

14. WASTE MANAGEMENT

14.1 Introduction

The potential for the generation of waste is an aspect of any business activity. In relation to the Proposed Development, there are two main activities that have the potential to generate waste:

- during the construction phase; and
- during the operational phase.

This chapter of the ES considers the potential for waste generation, the options to minimise that waste and the potential for any impacts related to the construction and operation of the Proposed Development. It does not cover the management of waste that is the fuel for the Proposed Development. The approach to management of the waste that is the fuel and the need for the Proposed Development are addressed in Section 4.2 and also the Planning Statement.

14.2 Scope of the Assessment

A detailed assessment of waste management impacts was carried out in relation to the Consented Development and presented in the 2016 ES. The 2016 ES found that wastes will be generated from all phases of construction and operation.

The composition and quantity of operational waste streams (e.g. air pollution control residues) and how they are managed may differ from the Consented Development due to the change in the proposed technology. The assessment therefore includes a semi-qualitative assessment of the capacity of waste facilities to accommodate waste arisings from the Proposed Development during construction and operation.

The construction methodology of the Proposed Development is similar to the Consented Development and will generate similar waste arisings. The construction waste assessment from the 2016 ES has been reviewed and minor, non-material updates have been made.

Baseline data relating to the capacity of relevant types of existing waste facilities within the local authority and region have also been reviewed and updated where appropriate as part of the assessment.

14.3 Assessment Methodology and Significance Criteria

14.3.1 Method

The waste management evaluation has considered the wastes that are likely to be generated as a result of the Site usage for its normal business (current and planned) and those related to the construction of the Proposed Development.

For the construction phase, consideration has been made of the potential wastes that will be produced. The methodology for looking at operational wastes has involved examining current waste management practices (where possible) on the Site and, as far as possible, predicting waste generation activities associated with the redeveloped site.

The potential effects have been classified, prior to mitigation, as minor, moderate or major (either "Adverse", "Negligible" or "Beneficial") as illustrated in

Table 14.1. Where the predicted effects are considered to be significant, mitigation measures have been incorporated to eliminate or reduce the impacts to an acceptable level.

Table 14.1 Waste Significance Criteria

Degree of Significance	Waste Criteria
Major adverse	Net increase in waste arisings relative to the baseline leading to a severe, regional-scale (England) reduction in landfill void space or management capacity for waste. Impact may be judged to be of importance in the regional planning context and, therefore, of potential concern to a project depending upon the importance attached to the issue in decision-making.
Moderate adverse	Net increase in waste arisings relative to the baseline without the Proposed Scheme leading to regional-scale (Midlands, England) reduction in landfill void space or management capacity for waste. Impact may be judged to be important in the local planning context, e.g. where impacts are permanent or long-term and the impact on local waste treatment and disposal infrastructure is such that additional capacity may be required.
Minor adverse	Net increase in waste arisings relative to the baseline leading to local-scale (Northamptonshire) reduction in landfill void space or management capacity for waste. Impact is of low importance in the decision-making process but may be of relevance to the detailed design and mitigation of a project.
Negligible	No significant increase in waste arisings relative to the baseline. No appreciable adverse or beneficial impacts.
Beneficial	Net reduction in waste arisings and diversion of waste from landfill relative to the baseline resulting in an environmental improvement. Positive impact on waste arisings overall and available capacity of waste treatment and disposal infrastructure

14.3.2 Assumptions

This assessment focusses on waste that is material (i.e. substance or object) which the holder has an intention to discard, must discard or has already discarded. There are certain exemptions within the environmental permitting regime where materials are not considered to be waste. Those exempt materials and any materials that are not waste are outside the scope of this assessment. For the purposes of this assessment surplus materials are considered as waste.

14.3.3 Limitations

The movement of waste from the waste producer to its final destination is a complex process, not least as waste may pass through several management facilities and be mixed with other waste streams before reaching its final destination. Waste is often transferred across authority boundaries for management and/or disposal, which makes the recording of accurate waste data more difficult.

Management of hazardous waste is extremely specialised in nature, and regional in its treatment distribution. Capacity for treating a particular waste stream may not be present local to the point of waste arising. As such capacity mapping and prediction depends on the specific waste stream For the Proposed Development, it is important to note, fly ash and APCR are classified as a hazardous waste streams.

14.4 Legislation, Planning Policy and Guidance

14.4.1 European Policy & Legislation

The European Commission's Waste Framework Directive (2008/98/EC) sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling, recovery. 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.

The 1999 Landfill Directive (1999/31/EC as amended by 1882/2003 EC) was introduced in order to prevent, or reduce as far as possible, the negative effects of landfilling waste.

14.4.2 National Policy & Legislation

The NPPF was published in December 2018 (Ref 14.1) but does not contain specific waste policies. Therefore, the NPPF should be read in conjunction with the Government's planning policies for waste, including the Waste Management Plan for England (December 2013) (Ref 14.2). More relevant policies that have been published by the Government since the 2016 assessment include the 25 Year Environment Plan (February 2018) and the Resource and Waste Strategy (December 2018).

The Waste Management Plan for England (December 2013) sets out the Government's ambition to work towards a more sustainable and efficient approach to resource use and management. Those principles that are relevant to the management of waste in the construction and operation of the Proposed Development are:

- 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;
- 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

The 25 Year Environment Plan (2018) (Ref 14.3) sets out the UK's goals for improving the environment within a generation and leaving it in a better state than we found it. The Plan identifies six key areas around which action will be focused:

- using and managing land sustainably;
- recovering nature and enhancing the beauty of landscapes;
- connecting people with the environment to improve health and wellbeing;
- increasing resource efficiency, and reducing pollution and waste;
- securing clean, productive and biologically diverse seas and oceans; and
- protecting and improving the global environment.

In relation to waste, the Plan sets out five goals will the main aim of making sure that resources are used more efficiently and kept in use for longer to minimise waste and reduce its environmental impacts by promoting reuse, remanufacturing and recycling. In order to do this, the Plan highlights the need to look at the whole life-cycle of resources.

The Resource and Waste Strategy (2018) (Ref 14.4) was developed to help the UK meet its commitments and this strategy gives a clear longer-term policy direction in line with the 25 Year Environment Plan. The Strategy focuses on eight key areas:

- sustainable production;
- helping consumers take more considered action;
- recovering resources and managing waste;
- tackling waste crime;

- cutting down on food waste;
- international leadership;
- research and innovation; and
- measuring progress: data, monitoring and evaluation.

The Overarching National Policy Statement (NPS) for Energy (EN-1) (Ref 14.5) is part of a suite of NPSs issued by the Secretary of State for Energy and Climate Change in 2011 and it sets out the Government's policy for delivery of major energy infrastructure. A further five technology-specific NPS for the energy sector cover: fossil fuel electricity generation (EN-2); renewable electricity generation (EN-3); gas supply infrastructure and gas and oil pipelines (EN-4); the electricity transmission and distribution network (EN-5); and nuclear electricity generation (EN-6). According to the Overarching National Policy Statement for Energy, in England and Wales this NPS is likely to be a material consideration in decision making on applications that fall under the Town and Country Planning Act 1990 (as amended)

The National Policy Statement (NPS) for Renewable Energy Infrastructure (EN-3) (Ref 14.6) provides the primary basis for decisions by the IPC on applications it receives for nationally significant renewable energy infrastructure. This NPS covers the following types:

- Energy from biomass and/or waste (>50 MW)
- Offshore wind (>100MW)
- Onshore wind (>50MW)

The combustion generating stations covered by this NPS are those which generate electricity:

- Using waste (possibly including non-renewable sources of waste) and/or biomass as a fuel; and

Generate more than 50MW of electricity Section 2.5 addresses biomass and waste combustion plants in more detail. It includes guidance on factors influencing site selection, technical considerations when determining waste combustion plan applications, as well as guidance on addressing the potential impacts including: air quality and emissions, landscape and visual, noise and vibration, odour, insect and vermin infestation, waste management, residue management, and water quality and resources.

Even though the Proposed Development will not produce over 50MW of electricity, NPS EN-3 states that this NPS is likely to be a material consideration in decision making on applications that fall under the Town and Country Planning Act 1990 (as amended).

14.4.3 Local Policy

The Northamptonshire Joint Municipal Waste Management Strategy (JMWMS) (Ref 14.7) (which includes Corby Borough Council) sets out how councils in Northamptonshire will manage the collection and treatment of municipal waste up to 2020 and beyond. Since the 2016 ES, the Northamptonshire Minerals and Waste Local Plan (2017) (Ref 14.8) was adopted and it summarises the updated targets from the JMWMS: household waste recycling (including composting) rate of 48% by 2012/3, 52% by 2015/6 and 56% by 2019/20.

The Minerals and Waste Local Plan is also the land use planning strategy for minerals and waste related development in the county. It provides the basis for investment in new waste and minerals development in Northamptonshire, and where in the county it should go to.

It has been recognised that a variety of different types and sized facilities distributed throughout the county will be required to deal appropriately with the different types of waste produced and establish a sustainable waste management network. Given the types of waste produced within Northamptonshire the following types of facilities could be used in combination to support the development of a sustainable waste management network and provide the required capacity:

- recovery and recycling facilities (including both material recycling facilities and secondary and recycled aggregate facilities for C&D waste);
- biological processing (including composting and anaerobic digestion);
- transfer stations (where required to support other facilities);
- waste to energy physio-chemical (such as thermal (e.g. incineration, gasification, or pyrolysis), fuel substitutes, plasma arc, and feedstock recycling / substitutes);
- bio-chemical waste treatment; and
- other waste to energy facilities and emerging technologies.

The following updated indicative capacity gaps, presented in **Table 14.2**, have been identified by the end of the Minerals and Waste Local Plan period (2031).

Table 14.2 Potential of Waste Management Facilities Needed to Address Capacity Requirements

Hierarchy Level	Management Method	Current Capacity (2012) (Mtpa)	Capacity Gap (Mtpa)			
			2016	2021	2026	2031
Preparing for re-use and recycling	Recycle	3.61	3.34	3.03	3.00	2.99
	Composting and anaerobic digestion	0.57	0.40	0.40	0.39	0.38
	Inert recycling	0.78	-0.01	-0.22	-0.26	-0.27
	Hazardous recycling	0.00	-0.02	-0.02	-0.02	-0.02
Other recovery	Advanced treatment	0.64	-0.21	-0.22	-0.25	-0.28
	Inert recovery / landfill	0.87	0.88	0.64	0.35	-0.13
	Hazardous treatment	0.22	0.21	0.21	0.21	0.06
Disposal	Non-inert landfill <i>(no residual / includes residual)</i>	0.45	-0.33 to -0.49	-0.45 to -0.62	-0.46 to -0.64	-0.67 to -0.85
	Inert recovery / landfill	0.87	0.88	0.64	0.35	-0.13
	Hazardous landfill <i>(no residual / includes residual)</i>	0.11	0.09	0.09	0.09	-0.2

Note: A negative, or red highlighting, indicates that the required capacity has not been met. Inert recovery / landfill is included in both 'other recovery' and 'disposal' as depending on the circumstance it may fall into either category however it has not been double counted in the totals.

Source: Ref 14.6, Table 7, pg42

14.4.4 Need for Energy Recovery Facilities in Policy and Guidance

The UK is legally bound to provide for 15% of its energy needs, including 30% of its electricity, 12% of its heat, and 10% of its transport fuel, from renewable sources by 2020. By 2017, the UK was not yet halfway towards the requirement for 12% of heat being from renewable sources. On its current course, there is growing concern that the UK will fail to achieve its 2020 renewable energy targets (Ref 14.9).

The Clean Growth Strategy, published in 2017, focuses its attention on the benefits to the economy of clean growth. It comments “We want a diverse electricity system that supplies our homes and businesses with secure, affordable and clean power. That means developing low carbon sources of electricity that are both cheap and clean, taking into account wider system impacts for all sources of generation (Ref 14.10) Energy recovery facilities (including EfW) have been recognised and defined as renewable energy for some considerable time. For example, in 2000, the Department of Trade and Industry stated that “...energy from waste (energy recovery from municipal solid waste [MSW] and from mixed streams of industrial and commercial waste [ICW]) are already commercially viable, well established in the market, and can compete with electricity from fossil fuels” (Ref 14.11)

The UK still landfills hundreds of thousands of tonnes of waste annually. Although the commercial contracts for the Proposed Development and therefore the exact source of waste are not confirmed, it is reasonable to assume that the Proposed Development will contribute to the national capacity of Energy Recovery Facilities and reduce the need for landfill whilst contributing to the renewable energy targets of the UK. The wider benefits of an Energy Recovery Facility as a waste management option, particularly in relation to avoided emissions, have been considered within Chapter 16 (Greenhouse Gas Assessment).

14.5 Baseline Conditions

14.5.1 Introduction

The baseline conditions for both the construction and operational phases have been updated to reflect new information that has been made available since the 2016 ES as a result of the publication and adoption of the Northamptonshire Minerals and Waste Local Plan in 2017.

According to the updated Minerals and Waste Local Plan, Northamptonshire produces 2.82 Mt of various types of waste, this includes: 0.36 Mt of Municipal Waste (13%); 1.06 Mt of Commercial and Industrial waste (37%); 1.35 Mt of Construction Demolition and Excavation waste (48%); and 0.05 Mt of hazardous waste (2%)¹. This waste is either disposed of to landfill or it is reused, recycled, composted or recovered through other forms of treatment (e.g. anaerobic digestion, waste to energy, etc.). The total permitted waste management and disposal capacity within the County (as at 2016) is 7.27 million tonnes per annum.

In order to facilitate improved monitoring of waste arisings and uptake of waste management capacity throughout the plan period, both waste arisings and indicative waste management (and disposal) capacity requirements are estimated in five year intervals. The waste arisings are presented in the following sub-sections.

14.5.2 Construction, Demolition and Excavation Waste (CDEW) (Updated baseline)

CDEW arises from the construction, demolition and excavation of development projects. Typically, this waste stream consists of inert material such as rubble and spoil, but may also include other materials such as timber, plasterboard and plastics from construction sites.

¹ Although the NMWLP dates from 2017, the waste arising and management data within it dates from 2011.

14.5.2.1 Baseline CDEW Waste Arisings

The current car storage activity on the Site is not generating any CDEW waste and therefore the baseline waste arisings for CDEW is zero.

14.5.2.2 Baseline CDEW Waste Management Capacity

The construction, demolition and excavation (CDEW) waste arisings and the permitted waste management and disposal capacity (as at 2016) for Northamptonshire are set out in **Table 14.3**.

Table 14.3 Waste Arisings and Management Method for CDEW Stream in Northamptonshire Plan Area

Hierarchy Level	Management method	Waste arisings (million tonnes per annum)					Permitted Waste Management and Disposal Capacity (Mtpa) ²
		2011	2016	2021	2026	2031	
Preparing for re-use and recycling	Inert recycling	0.74	0.74	0.74	0.74	0.74	0.74
Other recovery	Inert recovery	0.16	0.16	0.16	0.16	0.16	NA
	Other recovery	0.10	0.10	0.10	0.10	0.10	0.64
Disposal	Non-inert landfill ¹	0.34	0.34	0.34	0.34	0.34	0.45
	Inert recovery / landfill	0.16	0.16	0.16	0.16	0.16	0.87
Total		1.35	1.35	1.35	1.35	1.35	2.7

¹ 1) Municipal waste advanced treatment: The significant shift from disposal to treatment expected by 2016 is in line with the Councils procurement process for residual municipal waste contracts. 2) Residual waste arisings occur as an output from all management methods (recycling, composting, thermal treatment, etc.) as these methods also produce small amounts of residual waste that may require disposal to landfill (if not suitable for further treatment prior to disposal) and should not be discounted. 3) Total waste arisings excludes residual waste arisings and hazardous waste arisings. 4) Reference to non-inert landfill is taken to mean non-inert / non-hazardous landfill. 5) Some CD&E waste included within 'non-inert landfill' may be directed to quarries for backfilling (i.e. actually be disposed of to inert landfill) however no distinction is made between these in the original (national) survey data.

² Note: This is the position as at 1 January 2016 and does not take into account application determined since that date.

Source: Ref 14.6, Table 3 pg34

14.5.3 Operational Waste (Updated Baseline)

Operational waste arises throughout the life span of development projects. Typically, this consists of commercial and industrial (C&I) waste streams and municipal waste streams, depending on the nature of the project.

14.5.3.1 Baseline Operational Waste Arisings

The majority of the Site is currently utilised as a car storage area (i.e. tarmac roads with gravelled areas) bounded with palisade fencing and the northern elevation of the Site utilised for landscaping.

Whilst there was no visible evidence of waste storage at the Site as the site is operational, small-scale domestic and vehicle maintenance type wastes are likely to be produced by the site operator. These could include waste oils, rags, plastic, cardboard, empty drums and scrap metal.

Although there are small scale waste arisings currently at the Site, as the quantity of these is unknown, the operational baseline is assumed to be zero.

14.5.3.2 Baseline C&I Waste Management Capacity

The Commercial and Industrial (C&I) waste stream requirements and the permitted waste management and disposal capacity (as at 2016) for Northamptonshire are set out in **Table 14.4**.

Table 14.4 Waste Arisings and Management Method for C&I Waste Stream in Northamptonshire Plan Area

Hierarchy Level	Management method	Waste arisings (million tonnes per annum)					Permitted Waste Management and Disposal Capacity (Mtpa) ²
		2011	2016	2021	2026	2031	
Preparing for re-use and recycling	Recycling	0.13	0.13	0.14	0.14	0.14	3.04
	Composting and anaerobic digestion (AD)	0.08	0.08	0.08	0.08	0.08	0.23 (composting) 0.34 (AD)
Other recovery	Advanced treatment	0.55	0.56	0.57	0.58	0.60	0.64
Disposal	Non-inert landfill	0.29	0.29	0.30	0.30	0.31	0.45
	Disposal of residual arisings to non-inert landfill ¹	0.12	0.12	0.12	0.12	0.13	0.45
Total		1.06	1.07	1.08	1.10	1.14	5.15

¹ 1) Municipal waste advanced treatment: The significant shift from disposal to treatment expected by 2016 is in line with the Councils procurement process for residual municipal waste contracts. 2) Residual waste arisings occur as an output from all management methods (recycling, composting, thermal treatment, etc.) as these methods also produce small amounts of residual waste that may require disposal to landfill (if not suitable for further treatment prior to disposal) and should not be discounted. 3) Total waste arisings excludes residual waste arisings and hazardous waste arisings. 4) Reference to non-inert landfill is taken to mean non-inert / non-hazardous landfill. 5) Some CD&E waste included within 'non-inert landfill' may be directed to quarries for backfilling (i.e. actually be disposed of to inert landfill) however no distinction is made between these in the original (national) survey data.

² This is the position as at 1 January 2016 and does not take into account applications determined since that date.

Source: Ref 14.6, Table 3 pg34

14.6 Assessment of Impacts

14.6.1 Construction Phase Waste Arisings (No material change to 2016 ES)

As for the Consented Development, waste would be generated during all stages of the construction works. Although specific materials cannot be identified at this stage of the design, major and potential sources of waste within the construction process are anticipated to comprise:

- excavated soil associated with levelling of the Site, foundation excavation and trenching for services;
- spoil from piling operations;
- vegetation from site stripping (if required);
- waste water from vehicle wheel wash and dewatering of excavations
- waste paper, plastic, cardboard and wood from delivery of construction material and site activities during the works;
- redundant unused construction materials; and
- collected groundwater and rainwater.

The volume of the wastes that will be generated cannot be specified at this time. It is possible, however, to give a relative assessment of the potential waste types, quantities and their intended fate during the construction phase (**Table 14.5**). Whilst the majority of excavated soils will be needed onsite for landscaping, there is the potential that some will be unsuitable for re-use or surplus to the landscaping requirement; in this case it would become waste.

Table 14.5 Predicted Fate of Wastes for the Construction Phase

Waste Type	Relative Volume	Fate
Surplus excavated Soil or soils not suitable for re-use	Large c.2-3,000m ³	Off-site disposal for materials that cannot be managed on-site effectively. May be able to agree re-use offsite through the CL:AIRE 'Definition of Waste: Development Industry Code of Practice' – see Section 1.5.1.1
Redundant Construction Materials	Small	Return to supplier, recycling, sale or disposal.
Collected Perched Groundwater and Rainwater	Small	Discharge to site surface or drainage system under controlled conditions if suitable or off-site treatment. Discharge to foul sewer via silt separator/oil separator is preferred.
Trade Effluent from Vehicle Wheel Washing	Small	Discharge to foul sewer under controlled conditions to be agreed with Anglian Water Limited.
Waste Paper, Plastic, Cardboard and Wood	Small to Moderate	Off-Site recycling and disposal via contracted waste management firm.
Waste Oils, Chemicals and Potentially Hazardous Materials	Small	Removal to licensed treatment and disposal facilities.
Scrap Metal and Redundant Plant and Equipment	Small	Off-site recycling.
Vegetation from Site Stripping	Small	Off-site recycling or composting.
Sanitary Waste Water	Small	Discharge to foul sewer under controlled conditions to be agreed with Anglian Water Limited.

Key: Construction related wastes will only be generated during the construction period. The associated time interval of waste generation will ultimately depend upon the length of the construction period.

- Small = tens of tonnes/per annum

Waste Type	Relative Volume	Fate
<ul style="list-style-type: none"> ■ Moderate = hundreds of tonnes/per annum ■ Large = thousands of tonnes/per annum 		

14.6.1.1 Excavated Materials Management (No Material Change to the 2016 ES)

The CL:AIRE 'Definition of Waste: Development Industry Code of Practice' (CoP) Version 2 (Ref 14.12), as issued in March 2011 will be used to assess whether excavated materials are classified as waste or not. If excavated materials are dealt with in accordance with the CoP, the Environment Agency considers that these materials are unlikely to be waste if they are used for the purpose of land development. An integral part of the CoP is the production of a Materials Management Plan (MMP) which documents how all of the material to be excavated is to be dealt with. The significance of effect for this waste stream is considered to be the same as for the Consented Development, minor adverse, as the impacts will be temporary and not long-term so the impact on local waste treatment and disposal infrastructure is such that additional capacity is not required.

14.6.1.2 Solid Waste Management (No Material Change to the 2016 ES)

A Site Waste Management Plan (SWMP) will be developed and implemented detailing how waste created during the construction phase would be managed. The main objectives of which will be to make sure that all building materials are managed efficiently, that waste is disposed of legally, and that material recycling, re-use and recovery is maximised. This would be prepared by the Contractor in accordance with good industry practice. The Site Waste Management Plan Regulations 2008 have been repealed but the Contractor will follow its own, similar guidelines, to manage waste materials from construction. All relevant Contractors would be required to investigate opportunities to minimise waste arisings at source and, where such waste generation is unavoidable, to maximise the recycling and reuse potential of construction materials. Recycling of materials would take place off-site, where noise and dust are less likely to result in effects to the occupants of surrounding properties. Appropriate waste management and recycling centres, close to the Site would be identified prior to the construction works and contracts would be established with registered waste carriers and authorised waste disposers for the construction waste.

All waste would be stored on the Site in accordance with the relevant legislation, in particular the Duty of Care Regulations, 1991 (as amended) (Ref 6.1) and no burning of construction waste would be undertaken at the Site.

The Waste (England and Wales) Regulation 2011 repealed the Environmental Protection (Duty of Care) Regulations 1991 and apply the Duty of Care requirements brought in by the Environmental Protection Act 1990 (the EPA). The Waste Duty of Care: Code of Practice (2018) (Ref 14.13) sets out practical guidance on how to meet the waste duty of care requirements. It is issued under section 34(7) of the EPA in relation to the duty of care set out in Section 34(1) of the Act. All waste would be handled and stored safely and securely on Site in accordance with the statutory guidance set out in Waste Duty of Care: Code of Practice.

The destination of all waste or other materials removed during construction will be to an appropriately licensed waste management sites.

All excavations will be monitored and analysed by qualified and experienced field scientists to ensure the chemical characteristics of the materials are understood and that they are handled and segregated appropriately (e.g. contaminated soils will not be mixed with uncontaminated soils).

Arisings from piling operations, if required, will be treated similarly to other excavated materials and will be appropriately monitored, analysed and managed.

Detailed records (and where appropriate a photographic log) will be kept of all construction phase waste arisings and their management and fate.

Individual trade contracts will be required to incorporate appropriate requirements in respect of environmental control, based largely on the standards of 'good working practice' outlined in the CEMP in addition to statutory requirements. Contractors will therefore be required to demonstrate how they would achieve the provisions of the CEMP, how targets would be met, and how potential adverse environmental effects would be minimised.

Overall, the generation and management of solid waste associated with the construction phase is considered to have a 'minor adverse effect'. Even though the maximum predicted amount of excavated soil is 3000m³ or 7230 tonnes, the impacts have been judged in the local planning context to be unimportant. This is due to the impacts being temporary and not long-term so the impact on local waste treatment and disposal infrastructure is such that additional capacity is not required but the impacts are still relevant for the detailed design and mitigation of the project.

14.6.1.3 Wastewater Generation and Management (No Material Change to the 2016 ES)

In addition to the aforementioned solid wastes, the Proposed Development will also generate wastewater. The waste waters likely to be generated on-site during the construction phase are the same as those for the Consented Development and include the following:

- temporary septic tanks and/or portable toilets to be utilised by the construction workers with Site accommodation connected to foul sewer present in Shelton Road if possible at the earliest time as permanent connection will be required for the facility as well
- temporary discharges associated with changeover from the old drainage system to the new drainage system and its management;
- waste waters from dewatering of excavations (groundwater and surface water runoff); and
- dirty water from the temporary on-site wheel wash (should one be required during the construction works).

Temporary portable toilet units will be emptied frequently under a maintenance contract. The waste from the units will be taken off-site for treatment and disposal at a local municipal wastewater treatment works.

Any excess water arising from dewatering will be treated prior to discharging to the surface sewerage system, and only on the achievement of an approved discharge consent and compliance with quality requirements. As stated previously, all works will be undertaken with due attention to appropriate good construction practice. Waste water generated from the on-site wheel wash (if required) will be either be collected in a sealed system for reuse, or collected in a sealed system for authorised disposal.

Overall, the net increase in wastewater does not reduce the area's management capacity and the impact is of low importance in the decision-making process as the majority of the water usage on site is the harvested water being used within the facility. Therefore the generation and management of waste water associated with the construction phase is considered to have a minor adverse effect, reflecting the same conclusions drawn during the assessment for the Consented Development.

14.6.2 Operational Phase Waste Arisings (Updated Assessment)

The impact of waste from the operational phase was measured against the baseline in order to understand whether there is capacity to handle these new and/or increased waste generation rates within the existing waste management capacity. The waste generation rates are estimates and give an indication of the scale, type and intended management route of the waste streams. As a result the

impact assessment was qualitative and makes comment on how feasible it will be to manage the predicted wastes.

For the Proposed Development site, the anticipated waste types that are predicted during the operational phase are:

- bottom ash from the combustion process;
- fly ash from the flue gas prior to reagent injection;
- Air Pollution Control Residues (APCR) containing unspent lime (or possibly sodium carbonate) and PAC;
- general waste (paper, plastic, cardboard, food waste etc.);
- waste oils, chemical and potentially hazardous materials;
- construction waste from periodic contractor activities;
- scrap metal and redundant plant and equipment; and
- waste water (e.g. sanitary, wash down water).

The combustion processes will produce ash from incombustible materials. This is typically far denser than air and the majority is captured as Bottom Ash on the grate. Some smaller ash particles become entrained in the gas stream only to fall out where the speed of the gas flow changes. This lighter material is fly ash. Both of these streams can be separately collected in a modern EfW plant and are distinct from the more hazardous APCR.

The volume of the wastes that will be generated cannot be specified at this time. It is possible, however, to give a relative assessment of the potential waste types, quantities and their intended fate for the operational phase (

Table 14.6)

Table 14.6 Predicted Fate of Wastes for the Operational Phases

Waste Type	Relative Volume	Fate
Bottom Ash Produced from the Combustion Process	High	Bottom ash used off-site as a secondary aggregate material
Fly Ash Produced from the Combustion Process	Moderate to High	Fly ash will be recovered and mixed with Bottom Ash for re-use or removed to licensed facility
Dust filters from Flue Gas Cleaning Equipment i.e. Air Pollution Control Residues (APCR)	High	Removal to licensed disposal / recycling facility
General Waste: Paper, Plastic, Cardboard, Food Waste etc.	Small	Segregate for recycling off-site
Construction Wastes from Periodic Contractor Activities	Small	Removal to licensed treatment and disposal facilities
Scrap Metal and Redundant Plant and Equipment	High	Off-site recycling.
Sanitary Waste Water	Small	Discharge to foul sewer under controlled conditions to be agreed with Anglian Water Limited.

Waste Type	Relative Volume	Fate
Wastewater, Condensate and Wash Down Water	Moderate	On-Site treatment and re-use

Key: Construction related wastes will only be generated during the construction period. The associated time interval of waste generation will ultimately depend upon the length of the construction period.

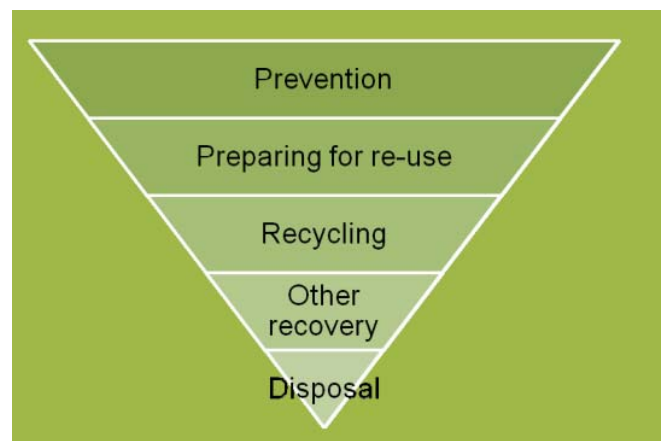
- Small = tens of tonnes/per annum
- Moderate = hundreds of tonnes/per annum
- High = thousands of tonnes/per annum

14.6.2.1 Solid Waste Management (Updated Assessment)

Fly and Bottom Ash are the largest waste stream during the operational phase, followed by APCR. The bottom ash and majority of the fly ash will be mixed together and processed for re-use off-site. Any ash that is not reused, and APCR is disposed of off-site. Some of these waste streams are classified as hazardous waste. All waste disposed of off-site will be done so in a suitably licensed facility. This will create a net increase in waste arisings relative to the baseline and will lead to local-scale (Northamptonshire) reduction in management capacity. However the impacts have been judged in the local planning context to be unimportant so the significance of effect is considered to be minor adverse. This results in a material change from the Consented Development which considered the significance of effect for these waste streams to be negligible..

Aside from bottom/fly ash and ACPR, other forms of solid waste streams during the operational phase are general waste, scrap metal, redundant plant and machinery as well as any construction wastes from periodic contractor activities during operation. It should be noted that in-line with *The Waste (England and Wales) Regulations 2011*, the Proposed Development will apply the waste hierarchy, as outlined in **Figure 14.1**².

Figure 14.1 Waste Hierarchy



Wherever possible waste will be minimised/prevented, where this is not possible the remaining waste will be segregated and recycled/recovered off-site. Where no recycling or recovery route exists, the waste will be disposed in a suitably licensed landfill. As shown in **Table 14.2**, Northamptonshire has the landfill capacity to deal with these waste streams and there is no appreciable adverse or beneficial

² Department of Environment, Food and Rural Affairs (2011) Guidance on applying the Waste Hierarchy

impact therefore the significance of effect is negligible. This reflects the same conclusions drawn for the Consented Development.

Processing of Ash

Bottom and fly ash produced at the Site, will be transported to a storage pit, by conveyors, passing through both a magnet for ferrous metals removal. These metals will then be transported off-site for recycling.

The remaining mixed bottom and fly ash will be loaded to vehicles for transport to reprocessing facilities as far as practicable. Here it will be reprocessed as per the following sections.

Bottom Ash re-use

Based upon the Specification for Highway Works [MCHW Volume 1] and the Design Manual for Roads and Bridges [HD 35/04], bottom ash can be used in:

- bitumen bound materials – base, binder and surface courses, where the relevant material and grading requirements are met;
- concrete – concrete bound layers, where the relevant material and grading requirements are met;
- pipe bedding – can be suitable for use in pipe bedding;
- hydraulically bound mixtures (HBM) for subbase and base;
- unbound mixtures for subbase – where the relevant material and grading requirements are met;
- capping – can be used in capping layers; and
- embankments and fill.

Other uses are in block making, landfill engineering and brownfield remediation [DCLG, 2007].

Fly Ash Reuse

Fly ash has a high alkalinity reserve making it particularly suitable for the stabilisation of acidic wastes. Ashes are cementitious so use as a stabiliser for liquid wastes and sludges allows their conversion from difficult to handle, readily leachable substances to relatively stable solid materials.

Direct replacement for cement is also possible in some circumstances.

Management of APCR

APCR waste will be collected and then conveyed outside the building to the 4 APCR silos for storage. Typically it will be taken to a suitable licensed management facility for hazardous waste. An alternative would be a reprocessing facility but this will be dependent on commercial arrangements.

Overall, the main waste streams for solid waste are fly and bottom ash, followed by APCR. A proportion of fly ash will be recovered and mixed with bottom ash for reuse, and the remaining will be sent to a licensed facility, along with the APCR. The bottom ash will be re-used as a secondary aggregate material. There is a net increase in Fly ash and APCR waste arisings relative to the baseline leading to the reduction in suitably licensed management capacity for these waste streams, however the impact is of low importance in the decision-making process. Therefore, overall, the generation and management of ash and APCR during the operational phase is considered to have minor adverse effects. This differs from the conclusions drawn as part of the assessment for the Consented Development, which considered the significance of effects to be negligible.

Other waste streams include general waste, contractors waste, scrap metal, and redundant plant and equipment, all of which will be recycled off-site or sent to a licensed treatment and disposal facility where appropriate. No significant increases in waste arising relative to the baseline are identified for

these waste streams, therefore the overall adverse effects are negligible, reflecting the same conclusions as the waste impact assessment for the Consented Development.

14.6.2.2 Waste Water Generation and Management (No Material Change to 2016 ES)

The main water usage during the operational phase is the water steam cycle (WSC). The WSC is designed as a “closed loop” system, with only condensate blown down exiting the system and requiring make up with treated water. This water could potentially be harvested and the Site will look to use all opportunities to collect and reuse water.

In addition to the aforementioned solid wastes, the Proposed Development will also generate wastewater. The main waste water stream once the Site is operational will be sanitary wastewater from the toilet blocks, washrooms and catering facilities associated with the plant. Sanitary waste water will be discharged to the foul sewer under controlled conditions to be agreed with Anglian Water Limited.

It is anticipated that only small volumes of waste water will be generated from the treatment processes. Water vapour (condensate) will be treated on-site and re-used (where possible).

All run-off arising from the operational areas of the Site will be contained and treated within a packaged water treatment plant. In addition, wherever possible liquids and effluents collected within the process will be harvested and recirculated.

Overall, even though the main water usage during operation is the water stream cycle which differs from the Consented Development, there is no significant increase in waste arisings relative to the baseline and no appreciable adverse or beneficial impacts as all water will be discharged to the foul sewer or harvested and reused where possible. Therefore the generation and management of wastewater associated with the operational phase is considered to have a negligible adverse effect. Even though the technology changed from the Consented Development, this resulted in no material changes to the significance of effects.

14.7 Cumulative Effects (Updated Assessment)

Development schemes which have been identified in the consideration of cumulative effects are included in Chapter 3 (EIA Methodology). Even though there is a potential for the Proposed Development to be under construction at the same time as some of the cumulative developments identified, all possibilities for preventing, preparing for re-use or recycling of the waste will be utilised first before disposal. Therefore, there are no cumulative effects from these schemes with respect to construction waste management as the available capacity for all waste management methods required is sufficient to accommodate for these developments.

14.8 Mitigation

The measures to be taken to minimise and manage solid and wastewater wastes generated during the construction and operational phases are described in the preceding sections. As mitigation measures have been incorporated into the design and the resulting predicted effects are minor or negligible, no further mitigation measures are proposed.

14.9 Residual Effects

14.9.1 Construction Phase (No Material Change to the 2016 ES)

As no further mitigation measures were identified, the residual effects from construction are:

- *Negligible* for excavated soils; no significant increase in waste arisings relate to the baseline;
- *Negligible* for wastewater; no significant increase in waste arisings relate to the baseline.

14.9.2 Operational Phase (Updated Assessment)

As no further mitigation measures were identified, the residual effects from operation are:

- *Minor adverse* for ash and APRC; the impact on management capacity is of low importance but was relevant to the design;
- *Negligible* for other solid waste streams (general waste, contractors waste, scrap metal, and redundant plant and equipment); no significant increase in waste arisings relate to the baseline; and
- *Negligible* for wastewater; no significant increase in waste arisings relate to the baseline.

14.10 Difference from the Consented Development

The technology change from the Consented Development introduced by this application has not changed the potential waste streams generated during the construction and operation phases. It has resulted in one material change to the significance of effects in relation to ash and APRC generated during the operational phase. The Consented Development concluded the effects of ash and APRC would be negligible; for the Proposed Development, the significance is predicted to be minor adverse. This, however, requires no changes to be made to the management of solid wastes during the operations.

14.11 Summary

In summary, the main waste stream during the construction phase is surplus excavated soil. During operations, the main waste stream will be ash followed by APRC. A summary of waste management is presented in **Table 14.7**.

Table 14.7 Waste Management Summary Table

Potential Effect	Nature or Effect (Permanent or Temporary)	Significance	Mitigation / Enhancement Measures	Residual Effects
Construction				
Excavated soils associated with site clearance and construction works	Temporary	Minor Adverse	On-site re-use of materials and off-site recycling or disposal of unsuitable materials. A voluntary Site Waste Management Plan will be provided to ensure material recycling, re-use and recovery is maximized.	Negligible.
Wastewaters generated	Temporary	Minor Adverse	The discharge of any water accumulated in excavations would be subject to EA approval and require monitoring. Sanitary Wastes are to be tinkered off-site to an appropriate treatment facility.	Negligible.
Operational Phase				

Potential Effect	Nature or Effect (Permanent or Temporary)	Significance	Mitigation / Enhancement Measures	Residual Effects
Ash and APCR produced as per the day to day running of the Proposed Development	Permanent	Minor Adverse	The main solid waste stream produced is bottom ash. The materials will be either re-used or suitably disposed of off-site. The waste operations will be permitted and regulated by the EA.	Minor adverse.
Other solid wastes produced during operations	Permanent	Negligible	Other waste streams include general waste, contractors waste, scrap metal, and redundant plant and equipment. This will be recycled off-site or sent to a licensed treatment and disposal facilities where appropriate	Negligible
Wastewaters generated during the operational phase of the Proposed Development	Permanent	Negligible	Process related waste water will be treated and reused on-site (where possible). Sanitary waste water will be discharged to the foul sewer under controlled conditions to be agreed with Anglian Water Limited.	Negligible.

14.12 References

Ref 14.1 Ministry of Housing, Communities & Local Government (2018) National Planning Policy Framework

Ref 14.2 Department for Environment, Food and Rural Affairs (2013) Waste Management Plan for England

Ref 14.3 Department for Environment, Food and Rural Affairs (2018) A Green Future: Our 25 Year Plan to Improve the Environment

Ref 14.4 Department for Environment, Food and Rural Affairs (2018) Our Waste, Our Resources: A Strategy for England

Ref 14.5: Department of Energy & Climate Change (2011) Overarching National Policy Statement for Energy (EN-1)

Ref 14.6: Department of Energy & Climate Change (2011) National Policy Statement for Renewable Energy Infrastructure (EN-3)

Ref 14.7: Northamptonshire Waste Partnership (2012); 'Northamptonshire Joint Municipal Waste Management Strategy'.

Ref 14.8 Northamptonshire County Council (2017) Northamptonshire Minerals and Waste Local Plan

Ref 14.9 Energy and Climate Change Committee. (2020) renewable heat and transport targets. Summary. Posted on www.parliament.uk. Appendix A

Ref 14.10 Clean Growth Strategy: Leading the way to a low carbon future (2017) HM Government

Ref 14.11 Section 2.4 of the Renewables Obligation Preliminary Consultation. DTI, 2000

Ref 14.12: CL:AIRE (2011), 'Definition of Waste: Development Industry Code of Practice (CoP)' Version 2, March 2011.

Ref 14.13 Department of Environment, Food and Rural Affairs (2018) Waste Duty of Care: code of practice