Tables

15. Sustainability, Waste and Climate Change

15.1 Introduction

15.1.1 This chapter of the Environmental Statement (ES) addresses the potential effects of the construction, operation (including maintenance) and decommissioning of the proposed WBC gas fired generating station on the site of the West Burton Power Station (the Proposed Development) on sustainability, focussing on climate change and waste (construction and operational waste). The assessment considers:

- the present-day and future baseline conditions during construction and at opening;
- the legislative background (European, national, regional), planning policy (national, regional and local) and guidance that promotes sustainability principles and appropriate waste management;
- the potential impacts of the Proposed Development during construction, operation and decommissioning and the need for mitigation measures; and
- the in-combination effects of key sustainability themes (i.e. of greenhouse gas emissions, flood risk, ecology, air quality, transport and waste). As a result, many of the sustainability issues considered in this chapter refer to other topic specific chapters of this ES; therefore, relevant chapters are referenced herein where appropriate.

15.1.2 The assessment of cumulative effects on sustainability associated with the Proposed Development and other committed developments in the vicinity are described in **Chapter 16**: Cumulative and Combined Effects.

15.1.3 This chapter is supported by **Appendix 15A:** Greenhouse Gas Assessment (ES Volume II) and **Figure 15.1** (ES Volume III).

15.2 Legislation, Planning Policy and Guidance

Legislative Background

Sustainability and Climate Change

Climate Change Act 2008

15.2.1 The Climate Change Act 2008 (Ref 15-1) sets a legally binding target for the UK to reduce its greenhouse gas emissions from 1990 levels by at least 80% lower than the 1990 baseline by 2050. This overall target is supported by a system of binding five-year '*carbon budgets'* as well as an independent body to monitor progress, the Committee on Climate Change (Ref 15-2).

Planning our Electric Future: a White Paper for Secure, Affordable and Low Carbon Electricity, 2011

15.2.2 This White Paper (Ref 15-3) identifies a number of '*unprecedented*' challenges to power generation in the UK, including a threat to security of supply as existing coal fired power stations close, decarbonisation of electricity generation, the likely rise in electricity demand, and expected rise in electricity prices. In response, a strategy has been put forward that includes the introduction of an Emissions Performance Standard (EPS) (Ref 15-4) for UK power generation proposed to be set as an annual limit equivalent to 450 grams of carbon dioxide (CO_2) per kilowatt hour at baseload.

7th Environment Action Programme (EAP)

15.2.3 The 7th EAP (Decision No. 1386/2013/EU) (Ref 15-5) came into force in January 2014, guided by the following long term vision:

"In 2050, we live well, within the planet's ecological limits. Our prosperity and healthy environment stem from an innovative, circular economy where nothing is wasted and where natural resources are managed sustainably, and biodiversity is protected, valued and restored in ways that enhance our society's resilience. Our low-carbon growth has long been decoupled from resource use, setting the pace for a safe and sustainable global society." (Annex, Paragraph 1)

15.2.4 The 7th EAP is based around three priority areas requiring more action, including:

1. protect nature and strengthen ecological resilience;
2. boost resource-efficient, low-carbon growth; and
3. reduce threats to human health and wellbeing linked to pollution, chemical substances, and the impacts of climate change.

15.2.5 In relation to aspects of sustainability covered by this chapter, the first priority area identifies further action on soil protection and sustainable use of land, while the third area covers challenges to human health including air and water pollution, excessive noise and toxic chemicals.

Waste

EU Strategy for Plastics in the Circular Economy (Ref 15-6)

15.2.6 Forms part of the implementation of the ambitious Circular Economy Action Plan (Ref 15-7) to transform Europe's economy into a more sustainable one. The Strategy for Plastics will transform the way plastics products are designed, produced, used and recycled. By 2030, all plastic packing should be recyclable. The strategy highlights the need to:

- to improve the economics and quality of plastic recycling;
- curb plastic waste and littering;

- drive investments and innovation; and
- harness global action.

Monitoring Framework on progress towards a circular economy (Ref 15-8)

15.2.7 In the transition to a more circular economy (CE), monitoring the key trends and patterns is key to understanding how the various elements of the CE are developing over time, to help identify success factors in Member States and to assess whether sufficient action has been taken. The results of monitoring should form the basis for setting new priorities towards the long-term objective of a CE. They are not just relevant to policy makers, but should inspire all and drive new actions. The monitoring framework is composed of a set of ten key indicators:

1. EU self-sufficiency for raw materials – CE helping to address supply risks for raw materials, particularly critical raw materials (e.g. cobalt, tungsten, tantalum);
2. green public procurement – public procurement accounts for a large proportion of consumption and can drive the CE;
3. waste generation – in a CE waste generation is minimised;
4. food waste – has negative environmental, climate and economic impacts;
5. overall recycling rates – increasing recycling is part of the transition to a CE;
6. recycling rates for specific waste streams – reflects progress in recycling key waste streams;
7. contribution of recycled materials to raw materials demand – in a CE, secondary raw materials are a commodity used to make new products;
8. trade in recyclable raw materials – reflects importance of internal market and global market in CE;
9. private investments, jobs and gross value added – reflects contribution of CE to create jobs and growth; and
10. patents – innovative technologies related to the CE, boost EU's global competitiveness.

Directive 2008/98/EC on waste (Waste Framework Directive)

15.2.8 The Waste Framework Directive (WFD) (Ref 15-9) sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling, recovery. It explains when waste ceases to be waste and becomes a secondary raw material (so called end-of-waste criteria), and how to distinguish between waste and by-products. The Directive lays down some basic waste management principles: it requires that waste be managed without endangering human health

and harming the environment, and in particular without risk to water, air, soil, plants or animals, without causing a nuisance through noise or odours, and without adversely affecting the countryside or places of special interest. Waste legislation and policy of the EU Member States shall apply as a priority order, following waste management hierarchy as illustrated on **Figure 15.1** (ES Volume III).

Directive 1999/31/EC on the landfill of waste (Landfill Directive)

15.2.9 The Landfill Directive (Ref 15-10) aims to reduce reliance on landfill as a disposal option. It seeks to decrease the environmental impacts of landfills and reduce the risk to human health while imposing a consistent minimum standard for landfills across the EU. The Landfill Directive:

- sets minimum standards for the location, design, construction and operation of landfills;
- sets targets for the diversion of Biodegradable Municipal Waste (BMW) from landfill;
- controls the nature of waste accepted for landfill; and
- defines the different categories of waste (municipal waste, hazardous waste, non-hazardous waste and inert waste) and applies to all landfills, defined as waste disposal sites for the deposit of waste onto or into land.

Site Waste Management Plan Regulations 2008

15.2.10 The Site Waste Management Plan Regulations 2008 (Ref 15-11) (enacting Clause 54 of the Clean Neighbourhoods and Environment Act 2005) (Ref 15-12) were revoked in December 2013. However, the main requirements of these Regulations, which govern the management of construction waste, are still considered to be best practice and many infrastructure projects require a Site Waste Management Plan (SWMP) to be prepared ahead of construction commencing, to guide project/construction personnel on how to manage all types of waste in accordance with best practice requirements.

The Waste (England and Wales) (Amendment) Regulations 2014 (Ref 15-13)

15.2.11 The Waste (England and Wales) Regulations 2011 (Ref 15-13) (as amended) transpose the EU Waste Framework Directive (Directive 2008/98/EC) into UK law and sets the legal basis for the '*Duty of Care*' for the management of waste in England and Wales. The Duty of Care relating to waste management requires that anyone in possession of waste must:

- prevent illegal disposal, treatment or storage of waste;
- prevent the escape of wastes;
- ensure transfer of waste to an authorised person;

- provide an accurate written description of the waste in order to facilitate the compliance of others with the Duty and avoidance of the offences under Section 34 of the Environmental Protection Act 1990 (Ref 15-14) via a compulsory system of waste information in respect of the transfer of controlled waste; and
- all those subject to the Duty should confirm conformance by others '*in the chain*' to the requirements of the Duty to an extent which is '*reasonable in the circumstances*' and all breaches of the Duty should be reported to the Environment Agency.

15.2.12 The Regulations also:

- require businesses to confirm that they have applied the waste management hierarchy when transferring waste and to include a declaration on their Waste Transfer Note (WTN) or Hazardous Waste Consignment Note (HWCN);
- requires businesses undertaking waste management activities such as import, production, collection, transportation, recovery and/or disposal to take all reasonable measures to apply the waste hierarchy, as shown in **Figure 15.1** (ES Volume III);
- introduce a two-tier system for waste carrier and broker registration, which includes those who carry their own waste, and introduces a new concept of a waste dealer;
- make amendments to hazardous waste controls and definition;
- exclude some categories of waste from waste controls, notably animal by-products whilst including a small number of radioactive waste materials; and
- require that local authorities who collect waste paper, metal, plastic or glass arrange to collect these waste streams separately.

Planning Policy Context

Sustainability and Climate Change

Overarching National Policy Statement for Energy (EN-1)

15.2.13 National Policy Statement (NPS) EN-1 (Ref 15-15) emphasises the importance of a diverse mix of energy generating technologies, including renewables, nuclear and fossil fuels, to avoid over-dependence on a single fuel type and so ensure a more secure energy supply. The policy states that developers should consider opportunities for Combined Heat & Power (CHP) and that all commercial scale (at or over 300MW) fossil fuelled generating stations have to be '*carbon capture ready*'. However, as the output capacity of the Proposed Development is less than 300MW, the Carbon Capture Readiness (Electricity Generating Stations) Regulations 2013 (Ref 15-16) do not apply to the Proposed Development.

National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2)

15.2.14 NPS EN-2 (Ref 15-17) sets out additional policy requirements for energy generating capacity of over 50MW, including, for example, those for land use, transport infrastructure, water resources, grid connection, climate adaptation and good design as follows:

- land use – the choice of a site may be affected by the quantity of chemicals that would be required to be stored at the site. This should be considered by an applicant;
- transport infrastructure – new generating sites should be sited as close to existing multi modal transport links as possible. This is for the delivery and removal of construction materials, fuel, waste, materials and staff to and from the site. Where road transport is required, consideration should be given to upgrading road access as required;
- water resources – applicants are required to ensure there is a sufficient water supply of the right quality to meet its anticipated demand;
- grid connection – information should be provided on the anticipated grid connection and the likely environmental impact of that connection;
- climate change adaptation – climate resilience should be considered by an applicant in their ES, including how the development would be resilient to higher temperatures for example; and
- good design – EN-2 requires applicants to demonstrate that the development design has taken into consideration potential landscape and visual effects, noise and traffic impacts for example.

15.2.15 The topic specific chapters (**Chapters 6-16**) of this ES (Volume I) provide further details of NPS requirements, and where in the assessment such issues are considered.

National Planning Policy Framework (NPPF)

15.2.16 The revised National Planning Policy Framework (NPPF) (Ref 15-18) was published in February 2019, replacing earlier versions published in July 2018 and March 2012.

15.2.17 Paragraph 5 of the NPPF makes clear that the document does not contain specific policies for determining applications for nationally significant infrastructure projects (NSIPs); these are to be determined in accordance with the decision making framework set out in the Planning Act 2008 and relevant National Policy Statements, as well as any other matters that are considered *'relevant'*.

15.2.18 Policies of particular relevance to the scope of the assessment as presented herein include:

- achieving sustainable development (paragraphs 7-14);
- promoting sustainable transport (paragraphs 102-111);
- achieving well designed places (paragraphs 124-132);
- promoting healthy and safe communities (paragraphs 91-101);
- meeting the challenge of climate change, flooding and coastal change (paragraphs 148-169);
- conserving and enhancing the natural environment (paragraphs 170-183); and
- conserving and enhancing the historic environment (paragraphs 184-202).

15.2.19 A number of these applicable policies are detailed in the various topic specific chapters presented within this ES (Chapters 6-16).

15.2.20 Paragraphs 151 - 154 of the NPPF specifically set out how planning authorities are to promote the use and supply of renewable and low carbon energy – a key part of the environmental objective of sustainable development. **Section 15.6** details how the Proposed Development performs with regard to sustainable development and climate change.

Bassetlaw Core Strategy

15.2.21 The Core Strategy and Development Management Policies DPD (Ref 15-19) was adopted by Bassetlaw District Council (BDC) in December 2011 and forms part of its Local Plan. The Core Strategy is the key Local Development Framework document that sets out a vision for change in Bassetlaw along with the place-specific policy approaches to be taken in order to achieve this vision over a period of 18 years. A small number of more detailed development management policies, are also included.

15.2.22 Relevant district wide policies include Policy DM10: Renewable and Low Carbon Energy, which states:

"The Council will be supportive of proposals that seek to utilise renewable and low carbon energy to minimise CO_2 emissions. Proposal for renewable and low carbon energy infrastructure will also need to demonstrate that they… iv. Will not result in unacceptable impacts in terms of visual appearance, noise, shadow flicker, watercourse engineering and hydrological impacts, pollution, or traffic generation."(paragraph 5.34)

15.2.23 BDC is currently in the early stages of preparing a new Local Plan for the District and began consulting on a Draft Bassetlaw Local Plan (Ref 15-20) in January 2019. Strategic objective 8 (Increase resilience to climate change through improved flood mitigation, better energy and water efficiency, and support for renewable energy production) states:

"New developments in Bassetlaw will seek to mitigate the effects of climate change. This will be achieved by securing designs and building layouts that deliver

improved energy and water efficiency. Wherever possible, new developments will take advantage of opportunities to produce renewable and low carbon energy at a scale appropriate to their size and location.

Developments in Bassetlaw will continue to be directed away from areas at most risk of flooding, and required to manage the flow of water off their sites to ensure they do not cause unmanageable impacts on drainage and sewage networks that could cause flooding issues in other locations." (paragraph 4.2)

Sturton Ward Neighbourhood Plan

15.2.24 The Sturton Ward Neighbourhood Plan (Ref 15-21) contains policies to guide new development and is used to assess planning applications submitted within the Parish, within which the Site is located. Policy 1 of the Sturton Ward Neighbourhood Plan specifically relates to sustainable development, stating:

"Policy 1: Sustainable Development

1. *All development over the Plan period will be required to minimise its environmental impact and, where applicable, to improve access to the countryside and open spaces for residents.*

2. *Development proposals will be supported:*

   a) at a scale and in locations that accord with policies set out in the Sturton Ward Neighbourhood Plan where it can be shown that such development would support the continued sustainability and viability of the Plan area,

   b) where it provides new homes of the type and mix required by local people,

   c) for new and expanded business premises within and on the edge of the settlements.

3. *All development shall be designed and located having regard to the principles and advice set out in this Neighbourhood Plan, and shall not cause material harm to the following factors:*

   a) The amenity of nearby residential properties; and

   b) The character and appearance of the part of the Plan area concerned; and

   c) The integrity, character and appearance."

15.2.25 The Plan makes reference to the West Burton Power Station site and encourages proposals which harness waste heat from commercial operations for the purpose of providing renewable energy for the benefit of the community.

15.2.26 A number of other policies are also of relevance, such as:

- Policy 2: Conservation and Enhancement of Existing Natural Features;

- Policy 3: Design Principals;
- Policy 4: Protecting the Historic Environment;
- Policy 6: Economic Development;
- Policy 12: Reducing the Risk of Flooding; and
- Policy 14: Energy Efficiency and Sustainability.

15.2.27 These are detailed in other topic specific chapters within this ES, as relevant.

Waste

National Planning Policy for Waste

15.2.28 The National Planning Policy for Waste (Ref 15-22) sets out the Government's ambition to work towards a more sustainable and efficient approach to resource use and management. Positive planning plays a pivotal role in delivering this country's waste ambitions through:

- delivery of sustainable development and resource efficiency, including provision of modern infrastructure, local employment opportunities and wider climate change benefits, by driving waste management up the waste hierarchy (refer to **Figure 15.1** (ES Volume III));
- ensuring that waste management is considered alongside other spatial planning concerns, such as housing and transport, recognising the positive contribution that waste management can make to the development of sustainable communities;
- providing a framework in which communities and businesses are engaged with and take more responsibility for their own waste, including by enabling waste to be disposed of or, in the case of mixed municipal waste from households, recovered, in line with the proximity principle;
- helping to secure the re-use, recovery or disposal of waste without endangering human health and without harming the environment; and
- ensuring the design and layout of new residential and commercial development and other infrastructure (such as safe and reliable transport links) complements sustainable waste management, including the provision of appropriate storage and segregation facilities to facilitate high quality collections of waste.

15.2.29 The National Planning Policy for Waste sets out detailed waste planning policies. It should be read in conjunction with the:

- NPPF (Ref 15-18);
- Waste Management Plan for England (Ref 15-23); and
- National Policy Statement for Hazardous Waste (Ref 15-24).

15.2.30 All local planning authorities should have regard to the National Planning Policy for Waste when discharging their responsibilities to the extent that they are appropriate to waste management.

Overarching National Policy Statement for Energy (EN-1)

15.2.31 NPS EN-1 (Ref 15-15) provides a summary of relevant advice regarding waste management and where this is considered in this chapter, as detailed in **Table 15-1**.

Table 15-1: Summary of relevant NPS EN-1 advice regarding waste management

Summary of NPS	Consideration within the Chapter
NPS EN-1 (Ref 15-15)	
Paragraph 5.14.6 states: *"The applicant should set out the arrangements that are proposed for managing any waste produced and prepare a Site Waste Management Plan. The arrangements described and Management Plan should include information on the proposed waste recovery and disposal system for all waste generated by the development, and an assessment of the impact of the waste arising from development on the capacity of waste management facilities to deal with other waste arising in the area for at least five years of operation. The applicant should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that this is the best overall environmental outcome."*	A Framework Construction Environmental Management Plan (CEMP) is provided in **Application Document Ref. 7.3;** also refer to **Section 15.5**.

Government Review of Waste Policy

15.2.32 The most recently published national waste strategy is the Government Review of Waste Policy (Ref 15-25). The Government's principal commitments set out in this review include:

- prioritising efforts to manage waste in line with the waste hierarchy (**Figure 15.1** (ES Volume III)) and reduce the carbon impacts of waste;
- developing a range of measures to encourage waste prevention and reuse, supporting greater resource efficiency;
- developing voluntary approaches to cutting waste, increase recycling, and improve the overall quality of recyclate material, working closely with business sectors and the waste and material resources industry;
- consulting on the case for higher packaging recovery targets for some key materials;

- supporting energy from waste where appropriate, and for waste which cannot be recycled;
- working to overcome the barriers to increasing the energy from waste which Anaerobic Digestion (AD) provides, as set out in the new AD strategy; and
- consulting on restricting wood waste to landfill and review the case for restrictions on sending other materials to landfill.

Waste Management Plan for England

15.2.33 The Waste Management Plan for England (the Plan) (Ref 15-23) is a high level document, which is non-site specific. It draws on the Government Review of Waste Policy (Ref 15-25) and provides an analysis of the current waste management situation in England. It evaluates how it will support implementation of the objectives and provisions of the revised Waste Framework Directive (Ref 15-9) (the Waste Directive) as transposed in to UK legislation by way of the Waste (England and Wales) (Amendment) Regulations 2014 (Ref 15-13).

15.2.34 This Plan sets out an overview of waste management in England to fulfil the revised Waste Directive Article 28 mandatory requirements, and other required content as set out in Schedule 1 to the 2011 Regulations. The Plan, in conjunction with the Government Review of Waste Policy (Ref 15-25), the National Planning Policy for Waste (Ref 15-22) meets the requirements of the Waste Directive by providing:

- an analysis of the current waste management situation and the measures being taken to deliver the hierarchy of re-use, recycling, recovery and disposal of waste, including an evaluation of how the plan would support the implementation of the objectives and provisions of the Directive;
- an analysis of the type, quantity and source of waste generated and the waste likely to be shipped from, or to England, along with an evaluation of the development of waste streams in the future;
- an overview of existing waste collection schemes and waste disposal and recovery installations, including any special arrangements for waste oils, hazardous waste or waste streams addressed by specific European Community legislation;
- an assessment of the need for new collection schemes, the closure of existing waste installations and the need for additional waste installation infrastructure in accordance with Article 16 (on the proximity principle) of the Waste Directive, and, if necessary, the investments related thereto;
- sufficient information on the location criteria for site identification and on the capacity of future disposal or major recovery installations, if necessary; and
- general waste management policies, including planned waste management technologies and methods, or policies for waste posing specific management problems.

Nottinghamshire and Nottingham Replacement Waste Local Plan (Waste Core Strategy)

15.2.35 The Waste Core Strategy (Ref 15-26) is a plan for managing all of the waste produced in Nottinghamshire and Nottingham up to 2031. It forms part of the formal development plan for the area.

15.2.36 The Waste Core Strategy sets out the Nottinghamshire County Council (NCC) and Nottingham City Councils' strategic planning policies for the development of future waste management facilities. This document identifies broad areas where waste management facilities, of different types, are likely to be acceptable, but it does not allocate specific sites for waste management use.

15.2.37 As well as recognising the value of waste as a resource and managing it more sustainably, it states that it is essential to put in place the right infrastructure to manage whatever waste is produced. This means planning to make sure the right types of waste management facilities in the right places to recycle, recover or, where necessary, dispose of our waste.

15.2.38 NCC and Nottingham City Council have worked together to produce a Waste Core Strategy which will guide the provision of essential waste management infrastructure over the next 20 years. To help achieve this, the strategy sets a 70% recycling target for all wastes by 2025 and allows for some additional energy recovery, where needed, to reduce what is sent to landfill to no more than 10% of the waste produced.

15.2.39 Policy WCS2 of the Waste Core Strategy states that developments should be:

"Designed, constructed and implemented to minimise the creation of waste, maximise the use of recycled materials and assist the collection, recycling and recovery of waste arising from the development." (paragraph 7.7)

Other Guidance

Sustainability and Climate Change

2015 UK Greenhouse Gas Emissions, Final Figures (Ref 15-27)

15.2.40 This provides the latest estimates of 1990-2015 UK greenhouse gas emissions by source and by end user sector.

15.2.41 In 2015, UK emissions of the seven greenhouse gases covered by the Kyoto Protocol were estimated to be 495.7 million tonnes carbon dioxide equivalent ($MtCO_2e$). This was 3.8% lower than the 2014 figure of 515.1 $MtCO_2e$.

15.2.42 Carbon dioxide (CO_2) is the main greenhouse gas, accounting for 81% of total UK greenhouse gas emissions in 2015. The drivers for the decrease in emissions were in the energy supply sector (down 12.3%), the business sector (2.6%) and the waste management sector (7.1%). The decrease in the energy supply sector is

due to the change in the fuel mix for electricity generation, with less use of coal and greater use of nuclear and renewables.

Waste

Designing Out Construction Waste - A Guide for Project Design Teams, Zero Waste Scotland

15.2.43 This guidance (Ref 15-28) formerly developed by the Waste & Resources Action Programme (WRAP), but now provided by Zero Waste Scotland, remains applicable to construction projects across the UK. The guide highlights the opportunities to adopt more circular approaches and to design out waste across the construction process. Importantly, the guide highlights the role of good decision-making throughout the entire construction process, and that design is not just decided by the architect, but is informed by many professionals across many disciplines, including project managers, quantity surveyors, mechanical and electrical engineers, facilities managers and other related disciplines involved in designing and building within the industry.

15.2.44 The guide discusses five key principles around how to design out wastes which, like ideas within the theory of circular economy, are not discrete, disconnected topics for consideration. Instead, they can all play a part within, and complement, the others:

1. design for waste-efficient procurement - involving early and ongoing communications between the client, design team, contractors and sub-contractors, and reviews of any specifications that may restrict waste reduction options;

2. design for materials optimisation – focusing on making most efficient use of resources (e.g. minimising excavation, simplification and standardisation of materials and components) without compromising design or quality;

3. design for off-site construction – utilising opportunities for materials and components being assembled in a factory environment; whilst still incorporating the principles of designing out waste;

4. design for re-use and recovery – focusing on the whole life cycle of materials used, extending their life and preparing for recovery (e.g. re-using existing structures on-site, sourcing reclaimed products or crushed demolition materials); and

5. design for deconstruction and flexibility – focussing on whole life cycle of materials and components; with strong links to re-use and recovery.

15.3 Assessment Methodology and Significance Criteria

Consultation

15.3.1 The consultation undertaken with statutory consultees to inform this chapter, including a summary of comments raised via the Scoping Opinion (**Appendix 1B** (ES Volume II)) and in response to the statutory consultation is summarised in .

Table 15-2: Consultation summary table

Consultee or organisation approached	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
Secretary of State	June 2017 (Scoping Opinion)	Comments received on the approach to the sustainability and climate change assessment and identifying significance criteria. The Secretary of State recommends that the Applicant specifically address the issue of climate change adaptation and resilience within the ES.	Adaptation and resilience of the Proposed Development to climate change has been assessed within this chapter of the ES, **Appendix 15A: Greenhouse Gas Assessment** and **Appendix 12A: Flood Risk Assessment** (ES Volume II).
		Comments regarding scoping out waste management stated: "*it is not considered appropriate to scope out waste management as an issue; however, the Secretary of State considers that provision of relevant information as part of the Scoping Opinion for West Burton C Power Station Sustainability and Climate Change Chapter would be acceptable. In providing this information, the Applicant should have*	Consideration of waste minimisation, implementation of the waste hierarchy, and waste management plan are presented within this chapter of the ES and a Framework Site Waste Management Plan (SWMP) is provided as Appendix A of the Framework Construction Environmental

Consultee or organisation approached	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
		regard to comments from NCC regarding the approach to waste management".	Management Plan (CEMP) (refer to **Application Document Ref 7.3**). Regard to NCC's comments is explained below.
Nottinghamshire County Council (NCC)	June 2017 (Scoping Opinion)	*"The County Council would be keen to see the best practice of waste management for the development. As set out in Policy WCS2 of the Waste Core Strategy, the development should be '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 arising from the development. In terms of the Waste Core Strategy, the site is not close to any existing waste management site (other than that associated with the operation of the power station) and so it does not raise any issues in terms of safeguarding our existing waste management facilities" (as per Policy WCS10).*	Consideration of waste minimisation is presented within this chapter of the ES.
Natural England	October 2017	*NE welcome the*	Comment only. No

Consultee or organisation approached	Date and nature of consultation	Summary of Response	How comments have been addressed in this Chapter
(NE)	(statutory consultation response on PEI Report)	*consideration of ecology and biodiversity in relation to the sustainability of the proposed development.*	response required.
Bassetlaw District Council Lincolnshire County Council Nottinghamshire County Council West Lindsey District Council	March/April 2019	Provision of copies of final draft chapter and offer of pre-application meeting to each consultee to: • discuss final proposals and assessments; • obtain feedback prior to submission of Application; and • agree an approach to drafting of Statements of Common Ground (SoCG) prior to submission of the Application. Further details on consultation undertaken can be found in the Consultation Report (**Application Document Ref. 7.1**).	

Summary of Key Changes to Chapter 15 since Publication of the Preliminary Environmental Information (PEI) Report

15.3.2 The PEI Report was published for statutory consultation in September 2017, allowing consultees the opportunity to provide informed comment on the Proposed Development, the assessment process and preliminary findings.

15.3.3 The key changes since the PEI Report was published are summarised in **Table 15-3**.

Table 15-3: Summary of key changes to Chapter 15 since publication of the PEI Report

Summary of change since PEI Report	Reason for change	Summary of change to chapter text in the ES
The findings of the carbon assessment have been updated in the chapter, with the full report included as **Appendix 15A:** GHG Assessment (ES	Carbon assessment completed.	Additional text added regarding operational emissions.

Summary of change since PEI Report	Reason for change	Summary of change to chapter text in the ES
Volume II).		
Anticipated type and estimated volumes of construction and operational waste added.	Assessment of construction and operational waste completed.	In light of further information on anticipated type and volumes of waste likely to be generated by the Proposed Development, this chapter includes a description of the types and volumes of waste, a description of the proposed impact avoidance measures to reduce volumes of waste and an assessment of the likely impacts and effects of waste during construction and operation.
Construction phase assessment year updated for road traffic related emissions.	To reflect updated indicative construction programme.	Update of relevant paragraphs in Section 15.6.

Assessment Methods

Sustainability and Climate Change

15.3.4 This sustainability assessment provides a mechanism for considering the sustainability of the Proposed Development as a whole and for integrating sustainability considerations throughout its lifecycle. It summarises the features and attributes of the Proposed Development that would contribute to, or affect each of the sustainability themes, and sets out actions, which would be taken during the design, construction and operation that would further assist in delivering sustainability benefits for the local and wider area.

15.3.5 Measures are outlined, where feasible, that would be considered for implementation to incorporate and improve sustainability within the Proposed Development design and management.

15.3.6 As part of the climate change assessment, greenhouse gas (GHG) emissions have been assessed using a calculation-based methodology as per the below equation:

Activity data x GHG emissions factor = GHG emissions value

15.3.7 A GHG Assessment report has been prepared and is included as **Appendix 15A** (ES Volume II). The indicative operational annual carbon footprint of the Proposed Development has been calculated using the Greenhouse Gas Protocol (Ref 15-29), which provides a methodology for calculating the carbon footprint of a project.

Waste

15.3.8 A waste assessment has been undertaken to identify the likely types and quantities of waste that would be generated during the construction, operation and decommissioning. The waste assessment has followed the following structure:

- baseline conditions for the region are restated from published data sources, including the waste treatment capacity of the immediate area and surrounding region;
- the anticipated type and estimated volumes of waste likely to be generated during construction;
- the anticipated type and estimated volumes of waste likely to be generated during operation; and
- a comparison of the anticipated waste arisings after development design and impact avoidance measures in the form of a SWMP is assessed against the baseline waste arisings to determine any environmental effects.

Significance Criteria

Sustainability and Climate Change

15.3.9 There is no standard methodology for assessing the magnitude of sustainability impacts and the significance of effects of proposed developments. Each project is evaluated according to its individual characteristics. As such, the approach taken has been to systematically and qualitatively consider the Proposed Development against relevant key sustainability themes and policy objectives. References made to other disciplines considered within this ES use the significance criteria detailed in the individual topic chapters referenced.

15.3.10 There is currently no guidance regarding significance levels for GHG emission impacts and effects. All GHG emissions contribute to global climate change and can therefore be considered to have some level of significance. The UK has legally binding GHG reduction targets and, therefore, the assessment of significance considers how the Proposed Development would contribute to the national GHG inventory and if it could impact the UK achieving its GHG reduction targets.

Waste

15.3.11 The magnitude of waste management effects have been assessed by:

- establishing the baseline waste generation rate for the Nottinghamshire and Nottingham area;
- estimating the likely types and quantities of waste that would be generated during construction, operation and decommissioning; and
- for each category of waste, comparing the likely waste arisings to the baseline waste arisings for the relevant area and evaluating any estimated percentage changes in waste arisings.

15.3.12 Identification of specific receptors and an estimation of their significance is not appropriate for waste management effects given the statutory duties, regulatory regimes and guidance detailed above, for example:

- waste producers have a legal duty of care to manage their waste in accordance with regulations and to ensure that any waste leaving the site of generation is transferred to a suitably licensed facility for further treatment or disposal;
- facilities transferring, treating or disposing of waste must be either licensed or apply for an exemption from a license, and impacts arising from the operation of waste management facilities are considered as part of the planning and permitting process for these facilities themselves; and
- good practice measures to mitigate any local impacts on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of waste would be adopted and are described in this chapter. Any associated local impacts (e.g. noise and traffic) are addressed separately in the relevant chapters of this ES.

15.4 Baseline Conditions

Existing Baseline

Sustainability and Climate Change

15.4.1 This chapter draws on information from a number of other chapters in this ES. A summary of baseline conditions is provided here, drawing on baseline information as detailed in the relevant technical chapters of this ES. This should be read in conjunction with the description of the Site, as detailed in **Chapter 3**: Description of the Site and its Surroundings.

15.4.2 For the purposes of the impact assessment, it has been assumed that the majority of the Site would be cleared. However, as detailed in **Chapter 9:** Ecology, the Proposed Development would avoid, as far as reasonably possible, areas of high quality habitat, such as mature trees and woodland/wetland habitats associated with Local Wildlife Sites (LWSs).

15.4.3 The wider baseline for GHG emissions is the existing power stations in the UK. **Table** 15-4 presents the carbon intensity of UK power stations sourced from the

'*Digest of United Kingdom Energy Statistics'* (Ref 15-30). The intensity figures stated comprise carbon intensity associated with the combustion of the primary fuel source (e.g. coal, natural gas, refuse derived fuel) for power stations (i.e. they do not include other elements of the carbon footprint such as transmission losses of natural gas).

Table 15-4: Comparison of carbon intensities for existing UK power stations 2017

Nature of Power Station	Carbon Intensity of Electricity Supplied (tCO_2e/GWh) Scope 1 only
Average UK power station 2017 - coal	918
Average UK power station 2017- fossil fuels only	460
Average UK power station 2017 - all fuel types (including nuclear & renewable)	225
UK Gas power station 2017	357

Waste

15.4.4 Review of the Nottinghamshire and Nottingham Replacement Waste Local Plan, Part 1 Waste Core Strategy (Ref 15-26) highlights that historically construction and demolition has made up more than half of the waste produced in Nottinghamshire and Nottingham, but has estimated to have fallen to around 1 million tonnes per year (Ref 15-31). National estimates suggest that between 80% and 90% of this waste is either re-used or recycled in some way (Ref 15-32). The Waste Core Strategy (Ref 15-26) also highlights a worse case that 20% (up to 200,000 tonnes) of the remaining waste is disposed of to landfill or managed through exempt sites, and assumes that the application of waste management practices are not applied.

15.4.5 Section 4.27 of the Waste Core Strategy (Ref 15-26) highlights research carried out in 2010 (Ref 15-33) on behalf of all of the East Midlands Waste Planning Authorities, estimated the total future waste arising for each authority. For Nottinghamshire and Nottingham it has been suggested that over the lifetime of the Waste Core Strategy (2015 to 2030) 5 million tonnes of waste could be generated per annum, with construction and demolition waste making up 2.725 million tonnes of this total. It is estimated therefore, that a worst-case scenario would mean that 545,000 tonnes of construction and demolition waste (20%) would be disposed of to landfill, assuming that the application of waste management practices are not applied.

15.4.6 Section 4.5 of the Waste Core Strategy (Ref 15-26) highlights that businesses and industry across Nottinghamshire and Nottingham are estimated to produce annually around 900,000 tonnes of commercial and industrial waste (Ref 15-34). It

has been estimated that around 468,000 tonnes (52%) of this waste was recycled (Ref 15-35), with a worse case that the 432,000 tonnes would be disposed of to landfill, and assumes that the application of waste management practices are not applied.

15.4.7 Waste from construction sites and commercial/industrial premises is typically managed by private sector waste management contractors. It can therefore be reasonably assumed that waste would be managed within the wider Nottinghamshire area, making this an appropriate baseline for comparison.

15.4.8 At this stage it is not expected that there would be any significant volumes of PFA or waste spoil required to be removed from the Site to facilitate the Proposed Development. The excavation and removal of any PFA is, therefore, not included within the scope of this assessment.

15.4.9 In order to establish whether the volume of waste generated during the construction is likely to be significant (refer to **Section 15.6**), it needs to be compared to overall total volume of construction and demolition waste generated within the Nottinghamshire and Nottingham area.

15.4.10 **Appendix 11A:** Phase I Geo-Environmental Site Assessment (ES Volume II) provides details of whether the material identified for the Proposed Development is likely to pose a risk of contamination to receptors. This is discussed in **Chapter 11**: Ground Conditions and Hydrogeology.

15.4.11 **Chapter 11**: Ground Conditions and Hydrogeology highlights that there may be potential sources of contamination within the Site (e.g. historical PFA deposits, excavations or temporary stockpiles) and outside the Site (typically within 500m). Where sources of contamination are discovered, it is assumed that the contractor would manage these in line with the relevant regulations and best practice.

15.4.12 The West Burton Plant C – Geotechnical Desk Study (Ref 15-36), provides an overview of the current conditions of the Site. This study recommends that once the locations of the proposed structures are finalised, a site investigation is undertaken in order to determine ground conditions and the presence of any contamination that may affect excavated material arisings. In light of this, a preliminary intrusive investigation, including soil and groundwater sampling, has been undertaken and the results have been provided in **Appendix 11B:** WBC Ground Investigation and Environmental Support and Sampling Report (ES Volume II).

Future Baseline

Sustainability and Climate Change

15.4.13 Climate change has the potential to impact on the future baseline conditions. The Proposed Development may impact on climate change (see **Section 15.6**), whilst climate change also has the potential to impact on the design and operation of the

Proposed Development. The Proposed Development should, therefore, be designed to be resilient to climate change to avoid or reduce its exposure to the effects of future climate change.

15.4.14 The UK Climate Projections 2018 (UKCP18) (Ref 15-37) provides climate change projections for pre-defined 30-year time slices (for example the 2040s (2030-2059), and 2060s (2050-2079) time periods), at annual and seasonal levels for changes to mean climatic conditions over land areas. For the purpose of the Proposed Development, UKCP18 projections for the following average climate variables have been obtained and analysed:

- mean winter temperature;
- mean summer temperature;
- mean winter precipitation; and
- mean summer precipitation.

15.4.15 Taking into account the expected design life of the project, the UKCP18 projections for the Representative Concentration Pathway 8.5 (RCP8.5) were analysed for the 2040s and 2060s time periods. **Table 15-5** summarises climate projections for the area surrounding the closest weather station to the Proposed Development (Scampton Weather Station), with the results presented as anomalies relative to the 1981 - 2010 average.

Table 15-5: Summary of climate projections for the 2040s and 2060s time periods

Climate Variable		2040s	2060s
Mean winter air temperature anomaly at 1.5m (°C)	50% probability (central estimate)	+1.3°C	+2.1°C
	Range	+0.2 to + 2.4°C	+0.7 to +3.5°C
Mean summer air temperature anomaly at 1.5m (°C)	50% probability (central estimate)	+1.7°C	+2.9°C
	Range	+0.7 to +2.8°C	+1.1 to +4.8°C
Winter precipitation rate anomaly (%)	50% probability (central estimate)	+6%	+11%
	Range	-3 to +16%	-3 to +27%
Summer precipitation rate anomaly (%)	50% probability (central estimate)	-14%	-24%
	Range	-34 to +6%	-50 to +3%

15.4.16 A high-level climate change resilience review has been undertaken to ascertain the vulnerability of the Proposed Development to climate change. This has been achieved through understanding the climate change projections summarised above in relation to potential impacts on both Proposed Development design and the surrounding environment. **Table 15-6** identifies common climate change and extreme weather impacts that are of relevance to the Proposed Development.

Table 15-6: Climate variable and potential impacts

Climate Variable	Trend (2017-2080)	Impact
Mean Summer and Winter Temperatures	Increase in temperatures	Heat damage, deformation, cracking and thermal expansion
		Overheating of electrical equipment
		Corrosion of structures
		Increasing snow/ice melt leading to flooding
Mean Winter Precipitation	Increase in rainfall	Damage to drainage systems due to flooding
		Surface water flooding and standing waters
		Deterioration of structures due to soil moisture levels
Mean Winter Precipitation	Decrease in snowfall	Reduced ice loading on structures and requirement for snow clearance
		Freeze-thaw causing increased pipework deterioration
Mean Summer Precipitation	Decrease in rainfall	Drying out of structures
Storms/Wind	Increasing frequency and magnitude	Increased risk of damage to utilities network
		Operational constraints
		Increased wind gusts affecting tall structures

15.4.17 The main impact of climate change parameters and the Proposed Development is considered to be the potential for increase in surface water run-off and drainage issues. The Proposed Development has the potential to increase surface water run-off during periods of heavy precipitation as there would be an increase in impermeable surfaces. The flood risk and drainage assessments (refer to **Appendix 12A**: Flood Risk Assessment and **Application Document Ref. 7.8**: Outline Drainage Strategy) have used a worst-case scenario future baseline accounting for likely increases in the risk of flooding with climate change. The Flood Risk Assessment (**Appendix 12A** (Volume II)) has identified a number of

mitigation measures to address future climate change predictions, for example, drainage systems would be designed to mitigate flooding during a 1 in 30 year plus climate change storm (see **Section 15.5**).

Waste

15.4.18 The future baseline for the operational assessment is taken to be the estimated waste arisings for 2030, which is 2.725 million tonnes per annum (Ref 15-26).

15.5 Development Design and Impact Avoidance

Sustainability and Climate Change

15.5.1 The Proposed Development design is based on Best Available Techniques (BAT) for open cycle gas turbine (OCGT) plants, which aims to minimise impacts on air quality, emissions, energy and water use. The following sections describe the sustainability impact avoidance measures that have been incorporated into the Proposed Development design, together with mitigation and management actions that are assumed to be taken that contribute to sustainability and mitigate the effects of climate change.

Ecology and Landscape

15.5.2 Ecology and biodiversity are important considerations in relation to the sustainability of the Proposed Development. A range of impact avoidance measures are set out in **Chapter 9:** Ecology. These include compliance with good environmental protection practice during construction to prevent surface and groundwater pollution, dust and noise pollution. It is assumed that such measures would be prepared and implemented by the contractor through a CEMP. A Framework CEMP has been prepared and is included as **Application Document Ref. 7.3**. The CEMP prepared by the contractor would be in accordance with the principles as set out in the Framework CEMP.

15.5.3 The Proposed Development would avoid, as far as reasonably possible, areas of high quality habitat, such as mature trees and woodland/wetland habitats associated with LWSs to the east of the Site. Retained trees adjacent to construction working areas would be protected by clearly defined root protection zones to prevent damage/compaction of roots by plant and other machinery. A great crested newt European Protected Species Mitigation (EPSM) licence would be required for construction works in the vicinity of breeding ponds. An Ecological Clerk of Works would be employed to supervise and manage the implementation of measures to mitigate impacts on ecological features prior to and during construction.

15.5.4 **Chapter 10:** Landscape and Visual Amenity considers that the existing vegetation around the Site provides screening for low level views into the Site. The mitigation of landscape effects is intrinsic within the Proposed Development, which seeks to substantially retain existing well established vegetation within the Site, where

possible. The Proposed Development design would use suitable materials for construction to minimise visual impacts as far as reasonably practicable, whilst lighting required during operation would be designed to reduce unnecessary light spill outside of the Site boundary.

Ground Conditions and Hydrogeology

15.5.5 **Chapter 11:** Ground Conditions and Hydrogeology considers the impact of the Proposed Development on soil and groundwater. Impact avoidance measures are defined that accord with standard practice in construction and operation, whilst measures are recommended for incorporation into the Proposed Development design. For example, minimising adverse land contamination effects on sensitive receptors by ensuring all earthworks materials are suitable for their proposed use. Measures to manage potential impacts upon ground conditions and hydrogeology during the construction phase would be implemented via the CEMP (a Framework CEMP is included as **Application Document Ref. 7.3**).

Air Quality

15.5.6 **Chapter 6:** Air Quality details best practice measures to be applied to manage emissions of dust and particulates by construction activities, construction traffic, as well as air emissions during operation. The management of dust and particulates and the application of adequate mitigation measures during construction would be controlled through the CEMP (a Framework CEMP is included as **Application Document Ref. 7.3**). It is proposed that the selected contractor would be encouraged to be a member of the Considerate Constructors Scheme (CCS) which is an initiative open to all contractors undertaking building work. This would assist in reducing pollution and nuisance from the Proposed Development.

15.5.7 During operation, emissions to air would comply with the Emissions Limit Value (ELV) requirements specified in the Industrial Emissions Directive (IED), 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 an Environmental Permit. Monitoring strategies for the operational plant will be enshrined within the Environmental Permit and are likely to require continuous monitoring of key pollutant emissions from each stack, with annual reporting of results to the Environment Agency and annual independent validation of the monitoring results.

Traffic and Transport

15.5.8 **Chapter 7**: Traffic and Transport and the SWMP (**Application Document Ref. 7.3,** Appendix A) details good practice measures that are assumed to be implemented to minimise construction traffic impacts (including delivery of materials and removal of waste generated). Traffic movements would be controlled during the construction phase to minimise, as far as reasonably practicable, impacts on the surrounding road network. A Construction Worker

Travel Plan (CWTP) would be required by the contractor, which aims to identify measures and establish procedures to encourage construction workers to adopt modes of transport, which reduce reliance on single occupancy private car use. In addition, the contractor would be required to prepare a Construction Traffic Management Plan (CTMP) to identify a number of measures to control the routing and impact that heavy goods vehicles (HGVs) would have on the local road network during construction. Framework CTMP and CWTPs are provided as **Application Documents Ref 7.6 and 7.7** respectively**.** The final plans would align with the Framework Plans.

Noise and Vibration

15.5.9 Mitigation of noise and vibration during construction operation are detailed in **Chapter 8**: Noise and Vibration. Construction mitigation measures include working within construction noise limits through the use of modern plant complying with the applicable UK noise emission requirements. Any noise complaints would be recorded and reported to the Applicant for immediate investigation. The management of noise and vibration and the application of appropriate mitigation measures during construction would be controlled through the CEMP, proposed to be secured through a Requirement of the draft DCO (**Application Document Ref. 2.1**). A Framework CEMP is included as **Application Document Ref. 7.3** and would form the basis of the CEMP.

15.5.10 In terms of operation, consideration of potential noise effects and proximity to noise sensitive receptors (NSR) have been considered, with plant being located close to West Burton B (WBB) Power Station, in order to increase the distance between plant and NSR. However, during the detailed design stage, options to mitigate potential significant residual noise effects by design will be further explored. Several options for configuration of plant and equipment and suppliers of the generation equipment have been considered within the Rochdale Envelope and assessed. Modelling shows that the plant is capable of meeting applicable threshold noise levels.

15.5.11 The Proposed Development would be operated in accordance with an Environmental Permit, issued and regulated by the Environment Agency. This would require control of operational noise through use of BAT, which would be demonstrated in the Environmental Permit application. Similarly, operational noise is proposed to be secured through a Requirement of the draft DCO (**Application Document Ref. 2.1**).

Flood Risk, Hydrology and Water Resources

15.5.12 **Chapter 12**: Flood Risk, Hydrology and Water Resources considers potential design and impact avoidance measures to minimise water environment impacts.

15.5.13 The construction contractor would be required to protect ground and surface water using a range of best practice construction methods, including pollution plans, storage of materials, staff awareness training and plans for appropriate water

discharge. Such measures would be implemented through a CEMP. A Framework CEMP has been prepared and is included as **Application Document Ref. 7.3**. The contractor would also be required to produce a Flood Risk Management Action Plan/Method Statement, which would provide details of the response to an impending flood. This is proposed to be secured through a Requirement of the draft DCO (**Application Document Ref. 2.1**) .

15.5.14 During operation, the Applicant's Environmental Management System (EMS) would include impact avoidance measures, such as pollution plans and containment measures, whilst the Site would be operated in accordance with the Environmental Permit. The Outline Drainage Strategy (**Application Document Ref. 7.8**) presents options for the outline drainage design that would be developed through the detailed design process. The drainage design considers high rainfall events of the kind that are projected to become more frequent with climate change.

15.5.15 Flood risk in association with climate change has been considered and flood resilience measures would be incorporated into the design to minimise the potential for damage and reduce recovery time. During construction, the opportunity would be taken to adopt flood resilient design techniques where possible, including placement of main plant and flood sensitive equipment above the River Trent 1 in 200 year flood level, plus an allowance for climate change. Further details are included within **Appendix 12A** Flood Risk Assessment (ES Volume II).

Waste

15.5.16 It is assumed that during detailed design best practice guidance, including designing out construction waste, published by Zero Waste Scotland (Ref 15-28), would be applied to minimise the volume of waste produced.

15.5.17 The CEMP, which would be developed by the contractor, would detail the legal and best practice requirements for environmental protection including those relating to waste. A SWMP, with targets for diverting waste from landfill would form part of the CEMP; providing a basis for the effective management of construction waste by the contractor. A Framework SWMP has been included within Appendix A of the Framework CEMP (**Application Document Ref. 7.3**).

15.5.18 The Framework SWMP includes the following best practice approaches as applicable, and where reasonably practical, to minimise the quantities of waste requiring disposal from both construction and operation of the Proposed Development, as far as reasonably practical:

- agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme;

- implementation of a '*just-in-time*' material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste;
- attention to material quantity requirements to avoid over-ordering and generation of waste materials;
- re-use of materials wherever feasible, e.g. re-use of excavated soil for landscaping and concrete crushing and re-use;
- segregation of waste at source where practical; and
- re-use and recycling of materials off-site where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing).

15.5.19 The following waste management measures are also included in the Framework CEMP (**Application Document Ref. 7.3**) in order to minimise the likelihood of any localised impacts of waste on the surrounding environment:

- damping down of surfaces during spells of dry weather and brushing/water spraying of heavily used hard surfaces/access points across the Site as required;
- off-site prefabrication, where reasonably practicable, including the use of prefabricated structural elements, cladding units, mechanical and electrical risers and packaged plant rooms;
- burning of waste or unwanted materials would not be permitted on Site;
- all hazardous materials including chemicals, cleaning agents and solvent containing products to be properly sealed in sealed containers at the end of each day prior to storage in appropriately protected and bunded storage areas;
- all construction workers would be required to use appropriate Personal Protective Equipment (PPE) whilst performing activities on-site;
- any waste effluent would be tested and where necessary, disposed of at the correctly licensed facility by a licensed specialist contractor(s); and
- materials requiring removal from the Site would be transported using licensed carriers and records would be kept detailing the types and quantities of waste moved, and the destinations of this waste, in accordance with the relevant regulations.

15.5.20 The contractor would use the CEMP in accordance with the Framework CEMP (**Application Document Ref. 7.3**) and CEMP to ensure:

- all waste from the Site would be dealt with in accordance with the waste duty of care in Section 34 of the Environmental Protection Act 1990 (the Duty) (Ref 15-11) and the Waste (England and Wales) (Amendment) Regulations 2014 (Ref 15-13); and

- materials would be handled efficiently and waste managed appropriately.

15.5.21 Further information on measures to mitigate effects on local air quality, noise and vibration and traffic and transport (including those arising from waste) are also included in the following chapters:

- **Chapter 6**: Air Quality;
- **Chapter 7**: Traffic and Transport; and
- **Chapter 8**: Noise and Vibration.

15.6 Likely Impacts and Effects

Construction

Sustainability and Climate Change

Ecology and Landscape

15.6.1 **Chapter 9**: Ecology considers the potential impacts and effects of the Proposed Development on ecological receptors. The impact of habitat loss and disturbance during construction is considered with regard to designated and non-designated sites, great crested newts, bats, badgers, grass snakes, birds, otters and hares. With the application of best practice construction methods (implemented via the CEMP) and proposed ecological enhancement, the resultant ecological effects would be neutral and thus not significant for all species other than great crested newt. The loss of habitat for great crested newt would reduce the availability of suitable foraging areas, refuge sites and hibernation sites in the vicinity of breeding ponds, and this could adversely affect the conservation status of the newt populations at the Site. However, through the habitat restoration and enhancement measures proposed, it is considered that the effect of the Proposed Development on great crested newt populations at the Site will be reduced to neutral (not significant). These measures would be implemented under a great crested newt European Protected Species Mitigation (EPSM) licence which would be sought from Natural England in advance of construction works.

15.6.2 The proposals would also deliver habitat enhancements (full details are provided in the Landscaping and Biodiversity Management and Enhancement Plan (**Application Document Ref. 7.5**) designed to ensure no net loss (and a small net gain) of biodiversity as a result of the Proposed Development.

15.6.3 **Chapter 10**: Landscape and Visual Amenity considers that the Proposed Development may affect landscape character during construction due to the introduction of additional built form, which is similar in form and smaller in scale to that already within the West Burton Power Station site. The magnitude of impact is assessed to be low or very low, with resultant minor or negligible adverse effects (not significant). With regard to visual effects, construction may give rise to temporary adverse or beneficial visual effects through obstruction in views,

alteration of the components of the view and the opening up of new views by removal of screening. A single significant adverse effect has been identified as resulting from the Proposed Development (Viewpoint 4 Junction of footpaths Bole FP3B and Bole FP4) during construction.

Ground Conditions and Hydrogeology

15.6.4 Potential impacts on soil and groundwater are presented in **Chapter 11:** Ground Conditions and Hydrogeology. Following implementation of mitigation measures via the CEMP, the likelihood of adverse land contamination effects and groundwater during the construction phase is assessed to be negligible or minor adverse (not significant).

Air Quality

15.6.5 **Chapter 6:** Air Quality indicates that with the implementation of best practice measures via the CEMP, the effects of emissions to air from construction activities are considered to be not significant on identified sensitive receptors (i.e. negligible/minor).

15.6.6 The effects of emissions to air from the construction traffic associated with the Proposed Development on the identified receptors are considered to be not significant as the predicted traffic flows are below the screening thresholds indicated in published guidance.

Traffic and Transport

15.6.7 The traffic and transport assessment presented in **Chapter 7:** Traffic and Transport is supported by a Transport Assessment (**Appendix 7A** (ES Volume II)). This includes assessment of the impacts of HGVs, abnormal loads and construction worker transport. The assessment concludes the effects of the construction traffic on all road links and junctions within the study area are considered to be negligible (not significant).

15.6.8 **Chapter 6:** Air Quality and **Chapter 8:** Noise and Vibration consider how construction traffic affects air quality and noise receptors respectively.

Noise and Vibration

15.6.9 **Chapter 8:** Noise and Vibration assesses the potential noise and vibration impacts of the Proposed Development. Construction noise effects at all NSR during construction phase are predicted to be negligible (not significant) during the daytime period, due largely to the distances between the construction works and NSR. It may be necessary for some construction activities to take place continuously over day, evening and night periods during peak construction times of the Proposed Development, although the exact nature of the works is unknown. Potential minor adverse (not significant) during evening and weekend working or moderate adverse (significant) effects could occur during night-time working at

some NSR. Therefore, construction activities taking place during night-time hours would be planned, managed and appropriately mitigated so as not to exceed the significant observed adverse effect level (SOAEL - 55 dB) threshold values and reduce levels towards the lowest observable adverse effect level (LOAEL - 45 dB) (or less) where practical. It is proposed that this would be secured by a Requirement in the draft DCO (**Application Document Ref. 2.1**). Measures to mitigate construction noise are detailed in **Chapter 8:** Noise and Vibration and would be implemented by the contractor via the CEMP (a Framework CEMP is provided as **Application Document Ref. 7.3**). With appropriate mitigation, construction activities at night-time would be considered as having a minor adverse effect or less (not significant).

15.6.10 With regard to noise from construction traffic, either no change or very low magnitude of noise impact is expected due to changes in traffic flows along all the assessed routes during construction. This would result in no change or negligible adverse effects (not significant) at local residential NSR.

Flood Protection and Water Quality

15.6.11 Potential impacts on flood risk and water resources are assessed in **Chapter 12:** Flood Risk, Hydrology and Water Resources. Implementation of applicable mitigation measures via the CEMP would reduce the risk of impacts occurring during the construction phase. Adverse residual effects on the key receptors have been assessed as minor adverse to negligible (not significant).

15.6.12 The assessment has identified the 'worst-case scenario', such as significant pollution events, which have a low probability of occurrence due to the procedures and measures that would be put in place. Adverse residual effects on the key receptors (River Trent, Wheatley Beck and Catchwater Drain, Railway Dyke Drain/Drain north of the Site, minor watercourses and drainage ditches, other identified water features and groundwater) have been assessed as minor adverse to negligible (not significant).

Socio-Economics

15.6.13 As well as environmental demands, sustainable development also considers social and economic demands.

Job Creation

15.6.14 As detailed in **Chapter 13:** Socio-economics, the Proposed Development would result in the creation of jobs during the construction phase. Based on experience of similar projects, the Proposed Development is anticipated to create an average of approximately 95 temporary construction jobs.

15.6.15 The direct, indirect and induced employment created by the construction phase of the Proposed Development is considered to have a minor short-term beneficial effect which would not be significant in terms on the local economy.

Human Health

15.6.16 **Appendix 13A:** Human Health (ES Volume II) discusses the potential impacts and effects of the Proposed Development construction on the safety, health and well-being of the workforce and the local community. The assessment considers effects on human health from electromagnetic-interference (EMF), air quality, traffic and transport, noise and vibration, landscape and visual amenity, ground conditions, flood risk, hydrology and water resources and socio-economics. Mitigation measures have been proposed to reduce adverse effects, where possible. It was concluded that with mitigation, there would be no significant residual health related effects from construction of the Proposed Development.

15.6.17 The single significant adverse effect identified as resulting from the Proposed Development (Viewpoint 4 Junction of footpaths Bole FP3B and Bole FP4) during construction is not considered to have the potential to affect the health of large numbers of people.

GHG Emissions

15.6.18 Construction emissions have been scoped out of the GHG assessment. There is a demand for increased power infrastructure in the UK. The emissions associated with the construction of power infrastructure are assumed to be already factored into the national inventory, regardless of the fuel type or capacity of the infrastructure. Therefore, the GHG emissions associated with construction of the Proposed Development are not anticipated to have a significant additional impact on the national inventory for the power sector, or the UK's carbon reduction targets.

15.6.19 Best practice measures to reduce GHG emissions during construction of the Proposed Development, such as switching off engines when not in use and ensuring vehicle compliance to current EU emissions standards, have been outlined in the Framework CEMP (**Application Document Ref. No. 7.3**).

Reducing the Use of Natural Resources in Construction Materials

15.6.20 The selection of materials for the construction of the Proposed Development will be informed by sustainability principles, including the prudent and efficient use of natural resources and the use of re-used and recycled materials where reasonably practicable. A primary principle of sustainable procurement is to question the need/requirement for the commodity in question.

15.6.21 To minimise the use of natural resources and unnecessary materials procured for the Proposed Development, suitable infrastructure already associated with the existing wider West Burton Power Station site would be re-used, where reasonably practicable. For example, the existing switchyard, the mains water infrastructure and drainage system from the WBB Power Station. Re-using existing structures would reduce the need for additional raw materials.

15.6.22 The Framework CEMP (**Application Document Ref. 7.3**) identifies best practice procedures, including environmental best practice, such as the processing and re-use of recovered materials on-site where practical.

15.6.23 Following implementation of the above design measures, the Proposed Development is expected to result in minor adverse effects (not significant) from the use of natural resources in construction materials.

Waste

15.6.24 An assessment of the impacts and effects associated with construction has been carried out, which includes details of anticipated types and quantities of waste generated. A Framework SWMP is included as Appendix A of the Framework CEMP (**Application Document Ref. 7.3**) in order to control Site activities and minimise environmental impacts as associated with waste during the construction phase.

15.6.25 The assessment carried out and summarised in **Table 15-7** has been informed by the design team, with information provided based on the anticipated type and estimated volumes of waste for similar projects and as such presents a worst-case for the volumes generated.

Table 15-7: Anticipated type and estimated volumes of waste from construction

Waste type	Approximate annual quantity (tonnes)
Bricks	77
Tiles and ceramics	1
Concrete	352
Inert	209
Insulation	3
Metals	21
Packaging	14
Gypsum	8
Binders	less than 1
Plastics	2
Timber	17
Floor coverings (soft)	less than 1
Electrical and electronic equipment	less than 1

Waste type	Approximate annual quantity (tonnes)
Furniture	5
Canteen/office/ad-hoc	18
Asphalt and tar	6
Hazardous	67
Mixed	77
Total	**800**

15.6.26 The Framework CEMP (**Application Document Ref. 7.3**) would be further developed by the contractor and then implemented during the construction phase. This includes identifying and adopting measures to minimise waste, as detailed in the Framework SWMP (refer to **Section 15.6.20 – 15.6.23**), as well as measures to facilitate reuse or recycling of wastes, prevent exposure to potentially harmful material, and nuisance during the collection, temporary storage and transportation of wastes.

15.6.27 The annual estimated volume of waste anticipated from construction is approximately 800 tonnes, which is very low when compared to the Nottinghamshire and Nottingham baseline annual estimate (2.725 million tonnes). In addition, through the effective use of best practice guidance from Zero Waste Scotland (Ref 15-28) during design, and adoption of the CEMP, it is estimated that the majority of this waste would be re-used or recycled.

15.6.28 Following implementation of the CEMP and the associated SWMP, the Proposed Development is expected to result in minor adverse (not significant) effects relating to waste during the construction phase.

Opening

Sustainability and Climate Change

15.6.29 The impacts and potential effects on sustainability and climate change at Proposed Development opening are assumed to be the same as those at operation, which are considered below.

Waste

15.6.30 The impacts and potential effects on waste at Proposed Development opening are assumed to be the same as those at operation, which are considered below.

Operation

Sustainability and Climate Change

Ecology and Landscape

15.6.31 **Chapter 9**: Ecology indicates that potential impacts during operation that could result in effects on ecological features are as follows:

- air pollution from stack emissions – potentially leading to adverse effects on sensitive habitats through increased nitrogen and acid deposition; and
- increased levels of disturbance (noise, vibration, artificial lighting) – potentially resulting in adverse effects on ecological features.

15.6.32 As detailed in **Chapter 9**: Ecology, the impact sources are not predicted to result in any significant ecological effects (with effects being neutral and not significant).

15.6.33 **Chapter 10**: Landscape and Visual Amenity considers that the Proposed Development may affect landscape character during operation through increased built form and structures. Landscape effects are predicted to range from minor adverse to negligible beneficial (not significant). With regard to visual effects, it has been assessed that the majority of visual receptors would experience a low or medium magnitude of impact during operation, resulting in a minor adverse effect (not significant). However, it is assessed that receptors at Viewpoint 4 (Junction of footpaths Bole FP3B and Bole FP4) would experience a medium magnitude of impact as a result of the introduction of built structures against the skyline, making them more prominent and extending the proportion of the view including large scale development. This would result in a moderate adverse effect (significant). The opportunity for mitigation of the visual effects of the Proposed Development is negligible due to the size and scale of constituent structures and as the effects on visual amenity largely relate to the height of the tallest structures.

Ground Conditions and Hydrogeology

15.6.34 As discussed in **Chapter 11:** Ground Conditions and Hydrogeology, assuming good housekeeping and management practices are adopted and adhered to through compliance with the Environmental Permit, effects related to potential geological, hydrogeological and contamination related impacts during Proposed Development operation are likely to be negligible or minor adverse (not significant).

Air Quality

15.6.35 During operation, emissions to air from the Proposed Development would comply with the Emissions Limit Value (ELV) requirements specified in the IED (Ref 15-38) 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.

15.6.36 **Chapter 6:** Air Quality has considered human health and ecological receptors that may be affected by the operation. It indicates that operational activities would have negligible effect on receptors (not significant).

Traffic and Transport

15.6.37 The traffic and transport impacts of the Proposed Development are considered in **Chapter 7:** Traffic and Transport and is supported by a Transport Assessment (**Appendix 7A (**ES Volume II)). This confirms that once operational, there would be very low traffic flows, significantly lower than those anticipated during the construction phase. The overall traffic effects during Proposed Development operation are considered to be negligible (not significant).

Noise and Vibration

15.6.38 **Chapter 8:** Noise and Vibration considers the potential impacts of the Proposed Development operation on NSR, modelling different scenarios for generating plant under consideration. The worst-case scenario (up to 5 smaller OCGTs) produces a range of unmitigated impact magnitudes from low to high at the seven selected NSR. This is assessed to result in adverse effects between minor adverse (not significant) to major adverse (significant). However, the results indicate that a low magnitude of impact is possible at all locations using mitigated operational noise data, which would result in a negligible/minor adverse effect (not significant).

15.6.39 The plant selection and detailed design processes are yet to take place. However, it is considered probable that operational plant noise could be mitigated by a combination of the following potential measures:

- reducing the breakout noise from the GT, generator and accessories through use of enhanced enclosures, or potentially containing them within a building;
- reducing the air inlet noise emissions by addition of further in-line attenuation;
- reducing the stack outlet noise emissions by addition of silencers or sound proofing panels;
- reducing fin fan cooler noise emissions by screening, re-sizing, fitting low noise fans or attenuation;
- screening or enclosing the transformers or other equipment;
- use of screening or bunding to shield receptors from noise sources; and
- orientation of plant within the Site to provide screening of low level noise sources by other buildings and structures, or orientating fans and the air inlets away from sensitive receptors.

15.6.40 As the design progresses to the detailed design stage, the existing noise model will be refined and additional acoustic assessment will be undertaken in consultation with the designers, to determine the most appropriate mitigation options in accordance with BAT. The findings of the further assessment will inform

the design to ensure that rating levels meet with a target of no greater than +5 dB above the representative background sound level at each NSR, resulting in no more than a low magnitude impact (daytime and night-time) and no greater than a minor adverse effect (not significant).

Flood Protection and Water Quality

15.6.41 **Chapter 12:** Flood Risk, Hydrology and Water Resources sets out the conclusions of the FRA (**Appendix 12A** (ES Volume II)), as well as measures to minimise water pollution. The FRA indicates that development of the Site is not anticipated to increase the risk of flooding from fluvial, groundwater or overland flow sources.

15.6.42 The Applicant's EMS would include impact avoidance measures such as accidental pollution plans and provision of spillage kits and containment measures, such as bunds. An Outline Drainage Strategy has been produced (**Application Document Ref. 7.8**), which would be developed through detailed design. It is anticipated there would be minimal contaminated wastewater generated from the Proposed Development during operation. Any non-contaminated surface water would be discharged directly to the River Trent via the drainage connection tie-in to WBA purge line in relation to the proposed northern or southern drainage connection corridors or through a connection to the WBB Power Station site drainage system, at restricted rates of 5 l/s, with excess runoff above this rate stored in an attenuation pond or tank.

15.6.43 Following implementation of the above design measures, the likelihood of water contamination is assessed as low. Potential impacts on water quality, water supply, recreation and biodiversity in the water environment are assessed to be of low magnitude with minor adverse or negligible effects (not significant) during operation (see **Chapter 12:** Flood Risk, Hydrology and Water Resources and **Chapter 11:** Ground Conditions and Hydrogeology).

Socio-Economics

Job Creation

15.6.44 As detailed in **Chapter 13**: Socio-economics, current plans indicate that up to 15 operational roles would be created at the Proposed Development, of which some may be new jobs or integrated with other on-site operations. This positive effect would be not significant.

Human Health

15.6.45 As detailed in **Appendix 13A:** Human Health (ES Volume II), the assessment considers the potential impacts and effects of the Proposed Development during its operation on the safety, health and well-being of the workforce and the local community. The assessment considers effects on human health from EMF, air quality, traffic and transport, noise and vibration, landscape and visual amenity, ground conditions, flood risk, hydrology and water resources and socio-

economics. Mitigation measures have been proposed to reduce adverse effects, where possible. It is concluded that with mitigation, there would be no significant residual health related effects from operation of the Proposed Development.

15.6.46 The single residual significant adverse effect on visual amenity for users of the FP3B and FP4 Bole ProW (Viewpoint 4, **Chapter 10**: Landscape and Visual Amenity) is not considered to have the potential to affect the health of large numbers of people, but effects would operate over the long-term. The effect would be reversible on eventual decommissioning of the Proposed Development.

GHG Emissions

15.6.47 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.

15.6.48 The Proposed Development is expected to operate for up to 1,500 hours per year on a rolling average. Its function would complement the intermittent nature of renewable energy sources, thereby supporting the UK's decarbonisation aims.

15.6.49 The GHG assessment is presented as **Appendix 15A:** Greenhouse Gas Assessment (ES Volume II), whilst **Table 15-8** summarises the operational phase carbon footprint of the Proposed Development.

15.6.50 **Table 15-8** indicates that the total annual carbon footprint of the Proposed Development is calculated to be between 239 kilotonnes and 288 kilotonnes CO_2e (rounded to the nearest thousand tonnes). Assuming that the Proposed Development exports 449GWh per year (based on generating capacity for up to 299MWe for 1,500 hours on a rolling five year average), this is equivalent to between 470 and 566 tonnes CO_2e per GWh electricity generation.

Table 15-8: Carbon footprint of Proposed Development

Emissions Source	Annual GHG emissions by Source (tCO_2e)	
	36.1% Efficiency	43.5% Efficiency
Emissions from fossil fuel (natural gas) combustion	235,994	210,786
Transport of raw materials	1	1
Transport of waste materials	2.67	2.67
Gas Combusted (well to tank emissions)	34,489	28,662

Emissions Source	Annual GHG emissions by Source (tCO_2e)	
	36.1% Efficiency	43.5% Efficiency
Total annual GHG emissions (tCO_2e)	**288,486**	**239,407**
Carbon Intensity of generated electricity all scopes (tCO_2e/GWh)	**566**	**470**

15.6.51 To achieve the required highly flexible nature of the plant, an open cycle plant is required, as opposed to the slightly more efficient combined cycle gas turbine (CCGT) technology used for power stations intended to run as mid-merit or baseload plant. Consequently the carbon intensity of the Proposed Development (in kg CO_2 generated per MWh of electricity produced) is higher than that of CCGT plants, although is still considerably lower than that of coal-fired power stations. However, the overall annual release of CO_2 from the Proposed Development is low (between 239 kilotonnes and 288 kilotonnes CO_2e per annum (rounded to the nearest thousand tonnes) due to the intermittent nature of its operation (expected to be less than 20% of the time). It is therefore considered that operation of the Proposed Development is consistent with realising the UK decarbonisation strategy.

15.6.52 If required to help restart the national electricity transmission system, under black start conditions, a small (anticipated to be circa 2MW output) diesel generator (hereafter referred to as the emergency diesel generator) is 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 the Proposed Development.

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

15.6.54 The air quality assessment (**Chapter 6**: Air Quality) has not specifically modelled emissions from the emergency diesel generator unit, as the emergency diesel generator is expected to run for less than 50 hours per year and does not require detailed assessment under the Environment Agency Standard Rules Permit conditions (SR2018 No.7) given that the diesel generator will have a minimum stack height of 3m above ground level and will be located more than 500m from a Natura 2000 site. The emergency diesel generator would be fired on liquid fuel.

Water Use

15.6.55 The Proposed Development would not require significant volumes of water for cooling processes. If a single gas turbine is selected, a small amount of water is

retained in the closed loop system with top-up periodically required. If multiple units are selected, cooling could be achieved by fan coolers housed on each unit separately, rather than in a bank of fans. The Applicant holds an Abstraction Licence (Ref 15-39) 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. Measures to reduce water use during operation of the Proposed Development will be selected through the use of BAT, with overall water use managed in accordance with the Environmental Permit.

Energy Efficiency

15.6.56 The Environmental Permit application presents a number of measures that the Proposed Development would include in order to improve energy efficiency and to reduce overall GHG emissions.

15.6.57 The design of the Proposed Development will be based on BAT for OCGT plants. The GHG assessment (**Appendix 15A** (ES Volume II)) has been modelled for between 36.1% and 43.5% thermal efficiency.

15.6.58 The consideration of alternatives and plant design is being undertaken with the aim of preventing or reducing adverse environmental effects, while maintaining operational efficiency and cost-effectiveness.

15.6.59 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.

15.6.60 Following implementation of the design measures, the Proposed Development is not expected to result in any significant effects with regard to energy efficiency. The Proposed Development will outperform existing average UK coal power stations by between 352 - 448 tonnes of CO_2e per GWh of electricity generated. When compared to average fossil fuel power stations, the Proposed Development would produce an additional 10-106 tonnes of CO_2e per GWh of electricity generated, depending on the efficiency level of the Proposed Development.

Waste

15.6.61 Operational waste would be managed in accordance with the Waste (England and Wales) (Amendment) Regulations 2014 (Ref 15-13), and consigned via a registered private waste carrier for treatment or disposal at a suitably licenced waste facility. The waste generated is, therefore, assumed not to enter into municipal waste streams and therefore would not be included within waste figures for BDC.

15.6.62 The assessment carried out for operational waste has been informed by the design team in respect of the Environmental Permit application. Typical waste arisings from operational and maintenance based activities would comprise oil contaminated (solid) wastes, resin and waste lubricating oils, as summarised in **Table 15-9**.

Table 15-9: Anticipated type and estimated volumes of waste from operation and maintenance of Proposed Development

Waste type	Annual quantity (tonnes)
Oil contaminated (solid) wastes	0.35
Resin	0.3
Lubricating oils	0.6
Turbine washwater	0.3
Total	**1.5**

15.6.63 The anticipated volumes of operational waste have been estimated using the operational waste figures from WBB Power Station, where the anticipated type and estimated volumes of waste are expected to be up to 25% of the current waste volume produced from the WBB Power Station.

15.6.64 The annual estimated volume of waste anticipated from the operation and maintenance activities is approximately 1.5 tonnes; very low when compared to the Nottinghamshire and Nottingham baseline annual estimate (900,000 tonnes).

15.6.65 Comparison of the baseline for operational waste against anticipated waste arisings for Nottinghamshire and Nottingham highlights that estimated volumes of operational waste from the Proposed Development are not significant.

Decommissioning

15.6.66 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.

15.6.67 Eventually decommissioning would require submission of a Decommissioning Environmental Management Plan (DEMP) to the local planning authority for approval secured by a Requirement of the draft DCO (**Application Document Ref. 2.1**). Decommissioning would involve the isolation and physical disconnection of feeds and services, including drainage, re-routing of services and control of access to decommissioned areas. If demolition or remediation is proposed, this would be undertaken.

15.6.68 An OCGT, whether single turbine or up to five OCGT units would either be removed as a unit for reuse elsewhere (depending on its 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.

Sustainability and Climate Change

15.6.69 The decommissioning works would be undertaken in accordance with an agreed DEMP which would set out measures to manage potential environmental impacts associated with decommissioning and demolition activities. The works are proposed to be secured by a Requirement of the draft DCO (**Application Document Ref 2.1**).

Ecology and Landscape

15.6.70 **Chapter 9**: Ecology indicates impacts associated with decommissioning are likely to be of a similar nature to those associated with the construction phase, with the resulting potential effects not anticipated to differ significantly from those at construction. The extent of habitat loss that is likely to be required during decommissioning is likely to be much less than at construction, and the resulting effects on ecological features are likely to be reduced.

15.6.71 **Chapter 10**: Landscape and Visual Amenity details that potential effects associated with Proposed Development decommissioning would be similar to those associated with the construction. Once decommissioning has been completed, it is anticipated that the resulting conditions would be similar to those currently in the existing baseline.

Ground Conditions and Hydrogeology

15.6.72 The DEMP would include a range of measures to prevent pollution of soils and groundwater during decommissioning. The impact avoidance measures for decommissioning would be similar to some of those identified for the construction phase. Following implementation of applicable mitigation measures via the DEMP, the likelihood of adverse land contamination effects and groundwater during the decommissioning phase is assessed to be negligible or minor adverse (not significant).

Air Quality

15.6.73 **Chapter 6**: Air Quality indicates that the predicted air quality effects of decommissioning are considered to be comparable to, or less than, those assessed for construction activities. Effects are therefore anticipated to be negligible/minor adverse (not significant). During the decommissioning works, best practice mitigation measures would be put in place via the DEMP.

Traffic and Transport

15.6.74 **Chapter 7:** Traffic and Transport indicates that decommissioning would require some traffic movements associated with the removal (and recycling, as appropriate) of material arising from demolition and potentially the import of materials for land restoration and re-instatement. However, vehicle numbers are not expected to be higher than those experienced during the construction phase. It is, therefore, considered that the overall effects of traffic during decommissioning would not be significant.

Noise and Vibration

15.6.75 The potential noise impacts and effects would require further consideration at the decommissioning phase, but potential measures to ensure that appropriate mitigation is in place during the works are detailed in **Chapter 8**: Noise and Vibration. The predicted noise effects of eventual decommissioning are considered to be comparable to, or less than, those assessed for construction activities.

Water Quality and Flood Risk

15.6.76 The works would include decommissioning of all potentially polluting plant and equipment so that it does not pose an unacceptable risk of contamination. It is assumed that all underground infrastructures would remain in-situ; however, all connection and access points would be sealed or grouted to ensure disconnection. Such works would be undertaken in accordance with the DEMP which would include a range of measures to prevent water pollution. **Chapter 12:** Flood Risk, Hydrology and Water Resources indicates that decommissioning effects would be similar to those experienced during the construction phase (i.e. minor adverse to negligible (not significant)).

Water Use

15.6.77 The Applicant will endeavour to minimise water use during decommissioning. No significant water demands are anticipated, therefore the effects with regard to water use are not anticipated to be significant.

Energy Use

15.6.78 The Applicant will endeavour to maximise energy efficiency of the decommissioning process, therefore no significant effects are anticipated with regard to energy use.

Waste

15.6.79 Waste generated during decommissioning has been scoped out of this assessment because:

- there is no information on waste policies, regional waste arisings or facilities that may be in place when the Proposed Development would be

decommissioned (as it has an anticipated operational life of up to circa 40 years, and hence it is not possible to define a baseline);

- any future decommissioning contractor(s) would be required to comply with relevant legislation and policy at that time;
- the majority of materials generated during future decommissioning would most likely comprise concrete and steel, both of which are likely to be recycled rather than disposed; and
- there is no certainty on the timing or method of decommissioning, and hence it is not possible to determine the quantities or types of waste that may be generated.

15.6.80 Assuming it is still good policy, the waste hierarchy (refer to **Figure 15.1** (ES Volume III)) would be followed during the decommissioning phase, therefore, it is anticipated that a large proportion of the materials resulting from any decommissioning or demolition would be re-used or recycled. A record would be kept of the level of recycling and reuse achieved. At this stage there is no certainty on the timing or method of decommissioning, although the measures to be detailed in the DEMP would aim to ensure that waste effects would not be significant.

15.7 Mitigation and Enhancement Measures

Sustainability and Climate Change

15.7.1 The Applicant's company environmental policy states that the company would *"design, build, engineer, operate and maintain all our facilities and equipment so they are safe, secure and acceptable to local communities and protect the environment"* (Ref 15-40). The statement commits to using best available techniques to tackle environmental impacts and reducing the contribution of their operations to climate change.

15.7.2 A Combined Heat and Power 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 1,500 hours per year on 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.

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

Waste

15.7.4 An assumption has been made that in light of the estimated volumes of waste generated during construction being low and that no PFA would be removed from Site prior to construction works commencing, that no further mitigation measures would be required. Following completion of the initial ground investigation in December 2017, the need for design and impact avoidance measures was further considered (refer to **Chapter 11**: Ground Conditions and Hydrogeology) and no additional measures were considered necessary in relation to waste.

15.7.5 During detailed design of the buildings associated with the Proposed Development, opportunities will be sought to design out waste through the application of best practice guidance (Ref 15-28).

15.7.6 The Proposed Development also presents a clear opportunity to re-use and redevelop a brownfield site, thereby preserving greenfield land; and making use of existing infrastructure for the import of gas and export of electricity, avoiding generation of waste that would potentially be generated if there was the need to construct new gas pipelines or overhead transmission lines.

15.8 Limitation or Difficulties

Sustainability and Climate Change

15.8.1 At this stage in the design process there are some limitations with regard to detailed design data; for the GHG assessment operational waste data and transport distances from the existing WBB Power Station has been used. The transport of waste and raw materials presents a conservative assumption and only accounts for 0.002% of the total emissions. These assumptions have been tested to determine that doubling the transport distances would not have a significant effect on the predicted total footprint.

Waste

15.8.2 The use of available benchmark data to estimate construction and operational waste arisings provides indicative rather than absolute estimations of likely waste arisings. Whilst this potential inaccuracy is acknowledged, the benchmarks are considered suitable and adequate to assess the significance of likely waste arisings in a local context.

15.9 Summary of Likely Significant Residual Effects

Sustainability and Climate Change

15.9.1 The Proposed Development would provide additional peak power generation capacity, which would contribute to providing a secure energy supply to the national grid. The GHG assessment (**Appendix 15A** (ES Volume II)) demonstrates that in comparison with UK average fossil fuel power stations (based on 2017 DECC data, published in 2018), the Proposed Development produces an additional 10-106 tonnes of CO_2e per GWh of electricity generated, depending on the efficiency level of the Proposed Development. The Proposed Development is a peaking plant to be used for short periods of time, operating for up to the maximum allowed under its Environmental Permit, which is anticipated to be approximately 1,500 hours per annum on a rolling five year average. It is therefore likely to be less efficient than the grid average. Despite this, the Proposed Development will outperform existing average UK coal power stations by between 352 and 448 tonnes of CO_2e per GWh. Whilst the UK is moving towards decarbonising the grid, efficient gas fired power stations are required as an important element of the overall transition fuel mix in order to ensure the UK's energy security.

Waste

15.9.2 Due to the low estimated volumes of waste, no significant residual effects are anticipated as a result of the Proposed Development.

15.10 References

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Ref 15-2 The Committee on Climate Change (2017) *Home Page* [Online] Available from: https://www.theccc.org.uk/ [Accessed 28/02/19]

Ref 15-3 Department for Energy and Climate Change (2011) *Planning our electric future: a White Paper for secure, affordable and low carbon electricity*.

Ref 15-4 Secretary of State (2015) *The Emissions Performance Standard Regulations.*

Ref 15-5 European Parliament (2013) *General Union Environment Action Programme to 2020 Living well, within the limits of our planet - 7th Environment Action Programme (EAP) (Decision No. 1386/2013/EU).*

Ref 15-6 European Commission (2015) *EU Strategy for Plastics in the Circular Economy.*

Ref 15-7 European Commission (2015) *Closing the loop - An EU action plan for the Circular Economy*.

Ref 15-8 European Commission (2018) *Monitoring Framework for the Circular Economy.*

Ref 15-9 European Commission (2008) *Directive 2008/98/EC on waste (Waste Framework Directive).*

Ref 15-10 European Commission (1999) *Directive 1999/31/EC on the landfill of waste (Landfill Directive).*

Ref 15-11 HM Government (2008) *Site Waste Management Regulations.*

Ref 15-12 HM Government (2005) *Clean Neighbourhoods and Environment Act.*

Ref 15-13 HM Government (2014) *The Waste (England and Wales) (Amendment) Regulations.*

Ref 15-14 HM Government (1990) *Environmental Protection Act.*

Ref 15-15 Department for Energy and Climate Change (2016) *Overarching National Policy Statement for Energy (EN-1).*

Ref 15-16 HM Government (2013) *The Carbon Capture Readiness (Electricity Generating Stations) Regulations.*

Ref 15-17 Department for Energy and Climate Change (2016) *National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2).*

Ref 15-18 Ministry of Housing, Communities and Local Government (2019) *National Planning Policy Framework*.

Ref 15-19 Bassetlaw District Council (2011) *Bassetlaw District Local Development Framework Core Strategy and Development Management Policies.*

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Ref 15-25 Department for Environment, Food & Rural Affairs (2011) *Government Review of Waste Policy in England 2011.*

Ref 15-26 Nottinghamshire County Council and Nottingham City Council (2013) *Nottinghamshire and Nottingham Replacement Waste Local Plan (Waste Core Strategy)* [Online] http://www.nottinghamshire.gov.uk/media/109118/waste-core-strategy-1.pdf (Accessed on 28 November 2019).

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Ref 15-29 World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) (2005) *Greenhouse Gas Protocol for Project Accounting.*

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Ref 15-31 Waste Resources Action Programme (WRAP) (2008) Local estimate derived from *Construction, Demolition and Excavation Waste Arisings, Use and Disposal for England 2008.*

Ref 15-32 Waste and Resources Action Programme (WRAP) (2008) *Construction, Demolition and Excavation Waste Arisings, Use and Disposal for England 2008.*

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Ref 15-34 Defra (2010) Local estimate derived from *Survey of Commercial and Industrial Waste Arisings.*

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