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4.0 THE PROPOSED DEVELOPMENT

4.1 Introduction

4.1.1 The Proposed Development comprises a gas-fired power station (also referred to as a power plant or generating station) which will have a gross output capacity of up to 2,500 megawatts (MW), including a Combined Cycle Gas Turbine (CCGT) Power Station and a 'fast response' gas-fired peaking plant of up to 299 MW gross output capacity.

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 Environmental Statement (ES). Justification for the need to retain flexibility in certain parameters is also outlined in this chapter and in Chapter 6: Need, Alternatives and Design Evolution.

4.1.4 Figure 3.2 (ES Volume II) shows the areas within which each element of the Proposed Development is anticipated to be constructed. The stack position is fixed and the limits of deviation for each element of the Proposed Development are defined in the draft Development Consent Order (DCO) and accompanying Works Plans (Application Document Ref. Nos. 2.1 and 4.4 respectively).

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 4.1-4.4, provided in ES 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 ES as 'the Site'. Schedule 1 of the draft DCO (Application Document Ref. No. 2.1) separates the components into 'Work Nos.' and the location of each Work No. within the Site is shown on the Works Plans (Application Document Ref. No. 4.4). Reference to Work Nos. are made in this Section to add cross-reference to these documents.

4.2.2 The Proposed Development will comprise a gas-fired power station with gross electrical output capacity of up to 2,500 MW and associated buildings, structures and plant, including:

- a CCGT plant (Work No. 1A) comprising –
  - up to three CCGT units,
  - turbine hall buildings for gas turbines and steam turbines,
  - heat recovery steam generators (HRSG),
  - gas turbine air intake filters,
  - co-located emissions stacks,
  - transformers,
  - deaerator and feed water pump buildings,
  - nitrogen oxide emissions control equipment and chemical storage,
  - chemical sampling/ dosing plants,
  - demineralised water treatment plant including storage tanks,
  - gas reception facility including gas supply pipeline connection works, gas receiving area, gas compression equipment and building, pipeline internal gauge (PIG) launcher for pipe inspection, emergency shutdown valves, gas vents and gas metering, dehydration and pressure reduction equipment,
  - auxiliary boilers with associated emissions stacks
  - standby diesel generators, and
  - continuous emissions monitoring system (CEMS);
- up to three banks of cooling towers for the CCGT plant, cooling water pumps, plant and buildings, and cooling water dosing and sampling plant and buildings (Work No. 1C);
- a peaking plant and a black start plant with a combined gross output capacity of the peaking plant and black start plant of up to 299 MW (Work No. 1B) comprising –
  - a peaking plant housed in a dedicated building, comprising either up to two open cycle gas turbines or up to ten gas-fired reciprocating engines and associated emissions stack(s),
  - a black start plant housed in a building, comprising either one open cycle gas turbine or up to three reciprocating gas engines with associated emissions stack(s),
  - diesel generators for black start plant start up prior to gas-firing,
  - gas turbine air intake filters,
  - CEMS, and
  - transformers;
- in connection with the CCGT units, peaking plant, black start plant and cooling infrastructure will be:
  - administration and control buildings;
  - diesel fuel storage tanks and unloading area;
  - pipework, pipe runs and pipe racks;
  - an electrical sub station, electrical equipment, buildings and enclosures to connect to the existing on-site National Grid 400 kV sub station;

- auxiliary plant, buildings, enclosures and structures;
- workshop and stores buildings;
- fire fighting equipment, building and distribution pipework;
- fire and raw water storage tanks;
- fire water retention basin;
- chemical storage facilities;
- lubrication oils and grease storage facilities;
- permanent plant laydown area for operation and maintenance activities;
- closed circuit cooling water plant and buildings;
- waste water treatment plant and building; and
- mechanical, electrical, gas, telecommunications and water networks, pipework, cables, racks, infrastructure, instrumentation and utilities.

- temporary construction laydown area (Work No. 2A) comprising hardstanding, laydown and open storage areas, backfilling of the lagoon, contractor compounds and construction staff welfare facilities, gatehouse and weighbridge, vehicle parking and cycle storage facilities, internal roads and pedestrian and cycle routes, security fencing and gates, external lighting including lighting columns, and closed circuit television (CCTV) cameras and columns;
- and carbon capture readiness (CCR) reserve space (Work No. 2B)
- electrical connection works (Work No. 3) comprising up to 400 kV underground electrical cables and control systems cables to and from the existing National Grid sub station (Work No. 3A) and works within the National Grid sub station including underground and overground cables, connections to the existing busbars and upgraded or replacement equipment (Work No. 3B);
- cooling water connection works (Work No. 4), comprising works to the existing cooling water supply and discharge pipelines and abstraction (intake) and discharge (outfall) structures, including, as necessary, upgraded or replacement pipelines, plant, buildings, enclosures and structures and underground electrical supply cables, transformers and control systems cables;
- groundwater and towns water supply connection works (Work No. 5), including works to the existing towns water pipelines and groundwater boreholes and pipelines, replacement and new pipelines, plant, buildings, enclosures and structures and underground electrical supply cables, transformers and control systems cables;
- gas supply pipeline connection works (Work No. 6) for the transport of natural gas to the Proposed Power Plant Site, comprising an underground high pressure steel pipeline of up to 1,000 mm (nominal bore) in diameter and approximately 4.6 km in length, including cathodic protection posts, marker posts and underground electrical supply cables, transformers and control systems cables;
- an Above Ground Installation (AGI) west of Burn village (Work No. 7) connecting the gas supply pipeline (Work No. 6) to the National Transmission System (NTS) Feeder 29 pipeline, comprising:
  - a compound for National Grid's apparatus comprising an offtake connection from the NTS, above and below ground valves, flanges and pipework, an above or below ground remotely operated valve (ROV), an above or below ground ROV bypass, an above or below ground pressurisation bridle, instrumentation and electrical kiosks, and telemetry equipment kiosks and communications equipment (Work No. 7A);
  - a compound for EPL's apparatus including above and below ground valves, flanges and pipework, an above or below ground isolation valve, an above or below ground PIG

launching facility, instrumentation and electrical kiosks, and telemetry equipment kiosks and communications equipment (Work No. 7B);
    - access works, vehicle parking, electrical and telecommunications connections, surface water drainage, security fencing and gates, CCTV cameras and columns and perimeter landscaping in connection with both of the above compounds;
- retained landscaping comprising (Work No. 8):
    - soft landscaping including planting;
    - biodiversity enhancement measures; and
    - security fencing, gates, boundary treatment and other means of enclosure;
- surface water drainage connection to Hensall Dyke, comprising works to install, repair or replace drainage pipes, and works to Hensall Dyke (Work No. 9);
- vehicular, pedestrian and cycle access works and rail infrastructure including alterations to or replacement of the existing private rail line , installation of new rail lines and crossover points and ancillary equipment (Work No. 10);
- in connection with the Proposed Development as described above (Work No. 1 to 7 and 9 to 10):
    - surface water drainage systems, storm water attenuation systems including storage basins, oil/ water separators, and including channelling and culverting and works to existing drainage systems;
    - electrical, gas, potable water supply, foul water drainage and telecommunications infrastructure connections and works, and works to alter the position of such services and utilities connections;
    - hardstanding and hard landscaping;
    - soft landscaping including embankments and planting;
    - biodiversity enhancement measures;
    - security fencing, gates, boundary treatment and other means of enclosure;
    - external lighting, including lighting columns;
    - gatehouses and weighbridges;
    - CCTV cameras and columns and other security measures;
    - site establishment and preparation works including site clearance (including vegetation removal, demolition of existing buildings and structures), earthworks (including soil stripping and storage and site levelling) and excavations, the creation of temporary construction access points, the alteration of the position of services and utilities, and works for the protection of buildings and land;
    - temporary construction laydown areas and contractor facilities including materials and plant storage and laydown areas, generators; concrete batching facilities, vehicle parking facilities, pedestrian and cycle routes and facilities, offices and staff welfare facilities, security fencing and gates, external lighting, roadways and haul routes, wheel wash facilities, and signage;
    - vehicle parking and cycle storage facilities;
    - accesses, roads and pedestrian and cycle routes.

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 Combined Heat and Power (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 CCR report has been prepared for the Proposed Development and submitted to support the DCO application (Application Document Ref. No. 5.8). The area set aside for CCR will initially be used for construction laydown for the Proposed Development. Requirements in Schedule 2 to the draft DCO (Application Document Ref. No. 2.1) secure the retention of such space and reviews to consider the feasibility of installing CCS plant in the future.

4.2.5 A CHP Readiness assessment has been prepared to support the DCO application (Application Document Ref. No. 5.7). This considers 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. Requirements in Schedule 2 to the draft DCO (Application Reference No. 2.1) secure the retention of such space and reviews to consider the feasibility of installing CHP in the future.

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 The CCGT plant will be located in the Proposed Power Plant Site.

4.2.8 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).

4.2.9 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.

4.2.10 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.

4.2.11 The CCGT power station is anticipated to consist of up to three CCGT trains (gas turbines and associated HRSGs and steam turbine(s)).

4.2.12 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. This is described further in Chapter 6: Need, Alternatives and Design Evolution.

4.2.13 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.

4.2.14 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.

4.2.15 The use of natural gas means that emissions of sulphur dioxide (SO_2) and particulates from the CCGT will be negligible. Emissions of nitrogen oxides (NOx) will be controlled by primary means and the use of dry low NOx 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. Selective Catalytic Reduction (SCR)) should that be necessary to be installed in the future. The SCR process would require anhydrous ammonia, aqueous ammonia or urea to be stored on Site.

4.2.16 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 and with reference to the conclusions of consultation feedback. The top of the stack is fixed at 99.9 mAOD (a 90 m stack assuming a maximum ground level of 9.9 mAOD) in the draft DCO (Application Document Ref. No. 2.1, see the Requirements in Schedule 2 and the design parameters in Schedule 14).

4.2.17 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). The Rochdale Envelope approach is used to retain the flexibility to build either plant configuration. Both configurations have therefore been assessed in this ES. 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.

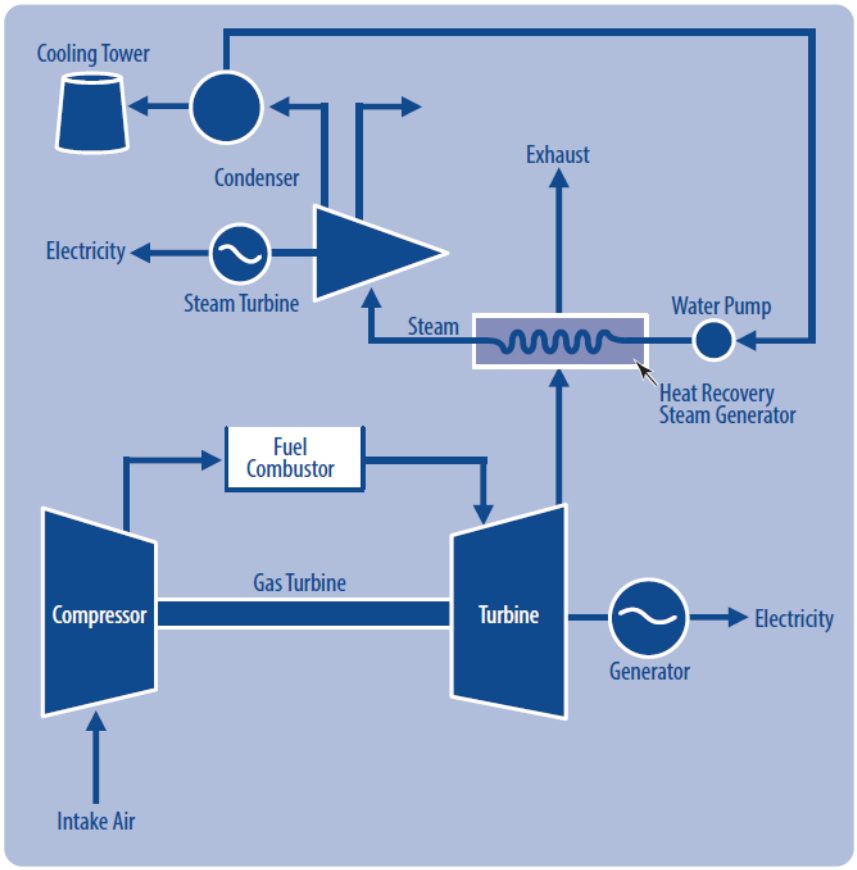
4.2.18 A single-shaft configuration (Figure 4.1a) consists of only one gas turbine, steam turbine, generator and HRSG per CCGT unit, with the gas turbine and steam turbine coupled to the same generator. The multi-shaft configuration (Figure 4.1b) includes two gas turbines and generators, but steam from 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).

4.2.19 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.

4.2.20 Irrespective of plant configuration, the tallest structures on site will be the stacks associated with the CCGT units, which will be approximately 90 m high (the top is fixed at 99.9 mAOD). The tallest buildings will be the HRSG buildings, up to 50 m above the finished ground level.

4.2.21 A schematic of the power generation process associated with the Proposed Development is provided below in Plate 4.1.

Plate 4.1: Power generation process (for a single shaft generating module)



4.2.22 To support the operation of the CCGT units, ancillary plant and equipment is also required within the Proposed Power Plant Site, including air intake filters, transformers, deaerator and feed water pump buildings, nitrogen oxide emissions control equipment and chemical storage, chemical sampling/ dosing plant, demineralised water treatment plant and storage tanks, and CEMS equipment. The demineralised water treatment plant, gas reception facility, auxiliary boilers and diesel generators are described separately at paragraphs 4.2.39 to 4.2.42 below. These will be located within the Proposed Power Plant Site as indicated in Figures 4.1a and 4.1b, noting that the concept layout is only indicative at this stage.

Cooling System

4.2.23 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. The cooling system will be located in the eastern part of the Proposed Power Plant Site.

4.2.24 Three types of methods for cooling are theoretically available for this type of plant – dry cooling, direct wet cooling, and hybrid cooling.

4.2.25 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).

4.2.26 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.

4.2.27 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 permitted water abstractions for the existing coal-fired power station (less than half).

4.2.28 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.

4.2.29 At this stage in the project design, the final cooling technology selection for the Proposed Development has not been made, but hybrid cooling or use of wet cooling towers is considered to 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. The responses received during public consultation in January/ February 2017 and the findings of the visible plume assessment (see Chapter 8: Air Quality) suggest that hybrid cooling is preferred, but the final decision will be made as part of the Environmental Permit application process for the Proposed Development (which is ongoing).

4.2.30 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.

4.2.31 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

4.2.32 A fast response peaking plant with a gross output capacity of up to 299 MW is included as part of the Proposed Development, to be located in the south-western part of the Proposed Power Plant Site. 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).

4.2.33 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 (see Chapter 6: Need, Alternatives and Design Evolution for explanation), 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 ES. The draft DCO secures relevant parameters of the Proposed Development (Application Document Ref. No. 2.1, see the Requirements in Schedule 2 and the design parameters in Schedule 14).

4.2.34 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.

4.2.35 If OCGT(s) are installed, the 299 MW gross output capacity could be delivered by one or more units within the building, with one or more (co-located) stack(s).

Black Start

4.2.36 A black start gas turbine (or reciprocating gas engines) is also included as part of the Proposed Development, to be located in the south-western part of the Proposed Power Plant Site. The gross output capacity of the black start plant is envisaged to be around 30 MW (potentially smaller depending on the technology provider). 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 m^3 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.

Demineralised Water Treatment Plant and Demineralised Water Storage Tanks

4.2.39 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, and stored in tank(s) prior to use. This will be located within the Proposed Power Plant Site.

Gas Reception Facility

4.2.40 A gas reception facility will be installed on the Proposed Power Plant site, connected to the CCGT, peaking and black start plants. 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 odorising 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.

Auxiliary Boilers and Associated Emissions Stacks

4.2.41 Auxiliary boilers are required for starting the CCGT plant. These will be gas-fired and have up to two associated emissions stacks, each up to 25 m high.

Diesel Generators, Diesel Fuel Storage Tanks and Unloading Area

4.2.42 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 2-5 MW, and will only be required as backup during a power failure onsite.

4.2.43 Diesel generators will also be required to start up the black start plant.

4.2.44 Diesel fuel storage tanks and an associated unloading area will be required to store diesel for the CCGT standby generators and black start plant start up generators. These will be located in the Proposed Power Plant Site.

4.2.45 Distillate (diesel fuel) will be stored in above ground bunded tanks of less than 200 m^3 total storage capacity.

Administration/ Control Building(s)

4.2.46 The administration/ control building(s) within the Proposed Power Plant Site will contain the main reception, offices, control room, station electrical equipment and staff welfare facilities.

Pipework, Pipe Runs and Pipe Racks

4.2.47 External pipework will be required throughout the Proposed Power Plant Site to provide connections between different components of the plant.

New Electrical Sub Station and Grid Connection to Existing National Grid Sub Station

4.2.48 The Proposed Development will connect to the existing National Grid 400 kV sub station within the existing coal-fired power station site (Work No. 3).

4.2.49 The connection between the CCGT plant and National Grid sub station will comprise below ground cables, within the route corridor indicated in Figure 3.2 (ES Volume II).

4.2.50 A new gas-insulated switchgear (GIS) 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.

Auxiliary Plant, Buildings, Enclosure and Structures, and Workshop and Stores Buildings

4.2.51 Additional components of plant will be required throughout the Proposed Power Plant Site associated with the CCGT, peaking and black start plants (see Figures 4.1a and 4.1b).

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

Fire Fighting Equipment, Fire/ Raw Water Storage Tanks and Fire Water Retention

4.2.53 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.

4.2.54 Fire fighting equipment will be housed in a 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 in a separate fire water retention basin. Water from the fire water tank will be used to suppress the fire until the arrival of the emergency services.

Chemical, Lubrication Oils and Grease Storage Facilities

4.2.55 Storage facilities will be located within the Proposed Power Plant Site for the storage of chemicals, oils and greases required for the operation and maintenance of the Proposed Development.

Permanent Plant Laydown

4.2.56 Permanent laydown areas will be required within the Proposed Power Plant Site for operation and maintenance activities. These will comprise areas of hardstanding.

Closed Circuit Cooling Water Plant

4.2.57 The closed circuit cooling water plant consists of large heat exchangers (coolers) and a closed loop pumping system. The liquid in the closed loop system picks up heat from individual items of plant which need cooling and transfers this heat to the heat exchangers. The heat exchangers are, in turn, cooled by water from the River Aire.

Waste Water Treatment Plant

4.2.58 A waste water treatment plant is required within the Proposed Power Plant Site to treat process water prior to discharge to the River Aire via the cooling water discharge. The waste water treatment process will include pH adjustment and suspended solid removal.

Temporary Construction Laydown Area and Contractors' Compound

4.2.59 Figure 3.2 (ES 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.

4.2.60 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.

Carbon Capture Readiness (CCR) Reserve Space

4.2.61 The carbon capture technology and transport of the CO_2 does not form part of the DCO application as the commercial deployment of carbon capture technology is not currently viable within the UK. For the purposes of this DCO application and in accordance with legislative and policy requirements, carbon capture technology has been considered through preparation of a standalone supplementary report to the EIA as a Carbon Capture and Storage (CCS) and Carbon Capture Readiness (CCR) Statement (Application Document Ref No. 5.8) that addresses the requirements of the DECC CCR Guidance (DECC, 2009).

4.2.62 In accordance with CCR requirements, the Proposed Development incorporates 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.

4.2.63 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).

4.2.64 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.

4.2.65 The CCR Report (Application Document Ref No. 5.8) outlines 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). Part of the area to be used for CCGT construction laydown is, following construction, to be reserved for CCR purposes.

4.2.66 An appropriate route for the transport of compressed CO_2 has been 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.

Water Supply Infrastructure

Cooling Water Abstraction and Discharge

4.2.67 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. The EIA has also considered the need for a temporary coffer dam, which is to be installed to enable construction works to take place in the River.

4.2.68 The volume of cooling water required for the Proposed Development will be less than half of the abstraction currently allowed in the Environmental Permit for the existing coal-fired power station due to the increased efficiency of the CCGT plant.

Groundwater Abstraction

4.2.69 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

4.2.70 In the event that there is an interruption to the groundwater supply, towns water will be used as raw water. Connections points may be available on the A19, Wand Lane and within the existing coal-fired power station.

Gas Supply Infrastructure and Above Ground Installation (AGI)

4.2.71 The gas supply for the Proposed Development will be via a new c. 4.6 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 (see Figure 4.3). 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).

4.2.72 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 Figures 3.2 and 4.3 (ES Volume II). The pipeline will mainly be installed through an open cut method whereby a trench will be excavated and the pipe laid approximately 1.2 m 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 14 m will be required for the pipeline to allow access for maintenance during operation.

4.2.73 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. The indicative layout of the National Grid AGI (northern) compound and the EPL AGI (southern) compound are shown on Figure 4.4 (ES Volume II)

4.2.74 The National Grid compound will comprise:

- a 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 bypass – 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.

4.2.75 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.

Landscaping and Biodiversity Enhancement Measures

4.2.76 An Indicative Landscape and Biodiversity Strategy has been prepared to accompany the DCO application (Application Document Ref. No. 5.10). This document sets 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 existing landscaped areas of the Site to be retained, protected and managed, which include the plantations on the embankment around the coal stockyard and the stands of trees on EPL owned land to the north of Wand Lane.

4.2.77 Hard landscaping will also be provided within the Site where appropriate.

Alterations to Existing Rail Infrastructure

4.2.78 Although the majority of the existing rail loop will need to be removed to enable the Proposed Development 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 (see Figure 4.2), 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.

4.2.79 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.

Surface Water Drainage, Stormwater Attenuation and Oil/Water Separators

4.2.80 An Outline Drainage Strategy is included as Annex 5 to the Flood Risk Assessment (Appendix 11A in ES Volume III). Surface water runoff will be drained and attenuated within the Proposed Power Plant Site and Proposed Construction Laydown area and is proposed to be discharged at an agreed rate to Hensall Dyke to the south-east of the Proposed Power Plant Site (subject to a discharge consent from Danvm Drainage Commissioners). If for any reason this discharge consent is not granted, the alternative method for discharge of surface water is via the cooling water discharge to the River Aire.

4.2.81 Oil/ water separators will be provided where necessary.

Electrical, Gas, Potable Water, Foul Drainage and Telecommunications Infrastructure

4.2.82 The Proposed Development will be connected to the National Grid via the existing sub station within the existing coal-fired power station site. Electrical connections from the Proposed Power Plant Site to the cooling water abstraction infrastructure and AGI compounds will be located within the Proposed Cooling Water and Gas Connection corridors.

4.2.83 Gas and potable water will be supplied via the gas and towns water connections to the Proposed Power Plant Site as described at paragraphs 4.2.71 and 4.2.70 respectively.

4.2.84 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.

4.2.85 Telecommunications services for the Proposed Power Plant Site will be provided by connections to local services (as for the existing coal-fired power station). The telecommunications connection for the AGI compounds and cooling water abstraction point may be provided via the Proposed Cooling Water and Gas Connection corridors from the Proposed Power Plant Site.

Security Fencing and Gates

4.2.86 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 (or similar) for the Proposed Power Plant Site to manage people access.

External Lighting and CCTV

4.2.87 Lighting will be required for the safe operation of the Proposed Development during hours of darkness. An Indicative Lighting Strategy is included in the DCO application (Application Document Ref No. 5.11).

4.2.88 CCTV and other security measures are anticipated to be required for security purposes at the Proposed Power Plant Site, cooling water abstraction point and AGI compounds.

Gatehouses and Weighbridges

4.2.89 Gatehouses and weighbridges will be located at the entrances to the Proposed Power Plant Site.

Vehicle Parking and Cycle Storage

4.2.90 The Proposed Development parking arrangements consist of dedicated staff/ visitor and operatives car parks and cycle storage facilities. Car parks will be surfaced and provided with oil interceptors.

Access and Internal Roadways

4.2.91 Access points are marked on Figure 3.2 (ES Volume II).

4.2.92 Three access points to the Proposed Power Plant Site are included for vehicles during construction and operation: 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. Hensall Gate entrance is currently used by existing coal-fired power station contractors for maintenance and overhaul of the existing coal-fired power station.

4.2.93 Rail access into the Site will be maintained, but the majority of the railway loop within the Proposed Power Plant Site will need to be removed to enable construction of the Proposed Development.

4.2.94 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.

4.2.95 Access to the Proposed AGI compounds will be via West Lane. Access to the Proposed Gas Connection pipeline easement will be via West Lane, the A19 at Whitings Lane, Millfield Road and Wand Lane.

4.2.96 Access to the Proposed Cooling Water abstraction and discharge points will be via the existing accesses (directly off the A19 as for the existing cooling water abstraction point, and from Wand Lane as for the existing cooling water discharge point).

4.2.97 Access to the Proposed Surface Water Discharge Connection to Hensall Dyke will be via the existing access from Hazel Old Lane.

4.2.98 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.

4.3 Design Parameters

4.3.1 The design of the Proposed Development is being developed 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 Tables 4.1 and 4.2 set out the maximum building parameters for the two potential layout options. The finished ground level at the Proposed Power Plant Site is not known but the limits of deviation allowed within the draft DCO are 7.9 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. The maximum dimensions of the largest buildings (those with a length or width of 15 m or more, or with a height of 10 m of more) are limited within the draft DCO at Schedule 14 (Application Document Ref. No. 2.1).

Table 4.1: Main building dimensions for single shaft layout

Component	Maximum length (m)	Maximum width (m)	Maximum height (m)	Maximum footprint (m^2)
Gas turbine hall building	76	76	30	5,776

Component	Maximum length (m)	Maximum width (m)	Maximum height (m)	Maximum footprint (m^2)
Heat recovery steam generator (HRSG)	63	28	50	1,764
Electrical building near HRSG	30	27	10	810
CCGT air intake filters (each)	24	16	30	624
Electrical building near air intake filter	39	16	10	624
Generator transformer	30	24	15	720
Feed water pump building	64	23	20	1,472
Demineralised water treatment plant, fire pumps and laboratory	57	33	20	1,881
Demineralised water storage tank	25 (diameter)		20	490.6
Gas reception facility	65	52	5	3,380
Gas compressors	50	20	10	1,000
Auxiliary boiler	30	15	20	450
Auxiliary boiler stacks (each)	1.5 (diameter)		25	1.8
CCGT standby diesel generators	19	9	8	171
CEMS container	10	3	3	30
Cooling towers (each)	240	27	25	6,480
Cooling water electrical module	15	6	10	90
Cooling water pumps	30	15	8	450
Cooling water sampling and dosing plant	19	11	8	42
Peaking plant building	103	65	30	6,045
Peaking plant stack(s) (each)	8 (diameter) for OCGT or 1.3 (diameter) for a 10 MW gas engines		45 for OCGT or 28 for gas engines	50.2 for OCGT or 1.3 for gas engines
Black start facility	55	43	30	2,795
Black start facility stack(s) (each)	2.5 (diameter) for OCGT or 1.3 (diameter) for gas engines		45 for OCGT or 25 for gas	4.9 for OCGT or 1.3 for gas engines

Component	Maximum length (m)	Maximum width (m)	Maximum height (m)	Maximum footprint (m^2)
			engines	
Diesel tank for black start diesel generator	12	4 (diameter)		48
Electrical, control room and admin building	85	24	20	2,040
Electrical sub station	40	17	15	680
Workshop and stores	51	20	12	1,020
Raw and fire water tank	25 (diameter)		20	490.6
Gas bottle stores (each)	17	5	3	85
Closed-circuit cooling water (CCCW) coolers	15	10	10	150
Waste water treatment plant	55	28	20	1,540
Firewater and stormwater retention basins	110	50	0	5,500
Gatehouse	12	12	5	144

Table 4.2: Main building dimensions for multi shaft layout

Component	Maximum length (m)	Maximum width (m)	Maximum height (m)	Maximum footprint (m^2)
Gas turbine hall building	76	76	30	5,776
Steam turbine hall building	64	54	30	3,456
Heat recovery steam generator (HRSG)	133	48	30	1,764
Electrical building near HRSG	30	27	10	810
CCGT air intake filters (each)	24	16	30	624
Electrical building near air intake filter	24	16	10	384
Generator transformer	21	20	15	420
Feed water pump building	54	26	20	1,404
Demineralised water treatment plant, fire pumps and laboratory	57	33	20	1,881
Demineralised water storage tank	25 (diameter)		20	490.6

Component	Maximum length (m)	Maximum width (m)	Maximum height (m)	Maximum footprint (m^2)
Gas reception facility	65	52	5	3,380
Gas compressors	50	20	10	1,000
Auxiliary boiler	30	15	20	450
Auxiliary boiler stacks (each)	1.5 (diameter)		25	1.8
CCGT standby diesel generators	19	9	8	171
CEMS container	10	3	3	30
Cooling towers (each)	240	27	30	6,480
Cooling water electrical module	15	6	10	90
Cooling water pumps	30	15	8	450
Cooling water sampling and dosing plant	19	11	8	42
Peaking plant building	103	65	30	6,045
Peaking plant stack(s) (each)	8 (diameter) for OCGT or 1.3 (diameter) for a 10 MW gas engines		45 for OCGT or 28 m for gas engines	50.2 for OCGT or 1.3 for gas engines
Black start facility	55	43	30	2,795
Black start facility stack(s) (each)	2.5 (diameter) for OCGT or 1.3 (diameter) for gas engines		45 for OCGT or 25 for gas engines	4.9 for OCGT or 1.3 for gas engines
Diesel tank for black start diesel generator	12	4 (diameter)		48
Electrical, control room and admin building	85	24	20	2,040
Electrical sub station	35	15	15	525
Workshop and stores	51	20	12	1,020
Raw and fire water tank	25 (diameter)		20	490.6
Gas bottle stores (each)	17	5	3	85
Closed-circuit cooling water (CCCW) coolers	15	10	10	150

Component	Maximum length (m)	Maximum width (m)	Maximum height (m)	Maximum footprint (m^2)
Waste water treatment plant	55	28	20	1,540
Firewater and stormwater retention basins	110	50	0	5,500
Gatehouse	12	12	5	144

4.3.4 The kiosks at the Proposed AGI Site will have maximum dimensions of 7 m (length) x 5 m (width) x 3 m (height).

4.3.5 The CCGT stack(s) height above ground will vary depending on the final finished ground level because the height of the top of the stacks is fixed in mAOD to ensure that the air quality and visual impact assessments are robust and conservative. The location(s) of the CCGT stack(s) are also fixed in the draft DCO for air quality and visual assessment purposes. The proposed fixed parameters are shown in Table 4.3 below.

Table 4.3: 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
CCGT stack(s) height	Top of stack in mAOD	99.9 mAOD

4.3.6 The diameter of each CCGT stack(s) will be a maximum of 9.6 m.

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/sulphuric acid, sodium hydroxide, sodium hypochlorite, carbohydrazide (or alternative oxygen scavenger) and trisodium phosphate);
- distillate fuel;
- ammonia or ammonia-based materials (boiler water conditioning and NO_x control (if SCR is installed);
- nitrogen (natural gas system purge);
- cleaning chemicals;
- acetylene (metal cutting);

- inert fire fighting gases;
- lubricating oils; and
- hydrogen for generator cooling and carbon dioxide for generator purging.

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. 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. The draft DCO (Application Document Ref. 2.1) secures the submission, approval and implementation of a decommissioning plan (see the Requirements in Schedule 2).

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.

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, or the equivalent prevailing legislation at that time.

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 CO_2 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.