22. Waste and Resource Efficiency

Purpose of the Assessment

22.1 This chapter assesses the potential environmental impacts and likely significant effects of the Proposed Development from the predicted wastes and resource efficiency arising from the construction phase, operational phase and decommissioning phase as can be reasonably predicted.

22.2 The chapter describes the assessment methodology; the baseline conditions in the Potential Development Area; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been employed.

22.3 The assessment is separated into effects arising from the Proposed Development as described in **Chapter 5: The Proposed Development**, covering the Main SRFI Site, J15a Works and Minor Highway Works. In addition to consideration of the individual aspects of the Proposed Development, the assessment addresses environmental impact arising from all development within the Order Limits as a whole.

22.4 There are, however, three aspects of the Minor Highway Works described in **Chapter 5** that have not been included in this assessment, due to their late identification as appropriate mitigation for the Proposed Development. These are:

- Junction 29 – A43/St John's Road (signage and road surfacing scheme on the A43),
- Junction 31 – A43 Northampton Road (signage scheme); and,
- Cycleway - Pedestrian/Cycle Way along Northampton Road and between Barn Lane to the junction of Collingtree Road (widening of existing footpaths, provision of new footpath and dropped kerbs, and realignment of the carriageway).

22.5 The first two elements listed above require no physical works to alter the footprint of the road. The pedestrian/cycle way is located within Highway land and will involve minimal disturbance of existing verges. Assessment of all three aspects will be included in the assessment undertaken for the final DCO submission.

22.6 This chapter should be read in conjunction with the Site Waste Management Plan (SWMP) which is a separate DCO Document that will be secured through a requirement in the DCO process. This describes how materials will be managed efficiently and disposed of legally during the construction of the works. It works to maximise the re-use and recycling of materials. This involves estimating how much of each type of waste is likely to be produced and the proportion of this that will be re-used or recycled on site, or removed from the site for re-use, recycling, recovery or disposal.

Legislative and Policy Framework

22.7 The assessment within this chapter has been guided and informed by relevant waste legislation, policy, relevant best practice standards and guidance. The following section summaries the key legislative and policy requirements.

Table 22.1: Relevant legislation and policy and guidance

Legislation / policy / guidance	Key provisions	Where In this Chapter Provision Addressed
International Policy		
Revised Waste Framework Directive (rWFD) (2008/98/EC) **(Ref 22.1)**	Establishes the basis for the management of waste across the European Union. It defines certain terms, such as "waste", "recovery" and "disposal", to ensure a uniform approach is taken across the EU. The rWFD sets out the concept of the waste hierarchy, proximity principle and self sufficiency. It also requires that waste is recovered or disposed of without endangering human health or causing harm to the environment. Recycling and recovery targets to be achieved by 2020 include preparing for re-use and recycling of certain waste materials from households by 50% and 70% preparing for re-use, recycling and other recovery of construction and demolition waste.	Refer to Embedded Mitigation Section and Site Waste Management Plan (SWMP)
Landfill Directive (1999/31/EC) **(Ref 22.2)**	The Landfill Directive aims to prevent or reduce as far as possible negative effects on the environment from the landfilling of waste, and setting a target of reducing biodegradable waste sent to waste to landfill by 50% of 1995 levels by 2013 and 35% by 2020.	Refer to Embedded Mitigation Section and SWMP
National Policy		
National Policy Statement for National Networks (NN NPS) **(Ref 22.3)**	The National Networks National Policy Statement (NN NPS), hereafter referred to as 'NPS', sets out the need for, and Government's policies to deliver, development of nationally significant infrastructure projects (NSIPs) on the national road and rail networks in England. It provides planning guidance for promoters of nationally significant infrastructure projects on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State. With respect to waste; advice is provided such that the applicant should set out the arrangements that are proposed for managing any waste produced. The arrangements described should include	Refer to Embedded Mitigation Section and SWMP

	information on the proposed waste recovery and disposal system for all waste generated by the development. 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 the alternative is the best overall environmental outcome.	
Duty of Care Environmental Protection Act (EPA) 1990 **(Ref 22.4)** Waste (England & Wales) Regulations 2011 (as amended) (SI 2011 No. 988) **(Ref 22.5)**	The waste duty of care is a legal requirement implemented by Section 34 of the EPA 1990, to ensure producers and holders handle their waste safely and in compliance with appropriate regulations. The Duty of Care provisions are now set out in more detail in the Waste (England & Wales) Regulations 2011). One of the fundamental aspects of Duty of Care requires the holder of waste to ensure anyone else dealing with their waste has the necessary authorisation to do so whereby they are a registered waste carrier and waste is taken to a licensed waste management facility.	Refer to Embedded Mitigation Section and SWMP
Waste Hierarchy Waste (England & Wales) Regulations 2011 (SI 2011 No. 988) **(Ref 22.5)**	These regulations implement the rWFD, Article 4 sets out the waste hierarchy. It is a legal requirement waste producers/holders follow the waste hierarchy (detailed in **Table 22.2**) when making decisions about waste management options for waste. Waste holders have to choose the highest hierarchical option for their wastes. Lower hierarchical options cannot be justified by cost alone.	Refer to Embedded Mitigation Section and SWMP
Environmental Permitting Regulations 2016 (SI 2016 No. 1154) **(Ref 22.6)**	These regulations create a framework for regulating and measuring operator compliance against the permitting regime. The regulations provide a system for environmental permits and exemptions for different activities and operations, including the management of waste.	Refer to Embedded Mitigation Section and SWMP
Hazardous Waste Hazardous Waste (England & Wales) (as amended) Regulations 2005 (SI 2005 No. 894) **(Ref 22.7)**	These regulations provide the method for assessing if a waste is hazardous or not. Hazardous wastes should be identified using the European Waste Catalogue (EWC) codes. Wastes which are hazardous are identified by an asterisk (*) known as absolute entries, other wastes require separate assessment dependent upon the concentration of dangerous substances present (known as mirror entries). Duty of Care must be adhered to and operators must not mix non-hazardous with hazardous waste in an attempt to re-classify waste as non-hazardous.	Refer to Embedded Mitigation Section and SWMP
National Planning Policy for Waste (October 2014) **(Ref**	Section 8 of the policy requires applications for non-waste development to consider the likely impact on existing waste management facilities.	Refer to Baseline Conditions Section

22.8)	The development should not prejudice the implementation of the waste hierarchy and/or the efficient operation of such facilities. Proposed development design should incorporate sufficient provision for waste management. The waste management strategy for construction and operational phases should maximise re-use/recovery opportunities, and minimise off-site disposal.	
Waste Management Plan for England (WMPE) (2013) **(Ref 22.9)**	The Waste Management Plan requires that 50% of household waste may be prepared for re-use or recycling by 2020. It also requires 70% of all construction and demolition to be subject to material recovery by 2020.	Refer to Embedded Mitigation Section and SWMP
Regional and Local Policy		
Northamptonshire Joint Municipal Waste Management Strategy (JMWMS) (2012) **(Ref 22.10)**	The JMWMS sets out the County's aims, objectives and targets for the management of municipal waste to 2026. The JMWMS sets out how the councils in Northamptonshire will manage the collection and treatment of municipal waste and identifies the types of services and technologies needed to reach the partnership's goals.	Refer to Baseline Conditions Section
East Midlands Regional Waste Strategy (2006) **(Ref 22.11)**	The strategy provides guidance in addressing waste planning in the region. The strategy refers to national and regional targets for waste management and objectives focusing on waste minimisation, efficient waste recovery and recycling and provision of new infrastructure.	Refer to Baseline Conditions Section
Northamptonshire Minerals and Waste Local Plan (2017) **(Ref 22.12)**	The plan identifies where mineral and waste development should be located in the county and the provision needed for such developments. The plan is underpinned by a set of objectives which are required to realise the vision of the plan and policies which address control and management of development (such as co-location of waste management facilities with new development, sustainable use of resources, addressing potentially adverse effects, preventing land use conflict, design and layout, and restoration).	Refer to Baseline Conditions Section

22.8 In line with the Waste (England and Wales) Regulations (as amended) 2011 SI 2011 No. 988 **(Ref 22.5**), which implement the rWFD in England and Wales. The waste hierarchy is set out at Article 4 of the rWFD. The waste hierarchy requires a demonstration by the producer/holder of a waste that the priority identified in **Table 22.2** has been considered in order to determine the most suitable waste management option for all waste arisings.

Table 22.2: The waste hierarchy

Waste Hierarchy	Relevant Activity
Prevention	Using less material in design and manufacture, keeping products for longer, re-use, using less hazardous materials.
Preparing for re-use	The waste is capable of being recycled by existing local or regional waste management facilities without requiring adaptation.
Recycling	Turning waste into a new substance or product, includes composting if it meets quality protocols.
Other Recovery	Includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat power) and materials from waste.
Disposal	Landfill and incineration without energy recovery.

Scoping and Consultation

22.9 To inform the assessment, a thorough consultation process has been undertaken with non-statutory consultees and statutory consultees. The comments received from the consultation have informed the decisions and the information presented in this document. Further information detailing the consultation process is presented in **Chapter 4 Overview of Consultation**. **Table 22.3** below addresses consultee comments relating to waste arising from the scoping exercise, and Table **22.4** additional comments arising from further consultation with stakeholders.

Table 22.3 Summary of Scoping Opinion

Scoping Opinion section /paragraph	Summary of Issue Raised	Where in this PEIR is this addressed
Scoping Opinion, January 2016 **Para 3.117**	The Scoping Report does not detail how waste generated during construction and operation of the proposed development will be removed from the site, although it is noted that Section 11 refers to the implementation of a SWMP as a mitigation measure. Details of likely vehicle movements, including the numbers of trips and routing in relation to the removal of waste during construction and operation, should be provided in the ES and used to inform the highways and transportation assessment	**Chapter 22: Waste** - Baseline Conditions, Embedded Mitigation and Assessment of Effects outlines potential volume of waste arisings and locations of treatment facilities **Chapter 19: Highways and Transportation** addresses vehicle numbers as whole for construction and operation (including waste)
Scoping Opinion, January 2016 **Para 3.126**	Secretary of State advises that the Environmental Statement (ES) should classify the types of all wastes to be processed as a result of the proposed development and that the effect of the	Throughout Chapter 22 Waste – including Assessment of Effects section

	proposal in terms of waste should be assessed and reported on within the ES	
Scoping Opinion, January 2016 **Para 3.127**	The environmental effects of the processing and removal of all wastes from the site should be considered. The ES will need to identify and describe the control processes and any mitigation measures associated with storing waste on-site and transporting waste off-site. All waste types should be quantified and classified.	Throughout Chapter 22 Waste– including Assessment of Effects section
Scoping Opinion, January 2016 **Appendix 3** South Northamptonshire Council Scoping Response	The ES should include a Waste Management Statement to show which waste management practices will be adhered to during the development	See SWMP
Scoping Opinion, January 2016 **Appendix 3** South Northamptonshire Council Scoping Response	All appropriate Local, National and European waste strategies (including the Waste Framework Directive) should be adhered to.	Chapter 22 Waste – Legislative and Policy Framework
Scoping Opinion, January 2016 **Appendix 3** South Northamptonshire Council Scoping Response	The importance of the waste hierarchy with a primary regard to re-use and recycle should be considered in the ES.	Chapter 22 Waste – Legislative and Policy Framework
Scoping Opinion, January 2016 **Appendix 3** South Northamptonshire Council Scoping Response	It is important to ensure that construction contractors for the development use licensed waste carriers and permitted waste treatment and disposal facilities if the application is successful. Any hazardous waste arising from any demolition, site clearance or construction should be legally disposed of by suitable licensed contractors	Throughout Chapter 22 Waste – including Assessment of Effects section
Scoping Opinion, January 2016 **Appendix 3** South Northamptonshire Council Scoping Response	The impact of the arising waste and its management should be scoped (to include direct, indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects for the whole life of the development; including construction, operational and decommissioning phases)	Throughout Chapter 22 Waste – including Assessment of Effects section

Table 22.4 Summary of Consultation Undertaken

Consultation and date	Summary of Consultation	Where in the ES is this addressed
Environment Agency – as part of Scoping Opinion	CEMP to include greater details of the following: Waste management plan for waste into and out of the development. Advice provided in relation to relevant permits required.	See CEMP and SWMP

Study Area

22.10 This PEIR considers the potential environmental effects of the Proposed Development within the Proposed Development Area (as described in **Chapter 5: The Proposed Development**), which comprises the following principal elements:

Main SRFI Site

- Demolition of existing buildings and structures and grading the land to create a series of plateaus and bunds to permit development;
- An intermodal freight terminal with direct connections to the Northampton Loop Line, capable of accommodating trains of up to 775m long, including up to 3 gantry cranes, container storage, a train maintenance depot and facilities to transfer containers to Heavy Goods Vehicles (HGV);
- An express freight terminal with direct connections to the West Coast Main Line, capable of accommodating trains of up to 240m long, a freight platform with associated loading and unloading facilities;
- Up to 702,097 sq m (Gross External Area) of rail connected and rail served warehousing and ancillary service buildings including a lorry park, terminal control building and bus terminal;
- New road infrastructure including a new separated access point on the A43 (T), an internal site underpass (under Northampton Road) and necessary utilities infrastructure; and
- Strategic and structural landscaping and development of open space including alterations to public rights of way, the creation of publicly accessible open areas, flood attenuation, and the partial diversion of the Milton Malsor brook. This will mitigate some effects arising on biodiversity as a result of the Proposed Development within the Main SRFI Site. However, the main area of ecological mitigation is adjacent to J15a.

J15a Works

22.11 Improvements to J15a of the M1, including:

- Pre-development works to facilitate widening/ reconfiguration (which will lead to some loss of vegetation in accordance with the draft landscape plan;
- Widening and signalisation of existing northern roundabout;
- Widening of A5123 approach; widening of M1 southbound off-slip approach;
- Widening of A43 northbound approach to northern roundabout;
- Reconfiguration of existing southern roundabout to provide signalised T-Junction;
- Provision of two lane free flow slip on A43 SB;
- Provision of new link road between southern junction to M1 northbound on and off slips;
- Widening of A43 northbound approach to southern junction; and
- Provision of ecological mitigation to the south-west of the J15a, to mitigate habitat loss at the Main SRFI Site, and landscaping around the junction.

Minor Highway Works

22.12 Minor highway works, are proposed as outlined in Table 5.5 in **Chapter 5: The Proposed Development** (and in Table 22.19 in this chapter). These works at 14 junctions would involve minor pre-development works, and measures such as widening carriageways, creation of new lanes and signalling/ signage/ road painting works, designed to ease congestion and aid traffic flow at the junctions. Works are largely located within the existing highways land.

22.13 This chapter addresses waste arising from the entire Proposed Development and its potential impact on the local and regional waste management infrastructure, so for the purpose of this assessment, the study area has been defined as the Order Limits plus a 10km surrounding buffer to identify waste management facilities which may be impacted by waste from the development. **(Figure 22.1).**

Baseline Conditions

22.14 This section considers the baseline waste arisings and waste management facilities within the Study Area. The assumption is that there is currently no significant waste arising from the Main SRFI Site, J15a or Minor Highway Works individually, so the baseline is not split into these aspects of the Proposed Development.

Current Waste Arisings

22.15 The environmental baseline is based on the current status of waste arisings from within the Study Area. The Main SRFI Site is currently undeveloped and as such there are no regular waste arisings. It is open land, mainly covered by thin vegetation. The other areas of the Proposed Development (J15a works and other highways works) relate to highways improvement and similarly there are not anticipated to be any regular waste arisings currently.

22.16 Therefore, any waste produced by the Proposed Development, is considered to be a deviation from the current baseline state; and is also likely to provide a generally adverse impact by virtue of waste generation.

Local Waste Management Facilities

22.17 **Table 22.5** identifies the waste management facilities that are located within 10km of the Order Limits.

Table 22.5: Local waste management facilities (within 10km).

Operator	Address	Type of Waste Site	Distance from Order Limits
Northamptonshire County Council	Gayton Landfill (post Op) Treatment Plant	Physical Treatment Facility	1.4
Viridor Waste Wootton Limited	Wootton Landfill	Co-disposal Landfill Site	3.5
Pianoforte Supplies Ltd	Pianoforte Supplies - Old Quarry	H, C&I Waste Landfill	4.3
Warren Mr D	Warrens Scrap Yard	Metal Recycling Site	5.3
3 C Waste Limited	S R 2010 No 5	Mobile plant (reclamation and restoration)	5.4
Waste Recycling Ltd	S R 2010 No 5	Mobile plant (reclamation and restoration)	5.4
F C C Environment (U K) Ltd	S R 2010 No11	Mobile plant (soil treatment <75,000 tpd)	5.4
Perrett's Metal Recycling Ltd	Perrett's	Metal Recycling Plant	5.6
Perrett. Anthony, Jonathon & Jacqueline	J D Skips	Metal Recycling Site	5.7
Mayer Parry Recycling Ltd	Mayer Parry Recycling Ltd	Metal Recycling Site	5.7

J C Recycling Limited	Tweed Road Inert Recycling	Physical Treatment Facility	5.9
Miswa Chemicals Ltd	Miswa Chemicals Ltd	Physico-Chemical Treatment Facility	5.9
Enterprise Managed Services Ltd	Westbridge Depot	H, C&I Waste Landfill	5.9
In 4 Ltd	In 4 Ltd	Physical Treatment Facility	6.0
Enterprise Managed Services Ltd	Sixfields Household Waste Recycling Centre	No-haz and haz HWA site	6.1
Pepper Barry William	Abel Skip Hire	H, C&I Waste transfer station	6.5
Suez Recycling And Recovery U K Ltd	Brackmills Transfer Station	Special waste transfer station	6.5
Enterprise Managed Services Ltd	Towcester Household Waste Recycling Centre	Non-haz and haz HWA site	6.7
Marriott Stephen	Northamptonshire Vehicle Dismantlers	ELV facility	7.2
Marriott Mr Stephen Ross	Northampton Vehicle Dismantlers	ELV Facility	7.2
T W / T S Threadgold & Son	T W Threadgold & Son	ELV facility	7.2
Bakers Waste Services Ltd	Units 17 18 And 19 Martins Yard	Physical treatment facility	7.3
D & M Recycling & Waste Management Limited	The Recycling Centre	H, C&I Waste transfer station	7.9
Ace Mini Skips Ltd	Whites Yard	H, C&I Waste transfer station	8.0
Pury Hill Developments (Mr N Taylor)	Pury Hill Developments - Pury Hill Farm	Landfill taking other wastes	8.1
S T & N J Page	Duston Oils	Physico-Chemical Treatment Facility	8.6
D A Bird Ltd	Pury End Quarry	Landfill taking other wastes	8.9
Bird D A	Pury End Quarry	Inert Landfill	9.0
D A Bird Ltd	D A Bird - Pury End Quarry	Landfill taking other wastes	9.0
Barton Plant Ltd	Harlestone Heath Quarry	Landfill taking no bio-deg waste	9.4
Barton Plant Ltd	Harlestone Quarry Extension	Landfill taking non bio-deg waste	9.5
Barton Plant Ltd	Harlestone Quarry	Landfill taking non bio-deg waste	9.5

Barton Plant Ltd	Harlestone Quarry	Inert Landfill	9.5

Regional Waste Management Facilities

22.18 An assessment of the potential availability of regional sites was carried out. The search identified that there are a wide variety of facilities. Note that the facilities identified above in the local vicinity, will also be covered in the data below. There are too many regional sites to list individually, however, the data in **Tables 22.6 to 22.10** provides an indication of the widespread availability of a range of types of waste management facilities within the (former) East Midlands Planning Region **(Ref 22.13)**.

Table 22.6: East Midlands Landfill Capacity 2016 (All figures are provided in 000s cubic meters).

Landfill Type	Sub-Region					
	Derbyshire	Leicestershire	Lincolnshire	Northamptonshire	Nottinghamshire	EAST MIDLANDS
Hazardous Merchant	-	-	-	1,040	-	**1,040**
Hazardous Restricted	-	-	-	-	-	**-**
Non Hazardous with SNRHW cell*	6,244	10,808	-	2,067	-	**19,119**
Non Hazardous	3,114	434	10,844	614	1,354	**16,360**
Non Hazardous Restricted	-	-	200	-	3,364	**3,564**
Inert	814	2,760	14,678	1,860	3,412	**23,524**
Total	10,172	14,002	25,722	5,582	8,130	63,608

*Some non-hazardous sites can accept some Stable Non Reactive Hazardous Wastes (SNRHW) into a dedicated cell, but this is usually a small part of the overall capacity of the site.

Table Notes:

Data for 2016 is classified into Landfill Directive categories.

2016 landfill capacity data was obtained from environmental monitoring reports required by permits or directly from the operator.

Table 22.7: East Midlands: Transfer, treatment and metal recycling site inputs 2016 (All figures are provided in 000s tonnes)

Site Type	Sub-Region					
	Derbyshire	Leicestershire	Lincolnshire	Northants	Nottinghamshire	East Midlands
Hazardous waste	175	100	66	124	156	**621**
HIC	578	549	768	363	451	**2,709**
Clinical	9	1	0	1	1	**12**
Civic amenity site	84	93	88	69	99	**433**
Non Biodegradable	-	22	140	-	90	**253**
Transfer Total	847	764	1,063	556	796	4,027
Material recovery	134	217	91	98	72	**611**
Physical	583	533	296	342	984	**2,738**
Physico-chemical	91	1	121	411	43	**666**
Chemical	38	0	-	0	-	**38**
Composting	82	72	115	308	80	**657**
Biological	141	408	179	269	309	**1,306**
Treatment Total	1,069	1,231	802	1,429	1,487	6,017
Vehicle depollution	8	9	6	13	22	**59**
Metal recycling site	256	15	247	37	349	**905**
Metal Recycling Sector Total	264	25	254	50	371	964

Table 22.8 East Midlands: Deposit in Landfill for Recovery Inputs 2016 (All figures are provided in 000s tonnes)

Site Type	Sub-Region					EAST MIDLANDS
	Derbyshire	Leicestershire	Lincolnshire	Northamptonshire	Nottinghamshire	
Deposit in landfill for recovery	1	-	121	122	366	**610**
Total	1		-			610

Note: This activity is the deposit of waste in land for benefit and recovery purposes. Landfilling is the deposit in land for the purposes of final disposal.

Both activities require an environmental permit under the Environmental Permitting Regulations.

Table 22.9: East Midlands: Use of Waste Inputs 2016 (All figures are provided in 000s tonnes)

Site Type	Sub Region					EAST MIDLANDS
	Derbyshire	Leicestershire	Lincolnshire	Northamptonshire	Nottinghamshire	
Use of waste in construction	-	4	-	57	12	73
Use of waste in reclamation	-	-	77	-	-	77
Use of waste for timber manufacturing	-	-	-	-	-	-
Total	-	4	77	57	12	150

Note: These activities are for use of waste permitted under Standard Rules Permits for waste operations.

Table 22.10: East Midlands: Hazardous waste deposited by fate 2016 (All figures are provided in tonnes)

Waste Fate	Derbyshire	Leicestershire	Lincolnshire	Northamptonshire	Nottinghamshire	EAST MIDLANDS
Incineration with energy recovery	33,800	17,335	1	-	-	**51,136**
Incineration without energy recovery	-	5	-	-	-	**5**
Landfill	8,670	8,449	-	131,991	-	**149,111**
Long term storage	-	-	-	-	-	**-**
Other Fate	-	-	-	-	0	**0**
Recovery	127,994	13,978	44,304	11,503	56,153	**253,933**
Rejected	288	-	0	610	8	**906**
Transfer (D)	5,242	2,674	573	33,288	3,211	**44,988**
Transfer (R)	8,252	4,756	26,024	64,571	12,153	**115,755**
Treatment	77,924	-	63	80,920	1,312	**160,220**
Total	262,171	47,199	70,965	322,883	72,836	776,053

Notes:

The Environment Agency is required to monitor registered hazardous waste movements. The data published here is a summary of these movements. The same waste may be moved between multiple facilities and each separate movement is recorded. This double counting should be taken into account when using this data

Transfer (D) means transfer before disposal, Transfer (R) means transfer before recovery.

In previous years Recovery was called Recycling/reuse.

In previous years the Landfill category included deep injection, land treatment and surface impoundment. These are now included in Other Fate.

Future Predicted Waste Generation for Northamptonshire

Construction, Demolition & Excavation (CD&E) Waste

22.19 CD&E waste is waste arising from construction, demolition or excavation as a result of any development. It includes waste such as vegetation and soils (contaminated and uncontaminated) from the clearance of land, masonry and rubble wastes arising from the demolition, construction or reconstruction of buildings or other civic engineering structures. CD&E waste may also include hazardous waste materials such as lead, asbestos, liquid paints, oils, etc. The Local Assessment of Waste Management Needs document (2013) **(Ref 22.14)** forecasts a 'no growth' scenario in Northamptonshire set out in **Table 22.11**. This projection has been adopted in line with the national guidance (PPS10 companion guide Annex D para 28 – 32) **(Ref 22.15)**. This will result in 1.35 Mt of CD&E waste arisings being produced for Northamptonshire by the end of the Northamptonshire County Council Minerals and Waste Local Plan period plan in 2031. An assumption of no net growth reflects in part the impact of the landfill tax and the Aggregates Levy, which will encourage the re-use of construction and demolition waste on-site in order to avoid additional disposal and raw material costs.

Table 22.11: Waste arisings (Mt) and waste management methods for CD&E over projected period.

Year	Total CD&E Waste	Inert Recycling	Re-use or Recovery (exempt sites)	Other Recovery	Disposal to landfill	Transfer
2011	1.35	0.74	0.16	0.10	0.34	0.03
2031	1.35	0.74	0.16	0.10	0.34	0.03

Commercial and Industrial (Operational) Waste

22.20 Commercial and industrial (C&I) waste is that produced by commercial premises including shops, warehouses, offices, entertainment and catering businesses (commercial waste), plus factories and industrial plants (industrial wastes). C&I waste generally includes a proportion of hazardous wastes and some inert or semi-inert material.

22.21 Baseline data for C&I waste generated within Northamptonshire includes the Study into Commercial and Industrial Waste Arisings (ADAS 2009) **(Ref 22.16)**, National Survey of Commercial and Industrial Waste Arisings (Department for Environment, Food and Rural Affairs, DEFRA, 2009) **(Ref 22.17)** and operator returns (reported through the Environment Agency, EA, 2009 Waste Interrogator) **(Ref 22.18)**. All of which present a similar picture of C&I arisings for the county: 1.06 Mt (ADAS), 1.04 Mt (DEFRA) and 0.87 Mt (EA).

22.22 Using the ADAS model and management rates based on maximising recovery it is estimated that 1.06 Mt of C&I waste is currently produced within Northamptonshire; of which 0.21 Mt is recycled or composted, 0.55 Mt is otherwise recovered and 0.29 Mt is disposed of to landfill. By the end of the plan period (2030/1) it is estimated that 1.13 Mt of C&I waste will be produced within the county.

Table 22.12: Waste arisings (Mt) and waste management methods for C&I Waste over a ten year projected intervals.

Year	Total C&I Waste	Preparing for re-use and recycling			Disposal to landfill	
		Recycling	Compost	Other Recovery	Disposal	Residual disposal
2010/1	1.06	0.13	0.08	0.55	0.29	0.12
2015/6	1.07	0.13	0.08	0.56	0.29	0.12
2020/1	1.08	0.14	0.08	0.57	0.30	0.12
2025/6	1.10	0.14	0.08	0.58	0.30	0.12
2030/1	1.12	0.14	0.08	0.59	0.31	0.13

Method of Assessment

22.23 In line with the scoping opinion this chapter is concerned with the management and disposal of waste produced in relation to the Proposed Development and the environmental effects of the processing and removal of all wastes from the site is considered. The control processes and mitigation measures associated with storing waste on-site and transporting waste off-site are also identified and discussed. The chapter includes an assessment of the CD&E waste which will be primarily generated from the development and also an assessment of the operational waste which includes an assessment of C&I waste.

22.24 For the purposes of this waste assessment, CD&E waste refers to all wastes generated as a result of all development within the Order Limits (therefore including the J15a and Minor Highways Works) for construction of the Proposed Development as well as ultimately the potential decommissioning waste and C&I waste refers to waste generated from the operational period of the site once the construction phase has been completed and prior to any decommissioning activities.

22.25 Other effects on the environment as a result of waste creation (as part of the construction, operational and decommissioning phases) are addressed in other chapters. For example:

- landscape and visual impacts – Chapter 17: Landscape and Visual;
- hydrological and drainage issues (i.e. surface water drainage, contamination of groundwater and surface water and sewerage disposal) – Chapter 14: Hydrology, Drainage and Flood Risk;
- remediation of land contamination due to previous land uses – Chapter 13: Ground Conditions; and
- transport issues – Chapter 19: Highways and Transportation.

22.26 The Northamptonshire Minerals and Waste Local Plan **(Ref 22.12)**, is the land use planning strategy for minerals and waste related development in the county. The purpose of this document is to set out a planning strategy for sustainable waste management up to 2031,

providing adequate provision of waste management facilities (including disposal) in appropriate locations for municipal, commercial and industrial waste, construction, demolition and excavation waste and hazardous waste. These facilities, current and proposed, have been considered as part of this assessment for the reason that they would receive waste arising from the CD&E and operational phrase of the Proposed Development.

The Risk Assessment Methodology and Significance Criteria

22.27 The assessment of waste generated from the development focuses on the potential impact of waste arisings on the existing local and regional waste management infrastructure and its capability to be able to manage such wastes. This includes wastes arising directly and indirectly from the Proposed Development, including short, medium and long-term and cumulative effects.

22.28 The scoping opinion (see **Table 22.3**) indicated that the ES (in this case the PEIR) should classify various waste types to be generated, identify and describe environmental effects of the processing and removal of all wastes from the site, having regard to control processes and any mitigation measures associated with storing waste on-site and transporting waste off-site. While an integral part of this assessment, these are considered in more detail in the SWMP. As addressed in the Embedded Mitigation section below, this assessment assumes principles within this document would be followed – for example following the waste hierarchy, adhering to relevant waste strategies and using licensed waste carriers and permitted waste treatment and disposal facilities. In addition, aspects such as the Environmental Permitting Regulations 2016 (in relation to moving subsoil etc off-site) are addressed. It is understood that the SWMP will be secured as a requirement stipulated in the proposed Development Consent Order (DCO).

22.29 The waste management infrastructure (local and regional) is the receptor to which the impacts of waste generated from the development have been assessed.

22.30 Effects on other aspects of the environment as a result of waste generation (for example, likely vehicle movements, including the numbers of trips and routing in relation to the removal of waste during construction and operation) are addressed in the relevant technical chapters (**Chapter 19: Highways and Transportation**) – as vehicle movements assessed therein include waste vehicles.

Significance Criteria

22.31 There are currently no fixed or recommended criteria for assessing the significance of impacts arising from the management of waste. Therefore, the Proposed Development is evaluated according to its individual characteristics and how it interacts with the identified receptors (local and regional waste management infrastructure). Overall the fundamental proposal for evaluating impacts from waste is to predict and characterise waste types and arisings and view them against existing waste generation baseline conditions in Northamptonshire. This assessment is then used to identify opportunities to respond to policy through means that reduce any adverse effects and increase the likelihood of beneficial effects.

Magnitude of effects

22.32 The magnitude of waste management impacts resulting were derived using the assessment criteria presented in **Tables 22.13** and **22.14** below. The tables provide a matrix to rank the magnitude of potential direct impacts on human health and/or the environment from wastes inappropriately stored and managed on site as well as impacts to the waste infrastructure and its potential to control / contain wastes which may harm human health and/or the environment. The assessment of magnitude is based on the pollution potential and quantity produced. The polluting potential is based on the general classification of the material, with inert waste having the lowest pollution potential and hazardous waste having the greatest pollution potential.

Table 22.13 Assessment of the magnitude of hazardous waste and non-hazardous waste on the Environment

Type of waste:	Limited quantities present in single container or small skip <10 m^3	Small quantities of a particular waste that can fit within one large container; or groups of small skips <50 m^3	Residues left in groups of large storage containers, or small stockpiles <100 m^3	Considerable quantities in stockpiles on-site >100 m^3
Non-hazardous	Negligible	Low	Medium	High
Hazardous	Low	Medium	High	High

Table 22.14 Assessment of the magnitude of inert waste on the Environment

Type of waste:	Low quantities of inert waste in containers (e.g. skips <100 m^3	Large quantities of inert waste in small stockpiles >100 m^3 to ≤1000 m^3	Considerable quantities in large stockpiles on-site >1000 m^3
Inert waste	Negligible	Low	Medium

Receptor Sensitivity

22.33 The significance of waste effects were determined by the type, location and capacity of local and regional waste management facilities and their ability to manage wastes in a suitably sustainable and proficient manner. A qualitative assessment of receptor (waste management infrastructure) sensitivity was used as described in **Table 22.15** below.

Table 22.15: Criteria for assessing receptor sensitivity

Receptor sensitivity	Criteria
Negligible	There is no requirement to transfer waste to local or regional waste management facilities, as all of the waste is capable of being re-used or recycled on-site of production

Low	Existing local or regional waste management facilities have the capacity and capability to recycle the waste.
Medium	Existing waste management facilities that are outside of the region have the capacity and capability to recycle the waste. Existing local or regional waste management facilities would require to dispose of the waste.
High	Insufficient disposal capacity exists regionally so waste will require disposal within another region

Impact Significance

22.34 The magnitude and receptor sensitivity are assessed qualitatively by expert opinion and are then combined to assess the significance of wastes from the construction and operational phases of the proposed development at the pre-mitigation stage, as shown in **Table 22.16** below.

Table 22.16: Significance of the waste management impacts based on the magnitude and sensitivity

Type of waste:		Magnitude			
		Negligible	Low	Medium	High
Sensitivity	High	Minor	Moderate	Major	Major
	Medium	Minor	Minor	Moderate	Major
	Low	Negligible	Negligible	Minor	Moderate
	Negligible	Not significant	Negligible	Minor	Minor

22.35 For the purpose of this assessment, an impact significance of moderate (or higher) is considered to be significant in terms of the EIA Regulations.

22.36 It is noted that waste arisings from construction, operation and decommissioning are considered to be an adverse impact compared to the baseline state. Also that the waste impacts from construction and decommissioning are considered to be temporary (albeit the proposed construction period is assessed as 10 years from 2019-2029) whereas the waste impacts associated with operation are long term.

Embedded Mitigation

22.37 There are certain principles of mitigation that will be applied to all waste (of particular types) that are created during the construction and operational phases. These principles are outlined in the Construction Environmental Management Plan (CEMP), included in this PEIR as Appendix 13.4 as well as a DCO Document which will be secured through a Requirement of the DCO. The CEMP forms part of the embedded mitigation for the Proposed Development. Measures relating to waste in the CEMP will include:

- Design brief for the Proposed Development is to retain all excavated material on-site where possible

- Adhere to waste legislation for storage and handling on-site; and, transport and disposal / recycling / recovery off-site at all times. Ensure that those who remove waste from site have the appropriate authorisation (i.e. are registered waste carriers); and those facilities that receive waste from the site hold a valid environmental permit;

- Allocate space on-site for the storage of waste materials and ensure that storage areas and containers are clearly labelled so site workers know what wastes should be put there;

- Hazardous waste will be stored separately from non-hazardous wastes to avoid contamination. Note, the Hazardous Waste regulations make it illegal to mix hazardous waste with non-hazardous waste;

- Provide separate receptacles for dry recyclables, such as paper & cardboard, plastic, glass, wood and metal. This will encourage recycling and increase the potential value of the recyclable items by avoiding contamination;

- No waste from the Proposed Development will be deposited outside the boundary of the development, unless it is in a site that holds a valid environmental permit. Off-site waste management facilities are legally obliged to operate under an environmental permit, which is in place to ensure that the site is operated in a manner to prevent emissions causing harm to human health or the environment;

- All wastes that are removed off-site will be described on a waste transfer note or hazardous waste consignment note (as appropriate) that tracks the movement of the waste to the specified disposal or recycling facility; and

- The appointed contractors will identify the staff who are responsible for waste management; and ensure that all contractor staff are aware of the appropriate re-use, recycling or disposal routes for each waste.

22.38 The SWMP holds similar principles, though also addresses operational waste. These principles will be expanded within the CEMP and the SWMP submitted with the DCO Application. They will be used to predict the actual quantities of waste arisings prior to construction and monitor wastes actually produced during construction, operation (and eventually decommissioning). This plan will identify the proposed waste management option (e.g. re-use on-site, recycle off-site, or dispose off-site) for each waste produced. This will promote sustainable waste management practices by maximising waste prevention, re-use and recycling for material destined for off-site waste management. This will actively discourage sending waste to landfill and will promote the waste hierarchy, which is a legal requirement.

Assessment of Construction Phase Effects

22.39 This section considers all waste arising from all development within the Order Limits (i.e. waste from the Main SRFI Site, J15a and Minor Highway Works), with different wastes from each aspect highlighted where relevant.

Predicted Waste Arisings

22.40 The potential waste types that could arise during this phase of the Proposed Development are summarised in **Table 22.17** below, with further information and assessment provided in the following sections.

22.41 It is anticipated that the majority of construction waste would arise from works associated with ground preparation and construction of the Main SRFI Site. However, similar types of waste would arise from the J15a works and other highways works, so they are included within this section.

Table 22.17: Potential waste sources during construction phase

Construction Phase	Potential Wastes Produced	Classification of Waste
Site Clearance (Main SRFI Site and Highway Works)	Vegetation	Non-hazardous
Excavation (Main SRFI site and Highways Works)	Made ground, soil and subsoil	Inert; and/or Non-hazardous; and/or Potentially hazardous if it contains sufficiently high levels of contamination
Construction and Demolition (Main SRFI Site)	Construction materials: concrete, bricks, ceramics, plastics, metals, plasterboard, timber, paint, etc.	Inert; and/or Non-hazardous; and/or Hazardous.
Construction (J15a and Other Highway Works)	Carriageway planings, concrete, bricks etc. from existing structures and drainage, metal rebar and traditional construction waste (as per Main SRFI Site)	Inert; and/or Non-hazardous; and/or Hazardous.

Site Clearance Waste (Main SRFI Site)

22.42 Site clearance works are likely to include the removal of significant amounts of vegetation from the site, such as trees, shrubs, branch trimmings, grass, plants and tree cuttings etc. This waste is non-hazardous, and it is estimated that the total quantity of vegetation is likely to exceed 100m^3, therefore, the magnitude of this waste is **High** (based on assessment criteria in **Table 22.13**).

22.43 The information provided in the baseline description identifies that there are local and regional capacity for composting facilities that are likely to be able to receive this waste.

Therefore, the sensitivity is considered to be **Low** (based on assessment criteria in **Table 22.15**)**.**

22.44 On this basis, the pre-mitigation significance is considered to be **Moderate Temporary** based on the impact only lasting for the part of the duration of the construction period**.**

Excavation Waste (Main SRFI Site)

22.45 Given the design brief for the Main SRFI Site within the Proposed Development is to retain all excavated material on-site it is considered likely that any potential surplus from the cut and fill balance for the overall development will be very low (<1000m^3)

22.46 Excavation wastes will comprise soil and stones, and may include some Made Ground. This material will largely be inert waste. Therefore, based on classification and the anticipated surplus (if any) the magnitude of this waste is considered to be **Low.**

22.47 It is proposed that this material will be retained on-site for recycling or re-use in the proposed development, e.g. as low-grade backfill, where it is suitable for use; otherwise, the material will be sent for recycling off-site**.**

22.48 Given that this excess material will be sent for recycling off-site, and that there are local facilities that can manage this waste, the sensitivity is assessed as **Low**.

22.49 On this basis, the significance (given embedded mitigation) is considered to be **Negligible Temporary** based on the impact only lasting for part of the duration of the construction period.

22.50 However, there may be small pockets of contamination on-site due to the previous site history. These are considered separately below.

Contaminated Excavation Waste (Main SRFI Site)

22.51 A soil contamination assessment of the development site has been undertaken by Hydrock Ltd (See **Chapter 13: Ground Conditions**)

22.52 For the Main SRFI Site, soil sample locations were determined by reference to the conditions identified in the preliminary risk assessment. Specific features were targeted including:

- landfill area;
- Lodge Farm;
- former filling station;
- former farm buildings;
- areas of fly tipping;
- areas of Made Ground in the south-east of the site;

- an area of unexpected landfilling identified in the north-east of the site (Rathvilly Farm); and
- an area of stockpiled material and Made Ground in the east of the site.

22.53 Subsequently appropriate chemical testing was undertaken to establish the potential contamination status of the soil in relation to harm to human health and to the environment.

22.54 The findings of the risk assessment concluded the following:

- That no significantly elevated Contaminants of Concern have been assessed and the risk evaluation indicates the site does not pose a significant risk to human health for the proposed commercial land use; and
- There is the potential for unknown petroleum hydrocarbons at the former filling station to the east of the A43, however, the impact of these will be localised and restricted to close proximity to the tanks.

22.55 It has therefore been assumed that based on the preliminary investigation undertaken that there is a relatively low potential that contaminated material requiring off-site disposal will be discovered. However based on the potential hazardous nature of this material and those volumes may exceed 100m^3, as a worst case scenario, the magnitude of this waste is considered to be **High.**

22.56 This material will be sent for treatment pending recovery off-site. The information provided in the baseline information identifies that there is regional capacity for treatment facilities that are likely to be able to receive this waste for disposal. Therefore, the sensitivity is considered to be **Low.**

22.57 On this basis, the pre-mitigation significance is considered to be **Moderate Temporary** based on the impact only lasting for a period the duration of the construction period.

Construction Waste (Main SRFI Site)

22.58 The vast majority of construction waste will be generated by the development of the Main SRFI Site - defined as the construction of industrial buildings (Land Use Class B8), as shown in the Parameters Plan in **Appendix 5.1**. Using waste benchmarking data from BRE **(Ref 22.19)**, the amount of construction waste for this development has been forecast as follows.

Table 22.18 Forecast Construction Waste Arisings (Main SRFI Site)

Zone	Use	Indicative total floor area (sq m)	Average Waste (Tonnes /100m^2)	Forecast Waste Arisings (Tonnes)
1	B8	112,024	12.6	14,115

2	B8	91,890		11,578
3	B8	130,985		16,504
4	B8	118,358		14,913
5	B8 (Rail Connected)	125,179		15,773
5a	B8 (Rail Connected)	86,087		10,847
6	Maintenance Depot	10,960		1,381
6a	Terminal Control Building & Gantry Crane	585		74
			TOTAL	**85,185**
(floor area based on illustrative masterplan (**Appendix 5.2**) so indicative only)				

22.59 Based on the proposed quantum of development and the construction waste benchmark standards, the estimation shows that approximately **85,185 tonnes** of waste may arise over the entire period of the construction works associated with the Main SRFI Site, which could be up to a period of 10 years (2019-2029).

22.60 The composition of the construction waste arisings will be dependent on the construction method employed but the broad categories of waste are anticipated to include the following.

- Contractor Waste
- Excess / out of specification materials
- Packaging
- Waste oil and empty drums
- Waste from spillages
- Miscellaneous Hazardous Waste

Contractor Waste (Main SRFI Site)

22.61 Waste will be created by site contractor staff, particularly from canteen or rest areas. This waste is considered to be similar in composition to municipal waste and is therefore, considered to be non-hazardous.

22.62 Over the course of the construction activity, the quantity of contractor waste on-site at any one time is unlikely to exceed 100m^3, therefore, the magnitude is considered **Medium.**

22.63 Some of this waste is anticipated to be sent for energy recovery or segregation for recycling. However, residual waste will be sent to landfill for disposal. The information provided in the baseline description identifies that there are local and regional facilities available for dealing with this waste, although some will require disposal. Therefore, the sensitivity is **Medium.**

22.64 On this basis, the pre-mitigation significance is considered to be **Moderate Temporary** based on the impact only lasting for the duration of the construction period.

Excess / Out-of-specification materials (Main SRFI Site)

22.65 Excess construction materials can arise where material is ordered in bulk to lower costs, but some material remains unused where more material was ordered than needed. These are waste if discarded.

22.66 Out-of-specification construction materials or damaged materials, which do not comply with technical requirements, are waste when discarded.

22.67 There is likely to be a range of types of excess material, out-of-specification material, or damaged material comprising inert (e.g. concrete, bricks) and non-hazardous material (e.g. wood). The estimated quantity of waste excess construction materials/out-of-specification material on-site at any one time is anticipated to be less than $50m^3$ for non-hazardous material and less than $100m^3$ for inert material. Therefore, the magnitude of this waste is assessed as **Low.**

22.68 The information provided in the baseline section identifies that there are local and regional capacity for facilities that are likely to be able to receive this waste for recycling. Therefore, the sensitivity is considered to be **Low.**

22.69 On this basis, the significance is considered to be **Negligible.**

Packaging waste (Main SRFI Site)

22.70 Equipment and construction materials are usually delivered packed (e.g. wrapped/protected by plastic, secured on pallets, boxed in cardboard etc.).

22.71 Packaging waste will be removed from the site and recycled appropriately. Packaging waste is non-hazardous. The estimated quantity of packaging waste on-site at any one time is anticipated to be less than $50m^3$. Therefore, the magnitude of this waste is **Low.**

22.72 The information provided in the baseline section identifies that there are local and regional capacity for facilities that are likely to be able to receive this waste for recycling. Therefore, the sensitivity is considered to be **Low.**

22.73 On this basis, the significance is considered to be **Negligible.**

Waste oil and empty drums (Main SRFI Site)

22.74 The operation and maintenance of plant equipment is likely to produce small quantities of waste oil and empty drums. These are classified as hazardous waste. It is estimated that less

than 50m^3 of waste oil and empty drums will be created over the course of the construction project. Therefore, the magnitude is **Medium.**

22.75 The information provided in the baseline section identifies that there are local and regional capacity for facilities that are likely to be able to receive this waste for recycling. Therefore, the sensitivity is considered to be **Low.**

22.76 On this basis, the pre-mitigation significance is considered to be **Minor Temporary** based on the impact only lasting for the duration of the construction period.

Waste from spillages (Main SRFI Site)

22.77 The operation of construction plant equipment and the potential for storage of fuel and liquids on-site during construction could lead to spillages. Absorbent material will be used to clean up any spillages of contaminating material (e.g. oil) which would be classified as hazardous waste. The estimated quantity of waste is predicted to be less than 50m^3 over the entire construction period. Therefore, the magnitude is considered **Medium.**

22.78 This material will require disposal off-site. The information provided in the baseline section identifies that there are local and regional facilities available for dealing with this waste, although some will require disposal. Therefore, the sensitivity is **Medium.**

22.79 On this basis, the pre-mitigation significance is considered to be **Moderate Temporary** based on the impact only lasting for the duration of the construction period.

Miscellaneous Hazardous Waste (Main SRFI Site)

22.80 The construction activities are likely to generate relatively small quantities of miscellaneous hazardous wastes, such as sealants, adhesives, resins, solvents, lead acid batteries and other used chemical products. These will be hazardous waste when discarded. It is estimated that less than 50m^3 over the entire construction period would be produced. Therefore, the magnitude is considered **Medium.**

22.81 The information provided in the baseline section identifies that there are local and regional capacity for facilities that are likely to be able to receive this waste for treatment or transfer, although some will require disposal. Therefore, the sensitivity is **Medium.**

22.82 On this basis, the pre-mitigation significance is considered to be **Moderate Temporary** based on the impact only lasting for the duration of the construction period.

J15a and Minor Highway Works

22.83 Based on the scope of highway works proposed, the broad categories of waste associated with the highway works are anticipated to be similar to that generated by construction of the Main SRFI Site as follows:

- Site Clearance and Excavation Waste
- Contractor Waste;

- Excess / out of specification materials;
- Waste oil and empty drums;
- Waste from spillages; and
- Miscellaneous Hazardous Waste

22.84 The highway works will also include the following additional waste types:

- Carriageway planings; and
- Concrete, bricks, metal rebar etc. from existing structures and drainage

22.85 In order to forecast the broad quantum of waste anticipated from the proposed highways works, **Table 22.19** provides a breakdown of the anticipated waste categories and a high level comparative consideration of waste arisings for each of the proposed highways work sites based on a description of the works proposed (eg work on existing roadway – to get indication of planings, work on bare ground to get excavation waste etc) and the planned extent (in hectares).

22.86 It should be noted that no agreed waste benchmarking data is available for highway works and therefore a qualitative assessment of anticipated waste volumes from each of the highways works sites has been undertaken to define the potential magnitude of possible waste impacts. The qualitative assessment is relative so +++ represents the most significant volumes, with ++ less significant, + less significant still and no + representing no significant arisings.

Table 22.19 Qualitative Assessment of Construction Waste Arisings (J15 and Minor Highway Works)

Works	Description	Area	Site Clearance	Excavation waste	Contractor Waste	Excess / out of specification materials	Waste Oil and Empty Drums	Spillages	Miscellaneous Hazardous waste	Carriageway planings	Concrete Bricks, metal rebar etc from existing structures
JUNCTION 1: Junction 16 of the M1 (M1/ A4500 (east to Northampton)/ A45 (west to Daventry)	Provision of traffic signal control; Reconfiguation of road markings to provide three lanes on circulatory carriageway; Widening of northbound and southbound off-slip approaches; and Widening of A45 approach.	4.8	+++	++	++	++	+	+	+	++	++
JUNCTION 12: Junction 15 of the M1 (M1/ A45 (north to Northampton and Wellingborough)/ Saxon Avenue/ A508, Northampton Road (south to Milton Keynes))	Widening of circulatory carriageway to provide three lanes from A45 up to existing M1 bridge	1.8	++	+	+	+				+	+
JUNCTION 3: A4500, Weedon Road (east)/ Tollgate Way/ A4500, Weedon Road (west)/ A5076, Upton Way	Provision of additional lane on A4500 eastbound approach	0.4	+								

JUNCTION 4: A5076/ A5123/ Upton Way Roundabout (Pineham Park) (Dane Camp Way)	Widening and reconfiguration of road markings on Upton Way approach; Reconfiguration of road markings on Danes Camp Way approach and on circulatory carriageway, additional lane on A5123 approach and on circulatory carriageway, and additional lane on Upton Way exit.	1.5	++	+	+	+				+	+
JUNCTION 6: A5076 (west)/ Hunsbury Hill Avenue/ Hunsbarrow Road/ A5076, Danes Camp Way/ Hunsbury Hill Road	Provision of traffic signal control on both A5076 approaches (and circulatory carriageway); Provision of additional lane on both A5076 approaches; Provision of additional lane and merge on both A5076 exits; and Provision of additional lane on both northern and southern circulatory carriageway.	2.3	+++	++	++	++	+	+	+	++	++
JUNCTION 7: Towcester Road/ A5076, Danes Camp Way/ A5123,	Provision of additional lane and merge on Towcester	1.8	+++	++	++	++	+	+	+	++	++

Towcester Road/ Mere Way/ Tesco Access	Road (westbound exit); Provision of additional lane on A5076, Danes Camp Way approach; Provision of local widening and traffic signal control (including on circulatory carriageway) on A5123, Towcester Road approach; Provision of additional lane and merge on Mere Way exit; and Provision of extension to right turn lane on Mere Way approach								
JUNCTION 9: A45 (south)/ Eagle Drive/ A45 (north)/ Caswell Road	Provision of traffic signal control on Caswell Road approach (and circulatory carriageway).	0.2							
JUNCTION 10: A45, Nene Valley Way (south); A428, Bedford Road (west)/ A5095, Rushmere Road/ A45, Nene Valley Way (north)/ A428, Bedford Road (east)	Widening of circulatory carriageway (between A45 (south) and A428 (west) by reducing central island; and Widening A428 (east) approach.	1.6	++	+	+	+		+	+
JUNCTION 11: A45, Nene Valley Way	Reconfiguration of road markings to provide three	0.6							

(south); A43, Lumbertubs Way/ A45, Nene Valley Way (north)/ Ferris Row	lanes on circulatory carriageway										
JUNCTION 14: Tove Roundabout (A43, Towcester Bypass (southwest)/ Towcester Road/ A5, (north)/ A43, (northeast)/ A5, Watling Street (southeast))	Provision of additional lane on A43 (southwest) approach; Widening and reconfiguration of Towcester Road approach and A5 (north) exit; Provision of additional lanes on A5 (north) approach); Widening of carriageway between A5 (north) and A5 (south) to provide additional lane on circulatory carriageway by enlarging central island.	2.6	+++	++	++	++	+	+	+	++	++
JUNCTION 15: Abthorpe Roundabout (Abthorpe Road/ A43, Towcester Bypass (north)/ Brackley Road/ A43, Towcester Bypass (south))	Provision of additional lane on A43 (north) approach; Realignment of A43 (north) and Brackley Road; Reconfiguration of road markings on Brackley Road and circulatory carriageway.	3.5	++	+	+	+				+	+
JUNCTION 19: A5076,	Provision of additional lane	1.8	++	+	+	+				+	+

Upton Way (south)/ Telford Way/ A5076, Upton Way (north)/ Walter Tull Way/ Dustan Mill Lane	on both Upton Way approaches; Provision of additional lane and merge on both Upton Way exits; Widening and reconfiguration of road markings on circulatory carriageway								
JUNCTION 20: A5076, Upton Way (south)/ High Street/ A5076, Upton Way (north)/ Dustan Mill (Stub)	Provision of additional lane on both Upton Way approaches; Provision of additional lane and merge on both Upton Way exits; and Widening and reconfiguration of road markings on circulatory carriageway	1.8	++	+	+	+		+	+
JUNCTION 25: A508, Harborough Road (south)/ A5199, Welford Road/ A508, Harborough Road (north)/ Cranford Road/ Kingsland Avenue	Widening on A5199 approach	0.1	+						

Site Clearance Waste (J15a and Minor Highway Works)

22.87 Site clearance works are likely to include the removal of some vegetation from around the various highways works sites, such as trees, shrubs, branch trimmings, grass, plants and tree cuttings etc. This waste is non-hazardous, and looking at the assessment in **Table 22.19** it is estimated that the total quantity of vegetation may exceed 100m^3, therefore, the magnitude of this waste is **High.**

22.88 The information provided in the baseline description identifies that there are local and regional capacity for composting facilities that are likely to be able to receive this waste. Therefore, the sensitivity is considered to be **Low.**

22.89 On this basis, the pre-mitigation significance is considered to be **Moderate Temporary** based on the impact only lasting for the part of the duration of the construction period**.**

Excavation Waste (J15a and Minor Highways Works)

22.90 The nature of the excavation waste from the highways work is anticipated to be similar to the excavation works from the Main SRFI site, in that it will comprise soil and stones and is anticipated to be largely inert waste. Although due to the nature of the proposed works it is unlikely that all excavated waste will be able to be retained on-site, it is anticipated that where possible it will be retained for use on the highways works or the Main SRFI sites. Therefore, based on the anticipated classification, the assessment of quantities in **Table 22.19**, and the anticipated surplus; the magnitude of this waste is considered to be **Medium.**

22.91 Given that this excess material will be sent for recycling off-site, and that there are local facilities that can manage this waste, the sensitivity is assessed as **Low**.

22.92 On this basis, the significance is considered to be **Minor Temporary** based on the impact only lasting for part of the duration of the construction period.

22.93 As with the Main SRFI site there may be small pockets of contamination on-site due to the previous site history. These are considered separately below.

Contaminated Excavation Waste (J15a and Minor Highways Works)

22.94 No soil contamination assessment of the highways works site has been undertaken, however based on the anticipated lack of historic potentially contaminative land use of the site works areas, it has been assumed that based there is a relatively low potential that contaminated material requiring off-site disposal will be discovered. However as a worst case scenario and based on a potential hazardous classification of some excavated material potentially exceeding 100m^3, a magnitude of **High** has been defined.

22.95 This material will be sent for treatment pending recovery off-site. The information provided in the baseline information identifies that there is regional capacity for treatment facilities that are likely to be able to receive this waste for disposal. Therefore, the sensitivity is considered to be **Low.**

22.96 On this basis, the pre-mitigation significance is considered to be **Moderate Temporary** based on the impact only lasting for a period the duration of the construction period.

Contractor Waste (J15a and Other Highway Works)

22.97 Given the anticipated extent and duration of the highways works, the quantity of contractor waste on-site at any one time is unlikely to exceed $50m^3$, therefore, the magnitude is considered **Low.**

22.98 Some of this waste is anticipated to be sent for energy recovery or segregation for recycling. However, residual waste will be sent to landfill. The information provided in the baseline description identifies that there are local and regional facilities available for dealing with this waste, although some will require disposal. Therefore, the sensitivity is **Medium.**

22.99 On this basis, the pre-mitigation significance is considered to be **Minor Temporary** based on the impact only lasting for the duration of the construction period**.**

Excess / Out-of-specification materials (J15a and Minor Highway Works)

22.100 For the highway works, the estimated quantity of waste excess construction materials/out-of-specification material is anticipated to be less than less than $50m^3$ for non-hazardous material and less than $100m^3$ for inert material. Therefore, the magnitude of this waste is assessed as **Low.**

22.101 The information provided in the baseline section identifies that there are local and regional capacity for facilities that are likely to be able to receive this waste for recycling. Therefore, the sensitivity is considered to be **Low.**

22.102 On this basis, the significance is considered to be **Negligible.**

Packaging waste (J15a and Minor Highway Works)

22.103 Given anticipated construction methodology and the anticipated bulk type materials used packaging waste for highway works is not considered significant.

Waste oil and empty drums (J15a and Minor Highway Works)

22.104 The operation and maintenance of plant equipment is likely to produce small quantities of waste oil and empty drums. These are classified as hazardous waste. Given the anticipated extent and duration of the highways works, it is estimated that less than $10m^3$ of waste oil and empty drums will be created over the course of the construction project. Therefore, the magnitude is **Low.**

22.105 The information provided in the baseline section identifies that there are local and regional capacity for facilities that are likely to be able to receive this waste for recycling. Therefore, the sensitivity is considered to be **Low.**

22.106 On this basis, the significance is considered to be **Negligible.**

Waste from spillages (J15a and Minor Highway Works)

22.107 Given the anticipated extent and duration of the proposed highway works, the estimated quantity of waste from spillages is predicted to be less than $10m^3$ over the entire construction period. Therefore, the magnitude is considered **Low.**

22.108 This material will require disposal off-site. The information provided in the baseline section identifies that there are local and regional facilities available for dealing with this waste, although some will require disposal. Therefore, the sensitivity is **Medium.**

22.109 On this basis, the pre-mitigation significance is considered to be **Minor Temporary** based on the impact only lasting for the duration of the construction period**.**

Miscellaneous Hazardous Waste (J15a and Minor Highway Works)

22.110 It is estimated that less than 10m^3 of miscellaneous hazardous waste will be created over the course of the construction project. Therefore, the magnitude is **Low.**

22.111 The information provided in the baseline section identifies that there are local and regional capacity for facilities that are likely to be able to receive this waste for treatment or transfer, although some will require disposal. Therefore, the sensitivity is **Medium.**

22.112 On this basis, the pre-mitigation significance is considered to be **Minor Temporary** based on the impact only lasting for the duration of the construction period.

Carriageway Planings (J15a and Minor Highway Works)

22.113 Waste tar-bound road planings are considered to be hazardous waste (European Waste Code 17 03 01* bituminous mixtures containing coal tar) where the level of coal tar is >0.1% w/w (1,000 mg/kg). Even when treated, normally by using a binding agent, they are still considered to be hazardous waste and their subsequent use in construction requires an environmental permit to be registered with the Environment Agency.

22.114 No information is currently available regarding the potential presence of tar-bound material within the proposed highway works area. The waste management option for this waste stream will be dependent on the potential volume of arisings, with the potential for re-use within the project under environmental permit being one such option. Given the extent of the works area in relation to the existing highways (which might contain tar bound material) and based on a worst case scenario that there is minimal re-use of this material it is estimated that up to 50m^3 of this hazardous waste will be created at any one time . Therefore, the magnitude is considered to be **Medium.**

22.115 The information provided in the baseline section identifies that there are local and regional capacity for facilities that are likely to be able to receive this waste for treatment or transfer, although some will require disposal. Therefore, the sensitivity is **Medium.**

22.116 On this basis, the pre-mitigation significance is considered to be **Moderate Temporary** based on the impact only lasting for the duration of the construction period

Concrete, bricks, metal rebar etc. from existing structures and drainage (J15a and Minor Highway Works)

22.117 No detailed information is available regarding the amount of existing highways infrastructure that will need to be redeveloped as part of this development; however It is anticipated that most of this waste will be classified as inert. Given the extent of the works area in relation to the existing highways it is estimated that less than 1000m^3 of this waste will be generated during the highway works and therefore the potential magnitude of this waste is **Low.**

22.118 The information provided in the baseline section identifies that there are local and regional capacity for facilities that are likely to be able to receive this waste for treatment or transfer. Therefore, the sensitivity is considered to be **Low.**

22.119 On this basis, the significance is considered to be **Negligible**

Assessment of Operational Phase Effects

22.120 For the purposes of this assessment operational waste is assumed to arise from the Main SRFI Site as follows:

- The train maintenance depot - expected to generate predominantly industrial type wastes; and,
- The rail served logistics developments - expected to generate predominantly commercial type waste.

22.121 J15a and minor highways works may generate operational waste, based on waste generated from additional vehicles using the roadways as a result of the Proposed Development (driver waste, vehicle end of life waste, vehicle maintenance waste etc) and also waste from maintaining the roads. However the highways works are being done to ensure the Main SRFI Site can operate safely and traffic proposed to use the site would otherwise use the road network as it exists at present. Therefore the Highway Works are not anticipated to generate significant quantities of operational waste when compared to an existing baseline scenario.

Waste from Site Operatives (Main SRFI Site)

22.122 Waste will be created by site staff, particularly from canteen or rest areas. This waste is considered to be similar in composition to municipal waste and is therefore, considered to be non-hazardous.

22.123 The likely volume of data is difficult to forecast however an estimate has been based derived from British Standard 5906:2005 Waste Management in Buildings - Code of Practice **(Ref 22.20).**

22.124 According to BS5906:2005, the weekly waste arisings for an industrial unit is equal to 5 litres per m^2 of floor area. Therefore the anticipated weekly waste arisings for the development are as follows.

Table 22.20 Forecast Operational Waste Arisings (Main SRFI Site)

Zone	Use	Indicative Total floor area (sq m)	Weekly Waste ((l /m^2)	Forecast Waste Arisings **(Litres)**
1	B8	112,024	5	560,120
2	B8	91,890		459,450
3	B8	130,985		654,925
4	B8	118,358		591,790
5	B8 (Rail Connected)	125,179		625,895
5a	B8 (Rail Connected)	86,087		430,435
6	Maintenance Depot	10,960		54,800
6a	Terminal Control Building & Gantry Crane	585		2,925

	TOTAL	**3,380,340 Litres =3,380m^3**
(floor area based on illustrative masterplan (**Appendix 5.2**) so indicative only)		

22.125 Over the course of the operational phase of the development activity, the quantity of non-hazardous waste on-site at any one time is likely to exceed 100m^3, therefore, the magnitude is considered **High.**

22.126 Some of this waste is anticipated to be sent for energy recovery or segregation for recycling. However, residual waste will be sent to landfill. The information provided in the baseline section identifies that there are local and regional facilities available for dealing with this waste; therefore, the sensitivity is **Medium.**

22.127 On this basis, the pre-mitigation significance is considered to be **Major** and **long term** for the life of the development.

Waste Oil and Empty Drums (Main SRFI Site)

22.128 The operation and maintenance of equipment at the train maintenance depot is likely to produce quantities of waste oil and empty drums. These are classified as hazardous waste. It is not clear at this stage what volumes of this type of waste the operation of the development is likely to produce and although the volume of this material would be appropriately managed, the quantity on-site at any one time may exceed 50m^3., and therefore as a potential worst case scenario, the magnitude is assessed as **High.**

22.129 The information provided in the Baseline section identifies that there are local and regional capacity for facilities that are likely to be able to receive this waste for recycling. Therefore, the sensitivity is considered to be **Low.**

22.130 On this basis, the pre-mitigation significance is considered to be **Moderate** and **long term** for the life of the development.

Miscellaneous Hazardous Waste

22.131 The proposed operation activities from both the train maintenance depot and logistics development are likely to generate quantities of miscellaneous hazardous wastes, such as sealants, adhesives, resins, solvents, paints and other used chemical products. These will be hazardous waste when discarded. It is not clear at this stage what volumes of this type of waste the operation of the development is likely to produce and although the volume of this material would be appropriately managed, the quantity on-site at any one time may exceed 50m^3., and therefore as a potential worst case scenario, the magnitude is assessed as **High.**

22.132 The information provided in the baseline section identifies that there are local and regional capacity for facilities that are likely to be able to receive this waste for treatment or transfer, although some will require disposal. Therefore, the sensitivity is **Medium**

22.133 On this basis, the pre-mitigation significance is considered to be **Major** and **long term** for the life of the development.

Assessment of Decommissioning Phase Effects

22.134 Decommissioning phase effects are the effects resulting from the activities associated with the removal of the Proposed Development once it is no longer required.

22.135 It is not known when there will no longer be a need for the Proposed Development and some elements of the development may not be decommissioned for many years. The design life of the warehousing buildings will be in the order of 60+ years (approximately), and the rail infrastructure and civil engineering works will be significantly longer than this. Once the warehouses reach their design life, it is entirely feasible that they will be re-provided in a modern form. Should that occur it would be subject to its own assessment of effects at the relevant time.

22.136 Predicting the baseline so far into the future to enable a meaningful assessment of the sensitivity of the environment, and the significance of effects from the decommissioning of the Proposed Development is extremely difficult.

22.137 When and if the development is decommissioned, the appropriate environmental assessments will be undertaken to identify any significant environmental effects and propose suitable mitigation methods. Notwithstanding this, we have taken the view that it is likely that the effects will be similar to those experienced during the construction phase assuming similar mitigation methods are employed and with appropriate or improved waste management facilities available.

Cumulative Effects

Cumulative Assessment: Intra-Project Effects

22.138 Intra-project cumulative effects are those that might arise between the different environmental topics being assessed in the EIA.

22.139 The following Chapters have been identified as topics which may share linkages with issues related to waste management

- Interaction with soil conditions or contamination (**Chapter 13: Ground Conditions**) with respect to the waste classification of excavated material and suitability for re-use.

- Interaction with the transportation requirements identified for the development (**Chapter 19 Highways and Transportation**) with respect to the potential movements of waste off-site

Cumulative Assessment: Inter-project cumulative effects

22.140 Inter-project cumulative effects are those that might arise as a result of the Proposed Development interacting with other developments projects in the vicinity.

22.141 The long-list of projects provided as **Appendix 7.1** includes projects located within the wider surrounding area and was undertaken to assess potential cumulative effects of the Proposed Development. The Northampton Gateway and grid connection for this Proposed Development will be of particular relevance given their proximity to the Potential Development Area, timescales and likely similar nature of waste to be produced.

Cumulative Effects from Construction Waste

22.142 There is not anticipated to be any significant identifiable cumulative effects with respect to the production of construction waste, based on the following assumptions.

- The Local Assessment of Waste Management Needs document (2013) (**Ref 22.14**) forecasts a 'no growth' scenario in Northamptonshire. The no net growth scenario reflects in part the impact of the landfill tax and the Aggregates Levy, which will encourage the re-use of construction and demolition waste on-site in order to avoid additional disposal and raw material costs;
-
- That the projection, of 1.35 Mt of CD&E waste arisings being produced for Northamptonshire by the end of the Northamptonshire County Council Minerals and Waste Local Plan period plan in 2031, has included for anticipated growth and development which makes an allowance for the potential development projects identified in the cumulative assessment.
-
- All planned and consented schemes in the surrounding area of the proposed development would generate waste. It is reasonable to assume that these schemes will be required to follow the requirements of the local and national legislation and waste planning, including the maximisation of re-use and recycling of CD&E wastes through a SWMP and meeting targets for recycling of waste. Therefore, collectively, these developments are unlikely to significantly deplete the existing and planned waste capacity of Northamptonshire.

22.143 Therefore overall, the cumulative effects from neighbouring developments and those from the production of waste during the construction phases of the proposed development are considered to be of **Negligible** significance.

Cumulative Effects from Operational Waste

22.144 The proposed mitigation measures will ensure that the waste hierarchy (prevention, preparation for re-use, recycling, other recovery and disposal) and disposal to one of the nearest appropriate facilities are observed wherever practical and commercially viable. It is reasonable to conclude that other schemes would effectively mitigate the impact of their waste arising during their operation.

22.145 Given the current and predicted waste production levels within Northamptonshire, it is reasonable to anticipate that there shall be suitable capacity to effectively manage the wastes associated with all current and proposed schemes.

22.146 Overall, the cumulative effects from neighbouring developments and those from the production of waste during the operational phases of the proposed development are considered to be of **Minor Adverse** significance.

Adaptive Mitigation

Mitigation of Construction Phase Effects

Site Clearance Waste (All Development within Order Limits)

22.147 It is unlikely that the amount of biodegradable material produced can be reduced; however, it can be effectively managed by being retained on-site for use as mulch or sent for recycling at a local composting facility. None of this material is anticipated to require landfill disposal. The vegetation will be removed from site progressively, i.e. the entirety of the anticipated vegetation will not be stockpiled before removal, to avoid on-site biodegradation of the material, which could lead to odours. This will also ensure that the amount of vegetation stored on-site pending off-site recycling is kept to a minimum. This material is likely to be recycled at a composing facility within the region and is therefore being managed at the highest option in accordance with the waste hierarchy; this will be via adherence to the SWMP which is to be secured as a requirement of the proposed DCO process.

22.148 Therefore post mitigation the magnitude of this impact is expected to be reduced from **High** to **Medium**. The residual significance following successful implementation of mitigation advice, as presented above, is predicted to be **Minor** (and **Not Significant** in terms of the EIA Regulations).

Excavation Waste (All Development within Order Limits)

22.149 The CL:AIRE Definition of Waste: Development Industry Code of Practice (the CoP) (**Ref 22.21**) is anticipated to provide the regulatory framework for the re-use of the excavated material, assuming that no further treatment is required, Use of the COP will mitigate the potential impact from disposal of excavated waste, where possible from both the Main SRFI Site and J15a / Minor Highway Works Sites. Use of the COP will be mandated in the SWMP (to be secured as a requirement of the proposed DCO process).

22.150 The CoP is supported by the Environment Agency. It sets out the principles for achieving a non-waste status by setting a risk-based approach to re-use. The CoP is subject to self-regulation, via the use of an independent assessment by a Qualified Person.

22.151 The scope of the CoP provides a set of principles to determine that the excavated material ceases to be waste when it is used within a development if:

- The proposed use of the material must not cause any harm to human health or the environment;

  A risk assessment for the specific end use is required following the principles defined in Model Procedures for the Management of Land Contamination, Environment Agency, 2004 (Contaminated land report 11, 'CLR11') **(Ref 22.22)**. This will find out whether any contaminants from anthropogenic and/or natural sources present an unacceptable level of risk to human health, controlled waters, ecosystems and/or the built environment, based on the available pathways and receptors. If the level of risk is unacceptable after treatment, the CoP cannot apply to the material, therefore, it will be a waste and an environmental permit will be required for reusing the material.

- The excavated material is suitable for its proposed use;

This will take into account the chemical and geotechnical requirements of the material in relation to a specification defined for their end use.

- The excavated material must not require further treatment prior to use;

  The material must be suitable for use in all respects without treatment. If it requires treatment, it is waste. However, it can be deemed a non-waste after treatment if it is suitable for use.

- The use of the excavated material is certain;

  The holder must be able to demonstrate that all of the material will be used and that use is a certainty, not a probability. The use of the excavated material must form part of the detailed design, so it can be clearly identified where in the scheme the material will be used; and how much will be used. The movement of the excavated material to final use must be clearly identified. This requires a Materials Management Plan (as part of the COP) to be prepared to show how and where all materials on the ground are to be dealt with. A tracking system must be defined to cover any waste/material movements and also contingency measures must be defined, i.e. who takes responsibility for and what happens in the event that the material is not suitable for use.

- Only a sufficient quantity of material will be used.

  The material must be destined for a defined purpose, which is defined in the scheme design. The quantity of material required for that purpose must be known prior to construction. If excess material is deposited to undertake that purpose this is an indication that it is being discarded and it will be considered to be waste.

22.152 The benefit of the CoP is that an environmental permit is not required where the principles can be met.

22.153 The proposal that the excavated material is used on-site as an engineering material, as part of the construction of the Proposed Development, would be considered a justifiable option under the waste hierarchy, because the retention of the material on-site would prevent emissions as a consequence of removal from the site. Furthermore, the proposal to use the material on-site as an engineering material achieves the preparation of product, which is not waste, that meets a defined specification; and has the added benefit of embracing the proximity principle by being used at the site where it came from.

22.154 As a worst-case scenario, it is anticipated that some excavated material will not be suitable for use, due to chemical or geotechnical properties and would not be suitable to be dealt with via waste exemption or environmental permit and therefore will be removed from site. There are facilities that can recycle the remaining waste. The information provided in the baseline section identifies that there are local and Regional aggregate recycling facilities that are likely to be able to receive this waste.

22.155 The use of the CoP will reduce the quantity waste being managed, because if the principles of the CoP are followed, the excavated material is not waste when used. Therefore, the magnitude of any residual waste would be reduced to **Low** which together with a **Low** sensitivity would reduce the significance of this impact to **Negligible** (and **Not Significant** in terms of the EIA Regulations) following successful implementation of mitigation advice, as presented above**.**

Contaminated Excavation Waste (All Development within Order Limits)

22.156 Excavated material would be tested to identify the appropriate waste classification.

22.157 Contaminated excavation waste will be stockpiled separately from other non-hazardous waste material to avoid cross-contamination. It will either be stored in covered skips or under covered stockpiles to prevent pollution from run-off.

22.158 This material will be removed from site as soon as possible to reduce stockpiling. The material would be sampled and tested to determine whether each container or stockpile should be classified as hazardous waste or non-hazardous waste. The contaminated material should be sent to a soil treatment facility, where it has the potential to be recovered into a saleable product.

22.159 Based on the sampling assessment and test data already undertaken for the development area, it has been assumed that there will not be a significant amount of excavation waste that cannot be re-used on-site. From the material that cannot be re-used it is further assumed that the majority of this material will be suitable for soil treatment and recycling; with a minor amount potentially requiring to be landfilled.

22.160 Where the material is classified as hazardous and is required to be landfilled, further testing will be carried out to ensure that it meets the Hazardous Waste Acceptance Criteria (WAC).

22.161 Sending contaminated excavated material to a soil treatment facility with a view to recycling promotes the waste hierarchy. The information provided in the baseline section identifies that there are Regional facilities available for treating this waste. Following successful implementation of the mitigation actions identified above, it is considered that the magnitude of any residual impact would reduce to **Medium** which together with a **Low** sensitivity would reduce the significance of this impact to **Minor Temporary** (and **Not Significant** in terms of the EIA Regulations).

Construction Waste (All Development within Order Limits)

Contractor Waste

22.162 For the remaining waste material, this material will be segregated into dry-recyclable streams (e.g. paper, plastic bottles and metal cans). All receptacles for contractor waste would be clearly labelled and have lids to prevent wind-blown litter. Frequent collections of waste would be arranged to ensure that quantities on-site are not retained on-site for long periods to reduce scavengers and vermin.

22.163 The remaining residual waste would be sent for energy recovery where possible, however, it is likely that some will be landfilled.

22.164 The most effective mitigation solution for managing waste as a consequence of site contractors is to introduce a policy to require them to take responsibility for their own

waste. This is likely to reduce the potential impact of the contractor waste produced and can be secured via contractual obligations.

22.165 The mitigation measures are anticipated to significantly reduce the amount of contractor waste on-site at any one time; and increase the amount that will be recycled. Therefore following successful implementation of the mitigation actions identified above, it is considered that the magnitude of any residual impact would reduce to **Low** which together with a **Medium** sensitivity would reduce the significance of this impact to **Minor Temporary** (and **Not Significant** in terms of the EIA Regulations).

Excess / Out-of-specification materials

22.166 Timely procurement and buying the required amount of material will ensure that the right amount of material is delivered at the time when it is needed. This will prevent waste generated as a result of bulk purchasing.

22.167 All perishable materials would be stored so that they are protected from the local climate.

22.168 All damaged or off-specification material would be returned back to the supplier where possible, which will reduce the amount of wastage.

22.169 The mitigation measures are anticipated to significantly reduce the amount of operational waste on-site at any one time. Therefore following successful implementation of the mitigation actions identified above, it is considered that the magnitude of any residual impact would reduce to **Low** which together with a **Medium** sensitivity would reduce the significance of this impact to **Minor Temporary** (and **Not Significant** in terms of the EIA Regulations).

Packaging waste

22.170 To minimise the impacts of packaging, suppliers would be required to take back any packaging associated with their products. This will assist the suppliers in fulfilling their own obligations under The Producer Responsibility Obligations (Packaging Waste) Regulations 2007 SI 2007 No. 871 (as amended) (**Ref 22.23**).

22.171 Packaging materials that cannot be returned would be kept for on-site use (e.g. use of pallets for storage).

22.172 Any residual packing that cannot be used on-site will be segregated into distinct dry recyclable waste streams and sent for recycling off-site. No waste packaging will be landfilled

22.173 The mitigation measures are anticipated to significantly reduce the amount of packaging waste sent off-site. The residual impact following successful implementation of mitigation advice, as presented above, is predicted to continue to be **Negligible** and therefore **Not Significant** in terms of the EIA Regulations.

Waste oil and empty drums

22.174 Empty fuel or oil drums would be retained for re-use on-site. Those that cannot be retained will be sent to a drum reconditioning facility to enable the material to be prepared for re-use. Damaged drums will be sent for recycling.

22.175 The mitigation measures are anticipated to maximise waste managed at the highest waste hierarchical option and reduce the amount of operational waste sent off-site. Therefore

following successful implementation of the mitigation actions identified above, it is considered that the magnitude of any residual impact would reduce to **Low** which together with a **Low** sensitivity would reduce the significance of this impact to **Negligible** (and **Not Significant** in terms of the EIA Regulations).

Waste from spillages

22.176 The use of an active maintenance regime on plant and equipment will reduce the potential for machinery to cause leaks. Valves, stopcocks and pipes will be regularly checked for leakages. Fuelling activities will be carried out in bunded areas, or off-site.

22.177 The storage of fuels and liquids will be in accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001 (**Ref 22.24**).

22.178 Ensuring compliance with the regulations will act as mitigation against leaks and will reduce the potential for leakages, therefore reducing the volume of absorbent required to clean up spillages. Therefore following successful implementation of the mitigation actions identified above, it is considered that the magnitude of any residual impact would reduce to **Low** which together with a **Medium** sensitivity would reduce the significance of this impact to **Minor Temporary** (and **Not Significant** in terms of the EIA Regulations).

22.179 The residual impact following successful implementation of mitigation advice, as presented above, is predicted to be **Negligible** (and **Not Significant** in terms of the EIA Regulations).

Miscellaneous Hazardous Waste

22.180 Ensure secure storage of Hazardous materials will be stored securely, away from non-hazardous or incompatible materials. Small items of hazardous waste will be prevented from being disposed of in general waste skips to avoid contamination.

22.181 Frequent collection of hazardous material will be undertaken to ensure total volume on-site at any one time is minimised.

22.182 Therefore following successful implementation of the mitigation actions identified above, it is considered that the magnitude of any residual impact would reduce to **Low** which together with a **Medium** sensitivity would reduce the significance of this impact to **Minor Temporary** (and **Not Significant** in terms of the EIA Regulations).

Carriageway Planings (Highway works)

22.183 Given the potential hazardous nature of tar bound road planings, samples from the roadways identified within the Highway Works area will be taken and tested for coal tar content to establish waste classification prior to extensive excavation.

22.184 In this way either the design of works can be altered to minimise the requirement to generate waste road planings if coal tar is identified or appropriate site based re-processing and treatment under and Environmental permit can be included in the works if required.

22.185 As per the mitigation of the other types of hazardous waste, storage will be secure and situated away for non- hazardous waste materials to avoid contamination.

22.186 Therefore following successful implementation of the mitigation actions identified above, it is considered that the magnitude of any residual impact would reduce to **Low** which together

with a **Medium** sensitivity would reduce the significance of this impact to **Minor Temporary** (and **Not Significant** in terms of the EIA Regulations).

Concrete, bricks, metal rebar etc. from existing structures and drainage (Highway works)

22.187 Existing structures associated with the Highways works that may require demolition and renewal may generate concrete, bricks and metal that may be classified as a waste. It is anticipated that the works will re-process and recycle the majority of this material, either on-site as low grade infill across the development or will be recycled off-site for use as a resource on other developments.

22.188 The residual impact following successful implementation of mitigation advice, as presented above, is predicted to continue to be **Negligible** and therefore **Not Significant** in terms of the EIA Regulations.

Mitigation of Operational Phase Effects

22.189 For the purposes of clarity the assessment of mitigation of operational effects have included the embedded mitigation already detailed previously to demonstrate how the principles of regulatory waste management will reduce potential impacts.

Waste from site operatives

22.190 For the remaining waste material, this material will be segregated into dry-recyclable streams (e.g. paper, plastic bottles and metal cans). All receptacles for contractor waste would be clearly labelled and have lids to prevent wind-blown litter. Frequent collections of waste would be arranged to ensure that quantities on-site are kept to a minimum and waste is not retained on-site for long periods.

22.191 The remaining residual waste would be sent for energy recovery where possible, however, it is likely that a small portion will be landfilled.

22.192 The mitigation measures are anticipated to significantly reduce the amount of operational waste on-site at any one time; and increase the amount that will be recycled. Therefore following successful implementation of the mitigation actions identified above, it is considered that the magnitude of any residual impact would reduce to **Medium** which together with a reduction in sensitivity over the long term as more opportunities for recycling become available, to **Low** would reduce the significance of this impact to **Minor Long Term** (and **Not Significant** in terms of the EIA Regulations).

Waste oil and empty drums

22.193 Empty fuel or oil drums would be retained for re-use on-site. Those that cannot be retained will be sent to a drum reconditioning facility to enable the material to be prepared for re-use. Damaged drums will be sent for recycling.

22.194 The mitigation measures are anticipated to maximise waste managed at the highest waste hierarchical option and reduce the amount of operational waste sent off-site. Therefore following successful implementation of the mitigation actions identified above, it is considered that the magnitude of any residual impact would reduce to **Medium** which together with a continuing **Low** sensitivity would reduce the significance of this impact to **Minor Long Term** (and **Not Significant** in terms of the EIA Regulations.

Miscellaneous Hazardous Waste

22.195 Hazardous materials will be stored securely, away from non-hazardous or incompatible materials. Small items of hazardous waste will be prevented from being disposed of in general waste skips to avoid contamination.

22.196 Frequent collection of hazardous material will be undertaken to ensure the total volume on-site at any one time is as low as possible.

22.197 Therefore following successful implementation of the mitigation actions identified above, it is considered that the magnitude of any residual impact would reduce to **Medium** which together with a reduction in sensitivity over the long term as more opportunities for treatment become available, to **Low** would reduce the significance of this impact to **Minor Long Term** (and **Not Significant** in terms of the EIA Regulations).

Residual Effects

22.198 Following the implementation of mitigation measures detailed above, either during construction or during operation, it is anticipated that all identified waste impacts will be reduced to negligible.

22.199 **Table 22.21** summarises the mitigation measures and residual risk magnitude for those linkages which were originally assessed as minor significance or greater.

Table 22.21: Summary of Residual Effects

Description of Impact	Significance of Effect	Possible Mitigation Measures	Residual Effect
CONSTRUCTION PHASE			
Main SRFI Site			
Site Clearance – Vegetation	Moderate Temporary	Retained on-site for use as mulch; or sent for recycling at a local composting facility. No landfilling. Vegetation removed from site progressively, i.e. the entirety of the anticipated vegetation will not be stockpiled before removal	Minor
Excavation Material	Negligible (given embedded mitigation)	Cut and fill balance designed to produce no surplus (see proposed Earthworks Strategy in **Chapter 5 Appendix 5.3**) Use of CLAIRE Code of Practice (COP) **(Ref 22.21)** to use excavated material in the development	Negligible
Contaminated Excavation Material	Moderate Temporary	Use of CLAIRE COP **(Ref 22.21)** Off-site soil treatment facility	Minor Temporary
Contractor Waste	Moderate Temporary	Segregation into dry-recyclable streams (e.g. paper, plastic bottles and metal cans). All receptacles for contractor waste clearly labelled with lids to prevent wind-blown litter.	Minor Temporary

		Frequent collections of waste to ensure that quantities are not retained on-site for long periods Contractor waste take home policy	
Excess / Out of Specification Waste	Negligible	Timely procurement and buying the required amount of material. Perishable materials stored so that they are protected from the local climate. All damaged or off-specification material returned to supplier where possible,	Negligible
Packaging Waste	Negligible	Suppliers required to take back any packaging associated with their products. Re-use on-site Segregation into dry recyclable streams	Negligible
Waste Oil & Empty Drums	Minor Temporary	Empty fuel or oil drums retained for re-use on-site. Those that cannot be retained sent to a drum reconditioning facility to be prepared for re-use. Damaged drums sent for recycling.	Negligible
Waste from Spillages	Moderate Temporary	Use of an active maintenance regime on plant and equipment to reduce potential for leaks. Valves, stopcocks and pipes regularly checked for leakages. Fuelling activities carried out in bunded areas, or off-site. The storage of fuels and liquids will be in accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001 **(Ref 22.24)**	Minor Temporary
Miscellaneous Hazardous Waste	Moderate Temporary	Hazardous materials stored securely, away from non-hazardous or incompatible materials. Small items of hazardous waste not disposed of in general waste skips to avoid contamination. Frequent collection of hazardous material to minimise total volume on-site at any one time.	Minor Temporary
J15a / Minor Highway Works			
Site Clearance – Vegetation	Moderate Temporary	Sent for recycling at a local composting facility. No landfilling. Vegetation removed from site progressively, i.e. the entirety of the anticipated vegetation will not be stockpiled before removal	Minor Temporary
Excavation Material	Minor Temporary	Use of CLAIRE Code of Practice (COP) **(Ref 22.21)** to use excavated material in the development	Negligible

Contaminated Excavation Material	Moderate Temporary	Use of CLAIRE COP **(Ref 22.21)** Off-site soil treatment facility	Minor Temporary
Contractor Waste	Minor Temporary	Segregation into dry-recyclable streams (e.g. paper, plastic bottles and metal cans). All receptacles for contractor waste clearly labelled with lids to prevent wind-blown litter. Frequent collections of waste to ensure that quantities are not retained on-site for long periods Contractor waste take home policy	Negligible
Excess / Out of Specification Waste	Negligible	Timely procurement and buying the required amount of material. Perishable materials stored so that they are protected from the local climate. All damaged or off-specification material returned to the supplier where possible.	Negligible
Waste Oil & Empty Drums	Negligible	Empty fuel or oil drums retained for re-use on-site. Those that cannot be retained sent to be prepared for re-use. Damaged drums will be sent for recycling.	Negligible
Waste from Spillages	Minor Temporary	Active maintenance regime on plant and equipment to reduce potential for leaks. Valves, stopcocks and pipes regularly checked for leakages. Fuelling activities carried out in bunded areas, or off-site. Storage of fuels and liquids in accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001 (**Ref 22.24)**	Negligible
Miscellaneous Hazardous Waste	Minor Temporary	Hazardous materials stored securely, away from non-hazardous or incompatible materials. Small items of hazardous waste not disposed of in general waste skips to avoid contamination. Frequent collection of hazardous material to minimise total volume on-site at any one time.	Negligible
Carriageway Planings	Moderate Temporary	Upfront testing of any suspect material Mitigation measures as per other hazardous materials Onsite Treatment and re-use of material under an Environmental Permit is excavated volumes significant	Minor Temporary

Concrete, bricks, metal rebar etc. from existing structures and drainage	Negligible	Anticipated that the majority of this material re-processed and recycled, either on-site as low grade infill across the development or off-site for use as a resource on other developments	Negligible
OPERATIONAL WASTE			
Waste from Site Operatives	Major Long Term	Segregation into dry-recyclable streams (e.g. paper, plastic bottles and metal cans). All receptacles for operational waste clearly labelled with lids to prevent wind-blown litter. Frequent collections of waste to ensure that quantities are not retained on-site for long periods	Minor Adverse Long Term
Waste Oil and Empty Drums	Moderate Long Term	Empty fuel or oil drums retained for re-use on-site. Those that cannot be retained sent to a drum reconditioning facility to be prepared for re-use. Damaged drums sent for recycling.	Minor Adverse Long Term
Miscellaneous Hazardous Waste	Major Long Term	Hazardous materials stored securely, away from non-hazardous or incompatible materials. Small items of hazardous waste not disposed of in general waste skips to avoid contamination. Frequent collection of hazardous material to minimise total volume on-site at any one time.	Minor Adverse Long Term

Monitoring

Construction Waste (All Development within Order Limits)

22.200 Appropriate targets will be set within the SWMP in relation to the minimisation and recycling of any construction waste materials to be agreed at inaugural meetings of the project team. Suitable material specific targets for recovery (re-use or recycling) can then be set.

Table 22.22 Standard, Good and Best Practice Recovery Rates by material (WRAP ref 22.25)

Material	Standard Recovery %	Good Practice Recovery (Quick /win) %	Best Practice Recovery %
Timber	57	90	95
Metals	95	100	100
Plasterboard	30	90	95
Packaging	60	85	95
Ceramics	75	85	100

Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95
Miscellaneous	12	50	75
Electrical Equipment	Limited Information	70*	95
Furniture	0-15	25	50
Insulation	12	50	75
Cement	Limited information	75	95
Liquids and Oils	100	100	100
Hazardous	50	Limited information **	Limited information**

* This is required recovery target for the type of Waste Electrical and Electronic Equipment (WEEE) likely to be produced from construction-sites, e.g. lighting (the WEEE Regulations)

**This cannot be 100%as most hazardous waste streams (e.g. asbestos) must be landfilled.

22.201 To ensure that the system of waste minimisation re-use and recycling is effective, setting of on-site waste targets for the proposed development should be included within agreements with the proposed Principal Contractor.

22.202 A suitable programme of monitoring of these targets should also be put in place to:

- Quantify raw material wastage;
- Quantify the generation of each waste stream;
- Record any improvements in current working practices;
- Record the methods by which the waste streams are being handled and stored; and
- Record the available waste disposal routes used.

22.203 Specific waste quantification and monitoring will be undertaken through the **SWMP;** a version of which has been included as a DCO document supporting the S42 consultation.

Operational Waste

22.204 MJonitoring of operational waste from the activities of the Main SRFI Site will be the responsibility of the individual operators. However, it is assumed that monitoring will include the following;

- Compliance assessment to ensure all waste generated by the individual operators is subject to appropriate management and controls as required by the relevant waste legislation and that each of the organisations are complying with their waste 'duty of care'. Operational targets for waste minimisation, re-use or

recycling. Specifically as the operations on the site continue a zero waste landfill management target might be considered.

Limitations and Assumptions

Construction and Decommissioning

22.205 The analysis of the construction waste generation from the Proposed Development, and the proposed waste management mitigation has been devised based on the best understanding of the anticipated construction methods and programme.

22.206 Any significant changes of the works activities, subsequent waste generation from the project, and the proposed waste management mitigation may affect the scope, extent and result of the assessment

Operation

22.207 Similarly, the estimation of the waste generated from the operational phase of the development is based the best understanding of the operational activities planned within the agreed quantum of development for the various land use classes. The estimation is based on benchmarking data commonly in use for waste management planning (**Ref 22.20**).

References

22.1 Revised Waste Framework Directive (rWFD) (2008/98/EC)

22.2 Landfill Directive (1999/31/EC)

22.3 National Policy Statement for National Networks (NN NPS)

22.4 Environmental Protection Act (EPA) 1990

22.5 Waste (England & Wales) Regulations 2011 (as amended) (SI 2011 No. 988)

22.6 Environmental Permitting Regulations 2016 (SI 2016 No. 1154)

22.7 Hazardous Waste (England & Wales) (as amended) Regulations 2005 (SI 2005 No. 894)

22.8 National Planning Policy for Waste (October 2014)

22.9 Waste Management Plan for England (WMPE) (2013)

22.10 Northamptonshire Joint Municipal Waste Management Strategy (JMWMS) (2012)

22.11 East Midlands Regional Waste Strategy (2006)

22.12 Northamptonshire Minerals and Waste Local Plan (2017)

22.13 https://www.gov.uk/government/statistics/waste-management-for-england-2015 - Accessed June 2017

22.14 The Local Assessment of Waste Management Needs document (2013)

22.15 PPS10 companion guide Annex D para 28 – 32)

22.16 Study into Commercial and Industrial Waste Arisings (ADAS 2009)

22.17 National Survey of Commercial and Industrial Waste Arisings (Department for Environment, Food and Rural Affairs, DEFRA, 2009)

22.18 Operator returns (reported through the Environment Agency, EA, 2009 Waste Interrogator)

22.19

http://www.smartwaste.co.uk/filelibrary/benchmarks%20data/Waste_Benchmarks_for_new_build_projects_by_project_type_31_May_2012.pdf - Accessed in July 2017

22.20 British Standard 5906:2005 Waste Management in Buildings - Code of Practice

22.21 CL:AIRE Definition of Waste: Development Industry Code of Practice (the CoP)

22.22 Model Procedures for the Management of Land Contamination, Environment Agency, 2004 (Contaminated land report 11, 'CLR11')

22.23 The Producer Responsibility Obligations (Packaging Waste) Regulations 2007 SI 2007 No. 871 (as amended)

22.24 Control of Pollution (Oil Storage) (England) Regulations 2001

22.25 http://www.wrap.org.uk/sites/files/wrap/WMM%20guide%20Mid%20level.pdf – Accessed in July 2017