Tables

4. The Proposed Development

4.1 Introduction

4.1.1 The Proposed Development comprises a gas fired generating station (peaking plant) that would generate up to 299MW gross electrical output.

4.1.2 Peaking plants, such as that proposed, are used to rapidly supply electricity to the network when required by the National Grid. These plants can be fired up at short notice to help cope with periods of high demand or low electricity supply nationally (for example when the wind is not blowing to enable sufficient output to be achieved from the wind farms in the UK), or when required to provide ancillary services to support the National Grid. This is expected to be weighted towards the winter period, usually for a few hours at a time. However, as the operation of the plant is driven by the dynamics of the energy market, the plant could run for longer periods, at any time of day, up to the maximum allowed under its Environmental Permit, which is anticipated to be 2,250 hours per year (1,500 hours per year as a rolling five year average).

4.1.3 Open cycle gas turbines (OCGTs) are one of the gas fired peaking plant technologies available. OCGTs have been selected instead of gas engines (which were previously under consideration at the Environmental Impact Assessment (EIA) scoping stage).

4.1.4 At this stage in the development of the Project, the final OCGT technology selection cannot yet be made, as it will be determined by various technical and economic considerations. The design of the Proposed Development, therefore, incorporates a necessary degree of flexibility in the choice of OCGT technology, plant dimensions and configuration of any enclosures or buildings, to allow for the future selection of the preferred technology and construction contractor. This flexibility relates to installing up to five OCGTs to meet the required capacity. This would allow the Applicant to optimise the Proposed Development, to help meet future requirements. The gas turbine(s) may be located within a dedicated building or alternatively each unit could have its own enclosure. Each unit would have its own stack.

4.1.5 For the purposes of the various environmental assessments (primarily for air quality, noise and vibration and landscape and visual amenity), the worst-case gas turbine configuration has been evaluated for each topic and the worst-case potential environmental effects are reported in this Environmental Statement (ES). The worst-case configuration may be different for each environmental effect and this is explained in each topic specific chapter (**Chapters 6-15**).

4.1.6 In order to ensure a robust assessment of the likely significant environmental effects of the Proposed Development, the EIA has been undertaken adopting the principles of the 'Rochdale Envelope' where appropriate, as described in the PINS Advice Note 9 (Ref 4-1). 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 ES. Justification for the need to retain flexibility in certain parameters is also outlined in the relevant chapters and at paragraph 4.3.2 below.

4.1.7 **Figures 4.1a** and **4.1b** (ES Volume III) show the areas of the Site within which each element of the Proposed Development is anticipated to be installed. These areas are the Work Areas specified in Schedule 1 of the draft DCO (**Application Document Ref. 2.1**) and also described in **Chapter 3**: Description of the Site and its Surroundings. The turbines and their associated stacks could be located anywhere within the defined Work Area within the Site; at this stage the stack locations cannot be fixed. Therefore, the air quality, noise and vibration and landscape and visual amenity assessments have considered the stacks in different locations within this defined area of the Site, with the worst-case impacts reported in the respective topic specific chapters (i.e. **Chapters 6-16**).

4.1.8 The indicative timescales for the construction and operation of the Proposed Development that have been assumed for the purposes of the assessments are as follows:

- it is currently anticipated that (subject to the necessary consents being granted and an investment decision being made), the earliest date that construction work would commence is around Quarter 3 (Q3) 2020 over a period of up to four years. A more likely construction programme would be within three years from commencement; and
- assuming a three year construction programme, the Proposed Development is unlikely to commence commercial operation before 2023.

4.1.9 Construction of the Proposed Development is detailed in Section 4.5 of this chapter.

4.1.10 Similarly, each assessment selects the most conservative year for determining worst-case impacts. So, wherever a potential impact is considered likely to be worse by starting earlier within the indicative timescale (for example, air quality impacts, where the background UK air quality tends to improve year on year) then that year has been assessed. Conversely, traffic impacts have been considered at a later year, since baseline traffic flows on UK roads tend to increase year on year.

4.1.11 It is envisaged that the Proposed Development would have an operational life of up to circa 40 years, therefore decommissioning activities are currently anticipated to commence after 2063.

4.1.12 This chapter is supported by **Figures 4.1a** and **4.1b** (ES Volume III). These figures show indicative layouts of a single OCGT or five OCGTs on the Site. Indicative elevations plans are also provided as **Figures 4.2a** and **4.2b** (ES Volume III). Throughout this chapter, reference is also made to the Works Plans that accompany the Application (**Application Document Ref. 3.2**).

4.2 Components of the Proposed Development

4.2.1 This section provides further detail on the components of the Proposed Development within the Site boundary, referred to in this ES as the 'Site'.

4.2.2 The Proposed Development would comprise a gas fired generating station with gross electrical output capacity of up to 299MW and associated buildings, structures and plant defined in the draft DCO as Work No. 1 and shown on the Works Plans (**Application Document Ref. 3.2**) as **Work No. 1: Sheet 1 of 10**, including:

- up to five OCGT units and associated generators, potentially housed within building(s), with stack(s), transformer(s), air inlet filter(s) and exhaust gas diffuser(s);
- associated switchgear and ancillary equipment; and
- auxiliary closed loop cooling equipment/systems.

4.2.3 Additionally, the gas fired generating station within the Proposed Development may include:

- a banking compound comprising up to six transformers, overhead busbars, cable sealing ends and associated switchgear and ancillary equipment.

4.2.4 The Proposed Development would also include:

- a gas receiving area, gas treatment and control facilities, including if required, a compression station, generator and other auxiliary control cabinets and equipment (**Work No. 2**);
- electrical connection works (**Work No. 3)** comprising:
  - up to 400kV electrical cables and control system cables to and from the existing West Burton B (WBB) Power Station switchyard **(Work No. 3A**); and
  - works within or adjacent to the existing WBB Power Station switchyard, including switchgear, electrical cables, connections to busbars and upgraded or replacement equipment **(Work No. 3B**).
- auxiliary buildings, structures and equipment (**Work No. 4**) comprising:
  - emergency diesel generator and associated fuel tank;
  - contained road tanker diesel unloading area;
  - workshop, store, control, administration and welfare building;
  - above ground raw water and fire water storage tanks and associated infrastructure;
  - an area of hardstanding for maintenance laydown and erection of temporary buildings associated with the commissioning, operation and maintenance of the OCGT unit(s);

  - pipework, pipe runs and pipe racks;
  - fire-fighting equipment, buildings and distribution pipework; and
  - chemical storage facilities, other minor infrastructure and auxiliaries/services.
- a new surface water drainage system comprising pond(s) and/or a tank or similar, including connection to an existing water drainage system on the West Burton Power Station site (**Work No. 5**);
- on or below ground gas supply pipeline connection works for the transport of natural gas to **Work No. 1** from an existing gas receiving facility within WBB Power Station including:
  - a high pressure steel pipeline (**Work No. 6A**) of up to 500mm (nominal bore) in diameter and up to 150m in length including controls and instrumentation,; and
  - an extension to the existing WBB Power Station gas receiving facility (**Work No. 6B**) comprising:
    - an offtake connection;
    - gas compressor, if required;
    - above and below ground valves, flanges and pipework;
    - an above or below ground remotely operated valve;
    - an above or below ground remotely operated valve bypass;
    - an above or below ground pressurisation bridle;
    - instrumentation and electrical kiosks; and
    - telemetry equipment kiosks and communications equipment.
- water supply and pipeline (**Work No. 7**) to the Work No. 1 from an existing water supply within WBB Power Station; and
- low voltage electrical, control, metering and other cables and associated switchgear and ancillary equipment and cabinets required to connect the Proposed Development with WBB Power Station (**Work No. 8**).

4.2.5 Additionally, the Proposed Development would include associated development within the meaning of the 2008 Act in connection with **Work Nos 1 – 8** comprising:

- a rail offloading area from the existing rail loop 'merry-go-round' that is present on the West Burton Power Station site (**Work No. 9**); and
- a Landscaping and Biodiversity Management and Enhancement Area (**Work No. 10**).

4.2.6 To the extent that it does not form part of any such works, further associated development within the meaning of the 2008 Act is proposed and has been assessed within the ES comprising:

- vehicle parking and cycle storage facilities;
- construction laydown areas and contractor facilities, including: materials and plant storage and laydown areas; generators; concrete batching facilities; vehicle and cycle 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;
- internal access roads, roadways and footpaths;
- noise attenuation features;
- landscaping, fencing and security provisions; and
- lighting columns and lighting.

4.2.7 Each part of the Proposed Development is described in further detail below. The maximum (and where relevant minimum) dimensions of each component are detailed in **Section 4.3** of this chapter.

Combined Heat and Power (CHP) Assessment

4.2.8 A CHP Assessment has been prepared to support the Application (**Application Document Ref. No. 7.2**). This considers the feasibility of installing CHP but concludes that:

- from local searches there are no suitable heat users of applicable scale to the unpredictable heat available within a search area up to 10km from the Proposed Development;
- no potential future heat requirements in the area have been identified and none that would match the operational pattern of a peaking power station are anticipated;
- the intermittent and peaking modes of operation of an OCGT are incompatible with the likely continuous demands of heat users;
- the Proposed Development has no steam cycle from which to extract waste heat for off-site users; and
- the plant is not expected to operate for more than 2,250 hours per year (1,500 hours per year as a rolling 5 year average) and therefore an equivalent standby or backup generating plant would be required to feed any off-site heat user when the plant is not operating.

4.2.9 For these reasons the Proposed Development is not considered to be viable for CHP opportunities.

OCGT Power Generation Plant and Associated Stacks

4.2.10 In an OCGT, natural gas fuel is mixed and combusted with air from the compressor section of the gas turbine and the hot gases are expanded through

the power turbine section of the turbine, which drives a generator to produce electricity for export to the National Grid electricity transmission system.

4.2.11 OCGTs are widely used in the power industry as a result of their multiple advantages, when compared to other power plants. Those advantages include flexibility of operation, reliability, ease of use, and compactness. Gas turbines are typically sized between circa 10MW and 470MW gross output.

4.2.12 OCGTs are ideally suited to peaking plant operation, as they can be started and shutdown quickly and operate flexibly across a range of loads. An OCGT power plant of this scale could comprise a large single gas turbine, or up to five smaller gas turbines, potentially within a building or enclosure, each with their own stack.

4.2.13 If a single large OCGT was selected for the Proposed Development, it would typically have dimensions of 50m in length x 20m in width (excluding gas turbine auxiliaries and associated plant and equipment) with a typical stack height in the range of up to 45m. Further detail on unit sizes for the Proposed Development is presented in **Section 4.3**.

4.2.14 If smaller gas turbines were selected for the Proposed Development, each unit would have typical dimensions of 35m in length x 12m in width, with a typical stack height in the range of up to 45m. The Proposed Development would comprise up to five units.

4.2.15 For a single OCGT, a transformer would be installed on the Proposed Power Plant Site, circa 10m in length x 15m in width x less than 8m in height. For multiple gas turbines, each unit could have a smaller transformer which may be housed in a banking compound, which could be up to 52m in length x 48m in width.

4.2.16 Maximum dimensions for the components of the Proposed Development are presented in **Table 4-1** and **Table 4-2**.

4.2.17 The plant would include suitably rated switchgear and ancillary electrical equipment to allow operation of the power plant and export of electricity to the existing WBB Power Station 400kV switchyard.

Fin Fan Cooling System

4.2.18 If a single gas turbine is selected, cooling would be undertaken through a closed loop cooling system and fin fan cooler arrangement. These fans are external to any structure and use air as the cooling medium. A small amount of water is retained in the closed loop system with top up periodically required; there is no steam cycle installed and therefore no need for large volumes of cooling water to be abstracted from or returned to the River Trent.

4.2.19 If multiple units are selected, cooling could be achieved by fan coolers housed on each unit separately, rather than in a bank of fans.

Black-start Capability

4.2.20 The Proposed Development may also provide a 'black-start' capability to National Grid, to help restart the national electricity transmission system in the event of a total or partial shutdown of the UK transmission system. It is not possible to accurately predict the likely frequency or duration of black-start events. However, historically black-start events have been very infrequent in the UK.

4.2.21 If required to help restart the national electricity transmission system a small (anticipated to be circa 2MW output) diesel generator (hereafter referred to as the emergency diesel generator) would be used to start a small (anticipated to be between 15 and 60MW output) gas turbine (hereafter referred to as the black-start auxiliary power unit). The black-start auxiliary power unit would be used to start a main gas turbine unit at either WBB Power Station or WBC.

4.2.22 Environmental impacts of the black-start auxiliary power unit have been considered within the overall up to 299MW generating capacity of the Proposed Development.

Emergency Diesel Generator

4.2.23 The emergency diesel generator is expected to run for less than 50 hours per year. The emergency diesel generator would be fired on liquid fuel. Distillate fuel or diesel would be stored in above ground storage tanks (AST) of less than 50m^3 capacity, with an associated unloading area.

4.2.24 In addition to the black-start capability mentioned above, the emergency diesel generator primarily provides for the safe shut-down of the plant in the event of an emergency or loss of power. This generator would be a separate standalone unit that would not be used to generate electricity to supply the national electricity transmission system and, therefore, does not contribute to the generating capacity of the station.

Gas Receiving Area

4.2.25 The Proposed Development would require a gas receiving area, gas treatment and control facilities, if required, a compression station, generator and other auxiliary control cabinets as defined in the draft DCO as **Work No. 2** and shown on the Works Plans (**Application Document Ref. 3.2**) (Work Plan No. 2: Sheet 2 of 10).

4.2.26 The gas receiving area would be installed on the Proposed Power Plant Site, connected to the OCGT. 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 may include dehydration, filtering and odorising of the natural gas.

Electricity Switchyard and Grid Connection

4.2.27 The Proposed Development would require an electrical connection as defined in the draft DCO (**Application Document Ref. 2.1**) as **Work No. 3A** and **Work No. 3B** and shown on the Works Plans (**Application Document Ref. 3.2**) (Work Plan No. 3: Sheet 3 of 10).

4.2.28 The Proposed Development would connect to the existing 400kV switchyard within the WBB Power Station. The connection between the Proposed Development and WBB Power Station 400kV switchyard would comprise up to 400kV electrical cables and control system cables which would be installed either above ground or below ground, or a combination of both. The route of the electrical connection would broadly follow the eastern boundary of WBB Power Station, as shown on **Figure 3.3** (ES Volume III).

4.2.29 Depending upon the final choice of gas turbine, upgrades to existing switchgear or other existing equipment may be required. As such, works within, or adjacent to, the existing WBB Power Station switchyard may include electrical cables, connections to busbars and upgraded or replacement equipment, as necessary.

Auxiliary Buildings, Structures and Equipment

4.2.30 The Proposed Development would require a range of auxiliary buildings, structures and equipment as defined in the draft DCO (**Application Document Ref. 2.1**) as **Work No. 4** and shown on the Works Plans (**Application Document Ref. 3.2**) (Work Plan No. 4: Sheet 4 of 10).

4.2.31 These would comprise:

- emergency diesel generators and associated diesel fuel tanks;
- contained road tanker diesel unloading area;
- workshop, store, control, administration and welfare building;
- above ground raw water and fire water storage tanks and associated infrastructure;
- area of hardstanding for maintenance laydown and erection of temporary buildings associated with the commissioning, operation and maintenance of the OCGT unit(s);
- pipework, pipe runs and pipe racks;
- fire-fighting equipment, buildings and distribution pipework; and
- chemical storage facilities, other minor infrastructure and auxiliaries/services.

4.2.32 The administration/control building(s) would contain the main reception, offices, control room, electrical equipment and staff welfare facilities.

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

4.2.34 The fire protection strategy for the Proposed Development would be developed to comply with the requirements of Building Regulations and Fire Safety Guidelines. Appropriate standards would also be referenced to provide the necessary fire safety design. Additional fire protection would be provided with reference to relevant British and other relevant Standards.

4.2.35 Fire-fighting equipment could be housed in a dedicated building/container. Fire water would be available from an existing water supply from WBB Power Station and if required, would be stored in a dedicated storage tank on-site (up to 1,100m^3 capacity) with dimensions up to 15m diameter and up to 7m height. Further consideration will be given to fire water requirements at the detailed design stage to ensure the capacity is sufficient for the Proposed Development.

4.2.36 In case of a fire, the outlet connection from the surface water drainage system would be closed and surface run-off (i.e. fire-fighting and rain water) would be contained within the Site.

4.2.37 The Proposed Development could incorporate an area of hardstanding for maintenance laydown. This area may have electrical, water and drainage connections for temporary buildings when they are brought onto Site.

4.2.38 Provision is also made for the erection of temporary buildings associated with the commissioning, operation and maintenance of the OCGT unit(s) (refer to **Figure 4.1a** (ES Volume III)).

4.2.39 The use of chemicals for the Proposed Development would be minimised as far as reasonably practicable, where it is not practical to eliminate them. All chemicals and materials which have the potential to present an environmental risk would be stored in appropriate containers with suitable spill protection including: bunds, bunded pallets, drip trays, specifically designed cabinets and cupboards, or other appropriate storage units and areas, as required.

4.2.40 The main raw material used at the Proposed Development would be natural gas, which would be used as fuel. The West Burton Power Station site is already permitted to use natural gas for the operation of the WBB Power Station, and has a dedicated gas receiving facility for this purpose, as described above.

4.2.41 Bulk storage of fuels (in AST) would be limited to fuel (diesel) for the emergency generators on-site in tanks with a capacity less than 50m^3.

4.2.42 The Applicant holds an Abstraction Licence (Ref 4-2) for abstracting water from the River Trent for use in West Burton A (WBA) Power Station and WBB Power Station. The licenced capacity is sufficient to provide for the minor water volume requirements of the Proposed Development, which would be drawn from the WBB Power Station water treatment facility and delivered either by pipeline or by road tanker.

4.2.43 In addition to these, small quantities of maintenance and cleaning chemicals are expected to be required for the maintenance of the Proposed Development.

Surface Water Drainage and Attenuation

4.2.44 The Proposed Development would include a new surface water drainage system, comprising pond(s) and/or a tank or similar, including connection to existing water drainage systems on the West Burton Power Station site as defined in the draft DCO (**Application Document Ref. 2.1**) as **Work No. 5** and shown on the Works Plans (**Application Document Ref. 3.2**) (Work Plan No. 5: Sheet 5 of 10).

4.2.45 An Outline Drainage Strategy is included as **Application Document Ref. 7.8**. This describes that the preferred drainage solution for the Proposed Development is to tie into the existing West Burton Power Station drainage system, following attenuation on-site in a pond (approximately 1,600m^3 volume at 1.5m deep, plus a 150mm freeboard allowance), although a below ground tank solution remains under consideration.

4.2.46 The proposed surface water drainage system would require a surface water drainage pipeline connecting the Proposed Power Plant Site into the existing West Burton Power Station site purge line that runs approximately parallel with River Road from the WBA Power Station cooling towers to the River Trent and forms part of the drainage system.

4.2.47 Three connection options into the existing West Burton Power Station drainage system are under consideration. One option is to connect to the purge line outfall at an access way prior to the sluice gate to the River Trent, near the existing sewage treatment works and without crossing the flood defence. This pipeline route (approximately 250m in length and referred to as the 'northern drainage connection corridor') would largely follow an existing access road that is used for access to the Severn Trent Water sewage treatment plant. The route would terminate prior to, and therefore not cross, the designated Public Right of Way (PRoW) (West Burton FP4), which follows the western flood embankment of the River Trent. This route, therefore, also does not cross the flood defence.

4.2.48 An alternative, 'southern drainage connection corridor' has also been identified connecting to the purge line outfall at an access way prior to the sluice gate to the River Trent, without crossing the flood defence. This pipeline route (approximately 350m in length) would connect from the Site to the south-east of the gas receiving facility for WBB Power Station and pass through an area of semi-improved grassland, scrub, wet ditch and broad-leaved semi natural woodland, which forms part of the Local Wildlife Site (LWS). From here, the southern drainage connection corridor would terminate in proximity to River Road, north of the abstraction pumping station and associated infrastructure associated with WBA Power Station. Like the northern drainage connection corridor, the route would stop short of the West Burton FP4 PRoW. The southern drainage connection corridor would also not pass through the flood defence.

4.2.49 A third option has also been evaluated to connect into the existing WBB Power Station site drainage system to the south of the Proposed Power Plant Site and to the north of WBB Power Station; its feasibility will be dependent on final plant design and the volumes of surface water to be accommodated. This option may

include the installation of an additional oily water separator to the south-east corner of the WBB Power Station site. This drainage route also connects into the WBA Power Station purge line. Each of these options is assessed in this EIA.

Gas Supply Infrastructure and Treatment Infrastructure

4.2.50 The Proposed Development would include gas supply pipeline connection works for the transport of natural gas to the proposed generating station (**Work No. 1)** from the existing gas receiving facility within WBB Power Station, as defined in the draft DCO as **Work No. 6** and shown on the Works Plans (**Application Document Ref. 3.2**) (Work Plan No. 6: Sheet 6 of 10).

4.2.51 The new gas connection pipeline would link into WBB's existing gas supply infrastructure, which is located immediately south of the Proposed Development. Works would comprise:

- an underground high pressure steel pipeline (**Work No. 6A**) of up to 500mm (nominal bore) in diameter and up to 150m in length including controls and instrumentation which would be installed at ground level or below ground; and
- an extension to the existing WBB Power Station gas receiving facility (**Work No. 6B**) comprising:
  - an offtake connection;
  - gas compressor, if required;
  - above and below ground valves, flanges and pipework;
  - an above or below ground remotely operated valve;
  - an above or below ground remotely operated valve bypass;
  - an above or below ground pressurisation bridle;
  - instrumentation and electrical kiosks;
  - gas chromatograph; and
  - telemetry equipment kiosks and communications equipment.

4.2.52 The new gas connection route would run within the Applicant's land ownership within the West Burton Power Station site. A connection would be made between the existing WBB Power Station gas receiving facility and the new gas receiving area on the Site, where the gas would be metered and conditioned to that required for the selected technology for the Proposed Development.

Sewerage and Drains

4.2.53 Foul drainage from any permanent welfare facilities would be directed to an on-site septic tank for treatment prior to discharge. The tank would be emptied by road tanker as and when required. It is not proposed to have a permanent discharge to sewer.

Low Voltage Electrical and Utilities Connections

4.2.54 The Proposed Development would include provision for a low voltage electrical supply and metering as defined in the draft DCO (**Application Document Ref. 2.1**) as **Work No. 8** and shown on the Works Plans (**Application Document Ref. 3.2**) (Work Plan No. 8: Sheet 8 of 10). It is anticipated that these would be supplied from the existing West Burton Power Station.

Vehicle Parking and Cycle Storage

4.2.55 There would be provision for several car parking spaces and cycle storage on-site for operational use. Additional car parking spaces would be provided on the site of WBB Power Station to support outages, if required.

Security Fencing and Gates

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

External Lighting and CCTV

4.2.57 Lighting would be required for the safe construction and operation of the Proposed Development, during the hours of darkness. However, this lighting would be restricted to focussed point use where reasonably practicable; the exception to this would be any lighting required for security or safety purposes.

4.2.58 The Lighting Strategy (**Application Document Ref 7.4**), prepared in accordance with the British Standard (BS 12464- 2:2014) (Ref 4-3) provides further definition of the type and level of lighting that would be employed in exterior areas of the Proposed Development during operation. It is expected that the lighting levels would be broadly comparable to those on WBB Power Station.

4.2.59 As the Proposed Power Plant Site will only be intermittently in operation and remotely operated, the overarching philosophy underpinning the design of the lighting for the Proposed Development is to have a reduced light site. Permanent lighting provided would be for general pedestrian movement, safety and security purposes only. Any lighting that may be required for maintenance purposes will be produced by temporary lighting sets specific to the required task.

4.2.60 Lighting shall be further reduced to only critical lighting from 23.00 to 05.00 to reduce the impact of obtrusive lighting on the local environment. 23.00 as per the recommendation from the Institute of Lighting Professionals Guidance Notes (Ref 4-4) for the Reduction of Obtrusive Lights and 05.00 as per the usual recommendation from local authorities.

4.2.61 CCTV and other security measures are anticipated to be required for security purposes at the Site.

Internal Access, Roadways and Footpaths

4.2.62 Access to the Site would be via the existing main entrance to the West Burton Power Station site, off Gainsborough Road to the south-west. Gainsborough Road links to the A620 and then the A631 near Beckingham to the north. This access would be utilised by all road users, including cyclists and pedestrians. Bus stops for routes 595 and 95A (Retford–Gainsborough) are located adjacent to the Gainsborough Road junction with Station Road, to the south of the West Burton Power Station site.

4.2.63 It is proposed that all construction workers for the construction works associated with the Proposed Development would access the Site via the existing entrance located off Gainsborough Road. All construction HGVs and Abnormal Indivisible Load (AIL) deliveries would also use this entrance.

4.2.64 Existing internal roadways would be used for access to the Site. Additional roadways would be constructed within the Site as appropriate. These would be hard surfaced, with appropriate drainage systems to manage surface water runoff and pollution risk.

Rail Offloading Area

4.2.65 The existing West Burton Power Station is connected directly to the Retford-Gainsborough railway line, principally to allow for coal deliveries to the WBA Power Station. The rail loop allows trains to turn around on-site, as required.

4.2.66 Transport of construction plant and equipment via the existing rail facility is being considered. Therefore, the Proposed Development includes provision of a rail offloading area for construction materials from the existing rail loop 'merry-go-round', as defined in the draft DCO (**Application Document Ref. 2.1**) as **Work No. 9** and shown on the Works Plans (**Application Document Ref. 3.2**) (Work Plan No. 9: Sheet 9 of 10).

4.2.67 However, for the purposes of providing a worst-case assessment of potential road traffic impacts in **Chapter 7**: Traffic and Transportation, no allowance has been made for the delivery of construction materials by rail. The contractor appointed by the Applicant to construct the Proposed Development would review options for the use of rail for deliveries when sourcing construction materials.

Landscaping and Biodiversity Enhancement Measures

4.2.68 The Proposed Development would include provision of a Landscaping and Biodiversity Management and Enhancement Area as defined in the draft DCO (**Application Document Ref. 2.1**) as **Work No. 10** and shown on the Works Plans (**Application Document Ref. 3.2**) (Work Plan No. 10: Sheet 10 of 10).

4.2.69 A Landscaping and Biodiversity Management and Enhancement Plan (**Application Document Ref. No. 7.5**) has been prepared to accompany the Application. This document sets out the principles of habitat creation,

management and enhancement and of landscape design that will be adopted in the detailed design process and the areas of the Site allocated for this purpose, as well as the existing areas of trees to be retained, protected and managed. Implementation of the proposed measures would be secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**).

Carbon Capture Readiness (CCR)

4.2.70 As the output capacity of the Proposed Development is less than 300MW, the generating station does not fall under the provisions of the Carbon Capture Readiness (Electricity Generating Stations) Regulations 2013 (the CCR Regulations) (Ref 4-5), which transposed Article 36 of the Industrial Emissions Directive (IED) (Ref 4-6) into UK legislation.

4.2.71 The CCR Regulations provide that no DCO (in England and Wales) may be made in relation to a combustion plant with a capacity at or over 300MWe, unless the relevant authority has determined (on the basis of an assessment carried out by an applicant) whether it is technically and economically feasible to retrofit the equipment necessary to capture the carbon dioxide that would otherwise be emitted from the plant, and to transport and store such carbon dioxide from the site.

4.2.72 As the CCR Regulations do not apply to the Proposed Development, no space allocation for future retrofit of carbon capture technology has been included within the Site.

4.3 Design Parameters

4.3.1 The design of the Proposed Development is following an iterative process, based on environmental assessments, consultation with statutory and non-statutory consultees and engagement with contractors and equipment providers. **Section 4.8**: Design Evolution and Consideration of Alternatives describes this process further, including options that have been considered and discounted or amendments made to the concept design to date. The Planning Statement (**Application Document Ref. 7.1**) provides further details on the design parameters that will form the basis of the detailed design, which will be secured by a Requirement of the draft DCO (**Application Document Ref 2.1**).

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 construction of the generating station has been completed. For example, the enclosure or building sizes may vary, depending on the contractor selected and their specific configuration and selection of plant. It is also important that the consent retains some flexibility to allow for changing market conditions and the advancement of turbine technology in the period between preparing the Application and starting construction.

4.3.3 Focussed use of the Rochdale Envelope approach is, therefore, being adopted to present a worst-case assessment of potential environmental effects of the different

parameters of the Proposed Development that cannot yet be fixed. These include the specific locations of emission points within the Proposed Power Station Site, the number of units to be installed, the massings of structures and buildings and the final stack heights, to allow flexibility in the selection of preferred technology. However, certain parameters have been fixed in the Proposed Development, including:

- defining a small area of the Site in which the generating station stacks can be located;
- specifying that if multiple turbines are installed, the units (and stacks) are located in a nominal north-south orientation, unless it can be demonstrated that environmental effects for any parameter would be no worse than those assessed and presented in this ES; and
- emission to air impacts have been assessed based on 35m stack heights (for each of up to five unit stacks) and 40m stack height (for a single gas turbine stack) based on height above finished ground level. These are the stack heights considered to adequately disperse emissions from the Proposed Development assessed options. Stacks of a different height could be utilised depending on the technology selected provided they adequately disperse the emissions which would need to be demonstrated by appropriate dispersion modelling work. Higher stacks could be employed (up to the 45m high stacks that have been assessed in **Chapter 10**: Landscape and Visual Amenity), which would further reduce predicted ground level pollutant concentrations.

4.3.4 Wherever an element of flexibility is maintained, alternatives have been assessed and the worst-case impacts have been reported in the ES.

4.3.5 As outlined previously, the envelope considers up to five OCGT units. Each environmental discipline has considered which scenario represents the worst-case scenario for potential environmental effects and that scenario has been assessed in the associated topic specific chapters (**Chapter 6-16**).

4.3.6 **Table 4-1** and **Table 4-2** set out the parameters that have been assessed within this ES for the OCGTs. Maximum building heights are given in mAOD, taking into account the expected maximum predicted ground level of +14.0mAOD.

4.3.7 Accompanying indicative layouts and elevations drawings are presented as **Figure 4.1a** and **Figure 4.2a** (ES Volume III).

Table 4-1: Main dimensions for single OCGT

Component	Maximum length (m)	Maximum width (m)	Indicative height (mAGL)	Maximum height (mAOD)	Maximum footprint (m^2)
Minimum final ground height (mAOD)	+7.1m				

Component	Maximum length (m)	Maximum width (m)	Indicative height (mAGL)	Maximum height (mAOD)	Maximum footprint (m^2)
Maximum final ground height (mAOD)	+14.0m				
Single gas turbine, exhaust gas diffuser, generator and air inlet filter (Work No 1a)	50	20	27	41.0	1,000
Gas turbine building (if required) (Work No 1a)	36	12	19	33.0	432
Stack(s) (Work No 1a)	10m diameter		45	59.0	79
Main generator transformer	10	15	8	22.0	150
Auxiliary closed loop cooling equipment (Work No. 1c)	30	15	12	26.0	450
Workshop, stores, control, administration and welfare buildings (Work No.4c)	40	30	10	24.0	1,200
Emergency diesel generator	15	5	6	20.0	75
Diesel storage tank	4m diameter		2	16.0	13
Raw water / fire water storage tank (Work No. 4d)	15m diameter		7	21.0	177
Demineralised water storage tank	5m diameter		5	19.0	20

Component	Maximum length (m)	Maximum width (m)	Indicative height (mAGL)	Maximum height (mAOD)	Maximum footprint (m^2)
Gas receiving area, gas treatment facilities, compression station and other auxiliary control cabinets and equipment (Work No. 2)	60	45	7	21.0	2700

4.3.8 **Table 4-2** sets out the parameters that have been assessed within this ES for the five smaller gas turbines. Maximum building heights are given in mAOD, based on the predicted highest finished floor level as described previously. Accompanying indicative layouts and elevations drawings are presented as **Figure 4.1b** and **Figure 4.2b** (ES Volume III).

Table 4-2: Main dimensions up to five gas turbines

Component	Maximum length (m)	Maximum width (m)	Indicative height (mAGL)	Maximum height (mAOD)	Maximum footprint (m^2)
Minimum final ground height (mAOD)	+7.1m				
Maximum final ground height (mAOD)	+14.0m				
Each single gas turbine and generator (Work No. 1a)	35	12	15	29.0	420
Each stack (Work No. 1a)	5m diameter		45	59.0	20
Banking compound area (Work No. 1)	52	48	8	22.0	2,500
Workshop, stores, control, administration and welfare buildings (Work No. 4c)	40	30	10	24.0	1,200
Emergency diesel generator	15	5	6	20.0	75
Diesel storage tank	4m diameter		2	16.0	13
Raw water / fire water storage tank (Work No. 4d)	15m diameter		7	21.0	177
Demineralised water storage tank	5m diameter		5	19.0	20
Gas receiving area, gas treatment facilities, compression	60	45	7	21.0	2700

Component	Maximum length (m)	Maximum width (m)	Indicative height (mAGL)	Maximum height (mAOD)	Maximum footprint (m^2)
station and other auxiliary control cabinets and equipment (Work No. 2)					

4.3.9 The exact positions of the OCGT stack(s) cannot be fixed until the detailed design stage as they will depend on the final technical configuration and plant optimisation. The OCGT stack(s) height above ground will vary depending on the final finished ground level. However, the stack location(s) relative to the buildings and structures are fixed, so for the purposes of the assessment, the OCGT units have been assessed at alternative locations within the Proposed Power Plant Site, with different building orientations as applicable, in order to determine the worst-case impacts at different receptors. No single layout for either the single OCGT or multiple units resulted in worst-case impacts at all receptors. The results in **Chapter 6**: Air Quality represent the worst-case from any of the modelled layouts.

4.3.10 Similarly for noise and vibration, in order to ensure that the impact assessment presented is robust and conservative, a wide range of plant and technology options and configurations have been assessed in order to determine a worst-case. **Chapter 8**: Noise and Vibration describes this further.

4.3.11 In assessing effects on landscape and visual amenity receptors, a worst-case scenario has been assumed that five stacks, each up to 45m in height, would be located within the Proposed Power Plant Site, as five stacks up to 45m high evenly placed across the Site/view would be more visually intrusive than a single structure up to 45m. **Chapter 10**: Landscape and Visual Amenity describes this further.

4.4 Proposed Development Operation

Hours of Operation

4.4.1 Peaking plants, such as that proposed, are used to rapidly supply electricity to the network when required by the National Grid. These plants can be fired up at short notice to help cope with periods of high demand or low electricity supply nationally (for example when the wind is not blowing to enable sufficient output to be achieved from the wind farms in the UK), or when required to provide ancillary services to support the National Grid. This is expected to be weighted towards the winter period, usually for a few hours at a time. However, as the operation of the plant is driven by the dynamics of the energy market, the plant could run for longer periods, at any time of day, up to the maximum allowed under its Environmental Permit, which is anticipated to be 2,250 hours per year (1,500 hours per year as a rolling five year average).

Site Staff

4.4.2 Operation of the Proposed Development is anticipated to create up to 15 operational roles. Some of the roles are expected to be undertaken by existing West Burton/Cottam Power Station employees. Temporary and contractor employees associated with maintenance activities would also be employed, as required.

Maintenance

4.4.3 Maintenance would be undertaken as dictated by the number of running hours or condition/age of the plant. Due to the predicted low annual running hours, it is likely that there would be several years between each significant plant overhaul period.

4.4.4 The Applicant's existing site Operations and Maintenance (O&M) procedures would be amended to include the Proposed Development and associated ancillary infrastructure or comparable independent arrangements would be put in place.

4.4.5 A range of maintenance activities may be required over the life of the Proposed Development, including replacement of parts or components, restoration of buildings or structures, civils works, upgrades, cleaning and refurbishment. These activities are implicitly considered in this ES as part of the operational impacts of the Proposed Development, unless otherwise stated.

Environmental Management

4.4.6 The Proposed Development would be designed such that process emissions to air comply with the ELV requirements specified in the IED (Ref 4-6) and the European Large Combustion Plant BAT Reference document which was finalised in 2017 and contained lower annual average emission limits than were included in the IED. This would be regulated by the Environment Agency through the Environmental Permit required for the operation of the Proposed Development. Specific details regarding control of air emissions and a summary of emission limit values for the Proposed Development are set out in **Chapter 6**: Air Quality.

4.4.7 The Proposed Development would be operated under the West Burton Integrated Business Management System (IBMS), which incorporates the existing Environmental Management System (EMS) for WBB Power Station, certified to ISO 14001, as well as the Energy Management System certified to ISO 50001 and an Occupational Health and Safety Management System certified to OHSAS 18001 or comparable independent arrangements would be put in place. The IBMS would be amended as appropriate to reflect the Proposed Development.

4.4.8 In summary, the management system outlines a series of policies and procedures that aim to minimise the risk of pollution and subsequent harm to the environment and harm to human health which may arise from the operations, maintenance, accidents, incidents and non-conformances specific to the Plant. The management system would be amended to reflect the operation of the Proposed Development.

4.5 Proposed Development Construction

Construction Programme and Methods

4.5.1 The Applicant would appoint one or more contractors for the construction of the Proposed Development. The Applicant is committed to ensuring a safe working environment for all employees and contractors.

4.5.2 Construction of the Proposed Development could (subject to the necessary consents being granted and an investment decision being made) potentially start as early as Quarter 3 2020. Construction activities are expected to be completed within four years and are more likely to be completed within three years. **Table 4-3** shows an indicative three year construction programme.

Table 4-3: Indicative three year construction programme

	Year 1				Year 2				Year 3			
	1	2	3	4	1	2	3	4	1	2	3	4
Site Preparation	■	■	■									
Main civil works		■	■	■	■	■	■	■				
Plant installation					■	■	■	■	■	■		
Gas and electrical connections							■	■	■	■		
Commissioning										■	■	■

Earthworks

4.5.3 Some earthworks may be required to re-profile the Site, to produce a level platform, excavate foundations and/or remove surplus material or remediate contaminated soils.

4.5.4 If any excess spoil material is generated during construction, it would be stored temporarily within the Site and then, as far as reasonably practicable, reused as part of the construction works, in accordance with the Framework Construction Environmental Management Plan (CEMP) (**Application Document Ref. No. 7.3**) and in accordance with best practice. It is not anticipated that significant volumes of spoil would be required to be removed off-site and a material cut and fill balance would be used to minimise waste arisings where reasonably practicable.

4.5.5 Soils would be managed in accordance with the Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites (Defra, 2009) (Ref 4-7) to minimise impacts on soil structure and quality. If necessary, suitable measures would be put in place to prevent sediment being washed off-site, and the stockpiles would be monitored/measured for wash away, as described in the Framework CEMP (**Application Document Ref. No. 7.3**).

4.5.6 The Framework CEMP incorporates measures to prevent an increase in flood risk during the construction works. For example, topsoil and other construction materials would be stored outside of the 1 in 100 year floodplain extent as far as reasonably practicable and only moved to the temporary works area immediately prior to use. As appropriate, a permit would be obtained from the Environment Agency for the temporary storage of materials within the floodplain, although the need for this would be designed out through the siting of stockpiles within the lower flood zone areas of the Site as far as reasonably practicable.

Construction Laydown Area and Contractors' Compound

4.5.7 **Figures 4.1a** and **4.1b** (ES Volume III) show the indicative area of land to be used for construction laydown and the contractors' compound. This area would also be used for materials and plant storage and laydown areas; siting of temporary generators; concrete batching facilities; vehicle and cycle parking facilities; and construction offices and construction staff welfare facilities. It would be secured by security fencing and gates as appropriate. Some pre-fabrication of materials and components is likely to be undertaken within the construction laydown area.

4.5.8 The area would be levelled to provide an even surface and underlain by semi-permeable surfacing, such that it allows surface water and rainwater to percolate through it. No hazardous materials would be stored unbunded within the construction laydown area.

Main Civil and Process Works

4.5.9 The contractor would prepare and level the Proposed Power Plant Site, followed by piling (if required) and excavation for main foundations. The lighter buildings may be piled or have raft foundations.

4.5.10 If piling is required, this would be subject to a piling and penetrative foundation design method statement, informed by a risk assessment. This would be submitted to, and after consultation with the Environment Agency, subject to the approval by BDC, secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**). All piling and penetrative foundation works would require to be carried out in accordance with the approved method statement to prevent contamination of the underlying soils and groundwater.

Construction of Gas Connection Pipeline

4.5.11 A new gas connection pipeline would link into WBB Power Station's existing gas supply infrastructure as outlined previously. A tee-connection would be made within the WBB Power Station gas receiving facility and a section of pipe would extend into the new gas receiving area.

4.5.12 Where the pipeline is installed below ground, it would likely be constructed using an open cut method, whereby the spoil would be excavated from the pipeline route and stored adjacent to it, while the pipeline is laid, before being reinstated. The high pressure pipeline would be constructed of steel and likely be installed to a

depth of circa 1.2m to the top of the pipe, which would be up to 500mm (nominal bore) in diameter and up to 150m in length.

Construction of Water Connections

4.5.13 A water supply pipeline would be constructed between the existing water supply within WBB Power Station to areas requiring water within the auxiliary/ancillary buildings and structures, including the fire water tanks.

Construction Staff

4.5.14 On average, it is estimated that there would be up to 95 construction personnel on the Site in any one day. The assumed worst-case is that the construction workforce would peak at circa 200 workers per day. This figure is based on experience of other similar developments and informs the transport assessment (**Chapter 7:** Traffic and Transport and **Appendix 7A**: Transport Assessment (ES Volume II)). The peak of construction activity is anticipated between months 25 to 27 of a three year construction programme.

4.5.15 Construction staff are anticipated to travel to the Site via the existing trunk road and local networks. The Applicant would seek to maximise sustainable transport options, such as public transport, cycling and car share, as far as reasonably practicable in accordance with its current practice and policy. This is outlined in the Framework Construction Workers' Travel Plan (**Application Document Ref. 7.7**) and the Construction Traffic Management Plan (**Application Document Ref. 7.6**).

Construction Hours of Work

4.5.16 Core construction working hours would be Monday to Friday 07:00 to 19:00 (except bank holidays) and Saturday 08:00 to 18:00. However, it is likely that some construction activities may need to be undertaken outside of these core working hours. This is partly because certain construction activities cannot be stopped, such as concrete pouring, if this is required, but also to manage the construction programme. Where on-site works are to be conducted outside the core hours, they would comply with any restrictions agreed with the local planning authorities, in particular regarding control of noise and traffic in accordance with the relevant requirements proposed to be secured by the draft DCO (**Application Document Ref. 2.1**).

4.5.17 A start-up period from 06:30 to 07:00 and shut-down period from 19:00 to 19:30 Monday to Friday and a start-up period from 07:30 to 08:00 and shut-down period from 18:00 to 18:30 on a Saturday would also be maintained.

4.5.18 24-hour working for certain activities has therefore been assessed in **Chapter 8**: Noise and Vibration. It is also proposed that some work may be carried out through the night. **Chapter 8**: Noise and Vibration sets out specific mitigation and control measures required to prevent disturbance from any required night-time construction activities, as far as reasonably practicable. Certain activities that could generate a noise nuisance would not be carried out at night including, but

not limited to, delivery of materials, use of certain piling methods, use of impact wrenches, concrete scabbling, use of reversing alarms and concrete jack hammering, subject to the outcome of a construction noise assessment in accordance with British Standard BS5228 (Ref 4-8), or as amended.

4.5.19 Noise monitors would be installed at agreed locations. A Requirement of the draft DCO (**Application Document Ref. 2.1**) requires the approval of a noise monitoring scheme during construction to be agreed with BDC to ensure the control is secured.

Construction Site Access

4.5.20 Access to the Site during construction would be via the existing private road owned by the Applicant, which joins the Sturton-le-Steeple to Bole Corner class III, C2 road, 300m to the north of Sturton-le-Steeple. This access road is a purpose built road that serves the existing West Burton Power Stations and is wide enough to allow access by construction traffic, without the need for alteration. Proposed access is illustrated on **Figure 4.1a** and **Figure 4.1b** (ES Volume III).

Storage of Construction Plant and Materials

4.5.21 At the end of each shift, mobile plant would either be returned to a secure overnight plant storage area or have appropriate drip trays positioned, if needed.

4.5.22 Storage areas for hazardous or potentially polluting materials would be located in a separate, where appropriate bunded and secure area. Material data sheets would be available for all these materials and the Control of Substances Hazardous to Health (COSHH) assessments kept within the relevant risk assessment for the task.

Hazard Prevention and Emergency Planning

4.5.23 The Applicant 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 would be written. Competent and adequately resourced duty holders as defined in the Construction (Design and Management) (CDM) Regulations (Ref 4-9) would be appointed, such as Principal Designer and Principal Contractor. The Applicant would ensure that its own staff, its designers and contractors follow the Approved Codes of Practice (ACoP) laid down by the CDM Regulations.

4.5.24 Written procedures clearly describing responsibilities, actions and communication channels would be available for operational personnel dealing with emergencies.

4.5.25 Management of the gas supply would be carefully controlled in accordance with UK requirements. The Environmental Permit for the Proposed Development would consider potential abnormal operation scenarios and prevention or minimisation of accidents through management procedures.

Lighting

4.5.26 Construction lighting will be required in areas where natural lighting is unable to reach (sheltered/confined areas) and prior to permanent lighting being installed. Lighting may also be required around the Site for night-time construction and during core working hours within winter months.

4.5.27 Artificial lighting would be provided to maintain sufficient security and health and safety for the Site, whilst adopting the mitigation principles outlined in the Lighting Strategy (**Application Document Ref 7.4**) to avoid excessive glare and minimise spill of light to nearby receptors (including ecology and residents) outside of the Site as far as reasonably practicable.

4.5.28 The Framework CEMP (**Application Document Ref. 7.3**) sets out standard best practice measures to minimise light spill including glare during construction. The contractor CEMP would be required to take these into account.

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

4.5.29 In accordance with policy requirements, through the on-going design, the Applicant would seek to ensure that the Proposed Development is designed, constructed and implemented to minimise the creation of waste, maximise the use of recycled materials and assist the collection, separation, sorting, recycling and recovery of waste arisings, as far as reasonably practicable.

4.5.30 The Applicant would require the contractor to produce and maintain a CEMP to control Site activities to minimise, as far as reasonably practicable, impacts on the environment. This would include industry best practice measures and specific measures set out in this ES. A Framework CEMP has been produced in support of the Application (**Application Document Ref. No. 7.3**). The Framework CEMP sets out the key measures to be employed during construction of the Proposed Development to control and minimise impacts on the environment. It describes how monitoring and auditing activities would be undertaken, in order to ensure that mitigation, management and monitoring measures are carried out and are effective. The contractor's CEMP must be in accordance with the principles set out in the Framework CEMP (**Application Document Ref. No. 7.3**) and would specify, as a minimum:

- a code of construction practice, specifying measures designed to minimise the impacts of construction works;
- a scheme for the control of any emissions to air;
- a soil management plan;
- a sediment control plan;
- a scheme for environmental monitoring and reporting during the construction of the Proposed Development, including measures for undertaking any corrective actions; and

- a notification scheme for any significant construction impacts on local residents and for handling any complaints received from local residents relating to construction impacts.

4.5.31 In order to manage and monitor waste, including any spoil generated on-site, a Framework Site Waste Management Plan (SWMP) has been developed as part of the Framework CEMP (**Application Document Ref. No. 7.3, Appendix A**). This would allow waste streams to be estimated and monitored and goals to be set with regards to the waste produced. The contractor's CEMP will incorporate the principles of the Framework SWMP as appropriate.

4.5.32 The Applicant would require that the contractor segregates the waste streams on-site, prior to them being taken to a waste facility for recycling or disposal. All waste removal from Site would be undertaken by licensed waste carriers and taken to licensed waste facilities.

4.5.33 Further assessment of impacts in relation to construction and operational waste is presented in **Chapter 15**: Sustainability, Waste and Climate Change.

4.6 Proposed Development Commissioning

4.6.1 Commissioning of the Proposed Development would include testing and commissioning of the process equipment in order to ensure that that all systems and components installed are in accordance with the requirements of the Applicant.

4.7 Proposed Development Decommissioning

4.7.1 It is envisaged that the Proposed Development would have an operational life of up to circa 40 years, therefore decommissioning activities are currently anticipated to commence after 2063.

4.7.2 Decommissioning would require submission of a Decommissioning Environmental Management Plan (DEMP) to the relevant planning authority for its approval, secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**).

4.7.3 Prevention of contamination will be a specific requirement of the Environmental Permit for the operation of the Proposed Power Plant Site. Therefore, it is being designed such that it would not create new areas of ground contamination or pathways to receptors as a result of construction or operation.

4.7.4 The gas and electricity connections would be disconnected and made safe. An OCGT, whether single turbine or up to five OCGT units, could either be removed as a unit for reuse elsewhere (depending on condition) or alternatively dismantled on-site and removed. Once the plant and equipment have been removed to ground level, it is expected that the hardstanding and sealed concrete areas would be left in place. Any areas of the Proposed Power Plant Site that are below ground level would be backfilled to ground level to leave a levelled area.

4.7.5 The DEMP would also need to be produced and agreed with the Environment Agency as part of the process to surrender the Environmental Permit. As such, the DEMP 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 decommissioning and demolition works.

4.7.6 The DEMP would include an outline programme of works. It is anticipated that it would take nine to twelve months to decommission the Proposed Power Plant, with demolition, if proposed, following thereafter.

4.7.7 Like construction, during decommissioning and demolition, there would be an electrical demand, as well as requirement for office, accommodation and welfare facilities.

4.7.8 The Site closure sequence would 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 decommissioning is achieved;
- if demolition is proposed, specialist demolition may be required (e.g. the stack(s)); 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 condition at the time that the Environmental Permit was issued, as far as reasonably practicable.

4.7.9 The contractor (to be appointed by the Applicant) will have a legal obligation to consider decommissioning (and demolition, if required) under the CDM Regulations 2015 (Ref 4-9), or the equivalent prevailing legislation at that time.

4.7.10 Decommissioning activities would be conducted in accordance with the appropriate guidance and legislation at the time of site closure. All decommissioning activities would 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 decommissioning would be re-used or recycled and a record would be kept to demonstrate that the maximum level of recycling and reuse has been achieved.

4.7.11 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. Records from the decommissioning process will be made available for inspection by the Environment Agency and other relevant statutory bodies.

4.7.12 In the light of the control measures set out above that would form part of the proposed DEMP, decommissioning is not anticipated to present any significant environmental impacts beyond those assessed for the construction phase of the Proposed Development.

4.8 Design Evolution and Consideration of Alternatives

4.8.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended) (the 2009 EIA Regulations) (Ref 4-10) state that the ES should include an outline of the main alternatives that have been studied and an indication of the main reasons for decisions made, taking into account the environmental effects. This should include consideration of 'do nothing'. Under the 2009 EIA Regulations, there is currently no requirement to assess alternatives, only a requirement to provide information regarding the alternatives that have actually been considered.

4.8.2 On the matter of alternatives, National Policy Statement (NPS) EN-1 (DECC, 2011a) (Ref 4-11) states that there is no *'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'.*

4.8.3 Taken together with EN-1, the NPS for Fossil Fuel Electricity Generating Infrastructure (EN-2) (DECC, 2011b) (Ref 4-12) provides the primary basis for decisions on applications for fossil fuel electricity generating stations, including gas fired power stations (such as the Proposed Development). Section 2.2 of EN-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 of construction materials, fuel, waste and equipment; and water resources, for example, some power stations have very high water demands for cooling; and grid connection. However, in outlining such factors, paragraph 2.2.1 states 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'.

4.8.4 It is considered that the '*Do Nothing*' scenario is not appropriate given the established national need for new energy generation (refer to **Chapter 5**: Legislative Context and Planning Policy Framework). Another key disadvantage of the '*Do Nothing*' scenario would be the lack of additional investment in the local economy since the Proposed Development would not be developed.

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

- the West Burton Power Station site has a long history of power generation;
- the Site has excellent existing electrical grid, gas, 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 Site (and particularly the Proposed Power Plant Site) is wholly in the freehold ownership of the Applicant; and
- the Proposed Power Plant Site is located in close proximity to the National Grid electricity transmission network and to available electrical, gas and utility connections associated with the existing WBA and WBB Power Stations, providing opportunities for synergies, efficiencies and thus economic and environmental benefits for the Proposed Development.

4.8.6 The consideration of alternatives and design evolution has been undertaken with the aim of preventing or reducing adverse environmental effects (following the mitigation hierarchy of avoid, reduce and, if possible, remediate) while maintaining operational efficiency and cost-effectiveness. The design has evolved in response to consultation feedback and the findings of surveys and technical studies. Mitigation measures that have been included within the design of the Proposed Development are referenced in each topic specific chapter (**Chapters 6–16**).

4.8.7 A number of alternatives have been and in certain cases, continue to be considered for the Proposed Development, which are discussed below, including:

- alternative OCGT technologies;
- alternative design options and design evolutions; and
- alternative Site drainage solutions.

Alternative OCGT Technologies

4.8.8 There are a number of alternative options for the OCGT(s) under consideration for the Proposed Development, given the different ranges of gas turbine output available. Gas turbines sized between 50MW and up to 299MW gross outputs remain under consideration for the Proposed Development.

4.8.9 At this stage, no options have been ruled out for the OCGT technology configuration, with further technical evaluation of the strengths of each option still under consideration. Where the scale of OCGT configuration has the potential to materially change the environmental effects of the Proposed Development (i.e. air quality, noise and vibration emissions and landscape and visual amenity impact), the various options have been considered in this ES and a worst-case is presented. Refer to **Chapter 6**: Air Quality, **Chapter 8**: Noise and Vibration and **Chapter 10**: Landscape and Visual Amenity.

Alternative Design Options and Design Evolution

4.8.10 Throughout the on-going design process, consideration has been 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. The design has evolved and been refined through a continuous process of environmental assessment, consultation and development to the point of submission of the Application.

4.8.11 Aspects of design that have been determined include:

- up to five OCGT units would be installed in a defined area of the Site;
- gas engines would not be utilised;
- if smaller OCGT units are installed, they would be orientated in a nominal north-south direction, unless it can be demonstrated that environmental effects for any parameter would be no worse than those assessed and presented in this ES;
- the operational plant would be sited close to WBB Power Station;
- no direct surface water discharge would be required into the River Trent;
- no direct water abstraction would be required from the River Trent;
- no works would be required through the existing flood defences, across any PRoW or into the River Trent; and
- the final areas have been selected for landscaping and biodiversity management and enhancement.

4.8.12 By contrast, the following aspects have not yet been determined, so options have been included and assessed within this ES:

- the manufacturer of the OCGT unit(s), therefore the final dimensions of the proposed structures and any buildings;
- final stack heights and locations;
- the need or otherwise for certain buildings and/or enclosures; and
- the preferred surface water drainage connection point.

4.8.13 The Rochdale Envelope approach (Ref 4-1) has been applied to address these options and the approach taken has been described in paragraph 4.3.2 and within each topic specific chapter (**Chapters 6-16**).

Alternative Site Drainage Solutions

4.8.14 Following further engineering design works, the potential surface water outfalls to the River Trent that had been under consideration at the EIA Scoping and statutory consultation stages (and were therefore set out in the Preliminary Environmental Information (PEI) Report (Ref 4-13) are now excluded from the Proposed Development and the proposed Order Limits, draft DCO and associated documentation.

4.8.15 By designing out the need for a direct discharge to the River Trent, potential impacts have been avoided, particularly relating to construction effects due to temporary works that would otherwise have been required in the River Trent.

4.8.16 Surface water from the Proposed Development would be attenuated on-site and would discharge to the existing drainage system of the West Burton Power Station site. Surface water discharge to the River Trent from the wider West Burton Power Station site would, therefore, continue via the existing outfall structure and the rate of discharge would be controlled via the surface water drainage system, to ensure that pre-development 'greenfield' runoff volumes are not exceeded.

4.8.17 **Chapter 12**: Water Resources, Flood Risk and Drainage of the ES is prepared on the basis that no new surface water outfall to the River Trent would be required. Consequently, a Water Framework Directive (WFD) screening assessment that was included as a draft in Appendix 12B (PEI Report Volume II (Ref 4-14) is no longer required.

4.9 References

Ref 4-1 Planning Inspectorate (2012) *Advice Note 9 – Using the 'Rochdale Envelope'*. Version 3, republished July 2018.

Ref 4-2 Environment Agency (2010) *Full Licence to Abstract Water* (L03/28/69/0070)

Ref 4-3 British Standards Institute (2014) *Light and lighting. Lighting of work places. Outdoor work places*.

Ref 4-4 Institute of Lighting Professionals (2019) *ILP Guidance Notes.* Available online https://www.theilp.org.uk/resources/free-resources/ilp-guidance-notes/

Ref 4-5 HMSO (2013) *Carbon Capture Readiness (Electricity Generating Stations) Regulations 2013*

Ref 4-6 European Commission (2010) *European Directive on Industrial Emissions 2010/75/EU*.

Ref 4-7 Defra (2009) *Construction Code of Practice for the Sustainable Use of Soil on Development Sites*, March 2011.

Ref 4-8 British Standards Institute (2014) *BS 5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites. Part 1: Noise*

Ref 4-9 HM Government (2015), *Construction (Design and Management) (CDM) Regulations 2015*.

Ref 4-10 HM Government (2009) *The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009*.

Ref 4-11 Department of Energy and Climate Change (2011), *Overarching National Policy Statement for Energy (EN-1)*.

Ref 4-12 Department of Energy and Climate Change (2011), *National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2)*.

Ref 4-13 AECOM (2017) *West Burton C Preliminary Environmental Information Report*, September 2017.