designation as a Drinking Water Protected Area .

Flood Risk

- 11.4.75 The importance of receptors in the context of flood risk relates to the NPPF vulnerability classification for land uses potentially affected by any changes in flood risk as a result of the Proposed Development. Potential receptors could therefore be occupiers or users of the Proposed Development itself, as well as users or occupiers of land outside of the Site boundary that could be affected by changes to flood risk resulting from the Proposed Development. The receptor importance is therefore defined independently of the sources of flood risk.
- 11.4.76 The NPPF considers the vulnerability of different forms of development to flooding and classifies proposed uses accordingly. The Proposed Development is considered as 'Essential Infrastructure' in the NPPF vulnerability classification and as such it is assigned as a receptor of very high importance. The vulnerability and hence importance of receptors elsewhere has been defined where flood risk impacts have the potential to occur
- 11.4.77 A FRA has been undertaken to ascertain if the Site is at risk of flooding or if the Proposed Development of the Site would cause an increase in the off-site flood risk (see Appendix 11A – Flood Risk Assessment in PEI Report Volume III). The FRA has been prepared in accordance with the NPPF and supporting PPG. For further information on flood risk, the FRA should be consulted, although the section below provides a summary of flood risk for the Proposed Development:
- the Proposed Power Plant Site, CCR Land and the southern area of the Proposed Construction Laydown area are located in Flood Zone 1 and is deemed at low risk of flooding from fluvial/ tidal sources (note this is not as shown on the EA flood maps, which are based on high-level information, but has been demonstrated by more recent EA modelling data and topographical data – see Appendix 11A, PEI Report Volume III);
 - the Proposed Gas Connection corridor is located predominantly in Flood Zones 3a and 3b and is therefore deemed at high risk of flooding from fluvial/ tidal sources;
 - the northern part of the Proposed Construction Laydown area is also located in Flood Zone 3 and is therefore at high risk of flooding from fluvial/ tidal sources;
 - the proposed works represent 'Essential Infrastructure' and are therefore appropriate to Flood Zones 3a and 3b subject to satisfying the Exception Test;

- the proposed works satisfy the two parts of the Exception Test; they will have wider sustainability benefits for the local community and will also be safe, taking account of the vulnerability of users and will not increase the risk of flooding, since the only works proposed in Flood Zones 3a and 3b are the installation of an underground pipe;
- the site is located in the vicinity of a number of watercourses and drainage ditches managed by the Selby IDB and Danvm Drainage Commission. It is considered that flood risk to the study area from these watercourse drainage catchments is low. During high return period storm events, the predominant flood risk to the area is from the River Aire;
- the impact of climate change is unlikely to increase the extent of fluvial/ tidal flooding to the north of the existing power station site, however, flood depths are likely to increase. It is recommended that the 8 mAOD contour that runs through the northern section of the existing power station site is retained to contain flood water to areas considered to flood under the existing scenario;
- the EA's map showing the risk of flooding from reservoirs in the event of a failure identifies the majority of the Site is located within an area identified as being at risk. Reservoir flooding is extremely unlikely to happen. All large reservoirs must be inspected and supervised by reservoir panel engineers on a yearly basis. For this reason the risk of flooding from reservoirs to the site is considered to be low;
- the risk of flooding from the Selby Canal and the Aire and Calder Navigation is considered to be low;
- the risk of flooding from groundwater and sewer sources is considered to be low;
- the proposed works involve new crossings over the River Aire, Ings and Tethering Drain and other smaller local watercourses. Formal consent is required from the EA for any development adjacent to or within a watercourse and from the relevant IDB for works located within the IDB byelaw distance; and
- there are not considered to be any off site impacts as a result of the Proposed Development in relation to flood risk.

11.4.78 The FRA (Appendix 11A, PEI Report Volume III) serves to demonstrate that the Proposed Development will remain safe during its lifetime and will not increase flood risk elsewhere and is, therefore, considered to be acceptable in flood risk terms.

Summary of Baseline Conditions and Importance of Existing Resource

11.4.79 Only surface watercourses in close proximity (hydraulic connectivity) to the Site and with the significant potential to be affected by the Proposed Development have been considered further within this impact assessment.

11.4.80 Table 11.11 describes the importance of the waterbodies in the vicinity of the Proposed Development.

Table 11.11: Importance of identified water resource receptors

Receptor	Attributes	Importance
Surface water		
River Aire	Water quality WFD: Moderate Potential (good chemical potential, moderate ecological potential)	Very high

Receptor	Attributes	Importance
	Water supply Number of industrial abstractions with a volume >1,000 m ³ /day	Very high
	Recreation/other uses Various including horse riding, walking, bird watching, fishing and boating General navigation.	High
	Biodiversity WFD: Moderate ecological potential Designated Freshwater Fish Directive	High
Ings and Tethering Drain	Water quality WFD: Moderate Potential (good chemical potential, moderate ecological potential)	High
	Recreation/other uses Limited access for horse riding, walking, bird watching.	Low
	Biodiversity WFD: Moderate ecological potential Designated Freshwater Fish Directive	High
Hensall Dyke	Water quality Detailed in the Digital River Network but does not have a WFD classification	Medium
	Recreation/other uses Limited access for horse riding, walking, bird watching.	Low
	Biodiversity Not designated for nature conservation value, but may provide habitat to fauna and flora (see Chapter 10: Ecology and Nature Conservation)	Low
Minor watercourses/ drainage ditches	Water quality Functions as surface water or agricultural drainage	Low
	Recreation/other uses Limited access for horse riding, walking, bird watching.	Low
	Biodiversity Not designated for nature conservation value, but may provide habitat to fauna and flora (see Chapter 10: Ecology and Nature Conservation)	Low
Other surface water features	Water quality Functions as surface water or agricultural drainage	Low
	Recreation/other uses Limited access for horse riding, walking, bird watching.	Low

Receptor	Attributes	Importance
	Biodiversity Not designated for nature conservation value, but may provide habitat to fauna and flora (see Chapter 10: Ecology and Nature Conservation)	Low
Groundwater		
Principal Aquifer (Aire and Don Sherwood Sandstone)	Water quality WFD: failing chemical status, quantitative status Good Principal Aquifer	High
	Water supply Water supply potable uses Industrial abstractions >1,000 m ³ /day Designated as a Drinking Water Protected Area	Very high
Secondary A Aquifer (Lacustrine Beach Deposits, Alluvium, and Brighton Sand)	Water quality No WFD designation Secondary A Aquifer	Medium
Flood risk		
The Proposed Development*	Flood risk receptors (Vulnerability Classification)	Very high

* vulnerability of flood risk receptors elsewhere is determined on a case by case basis where flood risk elsewhere could be increased by the Proposed Development.

Future Baseline – Construction (2019)

- 11.4.81 Baseline conditions in 2019 are not expected to be significantly different to current baseline conditions. In respect of water quality, the WFD is driving improvements in waterbodies, but the deadline for the River Aire and the Ings and Tethering Drain to achieve 'good' ecological and chemical potential is 2027, and it is not anticipated that significant progress will have been made by 2019. The future baseline (2019) is therefore assessed to be similar to current baseline conditions.

Surface Water

- 11.4.82 In terms of water quality, the River Aire currently has moderate ecological potential and has good chemical potential. It is expected that the water quality will improve in the future, meeting the requirements of the WFD (good ecological and chemical potential) by 2027. No substantial change is, however, expected by 2019.
- 11.4.83 No substantial changes are anticipated to all other identified waterbodies by 2019.

Groundwater

- 11.4.84 Groundwater quality of the underlying Principal Aquifer is currently of failing chemical status, quantitative status good. It is expected that groundwater status will improve in the future, meeting the requirements of the WFD (good quantitative status and good chemical quality by 2027). No substantial change is, however, expected by 2019.

11.4.85 No substantial changes are anticipated to Secondary A Aquifer by 2019.

Flood Risk

11.4.86 It is unlikely that there will be any substantial change in the risk of flooding from all sources by 2019.

Future Baseline – Opening (2022)

11.4.87 By 2022, the decommissioning and demolition of the existing coal-fired power station is expected to have commenced (and may even have been completed). As described above, at present surface water from the existing coal-fired power station is collected and pumped to Gale Common to transport PFA. When the existing power station is decommissioned and demolished the existing pumped drainage system will no longer be in operation and surface water is anticipated to be attenuated within the existing power station site and discharged to local watercourses (River Aire, Ings and Tethering Drain and/or Hensall Dyke), subject to agreement with the Environment Agency and relevant IDB. As such the discharge of surface water from the areas of the Site within the existing coal-fired power station site will represent an increase in impact on local watercourses compared to the existing baseline conditions.

11.4.88 The topography across the existing power station site is also likely to be altered in the future baseline scenario as a result of demolition works. Inert materials such as concrete are intended to be crushed and re-used within the Site to minimise the volume of waste to be taken off site.

11.4.89 In the absence of the Proposed Development, cooling water abstraction and discharge to the River Aire associated with the existing coal-fired power station would have ceased by 2022.

11.4.90 All other baseline conditions in 2022 are not expected to be significantly different to the baseline conditions in 2019, as outlined above.

Future Baseline – Opening (2037)

11.4.1 In addition to the changes outlined above for the 2022 future baseline associated with the closure of the existing coal-fired power station, other baseline conditions in 2037 will be moderately different to current baseline conditions as set out below.

Surface Water

11.4.2 In terms of water quality, it is expected that water quality in the River Aire and the Ings and Tethering Drain will improve, meeting the requirements of the WFD (good ecological and chemical potential) by 2027. Although water quality within the River Aire and the Ings and Tethering Drain will have improved under this scenario, the importance of the water quality attribute will remain unchanged as the waterbodies will continue to have water quality objectives under the WFD and, it is assumed, the size of the respective river channels will remain unchanged.

11.4.3 No substantial changes are anticipated to all other identified waterbodies by 2037. It is noted that some of the other water features currently located within areas of the Site within the existing coal-fired power station site will no longer be present (due to the decommissioning and demolition of the existing coal-fired power station).

Groundwater

- 11.4.4 It is expected that groundwater status will improve by 2037, meeting the requirements of the WFD (good quantitative status and good chemical quality). It is unlikely that the importance of the groundwater attributes will change as the Aire and Don Sherwood Sandstone will continue to have water quality objectives under the WFD and will remain designated as a Principal Aquifer.
- 11.4.5 Water quality within the Secondary A Aquifer may have improved under this scenario however, no substantial changes are anticipated to the attributes of the Secondary A Aquifer by 2037.

Flood Risk

- 11.4.6 Based on the Environment Agency climate change guidance it is likely that the peak river flow in the River Aire, Ings and Tethering Drain, Hensall Dyke and the minor watercourses will have increased by a maximum of 20% by the year 2037, based on predictions for the Humber River Basin District. Peak rainfall intensity is also predicted to increase by a maximum of 10% across the same timescale.
- 11.4.7 The impact of climate change, as outlined above, is likely to increase the risk of flooding to the Proposed Development and the surrounding area from all sources with the predominant flood risks being fluvial and surface water flooding.
- 11.4.8 Given the potential changes outlined above, the future baseline (2037) is therefore assessed as a worst case scenario against the operational phase of the Proposed Development.

Future Baseline – Decommissioning (2047)

- 11.4.1 Assuming there is no change to current legislation, baseline conditions in 2047 for surface water and groundwater resources are not expected to be significantly different to the baseline conditions in 2037, as outlined above.

Flood Risk

- 11.4.2 Environment Agency climate change guidance predicts that the peak river flow in the River Aire, Ings and Tethering Drain, Hensall Dyke and the minor watercourses will have increased by a maximum of 30% by the year 2047. Peak rainfall intensity is also predicted to increase by a maximum of 20% across the same timescale.
- 11.4.3 Based on the above, the impact of climate change is likely to increase the risk of flooding from all sources, above that predicted in 2037, to the Proposed Development and the surrounding area.

11.5 Development Design and Impact Avoidance

- 11.5.4 The Proposed Development has the potential to impact on both the surface and groundwater resources in the vicinity of the Site through both quality and quantity changes (though quantitative changes are only considered here in relation to the any general changes to the quantity of a waterbody as a resource).

- 11.5.5 The surface and ground waterbodies as described above have been assessed for the likelihood of actual effects occurring as a result of the Proposed Development.

Impact Avoidance

- 11.5.6 The following impact avoidance measures have either been incorporated into the design or are standard construction or operational practices. These measures have, therefore, been taken into account during the impact assessment process.

Construction

- 11.5.7 For the purposes of this assessment, it is assumed that the measures set out below will be required of any contractors undertaking construction work in relation to the Proposed Development.
- 11.5.8 As a general measure to protect ground and surface water from a range of potentially dangerous activities associated with construction of this type, best practice will be implemented through a Construction Environmental Management Plan (CEMP), whilst the contractors undertaking works at the Proposed Development will comply with relevant guidance during construction, including the Environment Agency PPGs listed at paragraph [11.2.39] above and IDB byelaws listed at paragraph [11.2.38]. A framework CEMP will be provided with the ES to support the DCO application.

Staff Awareness/ Training

- 11.5.9 The contractor(s) will ensure that site personnel are fully aware of the potential impact to water resources associated with the proposed construction works and procedures to be followed in the event of an accidental pollution event occurring. This will be included in the site induction and training, with an emphasis on procedures and guidance to reduce the risk of water pollution.

Pollution Plans

- 11.5.10 Plans to deal with accidental pollution will be drawn up and agreed with the Environment Agency prior to construction commencing and will also be included within the CEMP. The CEMP will include specific measures to manage pollution risks during construction of the Proposed Cooling Water and Gas Connections, which involve works in/ near to/ under the River Aire, Ings and Tethering Drain, and other minor watercourses and drains. Works to the existing cooling water abstraction and discharge infrastructure may require the use of coffer dams. The Proposed Gas Connection will be directionally drilled under the tidal section of the River Aire (in accordance with a Deemed Marine Licence (part of the DCO)), whereas open cut trench methods will be used to cross Ings and Tethering Drain and other minor watercourses and drains.
- 11.5.11 Any necessary equipment (e.g. spillage kits) will be held on site and all site personnel will be trained in their use. The Environment Agency will be informed immediately in the unlikely event of a suspected pollution incident.

Storage of Materials

11.5.12 The CEMP will incorporate measures set out in the Environment Agency PPG documents listed at paragraph 11.2.39 above. Examples of such measures include:

- placing arisings and temporary stockpiles outside of the Flood Zone 3 flood extent and away from drainage systems, and directing surface water away from stockpiles to prevent erosion;
- containment measures will be implemented, including drip trays, bunding or double-skinned tanks of fuels and oils; all chemicals will be stored in accordance with their Control of Substances Hazardous to Health (COSHH) guidelines (Health and Safety Executive, 2002), whilst spill kits will be provided in areas of fuel/ oil storage;
- an Emergency Spillage Plan will be produced, which site staff will have read and understood;
- the mixing and handling of materials will be undertaken in designated areas and away from surface water drains;
- plant and machinery will be kept away from surface water bodies wherever possible and will have drip trays installed beneath oil tanks/ engines/ gearboxes and hydraulics, which will be checked and emptied regularly. Refuelling and delivery areas will be located away from surface water drains; and
- exposed ground and stockpiles will be protected as appropriate and practicable to prevent windblown migration of potential contaminants. Water suppression will be used if there is a risk of fugitive dust emissions (see also Chapter 8: Air Quality).

Discharge/ Disposal of Site Runoff/ Material

11.5.13 Plans for the discharge and/ or disposal of potentially contaminated water will be agreed in advance with the Environment Agency, NYCC/ SDC and the relevant IDB where appropriate, and permits obtained as required. The existing Environmental Permit for the coal-fired power station is being substantially varied to accommodate the proposed gas-fired power station; therefore existing discharge points, monitoring, controls and limits will be retained and amended as appropriate to manage effluent discharges from the installation.

11.5.14 All foul water from any site compound (including temporary toilets) will be either tankered away to an appropriate disposal facility by a licensed waste disposal contractor, or discharged via connection to the existing foul sewer. Any potentially contaminated water will be tested, and if it is not of a suitable quality, agreed disposal procedures will be followed. Construction drainage details will be developed in consultation with the Environment Agency.

11.5.15 As will be detailed in the CEMP, if any suspected contaminated material is discovered during the works, it will be tested and dealt with appropriately. If material is considered to be contaminated it will be disposed of to a licensed facility (see also Chapter 12: Geology, Hydrogeology and Land Contamination).

11.5.16 Any waters removed from excavations by dewatering will be discharged appropriately, subject to the relevant licenses being obtained.

11.5.17 Foundations and services will be designed and constructed to prevent the creation of pathways for the migration of contaminants and will be constructed of materials that are suitable for the ground conditions and designed use. For example, water supply pipes will be

designed in accordance with current good practice and applicable guidance to ensure pipes are protected from potential impacts associated with contamination.

- 11.5.18 In addition no discharges from any self-contained wheel wash and localised wheel wash will be permitted to discharge into any surface water system.

Temporary Drainage and Settlement

- 11.5.19 Temporary drainage facilities will be provided during the construction phase, where necessary, to ensure controlled discharge of surface water runoff.

- 11.5.20 It will be a contractual requirement of the contractor to ensure that runoff from the Site does not cause pollution or flooding. Measures that will be considered for implementation for temporary drainage through the construction design and/or CEMP include:

- installation of measures such as swales, silt fences and appropriately sized settlement tanks/ ponds to reduce sediment load;
- cut-off ditches or geotextile silt-fences, installed around excavations, exposed ground and stockpiles to prevent uncontrolled release of sediments from the Proposed Development;
- Site access points will be regularly cleaned to prevent build-up of dust and mud;
- a valve will be installed to isolate the settlement tank/ ponds in the event of a polluted discharge;
- oil interceptors to be installed (notably the outflow from the settlement pond/ tank) to reduce the potential risk for contamination of groundwater and surface water; and
- all potentially polluted waters (including washdown areas, stockpiles and other areas of risk for water pollution) to have separate drainage and to be tankered away from the Site.

- 11.5.21 In addition, if monitoring (see below) demonstrates unsatisfactory levels of solids or other pollutants, measures will be implemented (e.g. changes to site drainage and settlement facilities and/or use of flocculants) to control suspended solids or other polluted discharge to watercourses.

Wastewater Generation

- 11.5.22 A connection to the foul sewer will be needed for sanitary connection from offices/ admin/ welfare facilities. It is possible this connection may also be licensed for discharge of process effluent in abnormal circumstances if required. However, this will depend on the final design of the plant. Foul drainage will either be discharged to the Yorkshire Water waste water treatment plant (adjacent to the Site, to the north of the Proposed Construction Laydown area) or to a septic tank within the Site that will be emptied as required and tankered off site to a waste water treatment plant.

Flood Risk

- 11.5.23 The proposed crossings of the River Aire and the Ings and Tethering Drain lie within Flood Zone 3b – Functional Floodplain. With the likelihood that the River Aire will flood during the duration of the proposed works, the emphasis is placed on managing and mitigating the risks to the proposed temporary works as well as not increasing the flood risk elsewhere.
- 11.5.24 Construction works undertaken adjacent to, beneath and within watercourses (including the construction of the Proposed Cooling Water and Gas Connections) will comply with relevant

guidance during construction, including the Environment Agency PPGs and the requirements of the Selby IDB and Danvm Drainage Commission byelaws, particularly Byelaws 3,6, 10 and 17.

11.5.25 The CEMP will incorporate measures aimed at preventing an increase in flood risk during the construction works. Examples of such measures include:

- topsoil and other construction materials will be stored outside of the 1 in 100 year floodplain extent and only moved to the temporary works area immediately prior to use;
- connectivity will be maintained between the floodplain and the River Aire, with no changes in ground levels within the floodplain;
- the construction laydown area site office and supervisor will be notified of any potential flood occurring by use of the Floodline Warnings Direct service; and
- the Contractor will be required to produce a Flood Risk Management Action Plan/ Method Statement which will provide details of the response to an impending flood and include –
 - a 24 hour availability and ability to mobilise staff in the event of a flood warning,
 - the removal of all plant, machinery and material capable of being mobilised in a flood for the duration of any holiday close down period,
 - details of the evacuation and site closedown procedures, and
 - arrangements for removing any potentially hazardous material and anything capable of becoming entrained in floodwaters, from the temporary works area.

Operation

11.5.26 A number of the impact avoidance measures employed during the construction phase will remain for the operation phases of the development (where relevant), and will be through the site operator's Environmental Management System (EMS), for example:

- plans to deal with accidental pollution and any necessary equipment (e.g. spillage kits) will be held on site and all site personnel will be trained in their use, for example the plan will incorporate details on how to appropriately deal with accidental spillages to ensure they are not drained to any surface water system;
- containment measures will be implemented, including bunding or double-skinned tanks for fuels and oils; all chemicals will be stored in accordance with their COSHH guidelines; and
- interceptors will be incorporated into the drainage system to prevent material entering the surface water drainage system or local waterbodies.

Contaminated Fire Water

11.5.27 In the event of a fire, the surface water drainage system will be closed to prevent contaminated water being released through surface water drains. Fire water will be contained on site and either disposed off-site in accordance with waste management legislation (if contaminated) or discharged to surface water (Hensall Dyke or River Aire) if the water quality is acceptable for surface water discharge (and subject to agreement with the Environment Agency and/ or the Danvm Drainage Commissioners). This strategy will prevent pollution of surface and ground waterbodies.

Abnormal Events

- 11.5.28 A plan will be developed in order to deal with abnormal events requiring boiler water drain down. The plan will detail where boiler water will be contained on site; options include the oversizing of the process effluent tank and/ or a dedicated separate tank. Water collected in such circumstances will be retained for reuse or taken off site for appropriate disposal.
- 11.5.29 Similarly, during commissioning of the plant an acid boiler clean will likely be required; contaminated wastewater from this clean will be retained in process tanks and tankered off site for appropriate treatment and disposal.

Site Drainage

- 11.5.30 An Outline Drainage Strategy has been produced see Appendix 11A (Flood Risk Assessment, including an outline Drainage Strategy as Annex 5)
- 11.5.31 The description below represents the strategy for what is proposed to be included as a minimum and will incorporate features such as:
- piped gravity system discharging at a restricted rate to the existing open channel of Hensall Dyke to the south-east of the Proposed Power Plant Site (subject to agreement with Danvm IDB);
 - separate networks for roof drainage and hardstanding areas, with runoff from hardstanding areas passed through oil interceptors, attenuated within the Site prior to discharge to Hensall Dyke;
 - surface water discharged from the Proposed Development will be restricted to the greenfield runoff rate, approximately 1.4 l/s/ha, via attenuation methods (with an estimated storage volume in the range of 13,700 m³ and 19,300 m³ for a 1 in 30 year event) and appropriate flow control device located within the Site boundary;
 - other SuDS techniques such as swales, permeable paving and soakaways, to attenuate flow from the Site and maximise infiltration (where appropriate), may be considered at the detailed design stage ;
 - for the management of foul water it is proposed that the Proposed Development is connected to either the Yorkshire Water waste water treatment plant on Wand Lane adjacent to the Site or to a septic tank within the Site which would be emptied as required and tinkered off site for treatment; and
 - silt traps and interceptors will be installed where appropriate.
- 11.5.32 The details set out in the drainage strategy (Appendix 11A (Flood Risk Assessment, including an Outline Drainage Strategy as Annex 5) represent an outline design and will be developed through detailed design and in response to requirements identified through the detailed design process.
- 11.5.33 Where surface water drainage to Hensall Dyke is proposed during operation of the Proposed Development (Appendix 11A (Flood Risk Assessment, including an Outline Drainage Strategy as Annex 5)) the Danvm Drainage Commissioners will be consulted regarding consenting requirements.
- 11.5.34 Land drainage along the Proposed Gas Connection corridor will remain at greenfield runoff rates and all land drains/ minor watercourses will be reinstated to ensure farmland drains

appropriately following construction of the pipeline. A commitment to undertake a study to identify all land drainage features with potential to be affected by the construction of the pipeline, and measures to ensure they are appropriately reinstated, will be included as a Requirement in the draft DCO.

Flood Risk

- 11.5.35 The Applicant will subscribe to the Environment Agency's Flood Alert Service in the area.
- 11.5.36 As a precaution, flood resilience measures will be incorporated into the Proposed Development to minimise the amount of damage and reduce the recovery time in the unlikely case of the Site becoming inundated. During construction the opportunity will be taken to adopt flood resilient design techniques for the terrestrial elements of the Proposed Development. The following resilient measures have been identified as possible options for inclusion at this site, subject to final design:
- placement of main plant and flood sensitive equipment above the River Aire 1 in 100 year flood level plus an allowance for climate change (7.65 mAOD);
 - finished floor level raised 300 mm above adjacent ground levels, where possible;
 - adequate containment of storage areas to ensure material does not wash away and cause pollution;
 - flood proofing including the use of flood resistant building materials, use of water resistant coatings, use of galvanised and stainless steel fixings and raising electrical sockets and switches;
 - inclusion in the existing Power Station's emergency response procedures including the recommendation of at least one Flood Warden for the Proposed Power Plant Site;
 - as a precaution, the AGI, located in Flood Zone 2, will not be visited for maintenance work when a flood warning is in effect on the River Aire;
 - implementation of a Surface Water Management Strategy; and
 - oil interceptors will be based on guidance within PPG3 (Ref 12-14) and are likely to be Class 1 Full Retention systems.
- 11.5.37 Further details are included within the FRA presented as Appendix 11A (PEI Report Volume III).

Decommissioning

- 11.5.38 A detailed Decommissioning Environmental Management Plan will be prepared to identify required measures to prevent pollution during this phase of the development, based on the detailed decommissioning plan.
- 11.5.39 The impact avoidance measures for decommissioning will be similar to those identified above for construction.

11.6 Likely Impacts and Effects

Construction

- 11.6.40 The surface watercourses described above (River Aire and Ings and Tethering Drain, Hensall Dyke, Minor Watercourses and Other Water Features) have been assessed for the likelihood of

actual effects occurring as a result of the construction phase of the Proposed Development, as has the groundwater resource below ground.

Surface Water Contaminated Runoff Entering Watercourses and Spillage of Pollutants

- 11.6.41 During construction, there is an elevated risk of leakage or accidental spillage of building materials and potential pollutants used on Site, migrating to nearby surface watercourses or infiltrating to groundwater. Washout facilities (washing of tools, plant and equipment), storage and use of various liquids and soluble solids, unstable exposed soils, excavated materials, stored aggregates, contaminated road surfaces, and fuel storage and handling all have the potential to result in pollution of water resources. Inappropriate disposal of waste materials associated with the construction phase also has the potential to enter surface water.
- 11.6.42 Some construction activities could have the potential to create pathways through the subsurface strata and lead to contamination of the underlying Principal Aquifer. A significant accidental discharge of fuel, for example, or a toxic substance would be detrimental to surface water and groundwater receptors and attributes.
- 11.6.43 Contaminated material exposed or disturbed during the construction works has the potential to affect surface water or groundwater (as discussed in Chapter 12: Geology, Hydrogeology and Land Contamination). As described, there is not a significant risk of impact from contaminated material on surface water and groundwater receptors after the implementation of impact avoidance measures. Details are provided in Chapter 12: Geology, Hydrogeology and Land Contamination which should be referred to for further information.
- 11.6.44 With the measures set out in the Impact Avoidance section above, the likelihood of such an event occurring is low. Taking this into account, and based on the information available to date, the anticipated potential effects on different attributes are described below.

River Aire

- 11.6.45 Potential contamination impacts and effects on the River Aire are assessed below.
- water quality and WFD status (high importance) -
 - possibility of a measurable but highly localised and temporary change in water quality, assuming a very worst case scenario (this conclusion is reached having consideration to the dilution potential of the River and its current quality). The potential impact is evaluated to be of low magnitude, and whilst effects might be experienced in the localised area, no effect on the quality of the River and WFD status would be experienced with the implementation of the impact avoidance measures,
 - the significance of this effect is therefore considered to be minor adverse (and unlikely to occur based on the impact avoidance measures to be implemented);
 - water supply (very high importance) –
 - there exists the potential for a localised temporary impact on water supply, but given the localised nature and the level of dilution provided within the River itself, the potential impact is evaluated to be of low magnitude on the River Aire,

- the resulting effect would be minor adverse (and unlikely to occur based on the impact avoidance measures to be implemented);
- recreation (high importance) -
 - there exists the potential for a localised temporary impact on recreational activity such as walking and river navigation, but given the localised nature, such an impact is evaluated to be of low magnitude as a worst case scenario,
 - the resulting effect would be minor adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- biodiversity (high importance) -
 - there is the possibility of a highly localised effect on water quality that could potentially have a temporary and localised ecological impact, however the impact and effect would be constrained to the area immediately adjacent to the Site (fish, invertebrates etc. being affected from the changes to water quality) and the impact is evaluated to be of very low magnitude due to high level of dilution,
 - the significance of this effect is therefore considered to be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented).

Ings and Tethering Drain

11.6.46 Potential contamination impacts and effects on Ings and Tethering Drain are assessed below.

- water quality and WFD status (high importance) -
 - possibility of a measurable but highly localised and temporary change in water quality, assuming a very worst case scenario (this conclusion is reached having consideration to the dilution potential of the Drain and its current quality). The potential impact is evaluated to be of low magnitude, and whilst effects might be experienced in the localised area, no effect on the quality of the Drain and WFD status would be experienced with the implementation of the impact avoidance measures,
 - the significance of this effect is therefore considered to be minor adverse (and unlikely to occur based on the impact avoidance measures to be implemented);
- recreation (low importance) -
 - there exists the potential for a localised temporary impact on recreational activity such as walking, but given the localised nature, such an impact is evaluated to be of low magnitude as a worst case scenario,
 - the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- biodiversity (high importance) -
 - there is the possibility of a highly localised effect on water quality that could potentially have a temporary and localised ecological impact, however the impact and effect would be constrained to the area immediately adjacent to the Site (fish,

invertebrates etc. being affected from the changes to water quality) and the impact is evaluated to be of low magnitude due to the moderate level of dilution,

- the significance of this effect is therefore considered to be minor adverse (and unlikely to occur based on the impact avoidance measures to be implemented).

Hensall Dyke

11.6.47 Potential contamination impacts and effects on Hensall Dyke are assessed below.

- water quality (medium importance) -
 - possibility of a measurable but highly localised and temporary change in water quality, assuming a very worst case scenario (this conclusion is reached having consideration to the dilution potential of the Dyke and its current quality). The potential impact is evaluated to be of low magnitude, and whilst effects might be experienced in the localised area, no effect on the quality of the Dyke would be experienced with the implementation of the impact avoidance measures,
 - the significance of this effect is therefore considered to be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented);
- recreation (low importance) -
 - there exists the potential for a localised temporary impact on recreational activity such as walking, but given the localised nature, such an impact is evaluated to be of low magnitude as a worst case scenario,
 - the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- biodiversity (low importance) -
 - possible localised and temporary ecological impact resulting from the effect on water quality, impact of very low magnitude,
 - this would have a temporary negligible adverse effect (but is unlikely to occur based on impact avoidance measures to be implemented).

Minor Watercourses/ Drainage Ditches

11.6.48 Potential contamination impacts and effects on minor watercourses and drainage ditches are assessed below.

- water quality (low importance) -
 - possible measurable but highly localised and temporary change in water quality, assuming a very worst case scenario, however the likelihood is considered very low due to the ephemeral nature of the watercourses. The potential impact is evaluated to be of low magnitude, and whilst effects might be experienced in the localised area, no effect on the quality of the watercourses would be experienced with the implementation of the impact avoidance measures,
 - the significance of this effect is therefore considered to be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented).

- recreation (low importance) -
 - there exists the potential for a localised temporary impact on recreational activity such as walking, but given the localised nature, such an impact is evaluated to be of low magnitude as a worst case scenario,
 - the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- biodiversity (low importance) -
 - possible localised and temporary ecological impact resulting from the effect on water quality, impact of very low magnitude,
 - this would have a temporary negligible adverse effect (but is unlikely to occur based on impact avoidance measures to be implemented).

Other Surface Water Features

11.6.49 Potential contamination impacts and effects other surface water features are assessed below.

- water quality (low importance) -
 - possible highly localised and temporary change in water quality, assuming a very worst case scenario, impact of very low magnitude,
 - this would have a temporary negligible adverse effect (but is unlikely to occur based on impact avoidance measures to be implemented).
- recreation (low importance) -
 - there exists the potential for a localised temporary impact on recreational activity, an impact of very low magnitude as a worst case scenario,
 - the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- biodiversity (low importance) –
 - possible localised and temporary ecological impact resulting from the effect on water quality, impact of very low magnitude,
 - this would have a temporary negligible adverse effect (but is unlikely to occur based on impact avoidance measures to be implemented).

Surface Water – Suspended Sediments in Site Runoff

- 11.6.50 The movement and storage of construction and waste materials to and from the Site, and from other construction activities has the potential to give rise to suspended solids that could become entrained in surface water run-off from the Site following rainfall. This creates a potential risk of increased sediment loads being discharged into the nearby surface water.
- 11.6.51 High sediment input has the potential to affect waterbodies by increasing turbidity, reducing dissolved oxygen (DO) levels and reducing light penetration. There could also be toxic effects caused by inorganic and organic compounds associated with suspended sediment. Indirect

effects could include impacts on invertebrates and fish communities, and destruction of feeding areas, refuges and both breeding and spawning grounds.

- 11.6.52 With the measures set out in the Impact Avoidance section above (including the implementation of a CEMP), however, the likelihood of this occurring will be very low. Taking this into account, the following effects on different attributes are described below.

River Aire

- 11.6.53 Potential impacts and effects on the River Aire from suspended sediments are assessed below.

- water quality and WFD status (high importance) -
 - possible localised and temporary changes in water quality, no effect on water quality and WFD status would be experienced, impact of very low magnitude,
 - the significance of this effect is therefore considered to be negligible adverse;
- water supply (very high importance)
 - there exists the potential for a localised temporary impact on water supply, but given the localised nature and the level of dilution provided within the River itself, the potential impact is evaluated to be of very low magnitude on the River Aire,
 - the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- recreation (high importance) -
 - there exists the potential for a localised temporary impact on recreational activity, but given the localised nature, such an impact is evaluated to be of very low magnitude as a worst case scenario,
 - the resulting effect would be negligible adverse; and
- biodiversity (high importance) -
 - it is possible that the River Aire could experience a localised and temporary impact with the potential to affect ecology (fish, invertebrates etc., resulting from a change in water quality). Considering a worst case scenario, this impact is evaluated to result in an impact of very low magnitude in the localised area immediately adjacent to the Site,
 - the significance of this effect is therefore considered to be negligible adverse.

Ings and Tethering Drain

- 11.6.54 Potential impacts and effects on Ings and Tethering Drain from suspended sediments are assessed below.

- water quality and WFD status (high importance) -
 - possible localised and temporary changes in water quality, no effect on water quality and WFD status would be experienced, impact of low magnitude,

- the significance of this effect is therefore considered to be minor adverse (and unlikely to occur based on the impact avoidance measures to be implemented);
- recreation (low importance) -
 - there exists the potential for a localised temporary impact on recreational activity such as walking, but given the localised nature, such an impact is evaluated to be of low magnitude as a worst case scenario,
 - the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- biodiversity (high importance) -
 - possible localised and temporary changes in water quality, no effect on water quality and WFD status would be experienced, impact of low magnitude,
 - the significance of this effect is therefore considered to be minor adverse (and unlikely to occur based on the impact avoidance measures to be implemented).

Hensall Dyke

11.6.55 Potential impacts and effects on Hensall Dyke from suspended sediments are assessed below.

- water quality (medium importance) -
 - possible localised and temporary changes in water quality, no effect on water quality would be experienced, impact of low magnitude,
 - the significance of this effect is therefore considered to be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented);
- recreation (low importance) -
 - there exists the potential for a localised temporary impact on recreational activity such as walking, but given the localised nature, such an impact is evaluated to be of low magnitude as a worst case scenario,
 - the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- biodiversity (low importance) -
 - possible localised and temporary ecological impact resulting from the effect on water quality, impact of very low magnitude,
 - this would have a temporary negligible adverse effect (but is unlikely to occur based on impact avoidance measures to be implemented).

Minor Watercourses/ Drainage Ditches

11.6.56 Potential impacts and effects on minor watercourses and drainage ditches from suspended sediments are assessed below.

- water quality (low importance) -
 - possible localised and temporary changes in water quality, no effect on water quality status would be experienced, impact of low magnitude,
 - the significance of this effect is therefore considered to be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented).
- recreation (low importance) -
 - there exists the potential for a localised temporary impact on recreational activity such as walking, but given the localised nature, such an impact is evaluated to be of low magnitude as a worst case scenario,
 - the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- biodiversity (low importance) -
 - possible localised and temporary ecological impact resulting from the effect on water quality, impact of very low magnitude,
 - this would have a temporary negligible adverse effect (but is unlikely to occur based on impact avoidance measures to be implemented).

Other Surface Water Features

11.6.57 Potential impacts and effects on other surface watercourses from suspended sediments are assessed below.

- water quality (low importance) -
 - possible highly localised and temporary change in water quality, assuming a very worst case scenario, impact of very low magnitude,
 - this would have a temporary negligible adverse effect (but is unlikely to occur based on impact avoidance measures to be implemented).
- recreation (low importance) -
 - there exists the potential for a localised temporary impact on recreational activity, an impact of very low magnitude as a worst case scenario,
 - the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- biodiversity (low importance) –
 - possible localised and temporary ecological impact resulting from the effect on water quality, impact of very low magnitude,
 - this would have a temporary negligible adverse effect (but is unlikely to occur based on impact avoidance measures to be implemented).

Disturbance of Contaminated Materials

- 11.6.58 Contaminated material exposed or disturbed during the construction works has the potential to affect surface water or groundwater (as discussed in Chapter 12: Geology, Hydrogeology and Land Contamination). As described, there is not a significant risk of impact from contaminated material on surface water and groundwater receptors after the implementation of defined impact avoidance measures. Therefore the significance of this effect is assessed as negligible. Details are provided in Chapter 12: Geology, Hydrogeology and Land Contamination, which should be referred to for further information.

Loss of Existing Lagoon

- 11.6.59 The existing lagoon is anticipated to be lost during the construction phase due to the need for this area for construction laydown space, and the ultimate severing of any supply to the pond when the new surface water drainage system for the Proposed Development is installed.
- 11.6.60 The lagoon is considered to be of low importance, and therefore the loss of this feature would be expected to be of negligible significance. This is considered further in Chapter 10: Ecology and Nature Conservation.

Groundwater – Accidental Leakage or Spillage of Pollutants

- 11.6.61 As discussed in relation to impacts on surface water, during the construction phase there is a low risk of leakage or accidental spillage of potential pollutants used during construction, which may then migrate to underlying groundwater (though the impact avoidance measures set out above will minimise the risk).
- 11.6.62 The Site is underlain by superficial deposits that are classed, predominantly, as a Secondary A Aquifer with soils having a high leaching potential. The superficial deposits will provide limited protection to the Principal Aquifer below however, measures included in Chapter 12: Geology, Hydrogeology and Land Contamination and in the impact avoidance section above will act to prevent such an incident from occurring, and therefore it is assumed the impact from an event would be of low magnitude and the significance of effect is assessed as minor adverse (but unlikely to occur) to the Principal Aquifer.
- 11.6.63 The impact on the water quality and quantity of the perched groundwater (Secondary A Aquifer of medium importance) would potentially be of moderate magnitude, although some attenuation of pollutants would occur in the superficial deposits, and there would be a negligible effect on the attribute. This is based on the poor quality of the Secondary A Aquifer (superficial aquifer of low importance based on it being an attribute of low quality).

Operation

- 11.6.64 Once the Proposed Development is open and operational it is considered that the majority of identified watercourses assessed during the construction phase will not be affected by the development.
- 11.6.65 Only the river Aire, Hensall Dyke, and the Minor Watercourses located in the vicinity of the AGI have been assessed for the likelihood of actual effects occurring as a result of the operational phase of the Proposed Development, as has the groundwater resource below ground.

- 11.6.66 The Proposed Development will continue to utilise the River Aire in terms of abstraction/ discharge of cooling water (as the existing coal-fired power station does) whilst Hensall Dyke will receive surface water drainage from the Proposed Power Plant Site.

Surface Water – Leakage from Drainage System

- 11.6.67 An Outline Drainage Strategy has been developed for the Proposed Development, as detailed in Appendix 11A (Flood Risk Assessment, Annex 5) (PEI Report Volume III)).
- 11.6.68 The proposed drainage system will be designed to ensure any polluting waste is discharged directly to a foul sewer and that any uncontaminated surface water is discharged directly to Hensall Dyke at greenfield rates via attenuation methods. Whilst pollution prevention features will be included in the design as set-out in the Impact Avoidance section above, there always remains the potential for leakage from the system to occur (albeit the risk is very low).
- 11.6.69 The effects of any accidental pollution from foul drainage on different attributes of the identified watercourses will be:

Hensall Dyke

- 11.6.70 Potential impacts and effects on Hensall Dyke from any leakage from the drainage system are assessed below.
- water quality (medium importance) -
 - possible localised and temporary changes in water quality, no effect on water quality would be experienced, impact of low magnitude,
 - the significance of this effect is therefore considered to be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented);
 - recreation (low importance) -
 - there exists the potential for a localised temporary impact on recreational activity such as walking, but given the localised nature, such an impact is evaluated to be of low magnitude as a worst case scenario,
 - the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
 - biodiversity (low importance) -
 - possible localised and temporary ecological impact resulting from the effect on water quality, impact of very low magnitude,
 - this would have a temporary negligible adverse effect (but is unlikely to occur based on impact avoidance measures to be implemented).

Minor Watercourses/ Drainage Ditches

- 11.6.71 Potential impacts and effects on minor watercourses and drainage ditches from any leakage from the drainage system are assessed below.

- water quality (low importance) -
 - possible localised and temporary changes in water quality, no effect on water quality status would be experienced, impact of low magnitude,
 - the significance of this effect is therefore considered to be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented).
- recreation (low importance) -
 - there exists the potential for a localised temporary impact on recreational activity such as walking, but given the localised nature, such an impact is evaluated to be of low magnitude as a worst case scenario,
 - the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- biodiversity (low importance) -
 - possible localised and temporary ecological impact resulting from the effect on water quality, impact of very low magnitude,
 - this would have a temporary negligible adverse effect (but is unlikely to occur based on impact avoidance measures to be implemented).

Surface Water – Contamination of Site Runoff

11.6.72 The impacts associated with contamination of surface water (with sediments, fuels etc.) are considered to be the same as those assessed in relation to leakage from the drainage system, as any potentially polluting substances would be stored inside buildings as set out below. Implementation of the Impact Avoidance measures as described above will ensure the risk of contamination of site runoff is low.

11.6.73 The potential effects of pollution from contaminated surface runoff will be:

Hensall Dyke

11.6.74 Potential impacts and effects on Hensall Dyke from contaminated runoff are assessed below.

- water quality (medium importance) -
 - any contaminated run off is likely to infiltrate into the surface layers or pond on the surface, allowing clean up, prior to reaching the watercourse. The surface drainage system will be designed with attenuation features that have the potential to capture any contaminated runoff for treatment. If, however, a spillage of pollutant did reach Hensall Dyke, or a leak occurred in the foul drainage system, considering the importance of the attribute, the potential impact would be localised, temporary and of low magnitude,
 - the significance of this effect is therefore considered to be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented);
- recreation (low importance) -

- there exists the potential for a localised temporary impact on recreational activity such as walking, but given the localised nature, such an impact is evaluated to be of low magnitude as a worst case scenario,
- the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- biodiversity (low importance) -
 - possible localised and temporary ecological impact resulting from the effect on water quality, impact of very low magnitude,
 - this would have a temporary negligible adverse effect (but is unlikely to occur based on impact avoidance measures to be implemented).

Minor Watercourses/ Drainage Ditches

11.6.75 Potential impacts and effects on minor watercourses and drainage ditches from contaminated runoff are assessed below.

- water quality (low importance) -
 - possible localised and temporary changes in water quality, no effect on water quality status would be experienced, impact of low magnitude,
 - the significance of this effect is therefore considered to be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented).
- recreation (low importance) -
 - there exists the potential for a localised temporary impact on recreational activity such as walking, but given the localised nature, such an impact is evaluated to be of low magnitude as a worst case scenario,
 - the resulting effect would be negligible adverse (and unlikely to occur based on the impact avoidance measures to be implemented); and
- biodiversity (low importance) -
 - possible localised and temporary ecological impact resulting from the effect on water quality, impact of very low magnitude,
 - this would have a temporary negligible adverse effect (but is unlikely to occur based on impact avoidance measures to be implemented).

Drainage and Flow to Surface Water and Ground Waters

11.6.76 The changes to drainage have the potential to alter the discharge rates from the Site and thus flow dynamics within adjacent watercourses (increase in spate flows, scouring of the stream bed, etc.), along with increasing infiltration to groundwater and therefore recharge of the aquifer. Surface water discharge will be restricted to greenfield runoff rates and discharge to watercourses in line with local IDB byelaws, therefore effects on surrounding waterbodies, such as Hensall Dyke, would be minimal.

11.6.77 Although the detailed drainage design will not be completed until the detailed design stage, drainage will follow the existing site catchment and outfall routes to surface watercourses and

will be designed so as not to increase flood risk. These measures allow the design criterion of no flooding during a 1 in a 30 year plus climate change storm to be achieved.

- 11.6.78 The volumes of the proposed cooling water abstraction and discharge to the River Aire for the Proposed Development will be lower than for the existing coal-fired power station and the discharge is anticipated to be subject to the same restrictions on quality (via the Environmental Permit), so no adverse effects are anticipated.

Flood Risk

- 11.6.79 The FRA for the Proposed Development, included within Appendix 11A (PEI Report Volume III), concludes that development of the Site will not increase the risk of flooding from fluvial, groundwater or overland flow sources.
- 11.6.80 An Outline Drainage Strategy has been developed for the Site and is presented as Appendix 11A (Flood Risk Assessment, Annex 5) (PEI Report Volume III)). As detailed in the drainage strategy report surface water discharged from the Proposed Development will be restricted to the existing greenfield runoff rate via attenuation methods and an appropriate flow control device located within the Site boundary.
- 11.6.81 Design of the surface water network will be based on the following design rainfall return periods and criteria:
- no surcharging of the network for a 1 in 2 year return period/ peak discharge rate restricted to equivalent greenfield rate;
 - no flooding of the network for a 1 in 30 year return period/ peak discharge rate restricted to equivalent greenfield; and
 - no flooding off site for a 1 in 100 year return period/ peak discharge rate restricted to equivalent greenfield rate/ any flooding to be assessed to determine overland flow routes.
- 11.6.82 Based on the preliminary proposed catchment areas and allowable discharge rates a storm water attenuation volume in the range of 13,700 m³ and 19,300 m³ for a 1 in 30 year event is estimated to be required for 1 in 30 year storm event with a 30% climate change allowance.
- 11.6.83 The Site will be assessed as part of the detailed drainage design to consider the risk posed by any flooding up to and beyond the 1% (1 in 100 year) flood event. Any flooding will be diverted away from critical infrastructure or access routes and retained on the Site wherever possible.
- 11.6.84 Other SuDs techniques such as swales, permeable paving and soakaways may be considered at the detailed design stage.
- 11.6.85 The Outline Drainage Strategy is fully compliant with the requirements of the NPPF, local policy and the recommendations of the Environment Agency and Lead Local Flood Authority (NYCC) and the relevant IDBs.

Groundwater

- 11.6.86 Once the Proposed Development is operational, the probability of any operational activity occurring that would affect groundwater is low. There is, however, the potential for leakage or accidental spillage of potential pollutants (e.g. diesel fuel stored on site or vehicle washing)

that may migrate to the underlying groundwater. The Environmental Permit will contain a condition to prevent any contamination of land or groundwater during the operational phase of the Proposed Development.

- 11.6.87 Unless a direct pathway to the underlying Principal Aquifer is created in the construction phase (and it is assumed that impact avoidance measures incorporated into the design will prevent this from occurring) then it is considered highly unlikely that any contaminant would reach the Principal Aquifer during site operation and therefore the effect on the Principal Aquifer would be negligible.
- 11.6.88 The effect of a spillage on the superficial deposits (Secondary A Aquifer) could cause a measurable but localised temporary change in groundwater quality (impact of low magnitude). Given the medium importance of this attribute, the effect on the superficial aquifer would be negligible adverse.

Decommissioning

- 11.6.89 Decommissioning of the Proposed Development will see the removal of all above ground structures down to ground level such that the site is cleared with only areas of hardstanding remaining.
- 11.6.90 It is assumed that all underground infrastructure will remain in-situ, however, all connection and access points will be sealed or grouted to ensure disconnection.
- 11.6.91 On this basis, decommissioning impacts are expected to be limited to watercourses/ groundwater bodies in close proximity to the Proposed Power Plant Site and the AGI (Hensall Dyke and Minor watercourses) and will be the same as construction impacts, as discussed above.

Summary of Potential Impacts on WFD Status

- 11.6.92 The WFD status of the River Aire and Ings and Tethering Drain has been considered for each of the potential impacts described as part of this assessment.
- 11.6.93 Given the nature of the impacts (notably that they are largely of temporary nature and/or unlikely to affect the WFD elements), and assuming the measures included in the Impact Avoidance section are effectively implemented, there will be no effect on WFD status and objectives.
- 11.6.94 Mitigation measures already in place on the River Aire (including Ings and Tethering Drain) include the strategic management of sediment, bank rehabilitation, reducing impact of dredging and reducing sediment suspension.
- 11.6.95 Proposed WFD mitigation measures as included within the Humber RBMP include the preservation of marginal aquatic habitat, banks and the riparian zone, improving floodplain connectivity, appropriate vegetation control, set back and the removal of obsolete structures.
- 11.6.96 The Proposed Development is unlikely to significantly impact upon the ability of these mitigation measures to be implemented and for the current mitigation measures to remain. The effect on the WFD status of both the River Aire and the Ings and Tethering Drain is therefore likely to be negligible.

11.7 Mitigation and Enhancement Measures

11.7.97 A number of legislative and best practice measures which will be followed during the construction, opening and operation and decommissioning of the Proposed Development are detailed in the Development Design and Impact Avoidance section. The design and impact avoidance measures have been taken into account in the assessment and no additional mitigation requirements have been identified.

11.8 Residual Effects

11.8.98 As no mitigation measures additional to those described within the Development Design and Impact Avoidance section have been identified, the residual effects remain as described in the Likely Impacts and Effects section above. It is acknowledged that even with the implementation of impact avoidance measures, there is still a very limited potential for some residual risk to the water environment associated with the construction and operation of the Proposed Development.

11.9 Limitations or Difficulties

11.9.99 The analyses and conclusions presented in this chapter are based on the data available at the time of publication of this document. Specifically the assessment has drawn on information contained within baseline surveys carried out in relation to the Proposed Development, and readily available baseline information.

11.9.100 As the Proposed Development is refined following consultation on this PEI Report, the assessment presented in the ES will be revised as necessary.

11.10 Conclusions

11.10.101 This chapter assesses potential impacts from the Proposed Development on the quality and quantity of groundwater and surface waterbodies, and the effects of these potential changes on key receptors (or attributes). Water features that could potentially be affected include the River Aire and Ings and Tethering Drain, Hensall Dyke, minor watercourses and drainage ditches, other identified water features and groundwater.

11.10.102 The standard impact avoidance measures proposed will reduce the risk of many impacts occurring during the construction, operational and decommissioning phases. These include implementation of Environment Agency PPGs, construction staff awareness and training, implementation of pollution plans and the appropriate discharge/ disposal of site runoff.

11.10.103 The assessment has identified the 'worst case scenario', such as significant pollution events, which have a low probability of occurrence due to the procedures and measures that will be put in place.

11.10.104 Adverse residual effects on the key receptors have been assessed as minor adverse to negligible adverse and therefore not significant.

11.10.105 The FRA (Appendix 11A (PEI Report Volume III)) concludes that development of the Site will not increase the risk of flooding from fluvial, groundwater or overland flow sources.

11.11 References

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12.0 GEOLOGY, HYDROGEOLOGY AND LAND CONTAMINATION

12.1 Introduction

- 12.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential effects of the proposed Combined Cycle Gas Turbine (CCGT) power station near Eggborough, North Yorkshire (hereafter referred to as the 'Proposed Development') on geotechnical and geo-environmental ground conditions and groundwater.
- 12.1.2 This chapter describes the existing geological and hydrogeological conditions at the Proposed Development, and assess the likely nature and existing sources of contamination which may be present at the site. In addition, an assessment of the likely ground conditions to be encountered is made, based on a review of existing site investigations conducted at the Site. Having established baseline conditions, an assessment is made of the potential impacts to the existing geological and hydrogeological conditions from the Proposed Development and likely mitigation measures identified. [].
- 12.1.3 This chapter is supported by Appendix 12A (Phase 1 Geotechnical and Geo-Environmental Site Assessment) provided in PEI Report Volume III. It should be noted that some of the potential impacts and effects relating to the hydrogeology underlying the Proposed Development are also addressed within Chapter 11: Water Resources, Flood Risk and Drainage of this PEI Report due to the considerable overlap between the two subject areas.

12.2 Legislation and Planning Policy Context

Legislative Background

- 12.2.1 Redevelopment of brownfield land such as the Site must take into account the regulatory context of the work, provide information that is appropriate for development, and be in accordance with UK good practice. An environmental assessment of the condition of the Proposed Development site must not only consider the potential receptors of human health and controlled waters, but also include a review of the relevant legislation and planning policy that applies to the Proposed Development site and its immediate environs.

European Legislation

Water Framework Directive (WFD)

- 12.2.2 The European Union (EU) Water Framework Directive (WFD) (2000/60/EC) (Commission of the European Communities, 2000) is one of the key European Directives setting the context for the hydrogeological assessment included within this chapter. The purpose of the Directive is to establish a framework for the protection and improvement of groundwater, and inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters. The assessment of surface waters is described in Chapter 11: Water Resources, Flood Risk and Drainage.
- 12.2.3 The Directive requires the UK to classify the current condition of key waterbodies (giving a 'Status' or 'Potential') and to set objectives to either maintain the condition, or improve it where a waterbody is failing minimum targets. Any activities or developments that could cause deterioration within a nearby waterbody, or prevent the future ability of a waterbody to reach

its target Status, must be mitigated so as to reduce the potential for harm and allow the aims of the WFD to be realised.

Industrial Emissions Directive (IED)

- 12.2.4 The Industrial Emissions Directive (IED) (2010/75/EU) was adopted on November 24, 2010 (European Commission, 2010), and entered into force in January 2011. The IED included revisions to the existing Environmental Permitting Regulations (EPR) including the requirement to establish a baseline report for all regulated sites storing and handling hazardous materials as required in Article 22 of the IED. This process is outlined in the European Commission Guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EU on industrial emissions (2014/C136/03).
- 12.2.5 This guidance presented a seven-stage approach to generating a 'baseline report' which presents the condition of the land under the site for 'relevant hazardous substances' present at the site. Following completion of a desktop assessment, collation of a targeted set of baseline site condition data for the site may be needed to meet this requirement, including collection of samples of soil and groundwater and their analysis.
- 12.2.6 Article 16 of the IED requires monitoring of groundwater and soil condition to be carried out every 5 and 10 years respectively, with the scale and scope of this monitoring determined based on the findings of the baseline report.

Groundwater Daughter Directive (GDD)

- 12.2.7 The Groundwater Daughter Directive (2006/118/EC) was adopted in November 2006, and sets out the approach to protect groundwater against pollution and deterioration in response to Article 17 of the Water Framework Directive. The transposition of the GDD into law in England & Wales is achieved through the Groundwater Regulations (2009), implemented in England and Wales through the Environmental Permitting Regulations (2010) and two Directions to the Environment Agency from the Secretary of State and National Assembly for Wales. The first Direction sets out the principles for classifying groundwater and surface water bodies and the second Direction sets out water quality standards and groundwater threshold values.

7th Environment Action Programme (EAP)

- 12.2.8 The 7th EAP (Decision No. 1386/2013/EU) entered into force in January 2014, and is guided by the following long term vision:

"In 2050, we live well, within the planet's ecological limits. Our prosperity and healthy environment stem from an innovative, circular economy where nothing is wasted and where natural resources are managed sustainably, and biodiversity is protected, valued and restored in ways that enhance our society's resilience. Our low-carbon growth has long been decoupled from resource use, setting the pace for a safe and sustainable global society"

- 12.2.9 The 7th EAP is based around three priority areas requiring more action, including:

1. protect nature and strengthen ecological resilience,
2. boost resource-efficient, low-carbon growth; and

3. reduce threats to human health and wellbeing linked to pollution, chemical substances, and the impacts of climate change.

12.2.10 In relation to geology, hydrogeology and ground conditions, the first priority area identifies further action on soil protection and sustainable use of land, while the third area covers challenges to human health including air and water pollution, excessive noise and toxic chemicals.

National Legislation

12.2.11 There are three key statutes dealing with the risks posed to human health and the environment associated with historic land contamination, namely:

- Part IIA of the Environmental Protection Act, 1990 (the 'Contaminated Land' regime) (HMSO, 1990);
- The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 (HMSO 2009a); and
- The Town and Country Planning Act, 1990 (HMSO, 1990).

12.2.12 In the UK, Part IIA of the Environmental Protection Act, as introduced by Section 57 of the Environment Act 1995, makes provision for identifying "contaminated land", the circumstances in which remediation is required and who is responsible for that remediation. . Under Part IIA, "contaminated land" in respect of which remediation may be required is "any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substance in, on or under the land, that -

- Significant harm is being caused or there is a significant possibility of such harm being caused; or
- Pollution of controlled waters is being or is likely to be caused."

12.2.13 Under the Water Resources Act, "controlled waters" are defined as including both surface waters and groundwater. Once a site is classified as 'contaminated land' then remediation is required to render significant pollutant linkages (i.e. the source-pathway-receptor relationships that are associated with significant harm and/or pollution of Controlled Waters) insignificant, subject to a test of reasonableness.

12.2.14 A number of specific regulations have been enacted to implement the statutory European and national legislation into UK law. These regulations include:

- The Anti-Pollution Works Regulations (HMSO, 1999);
- The Control of Pollution (Oil Storage) (England) Regulations (HMSO, 2001);
- The Environmental Damage Regulations (HMSO, 2009b); and
- The Environmental Permitting (England and Wales) Regulations (HMSO, 2010), which control discharge of water to surface water and groundwater.

12.2.15 A review of the national, regional and local planning policy pertaining to local ground conditions and contaminated land follows.

Planning Policy Context

National Planning Policy

12.2.16 The Overarching National Policy Statement (NPS) for Energy (EN-1) Section 4.10 (Pollution control and other environmental regulatory regimes) (Department for Energy and Climate Change, 2011a) details that issues relating to discharges or emissions from a proposed project which may affect air quality, land quality and the marine environment, or which include noise and vibration may be subject to separate regulation under the pollution control framework or other consenting and licensing regimes. Before consenting any potentially polluting developments:

- *the relevant pollution control authority is satisfied that potential releases can be adequately regulated under the pollution control framework; and*
- *the effects of existing sources of pollution in and around the site are not such that the cumulative effects of pollution when the proposed development is added would make that development unacceptable, particularly in relation to statutory environmental quality limits.*

12.2.17 Section 5.3 of EN-1 (Biodiversity and geological conservation) states that:

“where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity”

12.2.18 Section 5.10 of EN-1 (Land use including open space, green infrastructure & Green Belt) states that:

“applicants should also identify any effects and seek to minimise impacts on soil quality taking into account any mitigation measures proposed. For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination”

12.2.19 Section 5.15 of EN-1 (Water Quality and resources) states that

“where the project is likely to have effects on the water environment, the applicant should undertake an assessment of the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment as part of the ES or equivalent. The ES should in particular describe:

- *the existing quality of waters affected by the proposed project and the impacts of the proposed project on water quality, noting any relevant existing discharges, proposed new discharges and proposed changes to discharges;*
- *existing water resources affected by the proposed project and the impacts of the proposed project on water resources, noting any relevant existing abstraction rates, proposed new abstraction rates and proposed changes to abstraction rates (including any impact on or use of mains supplies and reference to Catchment Abstraction Management Strategies);*

- *existing physical characteristics of the water environment (including quantity and dynamics of flow) affected by the proposed project and any impact of physical modifications to these characteristics; and*
- *any impacts of the proposed project on water bodies or protected areas under the Water Framework Directive and source protection zones (SPZs) around potable groundwater abstractions.*

12.2.20 NPS EN-2 (Department for Energy and Climate Change, 2011b) on Fossil Fuel Electricity Generating Infrastructure (NPS EN-2) states that where a project is likely to have effects on water quality or resources the applicant for development consent should undertake an assessment which should particularly demonstrate that appropriate measures will be put in place to avoid or minimise adverse impacts of abstraction and discharge of cooling water. The applicant for development consent should demonstrate measures to minimise adverse impacts on water quality and resources.

12.2.21 NPS EN-4 (Department for Energy and Climate Change, 2011c) on Gas Supply Infrastructure and Gas and Oil Pipelines (NPS EN-4) Section 2.22 (Gas and Oil Pipelines Impacts: Water Quality and Resources) notes that the construction of pipelines can create corridors of surface clearance and excavation that can potentially affect watercourses, aquifers, water abstraction and discharge points. Potential pipeline impacts include interference with groundwater flow pathways, mobilisation of contaminants already in the ground, and introduction of new contaminants, and the applicant should provide an assessment of these impacts.

12.2.22 Section 2.23 of NPS EN-4 (Gas and Oil Pipelines Impacts: Soil and Geology) identifies that underground cavities and unstable ground conditions may present risks to pipeline projects, and that applicants should assess the stability of the ground conditions associated with the pipeline route:

“Desktop studies, which include known geology and previous borehole data, can form the basis of the applicant’s assessment. The applicant may find it necessary to sink new boreholes along the preferred route to better understand the ground conditions present. The assessment should cover the options considered for installing the pipeline and weigh up the impacts of the means of installation. Where the applicant proposes to use horizontal directional drilling (HDD) as the means of installing a pipeline under a National or European Site and mitigating the impacts, the assessment should cover whether the geological conditions are suitable for HDD.”

12.2.23 The National Planning Policy Framework (NPPF) (Department of Communities and Local Government, 2012) identifies land contamination as a material consideration in the planning process, stating in paragraph 120 that:

“To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner”.

12.2.24 Further, paragraph 121 of the NPPF states that planning policies and decisions should ensure that:

- *"The site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation";*
- *"After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990"; and*
- *"Adequate site investigation information, prepared by a competent person, is presented".*

Local Planning Policy

12.2.25 The Local Plan for Selby is currently undergoing a period of transition, as summarised below:

- adopted 2005 - Local Plan (Selby District Council, 2005);
- not yet adopted (subject to a legal challenge) - Selby District Core Strategy Local Plan (Selby District Council, 2013); and
- undergoing early consultation - Selby Sites and Policies Plan (Selby District Council, 2014).

12.2.26 Policy ENV2 sets out measures for developments on potentially contaminated land, namely:

- A.** *"Proposals for development which would give rise to, or would be affected by, unacceptable levels of noise, nuisance, contamination or other environmental pollution including groundwater pollution will not be permitted unless satisfactory remedial or preventative measures are incorporated as an integral element in the scheme. Such measures should be carried out before the use of the site commences".*
- B.** *"Where there is a suspicion that the site might be contaminated, planning permission may be granted subject to conditions to prevent the commencement of development until a site investigation and assessment has been carried out and development has incorporated all measures shown in the assessment to be necessary".*

12.2.27 Policy ENV4 sets out measures for installations handling or storing hazardous substances:

"Proposals involving the storage or use of hazardous substance, or developments in the vicinity of sites where hazardous substances are being stored or used, will only be permitted where the District Council is satisfied that:

- 1) There is no unacceptable risk to the public or the natural environment; and*
- 2) Opportunities for the development of land in the vicinity will not be severely restricted."*

12.2.28 In addition to The Local Plan for Selby, North Yorkshire County Council (NYCC) has the following local development plans:

- the 'saved' policies of the North Yorkshire Waste Local Plan (NYCC, 2006) – adopted 2006;
- the 'saved' policies of the North Yorkshire Minerals Local Plan (NYCC, 1997) – adopted 1997.

12.2.29 NYCC are also currently preparing a Joint Minerals and Waste Plan.

- 12.2.30 The majority of the 'saved' policies of the North Yorkshire Waste Local Plan relate to waste management facilities (defined in the Plan as "Facilities associated with the processing and disposals of waste materials") and are not therefore considered relevant to the Proposed Development as it is not a waste management proposal.
- 12.2.31 None of the 'Saved' policies contained in the North Yorkshire Minerals Local Plan are considered to be of relevance to the Proposed Development.

Other Relevant Legislation, Policy, Standards and Guidance

12.2.32

- 12.2.33 The Building Act 1984 is supported by the Building Regulations 2000, which contain detailed information regarding the preparation of a site for redevelopment and resistance to contaminants.
- 12.2.34 The Environment Agency provides general guidance on the management of land contamination in document 'GPLC1 - Guiding Principles for Land Contamination' (Environment Agency, 2010). The Environment Agency also acts as a statutory consultee for developments requiring an EIA. The Environment Agency's primary concern in the management of contaminated land through the planning regime is in respect of the protection of the water environment.
- 12.2.35 Model Procedures for the Management of Contaminated Land, Contaminated Land Report 11 (referred to in this ES as 'CLR11') (Department of the Environment, Food and Rural Affairs (Defra), 2004) outlines the approach for the evaluation of contamination in line with UK Government legislation, Environment Agency and National House-Building Council (NHBC) requirements. The procedures recommend the application of a risk based approach with the first tier assessment being a Phase 1 Desk Top Report to identify previous and current site uses, geological setting and historical contamination records. The approach to further investigation is then based on the risk established by virtue of the Phase 1 Report. If a site has no historical or current evidence of contaminative uses, the scope of further investigation can be less than sites with a long standing history of potentially contaminative uses.

12.3 Assessment Methodology and Significance Criteria

Methodology for Assessing Baseline Conditions

- 12.3.1 Baseline information has been obtained in order to assess the likelihood of finding contamination and its potential nature and extent. Baseline conditions have been identified from documentary research of the site history, geology, hydrogeology and hydrology, and review of a commercially available regulatory database. The assessment has involved a review of the Groundsure reports for the Proposed Power Station and, for the Proposed Gas Connection (available on request) existing site investigation reports relating to the wider power station site as well as publically available BGS mapping (BGS, 2016) and the Environment Agency website (EA, 2016). This information has then been used to formulate a Conceptual Site Model to allow an assessment of potential environmental risks. The above information has been synthesised, in order to characterise the baseline conditions of the Proposed Development Site (the Site).

- 12.3.2 Potential receptors were then identified and their relative sensitivity evaluated as described within Table 12.1. The criteria used to determine the sensitivity of receptors and the magnitude of impacts has been developed by technical specialists and has been applied to similar land development proposals. Where appropriate, for the purpose of this assessment, risk likelihood has been interpreted as being equal to the impact rating (e.g. low likelihood/ low impact).

Sensitivity/ Importance of Receptors

- 12.3.3 Using information gathered during the desk-based study, the presence and relative sensitivity of receptors at risk from potential land contamination and risks to geological/ geomorphologic features have been evaluated by consideration of the following factors:
- surrounding land uses, based on mapping and site visits and consideration of the occupants of adjacent sites;
 - proposed end-use, based on the nature of the Proposed Development;
 - type of construction operations that will be necessary as part of the Proposed Development;
 - surrounding sites of nature conservation importance;
 - underlying groundwater;
 - surrounding sites and/or areas of geological/geomorphologic importance; and
 - geology, hydrogeology and hydrology of the Proposed Development and its surrounding area.
- 12.3.4 The sensitivity of receptors or geological features that could be affected by the Proposed Development is described qualitatively according to the categories presented in Table 12.1.

Table 12.1: Descriptive scale for sensitivity of receptors

Qualitative description	Receptor sensitivity		
	Low	Medium	High
End users (operational workers/ visitors)	“Hard” end use (e.g. industrial, car parking)	Landscaping or open space	Residential, allotments and play areas
Surrounding land uses	Industrial area	Open space or commercial area	Residential area
Construction workers	Minimal disturbance of ground	Limited earthworks	Extensive earthworks and demolition of buildings
Ecological sites	No sites of significant ecological value close by	Locally designated ecological sites	Nationally or internationally designated ecological sites, including Sites of Special Scientific Interest (SSSIs), Local and National Nature Reserves, Special Protection Areas etc.

Qualitative description	Receptor sensitivity		
	Low	Medium	High
Built environment	Not applicable	Buildings, including services and foundations	Nationally or internationally designated sites of historic value or other sensitivity
Geology / geomorphology	Areas of superficial geology or geomorphologic features with no special significance	Other areas of potential mineral resources Exposed geological features of local importance or educational value	Nationally or internationally designated geological sites Local Geological Sites SSSIs Mineral reserve allocated on Local Minerals Plan
Groundwater	Non aquifer Low quality resource No abstractions within 1 km	Secondary Aquifer Abstraction point within 1 km SPZ within 1 km of the Site	Principal Aquifer High quality resource Abstraction point within 250 m SPZ on-site

- 12.3.5 The Site was then considered in detail with respect to the proposed construction, operational and decommissioning phases, and any ground contamination or soil quality related impacts considered likely to result are described herein and, where possible, quantified.

Prediction of Potential Impacts

- 12.3.6 The potential impacts (or risks) associated with contaminated land have generally been assessed by means of a hazard-pathway-receptor model (the Pollutant Linkage), where the following definitions apply:

- hazard = source of contamination;
- receptor = the entity that is vulnerable to harm from the hazard; and
- pathway = the means by which the hazard can come into contact with the receptor.

- 12.3.7 This assessment considers both the impacts of existing contaminants at the existing coal-fired power station, and the potential for the Proposed Development to impact on land quality and receptors on and adjacent to the Site. The assessment also considers the potential for the Proposed Development to impact upon any geological/ geomorphologic features.

Contamination Sources (Hazards)

- 12.3.8 Land contamination sources can be described qualitatively according to the categories shown in Table 12.2. This is a qualitative judgement, but has been developed in line with accepted methodology for Phase 1 desk studies and Part IIA contamination studies.

Table 12.2: Descriptive scale for different sources of land contamination

Qualitative description of source (hazard)	Previous land use
Low	Greenfield site, or previous or on-going activities with low potential to cause contamination (e.g. residential, retail or offices) OR site investigation data indicating no significant contamination
Medium	Previous or on-going activities with some potential to cause moderate contamination (e.g. railways, collieries, scrap yards) OR site investigation data indicating limited contamination
High	Previous or on-going activity on or near to site with high potential to cause land contamination (e.g. gasworks, chemical works, landfills) OR site investigation data including widespread or severe contamination

- 12.3.9 If a hazard has been identified and potentially sensitive receptors are present, then the potential impacts associated with the Proposed Development can be predicted by considering the pathways by which the hazard may affect the receptors. Table 12.3 indicates the most likely potential impacts that may occur in relation to the Proposed Development for different categories of receptor.

Table 12.3: Summary of the most likely sources of potential land contamination impacts that may affect sensitive receptors

End users (operational workers / residents / visitors)	Surrounding land uses (including offsite residential areas)	Construction workers	Sensitive water resources	Ecological sites	Built environment
Direct or indirect ingestion of contaminated soil (operation).	Inhalation or deposition of wind-borne dust (construction)	Direct or indirect ingestion of contaminated soil (construction)	Existing and/or new pollutant pathways (construction and/or operation)	Phytotoxic impacts on plants (operation)	Chemical attack of buried concrete structures (operation)
Concentration of flammable or asphyxiating in-ground gases in enclosed spaces (operation).	Migration of contamination in sub-surface strata (including gases) (construction and/or operation)	Concentration of flammable or asphyxiating gases in confined spaces (construction)	Generation of liquid and/or mobile contaminants (operation)	Toxic impacts on fauna (operation and/or construction)	Concentration of flammable/explosive gases in confined spaces. (operation)

End users (operational workers / residents / visitors)	Surrounding land uses (including offsite residential areas)	Construction workers	Sensitive water resources	Ecological sites	Built environment
Inhalation of harmful in-ground vapours / dusts indoors and outdoors (operation).	N/A	Inhalation of asbestos during building demolition (construction)	N/A	Indirect impacts via contamination of water resources (operation and/or construction)	Permeation of water supply pipelines. (operation)

12.3.10 The potential impacts are assessed based on the existing use and predicted construction and operational stages of the Proposed Development.

12.3.11 The magnitude of a potential impact is described wherever possible by using the terms defined in Table 12.4.

Table 12.4: Descriptive scale for the impacts of land contamination

Magnitude of impact	Examples of typical impacts
High	Loss of exposed designated geological feature Very high risk of exposure of a sensitive receptor to potentially harmful levels of contamination via a confirmed pathway
Medium	Quarrying of rock for imported fill, or substantial changes due to cuttings Proven source – pathway – receptor pollutant linkage identified with elevated level of contamination recorded/ or potential to be present
Low	Superficial disturbance to geology; changes in geomorphology Identified source – pathway – receptor pollutant linkage identified but contamination likely to be low risk
Very low	Changes to made ground deposits No source – pathway – receptor pollutant linkage identified

Significance of Effects

12.3.12 For each of the potential impacts identified, an assessment has been made of the likely level of the significance of effects.

12.3.13 Where geological receptors are present, then their importance (sensitivity) has been determined (see Table 12.1) and the potential impact of the Proposed Development qualitatively predicted (see Table 12.4).

12.3.14 Effects are classified based on the identified sensitivity/ importance of the receptor and the predicted magnitude of the impact, using the standard assessment matrix set out in Table 12.5, in conjunction with professional judgement of site-specific factors that may be of relevance.

Table 12.5: Matrix to determine the significance of an effect (prior to mitigation)

Magnitude of impact	Sensitivity/ importance of receptor			
	High	Medium	Low	Very Low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible

12.3.15 This chapter considers that major or moderate effects are significant for the purposes of the EIA Regulations, in accordance with standard EIA practice.

12.3.16 If potentially significant effects are identified, measures are proposed to mitigate the risks from the hazards. However, industry best practices will be applied whether there is the potential for significant effects, or not. The assessment is undertaken on the assumption that best practice will be implemented during construction and operation. The generic categories of mitigation are outlined in Table 12.6.

Table 12.6: Generic categories of mitigation

Category of mitigation	Description of mitigation measures
Remedial works	Remedial work may be required to allow the development to proceed. The scope and nature of any remedial work is likely to be highly dependent on the results of investigations and subsequent risk assessments.
Design changes	Significant effects can be reduced by changes in design e.g. protective measures to prevent build-up of flammable gases, or modification of layouts to ensure that sensitive end uses are sited away from likely areas of contamination. Relocation of built features away from geologically important features. Consideration of the construction method proposed for underground structures to minimise potential impacts on groundwater.
Protective measures during construction	Many of the potentially significant effects on the construction workforce can be mitigated by the use of appropriate protective equipment, such as gloves and respiratory protection, and effective dust suppression techniques.
Environmental management	Environmental management may be required to prevent construction work and future operations from giving rise to land contamination

Extent of Study Area

12.3.17 The Site encompasses the land required for the construction and operation of the Proposed Development and associated connections including: cooling water connections, borehole water connections, electricity connection, and the gas pipeline route. The Proposed Power Plant site is located on the existing coal stockyard (see Figure 3.1 in PEI Report Volume II). The

route of the Proposed Gas Connection is shown in Figure 3.2 (PEI Report Volume II). The study area encompasses the Site and a 2 km buffer around the Site.

Information Sources

Desk Study

- 12.3.18 A Phase 1 Geotechnical and Geo-Environmental Site Assessment (Appendix 12A in PEI Report Volume III) was conducted to determine the baseline ground conditions and potentially contaminative land uses. As part of this assessment, GroundSure Reports for the Proposed Power Station (including the Proposed Cooling Water Connections) and Proposed Gas Corridor were commissioned from GroundSure Limited (available on request).
- 12.3.19 The GroundSure Reports summarise environmental information typically available in the public domain from a variety of sources. Information is included on authorisations, permits, discharge consents, water abstractions, groundwater, surface water, ecological sensitivities, licensed waste management and disposal facilities, consented trade effluent discharges, records of unlicensed landfills in the search area, trade directory entries of potentially contaminating activities, Control of Major Accident Hazards (COMAH) registered sites, radon risk, coal (and other) mining and natural subsidence risk, and sensitive land uses (nature reserves, protected areas, sensitive habitats). It is noted that the GroundSure database is updated periodically and therefore it may not document recent developments/ registrations in the site area or activities which have not been declared.
- 12.3.20 In addition, copies of previous investigations conducted at the site were made available by Eggborough Power Limited (EPL) (the Applicant) for review, including:
- Strata Surveys Limited, 2012. Ground Investigation Report at Eggborough Power Station, Pontefract;
 - Wilkinson Associates, 2000. Soils Investigation – Flue Gas Desulphurisation Plant, Eggborough Power Station
 - Exploration Associates, 2001. Factual Report on Ground Investigation at Eggborough Power Station FGD Volume 1;
 - Arup, 2002. Mowlem Engineering Ltd, Eggborough Flue Gas Desulphurisation Plant Geotechnical Interpretative Report;
 - Soil Mechanics, 1996. Ground Investigation for a Proposed Glass Making Plant at Eggborough, North Yorkshire.
 - Arup, 2008. Engineering Mining Subsidence Structural Assessment at Eggborough Power Station;
 - Geosyntec, 2016. Eggborough Power Station Site Protection and Monitoring Programme – Annual Report 2015
 - Fugro, 2009 Geophysical Investigation at Eggborough Power Station;
 - Wardell Armstrong, 2009. Letter entitled ‘Eggborough Power Station Mining & Geology Update’; and
 - Wardell Armstrong, 2010. Geological Report on the Investigation of Faulting in the Vicinity of Eggborough Power Station.

Consultation

- 12.3.21 An initial consultation, part of the ongoing consultation exercise, has been undertaken and those responses pertinent to the assessment of geology, ground conditions and hydrogeology are summarised in Table 12.7 below.

Table 12.7: Initial consultation summary table

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
Natural England	30 th August 2016 (e-mail)	The EIA will need to “ <i>consider any impacts upon local geological sites</i> ”, and include “ <i>an assessment of the likely impacts on the geodiversity interests of such sites, and include proposals for mitigation of any impacts and if appropriate, compensation measures</i> ”.	Presence of any geological sites of interest have been identified from the GroundSure reports, risks to these sites been assessed and if required mitigation measures identified.
Public Health England	6 th September, 2016 (letter)	The ES should clearly identify “ <i>the location and distance from the development of off-site human receptors and environmental receptors such as the surrounding land, watercourses, surface and groundwater, and drinking water supplies such as wells, boreholes and water abstraction points</i> ”.	Presence of nearby groundwater abstraction wells have been identified from the Groundsure report and potential impacts to these assessed.
Coal Authority	13 th September 2016 (e-mail)	“ <i>the site does fall within the licence area of Kellingley Colliery, which ceased deep underground coal mining activity in December 2015.</i> ” “ <i>the longwall method of mining employed can potentially result in surface subsidence for several years following cessation of mining activities. It is assumed that this potential land instability risk will therefore be afforded due consideration as part of the design process for this development and the accompanying Environmental Statement.</i> ”	Ongoing assessment of the rates of potential settlement being experienced across the coal stockyard is being undertaken and reported elsewhere. If required, mitigation measures will be identified during the detailed design.
Environment Agency	16 th September 2016 (letter)	“ <i>We agree with the characterisation of the site’s geology and hydrogeology. Specifically, we are satisfied that the groundwater sensitivity beneath the main site has been classed as high, given the</i>	Potential risks to groundwater during construction and operation of the Proposed

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		<i>relatively thin and permeable superficial deposits which do not afford much protection to the groundwater should a pollution incident occur. The main site is correctly stated to be partially located within a Safeguard Zone (SgZ) for nitrate within a Drinking Water Protected Area (DWPA)."</i>	Development will be considered and appropriate mitigation measures identified and adopted

12.4 Baseline Conditions

Existing Baseline

- 12.4.1 This section describes the Site in its current state (without the Proposed Development) and the sensitivity of the receiving environment to change.

Designated Sites

- 12.4.2 The Site is located within a nitrate vulnerable zone.
- 12.4.3 No other environmentally sensitive sites, including Sites of Special Scientific Interest, Special Protection Areas, Special Areas of Conservation, Ramsar sites, or National and Local Nature Reserves, were identified within 2 km of the Site.
- 12.4.4 The sensitivity of the nitrate vulnerable zone is considered to be moderate.

Existing and Previous Land Uses

- 12.4.5 Table 12.8 details the history of the areas of the Site within the existing coal-fired power station site as based on available OS historical mapping (Appendix 12A, PEI Report Volume II).

Table 12.8: Review of historical maps relating to the existing coal-fired power station

Date	Onsite Land Use	Offsite Land Use
1852-1855	Agricultural land use.	Agricultural land use.
1891-1894	No significant changes.	Railway line approximately 750 m south of the Site; and Gravel pits approximately 750 – 900 m south of the Site.
1905-1908	No significant changes.	Gravel pit located approximately 500 m east of the Site; and Water works located adjacent to the west of the Site.

Date	Onsite Land Use	Offsite Land Use
1948-1950	Numerous sand and gravel pits located on site.	Water works adjacent to the eastern corner of the Site; and Additional sand and gravel pits from approximately 300 m south of the Site.
1955-1957	No significant changes.	No significant changes.
1973	Eggborough Power Station has been constructed, including railway line, ash tip, tanks, lagoons etc. Sewage works present in north-eastern corner.	The majority of previous sand and gravel pits are no longer shown.
1983	No significant changes.	No significant changes.
2002	No significant changes.	A works complex has been constructed adjacent to the southwest of the site (inferred to be the current glassworks and business park); Reservoir approximately 250 m south of the Site; and Depot and works approximately 600 m south of the Site.
2010	No significant changes.	No significant changes.
2014	No significant changes.	No significant changes.

12.4.6 Prior to its development as a power station in the 1960s, the existing power station site was primarily used as agricultural land. A number of sand and gravel pits were present on site and within 1 km of the site between the later 1800s and the 1970s, which are inferred to have since been backfilled. A limited number of other potential sources of contamination have been identified from the historical maps including a railway, water works, sewage works, infilled pond/ moat and nearby industrial land use.

12.4.7 The Proposed Cooling Water and Gas Connection routes are located primarily on agricultural land.

Surrounding Area

12.4.8 Between 1899 and the present day, the surrounding area has been occupied by potentially contaminative land uses including a power station, water works and a railway line.

12.4.9 Railway lines are located approximately 750 m south of the Proposed Power Station site and to the north-east of the Proposed Gas Connection.

12.4.10 Eggborough coal-fired Power Station was constructed between 1962 and 1973, including railway line, ash tip, tanks, lagoons, drainage, material storage.

- 12.4.11 Based on this risk outline, there is the potential for contamination to present a medium hazard to environmental receptors.

Superficial Geology

- 12.4.12 A review of the Groundsure reports (available on request), British Geological Survey (BGS) 1:50,000 solid and drift geology sheet 79 for Goole, existing site investigation records and publically available BGS borehole records have been reviewed to identify the likely geological sequence at the Site.
- 12.4.13 From a review of BGS information and the geology sections of the Groundsure reports (available on request), the following superficial deposits have been identified which may be present beneath the Site is listed below:
- alluvium;
 - Lacustrine beach deposits;
 - Brighton sand formation;
 - Hemingbrough glacio-lacustrine; and
 - Glacial till.
- 12.4.14 The relative extent of the uppermost superficial deposits in relation to the Site are discussed in more detail below.

Superficial Geology – Proposed Power Plant Site

- 12.4.15 Based on a review of the BGS sheets and GroundSure report, superficial deposits are shown to be absent from much of the Proposed Power Plant site, with the following exceptions:
- Lacustrine beach deposits – shingle, sand, silt and clay; present at the north-western corner of the Proposed Power Plant Site;
 - Hemingbrough glacio-lacustrine deposits shown to underlie the south-eastern corner of the Proposed Power Plant Site; and
 - glacial till – typically sandy and gravelly clays, with cobbles and boulders. The geological map indicates that these deposits may encroach onto the extreme south-western corner of the Proposed Power Plant Site.
- 12.4.16 Given much of the Proposed Power Plant Site is occupied by the coal stockyard for the existing coal fired power station, the presence of made ground is also anticipated.

Superficial Geology – Proposed Gas Connection and Cooling Water Connections

- 12.4.17 From the online BGS geological map and GroundSure report, the following units are anticipated to comprise the uppermost superficial deposit across the Proposed Cooling Water Connections and Proposed Gas Connection corridor:
- a 250 m corridor immediately northeast of Wand Lane = Brighton Sand;
 - River Aire channel (extending approximately 1.2 km north-east to approximately Millfield Road) = Alluvium;

- 300 m band from Millfield Road access to approximately Fox Lane access = Brighton Sand; and
- Fox Lane access to West Lane = Hemingbrough Formation.

Bedrock Geology

12.4.18 The geological map and GroundSure report indicate that the Site (including both Proposed Power Plant Site and Proposed Cooling Water and Gas Connections) is underlain by Sherwood sandstone. The following boreholes located close to the site encountered Sherwood sandstone:

- SE52SE99, located adjacent to the (Borehole No2) encountered Sherwood sandstone to a minimum depth of 90 m below ground level (bgl), and did not penetrate the full thickness of the unit;
- SE52SE43, located adjacent to Wand Lane immediately east of the Site encountered Sherwood sandstone to a minimum depth of 93 m bgl, and did not penetrate the full thickness of the unit; and
- SE52SE41, located immediately south of the junction between the A19 and Weeland Road, south of the site (Borehole No.1), encountered Sherwood sandstone to a maximum depth of 86 m bgl, with Permian Marl below this.

Coal Mining

12.4.19 The Groundsure report (available on request) indicates that the Site lies within an identified coal mining reporting area. The Coal Authority Report indicates that the Proposed Power Plant Site is in an area that could be affected by underground mining in one seam of coal located at a depth of 730 m to 760 m and last worked in 2015. The Coal Authority Report records four damage claims relating to ground subsidence, two located on the Proposed Power Plant Site and two located within 50 m of the Proposed Power Plant Site.

12.4.20 The Proposed Power Plant Site is understood to have experienced surface settlement as a result of the Kellingley coal mining. Mining at Kellingley Colliery ceased in December 2015, with the last coal seam mined beneath the southern boundary of the Site. The Beeston Coal Seam was the only seam worked at Kellingley Colliery. This seam was typically 2.6 m thick, and was worked at a depth of approximately 735 m bgl beneath the Proposed Power Plant Site.

12.4.21 The Coal Mining Abandonment plans (Catalogue No.:18339 Sheets 5, 10 and 11 of 35) indicate that the mined panel closest to the Proposed Power Plant Site is panel YZ502, which reached a final stop position in October 2012. Settlement monitoring commenced around the perimeter of the Proposed Power Plant Site in December 2013. By August 2014 settlement in the far south of the Proposed Power Plant Site reached approximately 100 mm, reducing to less than 5 mm in the north-western corner. Between August 2014 and August 2016, recorded settlement around the perimeter of the Proposed Power Plant Site was approximately 10 mm. This suggests that settlement on the Proposed Power Plant Site is reducing and is nearing completion.

12.4.22 Monitoring of ongoing potential settlement across the Proposed Power Plant Site is ongoing, and will be reported on as the results of future monitoring events become available.

12.4.23 The sensitivity of the geology is moderate, based on the previous coal mining at the Site.

Hydrogeology

- 12.4.24 The EA aquifer classifications for the identified superficial deposit and bedrock underlying the site is summarised in Table 12.9 below:

Table 12.9: Summary of EA aquifer classifications

Formation	EA aquifer classification	Aquifer definition
Superficial deposits		
Lacustrine Beach Deposits	Secondary A Aquifer	Defined by the EA as ‘permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers’.
Alluvium	Secondary A Aquifer	
Brighton Sand	Secondary A Aquifer	
Glacial Till (clay)	Secondary Undifferentiated Aquifer	Defined by the EA as ‘an aquifer where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.’
Hemingbrough Formation	Unproductive Strata	Defined by the EA as ‘rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow’.
Bedrock		
Sherwood Sandstone	Principal Aquifer	Defined by the EA as ‘layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer’.

- 12.4.25 Soils at the Site (except those associated with glacial till and glaciolacustrine deposits) are classified as having a high leaching potential, meaning that they may readily transmit liquid discharges and pollutants.
- 12.4.26 The Site, with the exception of the southern Proposed Borehole Water Connection and the northern end of the Proposed Gas Connection, is located in a groundwater Source Protection Zone (SPZ) 3 (total catchment).

- 12.4.27 The Groundsure report (available on request) records two active groundwater abstractions on the Proposed Power Plant Site; one for EPL for the abstraction of a maximum of 4,800 m³ per day for use as a boiler feed and one for The Hambleton Abstraction Partnership for the abstraction of a maximum of 900 m³ per day for use in irrigation. Both abstractions are from the Sherwood Sandstone Principal Aquifer. There are also a further thirty-nine historical groundwater abstraction licences recorded 2 km of the Site including for potable water, farming and domestic use.
- 12.4.28 There are no groundwater abstractions within the Proposed Gas Connection corridor.
- 12.4.29 Based on the presence of Secondary A Aquifers in superficial drift deposits and bedrock comprising a Principal Aquifer, coupled with the high leaching potential, groundwater at the site is considered to represent a highly sensitive receptor.

Radon

- 12.4.30 The Groundsure report (available on request) indicates that the Site is not located a Radon Affected Area, as less than 1% of properties are above the Action Level and no radon protective measures are necessary in construction of new properties or extensions.

Previous Investigations of the Site

- 12.4.31 The following historical reports have been reviewed as part of the Phase 1 desk study (Appendix 12A, PEI Report Volume III):
- Ground Investigation for a Proposed Glass-making Plant at Eggborough, North Yorkshire, Soil Mechanics, dated July 1998;
 - Soils Investigation – Flue Gas Desulphurisation Plant, Eggborough Power Station, Wilkinson Associates, dated 10th November 2000;
 - Eggborough Power Station FGD – Factual Report on Ground Investigation, Exploration Associates, dated December 2001;
 - Geotechnical Interpretative Report – Eggborough Flue Gas Desulphurisation Plant, Ove Arup & Partners, dated February 2002;
 - Geophysical Investigation – Eggborough Power Station, Fugro Aperio, dated April 2009;
 - Geological Report on the Investigation of Faulting in the Vicinity of Eggborough Power Station, Wardell Armstrong, March 2010;
 - Ground Investigation Report - Factual Report on a Ground Investigation at Eggborough Power Station, Pontefract, Strata Surveys Limited, dated 8th August 2012; and
 - Eggborough Power Station Site Protection and Monitoring Programme – Annual Report 2015, Geosyntec, dated 4th January 2016.

Soil Mechanics (1998)

- 12.4.32 Soil Mechanics undertook a ground investigation at the location of the Saint Gobain glassworks, approximately 100 m south-west of the Site, in 1998. A summary of information considered relevant to the Site is provided below:
- twenty-seven boreholes were advanced by cable percussion and rotary coring and nineteen trial pits were excavated to a maximum depth of 25.7 m bgl in April/ May 1998;

- no Made Ground was encountered, consistent with the lack of previous development of the investigation location. However sandy topsoil was present to a depth of approximately 0.4 m;
- superficial deposits were found to comprise glacial clay, sand and gravel, ranging in thickness from 2.0 m to 12.9 m and generally thickening towards the north. The sand and gravel was reported to be loose to dense;
- Sherwood Sandstone was encountered beneath the superficial deposits as very weak to moderately weak red-brown sandstone. Occasional layers of mudstone were identified; and
- groundwater level was noted to have been artificially lowered by pumping at the power station, however groundwater was encountered in boreholes at the far north of the investigation area (furthest from the abstraction borehole). Perched groundwater was also encountered in the superficial deposits towards the northeast.

Wilkinson Associates (2000)

12.4.33 Wilkinson Associates undertook an investigation on behalf of Kvaerner E&C UK Limited October 2000 with the aim of providing an assessment of ground conditions for a proposed FGD Plant. A summary of information is provided below:

- the investigation comprised the drilling of eight boreholes to a maximum depth of 11.1 m bgl and excavation of four trial pits to a maximum depth 3.0 m bgl;
- Made Ground was encountered at all locations between a thickness of 0.3 – 0.9 m, generally consisting of sands and gravels;
- in eight locations, the Made Ground was found to directly overlie weathered Sherwood Sandstone. In the remaining three locations, towards the north-east of the investigation area, glacial sand and gravel was encountered at a thickness of 1.2 – 2.3 m;
- Sherwood Sandstone bedrock was found to be weathered in all locations ranging from grade VI (residual soil) close to the surface to grade III (moderately weathered) at the base of the boreholes. Geotechnical testing (unconfined compressive strength) indicated that the rock was moderately weak;
- no significant groundwater was encountered. The report notes that this is consistent with the 1982 published hydrogeological map which records groundwater at a depth of approximately 12 m bgl in the area of investigation;
- no soil or groundwater samples were submitted for chemical analysis; and
- the report concluded that conventional spread foundations would likely be suitable for the proposed FGD plant.

Exploration Associates (2001)

12.4.34 In December 2001, Exploration Associates were commissioned to conduct a site investigation in order to help better understand the ground conditions at the site of the proposed FGD plant. A summary of information is provided below:

- four boreholes were drilled by cable percussion and rotary coring techniques to a maximum depth of 25.5 m bgl and ten trial pits were excavated to a maximum depth of

3.5 m bgl. Cone Penetration Tests (CPT) were undertaken at a further twenty-two locations. A crosshole seismic survey was also undertaken to determine the shear wave velocity profile;

- Made Ground was encountered at a thickness of 0.5 - >1.2 m, generally comprising sands and gravels;
- superficial deposits of glacial sand and gravel were encountered at all borehole locations at a thickness of approximately 1.5 – 2.5 m;
- Sherwood Sandstone bedrock was encountered as a weakly cemented, weathered sandstone; and
- groundwater strikes were encountered at approximately 9.0 – 15.6 m bgl during drilling, with a standing water level of 1.7 m bgl recorded during post-fieldwork monitoring.

Ove Arup & Partners (2002)

12.4.35 A Geotechnical Interpretative Report was prepared by Ove Arup in 2002 based on the results of the Wilkinson Associates and Exploration Associates investigations, as well as a desk study carried out by Ove Arup (not available for review). A summary of information from the interpretative report is provided below:

- an 'odour' was encountered in two locations;
- Made Ground is generally medium dense to dense and likely suitable for re-use as engineered fill if required;
- design Class DS1 sulphate resisting concrete was recommended for foundations based on pH and sulphate analysis of soil; and
- groundwater elevation is likely around 0 m AOD in the Sherwood Sandstone; and
- glacial sands and gravels and Sherwood sandstone in the FGD Plant area provide generally favourable conditions for foundations. Pad or raft foundations could be used in either strata, or piles could be extended into the Sherwood Sandstone.

Fugro (2009)

12.4.36 A geophysical investigation was conducted for EPL by Fugro to investigate the potential presence of faults beneath the existing coal-fired power station footprint. Previous 'deep' seismic investigations carried out in the area on behalf of UK Coal indicated highly reflective strata within the underlying Permo-Triassic sequence. Electrical resistivity tomography and multichannel seismic reflection techniques were deployed to explore to 30 m and 250 m depth respectively. The key findings included:

- structural discontinuities were identified within reflection data that were consistent with post-Permian faulting;
- reflection data were consistent with the presence of an unnamed fault previously identified to the north of the existing coal-fired power station;
- data suggested the absence of north-west south-east fault shown on a historic BGS map beneath the existing coal-fired power station; and
- the vulnerability of the existing coal-fired power station to fault reactivation through subsurface coal mining was likely to be greatest from those existing structures that may link the proposed mining area to the existing power station on its eastern flank.

Wardell Armstrong (2010)

12.4.37 Wardell Armstrong completed a review of the seismic surveys completed by Fugro (2009), and consulted with UK Coal Mining Ltd (UKMCL) to reassess the potential presence of faults beneath the site. The key findings included:

- the major fault shown on the 1971 published BGS map, the Bowers House Fault, does not pass through the existing coal-fired power station site;
- correlation with parts of the Kellington fault zone, probably passing through the northern part of the existing coal-fired power station site but probably outside the area of influence of the mining;
- further evidence of faults which appears to be parts of a zone of irregular minor faults previously interpreted by UKMCL from detailed seismic surveys of the Beeston mining panels and intersected by underground roadways, which may pass beneath the power station.

Strata Surveys Limited (2012)

12.4.38 Strata Surveys' ground investigation in 2012 focussed on the coal stockyard area. A summary of information is provided below:

- twenty-two boreholes were drilled by cable percussion and rotary coring techniques to a maximum depth of 25.0 m bgl and eleven trial pits were excavated to a maximum depth of 4.6 m bgl. Samples were collected for chemical testing and field and laboratory geotechnical testing was carried out;
- Made Ground in the coal stockyard comprised coal as fine to coarse gravels at a thickness of 0.2 m – 9.9 m, as well as localised sand, limestone gravel and brick fragments;
- superficial deposits of soft to firm gravelly clay, often interbedded with sand, were encountered in the southern part of the coal stockyard. Elsewhere on the coal stockyard and existing main power station site, glacial sand and gravel was encountered. The base of the superficial deposits was encountered between 1.7 and 3.7 m bgl;
- Sherwood Sandstone bedrock in the coal stockyard area was encountered at depths ranging from 0.8 m - 10.3 m bgl, and on the existing main power station site from 0.4 m - 2.00 m bgl;
- groundwater monitoring wells were installed in six locations, which returned standing elevations of 4.1 – 9.0 m bgl in June/ July 2012; and
- thirteen soil samples and five groundwater samples were scheduled for chemical analysis. Identified impacts included Polycyclic Aromatic Hydrocarbons (PAHs) Total Petroleum Hydrocarbons (TPH) and BTEX (benzene, toluene, ethylbenzene and xylene) in Made Ground as well as TPH in groundwater.

Geosyntec (2016)

12.4.39 Geosyntec have undertaken regular groundwater monitoring as part of Eggborough Power Station's Site protection and Monitoring Programme (SPMP) since 2008 in line with the requirements of the Environmental Permit to identify potential changes in groundwater quality as a result of the permitted operations. A summary of information considered relevant to the study site is provided below:

- groundwater flow direction is inferred to be radial towards the south and west from a high point in the northern-central part of the existing coal-fired power station site;
- a general decrease in pH (i.e. increase in acidity) of groundwater has been observed; and
- chemical concentrations in groundwater are generally consistent with historical trends, However molybdenum, a potential indicator of PFA contamination, has been identified in a number of locations in 2015.

Summary of Anticipated Ground Conditions – Proposed Power Plant Site

- 12.4.40 The ground investigation completed on the coal stockyard area (Strata Surveys, 2012) identified that the ground conditions beneath the northern part of the Proposed Power Plant Site comprised a mantle of made ground comprising black coal to 0.5 m to 1.5 m bgl, overlying completely weathered sandstone bedrock (Sherwood Sandstone). Competent sandstone bedrock is encountered at a relatively shallow depth across the coal stockyard area, as shown in Table 12.10 below:

Table 12.10: Generalised Ground Conditions Beneath the Proposed Power Plant Site

Geological unit	Top of strata (metres below ground level)	Description
Made ground	Ground surface	Black coal, recovered and fine to coarse gravel sized fragments (coal carpet).
Weathered Sherwood sandstone bedrock	0.5 – 1.5	Extremely weathered red brown sandstone.
Sherwood sandstone bedrock	4.0 – 7.0	Highly weathered red brown sandstone.

- 12.4.41 Previous reports and geophysical investigations (Arup, 2008, Fugro, 2009, Wardell Armstrong, 2010) suggest that there may be a possible fault, with a surface position within the far east of the Proposed Power Plant Site. It should be noted that fault positions have not been accurately located and could comprise a fault zone, which could result in disturbed ground, weaker rock or a deeper weathering profile.
- 12.4.42 Monitoring of groundwater wells installed during the Strata Surveys ground investigation (Strata Surveys, 2012) conducted in July and August 2012 suggests that the depth to groundwater may be approximately 7 m to 8 m below ground level (bgl).

Potential Pollutant Linkages

- 12.4.43 In order for an area of potential contamination identified within the confines of the Site to pose a significant level of risk to the Proposed Development or the wider environment, a potential source and sensitive target or receptor has to be identified, together with a plausible and effective pathway by which the receptor may be exposed to any given hazard.
- 12.4.44 Based upon the available information, potential sources of contamination within the Site include:
- the coal stockyard and associated activities, including impacted soil and groundwater as identified by the Strata Surveys 2012 investigation;
 - contamination associated with the coal stockyard machinery (stacker-reclaimer);

- the railway loop surrounding the coal stockyard;
- the site's effluent system, including oil-water interceptors;
- on-site pollution incidents identified as having a minor impact to land;
- historical contamination, including ground gas generation, related to the sand and gravel pits which are inferred to have been infilled prior to construction of the Proposed Development; and
- historical agricultural land use (e.g. use of pesticides, heavy equipment).

12.4.45 Based upon the available information, potential sources of contamination outside the Site (typically within 500 m of the Site, unless otherwise specified) include:

- permitted activities relating to the site's continued operation as a power station, including contaminants associated with the main power plant from the boiler house, turbine house, substation etc.;
- the FGD plant and associated substances and processes;
- fuel oil storage tanks;
- contamination associated with storing and handling of PFA, including the 'ash pit';
- sewage works, located north-east of the Proposed Power Station;
- nearby glass manufacturing facility, located approximately 100 m south of the Proposed Power Plant Site and adjacent to the southern Proposed Borehole Water Connection;
- former Lytag plant to the east of the Proposed Power Station, including pipeline formerly used to transport materials from the Site;
- nearby depot/ works, located approximately 600 m to the south of the Site;
- a railway line (Knottingley to Goole), located approximately 750 m south of the Site;
- a railway line (the East Coast Main Line) located approximately 250 m north of the Proposed Gas Connection;
- nearby historical landfill sites;
- nearby water works to the east and west of the Site;
- nearby registered waste treatment facility which accepts non-biodegradable wastes;
- historical contamination, including ground gas generation, related to numerous former sand and gravel pits in the vicinity of the site;
- offsite pollution incidents located within 500 m of the Site having a minor to significant impacts on air, land and water; and
- historical agricultural land use (e.g. use of pesticides, heavy equipment).

Potential Contaminants of Concern

12.4.46 Potential compounds of concern associated with the identified potential sources of contamination may include, but are not limited to:

- Volatile Organic Compounds (VOCs), including benzene, toluene, ethylbenzene and xylene (BTEX);
- Semi Volatile Organic Compounds (SVOCs) including polycyclic aromatic hydrocarbons (PAHs);
- Total petroleum hydrocarbons (TPH);
- Polychlorinated Biphenyls (PCBs);
- heavy metals;
- asbestos;
- inorganic ions, including alkalinity and sulphate; and

- ground gases (carbon dioxide, methane, hydrogen sulphide etc.).

Potential Receptors

12.4.47 Based upon the available information, the following are considered to be potential receptors:

- human health –
 - current site employees,
 - offsite employees on neighbouring sites,
 - residential neighbours (nearest dwellings are approximately 300 m east of the strategic coal stockyard); and
 - future onsite and offsite employees;
- controlled waters –
 - shallow groundwater within the superficial deposits (Secondary A Aquifer),
 - deeper groundwater within the bedrock (Principal Aquifer), and
 - surface water, including Ings and Tetherings Drain and the River Aire, assumed to be in hydraulic continuity with the shallow groundwater;
- infrastructure –
 - below-ground structures, e.g. concrete foundations, plastic water pipes, and
 - confined spaces within buildings (e.g. basements, store cupboards, service ducts); and
- ecology –
 - flora and fauna in woodlands surrounding the Site.

Potential Pathways

12.4.48 Based upon the available information, the following are considered potential pathways:

- human health –
 - dermal contact with substances in shallow soil and/or shallow groundwater,
 - inhalation of substances in dust,
 - inhalation of vapours from soil and/or shallow groundwater, and
 - accidental ingestion of soil/dust and/or shallow groundwater during potential groundworks;
- controlled waters –
 - vertical migration through unsurfaced areas, vegetated areas and hard-standing (where there are joins/ cracks) and drains/pipework into the Made Ground/ shallow soil,
 - lateral and vertical migration within the Made Ground and superficial deposits, e.g. leaching from soils in the unsaturated zone into shallow groundwater,

- preferential lateral and vertical migration along routes of underground services, pipelines and associated trenches (including granular backfilling materials),
- lateral and vertical migration within shallow groundwater in the Made Ground/superficial deposits, including to deeper groundwater,
- lateral and vertical migration within deeper groundwater in the bedrock, and
- lateral migration within groundwater to surface water courses;
- infrastructure –
 - direct contact of substances within shallow groundwater with concrete foundations, plastic water pipes etc., and
 - migration of ground gases and accumulation in confined spaces (e.g. basements, service ducts); and
- ecology –
 - plant uptake and subsequent ingestion by fauna.

12.4.49 Environmental receptors identified in the conceptual site model for the current operation of the existing coal-fired power station site (i.e. baseline conditions) are summarised in Table 12.11 below.

Table 12.11: Summary of baseline receptors and sensitivity

Receptor	Sensitivity	Assumptions
On-site workers	Low	Assumes correct use of suitable PPE and compliance with site operating procedures.
Construction / excavation workers	Medium	Assumes correct use of suitable PPE, compliance with procedures minimising exposure.
Off-site residents	Low	Initial high sensitivity reduced to low based on distance from site to neighbouring residents and assuming site operations are conducted according to agreed protocols, guidance and legislation, and no spillages or releases occur.
Groundwater (Principal Sherwood Sandstone Aquifer)	High	May be reduced to medium assuming normal site operations, no spills or releases and correct operation of site drainage.
On-site and off-site flora and fauna	Medium	Assuming normal site operations with no spills or releases and adherence to site guidance and protocols during operations
Off-site agricultural land	Medium	Proposed Gas Corridor

Future Baseline

12.4.50 In the event that the Proposed Development does not proceed, no significant changes to the existing baseline assumed for the Proposed Development are anticipated.

12.5 Development Design and Impact Avoidance

- 12.5.1 The following impact avoidance measures would either be incorporated into the design or are standard demolition, construction and operational practices. These measures have therefore been taken into account during the impact assessment in Section 12.6. Any need for additional mitigation measures as identified as a result of the impact assessment are described (where necessary) in Section 12.7.

Possible Foundation Solutions

- 12.5.2 Depending on structural loading and settlement tolerances, based on the known ground conditions at the Proposed Power Plant Site, foundations may comprise shallow pads/ rafts or piles.
- 12.5.3 It is likely that some of the more sensitive structures of the Proposed Development, including the stacks, turbine blocks and cooling towers will require piled foundations. For this reason, an assessment of the likely noise impacts of piling has been included in Chapter 9: Noise and Vibration.

Construction

- 12.5.4 The appointed contractor(s) will (in due course) be required to produce a Construction Environmental Management Plan (CEMP) that will provide details of proposed environmental control measures, including measures related to the protection of land quality. The CEMP will include the impact avoidance measures as outlined in this section. A Framework CEMP will be included in the ES to support the DCO application.
- 12.5.5 During construction of the Proposed Development the Contractor(s) will be required to minimise adverse land contamination effects on sensitive receptors by implementing good operational practices (e.g. employing suitable surface water drainage control).
- 12.5.6 Construction workers will be protected from contact with hazardous materials by adopting appropriate health and safety measures including an assessment of appropriate measures under the Control of Substances Hazardous to Health (COSHH) Regulations 2002. Such measures will include suitable personal protective equipment, hygiene facilities and the implementation of dust control where considered necessary.
- 12.5.7 With regards to earthworks, the Contractor(s) will ensure that all material is suitable for its proposed use and will not result in an increase in contamination-related risks on identified receptors including any landscaped areas and underlying groundwater. Any material moved onto or off the site will need to comply with a Materials Management Plan to ensure that all materials are suitable for the proposed end use.
- 12.5.8 The main potential source of oils and fuels on site is from plant and machinery. All plant and machinery will be checked regularly and, where possible, the use of drip trays will be employed, should vehicles be parked on unsurfaced areas of the site. An emergency spillage action plan will be produced and provisions made to contain any leak/spill.
- 12.5.9 Given the historical land use within the areas of the Site within the existing coal-fired power station, there is a potential for contamination to be encountered locally within excavations. The Contractor(s) will be required to implement pollution control measures to deal with any

contaminated land encountered during the construction works. These measures will include, as a minimum, the following:

- all workers will be required to wear PPE as applicable;
- should any potentially contaminated ground, including isolated 'hotspots' of contamination, be encountered during construction, the Contractor(s) will be required to investigate the area and then assess whether there is a need for containment or disposal of the material. The Contractor(s) will also be required to assess whether any additional health and safety measures are required. Any such investigations will be required to be undertaken in consultation with the Environment Agency and other appropriate consultees. To further minimise the risks of contaminants being mobilised and contaminating other soils or water, construction workers will be briefed as to the possibility of the presence of such materials;
- in the event that contamination is identified during construction works, appropriate remediation measures will be taken to protect construction workers, future site users, water resources, structures and services;
- the Contractor(s) will be required to place arisings and temporary stockpiles away from watercourses and drainage systems, whilst surface water will be directed away from stockpiles to prevent erosion;
- the risk to surface water and groundwater from run-off from any contaminated stockpiles during construction works will be further reduced by implementing suitable measures including sealing stockpiles to prevent rainwater infiltration. Alternatively bunding and/or temporary drainage systems will be put in place, designed in line with current good practice, following appropriate guidelines and obtaining all relevant licences including discharge consents;
- any waters removed from excavations by dewatering will be discharged appropriately, subject to the relevant licences being obtained; and
- the Contractor(s) will implement a dust suppression/management system in order to control the potential risk from airborne contamination migrating off-site to adjacent sites, specifically the adjacent agricultural land, surrounding villages and the River Aire.

12.5.10 A refurbishment/ demolition asbestos survey has been undertaken in 2016 to determine the risks associated with potential ACMs. Should any unconfirmed ACMs be encountered during the construction phase (such as within infilled ground/ Made Ground), associated works will be undertaken in accordance with the Control of Asbestos Regulations 2012, which includes measures set to safeguard human health and the environment.

12.5.11 Foundations and services will be designed and constructed to prevent the creation of pathways for the migration of contaminants and be constructed of materials that are suitable for the ground conditions and designed use, for example water supply pipes will be designed in accordance with current good practice and applicable guidance to ensure pipes are protected from potential impacts associated with any contamination.

12.5.12 Piling design and construction works will be completed following preparation of a piling risk assessment, completed in accordance with the Environment Agency's 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention' (Environment Agency, 2001).

- 12.5.13 A site-specific (Phase 2) intrusive ground investigation will be undertaken prior to the commencement of construction works. The Phase 2 ground investigation will be designed in order to:
- further investigate potential ground contamination associated with the previous land uses;
 - assess the potential for contamination to have migrated on-site from the adjacent land uses;
 - assess the potential risks associated with ground and mine gases;
 - include testing of soils with respect to contamination (including asbestos) for a subsequent risk assessment and identify potential options for reuse of the soils;
 - inform foundation design and remove uncertainty in ground conditions at the stack locations and at the Proposed Power Plant Site; and
 - better understand the ground conditions across the Proposed Power Plant Site, including variations in bedrock profile, the presence of geological faulting and the certainty of geology as critical structure locations.
- 12.5.14 Continued settlement monitoring of the ground surface across the Proposed Power Plant Site is considered necessary in order to confirm that longwall mining settlement has ceased.
- 12.5.15 Following completion of such an investigation, the need for any mitigation measures additional to the impact avoidance measures as presented above would be defined.

Operation

- 12.5.16 Liquid fuel storage areas and transformer building areas will be appropriately bunded to ensure that, in the event of any spillage, the materials are safely contained. Most significant impacts to soil and groundwater can be avoided with good housekeeping and management practices adopted and adhered to. However, cumulative emissions of oil based materials from road vehicles are more difficult to manage. Oil/ water separators will be installed as appropriate within the drainage system to reduce the likelihood of oil-based materials impacting on the environment.

12.6 Likely Impacts and Effects

Construction

- 12.6.1 Potential impacts during the construction phase (including demolition of structures within the Site) are anticipated to include the following:
- the discovery of soils exhibiting visual and olfactory evidence of contamination during groundworks and the potential disturbance of residual soil contamination through construction activities such as the removal of existing site drainage;
 - the discovery of impacted groundwater/ surface water recovered during dewatering which may not be suitable for discharge without treatment;
 - foundation methods and construction activities that may open and/ or modify potential pollutant linkages, including the disturbance of sediments from existing drainage channels and the lagoon;
 - re-profiling of the site including the possible introduction of new fill materials and the removal of unsuitable materials;

- runoff from contaminated material exposed and/ or stockpiled during site construction works;
- contamination arising from spillages associated with vehicles and construction materials;
- airborne contamination arising from potentially contaminated dust;
- removal of any waste materials and/ or contaminated soil; and
- introduction of contaminated materials during infilling activities.

Operation

12.6.2 Potential impacts during the operational phase are anticipated to include the following:

- leaks, spills and contamination from storage of chemicals, fuels and wastes on site affecting site users and groundwater; and
- presence of gases, vapours and groundwater in the ground affecting site users and buildings.

Decommissioning

12.6.3 Potential impacts during the decommissioning phase are anticipated to include the following:

- generation of wastes during decommissioning of existing chemical tanks, pipework, and associated infrastructure;
- generation of crushed concrete and other demolition materials;
- the discovery of soils exhibiting visual and olfactory evidence of contamination during demolition and the potential disturbance of residual soil contamination through demolition activities such as the removal of existing site drainage;
- the discovery of impacted groundwater recovered during removal of below ground structures (assuming these will be removed);
- demolition activities that may open and/ or modify potential pollutant linkages, including the disturbance of sediments;
- re-profiling of the site including the removal of unsuitable materials;
- runoff from contaminated material exposed and/ or stockpiled during site demolition works;
- contamination arising from spillages associated with vehicles and demolition materials;
- airborne contamination arising from potentially contaminated dust;
- removal of any waste materials and/ or contaminated soil; and
- introduction of contaminated materials during infilling activities.

Effects

12.6.4 It is concluded that, with the implementation of the impact avoidance measures and best practice guidance defined within Section 12.5, there is a low likelihood of the identified sensitive receptors being impacted upon by the Proposed Development throughout the construction, operation and decommissioning phases, as described in Table 12.12 below

Table 12.12: Summary of impacts and effects

Description of impact	Mitigating factors	Sensitivity of resource/receptor	Magnitude of impact	Classification of effect
Impact to construction workers from contaminated soils, sediments and groundwater / surface water encountered during construction	Depth to groundwater anticipated to be below proposed depth of construction. PPE requirements and engineering controls to be determined following groundwater monitoring as part of the future site investigation	Medium	Low	Minor adverse (not significant)
Impact to groundwater from runoff and/or leachates from stockpiled materials during construction	Limited made ground anticipated to be encountered during earthworks. Mitigation measures to be adopted including collection of runoff and /or covering of stockpiles.	High	Very low	Minor adverse (not significant)
Impact to groundwater through creation of new or exacerbation of existing pathways during construction	Potential for residual sources of contamination (assuming removal of coal carpet) likely to be very limited. Additional mitigation (e.g. piling risk assessment) will further reduce hazard.	High	Very low	Minor adverse (not significant)
Impacts to flora, fauna and agricultural land from contaminated soils encountered during construction	Contaminated soils anticipated to be restricted to proposed Power Plant Site, away from agricultural land.	Medium	Low	Minor adverse (not significant)
Impact to workers, offsite residents and land from potentially contaminated dusts generated during construction	Adoption of suitable mitigation measures to minimise dust generation (e.g. damping down of materials)	Medium	Low	Minor adverse (not significant)
Risks to underlying groundwater potential contamination in imported fill placed	Imported fill to be suitable for use, and subject to testing and visual inspection prior to acceptance at the site.	Medium	Low	Minor adverse (not significant)

Description of impact	Mitigating factors	Sensitivity of resource/receptor	Magnitude of impact	Classification of effect
at the site.				
Impact to groundwater from spills, leachates and runoff during site operation	All fuel and chemical storage areas to be bunded Design of surface water drainage to include oil-water separator and sediment traps	Medium	Low	Minor adverse (not significant)
Impacts to buildings and site workers from gases, vapours and groundwater during operation	Risks to be minimised through completion of site investigation and adoption of design measures and engineering controls to minimise risks	Low	Low	Negligible adverse (not significant)

12.7 Mitigation and Enhancement Measures

- 12.7.1 As no significant effects have been identified, no additional mitigation measures are required in order to further reduce the potential impacts and effects from the ground conditions on the Proposed Development.
- 12.7.2 Following completion of a ground investigation in due course, it will be possible to define the need for any additional mitigation measures further to the impacts avoidance measures detailed in Section 12.5.

12.8 Limitations or Difficulties

Assumptions

- 12.8.1 The identification of possible future receptors is based on the Proposed Development indicative concept design. Detailed method statements and/ or work plans for the construction activities at the Site are not available as a Contractor has not yet been appointed, however it is considered reasonable to assume that proposed demolition and construction activities will follow industry best practice and relevant guidance and comply with current applicable legislation, and that standard construction techniques will be used.

Limitations

- 12.8.2 Previous site investigations conducted within the existing power station site were typically focussed on the operational coal-fired power station and the western half of the coal stockyard. Little site investigation data was available for the eastern half of the Proposed Power Plant Site, and no data was available for the Proposed Cooling Water and Gas Connection corridors. The absence of data for these parts of the Proposed Development is considered to represent a data gap, and there may be ground conditions or contamination present within these areas which could not be included in the current assessment. However further site investigation will be undertaken prior to construction to enable appropriate mitigation and design measures to avoid significant adverse effects.

12.9 Residual Effects and Conclusions

- 12.9.1 Based on the information as detailed herein, the construction, operation and decommissioning activities proposed at the Site would have the potential to generate a number of land contamination related adverse effects on identified receptors if appropriate impacts avoidance measures as detailed in Section 12.5 are not implemented.
- 12.9.2 However as it can be assumed that the impacts avoidance measures detailed in Section 12.5 are employed and any further mitigation measures identified following an appropriately designed ground investigation are implemented, the significance of effects related to potential geological, hydrogeological and contamination related impacts associated with the Proposed Development during the construction, operation and decommissioning phases are likely to be negligible or minor adverse, and therefore not significant.

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13.0 CULTURAL HERITAGE

13.1 Introduction

- 1.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential effects of the proposed Combined Cycle Gas Turbine (CCGT) power station near Eggborough, North Yorkshire (hereafter referred to as the 'Proposed Development') on cultural heritage.
- 1.1.2 This chapter is supported by Figures 13.1 and 13.2, provided in PEI Report Volume II. A gazetteer of the heritage assets identified within this chapter is presented in Appendix 13A, which is provided in PEI Report Volume III.

13.2 Legislation and Planning Policy Context

Legislative Background

The Ancient Monuments and Archaeological Areas Act 1979

- 13.2.1 The Ancient Monuments and Archaeological Areas Act imposes a requirement for Scheduled Monument Consent for any works of demolition, repair, and alteration that might affect a designated Scheduled Monument. For non-designated archaeological assets, protection is afforded through the development management process as established both by the Town and Country Planning Act 1990 and the National Planning Policy Framework (NPPF) (Department for Communities and Local Government (DCLG), 2012).

The Planning (Listed Buildings and Conservation Areas) Act 1990

- 13.2.2 The Planning (Listed Buildings and Conservation Areas) Act (LBCA Act) sets out the principal statutory provisions that must be considered in the determination of any application affecting listed buildings and conservation areas.
- 13.2.3 Section 66 of the LBCA Act states that in considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses. By virtue of Section 1(5) of the Act a listed building includes any object or structure within its curtilage.
- 13.2.4 Section 72 of the LBCA Act establishes a general duty on a local planning authority or the Secretary of State with respect to any buildings or other land in a conservation area to pay special attention to the desirability of preserving or enhancing the character or appearance of a conservation area.
- 13.2.5 Recent case law (see particularly *E Northants DC v Secretary of State for Communities and Local Government* [2014] EWCA Civ 137) makes it clear that the duty imposed in the Act means that in considering whether to grant permission for development that may cause harm (substantial or less than substantial) to a designated asset (listed building or conservation area) or its setting, the decision maker should give considerable importance and weight to the desirability of avoiding that harm. There is still a requirement for a planning balance, but it

must be informed by the need to give that weight to the desirability of preserving the asset and its setting.

- 13.2.6 Any decisions relating to listed buildings and their settings and conservation areas must address the statutory considerations outlined above as well as satisfying the relevant policies within the National Planning Policy Framework and the Local Plan.

Planning Policy Context

National Planning Policy

Overarching National Policy Statement for Energy (EN-1)

- 13.2.7 Overarching National Policy Statement (NPS) for Energy (EN-1) (Department for Energy and Climate Change, 2011) recognises that the construction, operation and decommissioning of energy infrastructure has the potential to result in adverse impacts on the historic environment and sets out principles for assessing such impacts.
- 13.2.8 The NPS states that the historic environment results from the interaction between people and places through time, and includes all surviving physical remains of past human activity. NPS Paragraph 5.8.2 defines a heritage asset as an element of the historic environment that is of value to present and future generations because of its historic, archaeological, architectural or artistic interest. The sum of these interests is referred to as its significance.
- 13.2.9 NPS Paragraph 5.8.3 recognises that some heritage assets have a level of significance that warrants official designation, including World Heritage Sites, Scheduled Monuments, Protected Wreck Sites, Protected Military Remains, Listed Buildings, Registered Parks and Gardens, Registered Battlefields and Conservation Areas. The NPS also recognises that there are non-designated heritage assets that are demonstrably of equivalent significance to scheduled monuments, and if the evidence suggests that such an asset may be affected by the proposed development, it should be considered subject to the policies for designated heritage assets (paragraph 5.8.5).
- 13.2.10 NPS Paragraph 5.8.6 states that impacts on other non-designated heritage assets should be considered on the basis of clear evidence that they have a heritage significance that merits such consideration, even though the assets are of lesser value than designated heritage assets.
- 13.2.11 NPS Paragraph 5.8.8 states that, as part of its assessment, the applicant should provide a description of the significance of the heritage assets affected by the development and the contribution of their setting to that significance. The level of detail should be proportionate to the importance of the heritage asset and no more than is sufficient to understand the potential on the heritage asset. As a minimum, the applicant should consult the relevant Historic Environment Record (HER).
- 13.2.12 Where a development site includes, or has the potential to include, heritage assets of archaeological interest, the applicant should carry out a desk-based assessment and if necessary a field evaluation in order to properly assess the interest (NPS Paragraph 5.8.9). Ultimately, the applicant should ensure that the extent of the impact of the proposed development on the heritage assets can be adequately understood from the application and supporting documents (NPS Paragraph 5.8.10).

- 13.2.13 The NPS states that the significance and value of heritage assets should be taken into account when considering the impact of a proposed development. The desirability of sustaining or enhancing the significance of heritage assets should also be taken into account, along with the desirability of new development making a positive contribution to the character and distinctiveness of the historic environment. NPS Paragraph 5.8.14 states there should be a presumption in favour of the conservation of designated heritage assets, and loss of significance to any designated heritage asset should require clear and convincing justification. Substantial harm to or loss of a grade II listed building park or garden should be exceptional. Substantial harm to or loss of designated assets of the highest significance, including Scheduled Monuments; registered battlefields; grade I and II* listed buildings; grade I and II* registered parks and gardens; and World Heritage Sites, should be wholly exceptional. Any harmful impact on the significance of a designated heritage asset should be weighed against the public benefit of the development (NPS Paragraph 5.8.15).
- 13.2.14 NPS Paragraph 5.8.20 recognises that where loss is justified, based on the merits of the development, the developer should be required to record and advance understanding of the heritage asset before it is lost. Where appropriate, such work will be carried out in accordance with a written scheme of investigation that has been agreed in writing with the local authority (NPS Paragraph 5.8.21).

National Planning Policy Framework

- 13.2.15 A heritage asset is defined further in the NPPF (DCLG, 2012) in Annex 2: Glossary as “*A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage asset includes designated heritage assets and assets identified by the local planning authority (including local listing)*”. A designated heritage asset is defined in NPPF (Annex 2) as a “*World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered battlefield or Conservation Area designated under the relevant legislation*”.
- 13.2.16 In relation to heritage policy, the definition of the significance of heritage assets in Annex 2 of the NPPF follows the criteria set out in the NPS and describes it as “*The value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic.*” However, in addition, the NPPF recognises that “*Significance derives not only from a heritage asset’s physical presence, but also from its setting*”.
- 13.2.17 The setting of a heritage asset is defined in the NPPF as “*The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral*” (Annex 2, page 56).
- 13.2.18 Paragraph 133 of the NPPF identifies harm as being either substantial or less than substantial. Where a proposed development would lead to substantial harm to the significance of a designated asset, local planning authorities should refuse consent unless it can be demonstrated that the “*substantial harm or loss is necessary to achieve substantial public benefit that outweighs that harm*”.

- 13.2.19 In cases where less than substantial harm to the significance of a designated asset is anticipated *“this harm should be weighed against the public benefits of the proposal”* (paragraph 134). In respect of non-designated assets a balanced judgement is required *“having regard to the scale of any harm or loss and the significance of the asset”* (paragraph 135).
- 13.2.20 Local plans must be prepared with the objective of contributing to the achievement of sustainable development (NPPF paragraph 151). As such, significant adverse impacts on the three dimensions of sustainable development (including heritage and therefore environmental impacts) should be avoided in the first instance. Only where adverse impacts are unavoidable should mitigation or compensation measures be considered (NPPF paragraph 152). Any proposals that would result in harm to heritage assets need to be fully justified and evidenced to ensure they are appropriate, including mitigation or compensation measures.

Planning Practice Guidance (PPG)

- 13.2.21 The PPG (DCLG, 2014) provides further advice on enhancing and conserving the historic environment. The advice in this document expands on the guidance and policy outlined in the NPPF.
- 13.2.22 Paragraph 003 of the PPG states that where changes are proposed, the NPPF sets out a clear framework for both plan-making and decision taking to ensure that heritage assets are conserved, and where appropriate enhanced, in a manner that is consistent with their significance and thereby achieving sustainable development (ID 18a-003-20140306 Last updated 06 03 2014).
- 13.2.23 Significance of heritage assets and its importance in decision taking is explored in Paragraph 009 of the PPG which states that heritage assets may be affected by direct physical change or by change in their setting. Being able to properly assess the nature, extent and importance of the significance of a heritage asset, and the contribution of its setting, is very important to understanding the potential impact and acceptability of development proposals (ID 18a-009-20140306 Last updated 06 03 2014).
- 13.2.24 The setting of the heritage asset is also of importance and a thorough assessment of the impact on setting needs to take into account, and be proportionate to, the significance of the heritage asset under consideration and the degree to which the proposed changes enhance or detract from that significance and the ability to appreciate it. The extent and importance of setting is often expressed by reference to visual considerations. Although views of or from an asset will play an important part, the way in which an asset is experienced in its setting is also influenced by other environmental factors such as noise, dust and vibration from other land uses in the vicinity, and by our understanding of the historic relationship between places.
- 13.2.25 Paragraph 013 of the PPG recognises that the contribution that setting makes to the significance of the heritage asset does not depend on there being public right or the ability to experience that setting. When assessing any application for development which may affect the setting of a heritage asset, local planning authorities may need to consider the implications of cumulative change (ID 18a-013-20140306 Last updated 06 03 2014).

Local Planning Policy

- 13.2.26 The statutory development plan for Selby District Council (as explained in Chapter 7: Legislative Context and Planning Policy Framework comprises the Selby District Core Strategy

Local Plan 2013 and saved policies of the Selby District Local Plan 2005). They contain a number of policies of relevance to the assessment of the Proposed Development. These are discussed below.

- 13.2.27 Policy ENV27 of the 2005 Local Plan (Scheduled Monuments and Important Archaeological Sites) states that where scheduled monuments or other nationally important archaeological sites or their settings are affected by proposed development, there will be a presumption in favour of their physical preservation. In exceptional circumstances where the need for the development is clearly demonstrated, development will only be permitted where archaeological remains are preserved in situ through sympathetic layout or design of the development.
- 13.2.28 Policy ENV28 of the 2005 Local Plan (Other Archaeological Sites) states that:
- (A) Where development proposals affect sites of known or possible archaeological interest, the District Council will require an archaeological assessment/evaluation to be submitted as part of the planning application;
 - (B) Where development affecting archaeological remains is acceptable in principle, the Council will require that archaeological remains are preserved in situ through careful design and layout of new development; and
 - (C) Where preservation in situ is not justified, the Council will require that arrangements are made by the developer to ensure that adequate time and resources are available to allow archaeological investigation and recording by a competent archaeological organisation prior to or during development.
- 13.2.29 Policy EMP10 of the 2005 Local Plan (Additional Industrial Development at Drax and Eggborough Power Stations) states that additional industrial/business development may be permitted at or close to Drax and Eggborough power stations provided that the proposal would not harm nature conservation interests or sites of archaeological interest (point 6).

Other Guidance

Historic England Guidance

- 13.2.30 Historic England (formerly English Heritage) has produced a number of guidance papers in respect of a variety of conservation issues. These guidance papers are intended to establish broad frameworks and guidance in order to assist in the making of decisions about England's historic environment.
- 13.2.31 Historic England produced a small number of good practice advice (GPA) guides which have replaced the Planning Policy Statement 5 Planning Practice Guide. To date only three notes have been produced; GPA1: The Historic Environment in Local Plans (Historic England, 2015a), GPA2: Managing Significance in Decision Taking (Historic England, 2015b) and GPA3: The Setting of Heritage Assets (Historic England, 2015c). Of relevance to this assessment are GPA2 and GPA3.
- 13.2.32 GPA2 provides guidance on decision making within the historic environment. The document makes clear the need to establish the significance of the heritage resource to enable informed decision making. It sets out the principles for identifying heritage significance, in line with the NPPF, reinforcing the contribution that setting can make to this significance. The document

sets out a staged approach to establishing significance and assessing impacts on that significance; progressing from understanding significance, through processes for avoiding or mitigating impacts and seeking opportunities for enhancement, to the justification and/ or offsetting any residual harm. The document reinforces the requirement of the NPPF that the information provided should be proportionate to the significance of the asset and sufficient to make an informed decision.

- 13.2.33 GPA3 has been specifically written to address the complexities associated with making decisions associated with the setting of heritage assets. The document describes the key terms of curtilage, character and context and explains the extent of setting and that it is not fixed and changes depending on the asset. The document also highlights the importance of views to the understanding of setting and states which views could contribute to understanding the significance of a heritage asset. It then offers a staged approach to proportional decision-taking.
- 13.2.34 The contribution of setting to the significance of an asset is often expressed by reference to views and the GPA3 in paragraph 6 identifies those views such as those that were designed or those that were intended, that contribute to understanding the significance of assets. An approach to the assessment heritage significance within views is provided in the Historic England guidance 'Seeing the History in the View' (2011).
- 13.2.35 Historic England has also published guidance on tall buildings as part of their advice note series. Tall Buildings: Historic England Advice Note 4 updates previous guidance by English Heritage and CABE, produced in 2007. It seeks to guide people involved in planning for and designing tall buildings so that they may be delivered in a sustainable and successful way through the development plan and development management process.
- 13.2.36 In 2008, Historic England published 'Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment'. The aim of this guidance is to ensure consistency of approach in English Heritage's role as the Government's statutory advisor on the historic environment in England. It aims to set out a logical approach to decision making and offers guidance about all aspects of the historic environment and reconciling its protection with the economic and social needs and aspirations of the people who live in it.

Chartered Institute for Archaeologists

- 13.2.37 The baseline study has been undertaken in accordance with guidance published by the Chartered Institute for Archaeologists (CIfA), specifically the standard and guidance for historic environment desk-based assessment (CIfA, 2014).

13.3 Assessment Methodology and Significance Criteria

- 13.3.1 This section presents the following:

- the methodology behind the baseline assessment including the definition of an appropriate study area;
- the methodology and terminology used in the assessment of effects; and
- identification of the information sources that have been consulted throughout preparation this chapter.

Impact Assessment and Significance Criteria

- 13.3.2 The significance (heritage value) of a heritage asset is derived from its heritage interest which may be archaeological, architectural, artistic or historic (NPPF (DCLG, 2012) Annex 2, Glossary). The significance of a place is defined by the sum of its heritage values. Taking these criteria into account, each identified heritage asset can be assigned a level of significance (heritage value) in accordance with the criteria set out in Table 13.1.

Table 13.1: Criteria for determining the significance (heritage value) of heritage assets

Significance (heritage value)	Criteria
High	Assets of international importance, such as World Heritage Sites Grade I and II* listed buildings Grade I and II* registered historic parks and gardens Registered battlefields Scheduled monuments Non-designated archaeological assets of schedulable quality and importance
Medium	Grade II listed buildings Grade II listed registered historic parks and gardens Conservation areas Locally listed buildings included within a conservation area Non-designated heritage assets of a regional resource value
Low	Non-designated heritage assets of a local resource value as identified through consultation Locally listed buildings
Very Low	Non-designated heritage assets whose heritage values are compromised by poor preservation or damaged so that too little remains to justify inclusion into a higher grade

- 13.3.3 When professional judgement is considered, some sites may not fit into the specified category in Table 13.1. Each heritage asset is assessed on an individual basis and takes into account regional variations and individual qualities of sites.
- 13.3.4 Having identified the significance of the heritage asset, the next stage in the assessment is to identify the level and degree of impact to an asset arising from the Proposed Development. Impacts may arise during construction or operation and can be temporary or permanent. Impacts can occur to the physical fabric of the asset or affect its setting.
- 13.3.5 The level and degree of impact (impact rating) is assigned by reference to a four level scale as set out in Table 13.2. The level of impact takes into account mitigation measures which have

been embedded within the Proposed Development as part of the design development process (embedded mitigation).

Table 13.2: Criteria for determining the magnitude of impact on heritage assets

Magnitude of impact	Description of impact
High	Change such that the significance of the asset is totally altered or destroyed. Comprehensive change to setting affecting significance, resulting in a serious loss in our ability to understand and appreciate the asset.
Medium	Change such that the significance of the asset is affected. Noticeably different change to setting affecting significance, resulting in erosion in our ability to understand and appreciate the asset.
Low	Change such that the significance of the asset is slightly affected. Slight change to setting affecting significance resulting in a change in our ability to understand and appreciate the asset.
Very Low	Changes to the asset that hardly affect significance. Minimal change to the setting of an asset that have little effect on significance resulting in no real change in our ability to understand and appreciate the asset.

- 13.3.6 An assessment to classify the effect, having taken into consideration any embedded mitigation, is determined using the matrix at Table 13.3, which takes account of the significance (heritage value) of the asset (Table 13.1) and the magnitude of impact (Table 13.2). Effects can be neutral, adverse or beneficial.

Table 13.3: Classification of effects

Magnitude of impact	Significance (heritage value) of heritage asset			
	High	Medium	Low	Very Low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible

- 13.3.7 This chapter considers that major or moderate effects are significant for the purposes of the EIA Regulations, in accordance with standard EIA practice. Once the effect has been identified, additional (non-embedded) mitigation can be used to offset, reduce or compensate for any significant adverse effects, or to enhance positive effects. Reassessing the significance of the effect after applying additional mitigation reflects the success rating of the mitigation and allows the level of residual effect to be assessed (Table 13.4).

Table 13.4: Level of residual effect following the implementation of additional mitigation

Residual effect	Definition
Major adverse	Negative residual effect that would be an important consideration at a national level
Moderate adverse	Negative residual effect that would be an important consideration at a regional or county level
Minor adverse	Negative residual effect that would be a relevant consideration in a local context
Neutral	Residual effect that is negligible or imperceptible
Minor beneficial	Positive residual effect that would be a relevant consideration in a local context
Moderate beneficial	Positive residual effect that would be an important consideration at a regional or county level
Major beneficial	Positive residual effect that would be an important consideration at a national level

- 13.3.8 Within the NPS and the NPPF, impacts affecting the significance (value) of heritage assets are considered in terms of harm and there is a requirement to determine whether the level of harm amounts to ‘substantial harm’ or ‘less than substantial harm’.
- 13.3.9 There is no direct correlation between the classification of effect as reported in this PEI Report and the level of harm caused to heritage significance. A major effect on a heritage asset would, however, more often be the basis by which to determine that the level of harm to the significance of the asset would be substantial. A moderate effect is unlikely to meet the test of substantial harm and would therefore more often be the basis by which to determine that the level of harm to the significance of the asset would be less than substantial. In all cases determining the level of harm to the significance of the asset arising from development impact is one of professional judgement.
- 13.3.10 An assessment of effects is made both prior to the implementation of mitigation and after the implementation of mitigation to identify residual effects. This first highlights where mitigation may be necessary and then demonstrates the effectiveness of mitigation.

Extent of Study Areas

- 13.3.11 For designated assets (listed buildings, scheduled monuments, world heritage sites, conservation areas, registered parks and gardens, registered battlefields), a study area of 5 km was used from the Site boundary, including the Proposed Gas Connection pipeline route. The extent of the 5 km study area was informed by a site visit and allowed the identification of heritage assets which could potentially be impacted upon by visual intrusion, interruption of a designed view or landscape, or have an effect on their setting. As such, the Zones of Theoretical Visibility prepared for the landscape and visual impact assessment presented in

Chapter 16: Landscape and Visual Amenity and Figure 16.3 and 16.4 (PEI Report Volume III) were used to inform the definition of the study area.

- 13.3.12 For non-designated heritage assets (archaeological sites, findspots, locally listed buildings), a study area of 1 km was used to obtain data from North Yorkshire Historic Environment Record (HER) and the Historic England Archives. This distance was adopted to ensure that only relevant sites which had the potential to be impacted by the Proposed Development were considered.
- 13.3.13 The extent of both study areas was set out in the Scoping Report methodology (Eggborough Power Limited 2016, paragraph 6.86) and has been accepted by the statutory consultees (see Table 13.5).
- 13.3.14 The reference numbers are stated in the text in bold and shown on Figures 13.1 and 13.2.

Sources of Information/Data

- 13.3.15 Information and data has been gathered from a number of sources including:

- North Yorkshire HER;
- Historic England Archive for records within the National Record of the Historic Environment;
- National Heritage List for England;
- National Mapping Programme;
- British Geological Survey website;
- Ordnance Survey historic mapping data; and
- online sources.

- 13.3.16 The designated heritage assets within this assessment are identified with their National Heritage List for England (NHLE) reference number. The non-designated heritage assets are identified with their North Yorkshire HER reference number. All heritage assets are referenced in bold and tabulated in Appendix 13A.

Consultation

- 13.3.17 A summary of consultation undertaken to date in the preparation of this assessment is set out in Table 13.5 below. As explained in Chapter 1: Introduction, pre-application consultation will be documented within the Consultation Report that will form part of the DCO application.

Table 13.5: Consultation summary table

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
North Yorkshire County Council	5 th August 2016 (email)	Responding to request to comment on EIA Scoping Briefing Note. NYCC support the proposal to carry out a	Hall Garth has been assessed to be of high value in line with the consultation request

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		<p>desk based assessment supplemented by field evaluation to assess the significance of heritage assets.</p> <p>NYCC recommend that the double-moated site at Hall Garth is treated as a designated heritage asset, in accordance with NPPF Policy 139.</p> <p>NYCC support the consideration of the current plant at Eggborough Power Station as a heritage asset and recommend that it is subject to recording prior to demolition.</p>	<p>and in accordance with the criteria set out in Table 13.1 of this chapter.</p> <p>A programme of field evaluation is currently underway to further assess the significance of previously unrecorded archaeological assets in the site.</p> <p>Eggborough Power Station is assessed in this Chapter as a non-designated asset of local (low) value.</p>
Historic England (Keith Emerick)	10 th August 2016 (email)	<p>Responding to request to comment on EIA Scoping Briefing Note. HE stated that due to tight timescale they could not provide a detailed response, however HE confirmed that they agreed with the suggested structure of the cultural heritage assessment. In addition, HE stated that the issue to resolve was the degree of harm to the significance of heritage assets rather than just understanding impacts.</p>	<p>No further action required – continued with the scope and approach outlined in the EIA Scoping Report.</p> <p>ES will include a statement relating to the degree of harm to heritage assets once field evaluation has been completed.</p>

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
Secretary of State (SOS)	September 2016 (Scoping Opinion)	Two different study areas are proposed for designated and non-designated and these should be agreed with relevant authority and justified in the ES.	Refer to Section 13.3.10 Scoping responses from HE and NYCC agree with methodology proposed in Scoping Report (see below).
		Where relevant, cross reference should be made with other ES chapters, e.g. LVIA.	Cross-reference with other relevant chapters is included in the PEI Report.
		Agrees with Scoping methodology that further evaluation (e.g. through geophysical survey) may be required to understand baseline conditions.	Geophysical survey is being undertaken to further establish baseline conditions.
		SoS expects to see a clear definition between 'design or embedded mitigation' (ref paragraph 6.90 of the Scoping Report) within the ES.	Distinction between design and embedded mitigation has been set out in this PEI Report chapter.
		Where written schemes of investigation (WSI) are proposed in the ES, the scope should be agreed with the relevant planning authority or Historic England.	Reference to WSI will stipulate that they will be agreed with the relevant planning authority or Historic England.
Historic England (Emma Sharpe)	15 th September 2016 (letter)	Scoping Opinion. Formal response to EIA Scoping Report. HE is content with the	No further action required – continued with the scope and approach outlined in

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		scope and approach outline in the scoping report. No further comment to make at this stage.	the EIA Scoping Report.
North Yorkshire County Council	15 th September 2016 (email)	Scoping Opinion. Formal response to EIA Scoping. NYCC support recommendation for an initial desk-based assessment (DBA) to establish baseline conditions.	Baseline conditions have been established in this chapter through desk-based assessment.
		Developer should assume that a DBA assessment will be insufficient to properly assess the impact on the significance of archaeological remains. Further field evaluation is likely to be necessary and results should be included in EIA to enable a planning decision to be made. EIA should include strategy for any necessary mitigation prior to or during construction	A programme of field evaluation is being carried out (December 2016 – January 2017) in order to confirm the presence of archaeological remains and to help assess the impact on significance. The results of the evaluation will be included in the EIA and will inform the strategy for necessary mitigation.
Doncaster MBC	19 th September 2016 (email)	Formal response to EIA Scoping. DMBC agrees with methodology in EIA Scoping Report. DMBC do not have a local list of buildings of heritage significance and refers AECOM to potentially	Information noted.

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		useful sources of information re: conservation areas and local parks and gardens www.doncaster.gov.uk	
Historic England (Emma Sharpe)	23 rd November 2016 (email)	HE is content with the scope and approach outlined in the EIA Scoping Report. No further comment to make at this stage. Confirmed that HE would be happy to provide further comments on the report as it progresses if that would be helpful.	No further action required – continued with the scope and approach outlined in the EIA Scoping Report.
North Yorkshire County Council	14 th December 2016 (email)	Confirmation from The Principal Archaeologist for NYCC that the written scheme of investigation for geophysical survey of the gas pipeline corridor has been approved.	Geophysical survey to be carried out in accordance with the approved methodology.

13.4 Baseline Conditions

Existing Baseline

- 13.4.1 The assessment of existing baseline conditions has identified 117 designated heritage assets, comprising 4 Scheduled Monuments, 110 listed buildings and three Conservation Areas within the 5 km study area, and 71 non-designated assets within a 1 km study area. Heritage assets are identified in the baseline by either their HER or NHLE reference number in brackets.

Designated Heritage Assets

- 13.4.2 No designated heritage assets have been identified within the Site. There are four scheduled monuments within the 5 km study area. The scheduled monuments are illustrated on Figure 13.1 and comprise:

- a Roman fort to the west of Roall Hall (NHLE 1017822);
- Whitley Thorpe moated Templar grange (NHLE 1017458);
- Thorpe Hall moated monastic site (NHLE 1017460); and
- a World War II bombing decoy (NHLE 1020499).

Roman Fort to the West of Roall Hall

- 13.4.3 The scheduled Roman fort is located approximately 600 m north-west of the Site (NHLE **1017822**). The fort, and associated features, is located on a sandstone promontory on the south side of the River Aire floodplain. There are no known Roman roads leading to the fort and the garrison is believed to have been supplied by the river, which is relatively rare and contributes to the value of the monument.
- 13.4.4 There are also a number of non-designated assets that relate to the fort at Roall that are included for completeness, comprising the auxiliary fort (**MNY12278**), the vicus (**MNY12279/919950**) and the bath house (**MNY12280**).
- 13.4.5 The fort would originally have been located directly adjacent to the River Aire when it ran along its original course which is now indicated by the crescent shaped pond named Old Hee, visible along the northern boundary of the scheduled area. The fort is orientated north-east to south-west on its long axis and the main gate faces the river, on the north-east side. The fort is surrounded by a double ditch and given the typical shape and in comparison with other forts in the locality is thought to date to the 1st century AD, specifically the Flavian period (69 AD – 96AD). Geophysical survey and intensive aerial photograph analysis has been carried out at this site which has identified internal features and associated linear features beyond the defences. These include a possible bathhouse, an associated vicus located to the south-east and south-west and paddocks. It is likely that there will be waterfront type features located near the Old Hee pond and the relict course of the River Aire, including possible wharfs, bridge footings or boats themselves.
- 13.4.6 The setting of the fort is defined principally by the extent of its buried remains, and, if it was supplied by the Aire, by its topographical location and relationship with the former course of the river, although it does not flow in the same location as during the Roman period, as indicated by the location of the Old Hee pond. The fort occupies a level area which would have been directly on the banks of the river with extensive views in all directions. The setting

of the fort has altered, with the introduction of large, modern elements such as the existing coal-fired power station.

- 13.4.7 There is evidence for Roman military activity at Castleford to the west and Brough to the east with major road networks running to the east and west. In closer proximity, there are a number of non-designated cropmarks which have been tentatively dated to the Roman period indicating further activity in the study area.

Whitley Thorpe moated Templar grange

- 13.4.8 The scheduled site of Whitley Thorpe moated Templar grange is located approximately 3.8 km south-west of the Proposed Development (NHLE **1017458**). The site occupies an area of slightly raised ground; however long-range views do not form part of its setting. The setting of the grange is defined primarily by the extent of its buried and extant remains, which include infilled fishponds and denuded ridge and furrow, as well as its association with the surrounding lands which formed the manor of Whitley, held by the Knights Templar from before 1248.

Thorpe Hall Moated Monastic Grange

- 13.4.9 Another scheduled grange is located to the north, approximately 7 km north of the existing coal-fired power station and 4 km north of the northern extent of the Proposed Gas Connection. Thorpe Hall moated monastic grange (NHLE **1017460**) was originally a grange of the Benedictine abbey at Selby and includes a number of slight earthworks and extensive buried remains. The setting of the site is defined by the extent of the buried and extant remains and also by its historical association with the remnants of medieval agriculture in the surrounding area.

World War II Bombing Decoy

- 13.4.10 A World War Two (WW2) bombing decoy control building (NHLE **1020499**) is located approximately 4.8 km north of the northern extent of the Proposed Gas Connection, and 7.8 km north of the existing coal-fired power station site. The monument includes the standing remains of a control building for a dummy aerodrome, and the primary purpose of the site was to act as a decoy to divert enemy aircraft from attacking the RAF fighter station at Church Fenton, located 6.5 km to the north-west. The location of the decoy forms an integral component of its setting, and contributes to its significance as a feature which formed part of the chain of defence of Britain during WW2. It is located on the anticipated flight path that enemy aircraft would have taken towards the Church Fenton parent station, which would have seen them follow a course along the Humber Estuary and River Ouse before swinging north towards Church Fenton. The original function of the asset can only really be appreciated from the air and at night.

Listed Buildings

- 13.4.11 There are no listed buildings within the Site. 82 listed buildings are within the 5 km study area. These consist of four grade I, three grade II* and 75 grade II assets. Buildings located within settlements or which are similar in terms of their type and setting are grouped together accordingly for the purpose of this chapter.

- 13.4.12 The closest listed structure to the Proposed Power Plant Site is a grade II listed milestone (**NHLE 1430182**). It is located to the north-west of the Proposed Power Plant Site. It is one of a series of inscribed milestones for the Doncaster and Selby Turnpike Trust which was created in 1832. It is situated on the A19 approximately 120 m north of Roall Lane. It is a magnesian limestone pillar of rectangular section with a gabled head. It is inscribed on the side facing the road with "DONCASTER / 14 MILES / ASKERN 7 / SELBY 5 / YORK 20", this still being discernible despite heavy weathering. Its significance relates to its historic interest as a relatively rare example of early 19th century street furniture. This asset will be unaffected by the Proposed Development as the existing A19 will be unchanged. It has group value with five other Grade II milestones along the route of the Doncaster and Selby turnpike road, now the A19, two of which are within the study area. One is located to the north-east of this milestone approximately 100 m north of Common Lane on Doncaster Lane (**NHLE 1296820**); the other milestone is located within Brayton (**NHLE 1365809**) located 0.16 km north of the A19 junction with Barff Lane. There are another two milestones (**NHLE 1295652** and **1148541**) within the study area located 0.2 km on the A63 of Bar Lane and approximately 0.8 km east of the junction with Lowfield Road on the A63 respectively. These are located on the Selby and Leeds turnpike road now the A63. The setting of the milestones are similar they are intrinsically linked to their location, position and function next to the road. The significance and the setting of these assets will not be impacted by the Proposed Development.
- 13.4.13 The next closest listed building is a pair of gatepiers to Roall House (**NHLE 1174474**, grade II) and are located approximately 0.9 km from the Site boundary. These gates are constructed of magnesian limestone ashlar approximately 2.5 m high. It is situated between the boundary of the 20th century Roall Hall to the west and a light commercial development to the east. Their significance relates to their association with the Roall House and as a gateway. It denotes the earlier phases of development of Roall House and remains relatively unaltered denoting the historical origins of Roall House. The significance and setting of the gatepiers will be unaffected by the Proposed Development.
- 13.4.14 Four grade II listed bridges that span the Selby Canal also lie within the study area close to the proposed Gas Connection. Tankards Bridge (**NHLE 1316360**) located on the Main Street within West Haddlesey to the north. It dates from the late 18th century and is constructed of sandstone ashlar with cast iron balustrade. It is a humpbacked bridge. Its setting is related to the Selby Canal and West Haddlesey. The relatively flat topography and lack of intervening buildings or vegetation does allow views over agricultural land to the existing site to the south, however it is assessed that the significance and setting of Tankards Bridge will not be impacted by the Proposed Development.
- 13.4.15 There are a further three canal bridges that are also grade II listed buildings along the Selby Canal; these are Paper House Bridge (**NHLE 1174087** and **NHLE 1252273** (there are two separate list descriptions for the same bridge as they span parishes of Gateforth and Chapel Haddlesey)), Brayton Bridge (**NHLE 1132536**) and Burton Bridge (**NHLE 1246188**). The bridges date from the late 18th century and are associated with the development of Selby Canal. The Selby Canal was constructed between 1774-1778 with William Jessop as principal engineer. Their significance relates to the development of alternative means of transportation and advancement of technology during the late 18th century. Their setting is intimately linked to the canal which they facilitate the crossing of. The significance and setting of these assets will not be impacted by the Proposed Development.

- 13.4.16 Temple Manor is a grade II listed building (**NHLE 1295905**) it is located approximately 1.8 km from the Site. Temple Manor is a house dating from the 17th century that includes masonry from a Knights Templar Preceptory (date from the late 12th – early 13th century) and a 15th – 16th century tower of the fortified manor house of the Darcy family. The building has undergone extensive renovations and alterations c.1980 to convert it into various uses including a public house and then subsequently as a nursing home. It is constructed of brick under a pantile roof. Temple Manor's significance relates to the remains of the tower and other medieval fragments associated with both the fortified manor house of the Darcy family and the earlier preceptory of the Knights Templars. Its architectural interest relates to it being an example of a late 17th century manor house retaining a two storey porch. It also has archaeological interest as a marker for an expected area of important archaeological remains related to the Knights Templar preceptory. It is considered to be of medium value.
- 13.4.17 Manor Farmhouse (**NHLE 1148398**, grade II) is a farmhouse dating from the late 17th – early 18th century with later additions and alterations. It is cement rendered under a pantile roof. It is located within the sporadic linear settlement of Temple Hirst and is experienced in a village setting with multiple farm complexes and farm buildings. It is set back from the road behind a low close board horizontal plank fence and a front garden. There are glimpses of large expanses of agricultural land visible that provides its context and a link to its function as a farm house. It is located to the east of the embanked railway line.

Hensall

- 13.4.18 There are a number of listed buildings within the village of Hensall. Hensall House (**NHLE 1174458**, grade II) lies of the south side of the Main Street. It is a house dating from the late 18th century with later additions and alterations. It is constructed of brick under grey slate roof and sits in a prominent position on a corner plot with the village. Its location within the village provides the setting for Hensall House.
- 13.4.19 South of the village is Hensall Signal Box (**NHLE 1412058**, grade II). The signal box is sited adjacent to the level crossing at the western end of Hensall Station which dates back to the opening of the Wakefield, Pontefract and Goole Railway in 1848 and contained the levers to operate the signals and the fully glazed signal box on stilts gave a good view down the line. The former station house built in a 'Swiss Cottage' style is on the opposite (northern) side of the line. Just to the east of the signal box on the southern station platform is a Victorian timber-built waiting room. The railway line and the associated Victorian buildings provide the setting and contribute towards the significance of the signal box. Hensall Signal Box will not be impacted by the Proposed Development.
- 13.4.20 The church of St Paul (**NHLE 1295734**, grade II*) was conceived as a group with The Red House (**NHLE 1148401**, Grade II*) and Hensall Primary School (**NHLE 1148400**, grade II). The group is located approximately 1.3 km south-east of the Site. All date from 1854 with later alterations. They were designed by Architect William Butterfield. The patron was the 7th Viscount Downe. It was built by Charles Ward of Lincoln. They are constructed of pinkish-red brick in English bond with ashlar dressings under a grey slate roof, built in the style of Aesthetic Functionalism. The Church of St Paul lies to the north of the grouping west of the road with a churchyard surrounding it and mature trees flanking the perimeter particularly to the north-west. The Red House sits to the south-west of the church. It was a former vicarage, now house. Hensall Primary School sits to the south of the church parallel to the road. The buildings' significance lie in their architectural interest as buildings demonstrating an early example of a conscious

Victorian return to an honest, unpretentious style of building which is not stylistic and is devoid of imitative flavour. The three buildings form an important group and provide the setting for each other. They are located with open flat agricultural land visible with a few sporadic buildings arranged around the principal routes.

Kellington

- 13.4.21 The Church of St Edmunds (**NHLE 1148402**, Grade I), its associated gatepiers (**NHLE 1148403**, grade II) and churchyard cross (**NHLE 1295742**, grade II) lie approximately 2.55 km to the east of the Site. The church has Norman origins to the nave with mid-12th century reconstruction, further alterations and additions throughout the mid-14th and 15th century with further restorations of 1866-70. It is constructed of magnesian limestone ashlar with concealed roof to nave, stone roof to south porch and asphalt roof to chancel. It has a three stage west tower, a five bay nave with clerestory, a south porch and a north aisle. There is also a three bay chancel with north chapel. The church is located away from the main settlement of Kellington and is located, along with its churchyard, within flat agricultural land surrounding it with relatively low hedging. This makes the church a visible, prominent and isolated building within the landscape with long distance views to and from. The significance of the church lies in its early origins and later additions.
- 13.4.22 Kellington Windmill (**NHLE 1148404**, grade II) is a late 18th – early 19th century windmill. It is constructed of magnesian limestone rubble, partly rendered with brick infill and conical roof. Its significance relates to its functional association with the agricultural land that surrounds it and it illustrating the technological innovations for grinding flour at the time in which it was built. Its setting within agricultural land adds to the significance.

Birkin

- 13.4.23 Birkin contains five listed buildings. These are Church of St Mary's (**NHLE 1316671**, grade I), Coffin in churchyard of St Mary's (**NHLE 1316672**, grade II), pair of gatepiers to Birkin Hall (**1132451**, grade II), Birkin Grange (**NHLE 167448**, grade II) and Birkin House (**NHLE 1316672**, Grade II).
- 13.4.24 The Church of St Mary's dates from the 12th century with 14th century south aisle and the upper stage of tower attributed to this period. There are also additions and alterations dating from the 18th century. It is constructed of magnesian limestone ashlar with stone slate roof and wooden porch to the south. The church is situated at the southern part of the village with a low course stone wall enclosing the churchyard and the monuments including the listed coffin (**NHLE 1316672**, grade II). There are extensive panoramic views to the south over flat agricultural land. Just outside the boundary are the gatepiers to Birkin Hall that form a field boundary. Birkin Grange was the former vicarage but is now a house. Other listed buildings within Birkin are vernacular denoting the agricultural origins of the area.

Gateforth

- 13.4.25 Gateforth contains six listed buildings all of which are associated with Gateforth Hall, a grade II* listed building (**NHLE 1132514**). The hall was built in 1814 for Humphrey Osbalderston. It is constructed of brick with magnesian limestone ashlar dressings under a grey slate roof and rendered stacks. The principal frontage is two storeys, three bays of which the centre is a full-height, and a three window bow. There is a flight of four curved ashlar steps encompassing a bow with broad top step carrying a portico of four giant Ionic columns supporting a frieze,

cornice and low parapet. It was built as a hunting lodge and has many associated buildings and structures including the listed Ha-ha (**NHLE1316662**, grade II) to the south-east. There are a further three listed structures – Church Lodge (**NHLE 1174631**, grade II), The Coach House (**NHLE 1295640**, grade II) and West Lodge (**NHLE 1174668**, grade II).

Hambleton

- 13.4.26 There are four listed structures within Hambleton. These are 22 Main Street (**NHLE 1295633**, grade II), Walmsley House (**NHLE 1132516**, grade II), the Old Vicarage (**NHLE 1295621**, grade II) and Garth House (**NHLE 1316663**, grade II). These are all located within the built up settlement of Hambleton. Due to the distance from the Site, intervening buildings and their setting within an established village, these assets are not considered to be impacted by the Proposed Development.

Thorpe Willoughby

- 13.4.27 There are three listed buildings within the settlement of Thorpe Willoughby – Thorpe Hall (**NHLE 1365020**, grade II), buildings opposite Thorpe Hall (**NHLE 1132561**, grade II) and Barff Farmhouse (**NHLE 1132517**, grade II). Due to the distance from the Site, intervening buildings and their setting within an established village streetscape these assets are not considered to be impacted by the Proposed Development.

Brayton

- 13.4.28 There are two listed buildings within Brayton. The grade I listed Church of St Wilfred (**NHLE 1132537**) and the associated Vicarage (**NHLE 1167599**, grade II). The buildings are located in an open area between Selby and Brayton. Due to the distance from the proposed site and intervening buildings these assets are not considered to be impacted by the Proposed Development.

Selby

- 13.4.29 There are 60 listed buildings within Selby that fall within the 5 km study area. They are close to the boundary of the study area. A full list of these can be found in Appendix 13A however due to the distance from the Site, intervening buildings, other topographical features and their setting within an established townscape, these assets are not considered to be impacted by the Proposed Development.

Gowdal

- 13.4.30 Gowdal south-east of the Site contains three listed buildings – Cowdall Broach Farm (**NHLE 1347020**, grade II), Stable and pigeoncote west of Gowdal Hill Farmhouse (**NHLE 11310139**, grade II) and barn 30 m west of Gowdall Broach farm (**NHLE 1161433**, grade II). These are vernacular buildings associated with agriculture. They are set within agricultural land. Gowdall Broach Farm and associated barn is situated north of the A645 and M62. This is part of the setting of the farm.

Conservation Areas

- 13.4.31 The Site is not located within a conservation area. There are three conservation areas within the 5 km study area. These are Selby Town, Brayton and Armonry Road and Brook Street. Due

to the distance from the Site, intervening buildings, other topographical features and their location within historic built up areas within established village or townscapes these assets are not considered to be impacted by the Proposed Development.

Non-designated assets

- 13.4.32 There are four known non-designated heritage assets within the Site and a further 67 non-designated heritage assets within the 1 km study area (Figure 13.2). The non-designated heritage assets within the Site comprise the existing Eggborough Power Station (**1316287**) and an undated enclosure and field system identified from cropmark evidence (**MNY10018**). Within the footprint of the existing Eggborough Power Station is the site of a former manor (**MNY9849**) and Sherwood Hall (**MNY17093**); both of these assets are no longer extant.
- 13.4.33 There is known prehistoric activity in the 1 km study area. Cropmarks that are likely to be associated with an Iron Age or Roman ditched enclosure are located approximately 500 m to the east of the southern end of the Proposed Gas Connection and Proposed Cooling Water Connections (**1315714**).
- 13.4.34 Cropmark evidence has identified a trackway (**MNY10008**) and field system (**MNY10003**) of potential late prehistoric or early Roman date 450 m to the north of the Proposed Gas Connection.
- 13.4.35 Cropmark evidence has also identified an undated enclosure and possible trackway on the western edge of the Proposed Gas Connection corridor (**MNY24129**). A medieval find is also recorded in this location (**MNY10013**). There is no evidence to suggest that the features extend to the east into the Proposed Gas Connection corridor.
- 13.4.36 The remains of a double-ditched enclosure (**1318872**) and field system (**1318895**) are recorded on the south-western edge of the Proposed Gas Connection corridor at the point it crosses the existing A19 carriageway. An undated enclosure (**MNY10018**), also been identified from cropmark evidence, is located within the Site and is located approximately 220 m to the north-west of the double-ditched enclosure.
- 13.4.37 An undated enclosure has also been identified from cropmark evidence approximately 650 m east of the Proposed Gas Connection corridor (**MNY17090/1318742**) and may be of prehistoric or medieval origin. **MNY24130** is located approximately 150 m west of the Proposed Gas Connection corridor on the north bank of the River Aire. The feature was recorded during a watching brief on a gas pipeline and comprises a ditch and bank that may be part of a dyke system that went out of use in 1789 (On Site Archaeology, 1999).
- 13.4.38 The site of a former manor and Sherwood Hall (**MNY17093/MNY9849**) are located within the footprint of the existing coal-fired power station. Associated with Sherwood Hall are the cropmarks of three ponds and a possible drain (**1315781**). The remains of a metalled trackway (**MNY34131**) recorded during a watching brief in 1998 may also be associated with the Hall. Sherwood Hall was occupied by William Morritt Esq. in the 1820s (www.geunki.org.uk). The date of construction of this hall is unknown, but was previously known as Potterlawe and is claimed to have been a grange of the Templar Preceptory located at Temple Hirst to the north of the River Aire (Worsfold 1894). The hall was demolished in the 1960s to make way for Eggborough power station.

- 13.4.39 There are a number of non-designated assets relating to the medieval Hall Garth moated site (**56177/MNY9969**). The site is non-designated but has been identified through consultation as being of potential national importance. The known extent of the site has been defined primarily by cropmark evidence and map regression, and the Proposed Gas Connection corridor has been designed to avoid remains associated with the site.
- 13.4.40 The double moated site was constructed by the Basset family in the 12th century. The earliest structures included a hall with the moat added in the 13th century. Rescue excavation undertaken during the 1960s also found evidence of Roman and Saxon activity. Timber buildings were replaced with stone structures in the mid-13th century, and further alterations were made in the 14th century with the construction of a kitchen followed by the remodelling of the manor and construction of a gatehouse and bridge over the moat in the 15th and 16th centuries.
- 13.4.41 Hall Garth appears on the Ordnance Survey maps from the 1849 1st edition until the 1973 edition when it is no longer shown. The mapping shows the extent of the moat, showing that all four arms were visible as earthworks until the mid-20th century. The 1849 Ordnance Survey map shows the moat in detail, indicating that the western section of the moat may still have contained water, or at least be heavily waterlogged.
- 13.4.42 The disappearance of Hall Garth from the Ordnance Survey mapping may have occurred as a result of the construction of flood defences in the 1960s, which prompted the rescue excavation. The excavation, led by Mrs. J Le Patourel, recorded the extensive preservation of the asset and the chronology of the site's development. The existence of the moated site, along with the monastic granges and number of settlements in the study area suggests that this area was a relatively well-populated and utilised rural landscape during the medieval period.
- 13.4.43 The setting of Hall Garth is defined primarily by the extent of its buried remains. The shared historical association with remnant medieval field systems in the wider study area also contribute to the setting of Hall Garth.
- 13.4.44 Evidence of medieval agricultural activity has also been identified at the northern limit of the Proposed Gas Connection corridor, located to the west of the settlement of Burn abutting West Lane on its eastern side. Cropmark evidence suggests ridge and furrow and field boundaries (**1309762**). The site of a medieval windmill is recorded approximately 460 m east of the Proposed Gas Connection corridor on the south side of the River Aire (**MNY17065**).
- 13.4.45 Findspot evidence, which can provide a background signature on the type of activity in an area, includes two findspots of late Iron Age and Roman pottery (**MNY10002**, **MNY10001**) and also medieval finds (**MNY10000**) (**MNY9999**).
- 13.4.46 Burn Airfield is located approximately 600 m north-east of the Proposed Gas Connection corridor (**MNY1063**). The airfield opened in November 1942 as a base for Wellington Bombers of the RAFs 4 Group, Bomber Command, 578 Squadron, and had three concrete runways, associated hangars and accommodation buildings. The squadron was disbanded in 1946 and the runway closed in September 1946, although the airfield and surrounding area was used as a Prisoner of War camp for German soldiers until 1948. The airfield's last military use was during the Korean War and Suez Crisis, when it was used as a tank park.

- 13.4.47 Eggborough Power Station is a non-designated heritage asset (**1316287**). This coal-fired power station was constructed in the 1960s and opened in 1970, and was capable of producing enough electricity to meet the needs of two million households.

Potential for Previously Unknown Heritage Assets

- 13.4.48 The existing baseline evidence suggests the Site is located within an archaeological landscape with the potential to contain multi-period archaeological remains, in particular, late prehistoric, Roman, medieval and post-medieval remains. The archaeological investigations during the construction of a gas pipeline to the immediate west of the Proposed Gas Connection corridor (On Site Archaeology 1999) identified several features that are now recorded in the HER. The previous gas pipeline route was excavated through floodplain deposits, and the watching brief report notes that one of the features, a ditch and bank (**MNY24130**) was sealed by sandy clay alluvium. The course of the River Aire has deviated over time, and there is a high potential that river silts may have masked prehistoric, Roman, and later deposits and features associated with water-edge activities.
- 13.4.49 In line with the Scoping Opinion, a programme of field evaluation is being carried out (Dec 2016 – Jan 2017) to confirm the presence of archaeological remains within the Site and to help assess the impact of the Proposed Development on the significance of heritage assets. The results of the evaluation will inform the scope of necessary archaeological mitigation which will be agreed with the Principal Archaeologist for North Yorkshire County Council.

Future Baseline

- 13.4.50 It is predicted that in the future baseline conditions for cultural heritage, the existing coal-fired power station will have been demolished, or will be going through the process of demolition, during the construction or early operation of the Proposed Development, and the impact of these scenarios has been assessed in this chapter.
- 13.4.51 In the absence of the Proposed Development it is predicted that cultural heritage baseline conditions will not change.

13.5 Development Design and Impact Avoidance

- 13.5.1 Sites of known heritage importance, such as the double-moated site at Hall Garths, have been avoided during the refinement of the design of the Proposed Development (between Stages 1 and 2 of the consultation) in order to avoid impacts to their significance and their setting. The Proposed Gas Connection also has a limit of deviation which may (subject to constraints including technical matters) allow for the avoidance of discrete cultural heritage assets that are identified within the construction footprint.
- 13.5.2 The design of the Proposed Development has avoided any physical impact on listed buildings.

13.6 Likely Impacts and Effects

- 13.6.1 The elements of the Proposed Development within the existing coal-fired power station site include the Proposed Power Plant, Construction Laydown, Electricity and groundwater Borehole Connections and access points. The Proposed Cooling Water Connections to the north follow the route of the existing cooling water connections for the majority of their routes. Due the extent of ground disturbance caused by previous development at the existing

coal-fired power station site, impacts to previously unknown buried heritage assets is unlikely, and significant effects are not anticipated.

- 13.6.2 The Proposed Gas Connection to the north of the existing coal-fired power station site will cut through arable fields. There is a potential for the construction of the Proposed Gas Connection to impact previously unknown buried heritage assets.
- 13.6.3 The listed buildings and the non-designated heritage assets are experienced in a flat topography, with the existing coal-fired power station visible to many from the assets. Additional impacts as a result of the Proposed Development to the setting of listed buildings (from where the existing coal-fired power station is visible) are unlikely and significant effects are not anticipated.
- 13.6.4 The demolition of the existing coal-fired power station will result in the total loss of this non-designated heritage asset.

Construction

- 13.6.5 The existing coal-fired power station site does not contribute to, or form part of the setting of the scheduled moated sites in the study area. It is assessed that the construction of the Proposed Development will result in no impact and no change to the settings of Whitley Thorpe moated Templar grange and Thorpe Hall monastic grange, and the effect is assessed as **neutral**.
- 13.6.6 The setting of the WW2 bombing decoy control building (NHLE **1020499**) is defined by its location along the anticipated flight path of enemy aircraft and by its historical association with the RAF fighter station at Church Fenton. The Site does not contribute to, or form part of this setting. It is assessed that the construction of the Proposed Development will not impact or change the setting of the decoy and the effect will be **neutral**.
- 13.6.7 The setting of the scheduled Roman fort is defined principally by the extent of its buried remains, and also by its relationship with the former course of the River Aire. The fort occupies a level area which would have been directly on the banks of the river with extensive views in all directions, including to the east towards the proposed development. The existing coal-fired power station is part of the fort's current setting but does not contribute to the understanding of the fort's significance.
- 13.6.8 Enabling works for construction will include the demolition of several small structures within the footprint of the Site. This will not change the visual component of the fort's setting and will not change the significance of the asset. No impact is predicted, resulting in a **neutral** effect.
- 13.6.9 Construction traffic will use existing access points into the Site from the A19 carriageway and Wand Lane. Therefore there will be no noise and dust impacts to the setting of the fort arising from construction traffic and the effect will be **neutral**.
- 13.6.10 Temporary lighting will be used during construction to enable safe working in hours of darkness. Night-time lighting is already present within the existing coal-fired power station site including the Proposed Power Plant Site; therefore the introduction of lighting during construction represents only a slight change to the visual component of the fort's setting. The temporary impact is assessed to be very low, resulting in a **minor adverse effect** which is not significant.

- 13.6.11 The construction of the Proposed Development will comprise a number of elements, each with the potential to result in disturbance to below ground deposits. It is assessed that construction activities within the existing coal-fired power station site and the majority of the Cooling Water Connections route to the north will not result in significant adverse effects to buried heritage assets, due to the likely extent of previous ground disturbance. The assessment of impact to buried heritage assets therefore relates only to the construction of the Proposed Gas Connection.
- 13.6.12 The construction of the Proposed Gas Connection has the potential to impact buried archaeological remains within the working width corridor. The construction will require the removal of topsoil and the excavation of trenches which will have a direct, permanent impact on buried remains.
- 13.6.13 Remains of potential national importance have been avoided by design and therefore important features associated with Hall Garth medieval moated site are unlikely to be impacted. However, the western extent of the remains is based primarily on cropmark evidence, and there is the potential for associated remains to extend beyond the plotted cropmarks and into the Proposed Gas Connection corridor. Potential physical impacts to known heritage assets are likely to entail:
- features associated with Hall Garth moated site (**56177/MNY9969**);
 - undated double-ditched enclosure (**1318872**);
 - features associated with a possible field system complex (**1318895**); and
 - ridge and furrow and possible field boundary features associated with medieval agricultural activities (**1309762**).
- 13.6.14 In addition, there is a potential for previously unrecorded archaeological features to be present within the Proposed Gas Connection corridor.
- 13.6.15 Features associated with Hall Garth (**56177/MNY9969**) have the potential to be of national interest due to the archaeological value of the buried and possibly waterlogged remains, and the heritage value is assessed to be high. The Proposed Gas Connection has been designed to avoid known features associated with this site and impacts during construction are not anticipated, resulting in a neutral effect.
- 13.6.16 The construction of the Proposed Gas Connection will also result in a temporary impact to the setting of Hall Garth. The setting of the moated site is defined primarily by the extent of its buried remains and also by the historic associative relationship it has with the remnant medieval agricultural landscape. Construction activities will temporarily interrupt the visual relationship with the wider landscape, however this will have no real change in the ability to understand and appreciate the asset. The impact is assessed to be very low, resulting in a **minor adverse effect**.
- 13.6.17 The undated enclosure ditches associated with feature **1318872** are likely to be of low heritage value. Construction is likely to entail the removal and permanent loss of archaeological deposits and the magnitude of the impact is assessed to be high, resulting in a **moderate adverse effect**.
- 13.6.18 Features associated with a possible field system complex **1318895** are likely to be of low (local) heritage value. Construction is likely to entail the removal and permanent loss of

archaeological deposits and the magnitude of the impact is assessed to be high, resulting in a **moderate adverse effect**.

- 13.6.19 Features associated with remnant ridge and furrow cultivation **1309762** are likely to be of low (local) heritage value. Construction is likely to entail the removal and permanent loss of archaeological deposits and the magnitude of the impact is assessed to be high, resulting in a **moderate adverse effect**.
- 13.6.20 Previously unrecorded archaeological features within the Proposed Gas Connection corridor are likely to be of low to medium significance depending on whether they have a local or regional resource value. Construction is likely to entail the removal and permanent loss of archaeological deposits and at this stage the magnitude of the impact is assessed to be high. This will result in a **major adverse effect** if the features are of regional (medium) value.
- 13.6.21 The existing coal-fired power station site does not contribute to, or form part of the setting of the listed milestones in the study area. Their setting is experienced as part of the existing road infrastructure and their position adjacent to historic routes is how they are experienced and appreciated. It is assessed that the construction of the Proposed Development will result in no impact and no change to the settings of the six milestones (**NHLE 1430182, 1296820, 1365809, 1295633, 1295652** and **1148541**) and the effect is assessed as **neutral**.
- 13.6.22 The setting of the listed bridges associated with the Selby Canal is defined by their position as crossing over the canal and as an essential functional aspect of that infrastructure. The Site does not contribute to, or form part of their setting. It is assessed that the four canal bridges (**NHLE 1316360, 1174087, 1252273, 1132536** and **1246188** (the latter two are the same bridge but have separate NHLE numbers as they are in different parishes)) and the effect is assessed as **neutral**.
- 13.6.23 The setting of Temple Manor (**NHLE 1295905**) is associated with the relationship to the river and occupying a level area on the northern banks that would have allowed extensive views in all directions including south west towards the proposed development. The existing coal-fired power station is part of Temple Manor's current setting visible behind the building but does not contribute to the understanding of the listed building.
- 13.6.24 Enabling works for construction will include the demolition of several small structures within the footprint of the existing coal-fired power station site. This will not change the visual component of the Manor's setting and will not change the significance of the asset. No impact is predicted, resulting in a **neutral** effect.
- 13.6.25 Enabling works for construction will include the demolition of several small structures within the footprint of the Site. This will not change the visual component of the fort's setting and will not change the significance of the asset. No impact is predicted, resulting in a **neutral** effect.
- 13.6.26 Construction traffic will use existing access points into the site from the A19 carriageway and Wand Lane. Therefore there will be no noise and dust impacts to the setting of the Temple manor arising from construction traffic and the effect will be **neutral**.
- 13.6.27 Temporary lighting will be used during construction to enable safe working in hours of darkness. Night-time lighting is already present within the existing coal-fired power station; therefore the introduction of lighting during construction represents only a slight change to

the visual component Temple Manors' setting. The temporary impact is assessed to be low, resulting in a **minor adverse** effect which is not significant.

- 13.6.28 The Church of St Paul (**NHLE 1295734**, grade II*) was conceived as a group with The Red House (**NHLE 1148401**, Grade II*) and Hensall Primary School (**NHLE 1148400**, grade II). The three buildings form an important interrelated functional group and provide the setting for each other and the parish and the community that it serves. The existing coal-fired power station is part of the wider setting and is visible in glimpsed views through mature trees, gaps in hedges lines and on approach to and from the assets but does not contribute to the understanding of the listed buildings. Enabling works for construction will include the demolition of several small structures within the footprint of the proposed development site. This will not change the visual component of this group of heritage assets' setting and will have no change upon the significance of the assets. No impact is predicted, resulting in a **neutral** effect.
- 13.6.29 Construction traffic will use existing access points into the Site from the A19 carriageway and Wand Lane. Therefore there will be no noise and dust impacts to the setting of the Church of St Paul's and associated listed buildings arising from construction traffic and the effect will be **neutral**.
- 13.6.30 Temporary lighting will be used during construction to enable safe working in hours of darkness. Night-time lighting is already present within the existing coal-fired power station site, due to the intervening topographic features the introduction of lighting during construction represents a slight change to the visual component of the St Paul's setting. The temporary impact is assessed to be very low, resulting in a **minor adverse** effect which is not significant.
- 13.6.31 The setting of The Church of St Edmunds (**NHLE 1148402**, Grade I), its associated gatepiers (**NHLE 1148403**, grade II) and churchyard cross (**NHLE 1295742**, grade II) is associated with being visible to its congregation within the flat agricultural landscape. This makes the church a visible, prominent and isolated building within the landscape with long distance views to and from. The existing coal-fired power station is part of the wider setting and is visible to the west but does not contribute to the understanding of the listed buildings.
- 13.6.32 Enabling works for construction will include the demolition of several small structures within the footprint of the proposed development site. This will not change the visual component of this group of heritage assets' setting and will have no change upon the significance of the assets. No impact is predicted, resulting in a **neutral** effect.
- 13.6.33 Construction traffic will use existing access points into the site from the A19 carriageway and Wand Lane. Therefore there will be no noise and dust impacts to the setting of the Church of St Edmunds arising from construction traffic and the effect will be **neutral**.
- 13.6.34 Temporary lighting will be used during construction to enable safe working in hours of darkness. Night-time lighting is already present within the existing coal-fired power station site; therefore the introduction of lighting during construction represents a slight change to the visual component of the church's setting. The temporary impact is assessed to be very low, resulting in a **minor adverse** effect which is not significant.
- 13.6.35 The setting of the Church of St Mary's (**NHLE 1316671**) is associated with its location on the southern periphery of Birkin. The nature of the topography makes the church highly visible within the landscape and would have been built to be visible to agricultural workers that

would have traditionally farmed the land and formed the congregation. The siting of the church and the landscape allows extensive panoramic views to the south over flat agricultural land. The existing coal-fired power station is part of the wider setting and is visible on the skyline to the south west but does not contribute to the understanding of the listed buildings.

- 13.6.36 Enabling works for construction will include the demolition of several small structures within the footprint of the proposed development site. This will not change the visual component of the church's setting and will have no change upon the significance of the asset. No impact is predicted, resulting in a **neutral** effect.
- 13.6.37 The construction of the proposed development will introduce a number of new buildings, some of which will be substantial including a stack up to 90 m high, into the flat agricultural landscape. The impact of the structures once completed is assessed in the operation phase below; however, there will be corresponding impact as a result of visual intrusion during construction and erection. The proximity, and scale of the Proposed Power Plant combined with the flat topography mean that they will be highly visible from a number of listed buildings particularly Temple Manor (**NHLE 1295905**), The Church of St Pauls (**NHLE 1295734**, Grade II*), the Red House (**NHLE 1148401**, Grade II*), Hensall Primary School (**NHLE 1148400**) and the Church of St Edmund (**NHLE 1148402**, Grade I).
- 13.6.38 Temple Manor (**NHLE 1295905**) with its lack of intervening landscape features mean that the Proposed Development will be highly visible and will impact on the significance of the asset in that it was intended to have full visibility as a defensive structure. The Proposed Development will encroach further into the panoramic view from the building. However, this will be a slight change to the setting and significance. The archaeological and architectural interest of the building is unaffected. The existing coal-fired power station is part of the setting of the asset. However, the dynamic nature of construction will cause additional distractions from the skyline. The temporary impact is assessed to be low, resulting in a **minor adverse** effect which is not significant.
- 13.6.39 For the other assets: The Church of St Pauls (**NHLE 1295734**, Grade II*), the Red House (**NHLE 1148401**, Grade II*), Hensall Primary School (**NHLE 1148400**), Church of St Edmund (**NHLE 1148402**, Grade I). The existing coal-fired power station is part of the setting of these assets. However, the dynamic nature of construction will cause additional distractions from the otherwise rural skyline. The temporary impact is assessed to be very low, resulting in a **minor adverse** effect which is not significant.
- 13.6.40 Whilst there are a number of listed buildings where it is possible to see the Proposed Development from it has been established during the baseline that the assets do not have a relationship with the Site. In accordance with Historic England's guidance on the assessment of setting impacts (HE 2015), the ability to see the Proposed Development will not impact on the ability to understand and appreciate the significance of the asset or the contribution that setting makes to that significance. The effect is therefore considered to be **neutral**.
- 13.6.41 The construction of the Proposed Gas Connection will require the removal of topsoil and the excavation of trenches. There are no listed buildings within the Proposed Gas Connection corridor or immediately adjacent, therefore there will be no temporary impacts to the setting of listed during the construction of the Proposed Gas Connection.

- 13.6.42 There is a potential for previously unrecorded non-designated heritage assets to be present within the study area.

Operation

- 13.6.43 The operational development will introduce new buildings and structures into the visual setting of the scheduled fort to the west of Roall Hall (NHLE **1017822**). The introduction of new buildings and structures will not be incongruous with the existing visual setting of the fort. The impact is therefore assessed to be very low, resulting in a **minor adverse effect** which is not significant.
- 13.6.44 Physical impacts to buried cultural heritage assets are limited to the construction phase of the Proposed Development, and a level of appropriate archaeological mitigation will be undertaken either in advance of construction or during specific construction activities. There will be no additional impacts upon buried cultural heritage assets during the operational development.
- 13.6.45 The operational development will introduce new structures into the visual setting of the listed buildings of Temple Manor (NHLE **1295905**), Church of St Pauls (NHLE **1295734**, Grade II*), the Red House (NHLE **1148401**, Grade II*), Hensall Primary School (NHLE **1148400**), Church of St Edmund (NHLE **1148402**, Grade I) and Church of St Mary's (NHLE **1316671**). The existing coal-fired power station is part of the setting of these assets. The scale of the Proposed Power Plant means it has the potential to be highly visible. However, the introduction of new buildings and structures will not be incongruous with the existing visual setting of the listed buildings. The impact is therefore assessed to be very low, resulting in a **minor adverse effect** which is not significant.
- 13.6.46 There will be no additional impacts upon built cultural heritage assets during the operational development.

Decommissioning

- 13.6.47 There will be no physical impacts to buried cultural heritage assets during decommissioning of the Proposed Development as any impact upon archaeological remains will have been mitigated at the construction phase.
- 13.6.48 There will be temporary indirect impacts to the setting of designated assets in the wider study area during decommissioning, resulting from the use of machinery to disassemble the Proposed Development. Decommissioning is likely to affect the setting of the scheduled Roman fort to the west of Roall Hall (**1017822**) and the listed buildings of Temple Manor (NHLE **1295905**), Church of St Pauls (NHLE **1295734**, Grade II*), the Red House (NHLE **1148401**, Grade II*), Hensall Primary School (NHLE **1148400**), Church of St Edmund (NHLE **1148402**, Grade I). However, impacts will be no greater than those recorded during construction and operation, and the effects will therefore not be significant.
- 13.6.49 Impacts arising from decommissioning activities will be temporary and the duration will be shorter than the impacts during construction. The impacts will not be greater than those reported during construction.

13.7 Mitigation and Enhancement Measures

- 13.7.1 A geophysical survey across the Proposed Gas Connection corridor will be undertaken where feasible. The results of the geophysical survey will confirm the presence or absence of archaeological remains and will inform a suitable mitigation strategy, comprising either retention of the archaeological remains by design, or a programme of archaeological investigation and recording (which would be secured by a DCO Requirement). The geophysical survey results will be obtained (where possible) before finalisation of the Proposed Gas Connection corridor and completion of the ES supporting the DCO application.
- 13.7.2 Mitigation measures will be discussed and approved with the NYCC archaeologist. NYCC is currently being consulted on the methodology and scope of the geophysical survey, and consultation will continue when the results of that survey are known and any further mitigation requirements can be determined.
- 13.7.3 The successful implementation of an approved mitigation strategy will reduce significant adverse effects to a level which is not significant (i.e. minor adverse or lower), because heritage assets will either be avoided by design or appropriately investigated and recorded.

13.8 Limitations or Difficulties

- 13.8.1 No limitations or difficulties were encountered during the preparation of this PEI Report chapter. The findings of the geophysical survey, to be undertaken shortly, and ongoing consultation with NYCC, will further inform the final ES adding to the robustness of the EIA, and help refine the final route of the Proposed Gas Connection corridor for the DCO application submission.

13.9 Residual Effects and Conclusions

- 13.9.1 A summary of effects both before and after mitigation is provided in Table 13.5 below.

Table 13.5: Summary of significant effects

Development stage	Environmental effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/enhancement (if identified)	Classification of residual effect after mitigation	Nature of effect(s) (Lt/ Mt/ St and P/ T and D/ In)
Construction	Construction of Proposed Gas Connection may entail the removal and permanent loss of archaeological deposits associated with enclosure 1318872	Moderate adverse (significant)	If impacts cannot be avoided by design, a programme of archaeological excavation and reporting will be undertaken prior to construction	Minor adverse (not significant)	Lt, P, D
Construction	Construction of Proposed Gas Connection may entail the removal and permanent loss of archaeological deposits associated with field system 1318895	Moderate adverse (significant)	If impacts cannot be avoided by design, a programme of archaeological excavation and reporting will be undertaken prior to construction	Minor adverse (not significant)	Lt, P, D
Construction	Construction of Proposed Gas Connection may entail the removal and permanent loss of archaeological	Moderate adverse (significant)	If impacts cannot be avoided by design, a programme of archaeological excavation and reporting will be	Minor adverse (not significant)	Lt, P, D

Development stage	Environmental effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation	Nature of effect(s) (Lt/ Mt/ St and P/ T and D/ In)
	deposits associated with ridge and furrow 1309762		undertaken prior to construction		
Construction	Impacts on previously unrecorded heritage assets within Proposed Gas Connection corridor of low or medium value	Moderate/ major adverse (significant)	If impacts cannot be avoided by design, a programme of archaeological excavation and reporting will be undertaken prior to construction	Minor adverse (not significant)	Lt, P, D

Note: Lt = long term, Mt = medium term, St = short term, P = permanent, T = temporary, D = direct and In = indirect.

13.10 References

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14.0 TRAFFIC AND TRANSPORT

14.1 Introduction

- 14.1.1 This chapter of the Preliminary Environmental Assessment (PEI) Report addresses the potential effects of the proposed Combined Cycle Gas Turbine (CCGT) power station near Eggborough, North Yorkshire (hereafter referred to as the 'Proposed Development') on traffic and transport.
- 14.1.2 This chapter is supported by Appendix 14A (Transport Assessment) provided in PEI Report Volume III.

14.2 Legislation and Planning Policy Context

Planning Policy Context

- 14.2.3 This section outlines the planning policy relating to traffic and transport. A full overview of all relevant planning policy is covered in Chapter 7: Legislative Context and Planning Policy Framework, which also sets out the primacy of National Policy Statements (NPS) in decision-making on nationally significant infrastructure projects (NSIPs) such as the Proposed Development.

National Planning Policy

National Policy Statement for Energy (NPS EN-1)

- 14.2.4 The National Policy Statement (NPS) EN-1 (Department for Energy and Climate Change (DECC), 2011a) was published in 2011. Section 5.13 outlines the planning policy for traffic and transport, including guidance on the carrying out of the relevant parts of the Environmental Impact Assessment (EIA) (which has been taken into account in producing this PEI Report). The most relevant paragraphs for the transport assessment are 5.13.2 to 5.13.4 which state:

"5.13.2 The consideration and mitigation of transport impacts is an essential part of Government's wider policy objectives for sustainable development as set out in Section 2.2 of this NPS.

5.13.3 If a project is likely to have significant transport implications, the applicant's ES (see Section 4.2) should include a transport assessment, using the NATA/WebTAG139 methodology stipulated in Department for Transport guidance, or any successor to such methodology. Applicants should consult the Highways Agency and Highways Authorities as appropriate on the assessment and mitigation.

5.13.4 Where appropriate, the applicant should prepare a travel plan including demand management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts."

- 14.2.5 In terms of the Secretary of State's decision making, Section 5.13 of the NPS states that the IPC (now Secretary of State) should ensure that the applicant has sought to mitigate the impacts on the surrounding road infrastructure that may occur as a result of a new energy NSIP. Where

the proposed mitigation measures are insufficient to reduce the impact on the transport infrastructure to acceptable levels, the Secretary of State should consider requirements to mitigate the adverse impacts on transport networks arising from the development and could include:

- demand management measures;
- water-borne or rail transport, where cost effective;
- attaching conditions to a planning consent where there is likely to be substantial HGV traffic.

National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (NPS EN-2)

- 14.2.6 Section 2.2 of NPS EN-2 (DECC, 2011b) outlines the planning policy for traffic and transport specifically in respect of fossil fuel generating stations such as the Proposed Development. The relevant paragraphs for the transport assessment are 2.2.5 and 2.2.6 which state:

“2.2.5 New fossil generating stations need to be accessible for the delivery and removal of construction materials, fuel, waste and equipment, and for employees.

2.2.6 Government policy encourages multi-modal transport and materials (fuel and residues) may be transported by water or rail routes where possible. Applicants should locate new fossil generating stations in the vicinity of existing transport routes wherever possible. Although there may in some instances be environmental advantages to rail or water transport, whether or not such methods are viable is likely to be determined by the economics of the scheme. Road transport may be required to connect the site to the rail network, waterway or port. Any application should therefore incorporate suitable access leading off from the main highway network. If the existing access is inadequate and the applicant has proposed new infrastructure, the IPC should satisfy itself that the impacts of the new infrastructure are acceptable as set out in Section 5.13 of EN-1.”

National Planning Policy Framework

- 14.2.7 In March 2012, the Government published the National Planning Policy Framework (NPPF) (Department for Communities and Local Government (DCLG), 2012). The NPPF sets out the Government’s planning policies for England.
- 14.2.8 The NPPF refers explicitly to the five guiding principles of sustainable development in the Government’s document ‘Securing the Future’:
- living within the planet’s environmental limits;
 - ensuring a strong, healthy and just society;
 - achieving a sustainable economy;
 - promoting good governance; and
 - using sound science responsibly.
- 14.2.9 The NPPF (paragraphs 28 – 41) states that the transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how to travel. The policy states that local authorities should support a pattern of development, which, where reasonable to do so, facilitates the use of sustainable modes of transport. Plans and decisions should ensure that developments that generate significant movement are located where the

need to travel will be minimised and the use of sustainable transport modes can be maximised.

- 14.2.10 The NPPF recommends that a Transport Statement (TS) or Transport Assessment (TA) should support all developments that generate significant amounts of movement and that development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.

Local Planning Policy

North Yorkshire Local Transport Plan 2016 - 2045

- 14.2.11 The Local Transport Plan (LTP) was adopted by North Yorkshire County Council (NYCC) in April 2016. The LTP covers a 30 year period from 2016 – 2045. The plan builds on the previous plans and sets out how NYCC will manage, maintain and improve the transport system for the benefit of people living and travelling in the county. The objectives of the LTP in relation to traffic and transport can be summarised as:

- economic growth: contributing to economic growth by delivering reliable and efficient transport networks and services;
- road safety: improving road and transport safety;
- access to services: improving equality of opportunity by facilitating access to services;
- environment and climate change: managing the adverse impact of transport on the environment; and
- healthier travel: promoting healthier travel opportunities.

- 14.2.12 No significant transport improvement schemes are proposed in the LTP that are relevant to the Proposed Development.

Selby District Core Strategy Local Plan

- 14.2.13 The Selby District Core Strategy was adopted in October 2013 and provides a long-term strategic vision for how the District will be shaped by setting out a number of broad policies to guide development.

- 14.2.14 The objectives of the core strategy in relation to transport can be summarised as:

- concentrating new development in the most sustainable locations, where reasonable public transport exists, and taking full account of local needs and environmental, social and economic constraints; and
- minimising the need to travel and providing opportunities for trips to be made by public transport, cycling and walking.

Other Guidance

Planning Practice Guidance

- 14.2.15 Planning Practice Guidance titled 'Travel plans, transport assessments and statements in decision-taking' was published in March 2014 on the Government planning guidance planning portal (DCLG, 2014) and has been used to inform the transport assessment.

Guidelines for the Environmental Assessment of Road Traffic

- 14.2.16 The Guidelines for the Environmental Assessment of Road Traffic were published in 1993 by the Institute of Environmental Assessment. The guidelines provide a basis for a comprehensive and consistent approach to the appraisal of traffic and transport impacts. Extensive reference has been made to these guidelines throughout the preparation of this chapter.

Department for Transport Circular 02/2013: The Strategic Road Network and the Delivery of Sustainable Development

- 14.2.17 Circular 02/2013 was published in September 2013 by the Department for Transport which sets out the way in which Highways England will engage with the development industry to deliver sustainable development and, thus, economic growth, whilst safeguarding the primary function and purpose of the strategic road network and has been used to inform the transport assessment.

The Strategic Road Network: Planning for the Future

- 14.2.18 The Strategic Road Network: Planning for the Future 'A guide to working with Highways England on Planning Matters' published by Highways England in September 2015 offers advice and information regarding the information it expects to see within a planning proposal and has been used to inform the transport assessment.

14.3 Assessment Methodology and Significance Criteria**Overview**

- 14.3.19 The environmental impact of the development generated traffic has been assessed with reference to the 'Guidelines for the Environmental Assessment of Road Traffic' published by the Institute of Environmental Assessment (1993). In accordance with guidance, issues including severance, driver delay, pedestrian amenity and delay, accidents and safety associated with the Proposed Development have been investigated and are reported below.
- 14.3.20 Any likely significant environmental effects relating to noise and vibration and air pollution, generated by traffic from the Proposed Development are considered in the relevant technical chapters of this PEI Report.

Extent of Study Area

- 14.3.21 The study area scope of this assessment has been defined by reference to the 'Guidelines for the Environmental Assessment of Road Traffic' (Institute of Environmental Assessment (IEA), 1993). The guidelines set out two rules as follows:
- Rule 1 – include highway links where traffic flows are predicted to increase by more than 30% (or where the number of Heavy Goods Vehicles (HGVs) is predicted to increase by more than 30%); and
 - Rule 2 – include any other specifically sensitive areas where the traffic flow (or HGV component) are predicted to increase by more than 10%.

14.3.22 The road links that have been considered in the assessment of traffic effects, which is set out in Section 14.6 of this chapter, to determine if either of these rules are met, are:

- A19, south of the existing coal-fired power station main entrance;
- A19, north of the existing coal-fired power station main entrance;
- Wand Lane, east of Hensall Gate;
- West Lane, between A19 and the Proposed AGI location; and
- Millfield Road, east of Chapel Haddlesey to the Proposed Gas Connection corridor.

Sensitivity of Receptors

14.3.23 The sensitivity of a road or the immediate area through which it passes can be defined by the type of user groups who may use them. Vulnerable users will include elderly residents and children. It is also necessary to consider footpath and cycle route networks that cross the roads within the study area.

14.3.24 A desktop exercise has been undertaken to classify the sensitivity of the routes within the study area. Table 14.1 below identifies the links, the assigned sensitivity rating and the justification:

Table 14.1: Sensitivity of receptors

Link no.	Link description	Link sensitivity	Rationale
1	A19 (south of existing coal-fired power station main entrance)	Very low	The two-lane single carriageway A19 between the existing main entrance and the M62 grade-separated roundabout passes through largely open country. Any frontage development is industrial in nature. There are no pedestrian facilities along the road.
2	A19 (north of existing coal-fired power station main entrance)	Medium	The two-lane single carriageway A19 between the existing coal-fired power station main entrance and the A63 roundabout passes through largely open country. However the A19 does pass through the villages of Chapel Haddlesey and Burn with residential development fronting onto the A19. Pedestrian footway facilities are provided at certain points along the route including between the A63 roundabout and Burn village and between Wand Lane and the bus stops on the A19 opposite the existing coal-fired power station main entrance.
3	Wand Lane (west) of Hensall Gate entrance)	Very low	The two-lane single carriageway Wand Lane between the A19 junction and the Hensall Gate entrance passes through open country. There are no pedestrian facilities along the road
4	West Lane	Medium	The two-lane single carriageway has a width of approximately 6 m as it passes residential

Link no.	Link description	Link sensitivity	Rationale
	(between A19 and the Proposed AGI location)		properties on either side. A pedestrian footway is provided along the northern side of West Lane with footways provided intermittently along the southern side of the carriageway. As West Lane leaves Burn village in a south-westerly direction, the carriageway narrows to a single lane of approximately 3 m for 300 m as it passes Top House Farm to the west of Burn village. The carriageway then widens again to approximately 5 m as it crosses the East Coast Mainline via a railway bridge.
5	Millfield Road (east of Chapel Haddlesey to the Proposed Gas Connection corridor)	Medium	Millfield Road passes through the village of Chapel Haddlesey with residential properties fronting onto the carriageway for a distance of approximately 300 m. Pedestrian footways are provided either side of Millfield Road between the A19 and the church. Beyond the church the road passes through open country where no pedestrian facilities are provided.

Assessment Methods

- 14.3.25 The assessment methodology adopted in this chapter, as contained in the document 'Guidelines for the Environmental Assessment of Road Traffic' (IEA, 1993), is recognised as the industry standard methodology for the assessment of traffic and highway impacts. The guidelines outline the issues and the respective changes in volume and composition of traffic regarded as necessary before each issue results in traffic and transport impacts.
- 14.3.26 Due to uncertainties regarding the timescales for decommissioning and demolition of the existing coal-fired power station, the traffic and transport assessment has assumed a 'worst case' for each assessment scenario as follows:
- Construction phase (2019 – 2022) – the assessment assumes the peak of demolition (in terms of traffic generation) of the existing coal-fired power station could coincide with the peak of construction (in terms of traffic generation) of the Proposed Development;
 - Opening phase (2022) – the assessment assumes the peak of demolition (in terms of traffic generation) of the existing coal-fired power station could coincide with the start of operation of the Proposed Development;
 - Operation phase (2022) – the assessment assumes demolition of the existing coal-fired power station has been completed, so the traffic impact is from the Proposed Development's operation only (note 2022 is used for the transport assessment of operational effects without concurrent demolition of the existing coal-fired power station, rather than 2037 as in other technical assessment chapters, because an earlier year is a worst case in traffic terms as lower base flows mean the impact of the Proposed Development would comprise a greater % change); and
 - Decommissioning (2047).

- 14.3.27 The following environmental effects are regarded as susceptible to changes as a result of the Proposed Development.

Severance

- 14.3.28 Severance occurs in a community when a major artery separates people from places and other people. Severance occurs from difficulty of crossing a road or where the road itself creates a physical barrier. Severance can be caused to pedestrians or motorists.
- 14.3.29 The Guidelines (IEA, 1993) suggest that changes in total traffic flow of 30%, 60% and 90% will result in slight, moderate and substantial changes in severance respectively.

Pedestrian Amenity

- 14.3.30 Pedestrian amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition, pavement width and separation between vehicles and pedestrians. The impact manifests itself in fear and intimidation, exposure to noise and exposure to vehicle emissions.
- 14.3.31 The Guidelines (IEA, 1993) suggest that a doubling or halving of total traffic flow or the HGV composition could lead to perceptible negative or positive impacts upon pedestrian amenity.

Fear and Intimidation

- 14.3.32 The volume of traffic and its HGV composition are the factors that contribute to fear and intimidation. In the absence of thresholds set out in the guidance, this PEIR Report considers that changes in total traffic flow of 30%, 60% and 90% are considered to result in slight, moderate or substantial impacts.

Highway Safety

- 14.3.33 Highway safety is assessed by the frequency and severity of injury accidents that are attended by the police and recorded in official accident statistics. Intensification of use or changes in the composition of traffic has the potential to have an effect on collision rates.
- 14.3.34 The examination of recent collision statistics on routes within the study area will highlight any hotspots that need further examination.

Driver Delay

- 14.3.35 The use of industry standard junction capacity modelling programs provides a methodology to quantify junction delay. Driver delay is only likely to be significant where the existing study area highway network is at or close to capacity.

Significance Criteria

- 14.3.36 Using the information set out above, the magnitude of impacts is defined as set out in Table 14.2.

Table 14.2: Traffic and transport assessment framework – magnitude of impacts

Type of impact	Magnitude of impact			
	Very low	Low	Medium	High
Severance	Change in total traffic flow of <30%	Change in total traffic flow of 30% to 60%	Change in total traffic flow of 60% to 90%	Change in total traffic flow of >90%
Pedestrian amenity	Change in traffic flow (or HGV component) less than 50%.	Change in traffic flow (or HGV component) of 51% to 100%.	Change in traffic flow (or HGV component) of 101% to 150%.	Change in traffic flow (or HGV component) of > 151%.
Fear and intimidation	Change in total traffic flow of <30%	Change in total traffic flow of 30% to 60%	Change in total traffic flow of 60% to 90%	Change in total traffic flow of >90%
Highway safety	Magnitude of impact derived using professional judgment informed by the frequency and severity of collisions within the study area and the forecast increase in traffic			
Driver delay	Magnitude of impact derived using professional judgment informed by the increase in vehicle delay and whether a junction is at, or close to capacity			

14.3.37 By combining the receptor sensitivity with the magnitude of impact using the assessment matrix shown in Table 14.3, the effects are classified as negligible, minor, moderate or major (adverse or beneficial).

Table 14.3: Classification of effects

Magnitude of impact	Sensitivity/ importance of receptor			
	High	Medium	Low	Very low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible

14.3.38 Only moderate and major effects are considered to be 'significant'; minor and negligible effects are 'not significant'.

Sources of Information/ Data

14.3.39 A series of 7-day automated traffic counts (ATCs) were undertaken between Tuesday 18th October 2016 and Monday 24th October 2016 to provide a baseline for comparison on the following roads:

- A19 (north of M62 Junction 34);
- A19 (north of Wand Lane); and
- Wand Lane.

14.3.40 In addition to the ATC counts, it was agreed with NYCC that the impact of the Proposed Development would be examined at the following junctions on the local highway network for the overall network morning (AM) and evening (PM) peak hours:

- A19 / A645 Weeland Road;
- A19 / existing main power station entrance;
- A19 / Wand Lane;
- Wand Lane / Hensall Gate entrance; and
- A63 / A19.

14.3.41 Furthermore, it was agreed with Highways England that the impact of the Proposed Development would be reviewed at the A19 / M62 Junction 34 grade separated roundabout junction.

14.3.42 The junction surveys were undertaken on Tuesday 18th October 2016 between the hours of 07:00 and 19:00 hours, apart from the existing coal-fired power station site entrances which were surveyed on Thursday 3rd November 2016.

Consultation

14.3.43 A summary of the consultation responses specific to transport and access that have been received to date is provided in Table 14.4 below.

Table 14.4: Consultation summary table

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
NYCC	August 2016 (telephone conversation)	NYCC agreed to the traffic count locations proposed by AECOM	Traffic counts were commissioned by AECOM in October 2016.

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
Secretary of State	September 2016 (Scoping Opinion)	<p>A full Transport Assessment is required to be undertaken;</p> <p>The ES should detail the transport routes to be used during construction and operational phases;</p> <p>The ES should take account of any public rights of way (including bridleways) that may be affected and minimise hindrance to them where possible.</p> <p>Mitigation measures should be considered such as a travel plan.</p>	Full details provided within the TA (see Appendix 14A (PEI Report Volume II)).
NYCC	3rd November 2016 (meeting)	<p>Meeting held to discuss and agree the scope of the TA. NYCC indicated that the scope was acceptable however the following points were raised for consideration during the assessment of the scheme and for inclusion in the TA where necessary:</p> <p>The assignment of gas pipeline trips, particularly HGV trips through Burn, was identified by NYCC as a sensitive issue which will require careful analysis and mitigation within the TA;</p> <p>The workforce and shift times of the CCGT once operational should be set out within the TA;</p> <p>A Construction Traffic Management Plan is likely to be the main mitigation measure. NYCC expects that the CTMP will be addressed as part of the Statement of Common Ground.</p>	Full details provided within the TA (see Appendix 14A (PEI Report Volume II)).
Highways England	4th November 2016 (meeting)	<p>Meeting held to discuss and agree the scope of the TA.</p> <p>Highways England indicated that the scope was acceptable</p>	Full details relating to HGV movements and abnormal loads provided within the TA

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		<p>however the following points were raised for consideration during the assessment of the scheme and for inclusion in the TA where necessary:</p> <p>Some elements of clarity would be welcome in relation to HGV movements and any abnormal loads;</p> <p>Some clarification required in relation to routing of specific elements of the distribution;</p> <p>Road safety study area be extended slightly to include the interaction between the M62 junction 34 main line and the on and off slip roads.</p>	<p>(see Appendix 14A (PEI Report Volume II)).</p> <p>Assignment of trips amended as set out in the Highways England email dated 3rd November 2016.</p> <p>Road safety study area amended.</p>
NYCC	24th November 2016 (email)	<p>Email conversation held to discuss the construction of the Proposed Gas Connection including routing pipelines within the highway which would require temporary traffic management and / or closure of Wand Lane, access to the Above Ground Installation (AGI) via West Lane and providing an alternative access to the AGI and pipeline construction west of the A19 directly off the A19.</p> <p>NYCC provided the following comments:</p> <p>No issues in closing Wand Lane for a short time period. A diversion route via the A645 is the more appropriate route. A Temporary Traffic Regulation Order (TTRO) will need to be prepared and notices submitted.</p> <p>Concern regarding possible damage to the highway edge on West Lane and suggest this is monitored and repaired as necessary especially on the</p>	<p>Full details on construction of the Proposed Gas Connection provided within the TA (see Appendix 14A (PEI Report Volume II)).</p>

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		<p>narrow section of the road. The management of deliveries is essential and off street parking must be made available for contractors vehicles at the AGI once established.</p> <p>NYCC are comfortable with a construction vehicle access being provided off the A19 either utilising the existing entrance to Burn Lodge Farm or via a temporary access directly to the south of Burn Lodge Farm. However their preference would be the use of the Burn Lodge Farm entrance. NYCC has no concerns regarding the risk of fogging on the A19, based on the fact that the risk of a visible plume from the Proposed Development's cooling towers is around 0.1% (i.e. may occur once every three years) for a hybrid cooling tower.</p>	

14.4 Baseline Conditions

Existing Baseline

Site Location

- 14.4.44 The existing coal-fired power station site, within which the Proposed Power Plant Site, Proposed Borehole Water and Electrical Connections and Proposed Construction Laydown area are located, is approximately 2.5 km north of the M62, which connects to the A19 at Junction 34.
- 14.4.45 The A19 runs north-south along the western boundary of the existing coal-fired power station site, linking to Junction 34 of the M62 to the south at a grade separated roundabout and the A63 to the north at a four-arm roundabout junction. The A19 is a wide single carriageway road (not a trunk road where it passes the existing coal-fired power station) and is subject to the national speed limit adjacent to the existing coal-fired power station. To the north of the existing coal-fired power station site, in the vicinity of the Proposed Cooling Water and Gas Connections, the A19 passes through Chapel Haddlesey and Burn where the speed limit through these villages reduces to 40 mph and 30 mph respectively.

- 14.4.46 Pedestrian footway provision is provided at certain points along the A19 including the western side of the carriageway between the A63 roundabout and Burn village. In addition a footway is provided along the eastern side of the carriageway between Wand Lane and the bus stops located on either side of the A19.
- 14.4.47 In total there are three existing access points to the existing coal-fired power station from the A19; the main power station entrance, the Tranmore Lane access (used for coal deliveries only) and the Wand Lane access to the north of the existing coal-fired power station site. All three access points have been designed to Highways England's Design Manual for Roads and Bridges (DMRB) (1995) standards and include right turning lanes with good forward visibility.
- 14.4.48 Wand Lane is a single carriageway rural road and runs west to east along the northern boundary of the power station site connecting the A19 with the villages of Hensall, Gowdall and Snaith. The road is subject to a de-restricted speed limit along the site frontage. Access to the power station site from Wand Lane is located approximately 950 metres to the east of the A19 and is accessed via a simple priority junction.

Existing Traffic Flows

- 14.4.49 The following highway links form the agreed highway network of interest for this assessment:
- A19 (north of M62 Junction 34);
 - A19 (north of Wand Lane); and
 - Wand Lane.
- 14.4.50 Baseline 24 hour annual average daily traffic (AADT) two-way link flows for the agreed study area are provided in Table 14.5. Further details of the baseline traffic data are provided in the TA (Appendix 14A, PEI Report Volume III).

Table 14.5: 2016 baseline traffic flows (24 hour AADT)

Link no.	Link description	Total vehicles	Total HGVs
1	A19 (north of M62 Junction 34)	13,600	574
2	A19 (north of Wand Lane)	10,907	352
3	Wand Lane	1,039	29

Baseline Accident Record

- 14.4.51 Personal Injury Accident (PIA) data covering a five year period plus this year (01/01/2011 – 31/10/2016) has been obtained from NYCC. The area of investigation included the extents of the A19 from its junction with the M62 Junction 34 (including slip roads) to its junction with the A63 and Wand Lane up to and including its junction with the existing coal-fired power station main entrance. In addition accident data has been obtained from Crashmap covering the extents of West Lane and Millfield Road. Crashmap is an online database of Department of

Transport road casualty statistics which uses data collected by the police about road traffic crashes occurring on British roads where someone is injured.

- 14.4.52 In total, 41 accidents were recorded within the analysed area. Of these, thirty were recorded as 'slight', eight as 'serious' and three fatal. Table 14.6 summarises the accidents that have occurred over the specified period.

Table 14.6: Summary of recorded accidents (01/01/2011 to 31/10/2016)

Location	Accident severity			
	Slight	Serious	Fatal	Total
M62 Junction 34	4	2	1	7
A19 (between M62 and A645)	2	2	0	4
A19 / A645 junction	3	0	0	3
A19 (between A645 and Wand Lane)	4	1	0	5
A19 / Wand Lane junction	1	1	0	2
Wand Lane	1	0	0	1
A19 (between Wand Lane and A63)	6	2	1	9
A19 / A63 junction	7	0	1	8
West Lane	1	0	0	1
Millfield Road	1	0	0	1
Total	30	8	3	41

- 14.4.53 As can be seen from Table 6.6, the A19 between the M62 Junction 34, and the A63 has a generally low accident record. The cause of the majority of accidents was driver error due to lack of awareness or loss of control.
- 14.4.54 Only one accident took place in which a poor or defective road surface may have been a causation factor. Whilst any one incident is undesirable, it was also reported that the incident might have been due to a loss of control and/ or failing to look properly. As there have been no other reoccurrences of incidents throughout the five year plus study period at this location,

it is considered that the incident is likely to be a unique occurrence that would not be exacerbated by development traffic from the Proposed Development.

Future Baseline

- 14.4.55 Future year baseline traffic flows for the assessment year of 2020 for the peak of construction have been derived by applying the standard Trip End Model Presentation Program (TEMPro) to the above flows and are indicated in Table 14.7. These growth factors have been taken into account when comparing the baseline and future traffic scenarios.
- 14.4.56 Future year baseline scenarios are detailed for 2022 (opening) due to the very low traffic flows generated by the operation of the Proposed Development meaning that a quantitative assessment of operational traffic has not been necessary, with the vehicle numbers generated being significantly lower than experienced during the construction period.

Table 14.7: TEMPro traffic growth factors (average day)

Year	Vehicle type	Growth factor
2016 – 2020 (peak of construction)	All	1.0546

- 14.4.57 Future year baseline traffic flows for the assessment year of 2020 peak of construction are presented in Table 14.8.

Table 14.8: 2020 baseline traffic flows (24 hour AADT)

Link no.	Link description	Total vehicles	Total HGVs
1	A19 (north of M62 Junction 34)	14,343	605
2	A19 (north of Wand Lane)	11,503	371
3	Wand Lane	1,096	31

- 14.4.58 As agreed with NYCC during the scoping stage, the assessment has had regard to the traffic generated by the following committed developments which are identified in Figure 20.1 and described in more detail in Chapter 20: Cumulative and Combined Effects

- demolition of Eggborough Coal-Fired Power Station;
- Knottingley Power Project;
- Southmoor Energy Centre;
- Thorpe Marsh CCGT Power Station;
- Thorpe Marsh Gas Pipeline;
- Ferrybridge Multifuel 2;

- 55 dwelling residential development, Eggborough;
- 64 dwelling residential development, Eggborough;
- single storey production facility – Saint Gobain glass factory;
- Advanced Thermal Treatment Plant, Eggborough,
- hydro-electricity generation scheme, Chapel Haddlesey;
- proposed solar farm development, Pollington;
- Kellingley Colliery Business Park; and
- Yorkshire and Humber CCS Pipeline.

14.4.59 The total committed development two-way flows for each link road within the agreed study area are shown in Table 14.9.

Table 14.9: Committed development flows (24 hour AADT)

Link no.	Link description	Total vehicles	Total HGVs
1	A19 (north of M62 Junction 34)	3,266	543
2	A19 (north of Wand Lane)	2,060	207
3	Wand Lane	0	0

14.4.60 In addition it should be noted that traffic flows associated with the existing coal-fired power station which is due to cease operation in or before 2019 have been discounted to avoid double counting. These are summarised in Table 14.10.

Table 14.10: Existing traffic flows associated with coal-fired power station (24 hour AADT)

Link no.	Link description	Total vehicles	Total HGVs
1	A19 (north of M62 Junction 34)	-568	-37
2	A19 (north of Wand Lane)	-323	-3
3	Wand Lane	-348	-33

14.4.61 Table 14.11 summarises the future year baseline (i.e. existing baseline traffic, plus growth factor, plus committed development traffic flows, minus coal-fired power station existing traffic) for the assessment year 2020 peak of construction.

Table 14.11: 2020 Future Baseline (24 hour AADT)

Link no.	Link description	Total vehicles	Total HGVs
1	A19 (north of M62 Junction 34)	17,041	1,111
2	A19 (north of Wand Lane)	13,240	575
3	Wand Lane	748	0

14.5 Development Design and Impact Avoidance

14.5.62 A number of measures are already embedded into the routing and control of construction traffic movements and are taken into account in the analysis of effects presented above. These are:

- separating the construction worker and HGV access points reducing potential road safety issues – for the purposes of this assessment it is assumed that all construction workers will arrive and depart the site via the Hensall Gate entrance located off Wand Lane, and all construction HGVs will arrive and depart the site via the Tranmore Lane entrance which has historically been used for coal deliveries associated with the existing coal-fired power station (but this arrangement is not yet fixed); and
- the requirement for any HGV arriving or departing the Proposed Power Plant Site and other parts of the Site within the existing coal-fired power station site to travel to/from the south along the A19 to Junction 34 of the M62.

14.5.63 Traffic associated with the decommissioning and demolition of the existing coal-fired power station is proposed to be separated from the construction and operational traffic associated with the Proposed Development, with the decommissioning and demolition traffic currently expected to use the existing main entrance to the existing coal-fired power station off the A19 (although this is not yet fixed).

14.5.64 The existing coal-fired power station site is rail connected, and alterations to the existing rail infrastructure to enable the Site to remain rail connected following the removal of the majority of the rail loop are described in Chapter 4: The Proposed Development. The feasibility and viability of the use of rail will be considered by the contractor during detailed design and when the source of construction materials is known, but for the purposes of this assessment a ‘worst case’ assumption is made whereby all materials are assumed to be delivered by road.

14.6 Likely Impacts and Effects

Construction

- 14.6.65 Access to and from the parts of the Site within the existing coal-fired power station for construction workers will be via the existing Hensall Gate entrance located off Wand Lane.
- 14.6.66 The construction period for the Proposed Development is estimated to be approximately 40 months, currently anticipated to commence in early 2019 with a view to being fully operational in 2022 (subject to obtaining necessary approvals).
- 14.6.67 A holistic approach has been undertaken within the Transport Assessment to identify the peak month of activity combining the workforce associated with construction of the Proposed Development within the existing coal-fired power station and that associated with the Proposed Gas Connection to the north. It is expected that the construction workforce will peak at approximately 1,200 workers per day in Month 18 (i.e. Quarter 2 in 2020). As the proposed construction programme for the Proposed Gas Connection does not begin until Month 22, this does not coincide with the peak of construction in Month 18. Cumulative effects with the potentially coinciding decommissioning and demolition of the existing coal-fired power station are also considered later in this section, as one of a number of other 'committed developments' within the area.
- 14.6.68 Although the traffic associated with the construction of the Proposed Gas Connection is not therefore included in the main transport assessment (which focusses on the peak month (Month 18) as the 'worst case' for traffic), traffic associated with the construction of the Proposed Gas Connection has been considered separately in the Transport Assessment (Appendix 14A, PEI Report Volume III). At the start of the construction of the Proposed Gas Connection (around Month 22), when the majority of materials for the gas connection will be delivered to site, up to 40 HGV movements per day are anticipated. The peak of traffic associated with the Proposed Gas Connection is anticipated to be Months 25 and 26, when up to 90 construction worker traffic movements associated with the Proposed Gas Connection are predicted. These construction worker traffic movements would be spread over different parts of the Proposed Gas Connection corridor with one team of approximately 30 workers carrying out construction of the AGI and two teams of around 30 workers engaged in construction of the gas pipeline. Construction traffic flows associated with the Proposed Gas Connection construction will therefore be low in volume and temporary in nature, and no significant effects are anticipated (see Section 14.8 for discussion of further detail on this to be provided in the final ES and TA).
- 14.6.69 A profile of the anticipated daily workforce each month through the construction period is provided in Appendix 14A (PEI Report Volume III). The standard construction working hours for the Proposed Development will be 07:00 to 19:00 Monday to Friday (except bank holidays) and 07:00 to 13:00 on Saturday. Key exceptions to these working hours could include activities that must continue beyond these hours and non-noisy activities with night working if desired. However the traffic impact associated with extending the working hours is not considered material.
- 14.6.70 Based on the agreed methodology contained within the TA (Appendix 14A in PEI Report Volume II), the weekday construction worker shift is likely to generate 515 vehicular trips (one-way) during the AM arrival and PM departure periods at the peak of construction.

- 14.6.71 HGVs delivering construction materials will access the Site from Tranmore Lane located off the A19 with all HGVs arriving and departing the Site to/from M62 Junction 34. The volume of HGVs associated with the Proposed Development on the network is at its maximum of 80 two-way daily vehicle movements (40 in and 40 out) at the peak of construction in Month 18. Deliveries will be made between 08:00 and 18:00 hours.
- 14.6.72 A number of Abnormal Indivisible Load (AIL) movements are expected during the construction programme associated with the delivery of large items of plant and equipment.
- 14.6.73 Detailed consideration will be given to the appropriate port and AIL routes during detailed design. However, it is a reasonable expectation that major ports are able to accommodate abnormal loads and that adequate access to the strategic network is achievable. On this basis, only the route from the strategic network to the Site requires assessment.
- 14.6.74 The AIL route to the Site is as follows:
- exit M62 at Junction 34 to the A19; and
 - A19 to the Site.
- 14.6.75 It is anticipated that the gas turbines will be the largest single component deliveries. As such, swept path analysis has been undertaken for a vehicle capable of transporting a gas turbine, undertaking the right turn manoeuvre onto the A19 on leaving Junction 34 of the M62 and is provided within the Transport Assessment. This demonstrates that delivery of the largest AIL component via the M62 Jct 34 / A19 grade separated roundabout is possible. Once on the A19, the AIL delivery would head north along the A19 towards the Proposed Power Plant Site. The only pinch point along this section of the A19 is where it meets the A645 at a standard four arm roundabout. This would require the AIL delivery having to be driven over the roundabout and will require the temporary removal of street furniture and the necessary support put in place for the AIL to safely negotiate the roundabout. Due to the small number of AIL deliveries, such deliveries can be managed so as not to cause a nuisance to other road users.
- 14.6.76 Table 14.12 below summarises the expected diurnal profile of construction phase peak traffic levels (see the TA in Appendix 14A (PEI Report Volume III) for further details).

Table 14.12: Daily construction vehicle profile (peak month of construction)

Hour beginning	Construction worker vehicles		Construction HGVs	
	Arrival	Departure	Arrival	Departure
00:00	0	0	0	0
01:00	0	0	0	0
02:00	0	0	0	0
03:00	0	0	0	0
04:00	0	0	0	0
05:00	0	0	0	0

Hour beginning	Construction worker vehicles		Construction HGVs	
	Arrival	Departure	Arrival	Departure
06:00	154	0	0	0
07:00	283	0	0	0
08:00	52	0	4	4
09:00	26	0	4	4
10:00	0	0	4	4
11:00	0	0	4	4
12:00	0	0	4	4
13:00	0	0	4	4
14:00	0	0	4	4
15:00	0	0	4	4
16:00	0	26	4	4
17:00	0	77	4	4
18:00	0	386	0	0
19:00	0	26	0	0
20:00	0	0	0	0
21:00	0	0	0	0
22:00	0	0	0	0
23:00	0	0	0	0
Total	515	515	40	40

14.6.77 Based on the agreed vehicle assignment contained within the TA (Appendix 14A, PEI Report Volume II), Table 14.13 summarises the likely changes in link flows within the agreed study area for the assessment year 2020 peak of construction. As detailed in the TA (Appendix 14A, PEI Report Volume III), HGV traffic has been assigned to the most direct route to the strategic network which is the M62 Junction 34 and the A19, and the construction workers assignment has been based on the geographic split of population within a 30 minute drive-time of the construction site.

Table 14.13: 2020 base + committed + Proposed Development daily two-way traffic flows

Link no.	Link description	Baseline flow (inc. com dev)		Construction traffic		Percentage increase	
		Total veh.	Total HGVs	Total veh.	Total HGV	Total veh.	Total HGVs
1	A19 (north of M62 Junction 34)	17,041	1,111	894	80	5.2%	7.2%
2	A19 (north of Wand Lane)	13,240	575	154	0	1.2%	0.0%
3	Wand Lane	748	0	1,010	0	135.0%	0.0%

- 14.6.78 It is evident that the change in total traffic associated with the Proposed Development is significantly less than 30% on the A19 (very low impact) and therefore the severance effect is negligible. In comparison the change in total traffic on Wand Lane is greater than 90% (high impact), due to low current usage of that road, however given the link sensitivity is very low, the overall effect is considered minor adverse (not significant).
- 14.6.79 It is evident that the change in total traffic (or HGV component) is significantly less than 50% on the A19 (very low impact) and therefore the effect for pedestrian amenity is negligible (not significant). In comparison the change in total traffic on Wand Lane is greater than 100% but below 150% (medium impact) however given the link sensitivity is very low with no pedestrian footways provided on this section of Wand Lane, the overall magnitude of effect is considered negligible (not significant).
- 14.6.80 It is evident that the change in total traffic is significantly less than 30% on the A19 (very low impact) and therefore the effect on fear and intimidation is negligible (not significant). In comparison the change in total traffic on Wand Lane is greater than 90% (high impact) however given the link sensitivity is very low, the overall effect is considered minor adverse (not significant).
- 14.6.81 Accident data for the most recent five years has been acquired for the study area and is summarised in Section 6.4. The statistics provide information on the location and severity of each Personal Injury Accident (PIA). Given that the level of increase in traffic flow resulting from the development is negligible, the effect on highway safety is negligible (not significant).
- 14.6.82 The performance of a junction is judged by the ratio of flow to capacity (RFC). As a general guide, a junction operating below a threshold of 0.85 is considered to operate within its design capacity. Junction modelling has been undertaken at key junctions in the vicinity of the Site (the results of which are provided in the TA (Appendix 14A in PEI Report Volume II)) for the AM and PM Peak hours (07:00 – 08:00 and 17:00 – 18:00) and demonstrates that each junction operates within its design capacity in terms of the future baseline and future baseline plus Proposed Development scenarios. Junction modelling therefore leads to the conclusion that the driver delay effect of the Proposed Development will be negligible (not significant).

- 14.6.83 In summary, in line with the significance criteria set out previously, the effects of construction traffic on all road links and junctions within the study area are considered to have a minor/negligible adverse effect, all of which are therefore not significant. All roads experience less than a 30% increase in either total flows or HGV flows apart from Wand Lane during the peak of construction where a change of 135% is forecast in total daily traffic. However this higher percentage is primarily due to the low number of existing vehicles using Wand Lane. Notwithstanding this the overall effect of development traffic on Wand Lane is minor given the road's very low sensitivity between the Hensall Gate entrance and the A19.

Opening and Operation

- 14.6.84 Once operational there will be a maximum of approximately 40 full-time staff working in three shifts (06:00 – 14:00 hours, 14:00 – 22:00 hours and 22:00 – 06:00 hours). In addition there would be around 30 corporate staff based at the site working normal office hours (09:00 – 17:00 hours). Conservatively assuming a car occupancy of 1, this equates to 70 cars per day (140 vehicle movements).
- 14.6.85 In addition, there will be HGV traffic generated by deliveries of operational and maintenance plant and equipment. However this is expected to equate to a maximum of 4 HGVs per day. Fuel for the new power station will be natural gas imported to the Site via pipeline and there will be no vehicular movements associated directly with the transport of gas to the Site. Small quantities of back-up diesel would be delivered by road if refilling of storage tanks was required.
- 14.6.86 Due to the very low traffic flows which result once the Proposed Development is first operational in 2022, the vehicle numbers generated will be significantly lower than experienced during the construction period. The overall effects during operation are therefore considered to be negligible adverse (not significant). This conclusion is valid regardless of whether or not demolition of the existing coal-fired power station is still ongoing in the Opening assessment scenario (2022) as the vehicle numbers generated will continue to be significantly lower than experienced during the construction period. The same conclusion (no significant effects) applies to the future Operational assessment scenario (2037) when demolition activities would have been completed.

Decommissioning

- 14.6.87 The activities involved in the decommissioning process for the proposed power plant are not yet known in detail, as it has a design life of around 25 years. There would be expected to be some traffic movements associated with the removal (and recycling, as appropriate) of material arising from demolition and potentially the import of materials for land restoration and re-instatement. However, vehicle numbers are not expected to be any higher than those experienced during the construction period.
- 14.6.88 Current baseline data collected for the purposes of this assessment will not be valid at the year of decommissioning, which is currently unknown. However, as it is unlikely that baseline traffic figures on local roads will reduce appreciably over the next twenty five years, it is considered that the percentage increase in traffic due to decommissioning would be negligible, and that overall the effects of decommissioning traffic would be no greater than that of the construction traffic detailed above. Effects are therefore assessed as likely to be not significant.

14.7 Mitigation and Enhancement Measures

- 14.7.89 Whilst assessments have demonstrated that during the construction phase of the Proposed Development there will be no significant effects to any of the road sections assessed, a number of best practice mitigation measures will be implemented.
- 14.7.90 As described in paragraph 14.6.60, the standard construction working hours will be 07:00 to 19:00 Monday to Friday (except Bank Holidays) and 07:00 – 13:00 Saturday, and as such the majority of construction worker traffic is anticipated to avoid the AM and PM peak periods on the local highway network (identified to be 08:00 – 09:00 hours and 17:00 – 18:00 hours).
- 14.7.91 During the construction phase, Eggborough Power Limited (EPL) (the Applicant) will apply the following mitigation measures in respect of the local highways:
- implementation of a Construction Worker Travel Plan (CWTP) aimed at identifying measures and establishing procedures to encourage construction workers to adopt modes of transport which reduce reliance on single occupancy private car use;
 - liaison with the appointed contractor for the potential to implement construction worker minibuses and car sharing options (to be considered as part of the CWTP); and
 - the contractor will be required to prepare a Construction Traffic Management Plan to identify a number of measures to control the routing and impact that HGVs will have on the local road network during construction. It is proposed that all construction HGVs will be required to arrive and depart the site towards the M62 avoiding the villages of Chapel Haddlesey and Burn (with the exception of a small number accessing the northern parts of the Proposed Gas Connection construction area). A programme of monitoring will be recommended to assess the effectiveness of the measures proposed.

14.8 Limitations or Difficulties

- 14.8.92 A holistic approach has been undertaken in identifying the peak of construction for assessment combining the workforce associated with the construction of the Proposed Development of the CCGT and that associated with the Proposed Gas Connection. It is expected that the construction workforce will peak in Month 18 (i.e. Quarter 2 in 2020). As the anticipated construction programme for the Proposed Gas Connection Programme does not begin until Month 22, this does not coincide with the peak of construction in Month 18.
- 14.8.93 Whilst the peak of construction traffic does not include the anticipated Proposed Gas Connection construction traffic due to the timing of this element of work, it will be of interest to readers to understand the significance of effects when works specific to the Proposed Gas Connection works are taking place.
- 14.8.94 The following construction access points to the Proposed Gas Connection corridor have been identified
- West Lane;
 - the A19 in the vicinity of Burn Lodge Farm;
 - the A19 at Whitings Lane (opposite Burn Lodge Farm);
 - the A19 at Fox Lane;
 - Millfield Road east of Chapel Haddlesey; and
 - Wand Lane via existing tracks.

14.8.95 The 'worst case' impacts on the A19 and Wand Lane have been assessed as part of the assessment of the peak construction month in Section 14.6 of this chapter, but effects on West Lane and Millfield Road have not been assessed in detail at this stage. Observations during site visits have revealed that baseline traffic flows on both West Lane and Millfield Road are very low. It has also been established that flows associated with the construction of the gas pipeline and AGI are low in volume and temporary in nature. Our professional judgement is therefore that no significant effects will occur. However to ensure a robust assessment is undertaken, further baseline counts will be undertaken on West Lane and Millfield Road and junction modelling undertaken at their respective junctions with the A19 and this will be reported in the final ES and TA to support the DCO application.

14.9 Residual Effects and Conclusions

14.9.96 Residual effects are those predicted following consideration of any proposed mitigation measures. All effects are predicted to be minor/ negligible adverse (not significant), and the mitigation measures set out in Section 6.7 will not reduce the classification of these effects any further.

14.9.97 Traffic increases associated with the construction of the Proposed Development (combined with traffic associated with demolition of the existing coal-fired power station, which could occur concurrently) have been assessed to be minor/ negligible adverse (not significant). The additional traffic due to the Proposed Development construction activities will result in small, temporary, increases of traffic flows, including HGVs, on the roads leading to the Site. In line with the significance criteria presented earlier in this chapter and in the TA (Appendix 14A in PEI Report Volume II), the impacts of construction traffic on all road sections and junctions are considered to be minor/ negligible and not considered to be significant.

14.9.98 The generation of traffic during operation will be minimal when compared to the construction period and therefore will have an insignificant impact on the local highway network. During the operational phase of the Proposed Development, the potential effects are considered to be negligible and not considered to be significant.

14.9.99 Whilst assessments have demonstrated that, for both the construction and operational phases, there will be no impacts of any significance to any of the road sections assessed, a number of traffic management measures will be implemented to further minimise any traffic increases as a result of the Proposed Development as outlined in Section 6.7.

14.9.100 An assessment of the impact of traffic with regard to noise impacts and emissions to air have been undertaken and are presented in Chapter 9: Noise and Vibration and Chapter 8: Air Quality respectively.

14.10 References

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

Department for Energy and Climate Change (2011b) *National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2)*

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

Department for Transport (2013) *Circular 02/2013 – The Strategic Road Network and the Delivery of Sustainable Development*

Highways England Design Manual for Roads and Bridges, (1995) *Geometric Design of Major / Minor Priority Junctions (Volume 6, Section 2, Part 6 TD42/95)*

Highways England (2015) *The Strategic Road Network: Planning for the Future – A guide to working with Highways England on Planning Matters*

Institution of Environmental Management and Assessments (IEMA), (1994). *Guidelines for the Environmental Assessment of Road Traffic*

North Yorkshire County Council, (2016). *North Yorkshire Local Transport Plan 2016 – 2045*

Planning Practice Guidance, (2014). *Travel Plans, Transport Assessment and Statements in decision-taking*

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15.0 LAND USE, AGRICULTURE AND SOCIO-ECONOMICS

15.1 Introduction

- 15.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential effects of the proposed Combined Cycle Gas Turbine (CCGT) power station near Eggborough, North Yorkshire (hereafter referred to as the 'Proposed Development') on land use, agriculture, employment, local businesses and the local population.

15.2 Legislation and Planning Policy Context

Planning Policy Context

National Planning Policy

- 15.2.2 The planning context for the consideration of agricultural land and soil resource issues is provided primarily by national policies for development involving agricultural land, as set out in the National Planning Policy Framework (NPPF) (Department for Communities and Local Government (DCLG), (2012). This policy advice is predicated upon principles of sustainable development and requires land use decision makers to take account of the need to protect, and make prudent use of, natural resources. Consequently, it is necessary to have regard to the qualities of the agricultural land and soils within the Site.
- 15.2.3 Where it is demonstrated that significant development on agricultural land is necessary, and the options of utilising previously developed land or poorer quality land are not available or are inappropriate, decision makers are required to have regard to the economic and other benefits of the best and most versatile (BMV) agricultural land (Grades 1, 2 and 3a).

Table 15.1: National planning policy relevant to soils and agricultural land use assessment

Policy reference	Content
NPPF (DCLG, 2012a) and associated Planning Practice Guidance (PPG) (DCLG, 2012b)	
NPPF Paragraph 109: Conserving and Enhancing the Natural Environment	States that the planning system should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes, geological conservation interests and soils.
NPPF Paragraph 111 and PPG ID8: Natural Environment (Brownfield Land, Soils and Agricultural Land)	State that " <i>planning policies and decisions should encourage the effective use of land by re-using land that has been previously developed (brownfield land), provided that it is not of high environmental value.</i> "
NPPF Paragraph 112 and PPG ID8: Natural Environment (Brownfield Land, Soils and Agricultural Land)	Paragraph 112 requires local planning authorities to take into account the economic and other benefits of the best and most versatile (BMV) agricultural land. Where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality

Policy reference	Content
	land, in preference to that of a higher quality.
Department for Environment, Food and Rural Affairs (Defra) guidance	
Soil Strategy for England – Safeguarding our Soils (Defra, 2009a)	This sets out Defra's vision that by 2030, all of England's soils will be managed sustainably and degradation threats will be tackled successfully in order to improve soil quality and safeguard the ability to provide essential services for future generations. The Strategy sets out priorities for action in respect of better protection of agricultural soils; protecting and enhancing stores of soil carbon; building the resilience of soils to a changing climate; preventing soil pollution; effective soil protection during construction and development; and dealing with the legacy of contaminated land.
Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009b)	This is a practical guide to assist the construction industry to protect the soil resources with which it works and achieve good soil management at all stages of the construction process. It advises that the protection, use and movement of soil should be considered from the outset of a development project's planning, through its design and construction phases and on into future maintenance and operation. The code provides practical guidance on the following aspects of the sustainable use of soils on construction sites: <ul style="list-style-type: none"> • identifying existing soil resources on site; • on-site soil management; • topsoil and subsoil stripping; • soil stockpiling and placement; • sourcing, importing and manufacturing topsoil; • soil aftercare; and • uses for surplus topsoil.

- 15.2.4 The NPPF states that planning should proactively drive and support sustainable economic development. The NPPF requires local authorities to set out a clear economic vision and strategy for their area which encourages sustainable economic growth. Local authorities are also required to identify strategic sites for local and inward investment. The NPPF also requires local authorities to support existing business sectors and consider whether they are expanding or contracting.

Local Planning Policy

- 15.2.5 In the Proposed Development Study Area (defined in Section 15.3 below), planning policy regarding land use and socio-economics are made by Selby District Council.
- 15.2.6 Land use policy is described in Chapter 7: Legislative Context and Planning Policy Framework. Policy relating to socio-economics is described in further detail below.

Selby District Local Plan 'Saved Policies' (2005)

15.2.7 The Local Plan suggests that Selby's economy has traditionally been focussed on industrialised forms of employment such as coal mining and power generation but that it is increasingly important to *"stimulate economic development in a way which is compatible with environmental objectives"*. It supports the creation of new employment opportunities and inward investment with importance placed on the retention of established employment areas. Key objectives of the Local Plan include:

- safeguarding existing employment land;
- promoting the diversification of the local economy; and
- creating opportunities to improve the quality of the existing business environment.

15.2.8 Policy EMP11 of the Local Plan indicates that large-scale industrial development may be permitted provided that it would result in "substantial employment or other economic benefits".

Selby District Core Strategy Local Plan (2013)

15.2.9 A key objective of the Core Strategy is to promote economic prosperity. This is highlighted as important in reducing out-commuting and creating a more sustainable way of life for residents. It aims to "cater for inward investment as well as indigenous employment growth", with emphasis placed on retaining existing employment sites in the District. Selby District Council also supports the re-use of former employment sites.

15.2.10 The Core Strategy indicates that the energy sector will continue to play an important role in the economy of the District. It highlights Eggborough Power Station as a major employer which contributes to the national energy infrastructure as well as the local economy but recognises that it also has the potential for the future development of renewable and low carbon energy technologies. The Core Strategy suggests that *"there is a need for further investment in energy infrastructure in line with national policy as a prominent contributor to economic prosperity"* and *"supporting the energy sector will assist in reinvigorating, expanding, and modernising the District's economy"*.

Other Guidance

15.2.11 Whilst there is no dedicated UK legislation that details the content required for a socio-economic assessment as part of an EIA, the socio-economic assessment presented in this chapter is based upon a range of relevant guidance. This includes:

- Department for Business, Innovation and Skills (BIS) (2009) Research to Improve the Assessment of Additionality;
- HM Treasury (2011) The Green Book – Appraisal and Evaluation in Central Government;
- HM Treasury (2011) The Magenta Book – Guidance for evaluation; and
- Homes & Communities Agency (HCA) (2014) Additionality Guide (4th Edition).

15.3 Assessment Methodology and Significance Criteria

- 15.3.1 This assessment considers the impacts of the Proposed Development on existing land uses, agricultural land, soils within the Site, and the role of the Proposed Development in the generation of direct and indirect employment opportunities at the local and regional level.

Impact Assessment and Significance Criteria

Land Use Impact Assessment

- 15.3.2 Impacts on land uses may be direct or indirect. This chapter considers only direct impacts on land uses. The significance of any indirect effects on surrounding land uses, such as noise, dust, water quality, visual and traffic effects, are discussed in the relevant specialist chapters and are not repeated in this chapter.
- 15.3.3 The significance of an effect on a land use (with the exception of agricultural land, which is assessed separately as described in the next section) is assessed using the definitions in Table 15.2 and professional judgement. This methodology has been developed and used by AECOM for a number of similar land use impact assessments and deviates from the standard EIA methodology used elsewhere in this PEI Report, as effects are classified on the basis of the definitions in Table 15.2 rather than by combining receptor sensitivity and impact magnitude with a matrix.

Table 15.2: Classification of land use effects

Effect	Definition
Major adverse	Demolition of a large number of buildings or structures in beneficial use. Use of large areas of previously undeveloped (greenfield) land. Severance/ loss or large diversion of a formal PRoW. Large loss of formal recreational areas or other beneficial uses.
Moderate adverse	Demolition of a small number of buildings or structures in beneficial use. Use of some areas of previously undeveloped (greenfield) land. Severance/ loss or large diversion of an informal pedestrian or cycle route, or a moderate diversion of a formal PRoW. Small loss of formal recreational areas or other beneficial uses.
Minor adverse	Relatively small changes to informal or formal pedestrian or cycle routes. Loss of informal recreational areas or other beneficial uses.
Negligible adverse	Very small changes to informal or formal pedestrian or cycle routes. Loss of beneficial uses (e.g. woodland) with no public access.
Negligible beneficial	Very small improvement to informal or formal pedestrian or cycle routes. Increase in provision of beneficial land uses (e.g. woodland) with no public access.
Minor beneficial	Relatively small improvements to informal or formal pedestrian or cycle routes. Increase in provision of informal recreational areas or other

Effect	Definition
	beneficial uses.
Moderate beneficial	Refurbishment of a small number of buildings currently not in beneficial use. Use of some areas of previously developed (brownfield) land. Large improvements to an informal pedestrian or cycle route, or moderate improvements to formal routes. Small increase in provision of formal recreational areas or other beneficial uses.
Major beneficial	Refurbishment of a large number of buildings currently not in beneficial use. Use of large areas of previously developed (brownfield) land. Notable improvements to a formal PRow. Large increase in provision of formal recreational areas or other beneficial uses.

- 15.3.4 Effects are only considered to be significant if they are assessed to be major or moderate adverse or beneficial.

Agricultural Land and Soils Impact Assessment

- 15.3.5 The agricultural land and soils impact assessment has not yet been completed but will be reported in the ES to support the DCO application. The assessment methodology that will be used is set out below for information.
- 15.3.6 Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, and Grade 5 is very poor quality land, with severe limitations due to adverse soil, relief, climate or a combination of these. Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). The BMV agricultural land comprises Grades 1, 2 and 3a.
- 15.3.7 The sensitivity of agricultural land is assessed according to its grade within the Agricultural Land Classification (ALC) system, as set out in Table 15.3.

Table 15.3: Sensitivity of agricultural land

Sensitivity	Agricultural land
High	Grade 1, excellent quality agricultural land
Medium	Grade 2 and Subgrade 3a, very good to good quality agricultural land
Low	Subgrade 3b and Grade 4, moderate to poor quality agricultural land
Very low	Grade 5, very poor quality agricultural land

- 15.3.8 The thresholds for the magnitude of impact adopted in the agricultural land assessment have regard to Natural England's Technical Information Note 049 'Agricultural Land Classification: protecting the best and most versatile agricultural land' (Natural England, 2012), which

indicates that proposed developments affecting 20 ha or more of best and most versatile land require formal consultation with Natural England (see Table 15.4).

Table 15.4: Magnitude of impact on agricultural land

Magnitude of impact	Agricultural land
High	The development would lead to the loss of over 50 ha of agricultural land
Medium	The development would lead to the loss of between 20 ha and 50 ha of agricultural land
Low	The development would lead to the loss of between 5 ha and 20 ha of agricultural land
Very low	The development would lead to the loss of less than 5 ha of agricultural land

15.3.9 The impact on the soil resource is assessed according to the degree to which disturbed soil resources are re-used in a manner that enables the resource to fulfil one or more of the primary soil functions of:

- the production of food and biomass, and the provision of raw materials;
- the storage, filtration and cycling of water, carbon and nitrogen in the biosphere;
- the support of ecological habitats and biodiversity;
- support for the landscape;
- the protection of cultural heritage; and
- the provision of a platform for human activities, such as construction and recreation.

15.3.10 The sensitivity of the soil resource reflects its textural characteristics and its susceptibility to the effects of handling during construction and the re-instatement of land, as shown Table 15.5.

Table 15.5: Sensitivity of soil resources

Sensitivity	Soil resource
High	Soils with high clay and silt fractions (clays, silty clays, sandy clays, heavy silty clay loams and heavy clay loams)
Medium	Silty loams, medium silty clay loams, medium clay loams and sandy clay loams
Low	Soils with a high sand fraction (sands, loamy sands, sandy loams and sandy silt loams)

15.3.11 The criteria for assessing the magnitude of impact are set out in Table 15.6.

Table 15.6: Magnitude of impact on soil resources

Magnitude of impact	Agricultural land
High	The soil displaced from the development is unable to fulfil one or more of the primary soil functions
Medium	The soil displaced from the development mostly fulfils the primary soil functions off-site or has a reduced capacity to fulfil the primary functions on site

Magnitude of impact	Agricultural land
Low	The soil displaced from the development mostly fulfils the primary soil functions on-site
Very low	The soil retains its pre-existing functions on-site

- 15.3.12 Effects are classified as negligible, minor, moderate or major (adverse or beneficial) in accordance with the matrix at Table 15.9, based on the sensitivity of the resource or receptor and the magnitude of impact. For the purposes of this assessment, only moderate and major impacts are considered 'significant'.

Socio-Economic Impact Assessment

- 15.3.13 Where possible, socio-economic impacts have been appraised against relevant national standards, such as those provided by HM Treasury, Business, Innovation and Skills, and the Homes and Communities Agency. Where relevant standards do not exist, professional experience and expert judgement have been applied.

- 15.3.14 The socio-economic assessment determines the:

- sensitivity of receptors;
- magnitude of impacts; and
- the consequent significance of effects.

- 15.3.15 The sensitivity of socio-economic receptors is assessed as high, medium, low or very low. The socio-economic receptors include those who will potentially benefit from employment generation (either directly, indirectly or induced (secondary impacts, for example due to construction workers spending money at local businesses)). The sensitivity of these receptors is considered to be high due to the availability of labour and skills in the local area required for the Proposed Development.

- 15.3.16 Section 15.4 Baseline Conditions summarises the receptors that will be affected during construction and operation.

- 15.3.17 The magnitude of the effects of the Proposed Development is assessed as being high, medium, low or very low. This is determined by:

- extent of change - the absolute number of people affected and the size of area in which effects will be experienced i.e. the level of change to baseline conditions including the proportion of the existing workforce;
- scale of the impact - the relative magnitude of each impact in its relevant market context (for example, the effects on local employment will be considered in the context of the overall size of the local labour market); and
- duration of impact - more weight is given to long-term, permanent changes than to short-term, temporary ones, where temporary to short-term impacts are considered to be those associated with the construction works, and medium to long-term impacts are those associated with the operation of the Proposed Development.

- 15.3.18 The effects of the Proposed Development are defined as either:

- beneficial - an advantageous or beneficial effect on an impact area;
- negligible - an imperceptible effects on an impact area; or

- adverse - a disadvantageous or negative effect on an impact area.

15.3.19 Where an effect is assessed as being beneficial or adverse, the effect has been classified as minor, moderate, major or negligible. The assessment of significance is informed by the sensitivity of the receptor and the magnitude of impact as set out in Table 15.9. For the purposes of this assessment, only moderate and major impacts are considered 'significant'.

Table 15.9: Classification of effects on agricultural land use, soils and socio-economics

Magnitude of impact	Sensitivity/ importance of receptor			
	High	Medium	Low	Very low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible

Extent of Study Area

Land Use and Agriculture Study Area

15.3.20 The land use and agricultural assessment study area, which considers only direct impacts as a result of the Proposed Development, comprises the Site itself and immediately adjacent land. Indirect impacts on neighbouring land uses (such as noise, air quality, dust, visual and traffic effects) are discussed in the relevant technical chapters and not repeated in this chapter.

Socio-Economic Study Area

- 15.3.21 ONS statistical geographies have been used to define the study area for the socio-economic assessment as described below.
- 15.3.22 The Proposed Development falls within Lower Super Output Area (LSOA) Selby 010B (the 'Direct Impact Area'). LSOAs are small geographic areas defined by the ONS. There are 34,753 LSOAs across England and Wales with a minimum population of 1,000 and a maximum of 3,000.
- 15.3.23 As well as understanding the socio-economic conditions immediately surrounding the Proposed Development (as per the LSOA analysis), the socio-economic assessment also takes into account the principal labour market catchment area of the travel to work area (TTWA). TTWAs contain at least 75% of the area's workforce that both live and work in the area. TTWAs have populations of at least 3,500 people. The Proposed Development falls within the York TTWA (the 'Wider Impact Area').
- 15.3.24 The assessment outlines the socio-economic context of both the LSOA and TTWA, and makes comparisons to the whole of England. Key indicators include: population and labour force; skills and unemployment; industry and the economy.

Sources of Information/Data

- 15.3.25 Information on land uses within the Site has been gathered through a combination of a desk study of available maps and site visits.

Land Use and Agriculture Sources

- 15.3.26 To inform the land use and agricultural impact assessment, a soil survey is currently being undertaken to classify the agricultural land within the Site (i.e. within the Proposed Cooling Water and Gas Connection corridors) in accordance with the ALC system to determine the extent of best and most versatile land (BMV) affected by the Proposed Development. Initial results from the survey are summarised in this chapter and the full survey findings will be presented in the ES to accompany the DCO application.

Socio-Economic Sources

- 15.3.27 The following Office for National Statistics (ONS) datasets have been reviewed to inform the assessment: Business Register and Employment Survey (BRES) (2015); Jobseeker's Allowance by Occupation (2016); Census of Population (2011); and Population Projections (2015).

Consultation

- 15.3.28 Comments on the scope of the proposed land use, agriculture and socio-economics assessment have been provided within the Planning Inspectorate's EIA Scoping Opinion and through meetings and other communications with Natural England and North Yorkshire County Council.

Table 15.10: Consultation summary table

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/how comments have been addressed
Natural England	Email communication on 23 rd August 2016 following meeting on 4 th August 2016	<p>With regard to soils, the following should be considered as part of the ES:</p> <p>The degree to which soils will be disturbed/ harmed as part of the Proposed Development and whether 'BMV' agricultural land is involved.</p> <p>This may require a detailed survey if one is not already available.</p> <p>Natural England Technical Information Note 049 - Agricultural Land Classification: protecting the best and most versatile agricultural land contains useful background information.</p>	<p>A detailed ALC soil survey is being undertaken and initial findings are presented in this Chapter.</p> <p>The full impact assessment (including identification of mitigation measures) will be presented in the final ES.</p>

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		<p>If required, an agricultural land classification and soil survey of the land should be undertaken. This should normally be at a detailed level, e.g. one auger boring per hectare (or more detailed for a small site) supported by pits dug in each main soil type to confirm the physical characteristics of the full depth of the soil resource, i.e. 1.2 metres.</p> <p>The ES should provide details of how any adverse impacts on soils can be minimised. See the Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites.</p>	
Coal Authority	Response to Planning Inspectorate regarding EIA Scoping on 13 th September 2016	<p>Whilst the Proposed Development would be located within the defined coalfield, it would fall outside of the defined Development High Risk Area, meaning that there are no recorded coal mining legacy hazards at shallow depth that could pose a risk to land stability.</p> <p>The Site is also located outside of any area of surface coal resource so there is no need to consider the potential for prior extraction of coal resources.</p> <p>The site does fall within the licence area of Kellingley Colliery, which ceased deep underground coal mining activity in December 2015. The Coal Authority is therefore pleased to note that this is identified in Section 6.65 of the EIA Scoping Report (dated August 2016), and that this could potentially result in surface subsidence for several years following cessation of mining activities. This should be</p>	Subsidence is being monitored within the existing coal-fired power station site and is being considered as part of the design. This is discussed in PEI Report Chapter 12: Geology, Hydrogeology and Land Contamination.

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		considered in the design and the ES for the Proposed Development.	
Natural England	Response to Planning Inspectorate regarding EIA Scoping on 30 th August 2016	<p>Rights of Way</p> <p>EIA should consider impacts on access land, public open land, rights of way and coastal access routes in the vicinity of the Proposed Development. Also suggest reference to Rights of Way Improvement Plans is made.</p> <p>Soils and Agricultural Land Quality</p> <p>Impacts should be considered in light of the Government's policy for protection of best and most versatile (BMV) agricultural land as set out in paragraph 112 of NPPF.</p> <p>Also suggest soils be considered with reference to sustainable use of land and ecosystems services in line with paragraph 109 of the NPPF.</p> <p>The EIA should consider the degree to which soils will be disturbed/ harmed and whether BMV land is involved.</p> <p>The ES should provide details of how any adverse impacts can be minimised (see Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites).</p>	<p>Impacts on Public Rights of Way are considered in this chapter, and also in Chapter 16: Landscape and Visual Amenity.</p> <p>As described above, an ALC soil survey is being undertaken with initial findings presented in this chapter and a full assessment of impacts and mitigation will be presented in the ES.</p>
North Yorkshire County Council	Meeting and subsequent email communications in October-November 2016	Queries regarding employment and skills plan.	The draft DCO will include a Requirement for an employment and skills plan to be prepared in relation to the Proposed Development.

15.4 Baseline Conditions

Existing Baseline

Land Use

- 15.4.1 The existing land uses within the Site are summarised in Table 15.11 below. The different parts of the Site are marked on Figure 3.2 (PEI Report Volume II).

Table 15.11: Existing land uses within the Site

Part of the Site	Land uses
Proposed Power Plant Site	Coal stockyard for the existing coal-fired power station and associated rail loop and coal handling facilities, including conveyors, workshop, coal plant garage, gas oil tanks, amenity block, screening and crushing house and lighting towers. Biomass storage building (not in use for biomass). Small area of trees and scrub (to the north-east of the rail loop). Gypsum/ limestone hopper house and associated conveyors (to the north of the rail loop).
Proposed Cooling Water Connections	Internal access roads, storage areas, stores building, and gypsum and limestone conveyors (within the existing coal-fired power station and Proposed Construction Laydown area). Wand Lane and trees to the north of Wand Lane. Existing cooling water pipeline connections. Agricultural land and track between Wand Lane and the River Aire. Ings and Tetherings Drain. One Public Right of Way (PRoW) – a footpath linking Chapel Haddlesey Weir to Gallows Hill to the south-east (North Yorkshire County Council reference 35.27/1/1).
Proposed Borehole Water Connections	Internal access roads and railway lines. Trees, scrub and grass along Tranmore Lane, alongside the railway line between Tranmore Lane and Weeland Road, and to the east of Eggborough Sports and Leisure Complex (around the existing borehole site). Existing borehole water pipeline connections. Existing power station fire station, office and stores buildings.
Proposed Electricity Connection	Internal access roads, railway lines and gatehouse building. Trees between the railway lines, Tranmore Lane and other internal access roads (in the north-west corner of the rail loop).
Proposed Gas Connection and AGI	Internal access roads, storage areas, stores building, and gypsum and limestone conveyors (within the existing coal-fired power station and Proposed Construction Laydown area). Wand Lane and trees to the north of Wand Lane. Millfield Road, the A19 near Burn Lodge Farm and West Lane. Agricultural land: <ul style="list-style-type: none"> field and access track between Wand Lane and the River Aire; fields between River Aire and Millfield Road;

Part of the Site	Land uses
	<ul style="list-style-type: none"> • fields and access tracks between Millfield Road and the A19; • fields between the A19 and West Lane; and • field west of West Lane. <p>Ings and Tetherings Drain and field drains along the connection route.</p> <p>Two Public Rights of Way:</p> <ul style="list-style-type: none"> • footpath linking Chapel Haddlesey Weir to Gallows Hill to the south-east (North Yorkshire County Council reference 35.27/1/1); and • bridleway east of the A19 opposite Burn Lodge Farm, which crosses the railway line and loops back to the A19 at Blossom Hill, south of Burn (North Yorkshire County Council reference 35.14/4/1).
Proposed Construction Laydown area including Proposed Carbon Capture and Storage (CCS) Land	<p>Flue gas desulphurisation (FGD) project offices (portakabins, not in use).</p> <p>Gas oil and fuel oil tank.</p> <p>Waste management compound.</p> <p>Workshops and stores buildings.</p> <p>Gypsum and limestone conveyors.</p> <p>Emergency coal stockyard (not in use)</p> <p>Back-up cooling water storage lagoon.</p> <p>Contractors' compound, car park and amenity block.</p> <p>Hensall Road gatehouse and induction centre.</p> <p>Internal access roads.</p> <p>Trees, scrub and grass south of the FGD project offices, around the lagoon and along Wand Lane adjacent to the Hensall Gate entrance.</p>

15.4.2 The existing coal-fired power station is anticipated to cease operation during or before the end of 2019, around the time the Proposed Development construction will begin. All existing coal-fired power station buildings and activities within the Site are within the control of Eggborough Power Limited (EPL) (the Applicant) and will therefore cease operation at an appropriate time to allow construction of the Proposed Development to take place.

15.4.3 The only immediately adjacent land uses and receptors identified that have potential to experience direct effects (that are not considered in other technical chapters of this PEI Report) are:

- a short (less than 150 m long) Public Right of Way (PRoW) (footpath) heading east off the A19 along the north side of the Tranmore Lane entrance (North Yorkshire County Council reference 35.27/6/1), which will be used for construction and operational traffic;
- the existing coal-fired power station, which is expected to cease generated by 2019 and subsequently be demolished, and which located partly within the Site;
- Yorkshire Water waste water treatment works and Air Liquide air separation unit, to the east of Hensall Gate entrance, which is accessed via Wand Lane and could therefore be disrupted by short term construction activities within Wand Lane (i.e. Proposed Cooling Water and Gas Connections crossings); and

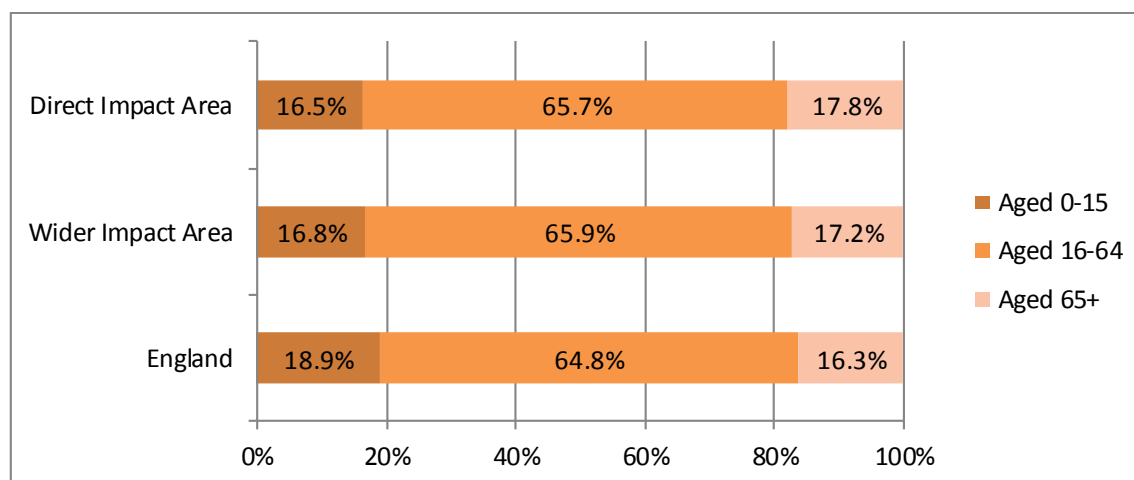
- users of local roads crossed by the Proposed Gas Connection (Wand Lane, Millfield Road and West Lane).

Agriculture

- 15.4.4 As summarised in Table 15.11 above, agricultural land is present within the Proposed Cooling Water Connections and Proposed Gas Connection and AGI areas of the Site. The Site includes approximately 49 ha of agricultural land, primarily within the Proposed Gas Connection corridor. At this stage the corridor is generally approximately 100 m wide (wider in places, for example at the River Aire crossing to allow additional space for directional drilling activities), but the final DCO Site boundary will be further refined following consultation (including on this PEI Report) to the required construction working width of around 36 m (wider in places such as at major crossings), although the actual pipeline will be less than 1 m in diameter with an associated easement of circa 15 m for maintenance.
- 15.4.5 The Provisional ALC map published by Natural England (available on the MAGIC website) shows the agricultural land within the Site to comprise a combination of Grade 2 (very good quality agricultural land) and Grade 3 (good/ moderate quality agricultural land).
- 15.4.6 A detailed soil survey is being undertaken in accordance with the method set out by Natural England (see Table 15.10) to confirm the ALC grade of the agricultural land within the Site. Initial findings based on field observations (note some parcels of land are yet to be surveyed and detailed laboratory analysis of soil samples has not yet been completed) suggest that over half the agricultural land within the Site is BMV agricultural land, and that the soils are a mixture of silty loams, sandy clay loams, silty clay loams, clays, silty clays and organic soils. As such the agricultural land is a mixture of high, medium and low sensitivity land and the soils are of high and medium sensitivity. The full survey results will be reported in the ES.

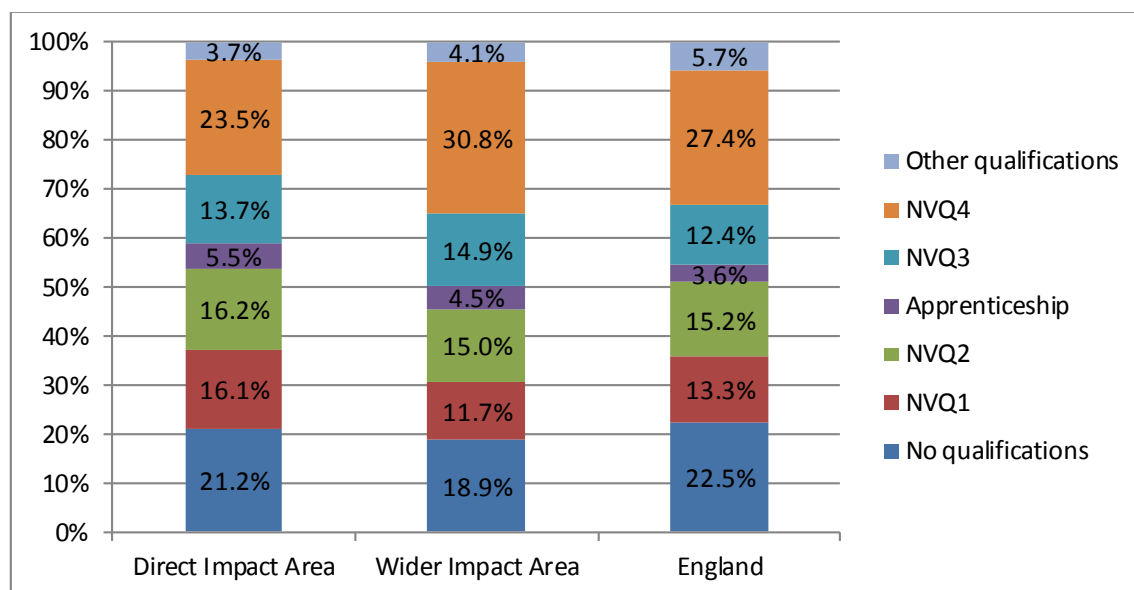
Socio-Economics

- 15.4.7 The existing coal-fired power station currently employs approximately 200 permanent staff, plus maintenance contractors, although these jobs are due to be lost when the existing coal-fired power station ceases generation (which is assumed to in 2019 at the latest).
- 15.4.8 This section outlines the socio-economic baseline conditions in the Direct Impact Area, Wider Impact Area and England. The local population and labour market are the main receptors in the assessment for employment effects. The baseline conditions help to determine the impact of employment generated by the Proposed Development. The impact is mostly influenced by the size of the labour market and whether it has the relevant skills, occupations and sector strengths to access employment opportunities.
- 15.4.9 The 2011 Census data show that the Direct Impact Area had a population of 1,696 while the wider impact area had a population of 330,397 (ONS, 2015). Plate 15.1 shows that both the Direct and Wider Impact Areas had a smaller proportion of young people (aged 0 to 15) than the average across England. Both the Direct Impact Area and Wider Impact Area contain more people of working age (aged 16 to 64) and elderly people (aged 65+) than the English average.

Plate 15.1: Population age structure

Source: ONS Census (2011)

- 15.4.10 The qualification levels differ markedly across the Direct Impact Area, Wider Impact Area and England (see Plate 2). The Direct Impact Area has a higher proportion of the population with qualifications at Apprenticeship level and below. 45.7% of the Wider Impact Area population have NVQ3 or NVQ4 as their highest qualification level, compared with 37.2% in the Direct Impact Area and 39.8% across England. Meanwhile the Direct and Wider Impact Areas had a lower proportion of their population with no qualifications than the average across England.

Plate 15.2: Population qualifications

Source: ONS Census (2011)

- 15.4.11 Employment in the Direct Impact Area is distributed to sectors quite differently to the Wider Impact Area and England. A higher proportion of people were employed in the production industries such as Agriculture, Mining, Energy, Manufacturing, Construction and Motor Trades than in the Wider Impact Areas and England (ONS 2015). The Direct Impact Area has particular

strengths in Manufacturing and Construction which were responsible for 13.4% and 15.4% of employment, respectively, at the 2011 Census.

- 15.4.12 A higher proportion of people in the Wider Impact Area work in service-based sectors such as ICT, Insurance, Property and Other Business Services and Public Administration, Defence, Education and Health. Table 15.12 shows the proportion of people employed in different sectors in the Direct and Wider Impact Areas and England.

Table 15.12: Employment sectors

	Direct Impact Area	Wider Impact Area	England
Agriculture, mining, energy and water	3.2%	2.1%	1.0%
Manufacturing	13.4%	9.0%	9.6%
Construction	15.4%	9.6%	10.0%
Motor trades, wholesale and retail	3.4%	1.5%	1.3%
Transport & Storage	6.5%	8.5%	8.9%
Accommodation and food services	22.3%	24.9%	25.2%
ICT, insurance, property and other business services	20.9%	22.1%	22.3%
Public administration, defence, education and health	8.5%	12.1%	11.3%
Other	6.4%	10.3%	10.3%

Source: ONS Census (2011)

- 15.4.13 The economic activity rate is higher in the Direct Impact Area, at 74.2%, than across the Wider Impact Area and England (ONS, 2015) (see Table 15.13). 1,102 people in the Direct Impact Area are economically active. There are a higher percentage of full-time and self-employed worker in the Direct Impact Area than in the Wider Impact Area and England. The Direct Impact Area and Wider Impact Area both have lower unemployment rates than in England as whole.
- 15.4.14 The percentage of full-time students in the Direct Impact Area is significantly below that of the Wider Impact Area and England. The Direct Impact area also has a higher percentage of retired people than the Wider Impact Area and England as a whole. This is reflected in the population age structure chart (Plate 15.1).

Table 15.13: Economic activity

Economic activity	Direct Impact Area		Wider Impact Area		England	
	Level	%	Level	%	Level	%
In employment	1,027	69.2	157,531	63.6	24,143,464	62.1

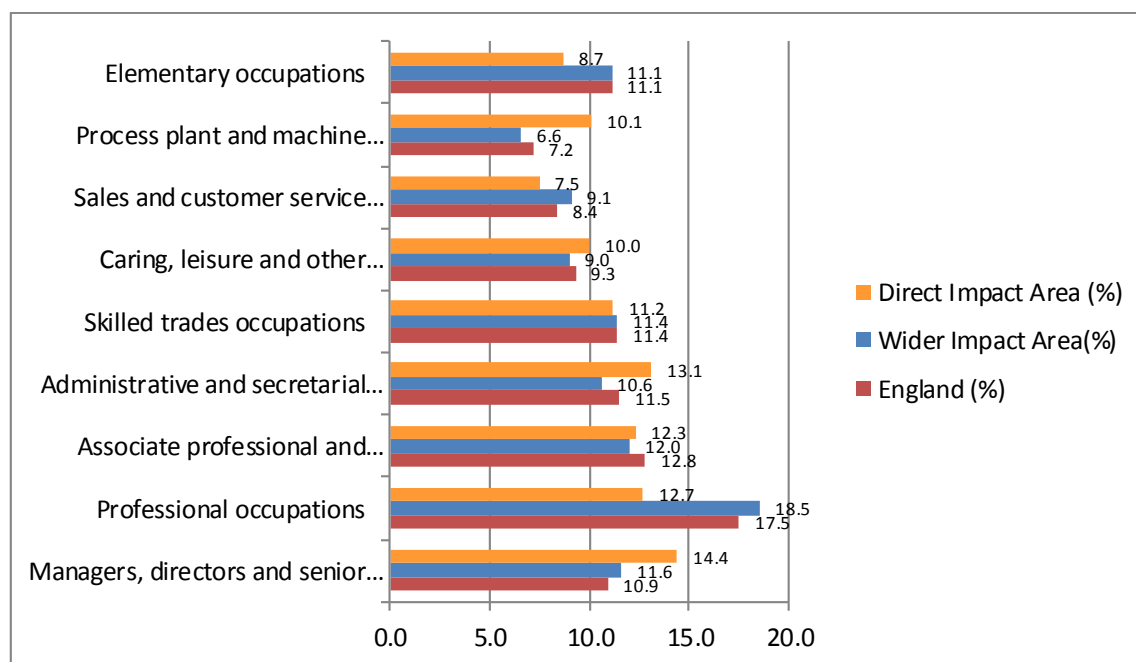
Employee: Part-time	215	14.5	37,132	15.0	5,333,268	13.7
Employee: Full-time	612	41.2	96,317	38.9	15,016,564	38.6
Self-employed	200	13.5	24,082	9.7	3,793,632	9.8
Unemployed	40	2.7	7,570	3.1	1,702,847	4.4
Full-time student	35	2.4	10,974	4.4	1,336,823	3.4
Total	1,102	74.2	176,075	71.0	27,183,134	69.9

Source: ONS Census (2011)

Economic inactivity	Direct Impact Area		Wider Impact Area		England	
	Level	%	Level	%	Level	%
Retired	244	16.4	36,501	14.7	5,320,691	13.7
Student (including full-time students)	43	2.9	17,789	7.2	2,255,831	5.8
Looking after home or family	50	3.4	7,337	3.0	1,695,134	4.4
Long-term sick or disabled	24	1.6	5,940	2.4	1,574,134	4.0
Other	22	1.5	4,219	1.7	852,450	2.2
Total	383	25.8	71,786	29.0	11,698,240	30.1

Source: ONS Census (2011)

- 15.4.15 The workforce occupation profile varies across the Direct and Wider Impact Areas and England. In general the Direct Impact Area has a greater proportion of managers, directors and senior officials and a larger amount of process plant and machine operatives (ONS 2015). The Direct Impact Area has a significantly lower percentage of workers employed in professional occupations than seen in the Wider Impact Area and England. There is also a lower proportion of workers employed in elementary occupations in the Direct Impact Area than seen in the Wider Impact Area and England. Plate 15.3 shows the composition of occupations in the workforce for the Direct and Wider Impact Areas and England.

Plate 15.3: Workforce occupations

Source: ONS Census (2011)

Future Baseline**Land Use**

- 15.4.16 Land uses within the existing coal-fired power station site are anticipated to change with or without the Proposed Development, because the existing coal-fired power station is likely to cease generation during or before 2019. As such it is assumed that all existing coal-fired power station buildings and structures would be removed by 2037. The existing coal-fired power station site may also be redeveloped but no detailed plans have yet been made in this regard, and as such this assessment is outwith the scope of this PEI Report.
- 15.4.17 Land uses within the Site but outside the existing coal-fired power station are not anticipated to change in the future baseline scenario.

Agriculture

- 15.4.18 No change to existing agricultural land uses and quality are anticipated in the future baseline scenario.

Socio-Economics

- 15.4.19 This section outlines the socio-economic future baseline conditions in the Direct Impact Area, Wider Impact Area and England. The future baseline conditions help to identify any changes anticipated in the baseline conditions in the absence of the Proposed Development.
- 15.4.20 While population growth in the Direct Impact Area is expected to be positive overall up to 2037, growth is driven by the 65+ age bracket with the working age population dropping markedly and those aged 0 to 15 seeing a slight fall. The working age population in the Wider

Impact Area is also due to recognise negative annualised growth during the time period, though the 0 to 15 population is set to increase. Once again, the Wider Impact Area is due to see population growth driven by the 65+ cohort. Relevant data is set out in Table 15.14 below.

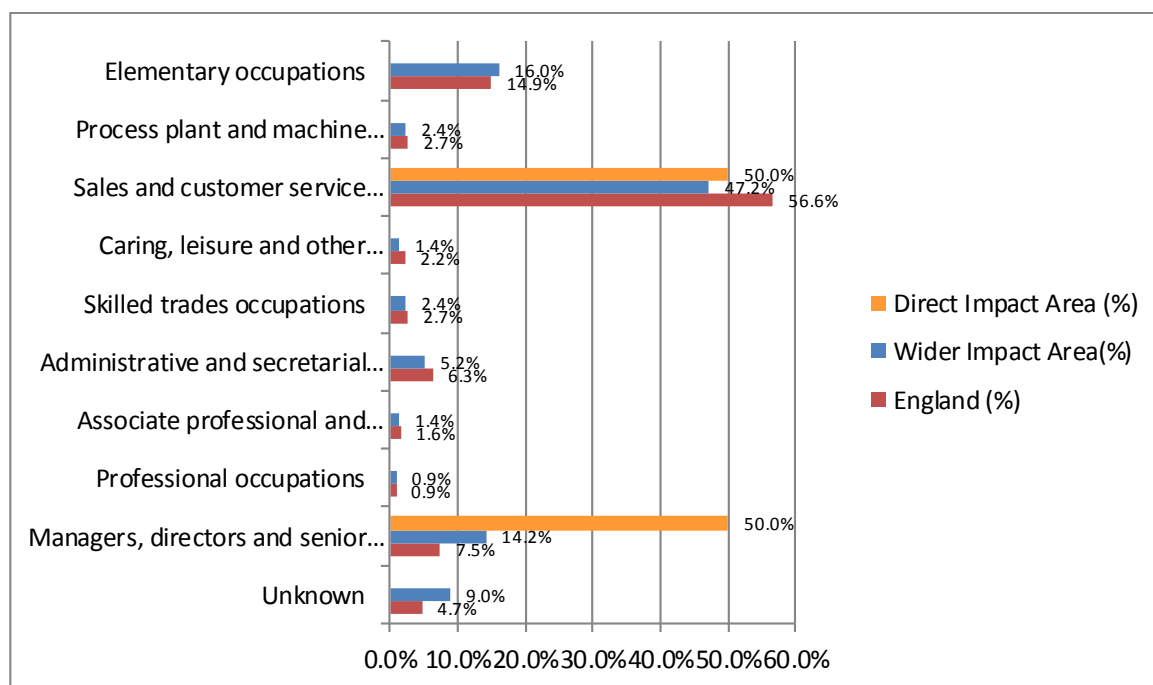
Table 15.14: Population growth

	Direct Impact Area*				Wider Impact Area*				England			
	Total	0 to 15	16 to 64	65+	Total	0 to 15	16 to 64	65+	Total	0 to 15	16 to 64	65+
2011	1,969	325	1,294	350	330,397	55,659	217,881	56,857	53,012,456	10,022,836	34,329,091	8,660,529
2016	1,990	327	1,254	394	345,425	58,417	218,583	67,307	55,381,043	10,577,510	34,824,363	9,974,203
2019	2,003	328	1,230	424	354,768	60,136	219,005	74,477	57,016,919	11,002,158	35,354,512	10,666,686
2022	2,027	331	1,208	460	366,303	62,100	220,278	82,756	58,794,386	11,407,290	35,836,383	11,574,381
2037	2,091	321	1,105	611	395,822	62,137	215,319	118,484	64,348,234	11,632,698	36,901,258	15,989,610
CAGR (%)	0.24	-0.05	-0.63	2.25	0.73	0.44	-0.05	2.98	0.78	0.60	0.29	2.48

Source: ONS Population Projections (2015)

* As data unavailable for the Direct Impact Area and Wider Impact Area, proxy population growth rates were applied – Direct Impact Area (Selby) and Wider Impact Area (North Yorkshire CC)

- 15.4.21 The most sought after occupations by jobseekers in the Direct Impact Area are in Sales and Customer Service occupations (5 jobseekers in September 2016) and Managers, Directors and Senior Officials (DWP, 2015). However, the percentages are somewhat skewed by the small sample size (10 claimants).
- 15.4.22 For the Wider Impact Area, Sales and Customer Service Roles are the most sought after with 47.2% of jobseekers preferring roles in these sectors. 170 jobseekers (16.0%) were looking for work in Elementary Occupations while 150 (14.2%) were looking for Management/Senior Official Roles. This data highlights the potential responsiveness of jobseekers in accessing roles made available through the Proposed Development.

Plate 15.4: Sought after occupations

Source: ONS Jobseeker's Allowance by Occupation (2016)

15.5 Development Design and Impact Avoidance

Land Use and Agriculture

- 15.5.2 The location for the Proposed Development, within the existing coal-fired power station, has been chosen to make use of land that will become redundant when the existing coal-fired power station ceases operation during or before 2019, and thereby reduce impacts on other beneficial land uses. The indicative concept layout within the Proposed Power Plant site has been developed to avoid impacts on the existing woodland around the perimeter of the existing coal-fired power station, which will be maintained for screening purposes.
- 15.5.3 The Proposed Cooling Water Connections also follow broadly the route of the existing coal-fired power station cooling water connections (except for at the southern end of the route where the Proposed Cooling Water Connections head east towards Hensall Gate to connect to the Proposed Development) thereby minimising impacts on land previously unaffected by the existing coal-fired power station.
- 15.5.4 The requirement for a gas connection to the existing National Grid gas transmission network necessitates the use of land outside the existing coal-fired power station, but the Proposed Gas Connection route that has been identified is the shortest available route, avoiding major technical and environmental constraints and seeking to minimise the number of landowners affected by the Proposed Development, so the extent of land affected outside of EPL ownership has been reduced as much as it can be at this stage.
- 15.5.5 At present the Proposed Gas Connection corridor is generally approximately 100 m wide (wider in places, for example at the River Aire crossing to allow additional space for directional drilling activities), but the final DCO Site boundary will be further refined following

consultation on this PEI Report to the required construction working width of around 36 m (wider in places such as at major crossings), and the actual pipeline will be less than 1 m in diameter. The required temporary land take for the construction of the Proposed Gas connection will thereby be reduced as much as possible by design.

- 15.5.6 Soils will be managed, retained, preserved and replaced in accordance with the Defra *Construction Code of Practice for the Sustainable Use of Soil on Development Sites* (Defra, 2009b) to minimise impacts on soil structure and quality, and appropriate measures to minimise short term and long term impacts on land drainage will be discussed and agreed with each landowner. These measures will be included in the Construction Environmental Management Plan, a framework for which will be included as part of the DCO application.
- 15.5.7 With the exception of the Proposed AGI site, the remainder of the land required for the Proposed Gas Connection will be returned to its current use following the completion of construction.
- 15.5.8 A Landscape and Biodiversity Strategy will be prepared to support the DCO application, setting out mitigation for the loss of small areas of vegetation within the existing coal-fired power station site.

Socio-Economics

- 15.5.9 EPL intends to include a Requirement within the draft DCO that will require the submission to and approval by the local planning authorities of a written plan detailing arrangements to promote employment, skills and training development opportunities for local residents.

15.6 Likely Impacts and Effects

Construction

Land Use

- 15.6.2 Land uses within the areas of the Site described in Table 15.11 will change as a result of the construction of the Proposed Development, but some of the changes would also occur in the future baseline scenario (assuming demolition of the existing coal-fired power station would start within the same timeframe). Where the changes would/ would not occur in the future baseline scenario, then this is highlighted in Table 15.11.
- 15.6.3 The following structures associated with the existing coal-fired power station may need to be removed to facilitate construction of the Proposed Development (although where appropriate some buildings may be retained for use during the construction phase):
- the majority of the rail loop around the coal stockyard (part of the northern section of railway track is to be retained);
 - coal handling facilities including conveyors to the boiler house, workshop, coal plant garage, gas oil tanks, amenity block, screening and crushing house and lighting towers;
 - biomass storage building (located within the coal stockyard but not in use for biomass);
 - gypsum/ limestone hopper house and associated conveyors (to the north of the rail loop);
 - flue gas desulphurisation (FGD) project offices (portakabins, not in use);
 - gypsum and limestone conveyors associated with the FGB plant;

- gas oil and fuel oil tank;
- waste management compound;
- workshops and stores buildings;
- back-up cooling water storage lagoon; and
- contractors' compound, car park and amenity block.

15.6.4 The effects are summarised in Table 15.15 below.

Table 15.15: Construction effects on existing land uses within the Site

Part of the Site	Impact	Effect (compared to future baseline)
Proposed Power Plant Site	The construction of the Proposed Development will require the removal of all existing buildings and structures including the private rail loop (although rail access to the Site will be retained), and a small area of trees and scrub to the north-east of the rail loop. For comparison, in the future baseline scenario (without the Proposed Development), the same changes are also anticipated (with the possible exception of the private rail loop and small area of trees and scrub to the north-east of the rail loop).	Minor adverse effect due to loss of private rail loop (a beneficial but private land use) with rail access to the Site retained (not significant).
Proposed Cooling Water Connections	The construction of the Proposed Development will require the removal of the existing buildings and structures within the existing coal-fired power station site and may require removal of some trees to the north of Wand Lane, cause temporary disruption to users of Wand Lane, cause the short term loss of c. 13 ha agricultural land use (during the construction of the Proposed Cooling Water Connections) and temporary disruption to a farm access north of Wand Lane, and require the temporary diversion or temporary stopping up of a PRow (the footpath linking Chapel Haddlesey Weir to Gallows Hill to the south-east). For comparison, in the future baseline scenario (without the Proposed Development), the same changes are anticipated within the existing coal-fired power station site, but no change is expected to Wand Lane, the trees north of Wand Lane, the use of agricultural land and the use of the PRow.	Minor adverse effect on Wand Lane due to short term effects on road users (not significant). Negligible adverse effect due to potential loss of trees north of Wand Lane because the trees are on private land with no public access (not significant). Moderate adverse (temporary) effect on PRow due to moderate short term diversion or temporary stopping up of the PRow (significant). Minor adverse effect on farm access north of Wand Lane due to short term

Part of the Site	Impact	Effect (compared to future baseline)
		disruption (although access will still be available throughout construction) (not significant). Effects on agricultural land assessed separately below.
Proposed Borehole Water Connections	The construction of the Proposed Development will require the temporary removal of trees, scrub and grassland, removal of existing buildings and structures, and temporary disruption to the use of internal access roads and railway lines. For comparison, in the future baseline scenario (without the Proposed Development), the existing buildings and structures are anticipated to be removed, but trees, scrub and grassland could be retained and there would be no disruption to the use of internal access roads or railway lines.	Negligible adverse effect due to loss of vegetation within the existing coal-fired power station site where there is no public access (not significant).
Proposed Electricity Connection	The construction of the Proposed Development will cause temporary disruption to the use of internal access roads and railway lines, and the removal of the gatehouse building and trees between the railway lines, Tranmore Lane and other internal access roads (in the north-west corner of the rail loop). For comparison in the future baseline scenario (without the Proposed Development), the gatehouse may be removed but trees, scrub and grassland could be retained and there would be no disruption to the use of internal access roads or railway lines.	Negligible adverse effect due to loss of vegetation within the existing coal-fired power station site where there is no public access (not significant).
Proposed Gas Connection and AGI	The construction of the Proposed Development will require the removal of the existing buildings and structures within the existing coal-fired power station site and may require removal of some trees to the north of Wand Lane, cause temporary disruption to users of Wand Lane, Millfield Road and West Lane, cause the short term loss of up to 43 ha agricultural land use (during the construction of the Proposed Gas Connection – note some of this is the same as the agricultural land affected by the Proposed Cooling Water Connections) and temporary disruption to farm accesses, and require the temporary diversion or temporary stopping up of two PROWs (the footpath linking Chapel Haddlesey Weir to Gallows Hill to the south-east and bridleway east of the A19 opposite Burn Lodge Farm).	Minor adverse effects on Wand Lane, Millfield Road and West Lane due to short term disruption to road users (not significant). Negligible adverse effect due to potential loss of trees north of Wand Lane because the trees are on private land with no public access (not

Part of the Site	Impact	Effect (compared to future baseline)
	For comparison in the future baseline scenario (without the Proposed Development), the same changes are anticipated within the existing coal-fired power station site, but no change is expected to Wand Lane, the trees north of Wand Lane, the use of agricultural land, and the use of the PRowWs.	significant). Moderate adverse (temporary) effect on PRow due to moderate short term diversion or temporary stopping up of the PRow (significant). Minor adverse effect on farm accesses due to short term disruption (although access will still be available throughout construction) (not significant). Effects on agricultural land assessed separately below.
Proposed Construction Laydown area including Proposed Carbon Capture and Storage (CCS) Land	The construction of the Proposed Development will require the removal of all existing buildings and structures, and areas of trees, scrub and grassland. For comparison in the future baseline scenario (without the Proposed Development), the same changes are also anticipated (with the possible exception of the grass south of the FGD project offices and trees and scrub along Wand Lane adjacent to the Hensall Gate entrance).	Negligible adverse effect due to loss of low value vegetation within the existing coal-fired power station site where there is no public access (not significant).

15.6.5 Potential direct effects on adjacent land uses that have been identified (that are not considered in other technical chapters of this PEI Report) are:

- negligible adverse (not significant) temporary effects on users of the short (less than 150 m long) PRow (footpath) heading east off the A19 along the north side of the Tranmore Lane entrance ((North Yorkshire County Council reference 35.27/6/1) caused by disruption due to construction;
- no significant effects on the existing coal-fired power station, because it is expected to cease generated by 2019 and subsequently be demolished, and there will be distinct, separate boundaries between the demolition and construction sites; and
- minor adverse (not significant) temporary disruption to access to the Yorkshire Water waste water treatment works and Air Liquide air separation unit, to the east of Hensall Gate entrance, due to the potential closure of Wand Lane for a period of days or weeks

during the construction of the Proposed Cooling Water and Gas Connections (alternative access would be available via Hazel Old Lane); and

- minor adverse (not significant) temporary disruption to users of roads crossed by the Proposed Cooling Water and Gas Connections (Wand Lane, Millfield Road and West Lane).

Agricultural Land and Soils

- 15.6.6 Based on limited available information (pending the completion of soil analysis), and the current Site boundary (which is generally 100 m wide along the Proposed Gas Connection, but will be refined following consultation to around 36 m wide) the construction of the Proposed Gas Connection and AGI and the Proposed Cooling Water Connections is anticipated to result in temporary impacts on more than 20 ha of BMV agricultural land (a medium magnitude impact on a medium/ high sensitivity receptor). This is considered to represent a significant but short term (approximately 12 months) and temporary effect. A full assessment will be presented in the ES when the soil analysis has been completed and the Proposed Gas Connection corridor has been refined to the required construction working width (c.36 m, but wider in places such as at major crossings, with the actual pipeline being less than 1 m in diameter) following consultation.
- 15.6.7 With appropriate soil management techniques in place, impacts on soils are anticipated to be short term, with soils reinstated at the end of the construction period. Although the sensitivity of the soils resources within agricultural land within the Site is medium/ high, the impact at the end of the construction period is anticipated to be low or very low so the effects are generally not considered to be significant. A full assessment will be presented in the ES when the soil analysis has been completed.

Employment

- 15.6.8 Construction of the Proposed Development is expected to last approximately three years between early 2019 and early 2022. During this time employment opportunities will be created as a result of the works.
- 15.6.9 Although these jobs are temporary, they represent a positive economic impact that can be estimated as a function of the scale and type of construction. The direct expenditure involved in the construction phase will lead to increased output generated in the York TTWA economy.
- 15.6.10 Based on experience of similar projects, it is anticipated that there would be approximately 1,200 workers required at the peak of construction.

Leakage

- 15.6.11 Leakage effects refer to the proportion of jobs within an Impact Area that are filled by residents living outside the Impact Area (i.e. outside the Wider Impact Area, defined as the York Travel To Work Area). Overall it is assumed that the majority of the employment generated will be taken by people living in the York TTWA. Leakage has been set at 20.4% in line with the proportion of jobs taken by non-residents of the York TTWA. A 20.4% discount is therefore applied to the 1,200 gross jobs created and as such it is estimated that 239 people from outside the York TTWA and 931 people from within will benefit from working at the Proposed Development during the construction period.

Displacement

- 15.6.12 Displacement measures the extent to which the benefits of a project are offset by reductions of output or employment elsewhere. Any additional demand for labour cannot simply be treated as a net benefit - it removes workers from other posts and the net benefit is reduced to the extent that this occurs.
- 15.6.13 Overall it is assumed that due to the flexibility of a typical construction workforce (i.e. they quickly move from project to project) displacement effects are considered to be low. The HCA Additionality Guide suggests 25% as a “ready reckoner” for low levels of displacement (i.e. there are expected to be some displacement effects, although only to a limited extent). Applying this level of displacement to total gross direct employment in the York TTWA results in net direct employment of 716.

Multiplier Effect

- 15.6.14 In addition to the direct construction employment generated by the project itself there will be an increase in local employment arising from indirect and induced effects of the construction activity. Employment growth will arise locally through manufacturing services and suppliers to the construction process (indirect or supply linkage multipliers). Additionally, part of the income of the construction workers and suppliers will be spent in the York TTWA, generating further employment (induced or income multipliers).
- 15.6.15 The impact of the multiplier depends on the size of the geographical area that is being considered, the local supply linkages and income leakage from the area. The HCA Additionality Guide provides ‘ready reckoners’ of composite multipliers – the combined effect of indirect and induced multipliers. It has been assumed that the York TTWA has ‘average’ supply linkages based on the scale of its economy. Therefore a multiplier of 1.3 is determined from the HCA guidance. Applying this multiplier generates an additional 215 indirect and induced jobs in the York TTWA.

Net Construction Employment

- 15.6.16 Based on the gross construction worker requirements in the construction schedule and the additionality factors outlined above 1,170 net construction jobs would be generated, of which 931 are expected to be from the York TTWA. This represents a significant proportion of the existing employment in the direct impact area. Therefore construction employment generated by the Proposed Development would have a significant effect on the local economy.
- 15.6.17 Table 15.16 presents the short-term employment created by the Proposed Development taking leakage, displacement and multiplier effects into account.

Table 15.16: Net construction employment in York TTWA (average no. of workers onsite per year)

	York TTWA	Outside of York TTWA	Total
Gross Direct Employment	955	245	1,200
Displacement	239	61	300
Net Direct Employment	716	184	900
Net Indirect/ Induced	215	55	270

Employment			
Total Net Employment	931	239	1,170

- 15.6.18 The sensitivity of receptors is considered as high. Taking into account the size of the labour pool of construction workers in the York TTWA (7,706 (BRES (2015))), the magnitude of impacts is considered to be high. For example, the gross direct employment required during the construction phase would account for around 12.4% of the existing construction workforce in the York TTWA. Therefore, the direct, indirect and induced employment created by the construction phase of the Proposed Development is likely to have a major beneficial short-term and therefore a significant effect on the York TTWA's economy.

Operation

Land Use

- 15.6.19 Effects of land uses will occur at the construction phase of the Proposed Development as described above, but no additional effects are anticipated during the operational phase.

Agriculture

- 15.6.20 Following the completion of construction of the Proposed Cooling Water and Gas Connections, agricultural land will be reinstated to its original condition and returned to its former use. The only area of agriculture land that will be lost permanently is at the AGI location. The ALC grade (and therefore sensitivity) of this land is not yet known, but the area of land will be less than 5 ha (very low impact) so the effect will not be significant.
- 15.6.21 The soil type at the AGI site is also not yet known, but it is likely that soils removed from the AGI site will be re-used for landscape planting around the AGI compound, so the effect is not considered to be significant. The final ES will include a full assessment of the effect when the soil survey has been completed.

Gross and Net Operational Employment

- 15.6.22 The Proposed Development will also generate long-term jobs once operational. The following analysis estimates gross operational employment arising from the Proposed Development and then takes into account deadweight (existing employment on site), leakage, displacement and multiplier effects (to assess indirect and induced employment) in order to assess net impacts on the sub-regional and national economies.
- 15.6.23 As described in Section 15.4, the existing coal-fired power station currently employs approximately 200 permanent staff, plus maintenance contractors, although these jobs are due to be lost when the existing coal-fired power station ceases generation (which is assumed to in 2019 at the latest).
- 15.6.24 Based on the assumptions set out in the previous section in relation to displacement and additionality, the deadweight loss of employment experienced by the York TTWA will be around 155 (see Table 15.17).

Table 15.17: Net deadweight employment of existing coal-fired power station

	York TTWA	Outside of York TTWA	Total
Gross Employment of Existing Site ('Deadweight')	159	41	200
Displacement	40	10	50
Net direct employment	119	31	150
Indirect & induced employment	36	9	45
Total Net Deadweight Employment of Existing Site	155	40	195

- 15.6.1 Assuming leakage of 20.4%, displacement of 25% and a composite multiplier of 1.3 (as per the gross to net calculations for construction employment – see paragraphs 15.6.11-15 below), it is estimated that the Proposed Development would result in the loss of 101 employees when operational in the York TTWA (see Table 15.18).

Table 15.18: Net employment of the Proposed Development in operation

	York TTWA	Outside of York TTWA	Total
Gross Direct Employment	56	14	70
Displacement	14	4	18
Net Direct Employment	42	11	53
Net Indirect / Induced Employment	13	3	16
Net Employment of Existing Site ('Deadweight')	155	40	195
Total Net Employment	-101	-26	-127

- 15.6.2 Taking into account the existing overall size of the labour pool in the York TTWA (157,531), a loss of 101 jobs accounts for around 0.06% of those currently in employment. The magnitude of impacts is therefore considered to be low during the operational phase. The loss of jobs once the Proposed Development is operational is likely to have a minor adverse long-term effect on the York TTWA's economy.

Decommissioning

- 15.6.3 The Proposed Development is expected to operate for at least 25 years. At the end of its operating life, the most likely scenario is that the Proposed Development would be shut down and all above ground structures removed from the Site. There is limited information available at this stage regarding decommissioning methods and timescales.

Land Use

- 15.6.4 It is not possible to predict the future use of the Site following the decommissioning and demolition of the Proposed Development. The land could be redeveloped for other beneficial uses but overall the effect is considered to be neutral (not significant).

Agriculture

- 15.6.5 It is assumed that the pipework for the Proposed Cooling Water and Gas Connections would be left in situ, so effects on agricultural land as a result of decommissioning and demolition would be limited to the Proposed AGI location. This land could potentially be returned to agricultural use, with the use of suitable measures to improve the soil quality of this area of land, but overall the effect is considered to be neutral (not significant).

Employment

- 15.6.6 The people employed to decommission the Proposed Development would have an effect on the economy by spending their wages in the same way that those employed in the other stages will. Overall the decommissioning phase of the Proposed Development will have a minor beneficial effect on employment in the local area.

15.7 Mitigation and Enhancement Measures

Land Use

- 15.7.2 Appropriate measures to mitigate temporary impacts on users of Public Rights of Way affected during the construction of the Proposed Cooling Water and Gas Connections will be discussed and agreed with North Yorkshire County Council. A signposted and safe alternative route will be provided where possible for the duration of the works, and the footpath and bridleway will be reinstated to their original condition following completion of the works.
- 15.7.3 The loss of trees and other vegetation from within the existing coal-fired power station site will be mitigated by the implementation of a Landscape and Biodiversity Strategy, which will be prepared to accompany the DCO application.

Agriculture

- 15.7.4 As described in Section 15.5, agricultural soils will be managed, preserved, retained and reinstated in accordance with Defra guidance (Defra, 2009b) to minimise impacts on soil structure and quality and appropriate measures to minimise short term and long term impacts on land drainage will be discussed and agreed with each landowner. No additional mitigation for agriculture has been identified as necessary at this stage.

Socio-Economics

- 15.7.5 Due to the significant effect on the local labour market during construction, there is a need to ensure local residents are able to secure the employment opportunities available. As described in Section 15.5, EPL intends to include a requirement within the draft DCO that will require the submission to and approval by the authorities of an employment, skills and training plan to promote opportunities for local residents.
- 15.7.6 No other additional mitigation measures, over and above that stated in the other technical chapters of this ES, are required to avoid or minimise the socio-economic effects identified in this chapter.

15.8 Limitations or Difficulties

- 15.8.1 The assessment is based upon available design information. As the DCO Site boundary is refined (in particular the Proposed Gas Connection corridor), the assessment will need to be revised as the area of agricultural land within the Site will decrease. As such the assessment presented in this chapter is considered to be a worst case.
- 15.8.2 The agricultural soil surveys are ongoing at the time of this assessment, so the agricultural land and soils assessment is based on interim findings. The full survey data will be available to inform the final ES.

15.9 Residual Effects and Conclusions

- 15.9.1 The significant effects associated with the Proposed Development before and after mitigation are summarised in Table 15.19.

Table 15.19: Summary of significant effects

Development stage	Environmental effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation	Nature of effect(s) (Lt/ Mt/ St and P/ T and D/ In)
Construction	Disruption to users of two PRowS during construction of Proposed Cooling Water and Gas Connections	Moderate adverse (significant)	A signposted and safe alternative route will be provided where possible for the duration of the works, and the PRowS will be reinstated to their original condition following completion of the works	Minor adverse (not significant)	St, T, D
Construction	Temporary loss of over 20 ha of BMV land from agricultural use	Significant adverse (but short term)	None	Significant adverse (but short term)	St, T, D
Construction	Net employment generated during construction	Major beneficial (significant)	None required	Major beneficial (significant)	St, P, D

Note: Lt = long term, Mt = medium term, St = short term, P = permanent, T = temporary, D = direct and In = indirect.

15.10 References

- Department for Business, Innovation and Skills (BIS) (2009) *Research to Improve the Assessment of Additionality*
- Department for Communities and Local Government (DCLG) (2012a) *National Planning Policy Framework*. DCLG, London.
- Department for Communities and Local Government (DCLG) (2012b) *Planning Practice Guidance*. DCLG, London.
- Department for Environment, Food and Rural Affairs (2009a) *Safeguarding our Soils – A Strategy for England*
- Department for Environment, Food and Rural Affairs (2009b) *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites*
- HM Treasury (2011) *The Green Book – Appraisal and Evaluation in Central Government*
- HM Treasury (2011) *The Magenta Book – Guidance for evaluation*
- Homes & Communities Agency (HCA) (2014) *Additionality Guide (4th Edition)*
- Multi Agency Geographic Information for the Countryside (MAGIC) *Interactive Map online* Available at www.magic.gov.uk
- Natural England (2012) *Technical Information Note 049 Agricultural Land Classification: protecting the best and most versatile agricultural land* (second edition)
- North Yorkshire County Council. *Rights of Way Maps online* Available at http://maps.northyorks.gov.uk/connect/analyst/?mapcfg=Out_and_About (accessed 2nd December 2016)
- Office for National Statistics (ONS) (2011) *Census 2011*
- Office for National Statistics (ONS) (2015) *Population Projections*
- Selby District Council (2005) *Selby District Local Plan ‘Saved Policies’*
- Selby District Council (2013) *Selby District Core Strategy Local Plan*

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16.0 LANDSCAPE AND VISUAL AMENITY

16.1 Introduction

- 16.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential effects of the proposed Combined Cycle Gas Turbine (CCGT) power station near Eggborough, North Yorkshire (hereafter referred to as the 'Proposed Development') on landscape character (as a resource in its own right) and visual amenity.
- 16.1.2 This chapter is supported by Figures 16.1-16.39, provided in PEI Report Volume II and Appendices 16A and 16B provided in PEI Report Volume III.

16.2 Legislation and Planning Policy Context

Legislative Background

- 16.2.1 The landscape and visual impact assessment takes account of the legislation relevant to landscape and visual issues, including the European Landscape Convention.

Planning Policy Context

National Planning Policy

- 16.2.2 The Overarching National Policy Statement (NPS) for Energy EN-1 (Department for Energy and Climate Change (DECC), 2011a) includes a number of statements pertinent to the potential landscape, including green infrastructure (GI) and visual impacts of energy infrastructure in general.
- 16.2.3 Section 5.9 of EN-1 sets out the requirements for assessing and mitigating landscape and visual impacts of proposed nationally significant energy infrastructure projects. The scope of the assessment should include construction phase effects as well as the effects of the completed facility and its operation on landscape components, landscape character and views and visual amenity.
- 16.2.4 In terms of mitigation, EN-1 encourages the reduction in scale of the buildings taking into consideration function, appropriate siting, design including colours and materials, and landscaping schemes to mitigate adverse landscape and visual impacts.
- 16.2.5 Paragraph 5.9.15 to 5.9.16 states

"The scale of such projects means that they will often be visible within many miles of the site of the proposed infrastructure. The IPC [Planning Inspectorate] should judge whether any adverse impact on the landscape would be so damaging that it is not offset by the benefits (including need) of the project.

In reaching a judgment, the IPC should consider whether any adverse impact is temporary, such as during construction, and/or whether any adverse impact on the landscape will be capable of being reversed in a timescale that the IPC considers reasonable."

- 16.2.6 Paragraph 5.9.18 states "All proposed energy infrastructure is likely to have visual effects for many receptors around proposed sites. The IPC will have to judge whether the visual effects on

sensitive receptors, such as local residents, and other receptors, such as visitors to the local area, outweigh the benefits of the project."

- 16.2.7 Paragraph 5.9.22 states *"Within a defined site, adverse landscape and visual effects may be minimised through appropriate siting of infrastructure within that site, design including colours and materials, and landscaping schemes, depending on the size and type of the proposed project. Materials and designs of buildings should always be given careful consideration."*
- 16.2.8 Section 5.10 of EN-1 establishes the requirements for identifying and mitigating impacts of energy infrastructure projects on open space (including green infrastructure).
- 16.2.9 An energy infrastructure project will have direct effects on the existing use of the proposed site and may have indirect effects on the use, or planned use, of land in the vicinity for other types of development. Given the likely locations of energy infrastructure projects there may be particular effects on open space including green infrastructure.
- 16.2.10 Where green infrastructure is affected, the Planning Inspectorate should consider imposing requirements to ensure the connectivity of the green infrastructure network is maintained in the vicinity of the development and that any necessary works are undertaken, where possible, to mitigate any adverse impact.
- 16.2.11 The NPS for Fossil Fuel Electricity Generating Infrastructure EN-2 (DECC, 2011b) provides further detail with respect to the impacts of large scale structures associated with fossil fuel generating stations.
- 16.2.12 Section 2.65 of EN-2 states that *"It is not possible to eliminate the visual impacts associated with a fossil fuel generating station. Mitigation is therefore to reduce the visual intrusion of the buildings in the landscape and minimise impact on visual amenity as far as reasonably practicable."* The design should provide the best fit with the existing local landscape and to minimise the impact through use of appropriate external finishes and colour choice and to enclose low level buildings and structures to reduce impacts from nearby receptors.
- 16.2.13 Within Paragraph 17 of the National Planning Policy Framework (Department for Communities and Local Government (DCLG), 2012) the Government sets out a number of overriding core planning principles that are relevant to the landscape including:
- always seek to secure high quality design and a good standard of amenity for all existing and future occupants of land and buildings;
 - take account of the different roles and character of different areas; and
 - contribute to conserving and enhancing the natural environment and reducing pollution.

Local Planning Policy – Scoping Report

- 16.2.14 The policies that are relevant to the site are:
- the 'saved' policies of the Selby District Local Plan – adopted February 2005 (Selby District Council, 2005); and
 - the Selby District Core Strategy Local Plan – adopted October 2013 (Selby District Council, 2013).

- 16.2.15 Both these documents contain a number of policies of relevance in landscape and visual terms to the Proposed Development, as follows:
- SP 18 (Selby Core Strategy) Protecting and Enhancing the Environment;
 - SP 19 (Selby Core Strategy) Design Quality;
 - ENV 1 (Selby District Local Plan) Control of Development;
 - ENV 15 Locally Important Landscape Area (Brayton Barff and Hambleton Hough);
 - ENV 21 Landscaping Requirements; and
 - EMP 10 (Selby District Local Plan) Additional Industrial Development at Drax and Eggborough Power Stations.
- 16.2.16 Policy SP 18 requires the safeguarding and, where possible, enhancement of the landscape character of the area. Policy SP 19 requires high quality design that has regard to local character and also the incorporation of new and/ or existing landscaping.
- 16.2.17 Policy ENV 1 sets out the considerations required in respect of new development including the impact on the character of the area, standard of layout and design including materials and landscaping scheme. Policy ENV15 states that the Council will resist development that is harmful to the landscape character and scenic quality.
- 16.2.18 Policy ENV 21 provides guidance on the requirements of landscape schemes in relation to development to ensure that the retention, replacement and planting of trees has been appropriately considered.
- 16.2.19 Policy EMP 10 states that no additional industrial/ business related development should be permitted at Eggborough Power Station if it results in significant adverse effect on residential amenity in nearby settlements.

16.3 Assessment Methodology and Significance Criteria

- 16.3.1 The landscape and visual impact assessment has been based on the following best practice guidance:
- Guidelines for Landscape and Visual Impact Assessment, Third Edition (Landscape Institute and Institute of Environmental Management and Assessment, 2013); and
 - An Approach to Landscape Character Assessment (Natural England, 2014).

Impact Assessment and Significance Criteria

- 16.3.2 A detailed description of the assessment methodology is included in Appendix 16A (PEI Report Volume III) and is summarised below.
- 16.3.3 For the purposes of comparison and in order to establish a 'control' scenario against which the effects of the Proposed Development may be assessed, the baseline conditions are projected forward to produce a future 'no development' (baseline) scenario. The potential impacts of the Proposed Development upon the baseline landscape and receptor views are then identified and any resulting effects are then assessed and classified. Potential landscape and visual impacts and the resulting effects (both adverse and beneficial) are considered for the following scenarios:

- Construction (2019-2022), assumes demolition of the existing coal-fired power station is ongoing and the main structures may be entirely or partly still standing;
- Opening (start of operation) (2022), assumes demolition of the existing coal-fired power station is ongoing and the main structures may be entirely or partly still standing;
- Operation (year fifteen of operation) (2037), assumes that the existing coal-fired power station, including cooling towers and stack, will be demolished. No new screening or additional mitigation is assumed for the purposes of the main assessment, although any such mitigation through planting is subsequently considered in the Residual Impacts Section 16.10; and
- Decommissioning (2047).

16.3.4 Effects may be temporary, permanent, short-term or long-term. Landscape and visual effects may be further categorised as being either direct, *i.e.* originating from the Site, or indirect within the Zone of Theoretical Visibility (ZTV), *e.g.* off-site visual impact of construction traffic.

Landscape Impact Assessment Methodology

16.3.5 In assessing and classifying the predicted effects from any likely impacts to the landscape resulting from the Proposed Development, the following criteria are considered:

- landscape character;
- landscape sensitivity;
- landscape capacity; and
- magnitude of likely impacts that may affect the landscape.

16.3.6 Landscape impacts are considered, including both the direct and indirect impacts of the Proposed Development upon landscape elements and features (or components), as well as the impact upon the general landscape character of the surrounding area.

16.3.7 The relationship between sensitivity and magnitude of impact allows an assessment of the relative significance of predicted landscape effects to be made. The sensitivity of the landscape to change is the degree to which a particular Landscape Character Area (LCA) or feature can accommodate changes or new features, without unacceptable detrimental effects to its essential characteristics.

16.3.8 The magnitude of a predicted landscape impact relates to the size, extent or degree of change likely to be experienced as a result of the Proposed Development. The magnitude takes into account whether there is a direct impact resulting in the loss of landscape components, or a change beyond the land-take of the Proposed Development that might have an effect on the character of the area, and whether the impact is permanent or temporary.

16.3.9 Table 16.1 below comprises the matrix used to combine sensitivity and magnitude of impacts on the landscape to determine the effect. For the purposes of this assessment, moderate and major impacts will be deemed 'significant'. Where significant environmental effects are identified, measures to mitigate these effects are proposed (where feasible) and remaining residual effects are identified.

16.3.10 A full explanation of the criteria used to assess sensitivity, magnitude of impact and classification of landscape effects is included in Appendix 16A (PEI Report Volume III).

Visual Impact Assessment Methodology

- 16.3.11 The assessment of effects likely to result from visual impacts is structured by receptor groups (e.g., residents, users of recreational spaces, business users and motorists). Individual receptors are identified through the definition of the ZTV, within which views of the Proposed Development are likely to be possible. Individuals are subsequently categorised into receptor groups within different areas. The sensitivity of each receptor group is then evaluated as being high, medium or low.
- 16.3.12 Views from each identified representative viewpoint are recorded, considering distance from the Site (as the crow flies), receptor type, sensitivity and a short description of the view.
- 16.3.13 For the purposes of assessment, the sensitivity of a receptor and the magnitude of an impact on that receptor are combined to determine the effect that the Proposed Development is predicted to have on existing baseline visual conditions for that given receptor. As previously described for the landscape impact assessment, specific terminology is used to describe the magnitude of impact (see Appendix 16A (PEI Report Volume II) for details).
- 16.3.14 Although some visual receptors may consider the Proposed Development to be visually appealing or interesting, the assessment follows standard best practice methods, and therefore assumes a 'worst case' scenario, whereby significant changes to views as a result of new tall/ large structures or buildings in an existing relatively open area are generally considered to be adverse.

Viewpoint photography accompanying this assessment has been undertaken based upon the guidance given in Landscape Institute Advice Note 01/11 'Photography and photomontage in landscape and visual impact assessment (Landscape Institute, 2011).

- 16.3.15 The relationship between the sensitivity of receptors and the magnitude of impacts allows the effects to be classified. Table 16.1 below provides a matrix used to describe this relationship, and so allow a relative level of significance of any predicted effects on visual receptors to be categorised. For the purposes of this assessment, moderate and major impacts will be deemed 'significant'. Where significant environmental effects are identified, measures to mitigate these effects are proposed and remaining residual effects are identified.

Table 16.1: Classification of landscape and visual effects

Magnitude of impact	Sensitivity/ importance of receptor			
	High	Medium	Low	Very low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible

Extent of Study Area

- 16.3.16 The extent of the Study Area is determined by the potential visibility of the Proposed Development in the surrounding landscape and is proportionate to its size and scale and the

nature of the surrounding landscape. Current guidance (Landscape Institute and IEMA, 2013) states that the Study Area should include “*the full extent of the wider landscape around it which the proposed development may influence in a significant manner*”.

- 16.3.17 For the purposes of this assessment the Study Area has been defined by a combination of ZTV analysis and professional judgement. Based upon the tallest element of the Proposed Development being the stack (with a maximum height of 90 m (99.9 m Above Ordnance Datum (AOD))) it is considered that it is highly unlikely that significant effects will be possible from further than 10 km from the centre of the stack.

Sources of Information/Data

- 16.3.18 Baseline data has been gathered from a study of Ordnance Survey (OS) maps and aerial photographs, publicly available documents such as landscape character assessment documents from local authorities within the immediate area and national character mapping available from Natural England (National Area Profiles, 2013). A site visit has also been undertaken by a chartered Landscape Architect on 29th September 2016, to provide valuable background knowledge on the existing character and impact of the Proposed Development on the surrounding community, and to record views from representative viewpoints.

Consultation

- 16.3.19 As part of the ongoing Environmental Impact Assessment (EIA) and design development process, consultation is being undertaken through a two-staged consultation process, as described in Chapter 1 (Introduction).
- 16.3.20 Consultation has been undertaken with local authorities located within the 10 km study area to agree the location of representative viewpoints. The consultation undertaken is set out in Table 16.2 and indicates how these have been addressed in the PEI Report.

Table 16.2: Consultation summary table

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/how comments have been addressed
North Yorkshire County Council (NYCC) Landscape Officer	21 st September 2016 (email)	Additional viewpoints to be considered – <u>Within 1 km</u> – Houses at Gallows Hill PROW 35.27/1/1 and 35.35/4/1 <u>1-2 km</u> Viewpoint A - alternative locations proposed <u>2-3 km</u> Viewing platform at the junction of the Selby Canal with River Ouse on PROW 35.72/2/1 <u>Linear viewpoints</u>	Suggested viewpoints were visited and considered as part of the potential viewpoints to be assessed. A list of all the viewpoints taken forward as part of the assessment is detailed within Appendix 16B (PEI Report Volume II) and illustrated on Figure 16.1.

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		M62 Railway Trans Pennine Trail Aire & Calder Navigation Selby Canal	
Additional NYCC consultation	16.11.16 Requesting feedback on photomontage locations (email)	VP 2 – Suggest you use VP1 due to lack of visibility from VP 2. VP 3 – suggested alternative viewpoint from Hazel Old Lane. VP 5 – suggested alternative viewpoint from near to potential viewpoint D. VP 10 – provides a good view of likely pipeline route and CCGT. VP 12 – possible location for photomontage but questions about number of people accessing that view. Requesting further information on assessment scenarios.	Photomontage to be prepared for VP 1. VP 3 was chosen as representative of views from rear of properties along Weeland Road. VP 5 was chosen as representative of close range views from the east of the Proposed Development. VP 12 is representative of users of the school playing fields and residential properties on the edge of Kellington.
Wakefield Metropolitan District Council Landscape Officer	21 st September 2016 (email)	Consider the recent approved scheme in relation to Knottingley Power Station in determining the location of viewpoint K. No further suggestions for additional viewpoints.	Due to lack of visibility of the Proposed Development, viewpoint K was not included as part of the assessment.
East Riding of Yorkshire Council Landscape Officer	21 st September 2016 (email)	Agree with the selection and range of potential viewpoint locations. Consider long distance	The request to consider this viewpoint was received after the site visit was conducted. It

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		<p>views from the south east, for example views from Crow Croft Bridge. Consider users of the TransPennine Trail near Crow Croft Bridge near Pollington to the south west of the Proposed Development.</p> <p>Could impacts on the Important Landscape Area (River Derwent Corridor & Lower Derwent Valley) lies outside of the 10 km buffer to the north east be considered.</p> <p>Include the relevant Landscape Character Areas within the baseline that relate to the East Riding.</p>	<p>will therefore be considered for potential inclusion as part of the final ES. It is anticipated that no significant impacts will be experienced from this viewpoint.</p> <p>As above.</p> <p>The study area has been limited to 10 km as outlined in paragraph 16.3.17.</p> <p>See Section 16.4</p>
Selby District Council	It is understood from NYCC and Selby that NYCC will respond to landscape comments on behalf of both Councils. However, any comments from Selby District Council are invited through the formal consultation process relating to this PEI Report.	n/a	n/a
Doncaster Metropolitan Borough Council	7 th December 2016 (email) – awaiting comments	n/a	n/a

16.4 Baseline Conditions

Existing Landscape Baseline

Landscape Characterisation

- 16.4.2 At a national scale the Study Area includes the National Character Area (NCA) Profile: 39 Humberhead Levels (NE339) (Natural England, 2013) which covers the Site and majority of the Study Area. The NCA Profile: 30 Southern Magnesian Limestone (NE464) lies to the west of the Study Area as illustrated on Figure 16.2.
- 16.4.3 The North Yorkshire and York Landscape Characterisation Project (Chris Blandford Associates, 2011) further subdivides NCA 39 into a series of landscape character areas within the Selby District at a regional level. At a local level, the Study Area is divided by the Landscape Character Assessment of Wakefield District (Wakefield Metropolitan District Council, 2004) and the East Riding of Yorkshire Landscape Character Assessment (Carl Bro, 2005). Selby District Council no longer provides a landscape character assessment, instead referring to the document produced by North Yorkshire County Council (NYCC).

National

- 16.4.4 The Site is located within NCA 39 (Natural England, 2013) which is described as being characterised by big skies with long open views with vertical elements such as water towers and power stations including Eggborough and the iconic grouping of cooling towers at Drax. Wind turbines are considered to be prominent within the NCA.
- 16.4.5 NCA 30 (Natural England, 2013) lies towards the outer edge of the Study Area to the west. This NCA is characterised by fertile intensively farmed arable farmland with long views over lowland to the east, west and to the south. The NCA contains a large number of abbeys, country house and estates although the NCA is locally influenced by industry including power lines, settlements and transport routes.
- 16.4.6 The NCAs are large in scale and cover a considerable area. NCA 39 covers an area north of Selby to the north, Retford to the south, Knottingley to the west and the edge of Scunthorpe to the east. NCA 30 covers a strip of land between north of Ripon to north of Nottingham in the south. Due to the scale of the NCAs in relationship to the size and nature of the Proposed Development, it is considered that they are unlikely to be significantly affected; as such these NCAs are not considered further within the assessment.

Regional

- 16.4.7 The North Yorkshire Landscape Characterisation Project (Chris Blandford Associates, 2011) covers the Site and land to the north of the Site. The Site lies within the Farmed Lowland and Valley Landscapes Primary Landscape Unit (PLU). This PLU covers a large amount of North Yorkshire and is divided up into eleven Landscape Character Types (LCT) of which the Levels Farmland (23) LCT and River Floodplain (24) LCT are relevant to the Site. The relevant characteristics of these LCTs are contained in Table 16.3 below along with the key characteristics of other PLUs and LCTs that are relevant to the Study Area.

Table 16.3: Landscape character summary table (Chris Blandford Associates, 2011)

Primary Landscape Unit/ Landscape Character Type	Key Characteristics
Limestone Landscapes (PLU)	
Magnesian Limestone Ridge (6) LCT	<ul style="list-style-type: none"> • <i>"A low ridge of gently rolling landform which is covered by a pattern of fertile farmland and well wooded estates;</i> • <i>Landform is intersected by a series of relatively intricate dry valleys;</i> • <i>Wooded limestone gorges, caves and crags are key landscape features;</i> • <i>The prominent transport corridor of the A1(M) which runs through the southern section of this LCT;</i> • <i>Large-scale arable fields dominate the landscape, facilitating long distance views, extending as far as Kilburn White Horse on the edge of the North York Moors National Park;</i> • <i>Intimate scale and grain of the landscape derived from complex topography and land use patterns;</i> • <i>Several historic country houses and associated designed landscapes, often containing mature veteran trees;</i> • <i>Limestone quarries are a relatively common landscape feature; and</i> • <i>Use of limestone as a building material which creates a unified character".</i>
Farmed Lowland and Valley Landscapes (PLU)	
Levels Farmland (23)	<ul style="list-style-type: none"> • <i>"Predominantly flat, low-lying landscape which encompasses a patchwork of arable fields;</i> • <i>Large scale, open and rectilinear field pattern;</i> • <i>Dykes or ditches often form field boundaries, with an general absence of hedgerows;</i> • <i>Industrial scale farm buildings, large embankments and drains, and major energy and transport infrastructure contribute human elements; and</i> • <i>Historical features, such as windmills, recording past attempts to drain the landscape are key features".</i>
River Floodplain (24)	<ul style="list-style-type: none"> • <i>"A series of flat, low lying, relatively narrow river corridors which flow through the different types of Vale Farmland LCT within the Study Area;</i> • <i>The 'Ings' - flood meadows maintained by traditional hay making activities;</i> • <i>Landscape pattern comprises a mixture of flood meadows, neutral grasslands and floodplain mires;</i> • <i>Halls and manor houses are key landscape features;</i> • <i>River engineering features such as Levees assert a human influence over the landscape;</i> • <i>Power stations, pylons and former collieries; and</i> • <i>The A1 (M) introduces a source of noise and visual intrusion in several places".</i>

Local

- 16.4.8 The western portion of the Study Area around Knottingley is covered by the Wakefield Landscape Character Assessment (Wakefield Metropolitan District Council, 2004), specifically the Limestone Escarpment LCT. This LCT is described as being predominantly urban in character and dominated by industrial development. Agricultural farmland is considered to be intensively farmed with few hedges and trees.
- 16.4.9 The south-eastern section of the Study Area around Pollington and Snaith is covered by the East Riding Landscape Character Assessment (Carl Bro, 2005), specifically LCT 4 River Corridors and LCT 8 M62 Corridor Farmland.
- 16.4.10 LCT 4 is divided into four different LCAs of which LCA 4D River Aire Corridor, Gowdall and Snaith to the Ouse Reach lies within the study area. LCT 4 is characterised by an intimate, low lying flat floodplain that is a marked contrast from the surrounding intensively farmed land. Railway bridges and road crossings impact on the character of these areas. LCA 4D is specifically characterised as relatively narrow, with a semi-enclosed character as a result of intermittent vegetation and river banks.
- 16.4.11 LCT 8 is divided into three LCAs of which 8C M62 Corridor Hook to Pollington relates to the study area. LCT 8 is characterised by low lying flat agricultural landscape with open views particularly from the M62 motorway. Communication infrastructure is considered a prominent feature with linear tree and woodland features associated with the motorway. Railway lines and pylons are prominent features. LCA 8C in relation to the Study Area is specifically characterised by intensively farmed land with very few trees or woods.
- 16.4.12 The southern section of the Study Area is covered by the Doncaster Landscape Character Assessment (ECUS Ltd, 2007), specifically the Settled Clay Farmlands LCT. This LCT is divided into two different LCAs of which the F2 Owston to Sykehouse LCA is relevant to the Study Area. This LCA is characterised by a flat, low lying landform with small scale fields with thick boundary hedgerows and occasional small deciduous woodland.

Vegetation Cover

- 16.4.13 The Study Area is characterised by small woodland blocks with intermittent hedgerow boundaries along the majority of routes. Vegetation is often found along the main arterial routes. Larger areas of tree planting are often associated with historic estates.
- 16.4.14 Vegetation within the existing coal-fired power station site (within which the Proposed Power Plant Site, Construction Laydown area, Borehole Water Connections and Electricity Connections are located) is very limited, restricted to screen planting along the outer boundaries of the existing power station site, along Tranmore Lane, the railway line to the south-west of the Site and small area to the north of the rail loop.
- 16.4.15 Vegetation within the Proposed Cooling Water Connection route and the Proposed Gas Connection route is limited to small areas of trees and scrub associated with agricultural field boundaries.

Topography and Drainage

- 16.4.16 The topography of the Study Area is relatively flat generally lying approximately between 4 m and 15 m AOD. An area of high ground lies to the south-western edge of the Study Area around Stapleton where the ground rises to approximately 50 m AOD.
- 16.4.17 The River Aire flows through the centre of the Study Area to the north of the existing coal-fired power station site, with the Aire and Calder Navigation located to the south of the Site. The Selby Canal lies to the west of the Above Ground Installation (AGI) site. A series of dykes and ditches are prominent in the landscape.

Settlements

- 16.4.18 The Study Area is generally characterised by small to medium sized settlements and isolated residential properties and farmsteads. Settlements in close proximity to the Site include Eggborough (to the south-west of the existing coal-fired power station site); Kellington (to the west of the existing coal-fired power station site); Hensall (to the east of the existing coal-fired power station site); and West Haddlesey, Chapel Haddlesey and Burn (to the north of the existing coal-fired power station site in the vicinity of the Proposed Gas Connection corridor). The large urban areas of Knottingley to the west and Selby to the north are located within the Study Area.

Communications

- 16.4.19 The larger settlements are connected by a series of motorways and large A roads. The A19 lies to the immediate western boundary of the existing coal-fired power station and runs in a north/ south direction linking Selby with Doncaster further to the south. The A645 lies to the south of the Site and runs in an east/ west direction from Knottingley in the west to Snaith in the east. The A104 lies to the east of the Site and links Snaith in the east to Selby in the north. The M62 motorway lies approximately 1.2 km to the south of the Site and is the main arterial route within the Study Area. A number of minor roads and tracks criss cross the Study Area linking smaller settlements and farmsteads.
- 16.4.20 A number of Public Rights of Way (PROWs) are located within the Study Area associated with waterways or linking settlements, as illustrated on Figure 16.3. A number of footpaths are located around the Site, including footpath 35.36/4.1 that leaves Wand Lane at Gallows Hill in a northerly direction before turning into footpath 35.27/1/1 at Ings Lane and terminating at the weir at Eggborough Ings to the north of the Site. A short section of footpath 35.27/6/1 follows Tranmore Lane to the west of the Site where it meets the A19.
- 16.4.21 A footpath 35.27/1/1, to the north of the existing coal-fired power station site and in proximity to the Proposed Gas Connection corridor, starts at Haddlesey Old Lock, follows the River Aire prior to following the route along Eggborough Ings where it meets Ings Lane and turns into footpath 35.27/2/1 prior to then terminating at Wand Lane. A further footpath 35.36/4/1 starts at Wand Lane and terminates at Main Street. A footpath 35.36/2/1 starts at Hazel Old Lane to the south-east of the Site where it terminates at Station Road, south of Hemswell. Bridleways 35.14/4/1 and 35.14/6/1 follow the route of Whiting's Lane near to Burn Lodge Farm, starting at the A19 and both terminating at the railway line.
- 16.4.22 The long distance route Trans Pennine Trail follows the River Ouse to Selby, in the north-east of the Study Area, where it turns south and follows Burn Airfield (PROW 35.14/15/1) before

turning easterly at Temple Hirst and weaving its way southwards across the Study Area. At its closest point it lies approximately 2.5 km from the Site.

The Site and Its Immediate Setting

- 16.4.23 The full extent of the Site is shown on Figure 3.1. The area required for each component of the Proposed Development is described separately, as shown on Figure 3.2 and described in Chapter 3 (Description of the Site).
- 16.4.24 The Proposed Power Plant Site is bound to the north-west by the Eggborough Sports and Leisure Complex and the A19; to the north, east and south by agricultural fields, Wand Lane and Hazel Old Lane; and to the south-west by agricultural land, beyond which lies the Saint Gobain glass and Celotex factory.
- 16.4.25 The Proposed Cooling Water Connections route is bounded to the west by the A19, agricultural fields to the north, south and east with the River Aire lying further to the north.
- 16.4.26 The Proposed Gas Connection corridor is generally bounded in all directions by agricultural fields. The route crosses the A19 south of the East Coast Main Line and north of Burn Lodge Farm, before heading south, passing beneath the River Aire at Eggborough Ings prior to reaching Wand Lane and the existing coal-fired power station site.
- 16.4.27 The Proposed Power Plant Site currently consists of the coal stockyard with woodland on bunds to the east and south. There are further smaller areas of woodland planting to the north. The Proposed Cooling Water and Gas Connection corridors consist of agricultural fields.
- 16.4.28 The Site lies between approximately 6 to 12.5 m AOD.

Value of the Landscape Receptor

- 16.4.29 The Study Area has no national statutory designations relating to landscape value, but two areas have been designated locally as Locally Important Landscape Area (Selby District Council). These are located approximately 7 km to the north (below Thorpe Willoughby) and 8 km to the west (to the east of Byram) of the Site.
- 16.4.30 There are no Registered Parks and Gardens located within the Study Area.
- 16.4.31 Table 16.4 below describes the factors relating to the value of the landscape at a Site and Study Area scale.

Table 16.4: Non-landscape designated areas/ features

Factor	Study Area	Site
Landscape quality (condition)	The landscape of the Study Area is predominantly open, low lying agricultural land influenced by industry, power stations, pylons and transport routes.	The Site's land-use relates to power production and agriculture and is typical of the immediate area and the wider Study Area.
Scenic quality	The Study Area contains two areas which are designated on the basis of scenic quality (Locally Important Landscape Areas). The Study Area is low lying allowing long distance views across the predominantly agricultural landscape. Large structures such as power station cooling towers and infrastructure associated with transport routes, are widely visible across the Study Area.	The Site has no scenic quality in relation to the existing coal-fired power station site due to its current use. Although the rest of the Site has some scenic quality based on the rural agricultural landscape.
Rarity	The landscape of the Study Area is typical of the wider landscape context regionally.	The Site contains no rare elements or features.
Representativeness	The Study Area does not contain elements or characteristics that are particularly important examples.	n/a
Conservation interests	The Study Area contains Sites of Special Scientific Interest, scheduled monuments and listed buildings	The Site contains a non-designated heritage asset.
Recreation value	Taken as a whole, the landscape of the Study Area is of some recreational value, restricted mainly to the use of the Trans Pennine Trail, PRoWs, waterways including canals and the River Aire and users of Burn airfield.	The area of the Site within the existing coal-fired power station site has no public access (with the exception of part of the existing coal-fired power station main entrance and the abstraction borehole near the Eggborough Sports and Leisure Complex) and is only of value relating to the woodland screening that is visible from adjacent PRoWs. The rest of the Site has some recreational value relating to PRoW and the River Aire.
Perceptual aspects	The Study Area contains a relatively high number of areas which can be regarded as tranquil and remote. However, access tends to be limited to	The northern section of the Site contains areas that can be regarded as tranquil. However, access is limited

	PRoWs.	to PRoWs and the River Aire.
Overall landscape value	Medium The Study Area includes a number of areas designated locally for their landscape character and/or perceptual qualities/tranquillity, whilst being heavily influenced by industrial developments and transport corridors.	Low The Site is an area of previously developed land with no important landscape features, other than the boundary features of linear mature woodland belts.

Existing Visual Baseline

Visual Receptors

- 16.4.32 In order to identify locations with potential to have views of the Proposed Development, three separate ZTVs have been produced as described below. These identify those areas which have potential for views of the Proposed Development and to what extent it is likely to be visible. The ZTVs are illustrated in Figures 16.4 to 16.6.

ZTV Analysis

- 16.4.33 Two ZTVs have been prepared for the Proposed CCGT based upon the tallest structure, i.e. the stack, at up to 90 m above the ground level (up to 99.9 m Above Ordnance Datum (AOD)), considering theoretical visibility of the Proposed CCGT both with and without the existing coal-fired power station to provide theoretical visibility whilst the existing coal-fired power station is present and once it has been demolished.
- 16.4.34 A third ZTV has been prepared for the proposed AGI at the connection point to the National Grid gas transmission network, which lies near Burn approximately 3.0 km to the north of the existing coal-fired power station site.
- 16.4.35 The ZTVs have been generated by analysis of a 3D digital terrain model (DTM) of the surrounding terrain and the Proposed Development. Significant built structures located within the existing coal-fired power station site were modelled at their actual heights, other significant built form was modelled at 8 m in height and large areas of mature woodland were modelled at 15 m in height to provide a more accurate ZTV than a bare-ground scenario (which does not take into account localised screening effects of vegetation and built form). The output provides a graphical representation of the computer calculated inter-visibility between a viewer (at 1.5 m height) and the Proposed Development (stack or AGI).
- 16.4.36 Potential viewpoints and receptors were identified throughout the Study Area. The potential receptors and their existing views are described in Appendix 16B (PEI Report Volume II) and located on Figure 16.1.
- 16.4.37 Visibility within the Study Area is generally widespread as a result of the low land form and limited intervening features such as hedgerows, woodland blocks and settlements.

Dynamic Views

- 16.4.38 Users of the main transport routes and long distance trails may gain dynamic views towards the Site to varying degrees dependant on intervening structures, screening vegetation, elevation and direction of travel.
- 16.4.39 Users of the M62, travelling in an easterly direction, gain views of the existing coal-fired power station from approximately 7 km at its furthest point from the Site. Views are wide and expansive with wind turbines, the existing cooling towers and stack forming the most prominent features within the view. Views are often broken or restricted by screening vegetation along the M62 corridor. Views for users of the M62 traveling in a westerly direction are more restricted as a result of the M62 being in a cutting for part of the route and significantly more screening vegetation. Views of the existing coal-fired power station site are available from approximately 4.7 km at its furthest point from the Site. Views along the rest of the M62 are focussed on other power stations including Drax and Ferrybridge, a number of wind farms and large infrastructure elements.
- 16.4.40 Users of the railway lines including the East Coast Mainline within the Study Area will gain transient, dynamic views within the Study Area of the Site and the existing coal-fired power station. This will be seen in the context of a landscape containing other large scale structures such as power stations, overhead power lines, highway infrastructure and wind farms.
- 16.4.41 Within the Study Area there are a number of waterways that may be used for leisure purposes. Generally views from these will be dynamic and ever changing, often limited by intervening vegetation and landform. Where views do exist it is anticipated that the existing coal-fired power station and infrastructure would be prominent in views close to the Site with views elsewhere within the Study Area influenced by a number of industrial structures including Drax Power Station and other industrial structures.

Visual Receptors and Representative Viewpoints

- 16.4.42 Through consultation with the relevant competent authorities listed in Table 16.2, a total of 14 representative viewpoints have been chosen to illustrate the typical range of views of the Site from within the Study Area, as listed in Table 16.5 and illustrated on Figure 16.7.
- 16.4.43 The full list of all viewpoints originally considered can be found in Appendix 16B (PEI Report Volume II).

Table 16.5: Representative viewpoints

Viewpoint ID	Name and location	Receptor type	Grid reference	View
1	Selby Road (north), Eggborough	Road users, residential	456431, 423705	View from the north of Eggborough in a north-easterly direction towards the existing coal-fired power station site. The view is constrained by roadside vegetation, field boundary vegetation and woodland associated with the existing coal-fired power station site. The tanks and other structures associated with the Air Liquide site are visible within the view. The existing coal-fired power station is visible within the view including the cooling towers, stack and main turbine hall. Pylons and electricity lines are visible within the wider view. Representative of views from Selby Road and the rear of properties along Ryecroft Gardens.
2	Selby Road (south), Eggborough	Residential	456094, 423310	View along Selby Road from within residential street containing a number of properties, boundary hedges and trees within gardens. Existing cooling towers and stack visible within view above and beyond properties and deciduous and evergreen trees. To the south-east of the view the large structures associated with Bowmans Flour Mill are clearly visible within the view. View for majority of residents, where available, would be oblique. Representative of views within Eggborough village.
3	Weeland Road	Residential Road users	457775, 422966	View across residential garden where a gap in road boundary vegetation allows views. View is constrained by boundary vegetation from within property. Cooling towers, stack and turbine hall of existing coal-fired power station are all visible above and beyond the screening vegetation. Representative of rear views from residential properties along Weeland Road and road users.

Viewpoint ID	Name and location	Receptor type	Grid reference	View
4	Selby Road, Whitley	Residential	456262, 420855	Partially restricted view from within Whitley to the farmland beyond. Vegetation along field boundaries limits extensive views beyond. The cooling towers and stack associated with the existing coal-fired power station are visible within the view, above screening vegetation. The majority of other structures are screened by boundary vegetation. Representative of medium distance views from the south.
5	Gallows Hill	Residential	458764, 423635	Short range views from within Gallows Hill residential area. Residential properties and woodland screening limit views towards the existing coal-fired power station site. Stack and cooling towers are visible beyond the residential properties. The lighting associated with the coal stockyard at the existing coal-fired power station is visible within the view to the left of the residential properties. Representative of close range views from the east.
6	Ings Lane PRoW 35.36/1/1	Users of PRoW (Footpath), road users	459446, 424245	Partially elevated, 360° long distance view across farmland. The majority of structures associated with the existing coal-fired power station are clearly visible, viewed against the skyline. Pylons and overhead power lines are clearly visible within the view to the north. The majority of lower level and ground structures are screened by the woodland surrounding the existing coal-fired power station. Drax Power Station is clearly visible within the view to the north-east, behind the direction of the viewpoint photography. Representative of views from the north.
7	St John the Baptist Church	Residents and	458279,	View across farmland in all directions, with occasional vegetation groups filtering views. The existing cooling towers, stack and turbine hall are

Viewpoint ID	Name and location	Receptor type	Grid reference	View
	Grounds, Millfield Road, Chapel Haddlesey	church users	426072	visible, viewed against the sky. Representative of views from the north from the rear of residential properties and the church yard.
8	Trans Pennine Trail PRow 35.14/15/1, Burn Airfield	Users of PRow and Burn Airfield	460826, 429075	Medium distance view over farmland and airfield in a south-westerly direction. Residential properties off Common Lane visible within the view to the right and cooling towers and stack associated with existing coal-fired power station visible on the horizon to the south-west, viewed against the sky. Large sections of woodland limit views further south and screen lower elements associated with the existing coal-fired power station. Representative of medium range views from the north-east. Views range from 4 km to 3.5 km for users of the Trans Pennine Trail in proximity to the Airfield.
9	Mill Lane, Brayton	Road users, Residents	459504, 430067	Open, long distance view across farmland, slightly foreshortened by topography and boundary vegetation. The cooling towers, stack and turbine hall of the existing coal-fired power station are visible on the horizon, seen against the skyline at approximately 4.6 km from the viewpoint. Other detractors visible within the view are limited to overhead power lines. Representative of long range views from the north.
10	West Lane, Burn	Road users	458100, 428163	Open, 360° medium range view across farmland. Long range views are available although severely restricted by vegetation, which forms the horizon in all directions. Limited intervening vegetation in the

Viewpoint ID	Name and location	Receptor type	Grid reference	View
				foreground of the view. The existing cooling towers, stack, pylons and overhead power lines are visible on the horizon, viewed against the skyline. The upper sections of the cooling towers, stack and turbine hall at Drax Power Station is visible on the horizon to the left of the view beyond the railway line. The AGI site is visible within the foreground of the view. Representative of medium range views from the north.
11	Selby Canal viewing platform PRoW 35.72/2/1	Users of the PRoW (footpath) and users of Selby Canal at Haddlesey Flood Lock	457080, 426412	Medium range view across farmland with significant woodland blocks. Existing coal-fired power station is visible beyond screening vegetation in the foreground. Pylons and overhead power lines are also highly visible within the wider landscape. Cooling towers associated with Drax Power Station are just visible within the view to the east. Representative of views from the north-west
12	Manor Garth, Kellington	Residential and school grounds	455301, 424936	Medium distance view across school playing field, foreshortened by dense screening vegetation. The upper parts of the cooling towers, stack and turbine hall of the existing coal-fired power station visible against the skyline. Pylons and overhead power lines also visible within the view. Representative of views from the edge of Kellington from the west.
13	Beal Lane, Beal	Residential, Road users	453620, 425259	Open, long distance view across farmland from the edge of Beal. Partially screened view of the cooling towers, turbine hall and stack of the existing coal-fired power station. Overhead power line and pylons visible within the view. Representative of medium distance views from the west.

Viewpoint ID	Name and location	Receptor type	Grid reference	View
14	Haddlesey Road/ Main Street, Birkin	Residential	453069, 426825	View from within village across farmland. Views restricted in parts from vegetation along field boundaries and small woodland groups. Turbine hall and stack of existing coal-fired power station visible on the horizon with the existing cooling towers partially visible, screened by trees in close proximity to viewpoint. Pylons and overhead power lines visible within the wider view. Drax Power Station partially visible to the left of the view. Representative of views from the rear of properties and from the PRow at Saint Mary Church, Birkin.

Summary of Visual Baseline

- 16.4.44 The scale of the Proposed Development is similar or smaller than the existing developments found within the Study Area including the existing coal-fired power station, Drax Power Station, Ferrybridge Coal Fired Power Station and Ferrybridge Multi Fuel 1 and 2. These can all be considered large scale and as such are recognisable features within the local landscape. Due to the generally open nature of views and low topography of the Study Area views of the existing buildings and structures are common place.
- 16.4.45 In many areas, due to a combination of the flat landscape and size, they are viewed against the skyline which increases their visibility.
- 16.4.46 The screening and limiting of views of the existing coal-fired power station is generally only possible where screening elements are located close to the receptor.
- 16.4.47 The extent of views available to receptors range from close proximity to long distance. A number of receptors are located within villages and along roads that are located in relative close proximity to the Site. Views of the Site tend to be from the edges of settlements or along roads and routeways where there is limited intervening vegetation and structures restricting views.

16.5 Future Baseline

- 16.5.1 As part of the future baseline it is predicted that the existing coal-fired power station, including cooling towers and stack, will be demolished. The timescales for demolition are unknown, but demolition may be underway in 2019-2022 and beyond (2019-2022 being the anticipated construction period, 2022 being the opening year and 2047 being the earliest decommissioning year, respectively for the Proposed Development).
- 16.5.2 The future baseline conditions against which the construction (2019-2022) and opening (2022) scenarios for the landscape and visual impact assessment are assessed therefore assumes demolition is ongoing and the existing coal-fired power station may be entirely or partly still standing.
- 16.5.3 The future baseline conditions against which the operational stage (2037) and decommissioned stage (2047) of the landscape and visual impact assessment is assessed comprises a 'modified' baseline where the existing coal-fired power station is no longer present. A number of large scale structures are assumed to still be present on site including the 400 kV National Grid sub-station, and structures associated with the Air Liquide air separation unit and Yorkshire Water waste water treatment plant.
- 16.5.4 The wider Study Area would continue to be influenced by a number of large scale industrial buildings, power station complexes and infrastructure corridors in the future baseline scenario.
- 16.5.5 In the absence of the Proposed Development it is considered that the existing coal-fired power station site may be used for other industrial or commercial developments, but the nature of these is unknown.

16.6 Development Design and Impact Avoidance

- 16.6.1 The site for the Proposed Power Plant Site has been selected partly due to the existing vegetation around the existing coal stockyard embankment which provides screening for low level operations and structures within the majority of the Study Area. The Proposed Power Plant Site was also adjusted to ensure that the existing vegetation was not directly impacted by the Proposed Development.
- 16.6.2 The mitigation of landscape effects is intrinsic within the development proposals which seek to substantially retain existing well established vegetation within the Site.
- 16.6.3 The following impact avoidance measures will either be incorporated into the design or are standard construction or operational methods. These measures have therefore been taken into account during the impact assessment process described in this chapter:
- suitable materials will be used, where possible, in the construction of structures to reduce reflection and glare and to assist with breaking up the massing of the buildings and structures;
 - the selection of finishes for the buildings and other infrastructure will be informed by the finishes of the adjacent developments and will be developed in consultation with Selby DC in order to minimise the visual impact of the Proposed Development;
 - lighting required during the construction and operation stages of the Proposed Development will be designed to reduce unnecessary light spill outside of the Site boundary. A lighting strategy will cover this aspect and will be secured through the DCO; and
 - existing vegetation along the boundary of the Site will be retained and managed to ensure its continued presence to aid the screening of low level views into the Site. Details will be provided in the Landscape and Biodiversity Strategy that will accompany the DCO application.

16.7 Likely Impacts and Effects

- 16.7.1 To avoid unnecessary repetition, the structure of the Likely Impacts and Effects section of this chapter does not follow the standard, whereby impacts and effects associated with the construction of the Proposed Development are discussed first, followed by discussion of opening, future operation and decommissioning stages of the development.
- 16.7.2 Landscape impacts and effects are described first, and summarised in Tables 16.7 (construction), 16.8 (opening) and 16.9 (operation).
- 16.7.3 Visual impacts and effects are then described, and summarised in Table 16.10.

Landscape

- 16.7.4 The potential landscape impacts of the Proposed Development relate to the loss of existing landscape features and the visibility of new landscape features (temporary and permanent), including how this affects the perceptual qualities and tranquillity of a character area. In the case of the construction of the Proposed Development this will relate to the following:
- movement of plant and heavy goods vehicles, both on site and in the surrounding area;

- temporary stockpiling of earth and storage of materials on site;
- establishment of site compounds resulting in temporary structures to serve the workforce;
- crane activity to assist high level construction works;
- building construction including the new stack; and
- external lighting to illuminate site operations after dark.

16.7.5 In the case of the opening and operational phases of the Proposed Development will relate to the following:

- introduction of permanent large scale structures including stacks and turbine hall within the Site; and
- introduction of a permanent site compound in relation to the AGI.

Landscape Capacity

16.7.6 The Proposed Power Plant Site is currently the coal stockyard within the south-east of the existing coal-fired power station site. The Proposed Cooling Water and Gas Connection corridors are currently agricultural farmland with limited structures located within this section of the Site, although influenced by major power stations and lines and transport infrastructure. Overall, it is therefore considered that the landscape has a high capacity to accommodate the Proposed Development due to the adjacent structures associated with the existing coal-fired power station and large scale infrastructure within the wider Study Area.

Overall Character and Key Characteristics of the Study Area

16.7.7 The topography of the Study Area is a considerable factor in defining the character of the area with the relatively flat landscape enabling wide, open and often long distance views across the Study Area.

16.7.8 The published landscape character assessments recognise power stations as a characteristic element of the landscape; as such it is considered that the construction of the Proposed Development would not introduce any new uncharacteristic landscape elements to the Study Area.

16.7.9 The large scale industrial buildings / structures and transport corridors located within the Study Area are also recognised as characteristic features in the landscape within the relevant published landscape character assessments.

Specific Aesthetic or Perceptual Aspects

16.7.10 Large scale industry and power generation is a well-established land-use within the Study Area and within the landscape immediately adjacent to the Site. Although relatively visible within the more remote areas of the Study Area, it is anticipated that the presence of the Proposed Development will not affect the aesthetic and perceptual qualities of the local landscape.

16.7.11 During construction there would be changes in the aesthetic and perceptual qualities through the movement of plant within close proximity to the Site and the introduction of large scale structures in various stages of development. At operation, the aesthetic and perceptual qualities would remain as present with large scale static structures characteristic of the wider landscape.

Assessment of Landscape Effects

- 16.7.12 The Proposed Power Plant Site is situated on the site of the existing coal-fired power station, where land-use includes numerous large scale power related buildings and structures (Eggborough Power Station and a National Grid sub-station). Within the Cooling Water and Gas Connection corridors the Site contains agricultural fields some of which have, in the past, experienced construction pipeline works. In relation to the areas of the Site within the existing coal-fired power station, the existing mature vegetation to the Site boundaries would remain intact during all periods of the Proposed Development. The agricultural fields would experience temporary disturbance as a result of the Proposed Cooling Water and Gas Connection works. The main feature of change during the construction would be the introduction of tall cranes and by opening in 2022 there would be new large scale structures within the Site. By 2037 structures associated with the existing coal-fired power station would have been demolished including the existing cooling towers and stack, leaving areas of bare ground and hardstanding.
- 16.7.13 The main potential for effects on landscape character relates to the intervisibility between the Proposed Development and the LCAs. Given that the Proposed Development is located within an area characterised by large scale industrial and power development, it is considered that it is likely to be congruous with its context and therefore there is a low potential for the landscape character of the surrounding areas to be affected.
- 16.7.14 Due to the existing industrial character of the setting of the Proposed Power Plant Site, it is anticipated that there is low likelihood that the effects will be sufficient to result in an inherent change to the existing landscape character at a local scale and negligible at a regional or national scale. Overall the influence of the Proposed Development will be limited to the localised landscape immediately adjacent to the Proposed Power Plant Site and the AGI Site.
- 16.7.15 Table 16.6 provides an assessment of the sensitivity of each landscape receptor whilst Tables 16.7 to 16.9 provide an assessment of the anticipated magnitude of landscape impacts and the classification of effects on each landscape receptor at construction, opening and operation stages.
- 16.7.16 A full description of the criteria used to assess the above can be found in Appendix 16A (PEI Report Volume II).

Table 16.6: Landscape Sensitivity Assessment

Landscape Receptor	Sensitivity assessment		
	Value	Susceptibility	Sensitivity
North Yorkshire and York Landscape Character Assessment			
Magnesian Limestone Ridge (6) LCT	Medium	The presence of localised woodland screening and existing large scale power stations and the A1(M) corridor does offer some capacity to absorb the type of development proposed. Susceptibility to change is therefore considered to be Medium.	Medium
Levels Farmland (23) LCT	Medium	As a result of the low-lying, relatively flat landscape and presence of major	Medium

Landscape Receptor	Sensitivity assessment		
	Value	Susceptibility	Sensitivity
		energy and transport infrastructure this LCT does offer some capacity to absorb the type of development proposed. Susceptibility to change is therefore considered to be Medium.	
River Floodplain (24) LCT	Medium	Due to the presence of large scale industrial and transport features this LCT does offer some capacity to absorb the type of development proposed. Susceptibility to change is therefore considered to be Medium.	Medium
Landscape Character Assessment of Wakefield District			
Limestone Escarpment LCT	Medium	As a result of the LCT being dominated by industrial development this LCT has a high capacity to absorb the type of development proposed. Susceptibility to change is therefore considered to be Low.	Low
East Riding of Yorkshire Landscape Character Assessment			
LCT 4 River Corridors (4D)	Medium	As a result of the semi enclosed nature and presence of a number of detractors the LCT does offer some capacity to absorb the type of development proposed. Susceptibility to change is therefore considered to be Medium.	Medium
LCT 8 M62 Corridor Farmland (8C)	Medium	As a result of the presence of infrastructure as detractors in the landscape the LCT does offer the capacity to absorb the type of development proposed. Susceptibility to change is therefore considered to be Low.	Medium
Doncaster Landscape Character Assessment			
LCA F2 Owston to Sykehouse	Medium	Limited detractors and development within the LCA. Susceptibility to change is therefore considered medium.	High
Locally Important Landscape Areas			
Brayton Barff and Byram	High	As a result of the enclosed and wooded nature of the areas the receptors have some capacity to absorb the type of development proposed. Susceptibility to change	High

Landscape Receptor	Sensitivity assessment		
	Value	Susceptibility	Sensitivity
		is therefore considered to be medium.	

Table 16.7: Assessment of landscape effects – construction (compared to future baseline with existing coal-fired power station present)

Landscape type	Sensitivity of receptor	Description of impact	Predicted magnitude of impact	Classification of effect
Magnesian Limestone Ridge (6) LCT	Medium	The Proposed Development lies outside of this LCT but will introduce construction activity within limited views from it. Due to existing views of large scale power complexes and transport infrastructure which lay within the adjacent landscape it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT in the short term.	Very low	Negligible adverse (not significant)
Levels Farmland (23) LCT	Medium	The Proposed Development will introduce construction activities to the LCT, immediately adjacent to other large scale power developments. The introduction of construction activities will increase the massing of large scale structures within this LCT, increasing the influence that the existing coal-fired power station site has on the wider LCT. The introduction of construction activities does have the potential to affect the landscape character, perception and tranquillity of this LCT in the short term within a localised area. However, due to the presence of other large scale industrial developments and road infrastructure within the LCT the Proposed Development would have a limited potential to affect the LCT as a whole.	Low	Minor adverse (not significant)
River Floodplain (24) LCT	Medium	The Proposed Development lies within this LCT and will introduce construction activity in relation to the connection routes within it and views of the Proposed Power Station within close proximity. Due to existing views of large scale power complexes and the presence of transport infrastructure which lay within the LCT it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT as a whole. It is anticipated that there will be a localised	Low	Minor adverse (not significant)

Landscape type	Sensitivity of receptor	Description of impact	Predicted magnitude of impact	Classification of effect
		change to perception and tranquillity within parts of the LCT in the short term, which lie in close proximity to the Proposed Development.		
Limestone Escarpment LCT	Low	The Proposed Development lies outside of this LCT but will introduce construction activity within limited views from it. Due to existing views of large scale power complexes and transport infrastructure which lay within the adjacent landscape it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT in the short term.	Very low	Negligible adverse (not significant)
LCT 4 River Corridors (4D)	Medium	The Proposed Development lies outside of this LCT but will introduce construction activity within limited views from it. Due to existing views of large scale power complexes and transport infrastructure which lie within nearby landscape character types it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT in the short term.	Very low	Negligible adverse (not significant)
LCT 8 M62 Corridor Farmland (8C)	Medium	The Proposed Development lies outside of this LCT but will introduce construction activity within limited views from it. Due to existing views of large scale power complexes which lie within the adjacent landscape and transport infrastructure which lies within this LCT, it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT in the short term.	Very low	Negligible adverse (not significant)
LCA F2 Owston to Sykehouse	High	The Proposed Development lies outside of this LCT but will introduce construction activity within long distance views from it. Due to existing views of large scale power complexes which lie within the adjacent landscape, it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT in the	Very low	Minor adverse (not significant)

Landscape type	Sensitivity of receptor	Description of impact	Predicted magnitude of impact	Classification of effect
		short term.		
Locally Important Landscape Area	High	Likely to be no view due to lack of indivisibility.	Very low	Negligible adverse (not significant)

Table 16.8: Assessment of landscape effects – opening (compared to future baseline with existing coal-fired power station present)

Landscape type	Sensitivity of receptor	Description of impact	Predicted magnitude of impact	Classification of effect
Magnesian Limestone Ridge (6) LCT	Medium	The Proposed Development lies outside of this LCT but will introduce a larger overall power station complex within limited views from it. Due to existing views of large scale power complexes and transport infrastructure which lie within the adjacent landscape it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT.	Very low	Negligible adverse (not significant)
Levels Farmland (23) LCT	Medium	The Site lies within this LCT and thus has potential to have a direct impact. The Proposed Development will introduce a larger overall power station complex compared to the existing baseline. Due to the presence of other large scale industrial developments and road infrastructure within the LCT and neighbouring LCTs the Proposed Development will have a reduced influence on the overall LCT although, still have the potential to affect the landscape character, perception and tranquillity of the LCT within a localised area. As a result of the increase in the massing and scale of the Proposed	Low	Minor adverse (not significant)

Landscape type	Sensitivity of receptor	Description of impact	Predicted magnitude of impact	Classification of effect
		Development it is anticipated that there will be a slight impact on landscape character and perception compared with the future baseline scenario.		
River Floodplain (24) LCT	Medium	The Proposed Development lies within this LCT but due to the location of the Proposed Power Plant will introduce a larger power station complex within close proximity views from it. Due to existing views of large scale power complexes and transport infrastructure which lie within the adjacent landscape it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT.	Very low	Negligible adverse (not significant)
Limestone Escarpment LCT	Low	The Proposed Development lies outside of this LCT but will introduce a larger overall power station complex within limited views from it. Due to existing views of large scale power complexes and transport infrastructure which lie within the adjacent landscape it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT.	Very low	Negligible adverse (not significant)
LCT 4 River Corridors (4D)	Medium	The Proposed Development lies outside of this LCT but will introduce a larger overall power station complex within limited views from it. Due to existing views of large scale power complexes and transport infrastructure which lie within nearby landscape character types it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT.	Very low	Negligible adverse (not significant)
LCT 8 M62 Corridor Farmland (8C)	Medium	The Proposed Development lies outside of this LCT but will introduce a larger overall power station complex within limited views from it. Due to existing views of large scale power complexes which lie within the adjacent landscape	Very low	Negligible adverse (not significant)

Landscape type	Sensitivity of receptor	Description of impact	Predicted magnitude of impact	Classification of effect
		and transport infrastructure which lies within this LCT, it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT.		
LCA F2 Owston to Sykehouse	High	The Proposed Development lies outside of this LCT but will introduce a larger overall power station complex within long distance views from it. Due to existing views of large scale power complexes which lie within the adjacent landscape, it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT in the short term.	Very low	Minor adverse (not significant)
Locally Important Landscape Area	High	Likely to be no view due to lack of intervisibility.	Very low	Negligible adverse (not significant)

Table 16.9: Assessment of landscape effects – operation (compared to future baseline with existing coal-fired power station no longer present)

Landscape type	Sensitivity of receptor	Description of impact	Predicted magnitude of impact	Classification of effect
Magnesian Limestone Ridge (6) LCT	Medium	The Proposed Development lies outside of this LCT but will introduce a power station development within views from it. Due to existing views of large scale power complexes and transport infrastructure which lie within the adjacent landscape it is considered that the operational Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT.	Very low	Negligible adverse (not significant)
Levels Farmland (23)	Medium	The Proposed Development will introduce a power station development	Low	Minor

Landscape type	Sensitivity of receptor	Description of impact	Predicted magnitude of impact	Classification of effect
LCT		compared to the modified baseline. The presence of other large scale industrial developments and road infrastructure within the LCT and neighbouring LCTs will reduce the influence of the Proposed Development on the LCT, although it will still have the potential to affect the landscape character, perception and tranquillity of the LCT within a localised area. As a result of the massing, scale and height of the Proposed Development it is anticipated that there will be an impact on landscape character and perception.		adverse (not significant)
River Floodplain (24) LCT	Medium	The Proposed Development lies within this LCT but due to the location of the Proposed Power Plant will introduce a power development within close proximity views from it. Due to existing views of large scale power complexes and transport infrastructure which lie within the adjacent landscape it is considered that the operational Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT.	Very low	Negligible adverse (not significant)
Limestone Escarpment LCT	Low	The Proposed Development lies outside of this LCT but will introduce a power station within views from it. Due to existing views of large scale power complexes and transport infrastructure which lie within the adjacent landscape it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT.	Very low	Negligible adverse (not significant)
LCT 4 River Corridors (4D)	Medium	The Proposed Development lies outside of this LCT but will introduce a power station within views from it. Due to existing views of large scale power complexes and transport infrastructure which lie within nearby landscape character types it is considered that the Proposed Development will have	Very low	Negligible adverse (not significant)

Landscape type	Sensitivity of receptor	Description of impact	Predicted magnitude of impact	Classification of effect
		limited potential to affect the landscape character, perception and tranquillity of the LCT.		
LCT 8 M62 Corridor Farmland (8C)	Medium	The Proposed Development lies outside of this LCT but will introduce a power station within views from it. Due to existing views of large scale power complexes which lie within the adjacent landscape and transport infrastructure which lies within this LCT, it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT.	Very low	Negligible adverse (not significant)
LCA F2 Owston to Sykehouse	High	The Proposed Development lies outside of this LCT but will introduce a power station within long distance views from it. Due to existing views of large scale power complexes which lie within the adjacent landscape, it is considered that the Proposed Development will have limited potential to affect the landscape character, perception and tranquillity of the LCT in the short term.	Very low	Minor adverse (not significant)
Locally Important Landscape Area	High	Likely to be no view due to lack of intervisibility.	Very low	Negligible adverse (not significant)

Visual Amenity

- 16.7.17 Potential visual effects of the Proposed Development in comparison with the future baseline visual context are considered in Table 16.10 by reference to representative viewpoints. The assessments contained within Table 16.10 should be read in conjunction with Figures 16.8 to 16.21 which illustrate the baseline situation at each viewpoint. A series of photomontages have been prepared (Figures 16.22 to 16.39 which illustrate the likely visibility of the Proposed Development at five of the assessed viewpoints. These viewpoints were chosen in consultation with NYCC as a range of representative views of the Proposed Development and illustrate the following scenarios:
- Opening 2022 (Proposed Development with existing coal-fired power station present); and
 - Operation 2037 (Proposed Development without existing coal-fired power station).
- 16.7.18 The assessment of effects during the each assessment scenario is based on a comparison of the future baseline conditions against the conditions with the Proposed Development. As such the effects of the operation scenario (2037) are compared to a future baseline with no coal-fired power station present on the Site, so these effects are generally greater than for the opening scenario (2022). In reality, due to the likely timescales for demolition of the existing coal-fired power station and construction of the Proposed Development, there will be no significant period of time (or quite possibly no period of time at all) when there will be no power station infrastructure on the Site. Visual receptors will not therefore actually be able to compare a scenario with no power station on the Site to a scenario with the Proposed Development present.
- 16.7.19 The viewpoints to be used for photomontages were chosen through professional judgement and consultation with NYCC.

Table 16.10 Assessment of effects on visual amenity

Viewpoint 1: Selby Road (North), Eggborough				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
56431, 423705	Road users, residential	12	0.7	East
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms secondary focus for road users at this location due to presence of alternative views to the west which contain limited large structures, although do contain overhead power lines. View from the rear of properties is narrow, channelled by vegetation. Therefore, susceptibility is considered to be medium for road users and high for residents.		Typical view containing a number of detractors. Low.		Low for road users. Medium for residential.
Size/ scale, duration and reversibility of impact at construction				
Medium distance views of construction activities, visible to the right of the existing turbine hall and stack. Views of ground level construction activities will be limited due to intervening vegetation. As the tallest structures are constructed they will be visible in the context of existing large scale structures, viewed as an extension to the existing turbine hall and stack. The existing coal-fired power station structures will still dominate views from this location due to the angle of view and their massing in relation to the proposed construction activities. Views for the majority of residential receptors will either be oblique or contain clear views of structures associated with the Saint Gobain factory site. Impacts will be short term and reversible.				
Magnitude of impact at construction				Medium
Significance of effect at construction	Road users			Minor adverse (not significant)
	Residential			Moderate adverse (significant)
Size/ scale, duration and reversibility of impact at opening				

<p>The Proposed Development will be viewed adjacent to the existing coal-fired power station, although seen as a much smaller (massing and height) development than the existing coal-fired power station. The Proposed Development will increase the overall massing of structures, increasing the proportion of view that is dominated by large scale structures. The addition of the new structures will change the balance of the view from this location. The imminent or future decommissioning and demolition of the existing coal-fired power station results in impacts being short term and reversible.</p>		
Magnitude of impact at opening		Low
Significance of effect at opening	Road users	Negligible adverse (not significant)
	Residential	Minor adverse (not significant)
Visual susceptibility to change at operation (2037 future baseline)	Value of view (2037 future baseline)	Sensitivity of receptor (2037 future baseline)
There is no change to susceptibility at this future baseline scenario. Therefore, susceptibility is considered to be medium for road users and high for residents.	Typical view containing a small number of detractors, now not containing the existing coal-fired power station. Medium	Medium for road users High for residential
Size/ scale, duration and reversibility of impact at operation		
A number of structures associated with the Saint Gobain factory and Air Liquide site will be visible within the view. The upper sections of structures associated with the Proposed Development including the stack will be clearly visible within the view, forming the most prominent features, although set in the context of an existing industrial site. The impact will be long term and reversible.		
Magnitude of impact at operation		Medium
Significance of effect at operation	Road users	Moderate adverse (significant)
	Residential	Major adverse (not significant)

Viewpoint 2: Selby Road (South), Eggborough				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
456094, 423310	Residential	11	1.5	North east
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms secondary point of focus and heavily influenced by residential development resulting in medium susceptibility.		View is well composed although commonplace and urban in nature. Low.		Medium
Size/ scale, duration and reversibility of impact at construction				
Medium distance views of construction activities will be mostly screened by existing residential properties and vegetation associated with the residential street scape. High level activities including cranes will be the only visible activity from this viewpoint and form part of the existing detractors including the existing stack and cooling towers. Impacts will be short term and reversible.				
Magnitude of impact at construction				Very low
Significance of effect at construction				Negligible adverse (not significant)
Size/ scale, duration and reversibility of impact at opening				
The Proposed Development will be viewed in the context of the existing coal-fired power station structures. Where views are available, it is anticipated that the tips of the stack or the upper sections of the larger structures will be visible from this location, viewed alongside the existing coal-fired power station. The additional elements will be seen as an extension of the existing coal-fired power station. The impacts will be short term and reversible.				
Magnitude of impact at opening				Very low
Significance of effect at opening				Negligible adverse (not significant)
Visual susceptibility to change at operation (2037 future baseline)		Value of view (2037 future baseline)		Sensitivity of receptor (2037 future baseline)
There is no change to susceptibility at this assessment scenario, resulting in medium susceptibility.		View is well composed although commonplace and urban in nature. Medium.		Medium.
Size/ scale, duration and reversibility of impact at operation				
From this direction the upper sections of the stack and structures will be partially visible, viewed above and beyond intervening vegetation and built development. The structures associated with the Proposed Development will not form dominant features within the view. The impacts will be long term and reversible.				

Magnitude of impact at operation	Low.
Significance of effect at operation	Minor adverse (not significant).

Viewpoint 3: Weeland Road				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
457775, 422966	Road users, residential	16	0.7	South
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms secondary focus for road users at this location due to presence of alternative views in different directions along the road corridor. View from the rear of properties is more focused and channelled. View contains the existing coal-fired power station. Therefore susceptibility is considered to be medium for road users and high for residents.		Typical view containing a number of detractors. Low.		Low for road users Medium for residential
Size/ scale, duration and reversibility of impact at construction				
Close proximity views of construction activities, visible in front of the existing turbine hall, stack and cooling towers. Views of ground level construction activities will be limited due to intervening vegetation including the woodland around the coal stockyard bund. As the tallest structures are constructed they will be clearly visible and form a prominent part of the view, although viewed in the context of existing large scale structures, and as an addition to the existing coal-fired power station structures. The impacts will be short term and reversible.				
Magnitude of impact at construction				High
Significance of effect at construction	Road users			Moderate adverse (significant)
	Residential			Major adverse (significant)
Size/ scale, duration and reversibility of impact at opening				
The Proposed Development will be viewed in front of the existing coal-fired power station, entirely screening the lower structures of the existing coal-fired power station. The completed structures will appear as the most prominent structures within the view, increasing the overall massing of the proportion of structures visible within the view. The existing stack and cooling towers will still be visible above and behind the Proposed Development, forming the tallest structures within the view. There will be a slight change in the balance of this view as a result of the addition of the new structures. The impacts will be short term and reversible.				
Magnitude of impact at opening				High
Significance of effect at opening	Road users			Moderate adverse (significant)

	Residential	Major adverse (significant)
Visual susceptibility to change at operation (2037 future baseline)	Value of view (2037 future baseline)	Sensitivity of receptor (2037 future baseline)
There is no change to susceptibility at this assessment scenario. Therefore susceptibility is considered to be medium for road users and high for residents.	Typical view containing a small number of detractors. Medium	Medium for road users High for residential
Size/ scale, duration and reversibility of impact at operation		
The structures associated with the Proposed Development, including stack and turbine hall, will be clearly visible within the view, forming the most prominent features. For road users views will be glimpsed and partially filtered by roadside vegetation. The impact will be long term and reversible.		
Magnitude of impact at operation		High
Significance of effect at operation	Road users	Major adverse (significant)
	Residential	Major adverse (significant)

Viewpoint 4: Selby Road, Whitley				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
456262, 420855	Residential	14	3.1	North east
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms primary view out of Whitley, other inward views available. Resulting in high susceptibility.		View is well composed and pleasing, looking out over rural farmland. Medium.		High
Size/ scale, duration and reversibility of impact at construction				
Medium distance views of construction activities, the majority of which will be screened by intervening vegetation. Where screening allows, construction activities will be visible in front of the existing coal-fired power station, although limited to higher level activities. There are a limited number of other detractors within the view. The impact will be short term and reversible.				
Magnitude of impact at construction				Very low
Significance of effect at construction				Minor adverse (not significant)
Size/ scale, duration and reversibility of impact at opening				
Filtered views of the Proposed Development will be available, visible in front of the existing coal-fired power station, of which the stack and cooling towers will be the only visible features. The Proposed Development will be viewed as an extension of the existing coal-fired power station and will not change the composition or balance of the overall view. The impact will be short term and reversible.				
Magnitude of impact at opening				Very low
Significance of effect at opening				Minor adverse (not significant)
Visual susceptibility to change at operation (2037 future baseline)		Value of view (2037 future baseline)		Sensitivity of receptor (2037 future baseline)
There is no change to susceptibility at this assessment scenario. Resulting in high susceptibility.		View is well composed and pleasing, looking out over rural farmland. Medium		High
Size/ scale, duration and reversibility of impact at operation				
From this direction the upper sections of the stack and structures of the Proposed Development will be visible where intervening vegetation allow. The structures, although partially visible will not form the most dominant features within the view. The impacts will be long term and reversible.				

Magnitude of impact at operation	Very low
Significance of effect at operation	Minor adverse(not significant)

Viewpoint 5: Gallows Hill				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
458764, 423635	Residential	14	0.5	West
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms secondary focus from residential area due to availability of alternative views, resulting in medium susceptibility.		Discordant view that contains a number of detractors including the cooling towers, stack and task lighting associated with the coal stockyard. Low		Medium
Size/ scale, duration and reversibility of impact at construction				
Close proximity views of construction activities, viewed to the left of the existing coal-fired power station, will be available from this viewpoint. Intervening vegetation will screen low level construction activities, with other activities, including the construction of the taller structures and stack will be clearly visible. The construction of the Proposed Development will be seen in the context and as an extension of the built form of the existing coal-fired power station. The construction activities will increase the massing of structures that appear within the view from this location. The impact will be short term and reversible.				
Magnitude of impact at construction				Medium
Significance of effect at construction				Moderate adverse (significant)
Size/ scale, duration and reversibility of impact at opening				
Views of the completed Proposed Development will be direct and at close proximity. The completed Proposed Development will form the primary focus of view for receptors within the public areas and where there are direct views from within properties towards the Site. The Proposed Development will be viewed as an extension to the existing coal-fired power station with the upper sections of the buildings and stack clearly visible. The Proposed Development will increase the massing of structures that are visible, causing a change to the composition and balance of the view. The impact will be short term and reversible.				
Magnitude of impact at opening				Low
Significance of effect at opening				Minor adverse (not significant)
Visual susceptibility to change at operation (2037 future baseline)		Value of view (2037 future baseline)		Sensitivity of receptor (2037 future baseline)

There is no change to susceptibility at this assessment scenario, resulting in medium susceptibility.	Discordant view that contains few detractors. Low	Medium
Size/ scale, duration and reversibility of impact at operation		
The Proposed Development will be clearly visible, located to the left of the residential properties and form the most dominant feature within the view. The majority of structures including the stack will be clearly visible, viewed behind intervening vegetation which will screen views of the lower sections of buildings and operations. Impacts will be long term and reversible.		
Magnitude of impact at operation		Medium
Significance of effect at operation		Moderate adverse (significant)

Viewpoint 6: Ings Lane PRoW (35.36/1/1)				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
459446, 424245	Users of PRoW, road users	16	1	South west
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms primary focus for users at this viewpoint resulting in high susceptibility.		View is well composed and pleasing, looking out over rural farmland, albeit with a number of detractors present. Medium		High
Size/ scale, duration and reversibility of impact at construction				
Medium distance views of construction activities, visible to the left of the existing coal-fired power station. Low level construction activities will be screened by the woodland planting on the coal stockyard bund, whilst remaining activities including cranes will be highly visible. The operations will be viewed as an extension to the existing coal-fired power station, increasing the massing of structures and proportion of view that contains large scale features. The availability of alternative views and the presence of other detracting features in the landscape reduce the impact that Proposed Development has on visual amenity. The impact will be short term and reversible.				
Magnitude of impact at construction				Medium
Significance of effect at construction				Major adverse (significant)
Size/ scale, duration and reversibility of impact at opening				
The completed Proposed Development will be clearly visible viewed to the left of the existing coal-fired power station turbine hall, although viewed as a development much smaller in scale and height compared with the existing coal-fired power station. The Proposed Development will be viewed as an extension of the existing coal-fired power station, increasing the massing and extent of the view which contains large structures, causing a change to the composition and balance of the view. The impact will be short term and reversible.				
Magnitude of impact at opening				Medium
Significance of effect at opening				Major adverse (significant)
Visual susceptibility to change at operation (2037 future baseline)		Value of view (2037 future baseline)		Sensitivity of receptor (2037 future baseline)

There is no change to susceptibility at this assessment scenario, resulting in high susceptibility.	View is well composed and pleasing, looking out over rural farmland. A small number of detractors are present. Medium	High
Size/ scale, duration and reversibility of impact at operation		
The Proposed Development will be clearly visible, forming the most prominent group of structures within the landscape. The turbine hall and stack will be viewed against the skyline, viewed within a relatively flat landscape with limited vertical structures. These structures include pylons, overhead power lines, overhead lines associated with the railway line and the structures associated with Drax Power Station. The impacts will be long term and reversible.		
Magnitude of impact at operation		Medium
Significance of effect at operation		Major adverse (significant)

Viewpoint 7: St John The Baptist Church Grounds, Millfield Road, Chapel Haddlesey				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
458279, 426072	Residents and church users	8	1.5	South
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms secondary point of focus and heavily influenced by residential development resulting in medium susceptibility.		Well composed view that contains a number of detractors including the cooling towers and stack. Low		Medium
Size/ scale, duration and reversibility of impact at construction				
Medium distance views of construction activities, viewed behind the cooling towers and turbine hall associated with the existing coal-fired power station. High level construction activities, including the use of cranes will be partially visible, marginally increasing the massing of structures that appear within the view from this location. The impacts will be short term and reversible.				
Magnitude of impact at construction				Low
Significance of effect at construction				Minor adverse (not significant)
Size/ scale, duration and reversibility of impact at opening				
Medium distance views of the completed development, viewed behind the cooling towers and turbine hall associated with the existing coal-fired power station. The taller structures including stacks and turbine hall will be partially visible, marginally increasing the massing of structures that appear within the view from this location. The impacts will be short term and reversible.				
Magnitude of impact at opening				Low
Significance of effect at opening				Minor adverse (not significant)
Visual susceptibility to change at operation (2037 future baseline)		Value of view (2037 future baseline)		Sensitivity of receptor (2037 future baseline)
There is no change to susceptibility at this assessment scenario, resulting in medium susceptibility.		Well composed view that contains few detractors. Medium		Medium
Size/ scale, duration and reversibility of impact at operation				
The Proposed Development will be clearly visible, viewed alongside the existing sub-station and Air Liquide structures. The extent of the view that the Proposed Development structures will occupy will be limited. Alternative direction of views will be available. The impacts will be long term and reversible.				

Magnitude of impact at operation	Medium
Significance of effect at operation	Moderate adverse (significant)

Viewpoint 8: Trans Pennine Trail PRoW 35.14/15/1, Burn Airfield				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
460826, 429075	Users of PRoW and Burn Airfield	7	5.7	South west
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms primary focus for users of the Trans Pennine Trail and Burn Airfield, resulting in high susceptibility.		Well composed view that contains some detractors. Medium		High
Size/ scale, duration and reversibility of impact at construction				
Long distance views of the construction activities, viewed to the left of the existing coal-fired power station, will be available from this viewpoint. The majority of high level construction activities will be visible with lower and ground level activities screening by intervening vegetation and woodland associated with the wider power station site. The construction of the Proposed Development will be seen in the context and as an extension of the built form of the existing coal-fired power station. The construction activities will increase the massing of structures that appear within the view from this location, although appearing at a smaller scale and height than the existing coal-fired power station structures and not altering the balance of the overall view. The impacts will be short term and reversible.				
Magnitude of impact at construction				Very low
Significance of effect at construction				Minor adverse (not significant)
Size/ scale, duration and reversibility of impact at opening				
Views of the completed Proposed Development will be direct and from approximately 5.7 km from the receptor (at the viewpoint). The completed Proposed Development will be seen as an extension of the existing coal-fired power station, increasing the massing of structures that appear within the view from this location. The completed stack and turbine hall will be viewed as smaller in scale to the existing coal-fired power station structures, although forming part of a larger complex. The introduction of the completed Proposed Development will not alter the balance of the overall view. The impacts will be short term and reversible.				
Magnitude of impact at opening				Very low
Significance of effect at opening				Minor adverse (not significant)
Visual susceptibility to change at operation (2037 future baseline)		Value of view (2037 future baseline)		Sensitivity of receptor (2037 future baseline)

There is no change to susceptibility at this assessment scenario, resulting in high susceptibility.	Well composed view that contains some detractors. Medium	High
Size/ scale, duration and reversibility of impact at operation		
The Proposed Development will be clearly visible, viewed as the most dominant feature within the view, albeit at an approximate distance of 5.0 km to 2.5 km from the airfield. The majority of structures, including the turbine hall and stack will be clearly visible, viewed behind intervening vegetation which will screen views of the lower portions of buildings. Impacts will be long term and reversible.		
Magnitude of impact at operation		Very low
Significance of effect at operation		Minor adverse (not significant)

Viewpoint 9: Mill Lane, Brayton				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
459504, 430067	Road users, residential	8	4.6	South
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms secondary focus for road users and primary focus for views from residential properties at this location. Therefore susceptibility is considered to be medium for road users and high for residents.		Well composed view, although contains a number of detractors. Medium		Medium for road users High for residential
Size/ scale, duration and reversibility of impact at construction				
Long distance views of construction activities, visible to the left of the existing coal-fired power station cooling towers and limited to operations located within the eastern part of the Site. Views of ground level construction activities will be limited as a result of intervening vegetation and woodland located along the northern boundary of the power station site. As the tallest structures are completed they will be clearly visible, although viewed in the context of existing large scale structures, and as a slight addition to the existing coal-fired power station structures. The impact will be short term and reversible.				
Magnitude of impact at construction				Very low
Significance of effect at construction	Road users			Negligible adverse (not significant)
	Residential			Minor adverse (not significant)
Size/ scale, duration and reversibility of impact at opening				
The completed Proposed Development will be located behind and alongside the existing coal-fired power station cooling towers. The eastern most structures will be the only completed structures clearly visible. Glimpsed views of the taller structures, including the turbine hall and stack, may be available between the existing coal-fired power station cooling towers. The Proposed Development will slightly increase the massing of structures visible from this location, although this will not alter the balance of the overall view. The impact will be short term and reversible.				
Magnitude of impact at opening				Very low
Significance of effect at opening	Road users			Negligible adverse (not significant)
	Residential			Minor adverse (not significant)

Visual susceptibility to change at operation (2037 future baseline)		Value of view (2037 future baseline)	Sensitivity of receptor (2037 future baseline)
There is no change to susceptibility at this assessment scenario. Therefore susceptibility is considered to be medium for road users and high for residents.		Well composed view containing few detractors. Medium	Medium for road users High for residential
Size/ scale, duration and reversibility of impact at operation			
The structures associated with the Proposed Development, including stack and turbine hall, will be clearly visible within the view, forming the most prominent features. The structures will be viewed at approximately 6 km distance resulting in a small change to the view. The impact will be long term and reversible.			
Magnitude of impact at operation			Low
Significance of effect at operation	Road users	Minor adverse (not significant)	
	Residential	Moderate adverse (significant)	

Viewpoint 10: West Lane, Burn				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
458100, 428163	Road users	7	3.5	South
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms primary focus for road users at this location. Therefore susceptibility is considered to be medium.		Well composed view, few detractors. Medium		Medium
Size/ scale, duration and reversibility of impact at construction				
Long distance views of construction activities for the Proposed Power Plant , the majority of which will be screened behind the existing coal-fired power station cooling towers with limited visibility to the right of the cooling towers. Where views are available ground level views will be screened by intervening vegetation. Close, clear and direct proximity views of construction activities for the AGI will be available from this location. The impact will be short term and reversible.				
Magnitude of impact at construction				Medium
Significance of effect at construction		Road users		Moderate adverse (significant)
Size/ scale, duration and reversibility of impact at opening				
Glimpsed views of the taller structures associated with the completed Proposed Power Plant will be available behind the existing coal-fired power station cooling towers. The Proposed Development will slightly increase the massing of structures visible from this location, although this will not alter the balance of the overall view. The completed AGI will be clearly visible from this location, seen in close proximity. As a result of limited other detractors within the view, the compound fencing and above ground structures will form a prominent new feature in the view that is readily apparent. The impact will be short term and reversible. Where views are available ground level views will be screened by intervening vegetation. The impact will be short term and reversible.				
Magnitude of impact at opening				Medium
Significance of effect at opening		Road users		Moderate adverse (significant)
Visual susceptibility to change at operation (2037 future baseline)		Value of view (2037 future baseline)		Sensitivity of receptor (2037 future baseline)

There is no change to susceptibility at this assessment scenario. Therefore susceptibility is considered to be medium.	Well composed view containing a number of detractors. Medium	Medium
Size/ scale, duration and reversibility of impact at operation		
The structures associated with the Proposed Power Plant will be barely visible, viewed behind intervening vegetation at a distance of 3.5 km. The upper sections of the structures including stack will be visible but not noticeable within the view. Close, clear and direct proximity views of the completed AGI will be available from this location. The mitigation planting will have matured by this date, forming a vegetative screen around the compound fencing, softening the impact of the fencing and above ground structures including kiosks. The impact will be long term and reversible.		
Magnitude of impact at operation		Low
Significance of effect at operation	Road users	Minor adverse (significant)

Viewpoint 11: Selby Canal Viewing Platform PRow 35.72/2/1				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
457080, 426412	Users of the PRow (footpath) and users of Selby Canal at Haddlesey Flood Lock	7	1.6	South
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms primary focus for PRow and canal users at this location. Therefore susceptibility is considered to be high.		Well composed view with a number of detractors. Medium		High
Size/ scale, duration and reversibility of impact at construction				
Medium distance views of higher level construction activities, visible to the right of the existing coal-fired power station turbine hall. Views of lower level activities will be screened by the existing cooling towers, turbine hall and intervening vegetation. Glimpsed views of higher level activities may be available between the existing cooling towers. The construction activities will be viewed as a slight addition to the existing coal-fired power station structures. The impact will be short term and reversible.				
Magnitude of impact at construction				Very low
Significance of effect at construction		PRow and canal users		Minor adverse (not significant)
Size/ scale, duration and reversibility of impact at opening				
The Proposed Development will be partially visible to the right of the existing coal-fired power station turbine hall. The upper sections of the stack and turbine hall will be visible with the rest of the Proposed Development screened by the existing coal-fired power station structures and intervening vegetation. The completed development will create a slight increase to massing of structures within the view, although will not change the overall balance of the view. The impact will be short term and reversible.				
Magnitude of impact at opening				Very low
Significance of effect at opening		PRow and canal users		Minor adverse (not significant)
Visual susceptibility to change at operation (2037 future baseline)		Value of view (2037 future baseline)		Sensitivity of receptor (2037 future baseline)
There is no change to susceptibility at this assessment scenario. Therefore susceptibility is considered to be high.		Typical view containing a number of detractors. Medium		Medium

Size/ scale, duration and reversibility of impact at operation		
The structures associated with the Proposed Development, including stack and turbine hall, will be clearly visible within the view, visible behind the sub station structures and forming the most prominent features. The impact will be long term and reversible.		
Magnitude of impact at operation		Low
Significance of effect at operation	PRoW and canal users	Minor adverse (not significant)

Viewpoint 12: Manor Garth, Kellington				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
455301, 424936	Residential and school grounds	13	1.9	South east
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms secondary focus for receptors at this location due to presence of alternative views. Therefore susceptibility is considered to be medium.		Typical view containing a number of detractors. Low		Medium
Size/ scale, duration and reversibility of impact at construction				
Medium range views of construction activities will be limited to upper level activities as a result of intervening vegetation. Visible construction activities will appear to the right of the existing coal-fired power station turbine hall. As the tallest structures are constructed they will be barely visible, viewed in the context of existing large scale structures, and as an addition to the existing coal-fired power station structures. The impact will be short term and reversible.				
Magnitude of impact at construction				Very low
Significance of effect at construction	Residential and school grounds		Negligible adverse (not significant)	
Size/ scale, duration and reversibility of impact at opening				
The stack of the Proposed Development will be visible to the right of the existing coal-fired power station, marginally increasing the massing of structures and appearing as an extension of the existing coal-fired power station. The impact will be short term and reversible.				
Magnitude of impact at opening				Very low
Significance of effect at opening	Residential and school grounds		Negligible adverse (not significant)	
Visual susceptibility to change at operation (2037 future baseline)	Value of view (2037 future baseline)		Sensitivity of receptor (2037 future baseline)	
There is no change to susceptibility at this assessment scenario. Therefore susceptibility is considered to be medium.	Typical view containing few detractors. Medium		Medium	
Size/ scale, duration and reversibility of impact at operation				

The upper sections of the stack associated with the Proposed Development will be visible. These structures will barely discernible with the existing pylons forming the most prominent features within the view. Views from residential properties will be limited to those located on the edge of Kellington and those with filtered views from within the residential area. The impact will be long term and reversible.		
Magnitude of impact at operation		Very low
Significance of effect at operation	Residential and school grounds	Minor adverse (not significant)

Viewpoint 13: Beal Lane, Beal				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
453620, 425259	Residential, road users	12	3.5	East
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms secondary focus for road users and primary focus for views from residential properties at this location. Therefore susceptibility is considered to be medium for road users and high for residents.		Typical view, although containing a number of detractors. Low		Medium for road users and residential
Size/ scale, duration and reversibility of impact at construction				
Long distance views of construction activities will be visible to the right of the existing coal-fired power station, viewed as an extension of the existing coal-fired power station. As the tallest structures are completed they will be clearly visible, although viewed in the context of existing large scale structures, and as a slight addition to the existing coal-fired power station structures. The impact will be short term and reversible.				
Magnitude of impact at construction				Low
Significance of effect at construction		Residential, road users		Minor adverse (not significant)
Size/ scale, duration and reversibility of impact at opening				
The completed Proposed Development will be located alongside the existing turbine hall, increasing the massing of structures and appearing as an extension of the existing coal-fired power station. There will be a slight change in the balance of this view as a result of the addition of the new structures. The impact will be short term and reversible.				
Magnitude of impact at opening				Low
Significance of effect at opening		Residential, Road users		Minor adverse (not significant)
Visual susceptibility to change at operation (2037 future baseline)		Value of view (2037 future baseline)		Sensitivity of receptor (2037 future baseline)
There is no change to susceptibility at this assessment scenario. Therefore susceptibility is considered to be medium for road users and high for residents.		Typical view, although containing a number of detractors. Low		Medium for road users Medium for residential

Size/ scale, duration and reversibility of impact at operation		
The structures associated with the Proposed Development, including stack and turbine hall, will be clearly visible within the view, forming the most prominent features. The structures will be viewed at approximately 3.5 km distance resulting in a small change to the view. The impact will be long term and reversible.		
Magnitude of impact at operation		Low
Significance of effect at operation	Road users	Minor adverse (not significant)

Viewpoint 14: Haddelsey Road/ Main Street, Birkin				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
453069, 426825	Residential	10	4.7	South east
Visual susceptibility to change (2016-2022 existing and future baseline)		Value of view (2016-2022 existing and future baseline)		Sensitivity of receptor (2016-2022 existing and future baseline)
View forms primary focus for residents at this location. Therefore susceptibility is considered to be high.		Typical view containing a number of detractors. Medium		Medium
Size/ scale, duration and reversibility of impact at construction				
Long distance views of construction activities, the majority of which will be viewed to the right of the existing coal-fired power station. Lower level activities will be screened by the woodland around the power station. Visibility of higher level activities will be dependent on intervening vegetation, although clear, uninterrupted views are available. The impact will be short term and reversible.				
Magnitude of impact at construction				Very low
Significance of effect at construction	Residential			Negligible adverse (not significant)
Size/ scale, duration and reversibility of impact at opening				
Long distance views of the Proposed Development will be visible, viewed to the right of the existing coal-fired power station. Where intervening vegetation allows, views of taller structures will be clear and direct, although at a long distance. The impact will be short term and reversible.				
Magnitude of impact at opening				Very low
Significance of effect at opening	Residential			Negligible adverse (not significant)
Visual susceptibility to change at operation (2037 future baseline)	Value of view (2037 future baseline)		Sensitivity of receptor (2037 future baseline)	
There is no change to susceptibility at this assessment scenario. Therefore susceptibility is considered to be high.	Typical view containing a number of detractors. Medium		Medium	
Size/ scale, duration and reversibility of impact at operation				
Long distance views of the Proposed Development will be visible. Where intervening vegetation allows, views of taller structures will be clear and direct viewed on the horizon against the skyline, although at a long distance. The impact will be long term and reversible.				

Magnitude of impact at operation		Low
Significance of effect at operation	Residential	Minor adverse (not significant)

Sequential Views

- 16.7.20 Users of the main transport routes and long distance trails will gain dynamic views towards the Site to varying degrees dependent on intervening structures, screening vegetation, elevation and direction of travel. Due to the height of the tallest structure within the Site (the stack, with a maximum height of 90 m) these receptors will gain a wide variety of views, dependent upon the proximity to the Proposed Development, and direction of travel.
- 16.7.21 The M62 is orientated in an east to west direction through mainly agricultural land with road side vegetation occasionally limiting views beyond the road corridor. The value of the view is considered to be medium. Views of the Proposed Development will fall within side views from the road and susceptibility to change is considered low. Overall sensitivity to change is considered to be **low**. Users of the M62, travelling in both directions, will gain views of the Proposed Development where not restricted by screening vegetation.
- 16.7.22 Views in proximity to the Proposed Development would be clear, although the lower sections of the structures are screened by the woodland around the coal stockyard bund. Magnitude of impact is therefore predicted to be **low** at construction and opening assessment scenarios resulting in a **negligible adverse effect** (not significant) that is short term and reversible.
- 16.7.23 As a result of the introduction of structures associated with a replacement power station at the operation assessment scenario, it is predicted that there would be a **medium** magnitude of impact resulting in a **minor adverse effect** (not significant) that is long term and reversible.
- 16.7.24 The East Coast Main Line, which is the closest rail line to the Site, is orientated in a north west to south direction through agricultural land with some screening vegetation and value of the view from it is considered to be medium. Views of the Proposed Development will fall within forward views from the north to side views in proximity to the Site. Susceptibility is considered to be medium with overall sensitivity to change considered to be **medium**.
- 16.7.25 Views from the trains will be intermittent as a result of intervening vegetation and occasional structures. Views of Drax Power Station will also be visible along the route. Views closest to the Proposed Development will be restricted as the line is in cutting at this point. Magnitude of impact is therefore predicted to be **low** at all assessment scenarios resulting in a **minor adverse effect** (not significant) that ranges from short to long term and that is reversible.
- 16.7.26 The waterways within the study area are generally located within agricultural land with land intervening vegetation and landform occasionally limiting views. The value of the view is considered medium. The direction of views ranges along the different waterways and susceptibility is considered to be high. Overall sensitivity is considered to be **high**. Views in proximity of the Proposed Development will be either restricted by flood embankments or partially screened by intervening vegetation from the woodland located around the coal stockyard. Views for these receptors will be similar to that reported in the assessment for viewpoint 11. Where views are available, views of the Proposed Development will be restricted at construction and opening assessment scenarios, as a result of screening from the

existing coal-fired power station structures. For operation, views of the structures associated with the Proposed Development will be more available.

- 16.7.27 Magnitude of impact for views in proximity of the Site are therefore predicted to be **very low** during construction and opening assessment scenarios, resulting in a minor adverse effect (not significant) that is short term and reversible and a **low** impact during operation, resulting in a **moderate adverse effect** (significant) that is long term and reversible. For views further afield, it is predicted that the magnitude of impact for all assessment scenarios would be low, resulting in a minor adverse effect (not significant) that ranges from short to long term and that is reversible.

Table 16.11 Summary of effects on visual amenity

Receptor reference	Receptor location	Receptor type	Significance of effect		
			Construction	Opening	Operation
1	Selby Road (north), Eggborough	Road users	Minor adverse (not significant)	Negligible adverse (not significant)	Moderate adverse (significant)
		Residential	Moderate adverse (significant)	Minor adverse (not significant)	Moderate adverse (significant)
2	Selby Road (south), Eggborough	Residential	Negligible adverse (not significant)	Negligible adverse (not significant)	Minor adverse (not significant)
3	Weeland Road	Road users	Moderate adverse (significant)	Moderate adverse (significant)	Major adverse (significant)
		Residential	Major adverse (significant)	Major adverse (significant)	Major adverse (significant)
4	Selby Road, Whitley	Residential	Minor adverse (not significant)	Minor adverse (not significant)	Minor adverse (not significant)
5	Gallows Hill	Residential	Moderate adverse (significant)	Minor adverse (not significant)	Moderate adverse (significant)
6	Ings Lane PRoW 35.36/1/1	Users of PRoW, road users	Major adverse (significant)	Major adverse (significant)	Major adverse (significant)
7	St John the Baptist Church Grounds, Millfield Road, Chapel Haddlesey	Residents and church users	Minor adverse (not significant)	Minor adverse (not significant)	Moderate adverse (significant)
8	Trans Pennine Trail PRoW 35.14/15/1, Burn Airfield	Users of PRoW and Burn Airfield	Minor adverse (not significant)	Minor adverse (not significant)	Minor adverse (not significant)
9	Mill Lane, Brayton	Road users	Negligible adverse (not significant)	Negligible adverse (not significant)	Minor adverse (not significant)
		Residential	Minor adverse (not significant)	Minor adverse (not significant)	Moderate adverse

Receptor reference	Receptor location	Receptor type	Significance of effect		
			Construction	Opening	Operation
			significant)	significant)	(significant)
10	West Lane, Burn	Road users	Moderate adverse (significant)	Moderate adverse (significant)	Minor adverse (not significant)
11	Selby Canal viewing platform PRoW 35.72/2/1	PRoW and canal users	Minor adverse (not significant)	Minor adverse (not significant)	Minor adverse (not significant)
12	Manor Garth, Kellington	Residential and school grounds	Negligible adverse (not significant)	Negligible adverse (not significant)	Minor adverse (not significant)
13	Beal Lane, Beal	Residential, road users	Minor adverse (not significant)	Minor adverse (not significant)	Minor adverse (not significant)
14	Haddlesey Road/ Main Street, Birkin	Residential	Negligible adverse (significant)	Negligible adverse (significant)	Minor adverse (not significant)

Decommissioning

- 16.7.28 The impacts on landscape character and visual amenity arising as a result of decommissioning of the Proposed Development are considered (using professional judgement) to be similar to those identified at the operation stage of the Proposed Development. For landscape this is as a result of the scale and nature of the development in relation to the existing industrial structures and complexes present in the wider landscape and the large scale of the landscape character areas. For visual amenity this is as a result of the visibility of decommissioning and demolition activities not being prominent for the majority of viewpoints as a result of long distance views, intervening vegetation and the presence of mature screen planting around the AGI.

16.8 Mitigation and Enhancement Measures

- 16.8.1 Significant adverse visual effects have been assessed for a number of representative viewpoints, as follows:
- Viewpoint 1 (Selby Road (north), Eggborough) during construction and operation assessment scenarios;
 - Viewpoint 3 (Weeland Road) during construction, opening and operation assessment scenarios;
 - Viewpoint 5 (Gallows Hill) during construction and operation assessment scenarios;
 - Viewpoint 6 (Ings Lane PRow 35.36/1/1) during construction, opening and operation assessment scenarios;
 - Viewpoint 7 (St John the Baptist Church Grounds, Millfield Road, Chapel Haddlesey) during operation assessment scenario;
 - Viewpoint 9 (Brayton) during operation assessment scenarios; and
 - Viewpoint 10 (West Lane, Burn) during construction and opening assessment scenarios.
- 16.8.2 Section 2.65 of NPS EN-2 (DECC, 2011b) states that *'It is not possible to eliminate the visual impacts associated with a fossil fuel generating station. Mitigation is therefore to reduce the visual intrusion of the buildings in the landscape and minimise impact on visual amenity as far as reasonably practicable'*.
- 16.8.3 The only potential mitigation that has been identified is for the effects on Viewpoint 3 (Weeland Road) during the operation stage. Offsite planting (within the boundaries of the affected properties) could be offered to residents of properties at the junction of Hazel Old Lane and Weeland Road to assist in reducing the visibility of the Proposed Development, but this will be subject to discussions with the land owners and is not therefore considered in this assessment as proposed mitigation.

16.9 Limitations or Difficulties

- 16.9.1 The technical difficulties in or limitations on carrying out the landscape and visual impact assessment are detailed below.
- 16.9.2 The field visit was conducted on 29th September 2016 and so a comparison of visibility of visual effects over four seasons or during a wide range of light and weather conditions has not yet been possible. The field visit was undertaken with trees having full leaf cover, although the assessment was carried out on the assumption of no leaf cover to aim to represent a 'worst

case' scenario. Private land outside of the control of Eggborough Power Limit (the Applicant) was not accessed. This is good practice and has not affected the appropriateness of the viewpoints selected nor the robustness of the assessment.

- 16.9.3 Guidance (Landscape Institute and IEMA, 2013) suggests that consideration be given to seasonal variation in effects where appropriate but acknowledges that the timing of the assessment may mean that this is not practical.
- 16.9.4 A further site visit will be undertaken during the winter months when there is no leaf cover and where there are important differences between seasonal views this will be indicated in and taken into consideration in reaching conclusions. Winter viewpoint photography will also be taken, and this will inform the preparation of the final ES to support the DCO application.
- 16.9.5 An assessment of the impacts of light pollution as required by NPS EN-1 has not been carried out within this PIER as the Lighting Strategy has not yet been prepared. The Lighting Strategy and the approach to necessary lighting of the Proposed Development will be appropriately assessed as part of the ES.
- 16.9.6 During the consultation process a number of alternative or additional viewpoints have been raised by NYCC and East Riding of Yorkshire Council. A number of these potential locations have not yet been visited, although the viewpoints that have been included within the assessment were based on representative views from where the receptor was considered the most sensitive (based on professional judgement). The inclusion of the additional or alternative viewpoints in the final ES will be considered once a further site visit has been undertaken.
- 16.9.7 The potential for visible plumes from the CCGT stacks or peaking plant stacks is considered to be very low as a result of the water content and temperature of the flue gas. No assessment of the potential landscape and visual impacts associated with potential visible plumes associated with the proposed cooling towers has been undertaken as they are not expected to generate a visible plume under most meteorological conditions. If wet cooling towers were to be used, these would likely result in more significant visible plumes being generated than the use of hybrid cooling. As set out in Chapter 8: Air Quality, the choice of cooling technology will be subject to a Best Available Technology (BAT) justification to be agreed with the Environment Agency. If wet cooling were to be selected as BAT, then a visible plume assessment would be undertaken.

16.10 Residual Effects and Conclusions

- 16.10.1 The assessment has determined that the Proposed Development is likely to result in a significant adverse effect on visual amenity at the construction stage from Viewpoints 1 (northern edge of Eggborough), 3 (Weeland Road), 5 (Gallows Hill), 6 (Ings Lane), 7 (Chapel Haddlesley) and 11 (West Haddlesley) as a result of the close distance and lack of intervening vegetation.
- 16.10.2 Mitigation measures are to be offered to residential properties in relation to Viewpoint 3.. The assessed effects in relation to this viewpoint could be reduced over time if planting took place. This assessment has assumed that the planting may not be delivered and therefore the residual effects remain as per the main assessment.

16.10.3 As no mitigation measures are to be implemented for the viewpoints detailed above, these effects will remain.

16.10.4 A summary of significant landscape and visual effects is presented in Table 16.12.

Table 16.12: Summary of significant effects

Development stage	Environmental effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/enhancement (if identified)	Classification of residual effect after mitigation	Nature of effect(s) (Lt/ Mt/ St and P/ T and D/ In)
Construction	Impact on visual amenity to residents at Viewpoint 1 during construction activities	Moderate adverse (significant)	None	Moderate adverse (significant)	St/T/D
Construction	Impact on visual amenity to road users at Viewpoint 3 during construction activities	Moderate adverse (significant)	None assumed to take place (although offer further screen planting to rear of properties to assist with screening of views)	Moderate adverse (significant)	St/T/D
Construction	Impact on visual amenity to residents at Viewpoint 3 during construction activities	Major adverse (significant)	None assumed to take place (although offer further screen planting to rear of properties to assist with screening of views)	Major adverse (significant)	St/T/D
Construction	Impact on visual amenity to residents at Viewpoint 5 during construction activities	Moderate adverse (significant)	None	Moderate adverse (significant)	St/T/D
Construction	Impact on visual amenity to footpath	Major adverse	None	Major adverse	St/T/D

Development stage	Environmental effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/enhancement (if identified)	Classification of residual effect after mitigation	Nature of effect(s) (Lt/ Mt/ St and P/ T and D/ In)
	and road users at Viewpoint 6 during construction activities	(significant)		(significant)	
Construction	Impact on visual amenity to road users at Viewpoint 10 during construction activities	Moderate adverse (significant)	None	Moderate adverse (significant)	St/T/D
Opening	Impact on visual amenity to road users at Viewpoint 3 during opening	Moderate adverse (significant)	None assumed to take place (although offer further screen planting to rear of properties to assist with screening of views	Moderate adverse (significant)	St/T/D
Opening	Impact on visual amenity to residents at Viewpoint 3 during opening	Major adverse (significant)	None assumed to take place (although offer further screen planting to rear of properties to assist with screening of views	Major adverse (significant)	St/T/D
Opening	Impact on visual amenity to footpath and road users at Viewpoint 6 during	Major adverse (significant)	None	Major adverse (significant)	St/T/D

Development stage	Environmental effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/enhancement (if identified)	Classification of residual effect after mitigation	Nature of effect(s) (Lt/ Mt/ St and P/ T and D/ In)
	opening				
Opening	Impact on visual amenity to road users at Viewpoint 10 during opening	Moderate adverse (significant)	None	Moderate adverse (significant)	St/T/D
Operation	Impact on visual amenity to residents at Viewpoint 1 during operation	Major adverse (significant)	None	Major adverse (significant)	Lt/P/D
Operation	Impact on visual amenity to road users at Viewpoint 1 during operation	Moderate adverse (significant)	None	Moderate adverse (significant)	Lt/P/D
Operation	Impact on visual amenity to road users at Viewpoint 3 during operation	Major adverse (significant)	None assumed to take place (although offer further screen planting to rear of properties to assist with screening of views)	Major adverse (significant)	Lt/P/D
Operation	Impact on visual amenity to residents at Viewpoint 3 during operation	Major adverse (significant)	None assumed to take place (although offer further screen planting to rear of properties to	Major adverse (significant)	Lt/P/D

Development stage	Environmental effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/enhancement (if identified)	Classification of residual effect after mitigation	Nature of effect(s) (Lt/ Mt/ St and P/ T and D/ In)
			assist with screening of views		
Operation	Impact on visual amenity to residents at Viewpoint 5 during operation	Moderate adverse (significant)	None	Moderate adverse (significant)	Lt/P/D
Operation	Impact on visual amenity to footpath and road users at Viewpoint 6 during operation	Major adverse (significant)	None	Major adverse (significant)	Lt/P/D
Operation	Impact on visual amenity to residents and church users at Viewpoint 7 during operation	Moderate adverse (significant)	None	Moderate adverse (significant)	Lt/P/D
Operation	Impact on visual amenity to residents at Viewpoint 9 during operation	Moderate adverse (significant)	None	Moderate adverse (significant)	Lt/P/D
Decommissioning	Impact on visual amenity to residents at Viewpoint 1 during	Major adverse (significant)	None	Major adverse (significant)	St/T/D

Development stage	Environmental effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/ enhancement (if identified)	Classification of residual effect after mitigation	Nature of effect(s) (Lt/ Mt/ St and P/ T and D/ In)
	decommissioning				
Decommissioning	Impact on visual amenity to road users at Viewpoint 1 during decommissioning	Moderate adverse (significant)	None	Moderate adverse (significant)	St/T/D
Decommissioning	Impact on visual amenity to residents at Viewpoint 3 during decommissioning	Major adverse (significant)	None assumed to take place (although offer further screen planting to rear of properties to assist with screening of views	Major adverse (significant)	St/T/D
Decommissioning	Impact on visual amenity to road users at Viewpoint 3 during decommissioning	Major adverse (significant)	None assumed to take place (although offer further screen planting to rear of properties to assist with screening of views	Major adverse (significant)	St/T/D
Decommissioning	Impact on visual amenity to residents at Viewpoint 5 during decommissioning	Moderate adverse (significant)	None	Moderate adverse (significant)	St/T/D
Decommissioning	Impact on visual amenity to footpath	Major adverse (significant)	None	Major adverse (significant)	St/T/D

Development stage	Environmental effect (following development design and impact avoidance measures)	Classification of effect prior to mitigation	Mitigation/enhancement (if identified)	Classification of residual effect after mitigation	Nature of effect(s) (Lt/ Mt/ St and P/ T and D/ In)
	and road users at Viewpoint 6 during decommissioning				
Decommissioning	Impact on visual amenity to residents and church users at Viewpoint 7 during decommissioning	Moderate adverse (significant)	None	Moderate adverse (significant)	St/T/D
Decommissioning	Impact on visual amenity to residents at Viewpoint 9 during opening	Moderate adverse (significant)	None	Moderate adverse (significant)	St/T/D

Note: Lt = long term, Mt = medium term, St = short term, P = permanent, T = temporary, D = direct and In = indirect.

16.11 References

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17.0 WASTE MANAGEMENT

17.1 Introduction

- 17.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential effects of the proposed Combined Cycle Gas Turbine (CCGT) power station near Eggborough, North Yorkshire (hereafter referred to as the 'Proposed Development') on waste management.
- 17.1.2 The scope of the waste management assessment comprises hazardous and non-hazardous waste generated during the construction and operation phases only. Assessment of waste associated with the decommissioning of the Proposed Development (in 2047 or later) has been scoped out of the assessment because of the number of uncertainties including changes in waste policies and facilities between now and 2047.
- 17.1.3 The demolition of the existing coal-fired power station is a separate project and does not form part of the Proposed Development. However, given the potential for overlap in timescales, and because both projects are within the control of Eggborough Power Limited (EPL) (the Applicant), the waste effects arising from both projects are considered in this assessment.

17.2 Legislation and Planning Policy Context

National Legislation and Policy

Government Review of Waste Policy

- 17.2.2 The most recently published national waste strategy is the Government Review of Waste Policy 2011 (Department for Environment and Rural Affairs (Defra), 2011). The Government's principal commitments set out in this review include:
- prioritising efforts to manage waste in line with the waste hierarchy and reduce the carbon impact of waste;
 - developing a range of measures to encourage waste prevention and reuse, supporting greater resource efficiency;
 - developing voluntary approaches to cutting waste, increase recycling, and improve the overall quality of recyclate material, working closely with business sectors and the waste and material resources industry;
 - consulting on the case for higher packaging recovery targets for some key materials;
 - supporting energy from waste where appropriate, and for waste which cannot be recycled;
 - working to overcome the barriers to increasing the energy from waste which Anaerobic Digestion (AD) provides, as set out in the new AD strategy; and
 - consulting on restricting wood waste from landfill and review the case for restrictions on sending other materials to landfill.

Waste Management Plan for England

- 17.2.3 The Waste Management Plan for England (Defra, 2013a) (the Plan) is a high level document which is non-site specific. It draws on the Government Review of Waste Policy (Defra, 2011) and provides an analysis of the current waste management situation in England, evaluating how it will support implementation of the objectives and provisions of the revised Waste

Framework Directive (European Commission, 2008) (the Directive) as transposed in to UK legislation by way of the Waste (England and Wales) Regulations 2011 (as amended) (the 2011 Regulations).

17.2.4 This Plan sets out an overview of waste management in England to fulfil the revised Waste Framework Directive Article 28 mandatory requirements, and other required content as set out in Schedule 1 to the 2011 Regulations. The Plan, in conjunction with the Government Review of Waste Policy (Defra, 2011), the National Planning Policy for Waste (Department for Communities and Local Government (DCLG), 2014) meets the requirements of the Directive by providing:

- an analysis of the current waste management situation and the measures being taken to deliver the hierarchy of re-use, recycling, recovery and disposal of waste including an evaluation of how the plan will support the implementation of the objectives and provisions of the Directive;
- an analysis of the type, quantity and source of waste generated and the waste likely to be shipped from or to England along with an evaluation of the development of waste streams in the future;
- an overview of existing waste collection schemes and waste disposal and recovery installations, including any special arrangements for waste oils, hazardous waste or waste streams addressed by specific European Community legislation;
- an assessment of the need for new collection schemes, the closure of existing waste installations and the need for additional waste installation infrastructure in accordance with Article 16 (on the proximity principle) of the Directive, and, if necessary, the investments related thereto;
- sufficient information on the location criteria for site identification and on the capacity of future disposal or major recovery installations, if necessary; and
- general waste management policies, including planned waste management technologies and methods, or policies for waste posing specific management problems.

National Planning Policy for Waste

17.2.5 The National Planning Policy for Waste sets out the Government's ambition to work towards a more sustainable and efficient approach to resource use and management. Positive planning plays a pivotal role in delivering this country's waste ambitions through:

- delivery of sustainable development and resource efficiency, including provision of modern infrastructure, local employment opportunities and wider climate change benefits, by driving waste management up the waste hierarchy;
- ensuring that waste management is considered alongside other spatial planning concerns, such as housing and transport, recognising the positive contribution that waste management can make to the development of sustainable communities;
- providing a framework in which communities and businesses are engaged with and take more responsibility for their own waste, including by enabling waste to be disposed of or, in the case of mixed municipal waste from households, recovered, in line with the proximity principle;
- helping to secure the re-use, recovery or disposal of waste without endangering human health and without harming the environment; and
- ensuring the design and layout of new residential and commercial development and other infrastructure (such as safe and reliable transport links) complements sustainable waste

management, including the provision of appropriate storage and segregation facilities to facilitate high quality collections of waste.

- 17.2.6 This National Planning Policy for Waste sets out detailed waste planning policies. It should be read in conjunction with the National Planning Policy Framework (DCLG, 2012), the Waste Management Plan for England (Defra, 2013a) and National Policy Statements for Waste Water (Defra, 2012) and Hazardous Waste (Defra, 2013b), or any successor documents. All local planning authorities should have regard to its policies when discharging their responsibilities to the extent that they are appropriate to waste management.

Site Waste Management Regulations 2008

- 17.2.7 The Site Waste Management Plan Regulations 2008 (enacting Clause 54 of the Clean Neighbourhoods and Environment Act 2005) were revoked in December 2013. However, the main requirements of these Regulations which govern the management of construction waste are still considered best practice measure and many developers still prepare a Site Waste Management Plan (SWMP) to act as a guide to project / construction personnel on how to manage all types of waste, in accordance with best practice requirements.

- 17.2.8 A framework SWMP will be prepared as part of the framework Construction Environmental Management Plan (CEMP) which will be included within the final Environmental Statement to accompany the DCO application. Once appointed, the Principal Contractor will update this framework SWMP and CEMP appropriately throughout the duration of the project and both Eggborough Power Limited (EPL) (the Applicant) and the Principal Contractor will ensure that:

- all waste from the site is dealt with in accordance with the waste duty of care in Section 34 of the Environmental Protection Act 1990 (the Duty) and the 2011 Regulations; and
- materials will be handled efficiently and waste managed appropriately.

- 17.2.9 The key benefits of having a SWMP for the Principal Contractor and their sub-contractors include:

- providing a structured and forward thinking approach to waste management on site;
- assisting with compliance of internal quality and environmental management systems and associated performance targets;
- providing greater control of regulatory risks relating to virgin materials, waste storage, handling and disposal at a site level;
- providing greater transparency with interested parties including Local Authorities and the Environment Agency;
- identifying savings through improved resource efficiency, ordering, materials storage & handling to eliminate waste at source; and
- enhancing waste storage and segregation practices to facilitate higher recycling and recovery potential on site.

The 2011 Regulations

- 17.2.10 The Duty of Care related to waste management as directed by the Regulations 2011 state that anyone in possession of waste must:

- prevent illegal disposal, treatment or storage of waste;

- prevent the escape of wastes;
- ensure transfer of waste to an authorised person;
- provide an accurate written description of the waste in order to facilitate the compliance of others with the Duty and avoidance of the offences under Section 34 of the Environmental Protection Act 1990 via a compulsory system of Waste Information in respect of the transfer of controlled waste; and
- all those subject to the Duty should confirm conformance by others 'in the chain' to the requirements of the Duty to an extent which is 'reasonable in the circumstances', and all breaches of the Duty should be reported to the Environment Agency.

17.2.11 The 2011 Regulations also:

- require businesses to confirm that they have applied the waste management hierarchy when transferring waste and to include a declaration on their Waste Transfer Note or consignment note;
- requires businesses undertaking waste management activities such as import, production, collection, transportation, recovery and/ or disposal to take all reasonable measures to apply the following waste hierarchy –
 - prevention,
 - preparation for reuse,
 - recycling,
 - other recovery such as energy recovery,
 - and finally, disposal;
- introduce a two-tier system for waste carrier and broker registration, which includes those who carry their own waste, and introduces a new concept of a waste dealer;
- make amendments to hazardous waste controls and definition;
- exclude some categories of waste from waste controls, notably animal by-products whilst including a small number of radioactive waste materials; and
- require that local authorities who collect waste paper, metal, plastic or glass arrange to collect these waste streams separately.

Local Policy

North Yorkshire County Council, the City of York Council and North York Moors National Park Authority Minerals and Waste Joint Plan (draft plan published November 2016)

- 17.2.12 North Yorkshire County Council is the waste disposal authority for the Site. North Yorkshire County Council, City of York Council and the North York Moors National Park Authority are producing a minerals and waste joint plan which will cover the period up to 31 December 2030. Work on the minerals and waste joint plan started in May 2013.
- 17.2.13 The Publication Draft Plan represents the outcome of an extensive consultation process and was published in November 2016. Following a further statutory six week period in which representations can be made on matters of soundness and legal compliance with relevant legislation, it will be submitted, along with any proposed changes and other submission documents, for examination in public by an independent planning inspector. The current timetable anticipates that the Plan will be adopted in November 2017.

- 17.2.14 It is a statutory requirement for plans to be founded on robust and credible evidence. There is also a need to ensure that evidence gathering is proportionate and targeted at the issues to be addressed. An extensive evidence base of documents has been prepared and published by the Authorities, including estimates of waste arisings and capacity requirements.
- 17.2.15 The evidence base includes an assessment of likely future arisings to 31st December 2030 in relation to local authority collected waste, commercial and industrial waste, construction, demolition and excavation waste, hazardous waste, agricultural waste, local level non-nuclear industry radioactive waste and waste water / sewage sludge. These projections are set within the context of varying growth scenarios. The work was updated in 2016.
- 17.2.16 The Joint Plan includes policies relevant to the development of waste facilities, but does not include policies relevant to waste generation from other (non-waste) facilities.

Selby District Core Strategy (adopted October 2013)

- 17.2.17 The following policy in the Selby District Core Strategy (Selby District Council, 2013) relates to waste arising from developments:

"Policy SP18 Protecting and Enhancing the Environment

The high quality and local distinctiveness of the natural and manmade environment will be sustained by:...

8. Ensuring developments minimise energy and water consumption, the use of non-renewable resources, and the amount of waste material."

Yorkshire and Humber Waste Position Statement (February 2016)

- 17.2.18 This Waste Position Statement for Yorkshire and Humber (Yorkshire and Humber Waste Authorities, 2016) has been produced jointly by all seventeen Waste Planning Authorities in the Yorkshire and Humber area to help ensure appropriate coordination in planning for waste. In particular, it helps demonstrate the scale and range of waste infrastructure, as well as the extent to which movements of waste within and across the Yorkshire and Humber boundary play a role in the management of waste. The position statement also provides data on waste arisings and methods of management within the region.

North Yorkshire Waste Local Plan (Adopted 2006)

- 17.2.19 The North Yorkshire Waste Local Plan (North Yorkshire County Council, 2006) provides detailed policies and proposals that will guide waste related development in the County of North Yorkshire, outside the Yorkshire Dales and North York Moors National Parks, and the City of York.
- 17.2.20 The plan was due to expire on 17 May 2009, however some policies have been 'saved' until the policies being developed in the minerals and waste development framework supersede them.
- 17.2.21 The 'saved' policies will continue to form part of the statutory development plan and provide the local policy framework for development control decisions until they are replaced by ones in the North Yorkshire Minerals and Waste Plan.

- 17.2.22 The majority of saved policies relate to development of waste management facilities and hence are not relevant to the Proposed Development. Relevant saved policies include:

“Policy 5/1 Waste Minimisation

Proposals for major development should include a statement identifying the waste implications of the development and measures taken to minimise and manage the waste generated. Permission will not be granted where this has not been adequately addressed.

Policy 5/8 Temporary Recycling Facilities for the Recycling of Construction and Demolition Wastes

Proposals for the location of temporary facilities on or close to construction and demolition sites for the recovery, separation and where appropriate processing of waste materials generated by the on-site construction or demolition works will be permitted provided that:-

- a) the facilities are removed on completion of the construction and demolition project; and*
- b) the highway network and site access can satisfactorily accommodate the traffic generated; and*
- c) the proposal will not have an unacceptable impact on local amenity or the environment.”*

17.3 Assessment Methodology and Significance Criteria

- 17.3.1 This waste assessment identifies the likely types and quantities of waste that will be generated during the construction and operation of the Proposed Development. This Chapter describes the suitable management routes that are available for dealing with the waste that is generated and assess whether there are likely to be any significant impacts arising as a result of the Proposed Development.
- 17.3.2 The assessment also outlines mitigation measures that will be adopted to minimise waste generation; facilitate reuse or recycling of wastes; and prevent exposure to potentially harmful material and nuisance during the collection, temporary storage and transportation of wastes.
- 17.3.3 The waste assessment follows the structure set out below:
- baseline conditions are determined from published data sources to provide an estimate of the quantity and type of waste anticipated to be produced and the waste treatment capacity of the immediate area and surrounding region;
 - the type and volume of waste likely to be generated and the type and volumes of materials required by the Proposed Development during construction is estimated; and
 - the capacity of local and regional facilities in relation to the predicted quantity of waste produced is assessed and any necessary mitigation identified.

Impact Assessment and Significance Criteria

17.3.4 Assessment of waste management impacts does not follow the approach used for other topics of identifying receptors and determining their sensitivity. Instead, the magnitudes and significance of waste management effects are assessed by:

- establishing the baseline waste generation rate for the relevant planning area;
- estimating the likely types and quantities of waste that will be generated by the Proposed Development; and
- for each category of waste, comparing the likely waste arisings from the Proposed Development to the baseline waste arisings for the relevant area and calculating the likely percentage increase in waste arisings.

17.3.5 Identification of specific receptors and estimation of their significance is not appropriate for waste management effects because:

- waste producers have a legal duty of care to manage their waste in accordance with regulations and to ensure that any waste leaving the site of generation is transferred to a suitably licensed facility for further treatment or disposal;
- facilities transferring, treating or disposing of waste must be either licensed or apply for an exemption from a license, and impacts arising from the operation of waste management facilities are considered as part of the planning and permitting process for these facilities themselves; and
- good practice measures to mitigate any local impacts on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of waste will be adopted and are described in this Chapter. Any residual local impacts (e.g. noise and traffic) are addressed separately in the relevant chapters of this PEI Report.

17.3.6 In the absence of other guidance on assessing the effects of developments on waste management arisings, the significance criteria used within this assessment have been derived from previous AECOM experience and on the basis of professional judgement. These criteria are set out in Table 17.1. All effects are considered to be adverse, because the Proposed Development will be producing waste.

Table 17.1: Classification of effects

Effects	Criteria for effects of waste generated	Significance
Major adverse	Large increase in waste arisings greater than 5% of current baseline; potentially causing significant burden to the local and regional waste management infrastructure.	Significant
Moderate adverse	Moderate increase in waste arisings between 2% and 5% of current baseline; potentially causing moderate burden to the local and regional waste management infrastructure.	
Minor adverse	Minor increase in waste arisings between 0.1% and 1.9% of current baseline; causing a minor burden to the local and regional waste management infrastructure.	Not significant
Negligible adverse	Negligible increase in waste arisings less than 0.1% of current baseline; causing insignificant burden to the local and regional waste management infrastructure.	

Effects	Criteria for effects of waste generated	Significance
No effect	No waste generation	

- 17.3.7 For the purposes of this assessment, only moderate and major effects are considered to be significant.

Extent of Study Area

- 17.3.8 The Study Area for waste generation comprises the Site of the Proposed Development. The Study Area for waste management effects comprises the planning area for waste management, consisting of the North Yorkshire County Council, City of York Council and North York Moors National Park planning authority areas.

Sources of Information/Data

- 17.3.9 Sources of information are referenced in the text of the Chapter and include national, regional and local regulations and planning policies (including supporting documents); published benchmark information on waste arisings rates; and design information for the Proposed Development.

Consultation

- 17.3.10 Comments received to date from stakeholders relating to waste management are summarised in Table 17.2 below.

Table 17.2: Consultation summary table

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/how comments have been addressed
Secretary of State	September 2016 (Scoping Opinion)	<p>Estimated construction waste should be based on worst case assumptions in terms of the need to import material and the extent to which the material derived on site is suitable for re-use.</p> <p>Effects linked to waste such as impacts on air or water quality should be cross-referenced where appropriate.</p> <p>Account should be taken of materials to be removed from the Site and associated traffic movements.</p> <p>There is no reference to the need for SWMPs or materials management plans – such details</p>	<p>Estimated construction waste arisings are presented in Section 17.6 of this Chapter, based on available benchmark data.</p> <p>Cross-references are included in this Chapter.</p> <p>The transport assessment (see Chapter 14: Traffic and Transport) presents estimated construction traffic volumes.</p>

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		<p>should be reflected in the ES and supporting documents such as the CEMP.</p> <p>The Applicant should consider the extent to which the waste generation associated with the decommissioning and demolition of the existing power station could be factored into the waste management strategies for the Proposed Development (although it is acknowledged they are distinctly separate applications).</p> <p>It is acknowledged that there will be relatively little waste produced during the operation of the Proposed Development but the ES should provide a description of such wastes and how they are proposed to be managed.</p>	<p>The ES will include a framework SWMP as part of the framework CEMP. Chapter 12: Geology, Hydrogeology and Land Contamination also sets out the need for a Materials Management Plan to avoid impacts on the environment from the handling of potentially contaminated materials arising during construction.</p> <p>This chapter considers the potential for using common strategies for managing wastes from the Proposed Development and the existing coal-fired power station demolition.</p> <p>This chapter includes a description and assessment of anticipated operational wastes and proposed management.</p>
Public Health England	6 th September 2016 (letter to Planning Inspectorate)	<p>The EIA should demonstrate compliance with the waste hierarchy (e.g. with respect to re-use, recycling or recovery and disposal).</p> <p>The EIA should consider:</p> <ul style="list-style-type: none"> • the implications and wider environmental and public health impacts of different waste disposal options; and • disposal route(s) and transport 	<p>This chapter sets out the principles of the waste hierarchy, which will be implemented through the SWMP.</p> <p>Potential public health impacts associated with waste are assessed as part of the air quality and noise traffic assessments</p>

Consultee	Date (method of consultation)	Summary of consultee comments	Summary of response/ how comments have been addressed
		method(s) and how potential impacts on public health will be mitigated.	(see Chapters 8: Air Quality and 9: Noise and Vibration), dust assessment (Chapter 8: Air Quality) and land contamination assessment (Chapter 12: Geology, Hydrogeology and Land Contamination). Health effects are also summarised in Chapter 19: Human Health.

17.4 Baseline Conditions

Existing Baseline

- 17.4.1 The Waste Arisings and Capacity Requirements Update Report (Urban Vision, 2016), produced as part of the evidence base for the Minerals and Waste Joint Plan (North Yorkshire County Council, the City of York Council and North York Moors National Park Authority, 2016), describes the quantities of construction, demolition and excavation (CD&E) waste and hazardous waste currently generated within the North Yorkshire sub-region (comprising the North Yorkshire, City of York and North York Moors National Park planning authorities).
- 17.4.2 The estimated quantities of CD&E waste, under various growth scenarios, are shown in 3 below, with estimates based on actual 2014 data and a range of growth factors. This waste is managed by CD&E recycling facilities, and by inert and non-inert landfills. The Yorkshire and Humber Waste Planning Authorities' Waste Position Statement (2016) looks at the total waste managed within the region, including the level of landfill required and existing void space, and identifies that the Yorkshire and Humber Region has in overall terms sufficient landfill capacity to meet its own needs.

Table 17.3: Current and predicted CD&E waste arisings for North Yorkshire

Growth scenario	Quantity 2016, tonnes (predicted)	Quantity 2020, tonnes (predicted)	Quantity 2025, tonnes (predicted)	Quantity 2030, tonnes (predicted)
No growth	820,705	820,705	820,705	820,705
Growth	837,201	871,196	897,639	920,306
Minimised growth	820,705	820,705	820,705	820,705

- 17.4.3 The estimated quantities of hazardous waste, under various growth scenarios, are shown in Table 17.4 below. Hazardous waste management within the North Yorkshire Sub-region is confined to waste taken to Waste Electrical and Electronic Equipment (WEEE) treatment facilities. Remaining arisings are deposited at transfer stations for onward movement (for treatment and disposal) or are exported directly from the area. Hazardous waste facilities for most forms of treatment, incineration and for landfill are located outside the plan area and the Local Authorities anticipate that provision will continue and remain available throughout the plan period.

Table 17.4: Current and predicted hazardous waste arisings for North Yorkshire

Growth scenario	Quantity 2016, tonnes (predicted)	Quantity 2020, tonnes (predicted)	Quantity 2025, tonnes (predicted)	Quantity 2030, tonnes (predicted)
No growth	33,143	33,143	33,143	33,143
Growth	33,542	34,353	35,395	36,467
Minimised growth	33,143	33,143	33,143	33,143

- 17.4.4 Since the construction period for the Proposed Development is anticipated to run from early 2019 to 2022, the baseline is taken to be the lowest (no growth) arisings predicted for 2020. This represents a worst case assessment, since under this scenario the potential waste from the Proposed Development would represent a higher percentage of the region's waste arisings.

Future Baseline

- 17.4.5 The future baseline for the operational assessment is taken to be the estimated waste arisings for 2020, as described above.

17.5 Development Design and Impact Avoidance

- 17.5.1 Contractors will be encouraged to adopt good practice in construction waste management which will reduce the quantity of waste generated. The following approaches will be considered within the SWMP, where practicable, in order to minimise the quantities of waste requiring disposal:

- agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme;
- implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste;
- attention to material quantity requirements to avoid over-ordering and generation of waste materials;
- re-use of materials wherever feasible, e.g. re-use of excavated soil for landscaping and concrete crushing and re-use;
- segregation of waste at source where practical; and
- re-use and recycling of materials off-site where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing).

17.5.2 The following waste management measures will be considered within the SWMP, where practicable in order to minimise the likelihood of any localised impacts of waste on the surrounding environment:

- damping down of surfaces during spells of dry weather and brushing/ water spraying of heavily used hard surfaces/ access points across the Site as required;
- off-site prefabrication, where practical, including the use of prefabricated structural elements, cladding units, mechanical and electrical risers and packaged plant rooms;
- burning of waste or unwanted materials will not be permitted on Site;
- all hazardous materials including chemicals, cleaning agents and solvent containing products to be properly sealed in sealed containers at the end of each day prior to storage in appropriately protected and bunded storage areas;
- all demolition and construction workers will be required to use appropriate Personal Protective Equipment (PPE) whilst performing activities on-site;
- any waste effluent will be tested and where necessary, disposed of at the correctly licensed facility by a licensed specialist contractor/s; and
- materials requiring removal from the Site will transported using licensed carriers and records will be kept detailing the types and quantities of waste moved, and the destinations of this waste, in accordance with the relevant regulations.

17.5.3 A framework Construction Environmental Management Plan (CEMP) will be included with the Environmental Statement to support the DCO application and finalised by the contractor prior to the start of construction. This will be secured through a requirement in the DCO. The framework CEMP will include a framework SWMP, which will set out how waste will be managed during construction, and opportunities to re-use and recycle waste will be explored in accordance with the waste hierarchy.

17.5.4 Further information on measures to mitigate any effects on local air quality, noise and traffic (including those arising from waste) are included in Chapters 8: Air Quality, 9: Noise and Vibration, and 14: Traffic and Transport.

17.6 Likely Impacts and Effects

17.6.1 The quantities and types of waste that will be generated by the Proposed Development have been estimated, and compared to the baseline waste generation in the region.

17.6.2 Local impacts and effects associated with air quality, noise and traffic are included in Chapters 8: Air Quality, 9: Noise and Vibration, and 14: Traffic and Transport. This includes consideration of the routing of potential traffic movements for wastes leaving Site.

Construction

17.6.3 The first stage of construction of the Proposed Development will require demolition of some existing structures on site. It is anticipated that a large majority of this waste will comprise either metals or hard inert material (such as concrete) that will be suitable for recycling. Consideration will be given to crushing hard inert material on Site, in order to allow it to be reused within the Proposed Development.

17.6.4 Pre-demolition audits will be carried out to identify materials that are suitable for re-use and recycling, as well as any hazardous materials that will require controlled removal.

- 17.6.5 The current design indicates that the earthworks on the Site will be approximately balanced (such that the quantities of 'cut' material match the quantities of 'fill'). As a result, there is not expected to be a requirement to dispose of significant quantities of surplus excavation waste from the site. No significant quantities of contaminated materials are expected to be generated based on the available information (see Chapter 12: Geology, Hydrogeology and Land Contamination). All materials will be managed in accordance with a Materials Management Plan as set out in Chapter 12: Geology, Hydrogeology and Land Contamination.
- 17.6.6 The quantities and types of waste that will be generated from the demolition of existing structures within the Site and construction of the Proposed Development have been estimated, based on available benchmark data.
- 17.6.7 The quantities of waste generated during construction have been estimated using the Smartwaste waste benchmark data (Building Research Establishment, 2012) for industrial buildings, which are available based on either construction spend, or building floor area (see Table 17.5).

Table 17.5: Waste benchmarks

	Average m ³ / 100 m ²	Average m ³ / £100K
Industrial buildings	13.0	10.8

- 17.6.8 The benchmark value for m³ of waste per 100 m² of floor area has been used for this assessment, and is considered to represent a realistic worst-case estimate. Using the benchmark value based on project cost would give a misleadingly high estimate, since a large proportion of the capital cost of the project relates to the power generation and associated plant, which is manufactured off-site and is unlikely to generate significant quantities of on-site construction waste.
- 17.6.9 Based on the indicative concept layout, the total footprint for all structures is anticipated to be around 41,000 m².
- 17.6.10 Using this footprint area and the benchmark data for waste generation, the total estimated waste arisings are around 5,300 m³. Using a generic conversion factor of 1.5 tonnes/m³, this is equivalent to approximately 8,000 tonnes of construction waste.
- 17.6.11 It is not possible at this stage to accurately estimate the quantities of different wastes that will be generated. Provisional estimates have been made based on average composition data for construction waste from new-build industrial buildings published by WRAP (WRAP, 2009), and are shown in Table 17.6 below (numbers rounded to the nearest 10). These estimates relate to the quantities of waste generated, and not the quantities of waste requiring landfill disposal. It is expected that a significant proportion of the waste may be suitable for re-use or recycling, and this will be considered in the SWMP.

Table 17.6: Estimated waste types

Waste type	Average percentage composition	Estimated tonnes
Bricks	10%	770
Tiles and ceramics	0%	10

Waste type	Average percentage composition	Estimated tonnes
Concrete	44%	3,520
Inert	26%	2,090
Insulation	0%	30
Metals	3%	210
Packaging	2%	140
Gypsum	1%	80
Binders	0%	Less than 10
Plastics	0%	20
Timber	2%	170
Floor coverings (soft)	0%	Less than 10
Electrical and electronic equipment	0%	0
Furniture	0%	Less than 10
Canteen/office/adhoc	1%	50
Liquids	0%	-
Oils	0%	-
Asphalt and tar	2%	180
Hazardous	1%	60
Other	0%	-
Mixed	8%	670
TOTAL	100%	8,000

17.6.12 The relative contribution of construction waste from the Proposed Development compared to the estimated future baseline arisings for the region in 2020 are shown in Table 17.7 below.

Table 17.7: Waste arisings from the Proposed Development as a percentage of regional arisings

Waste type	Waste from Proposed Development, tonnes	Predicated 2020 waste quantities for 2020 (no growth scenario), tonnes	Waste from the Proposed Development as a percentage of North Yorkshire total
Construction waste	7,940	820,705	1%
Hazardous construction waste	60	33,143	0.18%

17.6.13 For both waste streams, there will be a minor increase in waste arisings between 0.1% and 1.0% of current baseline, causing only a minor burden to the local and regional waste management infrastructure. The impacts are therefore assessed to be not significant based on the significance criteria previously outlined.

17.6.14 It is possible that the decommissioning and demolition of the existing coal-fired power station – which is a separate project and does not form part of the Proposed Development – will occur at the same time as the construction of the Proposed Development. An additional assessment

has therefore been carried out which considers both the Proposed Development and the existing coal-fired power station demolition together, in order to estimate the cumulative effects of these two projects.

- 17.6.15 In relation to the demolition of the existing coal-fired power station it is assumed that all inert demolition waste (concrete and brick) will be crushed and re-used within the existing coal-fired power station site. Scrap and non-inert materials will be removed from the existing coal-fired power station site for recycling and/or disposal. Traffic impacts associated with demolition of the existing coal-fired power station are included in the transport assessment (see Chapter 14: Traffic and Transportation).
- 17.6.16 The estimated quantities of waste (including ground remediation work) from the demolition of the existing coal-fired power station are shown in Table 17.8 below.

Table 17.8: Waste arisings from the demolition of the existing coal-fired power station as a percentage of regional arisings

Waste type	Estimated arisings (m ³)	Assumed density ¹ (tonnes/m ³)	Estimated arisings (tonnes)
Demolition			
Metal	n/a	n/a	86,000
Inert waste (e.g. concrete, brick)	87,500	0.66	57,750
Non-hazardous waste	54,600	0.32	17,472
Hazardous waste (e.g. treated timber, asbestos)	18,650	0.28	5,222
Remediation			-
Inert waste (e.g. concrete, sub-base)	184,300	0.66	121,638
Hazardous waste (bituminous waste containing coal-tar)	11,600	0.9	10,440

- 17.6.17 The relative cumulative contribution of construction waste from the Proposed Development and demolition waste from the existing coal-fired power station demolition compared to the estimated future baseline arisings for the region in 2020 are shown in Table 17.9 below.

¹ Environment Agency density conversion factors, <https://www.sepa.org.uk/media/163323/uk-conversion-factors-for-waste.xlsx>

Table 17.9: Cumulative waste arisings from the Proposed Development construction and existing coal-fired power station demolition as a percentage of regional arisings

Waste type	Waste from Proposed Development construction, tonnes	Waste from coal-fired power station demolition, tonnes	Cumulative waste total, tonnes	Predicated 2020 waste quantities for 2020 (no growth scenario), tonnes	Cumulative waste as a percentage of North Yorkshire total
Construction waste, of which:	7,940	282,860	290,800	820,705	35%
Metal	210	86,000	86,210		
Inert waste	6,390	179,388	185,778		
Other non-hazardous waste	1,340	17,472	18,812		
Hazardous construction waste	60	15,662	15,722	33,143	47%

The cumulative waste generated from the two projects may potentially have a major adverse effect on regional waste infrastructure and may be significant. It should however be noted that both metal and inert waste are expected to have a high recycling rate (approaching 100% for metals, and potentially higher than 90% for inert waste), such that the quantities of non-hazardous construction waste requiring disposal are likely to be much smaller. Further assessment of the routes and capacity for management of hazardous construction waste associated with the demolition of the existing coal-fired power station will be undertaken as part of that project, as it could form a significant proportion of the regional hazardous waste arisings.

Opening/ Operation

- 17.6.18 During operation, the quantities of waste that will be generated are expected to be very small. In contrast to coal, the combustion of gas does not generate any solid residues which require disposal.
- 17.6.19 The estimated quantities of waste generated during operation comprise:
- 3 tonnes per year of general domestic waste, consisting predominantly of paper, cardboard and plastic; and
 - 12 tonnes per year of general industrial waste, consisting predominantly of paper, cardboard, plastic and wooden packaging material; worn and damaged metal items; various other materials such as stuffing box materials, gaskets etc; and a small amount of waste oil. Waste oil will be classified as hazardous waste, whereas the other waste is likely to be classified as non-hazardous.
- 17.6.20 These quantities of waste are negligible when compared to the predicted hazardous and non-hazardous waste arisings within the Minerals and Waste Joint Plan (North Yorkshire County

Council, the City of York Council and North York Moors National Park Authority, 2016) area. All operational waste will be dealt with in accordance with the 2011 Regulations and consigned via a registered waste carrier for treatment or disposal at a suitably licenced waste facility.

17.6.21 The operational phase effects are therefore assessed to be not significant.

Decommissioning

17.6.22 Waste generated during decommissioning of the Proposed Development has been scoped out of this assessment because:

- there is no information on waste policies, regional waste arisings or facilities that may be in place when the Proposed Development is decommissioned (2047 or later), and hence it is not possible to define a baseline;
- it is expected that any future decommissioning contractor will be required to comply with relevant legislation and policy at that time;
- the majority of materials generated during future decommissioning will comprise concrete and steel, both of which are likely to be recycled rather than disposed;
- there is no certainty on the timing or method of decommissioning, and hence it is not possible to determine the quantities or types of waste that may be generated.

17.7 Mitigation and Enhancement Measures

17.7.1 No further mitigation measures for waste management are required for the Proposed Development other than those identified in Section 17.5 Development Design and Impact Avoidance above.

17.7.2 Should the coal-fired power station demolition be carried out at the same time as the construction phase of the Proposed Development, there is the potential for significant adverse impacts on the regional capacity for managing construction waste, largely as a result of the coal-fired power station demolition project which is estimated to generate much larger quantities of waste than the Proposed Development. Potential mitigation measures for the coal-fired power station demolition may include on-site recycling of inert waste (for example by using on-site crushers to provide aggregate), and confirmation of management routes and capacity both regionally and nationally for hazardous construction wastes.

17.7.3 It may be possible and beneficial for a coordinated SWMP to be prepared for the construction of the Proposed Development and the demolition of the existing coal-fired power station, but as the timescales for the decommissioning and demolition of the existing coal-fired power station are still unknown, and the two projects are distinctly separate, EPL cannot commit to this at present.

17.8 Limitations or Difficulties

17.8.1 In the absence of detailed design information, estimates of construction waste arisings have been based on benchmark data for similar types of development. These benchmarks are considered to be sufficiently accurate to enable a robust assessment to be carried out.

17.9 Residual Effects and Conclusions

- 17.9.1 No significant residual effects with respect to waste management are anticipated for the Proposed Development when considered as a stand-alone project.

17.10 References

Building Research Establishment (2012) *BRE Waste Benchmark Data (26th June 2012)*
http://www.smartwaste.co.uk/filelibrary/benchmarks%20data/Waste_Benchmarks_for_new_build_projects_by_project_type_31_May_2012.pdf

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Department for Communities and Local Government (2014) *National Planning Policy for Waste*

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North Yorkshire County Council (2006) *North Yorkshire Waste Local Plan*

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Selby District Council (2013) *Core Strategy adopted October 2013*

Urban Vision for North Yorkshire County Council, Yorkshire Dales National Park, North York Moors National Park and City of York Council (2016) *Waste Arisings and Capacity Requirements Update Report, September 2016*

WRAP (2009) *Benchmarks and Baselines 2009, Construction Resources and Waste Programme*
<http://www.wrap.org.uk/sites/files/wrap/Benchmarks%20and%20baselines%202009.pdf>

Yorkshire and Humber Waste Planning Authorities (2016) *Yorkshire and Humber Waste Position Statement*

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18.0 SUSTAINABILITY AND CLIMATE CHANGE

18.1 Introduction

- 18.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential effects of the proposed Combined Cycle Gas Turbine (CCGT) power station near Eggborough, North Yorkshire (hereafter referred to as the 'Proposed Development') with regards sustainability and climate change.
- 18.1.2 The chapter considers national, regional and local policy guidance that promotes sustainability principles and addresses the impacts (and where appropriate proposed mitigation measures) of the Proposed Development.
- 18.1.3 It should be noted that this chapter addresses the in-combination effects of the key sustainability themes, due to the overlap between subject areas. Therefore many of the sustainability issues are also discussed within other specific chapters, due to overlap between subject areas, and relevant chapters are referenced where appropriate.
- 18.1.4 A carbon impact assessment, CHP assessment and CCR study will also be submitted with the DCO application.

18.2 Legislation and Planning Policy Context

Legislative Background

Climate Change Act 2008

- 18.2.2 A landmark piece of environmental legislation, the Climate Change Act 2008, sets a legally binding target for the UK to reduce its greenhouse gas emissions from 1990 levels by at least 80% by 2050. This overall target is supported by a system of binding five-year 'carbon budgets' as well as an independent body, the Committee on Climate Change.

Planning our electric future: a White Paper for secure, affordable and low carbon electricity, 2011

- 18.2.3 This White Paper (Department for Energy and Climate Change (DECC), 2011) identifies a number of 'unprecedented' challenges to power generation in the UK including threatened security of supply as existing coal-fired power stations closes, decarbonisation of electricity generation, likely rise in electricity demand, and expected rise in electricity prices. A strategy has been put forward and includes the introduction of an Emissions Performance Standard (EPS) proposed to be set as an annual limit equivalent to 450 grams of carbon dioxide (CO₂) per kilowatt hour at baseload.

Planning Policy Context

National Policy Statements for Energy

- 18.2.4 National Policy Statement (NPS) EN-1 (DECC, 2016a) emphasises 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 so ensure a more secure energy supply. The policy states that developers should consider opportunities for combined heat and power (CHP) and

that all commercial scale (at or over 300 MW) fossil fuelled generating stations have to be 'carbon capture ready'.

- 18.2.5 NPS EN-2 (DECC, 2016b) covers fossil fuel generating stations and the impacts specifically associated with these types of power generation, including land use, transport infrastructure, water resources and grid connection. Carbon capture readiness and CHP criteria are provided in this NPS.

Local Planning Policy

- 18.2.6 The Selby District Core Strategy Local Plan, adopted in 2013 (Selby District Council, 2013), provides a spatial vision for Selby District with strategic objectives and a development strategy. The Core Strategy policies replace a number of the policies set out within the Selby District Local Plan (2005).
- 18.2.7 The primary aims of the Core Strategy include the promotion of sustainable development, considering sustainable land use, the economy, energy efficiency and reducing carbon dioxide (CO₂) emissions. The Strategy requires all development to incorporate sustainable development principles, looking at sustainable construction for example with low carbon design, considering drainage systems. The Strategy recognises that the existing Drax and Eggborough power stations are important to providing energy to the country and states that *"clean coal technologies/ CCS [carbon capture and storage] will be generally supported in line with national policy, where appropriate alongside other lower carbon schemes and environmental improvement schemes at the District's power stations"*.

18.3 Assessment Methodology and Significance Criteria

Impact Assessment and Significance Criteria

- 18.3.1 There is no standard methodology for assessing the magnitude of sustainability impacts and significance of effects of proposed developments. Each project is evaluated according to its individual characteristics. The approach taken is to systematically and qualitatively consider the Proposed Development against relevant key sustainability themes and policy objectives. Measures are outlined, where feasible, that will be considered for implementation to incorporate and improve sustainability within the design and management. This is considered to be appropriate for the likely types of impact that may result from the Proposed Development.
- 18.3.2 The sustainability assessment provides a mechanism for considering the sustainability of the project as a whole and for integrating sustainability considerations throughout the lifecycle of the Proposed Development. It summarises the features and attributes of the Proposed Development that will contribute to or affect each of the sustainability themes, and sets out actions which could be taken during the design, construction and operation that would further assist in delivering sustainability benefits for the local and wider area.

Extent of Study Area

- 18.3.3 The sustainability assessment covers the Site plus the likely effects on the surrounding local environment.

Sources of Information/Data

- 18.3.4 Many of the sustainability issues are discussed within other specific chapters, due to overlap between subject areas, and therefore chapters are referenced below as relevant.

Consultation

- 18.3.5 No specific consultation has been undertaken and no specific EIA Scoping responses have been received in relation to Sustainability, although environmental benefit and energy security were recognised as key themes from the Stage 1 consultation feedback.
- 18.3.6 The Scoping Opinion (see Appendix 1B (PEI Report Volume III)) asks for clear reference to the sustainability criteria that the assessment of sustainability and climate change is made against. The Scoping Opinion highlights the need to cross-reference other sections of the report where sustainability principles are considered. The 'likely impacts and effects' section and the 'mitigation and enhancement measures' section of this chapter reference the sustainability criteria that the development has been assessed against. Other chapters have been cross-referenced where relevant.

18.4 Baseline Conditions

Existing Baseline

- 18.4.1 A description of the existing Site is provided in Chapter 3 (Description of the Site). The Proposed Development will replace the existing coal-fired power station site at Eggborough, and CCGT technology is a more efficient method of electricity production.
- 18.4.2 This chapter summarises and assesses the findings of a number of other assessments within the PEI Report. Baseline information can be found in the relevant chapters referenced throughout this assessment.

Future Baseline

- 18.4.3 Climate change has the potential to impact on the future baseline conditions for example, increased incidences of heavy and prolonged rainfall could increase flood risk from surface water, groundwater and drainage systems.
- 18.4.4 The existing coal-fired power station is anticipated to cease operation by the end of 2019.

18.5 Development Design and Impact Avoidance

- 18.5.1 The development design is based on Best Available Techniques (BAT) for CCGT plants, which act to minimise impacts on air quality, emissions, and energy and water use. The following section describes the specific sustainability impact avoidance measures incorporated into the design alongside the likely impacts associated with each stage of the development.

18.6 Likely Impacts and Effects

Construction

Reducing the Use of Natural Resources in Construction Materials

- 18.6.2 The selection of materials for the construction of the Proposed Development has been informed by sustainability principles, including the prudent and efficient use of natural resources and the use of re-used and recycled materials. A primary principle of sustainable procurement is to question the need/ requirement for the commodity in question.
- 18.6.3 To minimise the use of natural resources and unnecessary materials procured for the Proposed Development, suitable infrastructure already associated with the existing coal-fired power station will be re-used where possible; for example, the site access routes, internal roadways and existing gatehouse. Consideration is also being given to use of the existing rail infrastructure at the Site for delivery of construction materials. Re-using existing structures reduces the need for additional raw materials.
- 18.6.4 A Construction Environmental Management Plan (CEMP) will be prepared prior to commencing construction works on site; this will identify all best practice procedures, including environmental best practice such as the processing and re-use of all recovered materials onsite where practical. A framework CEMP will be submitted with the DCO application.
- 18.6.5 Following implementation of the above design measures, the Proposed Development is expected to result in no significant adverse effects due to the use of natural resources in construction materials.

Minimising Use of Greenfield land

- 18.6.6 The Proposed Power Plant Site is situated within the existing coal-fired power station site, avoiding the use of 'greenfield' land.
- 18.6.7 'Greenfield' land will be required for the Proposed Gas Connection to the National Grid gas transmission network to the north, but as the pipeline will be below ground the only permanent land take of 'greenfield' land will be at the site of the Proposed Above Ground Installation (AGI) at the connection point. The use of 'greenfield' land for the Proposed Gas Connection is unavoidable as the Proposed Development requires a connection to the National Grid gas transmission network, and the Proposed Gas Connection route has been designed to be as short and direct as possible.
- 18.6.8 The Proposed Development is considered to result in no significant adverse effects with regards the use of 'greenfield' land. Effects on land use and agriculture are assessed in Chapter 15: Land Use, Agriculture and Socio-Economics.

Flood Protection and Water Quality

- 18.6.9 Chapter 11: Water Resources, Flood Risk and Drainage of this PEI Report sets out the conclusions of the Flood Risk Assessment (FRA) (which is included at Appendix 11A (PEI Report Volume III), as well as water quality impacts.

- 18.6.10 The FRA for the Proposed Development concludes that development of the Site will not increase the risk of flooding from fluvial, groundwater or overland flow sources. The Proposed Power Plant Site, CCR Land and most of the Proposed Construction Laydown area are at low risk of flooding, but the northern part of the Proposed Construction Laydown area and parts of the Proposed Gas Connection corridor are at high risk of flooding.
- 18.6.11 Chapter 11: Water Resources, Flood Risk and Drainage states that site staff will be trained on procedures and guidance, including pollution plans, to reduce the risk of water pollution during the proposed construction works. It will be a contractual requirement of the contractor to ensure that runoff from the Site does not cause pollution or flooding. An Outline Drainage Strategy is set out in Annex 5 of the FRA (Appendix 11A, PEI Report Volume III). Construction drainage details will be developed in consultation with the Environment Agency prior to construction commencing.
- 18.6.12 Flood resilience measures will be incorporated into the Proposed Development to minimise damage and reduce recovery time. Measures have been identified for inclusion at construction stage to protect the Proposed Development in the event of flooding during operation – see the Operation section below for further details.
- 18.6.13 Following implementation of the above design measures, the likelihood of water contamination is low. Potential impacts on water quality, water supply, recreation and biodiversity in the water environment are found to be of low magnitude with minor adverse or negligible effects (not significant) (see Chapter 11: Water Resources, Flood Risk and Drainage, and also consideration of groundwater impacts in Chapter 12: Geology, Hydrogeology and Land Contamination).

Waste Management

- 18.6.14 Chapter 17: Waste Management summarises the assessment of impacts and effects from the Proposed Development and details of measures to minimise waste generation and follow the waste hierarchy. A Site Waste Management Plan (SWMP) will be developed as part of the Construction Environmental Management Plan (CEMP) to control site activities and minimise environmental impacts. Waste streams will be separated on-site and monitored. A framework SWMP will form part of the framework CEMP that will be included in the final ES to support the DCO application.
- 18.6.15 Following implementation of the above design measures, the Proposed Development is expected to result in low adverse or negligible effects (not significant) (see Chapter 17: Waste Management).

Transport

- 18.6.16 The traffic and transport assessment is considered in Chapter 14: Traffic and Transportation supported by a Transport Assessment at Appendix 14A (PEI Report Volume III). The air quality and noise assessments in Chapter 8: Air Quality and 9: Noise and Vibration also considers how transport affects air quality and noise receptors.
- 18.6.17 Chapter 14: Traffic and Transportation confirms that the change in total traffic associated with the Proposed Development is lower than the very low impact threshold of 30% on the A19, although the change on Wand Lane is greater than 90% (high impact) as currently this road has low levels of traffic. Overall the effect is considered minor adverse (not significant).

18.6.18 During the construction phase, Eggborough Power Limited (EPL) (the Applicant) will apply the following mitigation measures to manage construction traffic:

- a Construction Method Statement and Construction Environmental Management Plan (CEMP) will be prepared prior to construction to manage, amongst other aspects, noise, dust and particulates (a framework CEMP will also be included in the ES to support the DCO application);
- a Construction Worker Travel Plan will be prepared prior to construction to identify measures and procedures to reduce single-occupancy car use and encourage more sustainable forms of transport; and
- a Construction Traffic Management Plan will be prepared to identify measures to control the routing and impact that HGVs will have on the local road network during construction, for example to route HGVs to arrive and depart the site towards the M62 to avoid the local villages of Chapel Haddlesey and Burn where possible.

Biodiversity/ Ecology

18.6.19 Chapter 10: Ecology and Nature Conservation considers the potential impacts and associated effects of the Proposed Development on ecological receptors. Surveys have identified bats, great crested newt, badger, otter, fish, reptiles and nesting birds are (or may be) present within the study area (see Chapter 10: Ecology and Nature Conservation for the definition of the study area for each ecological receptor, which range from 250 m from the Site for ponds to 10 km for statutory designated nature conservation sites). All of these species are considered to be ecologically important at a Local level, with the exception of great crested newt which is considered to have District value.

18.6.20 There are also a number of habitats with Local value within the study area – semi-natural broadleaved woodland, plantation woodland, a water storage lagoon and a pond (both within the existing coal-fired power station site), Ings and Tethering Drain, the River Aire and hedgerows.

18.6.21 A range of impact avoidance measures are set out in Chapter 10: Ecology and Nature Conservation including:

- good environmental protection practice during construction to prevent surface and ground water pollution, dust and noise pollution, implemented through a CEMP;
- measures to protect fish welfare during the draw-down of the lagoon;
- inclusion of appropriate fish screens on the water intake from the River Aire;
- minimisation of land take from semi-natural habitats, including minimising the loss of trees within the existing coal-fired power station site;
- use of directional drilling to construct the Proposed Gas Connection beneath the River Aire and location of Proposed Cooling Water Connections at the existing intake and outfall locations to reduce impacts on the river;
- avoidance of trees and hedgerows along the Proposed Gas Connection corridor where possible and reinstatement where this is not possible;
- reinstatement of habitats facing temporary disturbance during construction;
- relocation of the proposed Above Ground Installation (AGI) to increase distance from a great crested newt breeding pond to avoid impacts on this species;
- precautionary methods during construction of the Proposed Cooling Water and Gas Connections to avoid impacts on grass snakes;

- clearance of vegetation outside the bird breeding season where possible (or appropriate checks prior to clearance where this is not possible); and
- reinstatement of habitats subject to temporary disturbance during construction.

18.6.22 A Landscape and Biodiversity Strategy will be prepared to support the DCO application, including setting out biodiversity enhancement and management prescriptions.

18.6.23 No significant effects on ecological receptors are predicted.

Job Creation

18.6.24 As well as environmental demands, sustainable development also considers the social and economic demands. The Proposed Development will result in the creation of jobs during the site enabling, construction, operation and decommissioning phases. It is expected to provide around 1,200 temporary jobs at the peak of the construction period. Further details of socio-economic impacts are presented in Chapter 15: Land Use, Agriculture and Socio-Economics.

Operation

Carbon Footprint

18.6.25 A carbon impact assessment will be undertaken and reported in the final ES to support the DCO application.

18.6.26 The indicative operational annual carbon footprint of the Proposed Development will be calculated using the Greenhouse Gas Protocol (World Resources Institute and World Business Council for Sustainable Development, 2005), which provides a methodology for calculating the carbon footprint of a project.

Minimising Use of Water

18.6.27 The Proposed Development incorporates a number of measures to conserve water during operation, which increases the Proposed Development's resilience to future temperature rises and potential droughts as a result of climate change. These may include re-use of rainwater, use of borehole water in preference to towns water, potential re-use of cooled boiler blowdown water and potential re-use of firewater (after treatment if required).

18.6.28 The cooling water demand of the Proposed Development will be significantly less than the cooling water demand of the existing coal-fired power station (less than half) due to the increased efficiency of the CCGT plant, therefore no significant effects are anticipated.

Flood Protection and Water Quality

18.6.29 Chapter 11: Water Resources, Flood Risk and Drainage sets out the conclusions of the Flood Risk Assessment (FRA) (which is included at Appendix 11A (PEI Report Volume III)) as well as measures to minimise water pollution. The FRA concludes that development of the Site will not increase the risk of flooding from fluvial, groundwater or overland flow sources.

18.6.30 The operators Environmental Management System (EMS) will include impact avoidance measures such as accidental pollution plans and provision of spillage kits, containment measures such as bunds.

18.6.31 An Outline Drainage Strategy has been produced as part of the FRA, this will be developed through detailed design and will incorporate features such as:

- Greenfield runoff rate restriction for surface water discharge from the Proposed Development achieved by on-site attenuation of surface water runoff;
- use of oil interceptors where appropriate; and
- use of SuDS techniques including swales, permeable paving and soakaways to attenuate flow of water will be considered at the detailed design stage.

18.6.32 Flood resilience measures will be incorporated into the Proposed Development to minimise damage and reduce recovery time. Consideration has been given to the effect of climate change on river levels, with placement of main plant and flood sensitive equipment above the River Aire 1 in 100 year flood level an allowance for climate change. Flood proofing measures such as resistant building materials and emergency response procedures have also been identified as possible options for inclusion, subject to detailed design.

18.6.33 Following implementation of the above design measures, the likelihood of water contamination is low. Potential impacts on water quality, water supply, recreation and biodiversity in the water environment are found to be of low magnitude with minor adverse or negligible effects (see Chapter 11: Water Resources, Flood Risk and Drainage).

Energy Efficiency

18.6.34 The design of the Proposed Development is based on Best Available Techniques (BAT) for CCGT plants. Modern CCGT power stations have an electrical efficiency of more than 60% which is considerably higher than the conventional coal, biomass, or oil-fired plant.

18.6.35 Elements of the plant's design that will help achieve this efficiency include:

- modern design following current best practices in optimising efficiency;
- high gas turbine combustion temperatures;
- triple pressure HRSGs;
- hybrid cooling towers instead of air cooled condensers;
- high efficiency motors will reduce parasitic loads;
- plant components sized appropriately for the design capacity of the plant;
- where possible variable speed drives will be included on all sizeable motors (such as boiler feed pumps and cooling water pumps) will reduce parasitic loads;
- plant to be designed to be CHP ready, to enable the use of heat from the plant and thus increase efficiency further; and
- insulation of hot surfaces.

18.6.36 The plant will also be subject to regular planned maintenance in order to optimise the efficiency of the equipment on site.

18.6.37 Following implementation of the above design measures, the Proposed Development is expected to result in no significant effects.

Air Quality

- 18.6.38 The Proposed Development will comply with the European Industrial Emissions Directive (IED) (European Commission, 2010). This means minimisation of the impact of emissions to air, soil, surface and ground water, to the environment and human health.
- 18.6.39 Chapter 8: Air Quality assesses the effect of emissions from the Proposed Development as negligible for most receptors, with the worst affected receptor being assessed as minor adverse. No significant effects on soil, surface water or groundwater are identified in Chapters 11: Water Resources, Flood Risk and Drainage and 12: Geology, Hydrogeology and Land Contamination.

Waste Reduction

- 18.6.40 Waste producers have a legal duty of care to manage their waste in accordance with the Waste Regulations (2011). Chapter 17: Waste Management includes good practice measures to mitigate local impacts water resources, air quality, noise or traffic resulting from waste management activities.
- 18.6.41 During operation, the amount of waste that will be generated is anticipated to be very small (mainly from office and maintenance activities). This is especially in contrast to the existing coal-fired power station as the combustion of gas does not generate any solid residues that require disposal. The quantity of waste, and therefore the overall effect, is expected to be negligible when compared to the predicted waste arisings within the Minerals and Waste Joint Plan (North Yorkshire County Council, the City of York Council and North York Moors National Park Authority, 2016) area (see Chapter 17: Waste Management).

Transport

- 18.6.42 The traffic and transport assessment is considered in Chapter 14: Traffic and Transportation supported by a Transport Assessment at Appendix 14A (PEI Report Volume III).
- 18.6.43 Chapter 14: Traffic and Transportation confirms that once operational there will be approximately 40 full-time staff working shifts and 30 corporate staff working normal office hours, which is conservatively estimated at 140 vehicle movements per day and deliveries are accounted for as maximum 4 HGVs per day. These traffic flows are considered very low and therefore during operation the overall effects are expected to be negligible adverse (not significant).

Biodiversity/ Ecology

- 18.6.44 Chapter 10: Ecology and Nature Conservation considers that there are no significant operational effects predicted and therefore there is no requirement for mitigation.

Job Creation

- 18.6.45 As well as environmental demands, sustainable development also considers the social and economic demands. As described above in relation to transport, the Proposed Development is anticipated to support around 70 full-time permanent jobs during operation. Temporary and contractor employees associated with maintenance activities will also be employed at the Site as required.

Decommissioning

- 18.6.46 EPL will provide a Decommissioning Environmental Management Plan (DEMP) prior to the commencement of decommissioning works, setting out measures to manage potential environmental impacts associated with decommissioning and demolition of the Proposed Development.

Water Use

- 18.6.47 EPL will endeavour to minimise water use of the decommissioning process. No significant water demand is anticipated and the effects are unlikely to be significant.

Energy Use

- 18.6.48 EPL will endeavour to maximise energy efficiency of the decommissioning process. No significant effects are anticipated.

Waste Reduction

- 18.6.49 The waste hierarchy will be followed and it is anticipated that a large proportion of the materials resulting from the demolition will be re-used or recycled. A record will be kept to demonstrate that the maximum level of recycling and reuse has been achieved. However, at this stage there is no certainty on the timing or method of decommissioning and hence it is not possible to determine the effects at present (see Chapter 17: Waste Management).

Transport

- 18.6.50 The traffic and transport assessment is considered in Chapter 14: Traffic and Transportation supported by a Transport Assessment at Appendix 14A (PEI Report Volume III). Traffic movements are expected to be associated with decommissioning; these are currently not known in detail but are expected to be no greater than those predicted for the construction period. It is considered that the overall effects of traffic in decommissioning would be negligible.

Biodiversity/ Ecology

- 18.6.51 Chapter 10: Ecology and Nature Conservation considers that there are no significant effects predicted as a result of decommissioning. An ecological walkover will be undertaken to inform the development of the DEMP, and any necessary ecological mitigation measures.

Water Quality and Flood Risk

- 18.6.52 The DEMP will include identification of measures to prevent water pollution during decommissioning. Chapter 11 finds that decommissioning impacts are expected to be limited to watercourses / groundwater bodies in close proximity to the Site and will therefore be the same as the construction impacts (low adverse or negligible effect) as summarised previously in this chapter.

18.7 Mitigation and Enhancement Measures

- 18.7.1 In addition to any potential impacts of the Proposed Development on climate change, climate change also has the potential to impact on the design and operation of the Proposed Development. Consequently, adaptation to climate change concerns how the Proposed Development avoids or reduces its exposure to the effects of future climate change, such as increased temperatures and flood risk.
- 18.7.2 EPL is committed to reducing their environmental impact and have an environmental policy with key policy principles around: integration of environmental factors into strategy; compliance with requirements; continuous improvement and review and reporting of environmental performance; prevention and control of pollution; plus training and recognition for effective environmental management.
- 18.7.3 The design, construction and operation of the Proposed Development will seek to mitigate the causes of climate change by contributing to reducing greenhouse gas emissions and adapting to the predicted impacts of climate change.
- 18.7.4 A CHP assessment will be undertaken to identify potential customers for heat from the Proposed Development, and the Proposed Development will be designed to be 'CHP ready'.
- 18.7.5 A CCR study will also be provided with the DCO application. NPS EN-1 (DECC, 2016a) requires relevant power stations (such as the Proposed Development) to set aside land such that the Proposed Development can be retrofitted with carbon capture and storage (CCS) equipment at some point in the future if the technology becomes technically and economically viable.

18.8 Limitations or Difficulties

- 18.8.1 The carbon assessment, CHP assessment and CCR study have not yet been completed to inform this assessment, but will be incorporated into the final ES to support the DCO application.

18.9 Residual Effects and Conclusions

- 18.9.1 The Proposed Development has several characteristics incorporated into its design, construction and management which meet the key sustainability requirements as set out in national, regional and local policy.
- 18.9.2 The design, construction and operation of the Proposed Development will seek to mitigate the causes of climate change by contributing to reducing greenhouse gas emissions associated with waste disposal and electricity generation and adapting to the predicted impacts of climate change.
- 18.9.3 The Proposed Development will provide a low carbon source of electricity.
- 18.9.4 There is also potential for the Proposed Development to incorporate CHP (the plant is designed to be 'CHP ready') in the future. This would represent further carbon savings as heat from the Proposed Development could be reused by other local developments, reducing the need for grid electricity or gas.

18.9.5 In addition, the Proposed Development will consider a number of design and operational measures to increase resilience to potential effects of climate change including the mitigation of potential flood risk.

18.9.6 No significant effects have been identified.

18.10 References

Department for Energy and Climate Change (2011) *Planning our electric future: a White Paper for secure, affordable and low carbon electricity*.

Department for Energy and Climate Change (2015) *2014 UK Greenhouse Gas Emissions, Provisional Figures (March 2015)*.

Department for Energy and Climate Change (2016a) *Overarching National Policy Statement (NPS) for Energy (EN-1)*.

Department for Energy and Climate Change (2016b) *National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2)*.

European Commission (2010) Directive 2010/75/EU on industrial emissions.

Selby District Council (2005) *Selby District Local Plan*.

Selby District Council (2013) *Selby District Core Strategy Local Plan*.

World Resources Institute and the World Business Council for Sustainable Development (2005) *Greenhouse Gas Protocol for Project Accounting*.

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19.0 HUMAN HEALTH

19.1 Introduction

- 19.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential effects of the proposed Combined Cycle Gas Turbine (CCGT) power station near Eggborough, North Yorkshire (hereafter referred to as the 'Proposed Development') on human health.
- 19.1.2 This assessment is predominantly a 'signposting' document, highlighting key aspects of the technical assessments completed and presented elsewhere in the PEI Report.
- 19.1.3 No figures are produced specifically for this chapter; rather figures produced for the purposes of other technical chapters of the PEIR have been referenced. These are provided in PEI Report Volume II.

19.2 Legislation and Planning Policy Context

Legislative Background

- 19.2.1 The effects on health that have been considered in this PEI Report relate primarily to those arising from emissions to air (Chapter 8: Air Quality), noise and vibration (Chapter 9: Noise and Vibration), traffic (Chapter 14: Traffic and Transport), emissions to water (Chapter 11: Water Resources, Flood Risk and Drainage), waste management (Chapter 17: Waste Management), land quality/ contamination (Chapter 12: Geology, Hydrogeology and Land Contamination) and socio-economics (Chapter 15: Land Use, Agriculture and Socio-Economics). The relevant legislation relating to each of these topics is presented in the respective chapters for these disciplines.

Planning Policy Context

National Planning Policy

- 19.2.2 Given that this assessment is a 'signposting' document, the planning policy related to health impacts is presented in each of the technical chapters described above and in Chapter 7: Legislative Context and Planning Policy Framework.
- 19.2.3 Key issues in the National Policy Statements relating to health are set out below.
- 19.2.4 The Overarching National Policy Statement for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011a) begins by describing the process of sustainability appraisal that the Policy Statement was subject to. In relation to positive effects of energy policy for health, EN-1 states:

"The energy NPSs are likely to ... have positive effects for health and well-being in the medium to longer term, through helping to secure affordable supplies of energy and minimising fuel poverty; positive medium and long term effects are also likely for equalities."
- 19.2.5 EN-1 also recognises that energy infrastructure can have negative effects for health, stating:

“There may also be cumulative negative effects on water quality, water resources, flood risk, coastal change and health at the regional or sub-regional levels depending upon location and the extent of clustering of new energy and other infrastructure. Proposed energy developments will still be subject to project level assessments, including Environmental Impact Assessment, and this will address locationally specific effects.”

19.2.6 Section 4.13 of EN-1 makes clear that:

“Energy production has the potential to impact on the health and well-being (“health”) of the population. Access to energy is clearly beneficial to society and to our health as a whole. However, the production, distribution and use of energy may have negative impacts on some people’s health...Direct impacts on health may include increased traffic, air or water pollution, dust, odour, hazardous waste and substances, noise, exposure to radiation, and increases in pests.”

19.2.7 The NPS also recognises that *“Open spaces, sports and recreational facilities all help to underpin people’s quality of life and have a vital role to play in promoting healthy living...Green infrastructure ... a network of multi-functional green spaces, both new and existing, both rural and urban, ... is integral to the health and quality of life of sustainable communities.”*

19.2.8 The National Policy Statement for Electricity Networks Infrastructure (EN-5) (DECC, 2011b) provides specific policy in relation to electromagnetic fields (EMF) and their known and potential effects on health, stating:

“All overhead power lines produce EMFs, and these tend to be highest directly under a line, and decrease to the sides at increasing distance. Although putting cables underground eliminates the electric field, they still produce magnetic fields, which are highest directly above the cable (see para 2.10.12). EMFs can have both direct and indirect effects on human health. The direct effects occur in terms of impacts on the central nervous system resulting in its normal functioning being affected. Indirect effects occur through electric charges building up on the surface of the body producing a microshock on contact with a grounded object, or vice versa, which, depending on the field strength and other exposure factors, can range from barely perceptible to being an annoyance or even painful.”

19.2.9 NPS EN-5 makes reference to health protection guidelines for public and occupational exposure which are further discussed below (see ‘Other Guidance’).

19.2.10 The National Planning Policy Framework (‘NPPF’) (Department for Communities and Local Government (DCLG), 2012) as described in Chapter 7: Legislative Context and Planning Policy Framework, contains policies that are relevant at a national level and are expanded upon and supported by the Planning Practice Guidance, published in March 2014 (DCLG, 2014).

19.2.11 Paragraph 3 of the NPPF makes it clear that the document does not contain specific policies for Nationally Significant Infrastructure Projects (NSIPs) such as the Proposed Development and that applications in relation to NSIPs are to be determined in accordance with the decision making framework set out in the Planning Act 2008 and relevant NPSs, as well as any other matters that are considered both important and relevant. However, paragraph 3 goes on to confirm that matters that can be considered to be both important and relevant to NSIPs may include the NPPF and the policies within it.

- 19.2.12 Policies of particular relevance to the scope of this chapter are those described in the relevant technical chapters (e.g. promoting sustainable transport described in Chapter 14: Traffic and Transportation), but more specifically, Part 8 relates to promoting healthy communities. It states that:

“The planning system can play an important role in facilitating social interaction and creating healthy, inclusive communities... Access to high quality open spaces and opportunities for sport and recreation can make an important contribution to the health and well-being of communities.”

Local Planning Policy

- 19.2.13 Local planning policy relevant to health is as described in chapters on emissions to air (Chapter 8: Air Quality), noise and vibration (Chapter 9: Noise and Vibration), traffic (Chapter 14: Traffic and Transport), emissions to water (Chapter 11: Water Resources, Flood Risk and Drainage), waste management (Chapter 17: Waste Management), land quality/ contamination (Chapter 12: Geology, Hydrogeology and Land Contamination) and socio-economics (Chapter 15: Land Use, Agriculture and Socio-Economics).
- 19.2.14 There are no local policies requiring health impact assessment on a project specific level.

Other Guidance

- 19.2.15 To prevent the known effects of EMF, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) developed health protection guidelines in 1998 (ICNIRP, 1988) for both public and occupational exposure which have been taken into account in assessing the potential for health effects related to EMF.

19.3 Assessment Methodology and Significance Criteria

Impact Assessment and Significance Criteria

- 19.3.1 With the exception of effects relating to EMF, this chapter only ‘signposts’ health-related effects described elsewhere in the PEI Report (chapters on emissions to air (Chapter 8: Air Quality), noise and vibration (Chapter 9: Noise and Vibration), traffic (Chapter 14: Traffic and Transport), emissions to water (Chapter 11: Water Resources, Flood Risk and Drainage), waste management (Chapter 17: Waste Management) and land quality/ contamination (Chapter 12: Geology, Hydrogeology and Land Contamination)).
- 19.3.2 The methodologies for these assessments, including identification of receptors and their sensitivity, identification of impacts and their magnitude, and assessment of effects, are set out in the relevant technical chapters.
- 19.3.3 Risks associated with EMF have been derived considering the advice provided by Public Health England (PHE) in their response to the Scoping Report (see Consultation section below). The Electric and Magnetic Fields and Health (EMFs) website has been used in order to gather information on the EMF risks associated with the types of infrastructure proposed. ICNIRP guidelines (ICNIRP, 1988) have been used as the reference for the recommended limits of exposure of the general public, following current Government policy.

19.3.4 The associated reference levels are summarised in Table 19.1 below.

Table 19.1: ICNIRP 1988 electric and magnetic fields reference levels

Reference levels	Electrical field	Magnetic field
Public exposure	5 kV/ m	100 μ T
Occupational exposure	10 kV/ m	500 μ T

Source: ICNIRP, EMF guidelines, Health Physics 74, 494-522 (1998)

19.3.5 The assessment of potential EMF-related effects does not follow the 'standard' EIA methodology of identifying the sensitivity of receptors and magnitude of effects to classify the effect using a matrix. Rather all human receptors located within the electrical field are identified and, with reference to the identified impact avoidance measures, effects are either considered to be significant or not significant.

19.3.6 Standardised terminology is used to describe the relative significance of effects throughout this PEI Report (unless stated otherwise in specific chapters). Effects are described as:

- adverse – detrimental or negative effect to a receptor group; or
- beneficial – advantageous or positive effect to a receptor group; and
- negligible – imperceptible effects to a receptor group;
- minor – slight, very short or highly localised effects of no significant consequence;
- moderate – more than a slight, very short or localised effect (by extent, duration or magnitude), which may be considered significant; or
- major – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

19.3.7 For the purposes of this assessment, moderate and major effects are deemed 'significant'.

Extent of Study Area

19.3.8 The definition of the Study Area relevant to each of the health-related assessments in Chapters 8: Air Quality, 9: Noise and Vibration, 14: Traffic and Transport, 11: Water Resources, Flood Risk and Drainage, 17: Waste Management, 12: Geology, Hydrogeology and Land Contamination, and 15: Land Use, Agriculture and Socio-Economics are set out in each chapter. The study areas are a function of the nature of the impacts and the locations of potentially affected receptors.

19.3.9 For the definition of the baseline for health of the local population in Section 19.4, the study area is as defined for the socio-economics assessment in Chapter 15: Land Use, Agriculture and Socio-Economics.

19.3.10 Health profiles produced by the PHE provide baseline data on the health of people within the local area, to compare with average values for all areas of England. Data for Selby District and surrounding local authorities including Leeds, Wakefield, Doncaster, East Riding of Yorkshire, York and Harrogate has been used. By virtue of the geographical scale of these datasets, they include a much broader population than is predicted to receive direct or indirect impacts

associated with the Proposed Development. This allows data for Selby (within which any impacts would be expected to occur) to be compared with other neighbouring authorities within the region, so that any particular local trends or inequalities can be more readily identified.

- 19.3.11 To determine the study area in respect of EMF, it is necessary to consider where exposure to EMF is likely, considering the Proposed Development. EMF comprises electric and magnetic fields, the magnitude of which is defined by the design characteristics of the sources. It is recognised that there are potential health impacts associated with electrical and magnetic fields around substations and the connecting cables and power lines.
- 19.3.12 As described in Chapter 4: The Proposed Development, the Proposed Development will comprise a CCGT power station and associated buildings, structures and plant, including new below ground electrical cables to connect to the existing National Grid 400 kV sub station within the existing Eggborough Power Station site. In addition, a smaller new sub station is proposed as shown on Figure 4.1a and Figure 4.1b in PEIR Volume II. No new overhead power lines are proposed.
- 19.3.13 The DECC voluntary Code of Practice on compliance with EMF guidelines (DECC, 2012b) advises that the Energy Networks Association will maintain a publicly-available list on its website of types of equipment where the design is such that it is not capable of exceeding the ICNIRP exposure guidelines. This obligation is implemented through the industry web site (www.emfs.info), which lists compliant equipment.
- 19.3.14 The usual way of expressing the field from an EMF source, and thereby determining the potential exposure area, is to show how the field reduces with distance. For large sub stations where 400 kV lines are switched and electricity is transformed down to the next voltage, 132 kV, it is reported that a receptor would need to be within metres or perhaps tens of metres of the perimeter to receive an elevated field (www.emfs.info). As the National Grid sub station already exists, there will be no new EMF effects associated with its use for the Proposed Development. For the smaller new sub station, it is reported that the field is usually only really elevated within a few metres of the perimeter, but to adopt a conservative approach, the study area in respect of the new sub station has been set at a 100 m radius.
- 19.3.15 In relation to the new sections of underground cables that will connect into the existing 400 kV sub station and proposed new 132 kV sub station, research suggests that underground cables do not produce any external electric fields and that ground-level magnetic fields from underground cables fall much more rapidly with distance than those from a corresponding overhead line. However, magnetic fields can be higher at small distances from the cable and, overall, fields reduce to background concentrations at distances of around 20 m. To adopt a conservative approach, the study area in respect of the underground cables has been set at a 50 m linear distance from the centre line of the cables, shown on Figure 4.1a and 4.1b in PEIR Volume II.

Sources of Information/ Data

- 19.3.16 The data sources and methods used in surveys are set out in each of the chapters on emissions to air (Chapter 8: Air Quality), noise and vibration (Chapter 9: Noise and Vibration), traffic (Chapter 14: Traffic and Transport), emissions to water (Chapter 11: Water Resources, Flood Risk and Drainage), waste management (Chapter 17: Waste Management), land quality/

contamination (Chapter 12: Geology, Hydrogeology and Land Contamination) and socio-economics (Chapter 15: Land Use, Agriculture and Socio-Economics).

- 19.3.17 The health profiles produced annually by PHE have been utilised in the assessment. Data for 2016 has been used, representing the most up to date information (PHE, 2016). Furthermore, data on five indicators of mental health has been sourced for the relevant Clinical Commissioning Areas in order to determine the baseline status of the population in this respect (PHE, 2016).

Consultation

- 19.3.18 Pursuant to the Planning Act 2008 and associated regulations, PHE is a statutory consultee for NSIP applications, such as the Proposed Development, that are likely to involve substances e.g. chemicals or radiation, that could potentially cause harm to people. The Centre for Radiation, Chemicals and Environmental Hazards (CRCE) coordinates a response to the Planning Inspectorate and Secretary of State on these issues.

- 19.3.19 The Scoping Opinion included a response from PHE, who stated that they:

“believe the summation of relevant issues into a specific section of the report provides a focus which ensures that public health is given adequate consideration. The section should summarise key information, risk assessments, proposed mitigation measures, conclusions and residual impacts relating to human health. Compliance with the requirements of National Policy Statements and relevant guidance and standards should also be highlighted.”

- 19.3.20 PHE also highlighted that assessments undertaken to inform the ES should be proportionate to the potential impacts of the proposal (with respect to health impacts) and that the rationale for the methodology of assessments (e.g. quantitative vs. qualitative or assessments scoped in vs. scoped out) should be fully explained in the ES.

- 19.3.21 Clarification was also sought on whether consideration would be given to possible health impacts of EMF stating that:

“the proposer should confirm either that the proposed development does include or impact upon any potential sources of EMF; or ensure that an adequate assessment of the possible impacts is undertaken and included in the ES.”

- 19.3.22 A detailed appendix outlining general areas that should be addressed by all promoters when preparing an ES for inclusion within an NSIP submission was also provided, setting out detailed advice in relation to each of the risks to human health, including EMF.

- 19.3.23 For each of the other technical assessments, where effects on health are considered, consultation has been undertaken with the relevant Local Authorities and Health Authorities, and the findings of the Scoping Opinion taken into account within the assessments. The consultation outcomes are set out in each of these chapters (Chapter 8: Air Quality, Chapter 9: Noise and Vibration, Chapter 14: Traffic and Transportation, Chapter 11: Water Resources, Flood Risk and Drainage, Chapter 17: Waste Management, Chapter 12: Geology, Hydrogeology and Land Contamination and Chapter 15: Land Use, Agriculture and Socio-Economics).

19.4 Baseline Conditions

Existing Baseline

- 19.4.1 This section considers the community profile in the study area (as defined for the socio-economics assessment in Chapter 15: Land Use, Agriculture and Socio-Economics including the current health and mental health status of the population.

Public Health

- 19.4.2 The location of the existing local population within a 2 km study area has been described earlier in this PEI Report (see Chapter 3: Description of the Site). This comprises a number of isolated residential properties, clusters of properties and villages in the area surrounding the Proposed Development. The towns of Knottingley and Selby lie approximately 5.7 km and 5.0 km to the west and north-east of the Proposed Development respectively.
- 19.4.3 Health profiles produced annually by PHE provide a summary of the health of people within local authority areas and a comparison of local health with average values for all areas of England. Health profiles for 2016 have been obtained for the local authority area of Selby, within which the Site is located, as well as those for surrounding local authorities including Harrogate, York, East Riding of Yorkshire, Leeds, Wakefield and Doncaster (PHE, 2016). These predominantly report data for the 2012 – 2014 period. In the absence of more recent published data, these are assumed to represent the ‘current baseline’.
- 19.4.4 These show that the Selby District Council area has the smallest population of the local authorities within the study area, with just 85,000 people resident. The average life expectancy for people living within Selby and surrounding local authorities varies when compared to the national average (see Table 19.2). In the Selby district, life expectancy for both men and women is similar to the national average.

Table 19.2: Life expectancy and health inequalities within Selby and surrounding local authority areas

Location	Population	Female average (years)	Male average (years)	Difference in life expectancy between most and least deprived areas (female years)	Difference in life expectancy between most and least deprived areas (male years)	Average
England	54,316,600	83.2	79.5			
Harrogate	157,000	84.3	81.1	-	5.2	-
York	204,000	83.5	80.1	5.1	6.5	5.8
Selby	85,000	83.7	79.9	5.5	4.1	4.8
East Riding of	337,000	83.2	80.3	4.6	6.4	5.5

Yorkshire						
Leeds	766,000	82.4	78.4	8.4	11.0	9.7
Wakefield	331,000	82.0	78.2	7.8	8.5	8.2
Doncaster	304,000	81.6	77.5	7.1	10.7	8.9

^a values at birth (2012-2014) sourced from the Health Profile for the individual local authority

- 19.4.5 Both the male and female average life expectancy values for Selby, Harrogate, York and East Riding of Yorkshire local authority areas shown in Table 19.2 are equal to or better than the average life expectancy for males and females in England as a whole.
- 19.4.6 By contrast, Leeds' female population has a life expectancy just 8 months less than the England average. However, Leeds' male population and the male and female populations of Wakefield and Doncaster have life expectancies 1 -2 years less than national average.
- 19.4.7 Within each local authority, health inequalities exist, marked by the variance in life expectancy for men and women in the most deprived, compared to the least deprived areas. Data available on health inequalities is reported. Where a dash (-) is shown in Table 19.3, data is not available.
- 19.4.8 The most deprived areas within Leeds City Council administrative area have an average life expectancy that is 11.0 years shorter for men in the least deprived areas compared to the most deprived areas. The equivalent difference for women is 8.4 years. The least marked disparities are found in the Selby District (4.1 years for men and 5.5 years for women), indicating that health inequalities are less apparent in the Selby District, compared to surrounding local authorities.
- 19.4.9 Various factors contribute to mortality and indices are reported for eight factors which can be used to determine health inequalities of a local area, when compared to national average and neighbouring authorities. These are presented in Table 19.3 below.
- 19.4.10 The health outcomes for people, when contrasted against the England average, show that the Selby District performs well for all indices measured, with the exception of death from road injuries and excess winter deaths. In respect of the latter, the Office for National Statistics (ONS, 2015) reports that respiratory diseases were the underlying cause of death in more than a third of all excess winter deaths in 2014/15 nationwide. Despite appearing high for Selby, the excess winter mortality index was joint lowest in Yorkshire and The Humber and Wales. Fuel poverty is often a key factor attributed to causes of winter deaths. However, it is reported that Selby has one of the lowest proportions of fuel poverty within North Yorkshire.

Table 19.3: Baseline mortality rates within Selby and surrounding local authority areas

Community	Infant Deaths ^a	Road injuries and deaths ^b	Suicide rate ^c	Early deaths: Drug misuse ^b	Deaths from Smoking ^d	Early Deaths: cardiovascular ^b	Early Death: Cancer ^b	Excess Winter Death ^e
England	4.0	39.3	10.0	3.4	274.8	75.7	141.5	15.6
Harrogate	4.2	67.0	9.4	X2	225.3	57.9	113.6	16.7
York	2.9	30.3	11.1	X2	284.8	69.4	140.0	14.9
Selby	2.9	62.2	X2	X2	266.8	75.5	135.3	21.5
East Riding of Yorkshire	2.8	56.1	9.1	X2	270.0	71.8	133.6	13.1
Leeds	3.6	40.8	10.3	3.7	340.2	89.1	160.2	18.1
Wakefield	3.8	43.8	9.5	3.7	330.6	86.9	162.1	17.0
Doncaster	4.7	37.7	10.3	6.8	371.1	89.4	177.3	19.4

^a rate per 1,000 live births 2012-2014 sourced from the Health Profile for the individual local authority.

^b values expressed as per 100,000 population

^c values expressed as per 100,000 population (aged 10+)

^d values expressed as per 100,000 population age 35+

^e ratio of excess winter deaths to average non-winter deaths Aug 11 – Jul 14.

X2 – value cannot be calculated as number of cases (13) is too small

- 19.4.11 A topic specific review of the health indicators within the local population is undertaken for administrative areas by Joint Strategic Needs Authorities. Selby lies within the scope of the North Yorkshire County Council (NYCC) Joint Strategic Needs Assessment (JSNA). The latest report on the health and well-being of the local population was published in 2014/2015 (Annual Update) (NYCC, 2015). This report largely confirms the data reported above. Additional data relating to non-mortality indices of health is presented in the report, including the prevalence of asthma and chronic obstructive pulmonary disease, for which prevalence information is based on quality and outcomes data. This showed the prevalence of both diseases as significantly higher than national average for Selby.

Mental Health

- 19.4.12 Eggborough is located within the Vale of York Clinical Commissioning Group. Data published on mental health within this, and surrounding Clinical Commissioning Group areas, is provided in Table 19.4 below (NYCC, 2015).

Table 19.4: Clinical Commissioning Group report on common mental health disorders

Clinical Commissioning Group	Socio-economic deprivation overall indices of multiple deprivation Score	People estimated to have any common mental health disorder ¹	Long term mental health problems among GP survey respondents
England	21.5	15.62	4.6
Harrogate and Rural District	10.4	13.36	4.2
Vale of York	12.5	12.90	4.4
Doncaster	30.2	15.46	4.5
East Riding of Yorkshire	16.2	12.33	3.1
Leeds South and East	34.3	18.78	4.7
Wakefield	26.0	17.28	5.1

¹. Estimated % of population aged 16 - 74

- 19.4.13 Table 19.4 shows that the Vale of York compares favourably in relation to mental health, when compared to national average statistics and to some neighbouring Clinical Commissioning Group areas. A lower percentage of the population (12.9 %) is estimated to have common mental health disorders, some 2.7 % lower than the national average (15.6 %) and almost 5.4 % lower than the neighbouring Leeds South and East area, where almost 19 % of the population are estimated to have common mental health disorders.
- 19.4.14 Those with long term mental health problems in the Vale of York area are also slightly less than the national average (4.4 % compared to a national average of 4.6 %), comparing similarly to neighbouring areas including Harrogate and Rural District and Doncaster. Only the East Riding of Yorkshire compares considerably better (3.1 %).

Future Baseline

- 19.4.15 'Future baseline' conditions are predicted for each topic in the relevant technical chapters of this PEI Report, whereby the conditions anticipated to prevail if the Proposed Development was not to be progressed are identified for comparison with the predicted conditions with the Proposed Development. For example, potential future changes in air quality, which may affect human health, are described in Chapter 11: Air Quality.
- 19.4.16 Chapter 15: Land Use, Agriculture and Socio-Economics assesses that population growth in the Direct Impact Area is expected to be positive up to 2037, with growth driven by the 65+ age bracket and the working age population dropping markedly, whilst in the 0 to 15 age group, a slight fall is predicted.

Public Health

- 19.4.17 Changes to public health and inequalities are not straightforward to predict. NYCC sets out its priorities for future health as follows:

"To improve and protect the nation's health and wellbeing, and improve the health of the poorest fastest."

- 19.4.18 There are two key outcomes measures for the whole public health system:

- increased healthy life expectancy, i.e. taking account of the health quality as well as the length of life; and
- reduced differences in life expectancy and healthy life expectancy between communities (through greater improvements in more disadvantaged communities).

- 19.4.19 No specific predictions for future baseline public health are available for the local area. However, the King's Fund (www.kingsfund.org.uk/time-to-think-differently/trends) publishes analysis of future trends in health nationally which can be used to provide broad statements about potential health changes expected in the medium to longer term within the region.
- 19.4.20 The Kings Fund reports that that life expectancy has increased dramatically over the previous century and is predicted to continue to increase. Whereas in 2012, men could expect to live for just over 79 years and women to 83 years, by 2032 this is expected to increase to 83 years and 87 years respectively. Healthy life expectancy is growing at a similar rate, suggesting that the extra years of life will not necessarily be years of ill health. However, it is noted that medical advances, future patterns of disease and population behaviour could all have a significant impact on life expectancy and either drive it up or down.
- 19.4.21 The Kings Fund predicts that the number of people with diseases will double over the next 20 years, for example, by 2030 there will be 3 million with cancer, but states that many diseases will be easier to treat.
- 19.4.22 It forecasts that significant health inequalities are likely to persist, with people in more deprived populations having higher rates of disease and more than one disease. It suggests that population lifestyles will be a critical determinant of future patterns of disease and as such, a change in population lifestyles offers the greatest opportunity to reduce the burden of chronic disease.

- 19.4.23 On this basis, future baseline conditions in 2019 - 2022 for public health are not anticipated to be significantly different to the existing baseline conditions, although within the local Direct Impact Area (reported in Chapter 15: Land Use, Agriculture and Socio-Economics), population growth is expected, with the highest growth increases being in the older population. This aligns with the national trend.
- 19.4.24 Future baseline conditions in 2037 for public health are expected to include improved healthy life expectancy (based on the Kings Fund predictions), but with a large number of potential factors influencing public health, this cannot be quantified for the Study Area.

Mental Health

- 19.4.25 The Kings Fund analysis of mental health recognises that physical health problems significantly increase the risk of poor mental health, and vice versa, stating that approximately 30% of all people with a long-term physical health condition also have a mental health problem, most commonly depression/ anxiety.
- 19.4.26 It states that adult mental health has remained relatively stable over the last 20 years. However, looking to the future, it recognises that prolonged economic instability can be expected to increase demand for mental health services, as there is a close link between unemployment, debt and mental health problems – particularly depression and anxiety.
- 19.4.27 Future baseline conditions in 2019 - 2022 for mental health are not anticipated to be significantly different to the existing baseline conditions.
- 19.4.28 If economic instability prevails, there is the potential for prevalence of mental health conditions to increase by 2037, whereas if there is a greater increase in economic security, the prevalence of mental health conditions may decrease by 2037.

19.5 Development Design and Impact Avoidance

- 19.5.1 Chapter 6: Need, Alternatives and Design Evolution describes the measures that have been incorporated in order to 'design-out' potential impacts.
- 19.5.2 As described in Chapter 8: Air Quality, the primary means of avoiding impacts on health due to emissions to air has been through the selection of high efficiency generating units burning natural gas as the fuel. The Proposed Development will be designed such that process emissions to air comply with the Emission Limit Values specified in the Industrial Emissions Directive (Ref 19-14) and this will be enforced by the Environment Agency through an Environmental Permit required for the operation of the generating station.
- 19.5.3 By selecting the existing Eggborough coal-fired Power Station site rather than an alternative site, impacts on the health of the local population have been minimised as far as practicable. This is because the existing coal-fired power station is facing closure and without alternative investments, there would be a resultant impact on employment in the local area. There is a close link between unemployment, debt and mental health problems – particularly depression and anxiety. By continuing power generation at the existing coal-fired power station site, some of the existing workforce jobs will potentially be retained or similar employment opportunities will be provided.

-
- 19.5.4 As set out in Chapter 6: Need, Alternatives and Design Evolution, options for the specific location and layout of plant were carefully considered and evaluated at the feasibility stage, resulting in the preferred location for the Proposed Power Plant Site being selected at the coal stockyard of the existing coal-fired power station.
- 19.5.5 A potential golf course site option, located between the existing power station infrastructure and the A19, on the site of the existing golf course was discounted. One of the reasons for this was that it would result in loss of the golf course, sports and social club and wider sports amenity land. Access to high quality open spaces and opportunities for sport and recreation can make an important contribution to the health and well-being of communities. By discounting the golf course option, health benefits have been realised with resulting long term positive effects on users.
- 19.5.6 One of the reasons for the selection of the coal stockyard area for the Proposed Power Plant site was because it could be connected to the existing 400 kV sub station by shorter, underground cables, whereas the alternative site to the north-east (the Lagoon Site Option) would have a longer, overhead electrical connection. The health impacts resulting from the connection into the existing National Grid sub station via underground cables is likely to have reduced potential exposure to sources of EMF, particularly in relation to electrical fields, with resultant health benefits for any receptors exposed.
- 19.5.7 The Lagoon Site Option would also have been located closer to the nearest sensitive residential receptors (at Gallows Hill) compared to the coal stockyard area. By increasing the distance to sensitive receptors, potential health impacts are reduced (e.g. less potential for sleep disturbance due to noise or exposure to construction dust, with resultant potential health effects).
- 19.5.8 Three alternative options were considered in relation to route corridors for the gas pipeline required to connect the Proposed Development to the National Grid gas transmission network (see Chapter 6: Need, Alternatives and Design Evolution for more details). During the EIA Scoping stage, the eastern route was ruled out in part because it runs closer to existing residential areas with potential health impacts during construction. Potential health impacts have therefore been avoided by reducing the number of residential receptors close to the gas connection corridor.
- 19.5.9 The choice and design of plant and equipment will comply with standard industry guidelines set to protect human health, including construction workers and operational staff. As set out in the ICNIRP Guidelines (ICNIRP, 1988), the occupationally EMF-exposed population will consist of adults who are generally exposed under known conditions and are trained to be aware of potential risk and to take appropriate precautions.
- 19.5.10 Measures for the protection of workers from potential EMF effects include engineering and administrative controls, personal protection programs, and medical surveillance.
- 19.5.11 Appropriate protective measures will be implemented if exposure in the workplace is predicted to result in the basic restrictions set out within ICNIRP Guidelines (ICNIRP, 1988) being exceeded.

19.6 Likely Impacts and Effects

19.6.1 With the exception of effects relating to EMF, this chapter ‘signposts’ health-related effects described elsewhere in the PEI Report (chapters on emissions to air (Chapter 8: Air Quality), noise and vibration (Chapter 9: Noise and Vibration), traffic (Chapter 14: Traffic and Transportation), emissions to water (Chapter 11: Water Resources, Flood Risk and Drainage), waste management (Chapter 17: Waste Management), land quality/ contamination (Chapter 12: Geology, Hydrogeology and Land Contamination) and socio-economics (Chapter 15: Land Use, Agriculture and Socio-Economics). The key health impacts for each of these effects will be summarised in the Health Chapter of the Final ES to be submitted with the DCO application, for ease of reference.

19.6.2 Potential impacts and effects from the Proposed Development relating to human health include:

- emissions to air, which may affect air quality with consequential health effects (see Chapter 8: Air Quality);
- noise emissions, which may affect nearby sensitive receptors (see Chapter 9: Noise and Vibration);
- increases in traffic, which may cause severance of communities, reduction in pedestrian amenity, increase in fear and intimidation, and reduction in highway safety (see Chapter 14: Traffic and Transportation);
- emissions to water, which may affect water quality with consequential health effects (see Chapter 11: Water Resources, Flood Risk and Drainage);
- generation of waste, including hazardous waste, which must be handled and disposed of appropriately to avoid adverse health effects (see Chapter 17: Waste Management);
- land contamination or mobilisation of existing land contaminants, which may result in human contact and associated health impacts (see Chapter 12: Geology, Hydrogeology and Land Contamination); and
- creation of employment opportunities, with beneficial health impacts (see Chapter 15: Land Use, Agriculture and Socio-Economics).

EMF-Related Effects

19.6.3 The Proposed Development has the potential for differential rather than whole population impacts associated with EMF. Within the conservative up to 50 m radius study area around the proposed below ground electrical connection to the existing 400 kV National Grid sub station, no residential receptors are present and none are anticipated to be present in the future baseline. There are also no residential receptors within the conservative 100 m radius study area around the proposed new sub station at the Proposed Power Plant Site. As such, the only potential exposure to EMF arises for construction workers and operational staff and no significant health effect is predicted for the general public.

19.6.4 As set out in Section 19:5 (Development Design and Impact Avoidance) measures will be implemented to protect construction workers and operational staff from potential EMF effects associated with the existing sub station, the proposed sub station and the below ground electrical cable if necessary. With the appropriate precautions in place, no significant health effects in the medium to long-term for construction workers or operational staff are predicted.

19.7 Mitigation and Enhancement Measures

- 19.7.1 Mitigation measures are set out in the relevant technical chapters of this PEI Report. No additional mitigation has been identified.

19.8 Limitations or Difficulties

- 19.8.1 No significant limitations or difficulties have been identified in the preparation of this chapter.

19.9 Residual Effects and Conclusions

- 19.9.1 No significant EMF-related health effects have been identified. All other health-related effects are described in Chapters 8: Air Quality, 9: Noise and Vibration, 14: Traffic and Transport, 11: Water Resources, Flood Risk and Drainage, 17: Waste Management, 12: Geology, Hydrogeology and Land Contamination, and 15: Land Use, Agriculture and Socio-Economics. The key health impacts for each of these effects will be summarised in the Health Chapter of the Final ES to be submitted with the DCO application, for ease of reference.

19.10 References

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20.0 CUMULATIVE AND COMBINED EFFECTS

20.1 Introduction

- 20.1.1 This chapter of the Preliminary Environmental Information (PEI) Report addresses the potential for combined or cumulative effects to occur as a result of the Proposed Development. It draws on the assessment of impacts provided in Chapters 8 to 19 of this PEI Report, and information relating to other known developments that are proposed within the study area. This assessment does not consider developments that are already constructed and operating for the assessment of cumulative effects, as existing operational facilities are accounted for in the baseline conditions established for the main assessments within Chapters 8 to 19 of this PEI Report.
- 20.1.2 *Combined effects* may arise where several different effects resulting from the Proposed Development (e.g. decrease in air quality, increase in noise disturbance) have the potential to affect a single receptor.
- 20.1.3 *Cumulative effects* have the potential to arise where two or more developments are proposed within close enough proximity to lead to effects of the same type (e.g. air quality) on the same receptor.
- 20.1.4 The cumulative effects assessment therefore considers other proposed developments that are in the public domain, such as planning applications registered with the local planning authorities and/or already consented developments, but not yet constructed or operational.
- 20.1.5 This chapter is supported by Figure 20.1 (PEI Report Volume II).

20.2 Legislation and Planning Policy Context

- 20.2.1 The requirement for cumulative and combined impact assessments is clearly stated in the relevant European Directive and domestic legislation as detailed below:
- European Directive 2011/92/EU on the assessments of effects of certain public and private projects on the environment requires an assessment of “*the direct effects and any indirect, secondary, cumulative, short, medium and long term, permanent or temporary, positive and negative effects of the project*”; and
 - Schedule 4 Part 1 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 requires “*A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from -*
 - (a) The existence of the development;*
 - (b) The use of natural resources;*
 - (c) The emission of pollutants, the creation of nuisances and the elimination of waste,**and the description by the applicant of the forecasting methods used to assess the effects on the environment*”.

20.3 Assessment Methodology

Impact Assessment and Significance Criteria

- 20.3.2 There is no standard prescriptive method for assessing cumulative and combined effects and the extent to which the effects of other developments can be assessed quantitatively depends on the level of information available about the other developments. Such effects are, therefore, assessed by professional opinion, although matrices and modelling are used where appropriate and where enough information regarding the other developments exists. Where environmental assessment information regarding other developments is not available or uncertain, the assessment is necessarily qualitative.
- 20.3.3 When considering cumulative and combined effects, the mitigation measures as set out in Chapters 8 to 19 have been taken into account *i.e.* only residual (after mitigation) effects are discussed in this chapter.
- 20.3.4 Cumulative and combined effects are assessed to be neutral, minor, moderate or major. Moderate or major effects are considered to be significant, using the methodologies outlined in each technical chapter (Chapters 8 – 19 of this PEI Report).

Cumulative Effects

- 20.3.5 Cumulative effects are those that accrue over time and space from a number of developments.
- 20.3.6 The Planning Inspectorate Advice Note 17 ‘Cumulative effects assessment relevant to nationally significant infrastructure projects’ (Planning Inspectorate, December 2015) sets out a four stage approach to assessment of cumulative effects:
- Stage 1: identify the Zone of Influence and identify long list of other developments;
 - Stage 2: identify short list of other development for cumulative assessment;
 - Stage 3: information gathering; and
 - Stage 4: assessment.
- 20.3.7 This approach has been followed in undertaking the cumulative effects assessment presented in this chapter.
- 20.3.8 The Zone of Influence is discussed in the Study Area section below. A long list of developments was identified prior to the submission of the EIA Scoping Report and an initial shortlist was provided in the Scoping Report (see Appendix 1A in PEI Report Volume III). This has subsequently been reviewed and updated in consultation with the local planning authorities, and the current shortlist of other developments (as at the end of November 2016) is presented in Section 20.4 of this chapter. The list of developments will continue to be reviewed in the preparation of the final Environmental Statement (ES) to support the Development Consent Order (DCO) application for the Proposed Development.
- 20.3.9 In order to assess the potential for cumulative effects to arise in relation to these developments, where a planning application has been made, information presented within the Environmental Statement or environmental reports for the development has been gathered and reviewed. For developments that are known to be proposed (either via screening or scoping opinion requests submitted to the local authority/ Planning Inspectorate or following presentation of information in the public domain) but where an ES (or other environmental

reports) has not yet been prepared or submitted, any readily available information has been utilised. This includes communication with local authorities, public consultation material and material available via the internet.

- 20.3.10 Following information gathering from available sources (including review of documents submitted to support planning applications/ DCO applications for other developments), the effects of the Proposed Development have been considered in conjunction with the potential effects from other projects or activities that are both reasonably foreseeable in terms of delivery (*e.g.* have planning consent or are in the planning process) and are geographically located in a position where environmental impacts could act together to create an effect that is more (or less) significant overall than the effect of individual developments alone.
- 20.3.11 Operational impacts are generally long-term, and whilst construction impacts are often short term and temporary, they can potentially be of a large magnitude. Consequently, when cumulative effects that could be associated with construction at one site and operation at another are considered the difference in duration and reversibility is considered within the assessment.
- 20.3.12 In assessing cumulative effects, it is appropriate to also acknowledge the relative contributions that different projects make to a cumulative effect, and carefully consider whether a cumulative effect occurs at all. For example, effects associated with a large scale project may be significant, and whilst a smaller project may contribute to this effect, the cumulative effect of the smaller project and the larger project is only considered to be significant if it is of greater significance than the effect of either project in isolation.
- 20.3.13 Where applicable, the assessment considers all other known developments that have potential for cumulative effects with the Proposed Development together, as a worst case.

Study Area

- 20.3.14 Cumulative effects are generally unlikely to arise unless the other proposed development sites are in close proximity to the Site, recognising that actual distance varies with the nature of the potential effect and the nature of the receptor, *e.g.* cumulative air quality effects could occur for developments a greater distance apart than noise effects. Construction projects are, as a matter of routine, required to employ regulatory and managerial controls and employ good practice to mitigate construction impacts wherever possible. Nevertheless, consideration has been given to the presence of common pathways from nearby developments to a single receptor, and whether there is potential for impacts of a sufficient magnitude whereby a particular receptor could experience cumulative effects.
- 20.3.15 The study area for the consideration of cumulative and combined effects has been developed taking into account the predicted extent of impacts associated with the Proposed Development, and with the point at which the associated effects become insufficient to contribute in any meaningful way to those of another proposed development.
- 20.3.16 The study area for each environmental assessment topic is defined in the relevant technical chapter (Chapters 8 – 19). Information on the likely extent of impacts associated with other developments in the area has also been considered.
- 20.3.17 The largest study area, for the landscape and visual impact assessment, has defined the ‘zone of influence’ within which the search for other developments has been undertaken for the

cumulative assessment. Given the generally flat nature of the surrounding landscape, other developments within a 15 km zone of influence have been identified.

Consultation

A summary of consultation relevant to the cumulative and combined effects assessment is provided in Table 20.1 below.

Table 20.1: Consultation summary

Consultee	Date	Summary of response	Addressed
North Yorkshire County Council (Scoping Opinion)	August 2016	<p>It is recommended that details of cumulative effects are described first under relative topic headings and that this section in the ES brings together summaries of significant effects and discusses the interactions and combined effects. Whilst the EIA will cover project-specific cumulative effects, cumulative effects nationally will also need to be taken into account under topics such as climate change.</p> <p>EN-1 para 4.2.5 states that the ES should provide information on how the effects of the applicant's proposal would combine and interact with the effects of other development (including projects for which consent has been sought or granted), as well as those already in existence e.g. Drax Power Station. The developments to be taken into account may require further discussion.</p>	<p>Potential cumulative effects with other proposed developments are assessed in this chapter and have been set out under each topic area in the sections below.</p> <p>Projects that are already in existence form part of the baseline conditions for each technical assessment as described in the technical chapters (Chapters 8 – 19).</p> <p>A carbon assessment will be completed and included in the final ES to accompany the DCO application.</p>
The Secretary of State (Scoping Opinion)	August 2016	<p>The following comments were made with regards to cumulative assessment:</p> <ul style="list-style-type: none"> • The Applicant is referred to additional guidance on the assessment of cumulative effects published by the Planning Inspectorate in Advice Note 17. • The Secretary of State notes the list of reasonably foreseeable future projects in the vicinity of the proposed development 	<p>The cumulative assessment follows the guidance set out in Advice Note 17 (Planning Inspectorate, 2015).</p> <p>The methodology for producing the list of</p>

Consultee	Date	Summary of response	Addressed
		<p>provided in the Scoping Report. In the ES, the Applicant is requested to describe and justify the criteria used to produce this list. The Secretary of State also encourages the Applicant to consult the Local Authorities on the list of projects to be included.</p> <ul style="list-style-type: none"> • The Secretary of State welcomes the inclusion of the decommissioning and demolition of the existing Eggborough coal-fired power station as a development for consideration in the cumulative assessment. • The applicant is encouraged to present clearly the assessment of inter-related effects alongside consideration of cumulative developments (in particular the decommissioning of the existing power station). 	<p>other developments is outlined in Section 20.4 of this chapter. The local authorities have been consulted on the list of projects to consider.</p> <p>Cumulative effects with the decommissioning and demolition of the existing coal-fired power station have been assessed in each chapter throughout the PEI Report.</p> <p>Inter-related effects (referred to in this chapter as combined effects) are summarised in Table 20.7.</p>

20.4 Cumulative Effects Assessment (Stages 1-3)

Identification of Short List of Other Developments for Assessment

- 20.4.1 An initial screening exercise (Stage 1 of the cumulative effects assessment) was undertaken to identify potential major developments within the vicinity of the Proposed Development for consideration within the cumulative impact assessment. This process identified potential major developments within a 15 km radius to create an initial long list for consideration. The long list was subsequently screened based on the potential for impact (*e.g.* cumulative landscape and visual impacts have potential to occur over a greater distance than, for example, cumulative noise or archaeology impacts) and a refined short list was developed for further, more detailed consideration (Stage 2 of the cumulative effects assessment). The initial short list was presented in the Scoping Report (Appendix 1A in PEI Report Volume III) and has been revisited for this PEI Report to reflect the latest information available on other developments.
- 20.4.2 The short list of other developments identified at Stage 2 of the cumulative effects assessment are presented in Table 20.2 below, with details of their current status and comments regarding their temporal scope in relation to the temporal scope of the Proposed Development.

Table 20.2: Refined short list of projects within the 15 km zone of influence identified at Stage 2 of cumulative effects assessment

Name of development	Distance from closest part of the Site	Status (at time of assessment)	Description of development	Overlap in temporal scope with Proposed Development?	Cumulative effects to be assessed?	Environmental information available to inform assessment
Eggborough Coal-Fired Power Station Decommissioning and Demolition	Within part of the Site	Yet to enter the planning process	Decommissioning and demolition of existing coal-fired power station	Demolition may occur at the same time as the construction and/or initial operation of the Proposed Development	Yes	Information from Eggborough Power Limited (EPL)
Knottingley Power Station and Pipeline	2 km west	DCO granted in 2015	A proposed 1,500 MW CCGT power station including an 8 km gas supply pipeline and associated infrastructure located at former Oxiris Chemical Works, Knottingley	Construction may occur at the same time as the Proposed Development	Yes	Environmental Statement
Southmoor Energy Centre (NY/2012/0318/SCO)	5.4 km west	Planning consent granted in 2015	A proposed 26 MWe Energy from Waste facility with CHP potential, located at Kellingley Colliery	Construction may occur at the same time as the Proposed Development	Yes	Scoping Report
Thorpe Marsh CCGT Power Station	13.9 km south-east	Section 36 consent granted in 2011	A proposed 1,500 MW CCGT power station adjacent to the site of a former coal-fired power station (now been decommissioned and demolished)	Construction may occur at the same time as the Proposed Development	Yes	Environmental Statement
Thorpe Marsh Gas Pipeline	4.6 km east	DCO granted 2016	A proposed 19 km buried steel pipeline to transport gas to the	Construction may occur at the same time as the Proposed	Yes	Environmental Statement

Name of development	Distance from closest part of the Site	Status (at time of assessment)	Description of development	Overlap in temporal scope with Proposed Development?	Cumulative effects to be assessed?	Environmental information available to inform assessment
			proposed Thorpe Marsh CCGT Power Station	Development		
Ferrybridge Multifuel 2	9.1 km west	DCO granted in 2015 Under construction in 2016.	A 90 MWe multifuel power station, located at Ferrybridge Power Station	Construction may occur at the same time as the Proposed Development although construction on FM2 has commenced and is due to be completed in early 2019.	Yes	Environmental Statement
Residential development of 55 dwellings (2016/0875/FUL)	50 m south-west	Planning application submitted in July 2016, decision pending	Residential development of 55 dwellings – located on land immediately to the south-west of the A19/ A645 Weeland Road junction, at the Site's south-western corner	Construction may occur at the same time as the Proposed Development	Yes	Planning Statement Ecology Report Flood Risk Assessment Noise Survey
Residential development of 64 dwellings (2015/0356/OUT)	150 m west	Outline planning application submitted and approved in 2015	Erection of a residential development on 2.62 hectares of land off Selby Road, Eggborough, to the west of the Site	Construction may occur at the same time as the Proposed Development	Yes	Planning Statement Flood Risk Assessment Contaminated Land Report
Single storey production facility (2015/1392/EIA)	250 m south	Planning application submitted and approved	Single storey production facility – located on land at the Saint Gobain glass factory, approximately 250 m east of the	Construction may occur at the same time as the Proposed Development	Yes	Environmental Statement

Name of development	Distance from closest part of the Site	Status (at time of assessment)	Description of development	Overlap in temporal scope with Proposed Development?	Cumulative effects to be assessed?	Environmental information available to inform assessment
		in 2015. Under construction in 2016.	A19/ A645 Weeland Road junction at the Site's south-western corner			
Advanced Thermal Treatment Plant (NY/2016/0052/ENV)	100 m west	Planning application submitted and approved in 2016	Advanced Thermal Treatment Plant Located <100 m south-west of the Tranmore Lane/ A19 junction, between North Point Business Park and Euroauctions	Construction may occur at the same time as the Proposed Development	Yes	Environmental Statement
Hydro-electricity generation scheme (2014/1101/FUL)	100 m east	Planning application submitted and approved in 2014. Under construction in 2016.	Hydro-electricity generation scheme at Chapel Haddlesey Weir - including installation of three Archimedian screws and a fish pass - Located immediately to the east of the existing and proposed cooling water abstraction point on the River Aire	Construction may occur at the same time as the Proposed Development	Yes	Planning Statement Ecology Report
Solar farm (15/01403/STPLF)	4 km south-east	Planning application submitted and approved in 2015	Installation and operation of a solar farm and associated infrastructure, including photovoltaic panels, mounting frames, inverters, transformers, substations, communications building, access tracks, pole	Construction may occur at the same time as the Proposed Development	Yes	Planning Statement Landscape and Visual Impact Assessment Ecological

Name of development	Distance from closest part of the Site	Status (at time of assessment)	Description of development	Overlap in temporal scope with Proposed Development?	Cumulative effects to be assessed?	Environmental information available to inform assessment
			mounted CCTV cameras and fencing			Appraisal
Kellingley Colliery Business Park (2016/1343/OUTM)	5 km west	Planning application submitted November 2016, decision pending	Outline application including access (all other matters reserved) for the construction of an employment park of up to 1.45 million sq ft (135,500 sq m) gross floor space comprising of B2 , B8 and ancillary B1 uses, ancillary retail facilities (A1 - A4) including ancillary infrastructure and means of access.	Construction may occur at the same time as the Proposed Development	Yes	Planning Statement Air Quality Assessment Transport Assessment Landscape Visual Impact Assessment
Yorkshire & Humber Carbon Capture and Storage (CCS) Pipeline	8 km east	DCO application submitted June 2014, pending decision from Secretary of State	75 km pipeline between Drax and Barnston on the east Yorkshire coast	Construction may occur at the same time as the Proposed Development	Yes	Environmental Statement

- 20.4.3 All the developments identified in Table 20.2 are considered to be of such a nature and proximity to the Site to have the potential to generate significant cumulative effects when considered in context with the Proposed Development. These have therefore been subject to assessment for each environmental topic in Section 20.5 below. The location of the other developments in relation to the Site is shown in Figure 20.1 (PEI Report Volume II).

20.5 Cumulative Effects Assessment (Stage 4)

Air Quality

Construction Effects

- 20.5.1 The assessment of construction air quality effects at sensitive receptors has considered the emissions associated with the Proposed Development together with construction of the other proposed developments listed in Table 20.2 including:

- the emissions from dust generated by demolition and construction activities;
- the emissions from construction Non Road Mobile Machinery (NRMM); and
- the emissions from construction road traffic.

Dust and Emissions from NRMM

- 20.5.2 The cumulative effects due to emissions from NRMM and activities associated with the demolition of the existing Eggborough coal-fired power station and potentially concurrent construction of the Proposed Development have been considered within the air quality assessment (Chapter 8: Air Quality) and identified impact avoidance measures will be adopted to control the effects so that they are not significant.
- 20.5.3 With the exception of the demolition of the existing coal-fired power station (partly within the Site) and the construction of the proposed residential developments in Eggborough, there is not considered to be any potential for cumulative effects with other proposed developments arising from emissions from NRMM and dust from demolition and construction activities because these emissions have negligible effect at receptors beyond 200 m of the activities and no such receptors have been identified that are within 200 m of both the Site and the other identified developments.
- 20.5.4 Measures to control dust and emissions from the Proposed Development construction and existing coal-fired power station demolition to acceptable (not significant) levels are listed in Section 8.5 of Chapter 8: Air Quality. No significant cumulative effects are anticipated due to the potential concurrent construction of the Proposed Borehole Connection at the south-west limit of the Site and the construction of the two proposed residential developments, due to the short term and minor nature of the Proposed Borehole Connection works, which will also be managed using the same dust control techniques as described in Section 8.5 of Chapter 8: Air Quality.

Construction Traffic Emissions

- 20.5.5 The transport assessment (see Chapter 14: Traffic and Transportation, and the Traffic and Transportation cumulative assessment section below) includes traffic generated from the following other proposed developments for which traffic data is available and which could

contribute additional traffic to the same road network that will be affected by construction traffic for the Proposed Development:

- decommissioning and demolition of Eggborough coal-fired power station;
- Knottingley CCGT Power Station;
- Southmoor Energy Centre;
- Single-Storey Production Facility; and
- Kellingley Colliery Business Park.

20.5.6 The air quality effects of the total predicted cumulative traffic impact with these other developments at the peak of construction of the Proposed Development (which is assumed for the purposes of assessment to coincide with the peak of demolition activity at the existing coal-fired power station) have been assessed. The results of this cumulative assessment indicate that whilst the effects at the majority of the identified receptors were unchanged (no significant effect), the effects from nitrogen dioxide emissions at two receptor locations (properties adjacent to the A19, Low Eggborough) are predicted to change from negligible (not significant) to moderate adverse (significant), as detailed in Table 20.3 below, because the total concentrations of nitrogen dioxide are predicted to be at 96-103% of the National Air Quality Strategy (NAQS) objectives at these receptor locations.

20.5.7 It should be noted that this conclusion is based on a number of worst-case assumptions included within the air quality model including:

- use of a conservative estimated factor for model verification in the absence of suitable measured data;
- the assumption that peak construction traffic from the Proposed Development will occur at the same time as peak construction traffic from the other identified developments and also the anticipated peak demolition traffic from the adjacent existing Eggborough coal-fired power station demolition; and
- the assumption of no change (improvement) in the background nitrogen dioxide concentration (traffic contributions removed) between 2013 and 2020.

Table 20.3: Change in annual mean NO₂ predicted concentrations with Proposed Development (peak of construction) and other proposed developments

Receptor ID (see Chapter 8: Air Quality)	Annual mean predicted concentration NO ₂ / NAQS		Magnitude of change	Effect
	Change	Total		
25	2.8%	96%	Low	Moderate adverse
26	3.0%	103%	Low	Moderate adverse

20.5.8 As such, while the potential air quality effects of construction traffic associated with the Proposed Development are screened from further assessment and therefore assessed to be negligible with or without concurrent demolition of the existing coal-fired power station (see Chapter 8: Air Quality), it is recognised that there is potential for cumulative air quality effects to result from these other developments at receptors adjacent to the A19 in Low Eggborough. EPL is not in a position to influence the timing or routing of traffic to other developments but they do have the potential to influence the timing and routing of demolition traffic associated

with the existing coal-fired power station. It is therefore proposed that, once the timing of the existing coal-fired power station demolition activities is known, EPL will evaluate the need to prepare a Travel Plan for construction and demolition traffic accessing the site and to coordinate traffic flows to the two activities, to reduce cumulative air quality impacts associated with the two activities.

- 20.5.9 As described in Chapter 8: Air Quality, EPL is currently undertaking a NO₂ diffusion tube survey in order to supplement the baseline assessment and to review the verification factors assumed for the construction road traffic emissions assessment. The results of the diffusion tube survey will be used to review the construction road traffic effects assessment in the final ES.

Opening and Operation Effects

- 20.5.10 A qualitative assessment has been made of the operational Proposed Development air quality effects at sensitive receptors in combination with other proposed developments, through consideration of the nature, location and scale of these other developments, as described below:

- the existing coal-fired power station would not be operational at the same time as the Proposed Development and therefore is scoped out of the assessment;
- the Knottingley Power Station, Ferrybridge Multifuel 2 and Southmoor Energy Centre proposed power stations lie over 5 km west of the Proposed Power Plant Site. Given the distance between the developments and assuming the same wind direction would disperse emissions from each at any one time, it is considered that any emissions from operation of these other power stations would be unlikely to interact with emissions from the operation of the Proposed Development; the effects from emissions from the operational Proposed Development have been determined as not significant, therefore the potential for cumulative effects from these developments to be considered significant is very low and no further cumulative impact assessment has been undertaken;
- similarly the Thorpe Marsh CCGT proposed power station lies approximately 14 km from the Proposed Power Plant Site and therefore given this distance and the determination of the operational Proposed Development emissions as not significant, it is considered very unlikely that significant cumulative impacts would occur and no further cumulative impact assessment has been undertaken;
- the operational Advanced Thermal Treatment Plant is likely to emit similar pollutants to the operational Proposed Development and lies over 600 m to the west of the Proposed Power Plant Site (approximately 100 m west of the Site). The application for this other development has considered the potential air quality effects, taking into consideration the emissions from the existing Eggborough coal-fired power station within the background assessment; therefore as the Proposed Development will not be operational at the same time as the existing coal-fired power station, and the air quality effects from the operational Proposed Development are very unlikely to be worse than those resulting from the existing coal-fired power station it is considered that the cumulative effects will be not significant. This will be considered further in the final ES to confirm this conclusion; and
- the other proposed developments listed in Table 20.2, including residential developments, Thorpe Marsh Gas Pipeline, single storey production facility, solar farm, Kellingley Colliery Business Park, Yorkshire & Humber CCS Pipeline, are unlikely to result in emissions of pollutants within the impact zone of the operational Proposed Development and are therefore scoped out of further cumulative assessment.

Noise and Vibration

- 20.5.11 The majority of the other developments listed in Table 20.2 can be scoped out due to the distances from the Site.
- 20.5.12 Cumulative noise and vibration effects associated with the decommissioning and demolition of the existing coal-fired power station are included in the assessment in Chapter 9: Noise and Vibration.
- 20.5.13 The other developments that have been scoped in to the cumulative noise and vibration assessment due to their close proximity to the Site are:
- Advanced Thermal Treatment Plant (construction and operation);
 - single-storey production facility (operation only as construction is expected to be completed in advance of construction of the Proposed Development); and
 - hydro-electricity generation scheme (operation only as construction is expected to be completed in advance of construction of the Proposed Development).
- 20.5.14 The two proposed residential developments have been scoped out of the cumulative noise assessment due to the short term and minor nature of the Proposed Development construction works in this area (Proposed Borehole Connection only).

Advanced Thermal Treatment Plant

- 20.5.15 The proposed Advanced Thermal Treatment Plant to the south of Roall Waterworks has the potential to result in adverse noise effects at NSR3 1 Roall Waterworks (see Chapter 9: Noise and Vibration) and other nearby NSRs to the west of the Site, depending upon the nature and timing of the works. However, no assessment of potential construction noise and vibration levels is provided within the noise assessment for the Advanced Thermal Treatment Plant and therefore the potential impacts are unknown. If the construction timings of the Proposed Development and the Advanced Thermal Treatment Plant overlap, it is considered unlikely that noise and vibration from construction of the Proposed Development would be a significant factor in causing possible exceedance of the 65 dB $L_{Aeq,12hr}$ weekday daytime and Saturday morning noise limit at the NSR, as set out in Table 9.27 of Chapter 9: Noise and Vibration. This is because the highest predicted construction noise level associated with combined construction of the Proposed Development and demolition of the existing coal-fired power station (excluding noise from possible explosions during demolition of the existing cooling towers) is 56 dB $L_{Aeq,12hr}$ at NSR3 as presented in Table 9.24 of the Chapter 9: Noise and Vibration, which may be further reduced by construction noise mitigation. Where cumulative evening, night-time or extended weekend working is proposed, then further assessment will be made by the contractor if the construction of the Advanced Thermal Treatment Plant is concurrent with the Proposed Development construction and when further details of the construction works related to the Advanced Thermal Treatment Plant are known.
- 20.5.16 With respect to potential cumulative operational effects, the Advanced Thermal Treatment Plant is predicted to result in a rating level of 39 dB $L_{Ar,Tr}$ day and night at the nearby properties at Roall Waterworks. Predicted noise from the operation of the Proposed Development at 1 Roall Waterworks is 40 dB $L_{Ar,Tr}$ and 39 dB $L_{Ar,Tr}$ during the daytime and night-time respectively. Therefore there is the potential for some cumulative noise due to the intermittent use of the Advanced Thermal Treatment Plant, which is to be used to generate electricity only during

peak demand times (stated as typically being in the order of 1,000 hours per annum), when assessed in accordance with BS 4142. However, the greatest effects will be on different facades of the properties at this location due to the position of the two proposed developments. Furthermore, with respect to absolute noise levels, the predicted specific sound levels of 37 dB $L_{Aeq,T}$ and 36 dB $L_{Aeq,T}$ from the Advanced Thermal Treatment Plant and the operation of the Proposed Development respectively, summed with the existing ambient night-time level of 54 dB $L_{Aeq,8hr}$ (see Table 9.26 of Chapter 9) at 1 Roall Waterworks, would result in less than a 1 dB increase in existing ambient noise levels. This level of change would be negligible above existing average ambient $L_{Aeq,8h}$ night-time noise levels, and no significant cumulative effects is therefore predicted.

Single-Storey Production Facility

- 20.5.17 With respect to the Saint Gobain Production Facility, the predicted operational specific sound level at the nearest properties to the south-east of the Facility, in the area of NSR2 (Brimmond/ residential properties, Hazel Old Lane, Hensall), is 25 dB $L_{Aeq,T}$. This would not increase the rating levels predicted as a result of the operation of the Proposed Development at NSR2 of 40 dB $L_{Ar,Tr}$ and 39 dB $L_{Ar,Tr}$ for the two indicative concept layouts, and therefore no significant cumulative effect is predicted.

Hydro-Electricity Generation Scheme

- 20.5.18 With respect to the Hydro-Electricity Generation Scheme in Chapel Haddlesey, predicted rating levels from this development range between 29 – 35 dB $L_{Ar,Tr}$ at nearby properties. Predicted rating levels from the Proposed Development at the NSRs assessed in Chapel Haddlesey are 30-31 dB $L_{Ar,Tr}$, therefore there is the potential for some cumulative noise from operation of both developments together. However, combining the maximum predicted specific noise levels from the two developments at nearby NSRs assessed (i.e. 35 dB $L_{Aeq,T}$ at NSRs due to the Hydropower Development and 28 dB $L_{Aeq,T}$ from the Proposed Development) with the lowest measured ambient noise level in Chapel Haddlesey at night of 43 dB $L_{Aeq,8hr}$ (as presented in Table 9.26 of the PEI Report), would result in less than a 1 dB increase in existing ambient noise levels. This level of change would be negligible above existing average ambient $L_{Aeq,8h}$ night-time noise levels.

Cumulative Traffic Effects

- 20.5.19 The assessment of the Proposed Development construction traffic and existing coal-fired power station demolition traffic in Chapter 9: Noise and Vibration predicted maximum increases in traffic noise levels on the A19 north of Wand Lane of +0.4 dB $L_{A10,18hr}$, and on the A19 south of Wand Lane of +0.1 dB $L_{A10,18hr}$, resulting in negligible adverse effects (not significant) at nearby NSRs. With respect to Wand Lane, the assessment showed that the change in Basic Noise Level (BNL) was predicted to be higher at +3.7 dB $L_{A10,18hr}$, but there are no local NSRs that could be affected by this potential increase.
- 20.5.20 Additional traffic on the local road network associated with other developments in the area during construction of the Proposed Development and demolition of the existing coal-fired power station are predicted to increase noise levels slightly further from +0.4 dB to +1.6 dB $L_{A10,18hr}$ on the A19 north of Wand Lane, and from +0.1 dB $L_{A10,18hr}$ to +1.0 dB $L_{A10,18hr}$ on the A19 south of Wand Lane. Such increases would represent a minor adverse effect (not significant).

No further increase in noise from traffic using Wand Lane is predicted due to other proposed developments.

- 20.5.21 The assessment presented in Chapter 9: Noise and Vibration with respect to the cumulative effect of operational traffic from the Proposed Development and traffic related to the demolition of the existing coal-fired power station predicted maximum increases in traffic noise levels on Wand Lane was less than 1 dB, but with no nearby NSRs to be affected by the change.
- 20.5.22 Additional traffic on the local road network from other developments in the area during operation of the Proposed Development are predicted to increase noise levels slightly further from +0.1 dB to +1.4 dB $L_{A10,18hr}$ on the A19 north of Wand Lane, and from +0.0 dB $L_{A10,18hr}$ to +1.0 dB $L_{A10,18hr}$ on the A19 south of Wand Lane. Such increases represent minor adverse effects (not significant). No further increase in noise from traffic using Wand Lane is predicted due to other developments.

Ecology and Nature Conservation

- 20.5.23 Seven of the developments identified in Table 20.2 have been scoped out of the cumulative ecological assessment on the basis that there are no pathways by which the other developments could adversely affect ecological receptors within the zone of influence of the Proposed Development. The following other developments have been scoped out of the cumulative effects assessment on this basis:

- Thorpe Marsh Gas Pipeline;
- residential development of 55 dwellings;
- residential development of 64 dwellings;
- single storey production facility;
- solar farm;
- Kellingley Colliery Business Park; and
- Yorkshire and Humber CCS Pipeline.

- 20.5.24 The hydro-electricity generation scheme is also scoped out because construction is assumed to have been completed prior to construction of the Proposed Development and there is no potential for cumulative effects during its operation. Natural England indicated in its letter to Selby District Council on 21st November 2014 that it was satisfied that the hydro-electricity scheme will not result in any adverse effects on statutory designated sites. It is therefore concluded that there will be no adverse cumulative effects on the Humber Estuary SAC/ SPA/ Ramsar/ SSSI arising from the hydroelectric scheme and the Proposed Development.

- 20.5.25 The following other developments are assessed below:

- decommissioning and demolition of Eggborough coal-fired power station;
- Knottingley CCGT Power Station (operational air quality effects);
- Ferrybridge Multifuel 2 power station (operational air quality effects);
- Southmoor Energy Centre (operational air quality effects);
- Thorpe Marsh CCGT Power Station (operational air quality effects); and
- Advanced Thermal Treatment Plan (operational air quality effects).

Eggborough Coal-Fired Power Station Decommissioning and Demolition

- 20.5.26 The demolition of the existing coal-fired power station could coincide with the construction and/or initial operation of the Proposed Development. However, issues such as fugitive dust management and surface water run-off will be carefully controlled through construction and demolition best practice and environmental legislation as described in Chapter 8: Air Quality and Chapter 11: Water Resources, Flood Risk and Drainage. The ecological impacts have therefore already been assessed. No potential for significant cumulative effects on habitats resulting from changes in air quality and surface water pollution are therefore predicted.
- 20.5.27 There would be some loss of semi-natural habitat associated with the demolition works, but this would be limited to the ornamental pond (Waterbody 5) and the operational cooling water/ surface water discharge ponds (Waterbodies 3 and 4) that have been evaluated to be of negligible ecological value (see Appendix 10C in PEI Report Volume III). The loss of these ponds, in combination with the loss of the lagoon (Waterbody 1) due to the construction of the Proposed Development would not result in any significant cumulative effects on ecology features. The golf course and its pond (Waterbody 6), along with Waterbody 2 to the east of the cooling towers would not be affected by the construction or demolition works.

Knottingley Power Station, Ferrybridge Multifuel 2, Southmoor Energy Centre, Thorpe Marsh CCGT, Advanced Thermal Treatment Plant

- 20.5.28 The air quality impact assessment (see cumulative air quality assessment above) has concluded that there is no potential for cumulative air quality effects to arise from emissions to air from these other proposed power stations. It can therefore be concluded that there is no potential for cumulative impacts on the statutory designated sites within the zone of influence of the Proposed Development as identified in Chapter 10: Ecology and Nature Conservation.

Water Resources, Flood Risk and Drainage

- 20.5.29 Potential cumulative impacts to water resources during demolition and construction processes are associated with the generation of sediments and the release into the sewer drainage network, spillage and leakage of oils and fuels, leakage of wet concrete and cement, disturbance of contaminated land, suspended sediments, and disturbance to groundwater and foul drainage.
- 20.5.30 The majority of the other developments listed in Table 20.2 can be scoped out of the water resources, flood risk and drainage cumulative assessment due to their distances from the Site, such that no cumulative impacts to the identified water resource, flood risk and drainage receptors are predicted.
- 20.5.31 The following developments have been identified as being relevant to the cumulative impact assessment for water resources, flood risk and drainage due to their location and nature:
- decommissioning and demolition of Eggborough coal-fired power station;
 - Advanced Thermal Treatment Plant;
 - residential developments of 55 and 64 dwellings;
 - single-storey production facility (operation only as construction will have been completed); and

- hydro-electricity generation scheme (operation only as construction will have been completed).

20.5.32 All developments will be required to meet the requirements of the National Planning Policy Framework (NPPF) (Department for Communities and Local Government (DCLG), 2012) and local drainage policies to ensure the risk of flooding from all sources does not increase, therefore no further cumulative assessment of flood risk is included below.

Decommissioning and Demolition of Eggborough Coal-Fired Power Station

20.5.33 The demolition of structures associated with the existing coal-fired power station may occur at the same time as the construction of the Proposed Development. Measures to manage and control potential adverse effects on water resources are outlined Chapter 11: Water Resources, Flood Risk and Drainage. These measures will also be adopted during the demolition works through the adoption of a Demolition Environmental Management Plan (DEMP). As such the impact of the demolition of the existing coal-fired power station on the identified water receptors is expected to be no greater than the impact arising from construction of the Proposed Development, and significant cumulative effects are not anticipated.

Advanced Thermal Treatment Plant

20.5.34 This proposed Advanced Thermal Treatment Plant is located approximately 100 m west of the Site and its construction could occur at the same time as the Proposed Development. The concurrent construction of the treatment plant and the Proposed Development will result in a slight increase in construction activity in this area, but will not increase the magnitude of impact to identified water resource receptors that has already been recorded.

20.5.35 The Environmental Statement (ES) for the Advanced Thermal Treatment Plant confirms that a site drainage and containment system will be installed at the start of construction to avoid impacts on water quality, and suitable methods are also proposed for the operation of the development to treat waste water on-site and discharge surface water runoff to Ings and Tetherings Drain, to avoid impacts on water resource receptors.

20.5.36 No significant cumulative effects are anticipated as it is not intended that surface water run-off from the Proposed Development is directed to the Ings and Tetherings Drain.

Residential Developments of 55 and 64 Dwellings

20.5.37 Two residential developments are located 50 m south-west and 150 m west of the Site. The developments are not anticipated to result in additional impacts to the identified water resources in the study area as appropriate drainage systems will be installed as part of these developments.

20.5.38 No significant cumulative effects are anticipated.

Single-Storey Production Facility

20.5.39 The single-storey production facility is located approximately 250 m south of the Site adjacent to the existing Saint Gobain glass factory. The operational of this development is not

anticipated to result in additional impacts to the identified water resources in the study area as an appropriate drainage system will be installed.

20.5.40 No significant cumulative effects are anticipated.

Hydro-Electricity Generation Scheme

20.5.41 The hydro-electricity generation scheme is located on the River Aire at Chapel Haddlesey Weir, approximately 100 m east of the existing and proposed cooling water intake and 450 m west of the Proposed Gas Connection corridor. The construction of the scheme is currently in progress and is expected to be completed before construction of the Proposed Development commences, and no significant effects on water resources receptors are anticipated during its operation.

20.5.42 No significant cumulative effects are therefore anticipated.

Geology, Hydrogeology and Land Contamination

20.5.43 The majority of the developments listed in Table 20.2 can be scoped out of the geology hydrogeology and land contamination assessment due to their distances from the Site.

20.5.44 The following developments have been identified as being relevant to cumulative geology, hydrogeology and land contamination assessment due to their proximity to the Site and nature of development:

- decommissioning and demolition of Eggborough coal-fired power station;
- Advanced Thermal Treatment Plant;
- residential developments of 55 and 64 dwellings;
- single-storey production facility (operation only as construction will have been completed); and
- hydro-electricity generation scheme (operation only as construction will have been completed).

Decommissioning and Demolition of Eggborough Coal-Fired Power Station

20.5.45 The demolition of structures associated with the existing coal-fired power station may occur at the same time as the construction of the Proposed Development. Measures to manage and control potential adverse effects on soils and groundwater are outlined Chapter 12: Geology, Hydrogeology and Land Contamination. These measures will also be adopted during the demolition works through the adoption of a Demolition Environmental Management Plan (DEMP).

20.5.46 Potential cumulative effects that may result from the simultaneous demolition of the existing coal-fired power station and construction of the Proposed Development include:

- potential increased impact on Proposed Development construction workers and buildings from vapours and contaminated groundwater migrating on to the Site from the adjacent existing coal-fired power station – potentially significant cumulative effects will be avoided through consideration of mitigation measures including use of PPE and engineering controls should any spills or release occur;

- potential increased impact on soils and surface waters at the Site from deposition of potentially contaminated particulates and dust originating from the demolition of the existing coal-fired power station – potentially significant cumulative effects will be reduced through careful control of dusts and particulates that could be generated during demolition works; and
- potential increased impact on soils and groundwater at the Site due to the removal of the existing coal-fired power station's drainage system, but this will be avoided by the implementation of the Outline Drainage Strategy (see Appendix 11A in PEI Report Volume III) and an appropriate drainage strategy for the demolition site.

20.5.47 As such the impact of the demolition of the existing coal-fired power station on soils and groundwater is expected to be no greater than the impact arising from construction of the Proposed Development, and significant cumulative effects are not anticipated.

Advanced Thermal Treatment Plant

20.5.48 This proposed Advanced Thermal Treatment Plant is located approximately 100 m west of the Site and its construction could occur at the same time as the Proposed Development's construction. The concurrent construction of these two developments will result in a slight increase in construction activity in this area, but will not increase the magnitude of impact to identified soil and geological receptors already identified.

20.5.49 As described above in the cumulative water resources assessment, the ES for the Advanced Thermal Treatment Plant confirms that a site drainage and containment system will be installed at the start of construction to avoid impacts on water quality, and suitable methods are also proposed for the operation of the development to treat waste water on-site and discharge surface water runoff to Ings and Tetherings Drain, to avoid impacts on water resource receptors. The drainage systems and bunding of chemical storage facilities as detailed in the ES will allow any spillages to be controlled and managed to avoid effects on off-site receptors (including staff and buildings on the Site). No significant cumulative effects are predicted.

Residential Development of 55 and 64 Dwellings

20.5.50 Two residential developments are located 50 m south-west and 150 m west of the Site. These developments are not anticipated to result in additional impacts to the identified geological and hydrogeological receptors in the Study Area, and no significant cumulative effects are anticipated.

Single-Storey Production Facility

20.5.51 The development is located approximately 250 m south of the Site adjacent to the existing Saint Gobain glass factory. The operation of this development is not anticipated to result in any greater impacts than those already reported for the construction and operation of the Proposed Development and significant cumulative effects are not anticipated as an appropriate drainage system is being installed for this development.

20.5.52 As the development is up-gradient of the Site with respect to groundwater flow, this will ensure any accidental spills or releases of contaminants during operation do not affect groundwater quality and the viability of the continued operation of the groundwater abstraction boreholes for use during the operation of the Proposed Development.

Hydro-Electricity Generation Scheme

- 20.5.53 The hydro-electricity generation scheme is located on the River Aire at Chapel Haddlesey Weir, approximately 100 m east of the existing and proposed cooling water intake and 450 m west of the Proposed Gas Connection corridor. The construction of the scheme is anticipated to be completed prior to construction of the Proposed Development and no significant operational effects are anticipated due to the nature of the scheme.

Cultural Heritage

- 20.5.54 For a cumulative impact to arise as a result of physical impacts during construction, another development would have to share a boundary with the Site in order to potentially impact the same buried archaeological resource during construction. None of the other proposed developments are immediately adjacent to the Site, so there is no potential for cumulative physical effects on archaeological resources. This assessment therefore focuses on setting impacts.
- 20.5.55 Cumulative impacts can arise where the above ground built elements of a development, when viewed alongside the above ground built elements of the Proposed Development, contribute to changes to setting that affect an asset's significance (importance).
- 20.5.56 The majority of the developments listed in Table 20.2 can be scoped out of the cumulative cultural heritage assessment due to distances from the Site.
- 20.5.57 The following other developments have been identified as being relevant to cumulative impact assessment for cultural heritage:
- decommissioning and demolition of Eggborough coal-fired power station;
 - Advanced Thermal Treatment Plant;
 - residential developments of 55 and 64 dwellings;
 - single-storey production facility (operation only as construction will have been completed); and
 - hydro-electricity generation scheme (operation only as construction will have been completed).

Decommissioning and Demolition of Eggborough Coal-Fired Power Station

- 20.5.58 The demolition of structures associated with the existing coal-fired power station may occur at the same time as the construction of the Proposed Development. The activities associated with demolition, such as the use of tall cranes and potential short term increases in noise and dust, will result in a noticeable change to the visual setting of heritage assets in the study area. However, the activity associated with demolition is temporary and will not result in harm to the significance of heritage assets.
- 20.5.59 The impact of the demolition of the existing coal-fired power station on the setting of heritage assets is assessed to be no greater than the impact arising from construction of the Proposed Development, and significant cumulative effects are not anticipated.

Advanced Thermal Treatment Plant

- 20.5.60 This proposed Advanced Thermal Treatment Plant is located approximately 100 m west of the Site and its construction could occur at the same time as the Proposed Development. The concurrent construction of the Advanced Thermal Treatment Plant and the Proposed Development will result in a slight increase in construction activity in this area, but is not considered to increase the magnitude of impact to heritage assets that has already been recorded for the Proposed Development.
- 20.5.61 The operational Advanced Thermal Treatment Plant will introduce new structures into views from the Roman fort scheduled monument (**1017822**), grade II listed gate piers to Roall House (**1174474**) and a grade II listed milestone on the eastern edge of the A19 carriageway (**1430182**); however the new elements will not be incongruous with the current visual setting of the assets and will not affect their significance. The impact will be no greater than that recorded previously for the Proposed Development and there will be no significant cumulative effect.

Residential Developments of 55 and 64 Dwellings

- 20.5.62 Two residential developments are located 50 m south-west and 150 m west of the Site. These developments entail urban infill in an area dominated by residential housing and are not considered to result in additional impacts to the setting of heritage assets in the study area. No significant cumulative effects are anticipated.

Single-Storey Production Facility

- 20.5.63 The single-storey production facility is located approximately 250 m south of the Site adjacent to the existing Saint Gobain glass factory. The operation of this development is not considered to result in any greater impacts than those already reported for the construction and operation of the Proposed Development, and significant cumulative effects are not anticipated.

Hydro-Electricity Generation Scheme

- 20.5.64 The construction of the hydro-electricity generation scheme is underway and expected to be completed before the start of construction of the Proposed Development. Its operation is not considered to impact any heritage assets so there is no potential for significant cumulative effects with the Proposed Development.

Traffic and Transportation

- 20.5.65 Of the fourteen developments identified in Table 20.2, three developments fall outside the transport assessment Study Area for the Proposed Development and six were not required to present a transport assessment or transport statement as part of the planning application process. This is assumed to infer that these developments are relatively minor in scale and scope and will not result in significant traffic effects in isolation.
- 20.5.66 The five other developments for which traffic data is available and which could contribute additional traffic to the local road network in the vicinity of Site during the peak of construction and have been incorporated into the Transport Assessment are as follows:
- decommissioning and demolition of Eggborough coal-fired power station;

- Knottingley CCGT Power Station;
- Southmoor Energy Centre;
- Single-Storey Production Facility; and
- Kellingley Colliery Business Park.

20.5.67 Traffic associated with these other developments has been included in the Future Baseline assessment in Chapter 14: Traffic and Transportation, and as such the assessment presented in Chapter 14 is inherently a cumulative impact assessment. Details of the traffic generation predicted for each other development is summarised below. None of these developments, either individually or cumulatively, are expected to have a significant impact on the A19 with the main junctions along the A19 (*i.e.* A19/ A645 and A19/ M62 Junction 34) operating within their design capacity. On this basis, the cumulative traffic and transport effects are assessed to be negligible (not significant).

20.5.68 As set out in Chapter 14: Traffic and Transportation, traffic generation associated with the operation of the Proposed Development is minimal and therefore no further assessment of cumulative effects during operation of the Proposed Development has been undertaken.

Demolition of Eggborough Coal-Fired Power Station

20.5.69 To ensure a robust assessment, a worst case scenario in terms of traffic has been adopted whereby the peak demolition month is assumed to coincide with the peak construction month.

20.5.70 At the peak of demolition it is expected that there will be 100 two-way vehicle movements per day on the A19 (north of the M62) and 16 two-way vehicle movements per day on the A19 (north of Wand Lane) (information provided by EPL).

Knottingley CCGT Power Station

20.5.71 In order to assess the worst case scenario, the proposed construction peak hour traffic flows associated with Knottingley CCGT have been added to the applied to the peak construction month for the Proposed Development.

20.5.72 Information provided in the ES for this development (Knottingley Power, 2013) confirms that part of the road network will be used by construction traffic from both developments. This is the M62 Junction 34 and the A19 between the M62 and the A63.

20.5.73 The additional traffic from the proposed Knottingley Power Station project on the A19 (north of M62) and A19 (north of Wand Lane) is predicted to be 166 two-way vehicle movements per day on both links with the majority of vehicle movements occurring in the peak hours 06:00 – 07:00 and 18:00 – 19:00.

20.5.74 Once operational, Knottingley Power Station will employ around 50 staff, many working on shifts, and traffic generation will be low when compared to the peak construction period.

Southmoor Energy Centre

20.5.75 The Southmoor Energy Centre development is due to be fully operational in 2017. The Transport Assessment (Axis, 2013) predicts 134 two-way vehicle movements per day on the A19 (north of the M62) and 20 two-way vehicle movements per day on the A19 (north of Wand Lane).

Single Storey Production Facility

- 20.5.76 A new single-storey production facility for the manufacture of insulation boarding located on land at St Gobain glass factory, approximately 250 metres east of the A19/ A645 Weeland Road junction, is currently under construction. The additional traffic from the proposed development is predicted to be 110 two-way vehicle movements per day on the A19 (north of M62 J34) and 20 two-way vehicle movements per day on the A19 (north of Wand Lane) (Celotex, 2015).

Kellingley Colliery Business Park

- 20.5.77 An outline application was submitted in November 2016 for the construction of an employment park of up to 1.45 million sq ft (135,500 m²) gross floor space comprising of B2, B8 and ancillary B1 uses, ancillary retail facilities (A1 - A4) including ancillary infrastructure. The development is due to be fully operational by 2021. The additional traffic from the development is predicted to be 2,756 two-way vehicle movements per day on the A19 (north of M62 J34) and 1,838 two-way vehicle movements per day on the A19 (north of Wand Lane) (Optima, 2016).

Land Use, Agriculture and Socio-Economics

- 20.5.78 The Proposed Development will be located mainly within the existing coal-fired power station site (brownfield), but the Proposed Gas Connection will cross greenfield land to reach the National Grid gas transmission network to the north. The majority of the other developments listed in Table 20.2 are also located within existing industrial sites, with the exception of Thorpe Marsh Gas Pipeline, the residential developments of 55 and 64 dwellings, the hydro-electricity generation scheme, the solar farm and the Yorkshire and Humber CCS Pipeline. As the Proposed Development does not affect any of the same non-industrial land uses (such as Public Rights of Way) as any of the other developments, so no significant cumulative effects are anticipated.
- 20.5.79 Like the Proposed Gas Connection corridor (approximately 4.5 km long), the gas connections for the Knottingley and Thorpe Marsh CCGT Power Stations must cross agricultural land to reach the National Grid gas transmission network. The Knottingley Power Station gas pipeline is approximately 7.1 km long and the Thorpe Marsh Power Station gas pipeline is approximately 18 km long. The Yorkshire and Humber CCS Pipeline also crosses agricultural land and is approximately 75 km long. However, the majority of this land will be only temporarily affected during construction and will be reinstated to its original condition following completion of construction. The only permanent effects on agricultural land will be the loss of land required for Above Ground Installations (AGIs), and also the loss of agricultural fields for the two residential developments in Eggborough. If all four pipelines were to be constructed simultaneously, the short term cumulative effects on agricultural land may be significant, but no significant long term cumulative effects are anticipated.
- 20.5.80 All other developments will generate additional employment opportunities and associated socio-economic benefits to add to the benefits of the Proposed Development during their construction and operation. The cumulative effects during construction of all fourteen other developments together with the Proposed Development construction are considered to be significantly beneficial.

Landscape and Visual Amenity

Landscape

- 20.5.81 The landscape cumulative assessment assesses the cumulative effects on identified landscape receptors within the Study Area. Landscape receptors that have been assessed as having negligible effects have not been included in the assessment of cumulative effects, as it is considered unlikely that the addition of a negligible effect to the cumulative effects of other developments within the Study Area, would lead to a significant cumulative impact.
- 20.5.82 The majority of the other developments in Table 20.2 are located within the Levels Farmland (23) Landscape Character Type (LCT) (Chris Blandford Associates, 2011) and as such this LCT is likely to experience cumulative effects. The detailed landscape cumulative assessment is contained within Tables 20.4 and 20.5 below.
- 20.5.83 For the assessment of operational effects, the Opening (2022) scenario (with the existing coal-fired power station buildings and structures assumed to still be present) has been selected as a worst case for cumulative landscape assessment (because there would be a greater amount of built development present in the landscape).

Table 20.4: Assessment of cumulative landscape effects – Construction (compared to future baseline with existing coal-fired power station present)

Landscape type	Sensitivity of receptor	Description of impact	Predicted magnitude of impact	Classification of effect
Levels Farmland (23) LCT	Medium	The other developments would introduce further built form into the LCT alongside the construction activity associated with the Proposed Development. It is assessed that the introduction of construction activities associated with the Proposed Development would marginally increase the amount of built development within the LCT, although due to the large scale of the LCT and the existing presence of large scale power, industrial and infrastructure developments it is assessed that the impact of construction activities associated with the Proposed Development would remain at low magnitude of impact.	Low	Minor adverse (not significant)
River Floodplain (24) LCT	Medium	The other developments would introduce views of additional built form into views from the LCT. As a result of the existing views of large scale power complexes and the presence of transport infrastructure which are located in the LCT it is considered that the introduction of the Proposed Development would result in a limited cumulative impact with the other developments and that the assessed impact would remain at low magnitude of impact.	Low	Minor adverse (not significant)

Table 20.5: Assessment of cumulative landscape effects – Opening (compared to future baseline with existing coal-fired power station present)

Landscape type	Sensitivity of receptor	Description of impact	Predicted magnitude of impact	Classification of effect
Levels Farmland (23) LCT	Medium	The presence of the other developments will marginally increase the amount of built form within the LCT. The addition of the Proposed Development would also marginally increase the amount of built form within the LCT, which is already characterised by large scale industrial developments and road infrastructure. It is assessed that the cumulative impact would remain as that assessed for the Proposed Development in isolation.	Low	Minor adverse (not significant)
River Floodplain (24) LCT	Medium	As with the construction assessment scenario, it is predicted that the increase in built development as a result of the other developments and the addition of the Proposed Development would result in cumulative impacts that are no greater than that assessed in isolation.	Very low	Negligible adverse (not significant)

- 20.4.18 In summary the two identified LCTs, Levels Farmland (23) and River Floodplain (24), are not predicted to receive significant cumulative effects.

Visual Amenity

- 20.5.84 For the assessment of cumulative visual impacts the following other developments have been scoped out as a result of no intervisibility with the Proposed Development, the scale of the cumulative development (mass or height) or distance:

- Ferrybridge Multifuel 2 – due to distance and lack of intervisibility;
- hydro-electricity generation scheme – due to scale (height and mass) and lack of intervisibility;
- solar farm – due to distance, scale (height) and lack of intervisibility;
- Thorpe Marsh CCGT Power Station – due to distance;
- Thorpe Marsh Gas Pipeline – due to distance (and the pipeline is below ground);
- Yorkshire and Humber CCS Pipeline – due to distance (and the pipeline is below ground);
- residential development of 55 dwellings – due to lack of intervisibility;
- single-storey production facility – due to lack of intervisibility and screening as a result of the existing structures associated with Saint Gobain; and
- Kellingley Colliery Business Park – due to scale (height).

- 20.5.85 The other developments that have been scoped in to the cumulative visual impact assessment are as follows, including the assumed dates for construction activity based on information contained within the respective planning application documents:

- Eggborough coal-fired power station decommissioning and demolition (assumed to be some time between 2018 and 2024);
- Knottingley Power Project (construction 2017 to 2020);
- Southmoor Energy Centre (construction starting 2017);
- Advanced Thermal Treatment Plant (operation 2017); and
- residential development of 64 dwellings (assumed construction during 2019 to 2022).

- 20.5.86 The cumulative assessment in relation to the decommissioning and demolition of the existing coal-fired power station has been carried out for both the construction and opening scenarios as a result of the uncertainty around the dates that decommissioning and demolition will occur. A cumulative assessment where the existing coal-fired power station is no longer present has not been carried out as this has been assessed at the operation stage of the Proposed Development as part of Chapter 16: Landscape and Visual Amenity, since this is considered to represent the worst case visual impact scenario for the Proposed Development.

- 20.5.87 Visual receptors that have been assessed as having negligible effect due to the Proposed Development have not been included in the assessment of cumulative effects, as it is considered unlikely that the addition of a negligible effect to the cumulative effects of other developments within the study area would lead to a significant cumulative impact (viewpoints 2 and 9).

- 20.5.88 Potential cumulative visual effects of the Proposed Development in comparison with the future baseline visual context are considered in Table 20.6 by reference to representative viewpoints. The assessments contained within Table 20.6 should be read in conjunction with

Figures 16.7 to 16.20 (PEI Report Volume II) which illustrates the baseline conditions at each viewpoint.

Table 20.6: Cumulative visual effects from representative viewpoints

Viewpoint 1: Selby Road (North), Eggborough				
Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Site (km)	Direction of view
56431, 423705	Road users, residential	12	0.7	East
Other developments		Sensitivity of receptor (2016-2022 existing and future baseline)		
Residential development of 64 dwellings Advanced Thermal Treatment Plant Eggborough coal-fired power station decommissioning and demolition		Low for road users. Medium for residential (existing and new)		
Size/ scale, duration and reversibility of cumulative impact at construction				
From this viewpoint the construction of the proposed residential development of 64 residential properties off Ryecroft Gardens will partially screen views for the existing residential properties. Existing residents will be impacted by the construction operations of the proposed residential development, the demolition of Eggborough Coal-Fired Power Station and the operational stack associated with the Advanced Thermal Treatment Plant. It is predicted that there will be a cumulative impact for the residential properties as a result of the construction operations associated with the proposed residential development. It is predicted that the addition of the Proposed Development would result in a cumulative impact greater than that predicted in isolation, as a result of the scale of construction activity occurring, although, views for the majority of residential receptors will either be oblique or contain clear views of structures associated with the Saint Gobain factory site. Views for road users would be oblique and contain views of the proposed residential development. This impact would be short term and irreversible, as a result of the impacts associated with the removal of Eggborough Coal Fired Power Station.				
Magnitude of cumulative impact at construction				High
Significance of cumulative effect at construction		Road users	Moderate adverse (significant)	
		Residential	Major adverse (significant)	

Size/ scale, duration and reversibility of cumulative impact at opening		
<p>From this viewpoint the completed proposed residential development will partially screen views for the existing residential properties. Therefore, there will be a limited cumulative magnitude of change for the existing residents, which is less than that predicted for the Proposed Development in isolation. For the proposed residents, they will potentially gain views of the Advanced Thermal Treatment Plant stack, at 46.5 m, and the demolition of Eggborough Coal Fired Power Station. It is predicted that the addition of the Proposed Development would result in a cumulative impact greater than that predicted in isolation, as a result of the scale of construction activity occurring. Views for road users would be oblique and contain views of the proposed residential development. This impact would be short term and not reversible, as a result of the impacts associated with the demolition of Eggborough Coal-Fired Power Station.</p>		
Magnitude of cumulative impact at opening		High
Significance of cumulative effect at opening	Road users	Moderate adverse (significant)
	Residential (proposed)	Major adverse (significant)

Viewpoint 3: Weeland Road				
Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Site (km)	Direction of view
457775, 422966	Road users, residential	16	0.7	South
Other developments		Sensitivity of receptor (2016-2022 existing and future baseline)		
Eggborough coal-fired power station decommissioning and demolition		Low for road users Medium for residential		
Size/ scale, duration and reversibility of cumulative impact at construction				
The activities associated with the demolition of Eggborough Coal-Fired Power Station will be clearly visible, viewed beyond the construction activities associated with the Proposed Development. These activities will give rise to a cumulative impact greater than that predicted in isolation. The impacts will be short term and irreversible.				
Magnitude of cumulative impact at construction				High
Significance of cumulative effect at construction	Road users			Moderate adverse (significant)
	Residential			Major adverse (significant)
Size/ scale, duration and reversibility of cumulative impact at opening				
The demolition of the Eggborough Coal-Fired Power Station would be partially screened by the Proposed Development and would result in a marginal increase in cumulative impacts, slightly greater than that assessed in isolation. The impacts will be short term and irreversible.				
Magnitude of cumulative impact at opening				High
Significance of cumulative effect at opening	Road users			Minor adverse (not significant)
	Residential			Major adverse (significant)

Viewpoint 4: Selby Road, Whitley				
Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Site (km)	Direction of view
456262, 420855	Residential	14	3.1	North east
Other developments		Sensitivity of receptor (2016-2022 existing and future baseline)		
Eggborough coal-fired power station decommissioning and demolition		High		
Size/ scale, duration and reversibility of cumulative impact at construction				
Views of the demolition of the Eggborough Coal-Fired Power Station will be visible beyond the construction activities of the Proposed Development resulting in a cumulative impact that is marginally greater than that assessed in isolation. The impact will be short term and irreversible.				
Magnitude of cumulative impact at construction				Low
Significance of cumulative effect at construction				Moderate adverse (significant)
Size/ scale, duration and reversibility of cumulative impact at opening				
Views of the demolition of the stacks and cooling towers associated with Eggborough Coal-Fired Power Station will be visible behind the Proposed Development, resulting in a cumulative impact that is marginally greater than that assessed in isolation. The impact will be short term and irreversible.				
Magnitude of cumulative impact at opening				Low
Significance of cumulative effect at opening				Moderate adverse (significant)

Viewpoint 5: Gallows Hill				
Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Site (km)	Direction of view
458764, 423635	Residential	14	0.5	West
Other developments		Sensitivity of receptor (2016-2022 existing and future baseline)		
Eggborough coal-fired power station decommissioning and demolition Advanced Thermal Treatment Plant Knottingley Power Project Southmoor Energy Centre		Medium		
Size/ scale, duration and reversibility of cumulative impact at construction				
Close proximity views of the demolition of Eggborough Coal-Fired Power Station will be visible, viewed beyond residential properties. Longer range views of the stacks associated with the Thermal Treatment Plant, Knottingley Power Plant and Southmoor Energy Centre may be available, viewed to the left of the Proposed Development. A cumulative impact will arise as a result of the increase in construction activity visible, assessed as greater than that assessed for the Proposed Development in isolation. The impact will be short term and irreversible.				
Magnitude of cumulative impact at construction				High
Significance of cumulative effect at construction				Major adverse (significant)
Size/ scale, duration and reversibility of cumulative impact at opening				
The impacts will be similar to that assessed at the construction stage, although as a result of the opening of the Proposed Development, the amount of construction activity will be limited to the demolition of the Eggborough Coal-Fired Power Station. The cumulative impact will be greater than that assessed for the Proposed Development in isolation. The impact will be short term and irreversible.				
Magnitude of cumulative impact at opening				High
Significance of cumulative effect at opening				Major adverse (significant)

Viewpoint 6: Ings Lane PRow (35.36/1/1)				
Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Site (km)	Direction of view
459446, 424245	Users of PRow, road users	16	1	South west
Other developments		Sensitivity of receptor (2016-2022 existing and future baseline)		
Eggborough coal-fired power station decommissioning and demolition Advanced Thermal Treatment Plant Knottingley Power Project Southmoor Energy Centre		High		
Size/ scale, duration and reversibility of cumulative impact at construction				
From this location it is predicted that the long range views of the stacks associated with the Advanced Thermal Treatment Plant, Knottingley Power Project and Southmoor Energy Centre would be viewed between the Eggborough Coal-Fired Power Station and construction activity associated with the Proposed Development. The demolition activities associated with Eggborough Coal-Fired Power Station would be prominent in the view. The addition of the Proposed Development would result in cumulative impacts, greater than those assessed in isolation. The impact will be short term and irreversible.				
Magnitude of cumulative impact at construction				High
Significance of cumulative effect at construction				Major adverse (significant)
Size/ scale, duration and reversibility of cumulative impact at opening				
The demolition of the Eggborough Coal-Fired Power Station will be prominent in the view. The stacks associated with the other cumulative developments will be viewed at a long distance. The addition of the completed Proposed Development will result in cumulative impacts, greater than that assessed at isolation. The impact will be short term and irreversible.				
Magnitude of cumulative impact at opening				High
Significance of cumulative effect at opening				Major adverse (significant)

Viewpoint 7: St John The Baptist Church Grounds, Millfield Road, Chapel Haddlesey				
Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Site (km)	Direction of view
458279, 426072	Residents and church users	8	1.5	South
Other developments		Sensitivity of receptor (2016-2022 existing and future baseline)		
Eggborough coal-fired power station decommissioning and demolition		Medium		
Size/ scale, duration and reversibility of cumulative impact at construction				
The demolition of Eggborough Coal-Fired Power Station will be highly visible within the view resulting in a high magnitude of impact. The addition of the Proposed Development would result in a cumulative impact, although no greater than that assessed for the Eggborough Coal-Fired Power Station in isolation. The impacts will be short term and irreversible.				
Magnitude of cumulative impact at construction				Low
Significance of cumulative effect at construction				Minor adverse (not significant)
Size/ scale, duration and reversibility of cumulative impact at opening				
The impacts assessed for opening would be the same as those assessed at the construction stage as a result of the demolition of the Eggborough Coal-Fired Power Station. The impacts would be short term and irreversible.				
Magnitude of cumulative impact at opening				Low
Significance of cumulative effect at opening				Minor adverse (not significant)

Viewpoint 8: Trans Pennine Trail PRow 35.14/15/1, Burn Airfield				
Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Site (km)	Direction of view
460826, 429075	Users of PRow and Burn Airfield	7	5.7	South west
Other developments		Sensitivity of receptor (2016-2022 existing and future baseline)		
Eggborough coal-fired power station decommissioning and demolition Advanced Thermal Treatment Plant Knottingley Power Project Southmoor Energy Centre		High		
Size/ scale, duration and reversibility of cumulative impact at construction				
Long distance views of the demolition of Eggborough Coal-Fired Power Station will be prominent in the view whilst views of the construction of the stacks associated with Knottingley Power Project and Southmoor Energy Centre will be visible, viewed to the right of the existing cooling towers. The Advanced Thermal Treatment Plant stack will be barely perceptible, viewed to the immediate right of the cooling towers. The addition of the Proposed Development would result in cumulative impacts, although no greater than those assessed in isolation. The impacts will be short term and irreversible.				
Magnitude of cumulative impact at construction				Very low
Significance of cumulative effect at construction				Minor adverse (not significant)
Size/ scale, duration and reversibility of cumulative impact at opening				
The impacts assessed for opening would be similar to those assessed at the construction stage as a result of the demolition of the Eggborough Coal-Fired Power Station. The impacts would be short term and irreversible.				
Magnitude of cumulative impact at opening				Very low
Significance of cumulative effect at opening				Minor adverse (not significant)

Viewpoint 10: West Lane, Burn				
Grid reference	Receptor type	Elevation (mAOD)	Approx. distance from Site (km)	Direction of view
458100, 428163	Road users	7	3.5	South
Other developments		Sensitivity of receptor(2016-2022 existing and future baseline)		
Eggborough coal-fired power station decommissioning and demolition		Medium		
Size/ scale, duration and reversibility of cumulative impact at construction				
Long distance views of the demolition of Eggborough Coal-Fired Power Station will be visible from this location. The addition of the Proposed Development would result in cumulative impacts, although no greater than those assessed in isolation. The impacts will be short term and irreversible.				
Magnitude of cumulative impact at construction				Medium
Significance of cumulative effect at construction		Road users		Moderate adverse (significant)
Size/ scale, duration and reversibility of cumulative impact at opening				
The impacts assessed for opening would be similar to those assessed at the construction stage as a result of the demolition of the Eggborough Coal-Fired Power Station. The impacts would be short term and not reversible.				
Magnitude of cumulative impact at opening				Medium
Significance of cumulative effect at opening		Road users		Moderate adverse (significant)

Viewpoint 11: Selby Canal Viewing Platform PRoW 35.72/2/1				
Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Site (km)	Direction of view
457080, 426412	Users of the PRoW (footpath) and users of Selby Canal at Haddlesey Flood Lock	7	1.6	South
Other developments		Sensitivity of receptor (2016-2022 existing and future baseline)		
Eggborough coal-fired power station decommissioning and demolition Advanced Thermal Treatment Plant Knottingley Power Project Southmoor Energy Centre		High		
Size/ scale, duration and reversibility of cumulative impact at construction				
Medium distance views of the demolition of Eggborough Power Station will be prominent within the view. The operational stack associated with the Advanced Thermal Treatment Plant will be barely perceptible, viewed to the right of the cooling towers. Views of the construction of the stacks associated with the Knottingley Power Project and Southmoor Energy Centre would be at a long distance and viewed successively with the Proposed Development. The addition of the construction operations associated with the Proposed Development would result in a cumulative impact, although no greater than that assessed for the Proposed Development in isolation. The impact will be short term and irreversible.				
Magnitude of cumulative impact at construction				Very low
Significance of cumulative effect at construction		PRoW and canal users		Minor adverse (not significant)
Size/ scale, duration and reversibility of cumulative impact at opening				
The impacts assessed for opening would be similar to those assessed at the construction stage as a result of the demolition of the Eggborough Coal-Fired Power Station. The impacts would be short term and irreversible.				
Magnitude of cumulative impact at opening				Very low
Significance of cumulative effect at opening		PRoW and canal users		Minor adverse (not significant)

Viewpoint 12: Manor Garth, Kellington				
Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Site (km)	Direction of view
455301, 424936	Residential and school grounds	13	1.9	South east
Other developments		Sensitivity of receptor (2016-2022 existing and future baseline)		
Eggborough coal-fired power station decommissioning and demolition		Medium		
Size/ scale, duration and reversibility of cumulative impact at construction				
Medium range views of the demolition of Eggborough Coal-Fired Power Station will be visible from this location. The addition of the Proposed Development would result in slight cumulative impacts, although no greater than those assessed in isolation. The impacts will be short term and irreversible.				
Magnitude of cumulative impact at construction				Low
Significance of cumulative effect at construction		Residential and school grounds		Minor adverse (not significant)
Size/ scale, duration and reversibility of cumulative impact at opening				
The impacts assessed for opening would be similar to those assessed at the construction stage as a result of the demolition of the Eggborough Coal-Fired Power Station. The impacts would be short term and irreversible.				
Magnitude of cumulative impact at opening				Low
Significance of cumulative effect at opening		Residential and school grounds		Minor adverse (not significant)

Viewpoint 13: Beal Lane, Beal				
Grid reference	Receptor type	Elevation (m AOD)	Approx. distance from Site (km)	Direction of view
453620, 425259	Residential, road users	12	3.5	East
Other developments		Sensitivity of receptor(2016-2022 existing and future baseline)		
Eggborough coal-fired power station decommissioning and demolition Advanced Thermal Treatment Plant Knottingley Power Project Southmoor Energy Centre		Medium for road users and residential		
Size/ scale, duration and reversibility of cumulative impact at construction				
Long distance views of the demolition of Eggborough Coal-Fired Power Station will be visible from this location. Views of the operational Advanced Thermal Treatment Plant stack will be barely perceptible from this location. The construction of the Knottingley Power Project and the Southmoor Energy Centre will be visible from a medium distance, within successive views. The addition of the Proposed Development would result in a slight cumulative impact, although the magnitude is no greater than that assessed in isolation. The impacts will be short term and irreversible.				
Magnitude of cumulative impact at construction				Low
Significance of cumulative effect at construction		Residential, road users		Minor adverse (not significant)
Size/ scale, duration and reversibility of cumulative impact at opening				
The impacts assessed for opening would be similar to those assessed at the construction stage as a result of the demolition of the Eggborough Coal-Fired Power Station and the close proximity of the operational Knottingley Power Project and the Southmoor Energy Centre. The impacts would be short term and irreversible.				
Magnitude of cumulative impact at opening				Low
Significance of cumulative effect at opening		Residential, Road users		Minor adverse (not significant)

20.5.89 In summary the cumulative viewpoint assessment identified that Viewpoint 3 (residential receptors) would receive a major adverse significant cumulative effect as a result of views of both the Proposed Development construction and opening if concurrent with the decommissioning and demolition of the existing coal-fired power station (the same overall classification of effect as for the Proposed Development alone), and Viewpoint 6 would receive major adverse significant cumulative effects as a result of views of both the Proposed

Development construction and operation concurrent with the decommissioning and demolition of the existing coal-fired power station (the same overall classification of effects as for the Proposed Development alone). Viewpoint 1 (residential receptors) would receive a major adverse significant cumulative effect as a result of views of both the Proposed Development construction and opening if concurrent with the construction of the proposed residential development (an increase in classification of effect compared with that for the Proposed Development alone), and Viewpoint 5 would receive a major adverse significant cumulative effect as a result of views of both the Proposed Development construction and opening if concurrent with the decommissioning and demolition of the existing coal-fired power station (an increase in classification of effect compared with that for the Proposed Development alone).

- 20.5.90 Moderate adverse significant cumulative effects are also predicted at Viewpoints 1, 3 (road users), 4, and 10 as a result of both the Proposed Development and decommissioning and demolition of the existing coal-fired power station. Some of these cumulative effects are greater than the effects of the Proposed Development alone (i.e. Viewpoint 1 (road users) at construction of the Proposed Development, Viewpoint 1 (road users) at opening of the Proposed Development, and Viewpoint 4 at construction and opening of the Proposed Development,), whereas the remainder of effects are classified the same as for the Proposed Development alone.
- 20.5.91 The remaining viewpoints are all predicted to receive minor adverse cumulative effects that are not significant.

Waste Management

- 20.5.92 As part of their regional planning responsibilities, North Yorkshire County Council (the Waste Disposal Authority) has a responsibility to plan for waste management and to ensure that sufficient sites are available to provide the necessary capacity during the planning period. Further capacity may also be provided on a regional basis by waste transfers within the larger Yorkshire and Humberside region.
- 20.5.93 Within this larger regional context, the effects of waste generated from the Proposed Development on the regional capacity for waste management are at such a low level that significant cumulative effects with other developments are not anticipated.

Sustainability and Climate Change

- 20.5.94 When the impact on sustainability and climate change from the Proposed Development is considered in relation to the other developments, the national need for diverse and reliable energy supply and the local benefits of job creation in the area, the overall cumulative effect is considered to be beneficial.
- 20.5.95 A carbon assessment is being prepared to support the final ES and DCO application and further consideration of cumulative climate change effects will be undertaken at this time.

20.6 Combined Effects Assessment

- 20.6.96 Table 20.7 below identifies where in the PEI Report combined effects are considered in further detail with regard to the Proposed Development, and considers other combined effects that are not discussed elsewhere.

Table 20.7: Potential for significant combined effects

Chapter	Combined effects considered in technical chapter	Other combined effects to be considered
Chapter 8: Air Quality	<p>This chapter considers air quality effects of stack emissions and road traffic emissions, however the receptors of these two types of air quality effects are in different locations and the main road traffic emissions will occur before the plant is operational, so there is no potential for significant combined effects on a single receptor. No significant adverse effects are predicted.</p> <p>The chapter also considers air quality effects on designated nature conservation sites due to stack emissions (no significant effects are predicted). These sites are located several km from the Site so there is no potential for other effects from the construction and operation of the Proposed Development (traffic, dust, noise, visual etc.) to combine with air quality effects, therefore no significant combined effects on designated nature conservation sites are predicted.</p>	<p>There is potential for dust effects during construction to combine with noise and visual effects at individual receptors within 200 m of the Site, namely Eggborough Sports and Leisure Complex (residential receptor), properties in the north of Eggborough village, properties in Chapel Haddlesey and individual properties within 200 m of the Proposed Gas Connection route. As the construction works within 200 m of these receptors will be short term and relatively minor (i.e. pipeline construction), combined effects are not considered to be greater than the noise, dust or visual effects in isolation.</p>
Chapter 9: Noise and Vibration	No combined effects identified.	See discussion above regarding combined noise, dust and visual effects during construction.
Chapter 10: Ecology and Nature Conservation	This chapter considers the combined effects of noise, air quality, disturbance, water contamination and ground contamination on ecological receptors in the vicinity of the Site. No significant effects on ecological receptors are identified.	No other combined effects identified.
Chapter 11: Water Resources, Flood Risk and Drainage	No combined effects identified.	No other combined effects identified.

Chapter	Combined effects considered in technical chapter	Other combined effects to be considered
Chapter 12: Geology, Hydrogeology and Land Contamination	No combined effects identified.	No other combined effects identified.
Chapter 13: Cultural Heritage	This chapter considers both physical and setting impacts on cultural heritage assets. No significant effects are predicted following implementation of mitigation.	No other combined effects identified.
Chapter 14: Traffic and Transportation	This chapter considers a range of different traffic-related effects on roadside receptors (severance, pedestrian amenity, fear and intimidation, highway safety and driver delay). No significant effects are predicted.	There is potential for receptors located close to the road network to experience combined effects from traffic (severance, pedestrian amenity, highway safety etc.) and associated noise, vibration and air emissions during construction of the Proposed Development. The traffic, air quality and noise assessments do not identify any significant effects on sensitive receptors due to construction traffic and the combined effect is also considered to be not significant.
Chapter 15: Land Use, Agriculture and Socio-Economics	No combined effects identified.	There is potential for users of two Public Rights of Way (PRoW) (that will need to be temporarily stopped up/ diverted during the construction of the Proposed Gas Connection), and users of roads (required for construction access to the Proposed Gas Connection corridor), to also experience construction-related dust, noise and visual effects. However given the relatively short duration of the works, no significant combined effects are anticipated.
Chapter 16: Landscape and Visual Amenity	No combined effects identified.	See discussion above regarding combined visual, dust and noise effects during construction, and regarding combined effects on PRoW users.

Chapter	Combined effects considered in technical chapter	Other combined effects to be considered
Chapter 17: Waste Management	This chapter refers to good practice measures to avoid water resources, air quality, noise or traffic impacts resulting from the generation, handling, on-site temporary storage or off-site transport of waste. Traffic effects arising from the transport of waste are taken into account in the traffic and transport assessment (Chapter 14), and associated air quality and noise effects are assessed in Chapters 8: Air Quality and 9: Noise and Vibration. Best practice measures for the storage of waste on Site and appropriate drainage systems and bunding of storage areas as necessary will avoid impacts on water or land quality.	No other combined effects identified.
Chapter 18: Sustainability and Climate Change	This chapter considers the combined effects of the Proposed Development on land use, water quality, flood risk, waste, transport, ecology and employment in order to evaluate the overall sustainability of the Proposed Development. No significant effects are identified.	No other combined effects identified.
Chapter 19: Health Impact Assessment	In the final ES, this chapter will consider the combined effects of the Proposed Development on the health of the local community.	During the construction phase of the Proposed Development there will be changes in the local environment immediately surrounding the Site, for example noise and visual effects. The key factors (noise, traffic, air quality and landscape and visual) are all identified to primarily affect different receptors and are generally classified as minor (with the exception of some significant visual effects) therefore no combined effect on health is anticipated.

20.7 Limitations

- 20.7.97 Any limitations that were encountered during the individual assessments are detailed within Chapters 8 to 19.
- 20.7.98 The cumulative assessment is based on the currently available information on other potential or committed developments in the vicinity of the Site; this list and that information will be reappraised during the preparation of the final ES.

20.8 Conclusions

- 20.8.99 The assessment of combined effects has not identified any significant combined effects.
- 20.8.100 The assessment of cumulative impacts has considered a number of other developments within the vicinity of the Site and the potential for cumulative impacts to arise from one or several of the other developments together with the Proposed Development.
- 20.8.101 Through consideration of the information available for each other developments (including the Environmental Statements and detailed modelling information where available) it has been concluded there is the potential for significant cumulative air quality effects due to the cumulative traffic impacts associated with other developments (although the Proposed Development itself makes a negligible contribution) and visual effects from Viewpoints 1, 3, 4, 5, 6 and 10 as a result of views of both the Proposed Development and other developments during the construction period and opening of the Proposed Development.
- 20.8.102 All other assessment topics have concluded that there is no potential for significant cumulative effects to arise from the construction or operation phases of the Proposed Development when considered alongside other developments proposed within the vicinity of the Site.
- 20.8.103 Cumulative impacts with existing developments have been accounted for through establishing the current baseline for each technical assessment (presented in Chapters 8 to 19).

20.9 References

Axis (2013) *Southmoor Energy Centre – Transport Assessment and Interim Travel Plan*. Axis.

Chris Blandford Associates (2011) *North Yorkshire and York Landscape Characterisation Project*. North Yorkshire County Council Selby District Council (2005) *Selby District Local Plan, adopted February 2005, saved policies*

Celotex (2015) *Proposed Manufacturing Facility A645 Weeland Road, Eggborough Transport Assessment*. Celotex Ltd.

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

Knottingley Power (2013) *Knottingley Power Project Environmental Statement*. Knottingley Power Limited.

Optima (2016) *Redevelopment of Kellingley Colliery Proposed Commercial Development - Transport Assessment*. Optima.

Planning Inspectorate (2015) Advice Note 17 Cumulative effects assessment relevant to nationally significant infrastructure projects