



ENVIRONMENTAL STATEMENT

Regulation 5(2)(a)

**FOR THE DEVELOPMENT CONSENT ORDER
APPLICATION FOR THE ALTERATION AND
CONSTRUCTION OF HAZARDOUS WASTE AND LOW
LEVEL RADIOACTIVE WASTE FACILITIES AT THE EAST
NORTHANTS RESOURCE MANAGEMENT FACILITY,
STAMFORD ROAD, NORTHAMPTONSHIRE**

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Baddesley Colliery Offices, Main Road, Baxterley, Atherstone,
Warwickshire, CV9 2LE.

Telephone : 01827 717891, Fax : 01827 718507



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This report has been prepared by MJCA with all reasonable skill, care and diligence, and taking account of the Services and the Terms agreed between MJCA and the Client. This report is confidential to the client and MJCA accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by MJCA beforehand. Any such party relies upon the report at their own risk.

Executive Summary

ES.i This Environmental Statement has been prepared on behalf of Augean South Limited (Augean). In the Environmental Statement the results of the Environmental Impact Assessment (EIA) for the proposed development are presented. The Environmental Statement accompanies the application for a Development Consent Order (DCO) for the East Northants Resource Management Facility (ENRMF). The application for a DCO is for the alteration and construction of hazardous waste and low level radioactive waste facilities at the East Northants Resource Management Facility, Stamford Road, Northamptonshire.

ES.ii In summary the main elements of this application comprise:

- The construction of new landfill void in the Proposed Western Extension for the continued disposal of the same range of predominantly hazardous wastes and a limited amount of low level radioactive waste (LLW) as deposited at the Existing ENRMF with a capacity of greater than 100,000 tonnes per annum (tpa) of hazardous waste which satisfies section 30(1) and section 30(2)(a) of the Act.
- A proposal for a coherent landform for the restoration of the Existing Landfill Facility and the Proposed Western Extension resulting in the construction of new landfill void in the Existing Landfill Facility to connect with the Proposed Western Extension with a capacity of greater than 100,000 tonnes per annum (tpa) of hazardous waste which satisfies section 30(1) and section 30(2)(a) of the Act.
- A total additional landfill void to be constructed of approximately 2.5 million cubic metres.
- The winning and working of minerals in the Proposed Development in order to create the landfill void and provide extracted materials for use on site as well as the exportation of clay and overburden for use in engineering, restoration and general fill at other sites.

- The temporary stockpiling of clay, overburden and soils for use in the construction of the engineered containment system at the site and restoration of the site.
- The direct input of waste into the Existing Landfill Facility and the Proposed Western Extension will continue at a rate of up to 150,000tpa.
- An increase to the hazardous waste throughput of the Existing Waste Treatment and Recovery Facility from 200,000tpa to 250,000tpa which comprises an increase of 50,000tpa compared with the rate consented in the Original Order and the extension of the treatment area to the south while remaining within the Existing ENRMF footprint which satisfies section 30(3) and section 30(4)(b) of the Act.
- A combined total waste importation rate limit to site for the Proposed Development of 300,000tpa which is an increase of 50,000tpa compared with the rate consented in the Original Order.
- The LLW which will continue to be disposed of at the ENRMF and will be disposed of in the Proposed Western Extension will be limited to that which is at the lower end of the activity range and typically will have a level of radioactivity of up to 200 Bq/g.
- The diversion of the overhead electricity cable that crosses the Proposed Western Extension to a trench which follows the route of the water pipes across the Proposed Western Extension and then follows the western margin of the site to the northern corner.
- The operational hours of the site will not change from those already consented in the Original Order.
- Restoration of the whole site to generally domed profiles to create a coherent restoration landform.
- Restoration of the site to improved biodiversity and nature conservation interest using the soils available at the site as well as suitable imported materials. The site will be restored to a mosaic structure of woodland with shrubby edges, flower meadow grassland, scattered trees, hedgerows and waterbodies.

- Completion of the landfilling and restoration operations by December 2046 and removal of the Existing Waste Treatment and Recovery Facility.
- Retention of infrastructure until 2046 and the retention of long term management infrastructure beyond this date.

ES.iii The operations at the existing ENRMF are the subject of Environmental Permits issued and regulated by the Environment Agency. Any extension to the waste management operations at the site will continue to be the subject of Environmental Permits. It is necessary to vary the Environmental Permits in respect of the existing hazardous waste and LLW landfill site to include the proposed western extension. The Environmental Permit for the treatment facility is being varied in order to increase the waste throughput rate and to include any changes to the processing activities.

ES.iv In this Environmental Statement a description of the proposed development is presented together with a summary of the approach to the EIA and the way in which the scope covered by the EIA was determined. Information is presented on the site setting including the features at and around the site. A description of the existing site operations and the operations the subject of the proposed development is provided as well as details of the restoration proposals for the site. The alternatives to the proposed development that were considered are explained.

ES.v Extensive technical studies have been undertaken to establish the environment of the site and surrounding area to facilitate a robust assessment of the potential impacts of the proposed development. The studies carried out to establish the baseline environmental conditions at the site together with the assessment of the environmental effects are presented. The environmental impact assessments that have been carried out comprise the assessments of impacts on population including on human health, ecology and biodiversity, landscape

and visibility, soil resources and agricultural land quality, archaeology and cultural heritage, water resources, flood risk, transport and traffic, noise and vibration, air quality, amenity, socio-economic and health and wellbeing. Technical reports for the impact assessments are appended to the Environmental Statement. Consideration also has been given to the impacts of the proposed development on climate change and the vulnerability of the site to climate change and major accidents or disasters.

ES.vi It is concluded based on the assessments of environmental impacts including cumulative impacts that the proposed development will not result in an unacceptable adverse impact on human health or the environment and that the proposed development will provide a significant strategic contribution to the safe, sustainable and economic management of hazardous wastes and LLW.

1. Introduction

- 1.1.1** Augean South Ltd (Augean) operates the integrated East Northants Resource Management Facility (ENRMF) in Northamptonshire (Figures ES1.1 and ES1.2). The ENRMF site has a long history of mineral and waste development and is an established waste treatment and recovery facility together with a hazardous waste and low level radioactive waste (LLW) landfill site. The treatment facility provides a range of specialist waste management processes for the recovery and disposal of primarily industrial wastes including hazardous and non-hazardous waste. The residues from the treatment processes that are not suitable for recovery are deposited in the adjacent hazardous waste landfill site or the nearby Augean Thornhaugh non-hazardous waste landfill site.
- 1.1.2** Augean is a leader in the specialist waste management sector. The company delivers a broad range of services across many nationally critical areas for the safe and sustainable management of waste. The company specialises in the management of the UK's more difficult to manage wastes including hazardous waste and low level radioactive waste. The company seeks to apply the waste hierarchy to enable recovery and reuse wherever possible for these more challenging waste types. Where waste must be disposed of Augean treats the waste where practicable to reduce the polluting potential before landfill disposal.
- 1.1.3** The facilities at ENRMF are an acknowledged part of the nationally significant infrastructure for the management of hazardous waste and LLW and as such serve more than just a local need. Clay extraction has taken place at the site since 1957, landfill disposal commenced in 2000, the site has accepted only hazardous waste since 2004, the treatment plant was granted planning permission in January 2008 and LLW first was accepted at the site in December 2011. The ENRMF was granted a Development Consent Order in 2013 for the operation of the site until 2026.

- 1.1.4** The site is one of only nine landfill sites in the UK that can accept a wide range of hazardous waste, one of only three landfill sites that can receive LLW and the only hazardous waste landfill site that can take LLW. Given its unique specialist nature the site receives wastes from across the UK but primarily waste generated in the centre and south of the UK.
- 1.1.5** The need for specialist facilities to manage hazardous waste and LLW will continue beyond the duration of the current consent which terminates in 2026. In order to secure the ongoing provision of these regionally and nationally important services beyond 2026 Augean is seeking a new Development Consent Order (DCO) for an extension to the west of the existing site and the continued operation of the overall facility for a further 20 years.
- 1.1.6** The proposal includes the construction of new landfill void to the west of the currently consented hazardous waste and low level radioactive waste landfill area and the amendment of the restoration profile and the timescale for completion of the existing landfill site in order to integrate the final landscape of the existing site with the western extension. To meet ongoing demand for the site services the application includes an increase in the annual consented throughput of waste to the waste treatment and recovery facility and an increase in the total waste input rate to the site. In order to construct the western extension landfill void it will be necessary to win and work minerals including the extraction of soils, overburden and clay. The soils and some clay will be retained on site for use in site restoration and the construction of the low permeability engineered liner and capping layers for the landfill site. The remaining materials will be exported off site for use elsewhere. The application includes the extension of the operational period of the existing ENRMF activities and the western extension to 2046.
- 1.1.7** The proposed development comprises the construction and alteration of a hazardous waste facility in accordance with Section 14 (1)(p) and Section 30 of The Planning Act 2008 (as amended) hence is a Nationally Significant Infrastructure Project. This Environmental Statement includes the information

required under Regulation 14(2) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017¹ which is reasonably required for the consultation and examination bodies to develop an informed view of the likely significant environmental effects of the proposed development.

1.1.8 The overarching purpose of this DCO application and the proposed development is to continue to meet the established need for the management of hazardous wastes and low level radioactive wastes generated primarily in the centre and south of the UK beyond the consented life of the existing ENRMF. The proposed development is designed to satisfy all relevant legal, policy and regulatory considerations and to make sure that people and the environment are properly protected in the short, medium and long term. The proposed development also must be commercially viable and provide business security in order for it to support the needs of the businesses generating the wastes managed at the site.

1.1.9 The current operations at ENRMF are the subject of Environmental Permits issued and regulated by the Environment Agency. Any extension to the waste management operations at the site will continue to be the subject of Environmental Permits. Applications have been submitted to the Environment Agency to vary the Environmental Permits in respect of the existing hazardous waste landfill site and the waste treatment facility in order to include the activities and areas the subject of this DCO application. An application will be submitted to the Environment Agency to vary the Environmental Permit for the deposition of LLW in the landfill site to include the proposed western extension. The processing of the applications to vary the Environmental Permits for the landfill site and treatment facility is taking place in parallel with the DCO application.

1.1.10 MJCA are commissioned by Augean to undertake an Environmental Impact Assessment (EIA) of the proposed development. The EIA has been based on

¹ *The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017*

discussions with Augean, statutory consultees and the experience of MJCA together with specialist technical advice. This document comprises the Environmental Statement that has been prepared based on the EIA and forms part of the application for the DCO. In summary this Environmental Statement includes a description of the main development, an outline of the main alternatives studied, a description of the aspects of the environment which have the potential to be significantly affected by the development, a description of the likely significant effects of the development on the environment and a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment. A non-technical summary of the Environmental Statement is provided as a separate document. The approach to the EIA is set out in detail in Section 2.

- 1.1.11** In accordance with Regulation 14(4) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 a statement is provided at Appendix ES1.1 outlining the relevant expertise and qualifications of those who have carried out the EIA and prepared the Environmental Statement in order to confirm their competence to carry out the work. A statement by the applicant confirming that the Environmental Statement has been prepared by competent experts is also provided at Appendix ES1.2.
- 1.1.12** Throughout this report ‘the existing ENRMF’ refers to the area within the boundary of the East Northamptonshire Resource Management Facility Order 2013 as amended by the East Northamptonshire Resource Management Facility (Amendment) Order 2018 (the Original Order). The existing ENRMF comprises the existing landfill facility and the existing waste treatment and recovery facility. The proposed additional landfill area to the west of the existing ENRMF is referred to as ‘the proposed western extension’. The area within the DCO application boundary includes the existing ENRMF and the proposed western extension and is referred to as ‘the site’.

2. Approach to the Environmental Impact Assessment, screening and scoping

2.1.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) specify the projects that will and the projects that may be the subject of an Environmental Impact Assessment (EIA). Schedule 1 of the EIA Regulations lists projects for which it is mandatory to undertake an EIA and Schedule 2 of the EIA Regulations lists the projects for which an EIA may be necessary. The proposed development falls under Paragraph 9 of Schedule 1 of the EIA Regulations being a waste disposal installation for the chemical treatment and landfill of hazardous waste.

2.1.2 The EIA of the proposed development has been undertaken in accordance with the EIA Regulations and guidance² produced by The Planning Inspectorate (PINS) has been considered. In the guidance it is stated that:

‘The ES [Environmental Statement] should provide a clear, objective and realistic description of the likely significant effects of the Proposed Development. Information should be presented so as to be comprehensible to the specialist and non-specialist, alike’

2.1.3 In this Environmental Statement information is collated, the results of the investigations, the details of the development and the results of the assessments are presented and the positive and negative effects of the development are explained. The Environmental Statement presents a description and evaluation of the baseline environmental conditions at the site against which the assessment of the environmental impact of the proposed development is made.

2.1.4 The EIA Regulations state that the applicant can request a screening opinion under Regulation 8 and a scoping opinion under Regulation 10 from the

² Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements Version 7 dated May 2020. <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/12/Advice-note-7.pdf> accessed on 26 May 2021

Secretary of State. The screening opinion allows applicants to ascertain whether it is necessary for an EIA to be undertaken for a Schedule 2 development. A scoping opinion provides the opinion of the Secretary of State together with the opinions of the statutory consultees regarding the scope of the assessments that will be undertaken as part of the EIA. As the proposed development falls under Schedule 1 of the EIA Regulations an EIA is mandatory therefore a screening opinion was not requested.

- 2.1.5** In accordance with good practice³ the scope of the EIA was determined by consultation with the Secretary of State, the local authorities, statutory consultees and interested parties. A scoping document was prepared including a brief description of the proposed development and the proposed scope of the EIA. The Scoping Report was submitted to the Secretary of State on 1 July 2020 and circulated to a wide range of consultees. The Scoping Report dated July 2020 is presented at Appendix ES2.1. A copy of the formal Scoping Opinion dated August 2020 from the Secretary of State which includes the list of the consultation bodies consulted formally and their responses is presented at Appendix ES2.2. The responses and the way in which the comments in the Scoping Opinion have been addressed in the EIA and Environmental Statement are summarised in Table ES2.1.
- 2.1.6** The issues raised in the Scoping Opinion have been taken into account where appropriate when undertaking the environmental impact assessments and finalising the proposals. The specialists who carried out the assessments liaised closely with the consultees and third parties where appropriate to determine that the scope, methodology and results of the assessments are acceptable to the authorities and address issues raised.
- 2.1.7** The proposed development has been the subject of extensive pre-application consultation with statutory consultees and those living and working in the vicinity of the proposed development including the Kings Cliffe Local Liaison Group and other members of the public as explained in the Consultation

³ Advice Note Three: EIA Notification and Consultation. National Infrastructure Planning. 2012

Report (PINS document reference 4.1) which accompanies this application. The Scoping Report, Scoping Opinion and other responses to the Scoping Report have identified that the following environmental impacts should be assessed in the EIA: population and human health, ecology and biodiversity, landscape and visual effects, soil resources and agricultural land classification, archaeology and cultural heritage, water resources, flood risk, transport and traffic, noise and vibration, air quality, odour, dust, amenity, climate change and socio-economic impacts.

2.1.8 As part of the pre-application stakeholder engagement a Preliminary Environmental Information Report (PEIR) was prepared and provided for consultees and other interested parties to review and comment as described in the Consultation Report (PINS document reference 4.1). A full copy of the report is available on the Augean website. The PEIR included a description of the development, an outline of the main alternatives studied, a description of the aspects of the environment with the potential to be affected significantly by the development, a description of the likely significant effects of the development on the environment, a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment, a non-technical summary and an indication of any difficulties encountered in compiling the information.

2.1.9 The PEIR was published and widely distributed on 29 October 2020. The list of all those included in this aspect of the pre-submission consultation is provided at Appendix CRP to the Consultation Report (PINS document reference 4.2.16). Consultation with stakeholders originally was scheduled to continue to 14 December 2020 but was extended twice following the receipt of requests for further time and therefore continued up to 15 February 2021. Any comments received after that date also were taken into account. A copy of the PEIR is provided at Appendix CRQ to the Consultation Report (PINS document reference 4.2.17). As a result of the restrictions in place associated with the Covid-19 pandemic, all consultation was carried out remotely using a variety of methods as agreed during the preparation of the Statement of

Community Consultation (provided at Appendix CRF to the Consultation Report (PINS document reference 4.2.6)). Full details of the consultation process and outcomes are presented in the Consultation Report (PINS document reference 4.1). A summary of the main issues raised by the statutory consultees under Sections 42 and 43 of the Planning Act 2008 during the consultation process and the way in which they have been taken into account in the finalisation of the design of the development and in the assessments which have been carried out is presented in Table ES2.2 of this Environmental Statement. A summary of the main issues raised by the consultees identified under Sections 44 and 47 of the Planning Act 2008 is presented in Appendix CRR of the Consultation Report (PINS document reference 4.2.18) and included at Table ES2.2 of this Environmental Statement.

3. The site location and description

3.1.1 The site is located in the council area of North Northamptonshire approximately 19km west of Peterborough and 7km south west of Stamford. The application boundary lies approximately 1.1km east south east of Duddington village and approximately 2km north north west of Kings Cliffe village at its closest points. The application boundary is centred on NGR TL 004 999 (Figure ES1.2). The application boundary covers an area of approximately 58.5 hectares and includes the existing ENRMF site. The existing ENRMF site is approximately 31.8 hectares and the proposed western extension covers an area of approximately 26.8 hectares. Almost all the land within the application boundary is either owned or leased by Augean or under an option agreement for Augean to purchase the land. As a result of comments received during the formal consultation period in relation to drainage, the application boundary was amended very slightly following the consultation to incorporate the entirety of the fenced perimeter of the swallow hole drainage feature and to extend the boundary of the eastern edge of the proposed western extension to mirror the boundary of ownership for the land under option and incorporate the existing drainage ditch. The extension in the area around the swallow hole resulted in the inclusion of small amount of additional land which is not under the control of Augean. The setting is generally rural with the majority of the land surrounding the site comprising open farmland or woodland as shown on the aerial photograph at Figure ES3.1.

3.1.2 As explained in Section 1, the existing ENRMF comprises an active waste treatment and recovery facility and a hazardous waste and low level radioactive waste (LLW) landfill site and includes restored and partially restored landfill areas together with material stockpile areas. An area for a gas management and surface water management compound including a flare stack is located in the north western corner of the existing ENRMF. Site infrastructure including the site access, weighbridge and waste reception facilities, car parking areas, site offices, welfare facilities, storage areas,

laboratories and wheel and vehicle body washing facilities are in place at the site (Figure ES3.2). The site infrastructure will be retained and adapted as associated development and ancillary activities to the main site activities.

- 3.1.3** The highway access to the site is from Stamford Road which runs adjacent to the eastern boundary of the site from the A47 to the north. Waste delivery and collection vehicles using the site access are not permitted to travel to the south of the site access on Stamford Road towards the village of Kings Cliffe unless they are delivering wastes collected locally. The access road enters the reception area adjacent to and east of the landfill. Consented improvements to widen the site access are being implemented currently. The existing highway access to the existing ENRMF will continue to be used for the proposed development.
- 3.1.4** The existing landfill comprises 11 phases of landfilling (Figure ES3.2). Landfilling operations are complete in Phases 1 and 2 which are capped and partially restored to species rich meadow. Landfilling operations are completed in Phases 3, 4, 5 and the southern part of Phase 6. Phases 3, the northern part of Phases 4 and 5 and the southern part of Phase 6 are capped with the remaining areas of Phases 4 and 5 covered with temporary capping. Currently landfilling operations are being carried out in the northern part of Phase 6, in Phase 10 and in Phase 7. Phase 6 and Phase 10 are shortly to be capped and the construction of Phases 8 and 9 will commence during 2021. The central area of the existing landfill is used for stockpiling excavated clay and overburden pending use or removal from site for use elsewhere.
- 3.1.5** The waste treatment and recovery facility is located in the north western corner of the existing ENRMF (Figure ES3.2). Under the extant DCO the waste treatment and recovery facility is due to be removed from the site prior to the development of the final phases of landfilling (Phase 11). The waste treatment and recovery facility comprises a concrete pad and adjacent clay hardstanding area which currently includes storage areas for solid wastes and sludges, a soil washing plant, a stabilisation unit, an enclosed bag processing

unit, a laboratory/office, a welfare facility, a surface water collection lagoon, a weighbridge and an area for bioremediation. The plant comprises modular units including silos, material feed hoppers, transfer conveyors and closed mixing vessels as well as storage areas for wastes awaiting treatment and treated wastes awaiting removal.

- 3.1.6** The proposed western extension currently comprises two areas of arable land with grassy margins. A hedgerow forms the boundary between the two areas. There is an area of young scrubby woodland in the south eastern corner of the northern area. The topography of the proposed western extension generally is gently sloping towards the central boundary between the two areas. The ground elevation of the northern area ranges from 89m Above Ordnance Datum (AOD) in the north to 80mAOD in the south. The ground elevation in the southern area ranges from 86mAOD in the south to 81mAOD in the north with a high point of 88mAOD in the centre of the southern area. The proposed western extension is bordered by woodland and arable fields.
- 3.1.7** The existing ENRMF is bordered by a dense continuous thorn hedge and/or 1.8m high chain link fencing on all boundaries. There are gates at the site entrance which are locked outside operating hours. A farm access track runs outside and adjacent to the southern boundary of the existing ENRMF and joins an access track running north to south along the eastern boundary of the southern section of the proposed western extension. The access track then turns to the west to the south of the southern section of the proposed western extension. An agricultural storage area with barns used by the farmer of the adjacent fields is located in the inset on the southern boundary of the existing ENRMF.
- 3.1.8** There are scattered properties within 1km of the site. The closest properties to the site are the properties at Westhay Cottages located approximately 25m to the east of the application boundary and approximately 815m to the east of the proposed western extension. Westhay Farm is located approximately 75m east of the application boundary and approximately 865m to the east of the

proposed western extension and is operated as a haulage yard and a farm with associated agricultural and commercial buildings. A cleared area in the centre of the woodlands located to the north of the existing ENRMF was used formerly by the Ministry of Defence for storage associated with the Wittering Airfield. This area has been granted planning permission for development as a transport facility but is unused currently. Westhay Lodge Farm is located approximately 615m to the south of the application boundary. There are currently two distinct properties at this location, Westhay Lodge which comprises the original farmhouse and Westhay Barn which was formerly one of the agricultural buildings. There are a number of properties between 750m and 955m to the north of the application boundary including an unnamed property approximately 750m north of the application boundary and Cuckoo Lodge which is approximately 875m to the north of the application boundary. The closest point of the boundary of the operational training airfield at RAF Wittering and associated accommodation is located approximately 840m to the north north east of the application boundary. The closest settlement to the site is Duddington the outskirts of which are located approximately 1.1km to the west north west of the boundary of the northern section of the proposed western extension. Collyweston is located approximately 1.6km to the north north west of the northern section of the boundary of the proposed western extension. The village of Kings Cliffe is located approximately 2km to the south south east of the southern section of the boundary of the proposed western extension. The hamlet of Fineshade is located approximately 2.4km to the west south west of the southern part of the proposed western extension.

- 3.1.9** There are two Grade II* listed buildings and 32 Grade II listed buildings within 2km of the site. The closest are located within Duddington Village over 1.2km west of the site. The nearest Scheduled Monument is Duddington Bridge which is situated to the west of the Duddington Village approximately 1.6km west north west of the site. There are no other designated heritage assets within 2km of the site.

- 3.1.10** To the south of the application boundary is open agricultural land. The area of agricultural land to the south of the extension area is bordered to the south by woodland known as Little Wood (Figure ES3.3). To the west of the majority of the application boundary is woodland known as Fineshade Wood part of which is known as The Assarts and which is a Local Wildlife Site (Figure ES1.2). A short length of the western boundary of the northern section of the northern area abuts agricultural fields. The northern boundary of the western extension is formed of woodland with a field with a number of lagoons created in a fenced area beyond. The eastern boundary of the northern section of the extension area is adjacent to Collyweston Great Wood. To the east and north east of the application area beyond Collyweston Great Wood and east of Stamford Road is an area of woodland known as Easton Hornstocks. Parts of the Collyweston Great Wood and Easton Hornstocks comprise a Site of Special Scientific Interest (SSSI) and a National Nature Reserve (NNR) (Figure ES1.2). The eastern boundary of the western extension area adjacent to Collyweston Great Wood includes the drainage ditch which runs along the western boundary of the woodland which is included in the area designated as the SSSI. The ditch will be used only for continued surface water drainage. No operational works will take place in the SSSI.
- 3.1.11** The north eastern part of the existing ENRMF site and a section of the central area of the extension together with the woodland and pond area immediately to the north of the western extension area are designated as a Potential Wildlife Sites (PWS). Local Wildlife Sites (LWS) and PWS were reviewed by The Wildlife Trust for Northamptonshire in 2006. PWS are sites that are either known or thought to be of higher biodiversity value than the average countryside but have not been confirmed to be of LWS standard. Category 1 PWS are sites that were never fully surveyed and assessed against LWS criteria. The area of the ENRMF site which comprises the PWS is species-poor seeded grassland habitat over a capped area of the landfill. No information is available on the reasons for its selection. The designated sites in the vicinity of the application boundary including the Regionally Important Geological Sites are shown on Figure ES1.2. The closest sites which form

part of the National Sites Network as established in the Conservation of Habitats and Species Regulations 2017 (as amended), formerly known as 'European sites', to the application boundary are Rutland Water and Barnack Hills and Holes which are shown on Figure ES1.1. A full list of the designated sites which form part of the National Sites Network within 10km of the application boundary, the statutorily protected sites within 5km of the application boundary and the locally designated sites within 2km of the application boundary is provided at Appendix ES3.1.

3.1.12 The void for the existing ENRMF landfill is formed from excavations extending through glacial till comprising predominantly clay (formerly referred to as Boulder Clay) and the Blisworth Limestone Formation where these formations are present and into the clay of the Rutland Formation. The Rutland Formation is underlain by the Lincolnshire Limestone Formation. The site geology is described in detail in Section 17 of this Environmental Statement. A swallow hole is located close to the north western corner of the existing landfill and further limestone solution features (known as dolines) may be present in the vicinity of the swallow hole. The swallow hole provides a significant drainage feature for surface water from a wide catchment area including parts of the proposed western extension and is included in the application boundary. The Blisworth Limestone Formation and the Lincolnshire Limestone Formation are designated as principal aquifers by the Environment Agency. The glacial till is designated as a secondary undifferentiated aquifer and the Rutland Formation is designated as a secondary B aquifer. The site is not located in a groundwater source protection zone (SPZ).

3.1.13 Based on the Environment Agency Flood Map for Planning the site is located in Flood Zone 1. Flood Zone 1 is defined as land having a less than 1 in 1,000 annual probability of river or sea flooding. The existing ENRMF is located in the catchment of the River Nene which flows generally eastwards and is located approximately 6km east south east of the site at the closest point. The surface water management system for the restored landform for the existing ENRMF is designed to lead to a drainage area at the south eastern corner of

the site and to discharge to a drainage ditch which flows generally to the south. After joining a stream the flow outfalls to the Willow Brook approximately 2.5km south of the site. The Willow Brook joins the River Nene approximately 9km south east of the site.

- 3.1.14** The proposed western extension to the landfill is located on a surface water divide with the majority within the catchment of the Willow Brook consistent with the existing ENRMF and part of the northern section of the proposed western extension draining to the east to a drainage ditch which runs along the western and southern boundaries of Collyweston Great Wood. The drainage ditch continues eastwards from the site joining a tributary of the Wittering Brook where it issues approximately 2.0km north east of the current ENRMF and approximately 2.7km east north east of the proposed western extension. The Wittering Brook joins the River Nene approximately 7.5km east of the site.
- 3.1.15** No public rights of way cross the site (Figure ES3.3). There are rights of way to the west of the proposed western extension which run through The Assarts woodland (part of Fineshade Wood). The closest right of way is Footpath MX15 which is approximately 100m to the west of the boundary of the proposed western extension at its closest point. Footpath MX15 runs in a north westerly and south westerly direction and connects into the wider public rights of way network. The Jurassic Way bridleway (NE12) is located approximately 845m to the west of the site at its closest point (Figure ES3.3).
- 3.1.16** There are a number of services which cross the proposed western extension and which are in the vicinity of the site. The services at and in the vicinity of the site are shown on Figure ES3.3. A mains gas pipeline runs parallel to the southern boundary of the existing ENRMF and crosses the southern section of the proposed western extension in an east to west direction. Overhead electricity cables run along the western boundary of the existing ENRMF before turning in a north westerly direction across the northern section of the proposed western extension. Two water pipelines cross the northern part of

the southern section of the proposed western extension. A short section of redundant, closed out pipeline owned by the MOD is present at the northern point of the proposed western extension. An oil pipeline is located in Collyweston Great Wood to the east of the eastern boundary of the northern section of the proposed western extension.

3.1.17 The former Northamptonshire County Council and East Northants District Council were contacted to identify any relevant planned developments in the vicinity of the site which should be included in the assessments of cumulative impacts. The former Northamptonshire County Council confirmed that the developments that should be considered include Collyweston Quarry, Wakerley Quarry, Cooks Hole Quarry and Thornhaugh Quarry the locations of which are shown on Figure ES1.1. No additional relevant developments were identified by the former East Northants District Council.

4. Summary of the proposed development

4.1.1 The proposed development comprises the construction of new landfill void to the west of the currently consented hazardous waste and LLW landfill area (the proposed western extension) and amendment of the restoration profile and the timescale for completion of the existing ENRMF landfill in order to integrate the final landscape of the existing ENRMF with the western extension.

4.1.2 The application includes an increase in the consented throughput of waste to the waste treatment and recovery facility and an increase in the total input rate to the site.

4.1.3 In order to construct the void in the proposed western extension it will be necessary to win and work minerals including the extraction of soils, overburden and clay. The soils and some clay will be retained on site for use in site restoration and the construction of the low permeability engineered liner and capping layers. The remaining materials will be exported off site.

4.1.4 The application includes an extension to the operational period of the existing ENRMF activities and the proposed western extension to 2046.

4.1.5 A full description of the proposed development is presented in Sections 5 to 9 of this document and a summary of the proposed development is presented below.

- The construction of new landfill void in the Proposed Western Extension for the continued disposal of the same range of predominantly hazardous wastes and a limited amount of low level radioactive waste (LLW) as deposited at the Existing ENRMF with a capacity of greater than 100,000 tonnes per annum (tpa) of hazardous waste which satisfies section 30(1) and section 30(2)(a) of the Act.
- A proposal for a coherent landform for the restoration of the Existing Landfill Facility and the Proposed Western Extension resulting in the construction of new landfill void in the Existing Landfill Facility to

connect with the Proposed Western Extension with a capacity of greater than 100,000 tonnes per annum (tpa) of hazardous waste which satisfies section 30(1) and section 30(2)(a) of the Act.

- A total additional landfill void to be constructed of approximately 2.5 million cubic metres.
- The winning and working of minerals in the Proposed Development in order to create the landfill void and provide extracted materials for use on site as well as the exportation of clay and overburden for use in engineering, restoration and general fill at other sites.
- The temporary stockpiling of clay, overburden and soils for use in the construction of the engineered containment system at the site and restoration of the site.
- The direct input of waste into the Existing Landfill Facility and the Proposed Western Extension will continue at a rate of up to 150,000tpa.
- An increase to the hazardous waste throughput of the Existing Waste Treatment and Recovery Facility from 200,000tpa to 250,000tpa which comprises an increase of 50,000tpa compared with the rate consented in the Original Order and the extension of the treatment area to the south while remaining within the Existing ENRMF footprint which satisfies section 30(3) and section 30(4)(b) of the Act.
- A combined total waste importation rate limit to site for the Proposed Development of 300,000tpa which is an increase of 50,000tpa compared with the rate consented in the Original Order.
- The LLW which will continue to be disposed of at the ENRMF and will be disposed of in the Proposed Western Extension will be limited to that which is at the lower end of the activity range and typically will have a level of radioactivity of up to 200 Bq/g.
- The diversion of the overhead electricity cable that crosses the Proposed Western Extension to a trench which follows the route of the water pipes across the Proposed Western Extension and then follows the western margin of the site to the northern corner.

- The operational hours of the site will not change from those already consented in the Original Order.
- Restoration of the whole site to generally domed profiles to create a coherent restoration landform.
- Restoration of the site to improved biodiversity and nature conservation interest using the soils available at the site as well as suitable imported materials. The site will be restored to a mosaic structure of woodland with shrubby edges, flower meadow grassland, scattered trees, hedgerows and waterbodies.
- Completion of the landfilling and restoration operations by December 2046 and removal of the Existing Waste Treatment and Recovery Facility.
- Retention of infrastructure until 2046 and the retention of long term management infrastructure beyond this date.

4.1.6 The limits of extraction and the operational areas for the proposed western extension have been determined based on the boundaries of the land under the control of the applicant together with other constraints at the site such as the presence of boundary features, the need for ecological mitigation areas, the locations of services, the locations of geological features and the overall topography and surface water management needs.

4.1.7 The Environmental Permits for the existing ENRMF landfill operations specify the types of hazardous waste and LLW permitted for importation and deposition at the existing ENRMF. To ensure that only permitted wastes are deposited within the landfill Augean operates a rigorous set of waste acceptance criteria. The Environmental Permit for the waste treatment and recovery facility specifies the types of wastes that can be treated at the facility. Treated wastes from the facility are either recovered and transferred from the site for recovery or use elsewhere, are transferred for landfill disposal at a non-hazardous waste landfill site such as the Augean Thornhaugh Landfill Site or are transferred to the ENRMF hazardous waste landfill site for disposal depending on the nature of the output from the treatment process.

- 4.1.8** In order to preserve the majority of the void in the existing and the proposed new landfill site for hazardous waste, a quantity limit will be set for the maximum proportion of the void that can be used for the disposal of LLW. The amount of LLW that will be deposited at the site will be controlled through the Environmental Permit and the maximum will be determined by the radiological capacity as described in Section 11 of this Environmental Statement and is likely to be well below the overall limit set in the DCO. There is an upper limit on the maximum quantity of LLW which can be deposited in the existing ENRMF which is specified as 448,000tonnes in the original Order and this limit will be retained for the existing ENRMF landfill in the proposed new DCO. This tonnage limit was determined based on 20% of the landfill void into which LLW could be deposited. In a similar manner, the maximum quantity of LLW which will be deposited in the proposed new landfill void of approximately 2.5million cubic metres will be limited in the new DCO. 20% of the total proposed new void is 500,000cubic metres (m³). Based on an assumed density for the LLW deposited at the site of 1.4tonnes of LLW per cubic metre (1.4t/m³) this gives a tonnage limit for LLW in the proposed western extension of 700,000tonnes.
- 4.1.9** The site will be subject to a twenty year aftercare and maintenance period following the completion of restoration. The Environmental Permits for the landfill site will continue for a longer period until the point at which the Environment Agency consider that the site no longer presents a potential risk to the environment and that the permits can be surrendered.

5. The current landfill operations and the proposed landfill operations

5.1 Introduction

5.1.1 The landfill currently accepts hazardous waste and low level radioactive waste (LLW). Hazardous waste is classified as such based on the concentrations of specified contaminants present in the waste material. As is the case currently, hazardous wastes will only be accepted for landfill disposal if they meet specified waste acceptance criteria for hazardous waste landfill sites. The types of hazardous waste typically accepted by Augean at ENRMF include contaminated soils, contaminated dredging materials from the clearance of watercourses and harbours, treatment residues such as filter cakes, manufacturing residues and air pollution control residues used for scrubbing stack emissions at industrial facilities. In accordance with legislation the hazardous wastes that are permitted for deposition at the landfill site are subject to a maximum total organic carbon content of 6% by weight. Hazardous wastes with leachable components above those specified in the legislation are not accepted for landfill disposal at the site. Wastes which are not accepted for landfill disposal include liquid wastes, corrosive wastes, flammable wastes and wastes that are classified as oxidising.

5.1.2 As is the case currently, it is proposed that Augean will continue to accept LLW for disposal from sources such as the decommissioning of nuclear facilities, manufacturing activities and research facilities and hospitals where radioactive materials are used. The proportion of LLW deposited at the site will be small relative to hazardous waste deposited at the site. The wastes will also include naturally occurring radioactive material (NORM) waste from the oil and gas and mineral processing industries notably supporting the decommissioning programme for the North Sea oil and gas extraction infrastructure. The LLW waste types principally will comprise construction and demolition waste such as rubble, soils, crushed concrete, bricks and metals from the decommissioning of nuclear power plant buildings and infrastructure, small amounts of lightly contaminated miscellaneous wastes from

maintenance and monitoring at these facilities such as plastic and metal and wastes from manufacturing activities, science and research facilities and hospitals where radioactive materials are used. LLW is only accepted at the site if it is compatible with other wastes, meets the site conditions for acceptance and it has been demonstrated that disposal at the site represents the Best Available Technique for the management of the waste.

5.1.3 The landfill is operated on the principle of containment and the new landfill void will be operated as an extension of the existing landfill area based on the same principle of containment. The existing and the new landfill void has been and will continue to be lined with an engineered low permeability barrier designed to retain contaminants within the engineered landfill. The landfill will continue to be operated in a series of phases which are filled and restored progressively. To complete the containment structure, to separate the restoration materials from the wastes and to minimise the infiltration of rainfall into the waste following achievement of final waste levels, the landfill is and will continue to be capped with a low permeability layer keyed in to the low permeability side liner system. The restoration materials will be placed above the low permeability cap.

5.1.4 Consistent with the current landfill the proposed western extension landfill will be operated in a number of phases, some of which will be separately constructed and contained landfill areas as a result of the presence of the services which cross the site and the need to maintain a surface water drainage route from the west to the east of the site. The central landfill area will be contiguous with the landfill in the existing ENRMF and filling will be continuous across the existing western boundary. The locations of Phases 1 to 11 in the existing ENRMF and Phases 12 to 21 in the proposed western extension landfill area are shown on Figure ES5.1.

5.2 The design and phasing of the extended landfill

5.2.1 The landfill design principles are described in this section of the document. The landfill will be constructed in phases and each phase will be subject to the

preparation of a detailed engineering design which will be submitted to the Environment Agency for approval under the Environmental Permit prior to its construction. During the preparation of the final design, the principles set out below will be adhered to but minor amendments which are not material in land use terms may be made to take into account details of the phase-specific geology, drainage, ecology and information on other features such as the precise location of services and the final design of boundary surface water management drains and basins.

Services routes

- 5.2.2** The gas pipeline which crosses the site from east to west as shown on Figure ES5.1 will not be diverted and it will not be possible to landfill or place materials over the pipeline as access must be maintained. The area to the south of the gas pipeline in the proposed western extension (Phases 15 to 17) will be developed as a separately constructed, fully contained landfill area. A minimum easement distance from the gas pipeline has been agreed with the pipeline authority as described in Appendix ES5.1. The area along the gas pipeline corridor will be developed for ecological benefit as described further below.
- 5.2.3** The water pipes which cross the proposed western landfill area will not be diverted. It will not be possible to landfill or place materials over the route of the water pipes as access must be maintained. The area between the gas pipeline and water pipes will be developed as a separately constructed, fully contained landfill area (Phase 18) with suitable stand off distances from the water pipes as agreed with the water authority as described in Appendix ES5.1. The area along the water pipeline corridor will be developed for ecological benefit as described further below.
- 5.2.4** The overhead electricity power cables which follow the western boundary of the existing ENRMF and cross the proposed western extension as shown on Figure ES3.3 will be diverted and run below ground. The cables will be diverted from the south western corner of the existing ENRMF to follow the

route of the water pipelines and then to turn to the north at the western boundary of the site and follow the western site boundary and re-join the original cable route at the north western corner of the site as described at Appendix ES5.1.

- 5.2.5** Prior to the finalisation of the design of the standoffs for all the original and diverted services routes, further detailed discussions will be held with the relevant authorities to agree the appropriate, safe standoff distances from the location of the services to the excavation boundary and to agree the distances to be allowed between the locations of the water and electricity services where they are laid parallel to each other.
- 5.2.6** An abandoned pipeline from the former Government Oil and Pipeline System may be present in the northern area of the site at the location shown on Figure ES3.3. It has been confirmed by the Defence Infrastructure Organisation that the pipeline has been declared redundant by the Ministry of Defence (MOD) and that the necessary legal charges have been removed in accordance with the Land Powers (Defence) Act 1958. This length of pipeline will be removed with appropriate precautions in place when the northern area of the site is developed.

Boundary standoffs

- 5.2.7** The landfill footprint and boundary treatment of the proposed western extension phases have been determined taking into account detailed consideration of the sensitivity of ecological resources within the site, such as insect rich field margins and adjacent woodland to the east (Collyweston Great Wood) and west (Fineshade Wood/The Assarts) as discussed in Section 13 of this Environmental Statement.
- 5.2.8** The derivation of the width of the boundary standoff distance used in the design for each area is based on a combination of:
- Tree root protection area (RPA) distance.

- Width of the field margin to be retained at the edge of the site
- Installation of animal exclusion fencing
- Standoff from buried services.
- Working margin inside the animal exclusion fence between the fence and the extraction boundary.

5.2.9 The derivation of the standoff distances used in the design for each area of the development is described at Appendix ES5.1.

Central doline area and surface water drainage route

5.2.10 As described further in Section 17 of this Environmental Statement, a site investigation was carried out in the proposed western extension to establish the geological and hydrogeological conditions. The scope of the site investigation was agreed with the Environment Agency before it commenced. Particular attention was paid to examining the geology in the vicinity of the swallow hole that is located close to the north western corner of the existing ENRMF and to the possible presence of further limestone solution features (known as dolines) in the vicinity of the swallow hole. The swallow hole is one of a series of depressions in the ground surface which are interpreted as dolines that run in a line from west to east approximately 40m north of the existing ENRMF site boundary and which extend through the proposed western extension. It has been agreed with the Environment Agency that the final design of the proposed western extension landfill in the vicinity of the swallow hole and potential other limestone solution features will be developed in detail under the control of the Environmental Permit following the issue of the Development Consent Order (DCO) and Environmental Permit variation. Further targeted site investigations will be carried out in this central area of the site prior to finalising the design in this area.

5.2.11 The design in this central area is based on the retention of a 20m wide corridor linking the land to the west of the proposed extension to the swallow hole in

the east to provide a continuing route for the drainage of surface water from the west to the east. No landfilling will be carried out in this area and it is proposed that the current below ground surface water drainage pipe is excavated and replaced with an open watercourse with ponds which will be developed for ecological benefit as well as continuing drainage provision. If the results of the further site investigation lead to the conclusion that there should be a wider distance from the potential doline area in which there should be no landfilling of waste, the excavation boundary for the landfill will be relocated to reflect the findings. Overburden excavated from elsewhere in the site will be placed against the completed and restored landfill in the area between the revised landfill boundary and the edge of the 20m wide corridor so that the same restoration profile will be achieved. Accordingly the proposed restoration landform will not be affected by any change to the landfill boundary that may be agreed with the Environment Agency following the further investigations in the doline area.

Phasing

- 5.2.12** The current landfill comprises 11 phases of landfilling as shown on Figure ES5.1. Landfilling operations are complete in Phases 1 and 2 which are capped and partially restored. Landfilling operations are completed in Phases 3, 4, 5 and the southern part of Phase 6. Phase 3, the northern part of Phases 4 and 5 and the southern part of Phase 6 are capped with the remaining areas of Phases 4 and 5 covered with temporary capping. Currently landfilling operations are being carried out in the northern part of Phase 6, in Phase 10 and in Phase 7. Phase 6 and Phase 10 are shortly due to be capped and the construction of Phases 8 and 9 will commence during 2021.
- 5.2.13** The proposed western extension will be developed in a number of phases. The phasing order for the proposed western landfill area has been finalised following responses to the pre-application consultation and is designed to achieve the completion of the northern area of the western extension at the earliest opportunity.

- 5.2.14** The completion and restoration of the northern area (Phases 12 to 14 as shown on Figure ES5.1) will allow the early development of habitats on the restored site which are designed to link and provide habitat continuity between the woodlands either side of the northern section of the site. The current projection is that the first, northernmost, area (Phase 12) will be restored in around 5 years from the start of the commencement of cell excavation work in that phase. The additional site investigations in the central area of the extension will take place while Phases 12 and 13 are being developed and filled and before the design of Phase 14 is finalised enabling completion of all of Phases 12 to 14 in as short a timescale as possible. Once these phases are completed and restored, they will not be disturbed as part of ongoing site operations to the south and they will not be used for stockpiling.
- 5.2.15** Following the completion of landfilling in Phase 14, landfilling operations will move to the south of the proposed western extension and move sequentially from Phase 15 northwards to Phase 17. Phase 18 located between the gas and the water pipelines will be the next phase which is landfilled. Phases 19 to 21 in the central area will be filled last. The landfill in Phases 19 to 21 will be joined to the partially completed landfill areas in the western phases of the existing ENRMF (Phases 7, 8 and 9). Towards the end of landfilling in this central area the waste treatment facility will cease operating and the infrastructure will be removed. Phase 11 will then be prepared for landfilling and will be completed together with the remaining sections of the landfill.
- 5.2.16** As explained above, the landfilling in the western phases of the existing ENRMF landfill site (Phases 7, 8, 9 and 11) will be continuous with the landfill in the proposed adjacent phases of the western landfill area (Phases 19, 20 and 21). The continuous nature of the landfill between these two areas is shown schematically on Figure ES5.2. This continuous landfill will make the most efficient use of the area available for waste void and will result in the creation of an integrated and consistent restoration profile.

5.2.17 The phases of the landfill site are developed generally in a similar sequence in order that completed areas are covered with a low permeability capping layer and restored as soon as possible taking into account operational constraints such as stockpiling. At any one time the previous completed area of landfilling would be undergoing capping, soil placement and restoration planting while landfilling is taking place in the operational phase. Concurrent with these operations the next phase would be being excavated and engineered in preparation for landfilling. The development of these different stages in each phase is illustrated in Table ES5.1.

5.2.18 The site including the proposed western extension will provide landfill void which will result in the operation of the landfill for a period of up to 20 years from commencement. It is anticipated that extraction and engineering operations will commence shortly after the DCO and Environmental Permit are granted.

5.3 Pre-construction works including mitigation and enhancement measures

5.3.1 A number of measures will be implemented before work starts on the construction of the landfill areas in the proposed western extension. These works will be phased and will be carried out before the landfill development works in each individual phase or area. The works will comprise practical preparatory measures as well as enhancements and measures necessary to provide the mitigation identified in the impact assessments which are reported in this Environmental Statement (ES). The details of the implementation of the pre-construction mitigation measures are set out in a number of schemes which will be implemented as a Requirement of the DCO and which are listed in Table ES5.2.

5.3.2 Details of the ecological and habitat mitigation works are provided in Section 13 of this ES and a summary only is provided here. Land will be retained under agricultural management until the site operations commence in each

area unless the areas are needed for early ecological mitigation or material storage.

- 5.3.3** A new species-rich hedgerow will be created running parallel to and 1m to 2m away from the existing, grown-out and gappy hedgerow currently forming part of the western boundary of the proposed western extension between the northeast end of The Assarts (Fineshade Woods) and the northwest corner of the western extension (Figure ES5.1). The current poor hedgerow along the northern boundary of the western extension will be improved by gapping up with a range of local species (Figure ES5.1). These hedgerows will provide larval food plants for a range of invertebrates and mammals, including dormice. Blackthorn planting is proposed in particular to enhance the habitat at locations where the local colony of Black Hairstreak butterflies have been identified.
- 5.3.4** At or prior to the commencement of works in the proposed western extension two parallel rows of double hedgerows to the north and south of the proposed east/west drainage channel will be planted so that they have as much time as possible mature and develop. At the same time a species rich hedge with trees will be planted along the eastern boundary of the southern part of the proposed western extension (Phases 15 to 17) parallel to the farm track and the existing hedge along the southern boundary of the current landfill will be improved (Figure ES5.1).
- 5.3.5** Following the granting of the DCO an application will be made for a licence to erect an amphibian exclusion fence around the proposed active area(s) where protection is necessary. As the area that will be surrounded by the fence currently comprises agricultural land no significant great crested newt terrestrial habitat will be lost. Grassland habitat will remain available in the boundary ecological mitigation area outside the fenced area and connectivity between all existing ponds and feeding areas will be retained. The protected grassland areas between the protective fences and the adjoining woodlands will provide feeding, basking and hibernation areas for a wide range of

invertebrates, amphibians, reptiles and small mammals. This habitat will be excluded from agricultural use and managed for the duration of the active works. The function of the fence will be to protect the amphibians and reptiles by excluding them from the operational areas. The animals which are displaced from the agricultural fields will be moved to the boundary ecological mitigation area. Fencing for the exclusion of other animals such as badgers and deer will also be erected where necessary as explained in Section 13 of this ES.

- 5.3.6** All existing vegetation that is due for removal will be retained for as long as possible during the development. Vegetation will be removed progressively as necessary in advance of each area being developed. Vegetation will be removed outside the breeding bird season wherever possible. If it is necessary to remove vegetation during the breeding bird season (March to August) then all clearance will be preceded by a survey for nesting activity by a suitably qualified and experienced ecologist.
- 5.3.7** Initial works will include the removal of a section of the western boundary hedgerow between the existing ENRMF and proposed western extension in order to provide access for the haul road from the existing ENRMF and a section in the eastern half of the central hedgerow currently crossing the proposed western extension in order to create the route for the haul road to the northern Phase 12 area. The hedgerow removal will take place following erection of the exclusion fencing around the initial operational area including the haul road and once all animals are removed to safety.
- 5.3.8** Works for the diversion of the electricity cables along the western site boundary of the existing site will be carried out prior to the creation of the haul road access route. Detailed planning discussions will be held with Western Power regarding the diversion of the electricity cables and with Anglian Water regarding the placement of the diverted cables adjacent to the water pipelines in advance of excavation works for the buried diverted cables.

- 5.3.9** Once Phase 14 of the western extension area is completed and restored, the existing surface water drainage pipe which runs below ground across the doline area to drains to the swallow hole feature will be excavated and replaced with a surface water channel and ponds bounded by grassland and the parallel hedgerows planted earlier as described above and located either side of the water drainage channel as shown on the illustrative sketch at Figure ES5.3.
- 5.3.10** Prior to the commencement of operations in Phases 19 to 21, the remaining length of the western hedgerow will be trapped out, with any remaining animals transferred to the boundary area and this hedgerow will be cleared before excavation works commence in these phases.
- 5.3.11** Prior to the commencement of operations in Phase 21 the remaining length of the central hedgerow will be trapped out, with any remaining animals transferred to the boundary area and this hedgerow will be cleared before works commence in Phase 21.
- 5.3.12** As described in Section 16 of this report, the site has limited areas of potential archaeological interest. The two areas of local archaeological interest which have been identified by the evaluation will be subject to a watching brief during soil stripping under the direction of an archaeologist, followed by archaeological excavation in advance of development in these areas. The areas comprise an area in the northern part of the western extension and an area in the centre of the western extension (Figure ES5.1). A watching brief will be undertaken where soil is stripped from areas close to the water pipelines prior to the excavation of trenches for the diverted electricity cables, because these areas were excluded from the archaeological trial trenching.
- 5.4 The stripping, extraction and stockpiling of soils, overburden and clay**
- 5.4.1** There are no soils other than those in stockpiles on the existing ENRMF landfill area. As the remaining phases of the existing ENRMF are constructed it will be necessary to excavate clay and overburden. Clay will be extracted to a

maximum depth of approximately 74.5m AOD which is approximately 13m below the boundary ground level.

- 5.4.2** Soils and overburden will be stripped from the proposed western extension prior to mineral extraction and landfill construction operations in each area. Topsoil and subsoil will be stripped separately. All soil stripping, handling, storage and management operations will be carried out progressively in accordance with prepared phasing plans and the Soils Management and Handling Scheme (PINS document reference 6.5) which has been prepared in accordance with the relevant guidance for the Good Practice Guide for Handling Soils as explained further in Section 15 of this ES. Part of the northern area of the proposed western extension has an area of soil which is classified as Grade 3A Best and Most Versatile agricultural soil. This soil has been identified as having a high pH and calcium carbonate content and therefore will be husbanded for use in developing the areas of the site to be restored as calcareous grassland.
- 5.4.3** Clay and overburden will be excavated from the proposed western extension. Clay will be extracted to a maximum depth of approximately 72m AOD and approximately 16m below ground level. Clay suitable for use in constructing the clay lining for the landfill will be selected during excavation.
- 5.4.4** Suitable clay from current stockpiles together with clay extracted during the preparation of the proposed western extension will be used in constructing the clay lining for the proposed western extension. Clay and other suitable materials will be exported from the site to the nearby Augean landfill site at Thornhaugh as there is a requirement for clay for use in the construction of the engineered lining system. Any remaining clay and overburden will be exported for general sale and use. Excavated materials that do not comprise engineering clay will be used as daily cover material and as protective cover and restoration material over the clay cap.
- 5.4.5** Theoretically, soils that are stripped in one phase can be reused directly in an earlier phase which is undergoing restoration. Clay excavated from one phase

can be reused directly in the capping of an earlier phase where landfilling is complete and in the construction of the engineered liner in the next phase which is being prepared for landfilling. Clay and overburden which is excavated and is surplus to requirements on site can be removed from site directly for use elsewhere. In practice, there will be a temporary delay between the excavation and placement of materials and in the removal of materials from the site depending on the timing of development projects where the clay is needed and the timings for transportation. It will be necessary to make provision for temporary stockpiling of materials to allow for these interim measures.

5.4.6 The central and eastern area of the existing landfill site already is used for stockpiling as shown on Figure ES5.4. It is proposed that the area and height of this stockpile is progressively reduced. The areas currently used for stockpiling will be restored progressively as the areas occupied by the stockpile are released. It is proposed that the area of Phases 19, 20 and 21, which will be the last areas to be landfilled, are used where necessary for the formation of temporary stockpiles. No stockpiles will be constructed in Phases 19 to 21 that exceed the height of the proposed restored landform. Stockpiles will be orientated where possible to maximise screening of the haul road access point from the current landfill site in order to reduce further the visibility of operations from the footpath to the west of the site.

5.4.7 When site operations in the proposed western extension progress to excavate, construct and fill the landfill areas in Phases 19 to 21, the area available for stockpiling gradually will be reduced and it will become necessary to create a temporary stockpile area in the existing ENRMF. In order not to disturb the main area of the existing ENRMF landfill which will have been restored by this stage, a temporary stockpile location will be created against the south eastern flank of Phases 4B and 5B at the location shown in the Stockpile Management Scheme (PINS document reference 6.5). This location is considered the least visually intrusive location that can temporarily accommodate the necessary material.

5.4.8 All soil stockpiles will be constructed and managed in accordance with the Soils Management and Handling Scheme (PINS document reference 6.5). Topsoil stockpiles will be no higher than 3m and subsoil stockpiles will not exceed 5m in height. All clay and overburden stockpiles will be constructed and managed in accordance with the Stockpile Management Scheme (PINS document reference 6.5). Any stockpiles that will remain in place for more than 12 months will be vegetated and the vegetation will be managed in accordance with the scheme.

5.5 Landfill engineering and containment design

5.5.1 The principles of the engineering and containment design of the landfill cells and the measures for the placement and containment of waste are described here. The general site operations and infrastructure are described in Section 7 of this ES. Given the similar geology beneath the proposed western extension and the existing ENRMF it has been agreed in principle with the Environment Agency that the same approach to the landfill engineering can be applied in the proposed western extension. As implemented in the areas being constructed for landfilling at the existing ENRMF, a minimum thickness of Rutland Formation and/or glacial till of not less than 2m will be retained in situ beneath the engineered low permeability basal liner.

5.5.2 As stated in Section 3 cell construction will commence shortly in Phase 8 and 9 of the existing ENRMF landfill. In discussion and agreement with the Environment Agency, during the preparation of future cells, particularly those close to the known and potential limestone solution features, geophysical surveying may be undertaken following excavation to the formation level but prior to the construction of the engineered liner to identify and locate the presence of potential solution features in the Lincolnshire Limestone. The approach taken for each cell including the need for geophysical surveys is agreed with the Environment Agency through the preparation of a Construction Quality Assurance (CQA) Plan. Any such features identified will be further investigated and appropriate action carried out for example infilling

with suitable low permeability material. Cell construction in the existing landfill area comprises the following components constructed in sequence up from the top of the in-situ material:

- at least a 1m thickness of engineered low permeability site derived clay,
- an artificial sealing liner comprising a 2mm thick HDPE geomembrane,
- a protection layer above the low permeability seal formed from geotextiles or sand,
- an overlying leachate drainage layer on the base of crushed aggregate or shredded tyres and/or tyre bales with drainage pipes,
- leachate monitoring and extraction wells,
- a concrete target pad for retrospective well drilling, and
- a drainage geocomposite on the side slopes.

5.5.3 The liner specification for the existing ENRMF landfill is agreed with the Environment Agency in accordance with the Environmental Permit through CQA Plans prepared and agreed for each area of engineering and these principles will continue for the proposed western extension.

5.5.4 The design of the low permeability capping layer at the existing ENRMF is agreed with the Environment Agency through CQA Plans prepared and agreed for each area of engineering and this principle will continue for the proposed western extension. The specification for the low permeability capping currently comprises the following elements or alternative specification providing equivalent protection. A composite cap consisting of:

- a regulating layer of approximately 0.3m over the top of the waste,
- a 1m thick low permeability engineered clay liner formed from site derived clay,

- a drainage layer typically formed of a geocomposite or 0.3m layer of suitable material, and
- 1m to 1.5m of restoration materials.

5.5.5 The nature of the site containment including the basal and side wall lining system and the capping layer will be specified through the Environmental Permit. The final profile of the waste and capping layer is designed to form a stable slope which will encourage shedding of rainfall to minimise infiltration and as a consequence to minimise the generation of leachate which is the contaminated liquid formed when water infiltrates into the waste and which is collected in the base of the site.

5.5.6 As explained above a leachate drainage blanket and leachate collection sumps will be constructed at the base of the site above the low permeability basal liner. The leachate levels will be controlled by pumping leachate from the leachate collection sumps or other extraction wells drilled as necessary. The level at which the leachate is maintained will be specified in the Environmental Permit.

5.5.7 The leachate generated at the site will not be recirculated above the ground. The excess leachate will continue to be pumped into a leachate storage tank and used in the on-site waste treatment facility in place of mains water. If the leachate is not needed in the on-site waste treatment facility it will be removed from site by tanker for treatment at a suitably authorised waste water treatment plant.

5.5.8 The waste types accepted in the initial cells at the existing ENRMF prior to July 2004, which is when the limitation on the organic content of landfilled hazardous wastes was implemented, have the potential to generate significant quantities of landfill gas. Even though the wastes that have been deposited since July 2004 and those that will be deposited in the future at the site will have a limited organic carbon content there is residual potential for the generation of small quantities of landfill gas and volatile organic compound

vapours. Landfill gas is generated as a result of the biodegradation of materials formed of organic carbon materials, typically food waste and vegetation. Materials such as paper, textiles and wood are also biodegradable but generally only at very slow rates.

- 5.5.9** The LLW wastes that will continue to be disposed of at the site will exclude biodegradable materials as far as is reasonably practicable. The levels of radioactivity in the LLW which is accepted are too low to give rise to a risk from radiolytic hydrogen gas evolution. It is unlikely that significant quantities of landfill gas will be generated from the LLW that will be deposited at the site. If gas is generated by the hazardous waste and/or LLW, the gas will be collected in the gas management system and directed to the gas flare for combustion.
- 5.5.10** A dual system of gas and vapour migration control is and will continue to be operated at the site in order to control any gas or vapour that might be generated. The engineered low permeability basal and sidewall liners impede lateral gas and vapour migration and the low permeability cap reduces the emissions to the atmosphere. A pumped landfill gas extraction system is and will continue to be operated which prevents the accumulation of gas under elevated pressures in the landfill minimising further the risk of the migration of gas and the emissions of gas to the atmosphere. The collected gas and vapours will continue to be directed to the gas flare located to the north west of the current landfill area and combusted in a high temperature flare. Combustion of the gas and vapours destroys potentially harmful and odorous components in the gas and minimises the release of methane which is a potent greenhouse gas. The location of the gas pumping system and flare stack is shown on Figure ES3.2. The gas pumping system and flare stack is surrounded by 1.8m high fencing. The maximum height of the flare stack is 10m. The gas flare and pumping facility will be used also for any gas control and management needed for the proposed western extension landfill and will remain at the site beyond the completion of landfilling for as long as ongoing gas control is needed.

- 5.5.11** Surface water that has been in contact with waste will continue to be collected and managed as contaminated water. The operational surface water management system for the existing ENRMF will be extended to include the proposed western extension. The operational surface water management system will continue to be installed progressively as landfilling continues in the existing and future landfill areas. Currently surface water is used in the waste treatment and recovery facility, for dust suppression and in the vehicle wheel wash.
- 5.5.12** Clean surface water runoff is separated from and managed in a separate system to the operational surface water which has the potential to be contaminated. Clean surface water that has not been in contact with waste will continue to be collected in a series of drainage ditches. In the event that not all the clean surface water is used on site it is discharged to a drainage ditch adjacent to Stamford Road in accordance with the conditions set by the Environment Agency in the current Environmental Permit. The Environmental Permit specifies that any discharges are monitored and subject to limits.
- 5.5.13** As described in Section 18 of this ES the proposed restoration design for the western extension incorporates areas designed to function as surface water attenuation basins. The rate at which water will leave the attenuation basins will be controlled so that during extreme rainfall events a significant proportion of runoff will be retained to attenuate the runoff peak. On this basis the surface water attenuation function of the surface water management system will be accomplished primarily by allowing water to accumulate in the basin areas temporarily during storm events and to be released from the basin areas in a controlled manner. The management of surface water for the restored areas of the site is addressed in more detail in Section 18 of this ES.

5.6 Disposal of hazardous waste

- 5.6.1** Details of the controls in place for the acceptance of hazardous waste in the landfill site are presented in Section 8 of this ES. Once the waste has been accepted at the site the delivery vehicle will travel along internal haul roads to

the operational landfill area where wastes will be deposited at the working face. Hazardous waste will continue to be placed and covered progressively throughout the day and at the end of the day with suitable cover material to ensure that deposited waste is not exposed. Dusty wastes and any potentially odorous wastes will continue to be covered immediately with a minimum thickness of cover material as specified in the Operating Techniques that are controlled through the Environmental Permit. Wastes containing asbestos will continue to be covered immediately with at least 300mm of material and with a further 700mm of material by the end of the day. The operational area will continue to be covered by a minimum thickness of 300mm of cover material at the end of each working day. As discussed further in later sections of this ES, monitoring that is carried out at the existing site demonstrates that the current procedures and controls are effective in the safe disposal of the hazardous waste that is received at the site.

5.7 Disposal of LLW

5.7.1 Details of the controls in place for the acceptance of LLW in the landfill site are provided at Section 8 of this ES; the methods of landfilling and depositing the waste will continue to be carried out in accordance with the current effective procedures and controls. Once the waste has been accepted the delivery vehicle will travel along the internal haul roads to an unloading point adjacent to the active landfill area. The waste packages will be lifted from the delivery vehicles using mechanical handling machines such as fork-lift trucks and placed in the landfill. Waste will not normally be tipped into the landfill but on a limited number of occasions if there are specific arisings of loose wastes that might be deposited by direct discharge from a vehicle (which would be covered or sheeted for transport) then this would be discussed and agreed with the Environment Agency based on specific risk assessments and with agreed additional measures in place. The waste will continue to be disposed of in the operational working cell or cells and will continue to be placed alongside hazardous waste. The disposal of waste will take place only under

the supervision of a trained operative (a Radiation Protection Supervisor) who will be responsible for the operation of the plant at the disposal face.

5.7.2 Immediately after placement the deposited wastes will continue to be covered with a minimum thickness of 300mm of suitable cover material over all exposed surfaces. The radiation levels at 1m above the top of the cover material will be measured to check conformance with the specified dose rate of 2 μ Sv/hr. If the radiation level exceeds the specified dose rate additional cover will be placed as necessary until the specified dose rate is achieved.

5.7.3 As the predicted doses of radiation to which workers at the site will be exposed are below those specified under the Ionising Radiation Regulations 2017 no workers will be defined as Classified Persons in accordance with the regulations. Specific personal protective equipment will not be necessary during normal site operations additional to the standard equipment used and worn by workers at a hazardous waste landfill site. Passive dosimeters will continue to be worn by staff working in the LLW reception and disposal areas as reassurance to confirm that the exposures received are in accordance with the predictions. As discussed further in later sections of this ES, monitoring that is carried out at the existing ENRMF demonstrates that the current procedures and controls are effective in the safe disposal of the LLW that is received at the site.

5.8 Restoration contours

5.8.1 The landfill site will be constructed so that the completed ground level is at the proposed restoration contours. The restoration contours for the final restored landform are shown on Figure ES5.5. Deposited wastes can be subject to settlement for a period following deposition. Settlement can comprise components of physical settlement over time due to self-weight consolidation or settlement following biodegradation and loss of mass. The working assumption when the existing ENRMF was designed was that the landfilled waste would settle by around 15% and therefore the height of the final landform was designed to allow for settlement to achieve approximately the

levels of the approved restoration profile. However, there is little experience of long term settlement rates in hazardous waste landfill and due to the nature of the wastes received at ENRMF it is likely to be much slower and more limited than for landfills containing putrescible wastes. For the purpose of this DCO application the landscape impact assessment considers the restored landform both with and without settlement.

6. Description of the current operations and the proposed development at the waste treatment and recovery facility

6.1 The operation of the waste treatment and recovery facility

6.1.1 The waste treatment and recovery facility located in the north west of the existing ENRMF is the subject of an Environmental Permit for the operation of a soil washing plant, a stabilisation unit, a laboratory/office and an area for bioremediation (Figure ES3.2). The plant comprises modular units including storage silos, material feed hoppers, transfer conveyors and closed mixing vessels. The plant is located on a concrete pad which has a self-contained surface water management system and collection sump. The total area of the waste treatment and recovery facility is approximately 2 hectares. The concrete pad and an adjacent area formed of engineered clay is used for the storage of wastes awaiting treatment as well as for outputs from the treatment processes awaiting transportation from the treatment facility. A lined lagoon is in place to the west of the treatment area which is used for the storage of waste dredgings prior to their treatment.

6.1.2 The modular units including the storage silos currently have a maximum height of 15m. The maximum height of the soil washing plant is approximately 8m. The plant is painted or clad in 'olive drab'.

6.1.3 The current waste throughput of the waste treatment and recovery facility is 200,000 tonnes per annum of hazardous waste. It is proposed that the throughput is increased to 250,000 tonnes per annum of hazardous waste, an increase of 50,000 tonnes per annum.

6.1.4 No substantial changes are proposed to the waste treatment and recovery facility other than an increase in the proposed throughput of the treatment plant and an extension in the area of the treatment and storage facility. The wastes will continue to be treated using modular plant which is adapted as needed depending on the waste types being received and the treatment processes being carried out. The details of the waste treatment processes

and controls are specified and regulated through the Environmental Permit for the treatment and recovery facility. It is important that the specification of the treatment plant remains modular and flexible so that the treatment and recovery processes can be adapted to respond to changes in waste types as well as to national policies and guidance regarding the appropriate treatment which should be applied in order to achieve the management of waste as high up the waste management hierarchy as possible. In order to accommodate the larger treatment and storage area which already is included in the boundary of the waste treatment and recovery Environmental Permit, the waste treatment area will be extended as shown on Figure ES3.3. The total area of the current facility is approximately 2ha and the proposed extended area covers a total area of 2.64ha.

6.2 Acceptance of wastes for treatment and recovery

- 6.2.1** The wastes which are accepted at the treatment and recovery facility comprise predominantly hazardous waste but include some non-hazardous waste. LLW is not accepted at the treatment facility. The wastes typically are delivered in tankers, sheeted tipper trucks, intermediate bulk containers or bulk bags.
- 6.2.2** Prior to entering into a contract for the delivery of wastes for treatment at the facility a pre-acceptance assessment will continue to be carried out using available analytical data or on analytical data for samples taken from the materials destined for treatment in order to confirm the technical feasibility of treating the wastes and to facilitate the selection of the most efficient treatment process. If after treatment materials will not meet acceptance criteria for recovery and use or disposal in a landfill they will not be accepted for treatment at the waste treatment and recovery facility.
- 6.2.3** Wastes delivered to the site for treatment will continue to be inspected visually on arrival and analysis will be undertaken as necessary to confirm that the material is consistent with the pre-acceptance data provided. Only once it is

confirmed that the material is consistent with the pre-acceptance data will materials be accepted for treatment at the facility.

- 6.2.4** Following delivery of material and acceptance for treatment the site chemist will inspect the load visually and select a bay in the hardstanding area for stocking the material. The stocking bays are identified with clear signs and the location of each load delivered will be tracked in a register that is updated daily. Dredging wastes awaiting treatment are stored in the lined lagoon area. The lagoon area is constructed of low permeability clay and is subject to Construction Quality Assurance.
- 6.2.5** Based on the nature of the material, material from different locations or projects will be combined to form compatible batches for treatment. The stockpiles will be a maximum of 5m in height. Dusty wastes such as air pollution control residues (APCR) will not be stored in stockpiles but will be stored in large isopropylene or similar storage bags or will be delivered by powder tankers and transferred to the silos for storage. A schematic flow diagram showing the principles of the waste treatment processes is provided on Figure ES6.1.
- 6.2.6** Prior to some forms of treatment the waste material will be screened to remove oversize fractions. The removal of the oversized fractions is necessary to prevent obstructions in the plant during soil washing or stabilisation or to improve the soil condition for bioremediation. Oversize fractions will be stockpiled before being crushed using a mobile crushing plant if necessary. Crushing will be carried out on stockpiled material on a campaign basis over a period of approximately one week. It is likely that crushing will be carried out during only five or six campaigns per year. Samples of the crushed material will be analysed to assess the nature and composition of the material which will be treated in the site plant if necessary. The main components of the soil washing, stabilisation and bioremediation processes are described below.

6.3 Soil washing

- 6.3.1** The principal elements of the soil washing process are separation, washing, polymer addition, flocculation and dewatering. The soil washing process includes wet physico-chemical treatment to separate pollutants from the clean aggregate materials. The removal efficiency depends on the form in which the contaminants are present and the structure of the soil.
- 6.3.2** The contaminated soils comprising materials with a specified maximum particle size will be transferred by mobile plant from the stockpiles to the input hopper of the soil washing plant. The materials will be transported by conveyor to a wet screen where the materials are separated into a gravel fraction greater than 3mm and a fine fraction less than 3mm. Entrained pieces of metal will be removed by an overhead magnetic belt above the conveyor. The fraction greater than 3mm will be transported by conveyor to a sword washer in which the cohesive soil is broken up. Organic lighter materials in the feed material such as pieces of wood or paper will be removed. Any fine material adhering to the coarser fraction will be washed off.
- 6.3.3** The coarse materials pass from the sword washer to a stockpile. The process water and fine material washed out during the process will pass through a dewatering screen to remove coarse organic material. From the screen the water and the fine fractions mixture will be collected in a buffer tank before being pumped to a series of cyclones.
- 6.3.4** The cyclones process the wash water and fine fractions recovered from the sword washer. The cyclones separate by gravity the finer material into a sand fraction and a residual silt slurry. The sand fraction will be passed over a dewatering screen and be collected in a stockpile. The silt slurry will be removed from the cyclone to an upstream classifier to remove organic material from the slurry together with the fractions less than 3mm separated from the initial feed on the wet screen. The slurry will be transported to a moving belt where flocculating polymers are added to accelerate settlement in a sedimentation unit by breaking down the slurry to form a solid and a liquid

phase. From the sedimentation unit the solid phase will be pumped to a sieve belt-press where it will be dewatered until a firm filter cake is generated. The water released from the belt press will be re-used in site processes.

- 6.3.5** Provided that it meets the landfill acceptance criteria the filter cake comprising the residue from the soil washing process will be transported to the adjacent hazardous waste landfill for disposal. Where the treatment residue for disposal comprises a non-hazardous waste it will be exported from the site for disposal at an appropriately permitted facility which is likely to be the nearby Augean Thornhaugh Landfill Site. The treated sand and gravel fractions will be recovered for use as an engineering and restoration material at the site or may be exported for re-use elsewhere. Prior to re-use or landfilling of the products from the soil washing plant samples will be taken from the materials produced. Samples will be submitted to the site laboratory for appropriate chemical analyses. The final destination or use of the materials generated in the soil washing plant will be determined based on the nature of the material and the analytical results for the different fractions produced.
- 6.3.6** The throughput of the soil washing plant will be 30 tonnes to 40 tonnes per hour of incoming material and the process will be controlled from a control room. A weighing belt on the conveyor located after the input hopper will record the quantity of material added to the process. A weighing belt located after the sword washer and the sieve belt press will record the quantity of material recovered from the process.
- 6.3.7** The soil washing process necessitates approximately 300m³ of water at start-up. The process water will be stored in water buffer tanks housed in the plant. The water will be recycled and treated during the process. There may be water losses during operations through uptake by the solid fractions, spillage and evaporation. Water will be added to the system from the site drainage system. When due to contamination the process water becomes unsuitable for recirculation in the soil washing plant the process water will be used in the

stabilisation process or elsewhere on site as appropriate. No changes are proposed to the soil washing process as a result of the proposed development.

6.3.8 Polymers will continue to be used to facilitate the dewatering of the sludge produced in the soil washing plant. The polymers will be stored in appropriate dry and secure containers.

6.3.9 Some of the residues produced by the soil washing process may not meet the hazardous waste acceptance criteria for landfilling as contaminants in the residues may be too readily leachable. To render the residue suitable for disposal to landfill the residue subsequently can be treated by the stabilisation process.

6.4 Stabilisation process including immobilisation and neutralisation

6.4.1 The processes of stabilisation, solidification, immobilisation and neutralisation are undertaken at the stabilisation plant. The processes are similar but vary in the objectives of treatment and inputs to the process. The purpose of stabilisation and solidification is to fix mobile contaminants in the matrix of the waste to reduce their polluting potential. The purpose of immobilisation is primarily to change the physical characteristics of the waste but the process can also encapsulate contaminants in the waste. The purpose of neutralisation is to moderate the pH of waste, usually to a neutral condition. Where the pH is a significant factor in the hazardousness of the waste it can be possible to generate a non-hazardous waste output. The outputs of all these processes commonly are managed by disposal in landfill but where the chemical nature of the material being treated and the treated outputs are suitable, the treated material can be recovered for a variety of uses including block making, engineering and for reclamation purposes.

6.4.2 The processes described above are referred to collectively in this section of the Environmental Statement (ES) as stabilisation. During the stabilisation process the potentially mobile contaminants in the waste are fixed through the introduction of reagents that reduce the potential for leaching from the waste.

The reagents or mix of reagents used in the process are specific to the type and form of the contaminant present in the waste. The reagents that may be used in the process are subject to Environment Agency approval and currently include cement, flyash, air pollution control residues, landfill leachate, lime, clays, asphalt, iron powder or a combination of binding polymers or other additives. Additional reagents such as waste acids or other waste materials may be added to the consented waste treatment processes in the Environmental Permit.

6.4.3 The throughput of the stabilisation plant will be approximately 20 tonnes to 40 tonnes per hour of incoming material. The waste will be transferred by mobile plant from the stockpiles to the input hopper of the stabilisation plant. From the input hopper the material will be transferred to a mixer where a fixed amount of additive will be added and the contents mixed. The output from the mixer will be an immobilised material which is deposited in the landfill once samples have been collected and chemical analyses have been completed and assessed against the relevant landfill waste acceptance criteria or, where the material is suitable, it may be recovered for use elsewhere.

6.4.4 The reagents for use in the stabilisation process will be stored in secure areas at the treatment facility. One of the reagents used in the stabilisation treatment process as a substitute for cement is air pollution control residues (APCR) from incinerators or biomass plants. Incinerators and biomass plants produce the APCR 24 hours a day, 7 days a week. The incinerator and biomass plants have capacity to store the APCR over weekends but not where the weekends are extended due to public holidays. To provide a continuing disposal outlet for the APCR these materials will continue to be accepted on public holidays and the treatment facility will be operated to use the material as a reagent to treat wastes already stocked at the site. No more than twenty tanker loads of APCR will be received at the site on public holidays. No waste will be landfilled during these days. No significant changes are proposed to the stabilisation process as a result of the proposed development.

6.5 Bioremediation process

- 6.5.1** The bioremediation process is based on enhancement of the rate and extent of natural biodegradation of organic pollutants in the wastes, commonly waste soils, into carbon dioxide and water. Wastes such as soils that are contaminated with light hydrocarbons for example petrol and diesel are suitable for bioremediation. The natural bioremediation process is accelerated by the addition of nutrients.
- 6.5.2** The contaminated wastes for the bioremediation process will be screened to reduce particle sizes and nutrients will be added to the screened waste. The material will be stored in a stockpile and covered with a canvas on the hardstanding area at the treatment facility in an area allocated for bioremediation.
- 6.5.3** The material will be turned as necessary to facilitate aeration of the material. Approximately every two weeks during the bioremediation process and at the end of the process representative samples will be recovered from the stockpile and sent to the site laboratory for analysis of the organic compounds. When the concentrations of organic pollutants have been degraded to an acceptable concentration the material is suitable for re-use in engineering and restoration works at the landfill or for exportation from the site for re-use elsewhere. No changes are proposed to the bioremediation process as part of the proposed development.

6.6 Additional processes and controls

- 6.6.1** The potential for dust generation at the soil treatment plant is low as the processes for soil treatment are enclosed or will be undertaken on damp materials. The potential for dust blow from soils stored in stockpiles on the hardstanding before treatment will continue to be minimised by using a water bowser or sprays as necessary.
- 6.6.2** The mixing of APCR for stabilisation, immobilisation and neutralisation is carried out in a closed vessel which will prevent dust emissions. On

completion of the treatment the product from the stabilisation processes will be removed for re-use elsewhere or disposal in the landfill site. The bioremediation process will take place in covered stockpiles which prevents dust emissions from the soil during treatment. The remediated material product will be removed for re-use on completion of treatment. If there is any delay in removal the treated material stockpiles will be kept damp by means of a water spray before being exported from the treatment area.

6.6.3 The waste treatment and recovery facility is responsive to market conditions while operating to high environmental and safety standards. In order to respond to the market it is necessary for there to be flexibility to allow the movement of modular units within the footprint of the concrete pad and adjacent storage area to provide alternative arrangements. It is necessary to extend the total area of the waste treatment and recovery facility from approximately 2ha to 2.64ha in order to accommodate the proposed increase in the throughput to the treatment plant including areas for the storage of wastes. The assessments within the Environmental Impact Assessment reported in this document are undertaken based on the worst case scenario⁴ based on the Rochdale Envelope Principle whereby the landscape and visual impact is assessed based on the assumption that the tallest plant items may be located anywhere in the proposed consented area e.g. the tallest modular unit in the most visible location. As the majority of the units on the concrete pad are modular there is not significant massing of buildings or structures on the concrete pad.

6.6.4 The operation of the waste treatment and recovery facility will be extended to 2046 at the latest to match the estimated lifetime of the extended landfill site. Prior to the commencement of the final phase of landfilling in the proposed western extension it is proposed that the waste treatment and recovery facility will be removed. If possible and practical all or elements of the treatment plant will be reused elsewhere or refurbished for use elsewhere. The hardstanding

⁴ *The Planning Inspectorate (2018) Advice Note Nine: Rochdale Envelope*

will be broken up and crushed for use as recycled secondary aggregate. Following removal of the treatment plant and associated infrastructure, landfilling of the north western section of the existing ENRMF (Phase 11) will be the final area landfilled and restored prior to the closure of the site.

7. General site operations and infrastructure

- 7.1.1** The general layout of the site infrastructure is shown on Figure ES3.2. The infrastructure includes site offices and welfare facilities, a laboratory, weighbridge, wheel washing facilities, lighting, security cameras and fencing together with fuel and leachate storage facilities and the gas flare.
- 7.1.2** The landfill and treatment facility will continue to be accessed from the current site entrance on Stamford Road and using the site reception, weighbridge and wheelwash facilities shown on Figure ES3.2. Temporary access routes through the proposed western extension to the operational phases will be constructed as needed. Where it is necessary to cross the routes of services, suitably supported temporary crossings will be constructed as agreed with the relevant services authority.
- 7.1.3** It is proposed that the mineral extraction, construction and operation of the landfill, waste treatment and recovery facility will continue to be between 0700 and 1800 Monday to Friday and 0700 to 1300 on Saturday. There will be no waste management operations or importation of waste materials on Sundays or on public holidays with the exception of the receipt and use in the treatment facility of up to 20 loads of air pollution control residues on public holidays.
- 7.1.4** It is proposed that a chemical analytical laboratory will continue to be operated at the site. The laboratory at the site currently includes advanced analytical equipment and qualified chemists to provide an accurate and detailed testing capacity for wastes and environmental samples.
- 7.1.5** To minimise the potential for dust generation as a result of site traffic during dry weather haul routes will continue to be kept damp with water delivered from a bowser or other spray. The running surface of roads formed of hardcore or similar materials will continue to be maintained to prevent the formation of ruts and potholes that may trap silt laden water which could cause dust when it dries and result in increased noise from site traffic. The movement of mobile plant and site traffic will be restricted to defined haul routes which are treated.

Vehicle speed limits will continue to be imposed to control noise levels and reduce the potential for dust to be raised. All site vehicle exhausts will be upward pointing to prevent dust being 'blown' up from the road surfaces. During landfill engineering works to ensure that the optimum moisture content is maintained clay is maintained in a damp condition hence landfill engineering does not result in the generation of dust.

7.1.6 All vehicles associated with delivering waste to the site must make use of the wheelwash before exiting onto the road network. The wheel cleaning facilities present at the site comprise three stages:

- a wheel spinner
- a hurricane style power wash
- polishing stage with power wash.

7.1.7 All drainage from the wheelwash system is recycled. Silt from the system is disposed of in the landfill site. When the water is no longer suitable for recycling it is used for dust suppression in the landfill area or in place of mains water in the treatment and recovery facility. All waste delivery drivers are issued with site rules as part of their induction to the site. The rules include instructions on the use of the wheel cleaning facilities.

7.1.8 The hard surfaced internal roads, site access and the section of Stamford Road close to the site entrance will continue to be swept regularly by a road sweeper to remove any debris and mud. A closed circuit television (CCTV) camera is installed at the site entrance and monitored from the weighbridge office to direct additional road cleaning when necessary both inside the site and on Stamford Road.

7.1.9 It is proposed that procedures will remain in place to direct site waste traffic, other than traffic making deliveries from a local source, to only enter and exit the site to and from the north along Stamford Road. Signs are in place to state that vehicles must turn left on leaving the site. It will be specified in the contract

with the consignors of LLW that other than Stamford Road delivery routes must use A roads only between the A47 and the site.

- 7.1.10** Site security is the subject of the Environmental Permit and has been agreed with the Environment Agency on the basis of risk. The entire operational landfill, reception area and site entrance will continue to be covered by 24 hour CCTV. The CCTV system includes night vision and motion sensing. The CCTV feeds will continue to be manned remotely. In the event of intrusion the police and site management will be called.
- 7.1.11** As stated in Section 3 the existing site has either a 1.8m high fence or a thorny hedge around the entire site boundary. Advice will be taken from the local police force and the Environment Agency with respect to site security for the proposed western extension. Site fencing or alternative barriers will be extended around the operational areas of the proposed western extension in order to prevent the entry of animals including deer. The animal exclusion fencing will also be designed to serve as appropriate security fencing.
- 7.1.12** An Emergency Plan is in place as part of the Environmental Management System at the site which includes the actions which are necessary to inform the public in the highly unlikely event of an accident that has the potential for a significant effect beyond the site boundary. The Emergency Plan will be adapted and communicated as necessary based on the extended operations permitted at the site.
- 7.1.13** The existing ENRMF lighting comprises units fixed at a height of approximately 5m directed towards the ground. The units operate on dusk to dawn optic sensors and all lighting is set up to minimise glare but to provide suitable light to ensure the effectiveness of the CCTV camera system. The lighting is located in key areas at the main reception and office areas for both security and health and safety considerations. The key locations are the site entrance and visitors' car park, the main site office to provide light to the staff car park and weighbridge area and around the laboratory and vehicle inspection area. Mobile lighting is provided on the landfill and down-facing

lighting units are fixed to appropriate points on the waste treatment plant. The site lighting at the site infrastructure will not change as a result of these proposals. Mobile lighting will be used as necessary on the proposed western extension during operational hours when light levels are low.

7.1.14 The following existing ancillary infrastructure will be retained for the proposed development period to 2046:

- Weighbridge
- Wheel cleaning facilities
- Landfill gas flare and pumping station
- Laboratory
- Canteen
- Offices
- Cess pit
- Leachate storage tanks (mobile locations)
- Fuel storage tanks
- Monitoring boreholes
- Security cameras
- Boundary fencing.

7.1.15 Following the closure of the landfill to the receipt of waste, the leachate storage tanks, landfill gas management, surface water management and associated fuel storage and infrastructure will be retained at the site as necessary. All site infrastructure which no longer is necessary including offices, mess facilities, the weighbridge, wheelwash and security infrastructure will be removed.

7.1.16 As described further in Section 9 of this Environmental Statement, in response to requests made during the pre-application consultation, the area in the south eastern corner of the site will be repurposed as a small car park for use by those visiting the site to benefit from the footpaths that will be created.

8. Regulation and site monitoring

8.1 Site regulation

8.1.1 The existing ENRMF operations and management systems for the acceptance of waste and the operation of the hazardous waste and LLW landfill site and the waste treatment and recovery facility are developed based on guidance from the Environment Agency and the application of best practice. Environmental monitoring that is carried out in accordance with guidance and site specific schemes agreed by the Environment Agency confirm that the operations are not having a significant impact on the environment and do not represent an unacceptable risk to human health. It is proposed that these operating systems and schemes will be continued at the site including the proposed western extension. The systems and schemes will be adapted as necessary in response to site specific experience and changes in guidance.

8.1.2 As part of its PAS 99 fully integrated and externally certified Environment, Health and Safety and Quality Management System Augean has formal procedures in place to assess and check that only permitted wastes are received at the site for treatment or disposal. Procedures for the pre-acceptance assessment, waste acceptance criteria and the reception, inspection and verification of waste are formalised in the management system and are rigorously enforced. Any waste that arrives at the site that has not been subject to the pre-acceptance and booking procedure is rejected or quarantined and the Environment Agency is informed.

8.2 Acceptance of waste

Acceptance of hazardous waste

8.2.1 Approved procedures for the management of hazardous wastes which will continue to be used at the site include pre-acceptance procedures which are carried out prior to the delivery of waste to the site and site acceptance procedures that are carried out when waste is delivered to the site. In

accordance with legislation the hazardous wastes that are permitted for deposition at the landfill site will be subject to a maximum total organic carbon content of 6% by weight. Hazardous wastes with leachable components above those specified in the legislation will not be accepted for landfill disposal at the site. Wastes which will not be accepted for landfill disposal include liquid wastes, corrosive wastes, flammable wastes and wastes that are classified as oxidising.

- 8.2.2** Waste will only be accepted at the site for treatment when it has been subject to a pre-acceptance procedure which determines that the waste can be accepted and treated in accordance with the Environmental Permit.
- 8.2.3** Hazardous waste will continue to be received only from contracted customers who must provide information and analytical data regarding the form and chemical nature of the waste and its leaching properties. An assessment will be carried out by the Augean team of specialist Technical Assessors to confirm that the waste is included in the Environmental Permit and that it meets the specified waste acceptance criteria for acceptance at the site.
- 8.2.4** A waste consignment note will be prepared by the customer that describes the waste source and nature, the chemical components and concentrations, the hazards, the form and the quantity of the waste together with the type and number of containers and special handling requirements. The consignee must ensure that the waste is contained as necessary for transport in accordance with the relevant transportation legislation. All asbestos wastes will continue to be delivered to the site and deposited in double skinned bags or containers. Following implementation of Regulation 12 of The Waste (England and Wales) Regulations 2011 the producer of the waste must declare on the hazardous waste consignment note that they have fulfilled their duty to apply the waste hierarchy.
- 8.2.5** On arrival at site the consignment note will be inspected and the accompanying paperwork will be checked together with comparison with the pre-acceptance details. The waste will be weighed and will be inspected and

sampled as necessary to confirm consistency with the consignment note. The consignment note will be completed and logged. Any waste that arrives at the site that has not been subject to the pre-acceptance and booking procedure will be rejected or quarantined and the Environment Agency informed. It is proposed that waste will remain in the quarantine area for a maximum of 10 days. The Quarantine Log will be updated and the Environment Agency notified when the waste is removed off site. Details on the disposal of hazardous waste are provided in Section 5 of this Environmental Statement (ES).

Acceptance of LLW

- 8.2.6** The radioactivity of the LLW that will continue to be accepted at the site is minimal. LLW comprises radioactive waste with a radioactive content not exceeding 4,000 becquerels per gram (Bq/g) of alpha activity or 12,000 Bq/g of beta or gamma activity however the waste which will continue to be disposed of at the site will be limited to that which has a level of radioactivity at the lower end of the activity scale and typically will be up to 200 Bq/g. This means that only LLW with very low levels of radioactivity will be accepted at the site.
- 8.2.7** Prior to agreement that each specific LLW consignment can be accepted at the site Augean will request amongst other information, detailed characterisation information regarding the physical nature, the chemistry and radioactive content of the waste together with information regarding the quantity, form and proposed packaging of the material. Augean will need to be provided with a copy of the relevant Environment Agency Authorisation or Environmental Permit for the disposal of the waste from the source site. The information will be assessed by Augean Technical Assessors and the site management to determine if the material is suitable for disposal at the site and is consistent with the conditions of the Environmental Permit. On approval by the Technical Assessor and site management the consignor will be permitted to make a booking to deliver the waste to the site. The consignor will be

advised of the delivery requirements for the waste including an external exposure limit of 10 micro sieverts per hour ($\mu\text{Sv/hr}$) at a 1m distance from each package.

- 8.2.8** The LLW will be transported to the site in accordance with relevant transport regulations that apply to radioactive wastes. The regulations are established to control the risks to vehicle drivers and risks from for example transport accidents that could result in waste spillage. Due to the limited amount of radioactivity in the LLW that can be accepted at the site, most wastes which will be delivered to the site will not need any form of special packaging or shielding during handling or transport. However for ease of handling and in order to minimise the potential for spillage Augean will oblige waste producers to ensure that waste is transported in enclosed containers such as drums, bulk bags or other containers. Some large items of waste such as metal sheeting may not be transported in containers but will be wrapped.
- 8.2.9** Prior to the delivery of wastes the timetable and details of the waste will be pre-notified to the site in accordance with the transportation regulations and pre-acceptance checks will be carried out to confirm the suitability of the waste for deposition at the site. Prior to the packing of each package or similar group of packages of LLW at the generating site a representative sample will be taken and retained by the source site for a year after the disposal of the package at the landfill. Augean will audit the consigning facilities routinely to confirm that the characterisation and packaging procedures are followed. The detailed procedures are set out in accordance with the Environmental Permit issued by the Environment Agency.
- 8.2.10** On arrival at the site and prior to acceptance onto the landfill area the site chemist will confirm that the characterisation information which accompanies the waste load is adequate, conforms with the pre-acceptance information and that the load is acceptable for deposition at the site. Wastes arriving at the landfill will be subject to a physical check on the integrity of the packaging and monitoring to check that the external radiation dose is no more than 10 $\mu\text{Sv/hr}$

at a distance of 1m from the face of each package. The packages will not be opened or sampled at the site in order to minimise unnecessary exposure.

8.2.11 As explained in Section 5 of this ES additional precautions will be implemented after the waste is deposited in the landfill area and has been covered by suitable non-LLW material. Measurements will be made above the surface of the cover material to confirm that the activity measured at 1m above the surface of the covered LLW would result in an exposure of less than 2 μ Sv/hr. The depth of cover will be increased if necessary to ensure that this limit is not exceeded. These precautions will provide additional confidence that no specific protective measures are needed for workers at the site who are closest to the LLW and will provide additional confidence that anyone off site also is suitably protected.

8.2.12 In the unlikely event that unacceptable wastes are received at the site and the waste can be returned safely to the consignor the wastes will be refused entry to the site and returned to their source. In the unlikely event that a waste consignment is found on arrival to be unacceptable for receipt at the site and may not be safe to return to the sender quarantine measures will be implemented. The Environment Agency will be notified immediately. The detailed procedures for quarantine are specified in accordance with the radiation protection plan for the site which is established in accordance with the Environmental Permit in order to meet the requirements of the Ionising Radiation Regulations 2017.

8.3 Site and environmental monitoring

8.3.1 The purpose of monitoring is to confirm that the site is operating in accordance with the environmental impact assessments and the design. The monitoring is designed to identify at an early stage any deviations in the expected behaviour of the facility to ensure that appropriate remedial action can be taken before significant impact occurs.

- 8.3.2** The site operations and monitoring schemes all will continue to be carried out in accordance with the Augean Environmental Management System (EMS) which is externally certified and accredited to the ISO14001 standard. The EMS together with the health and safety and quality management systems are integrated in accordance with the PAS 99 integrated management system standard. The EMS incorporates procedures and processes for operations and it includes a cycle of setting targets and objectives, planning, implementation, auditing and review together with undertaking where necessary corrective action and setting new targets and objectives. Through the EMS and liaison with the local community in particular through the Kings Cliffe Liaison Group Augean will continue to seek to address potential environmental issues before they become a problem or nuisance.
- 8.3.3** In order to monitor the nature of the leachate generated at the site and to confirm its suitability for use in the site treatment plant leachate monitoring will continue to be carried out routinely in accordance with schemes agreed with the Environment Agency. Site radiochemical monitoring of the leachate will continue to be carried out based on a scheme prepared in accordance with the Environmental Permit.
- 8.3.4** To confirm the effectiveness of the landfill containment system groundwater quality up and down hydraulic gradient of the landfill will continue to be monitored routinely in boreholes external to the waste based on a groundwater monitoring plan which is prepared in accordance with the Environmental Permit. Surface water quality at and around the landfill will continue to be monitored based on a surface water monitoring plan prepared in accordance with the Environmental Permit. The monitoring scheme includes radiochemical monitoring of groundwater and surface water samples.
- 8.3.5** To confirm the effectiveness of the gas control systems landfill gas and volatile compounds are monitored in boreholes installed in the waste, in monitoring boreholes external to the waste located around the landfill and at the gas flare. The gas and vapour monitoring is carried out based on a gas monitoring plan

which is prepared in accordance with the Environmental Permit. Site radiochemical monitoring will continue to be carried out of gas emissions in accordance with a scheme agreed with the Environment Agency as part of the Environmental Permit.

- 8.3.6** Monitoring will continue to be undertaken at the site boundary for methane, hydrogen sulphide and volatile organic compounds. Monitoring of deposited dust, suspended particulates (PM10) and asbestos fibres is undertaken at various locations on the site (Figure ES8.1). Radiochemical monitoring is carried out of particulate emissions in accordance with a scheme is agreed with the Environment Agency as part of the Environmental Permit.
- 8.3.7** Monitoring of noise will continue to be carried out twice a year in accordance with the Noise Management and Monitoring Scheme which is updated from the current approved scheme and which will be implemented through the DCO.
- 8.3.8** A site-wide radiochemical monitoring scheme approved by the Environment Agency and Public Health England is implemented at the site. Public Health England (which is now part of the National Institute for Health Protection) carry out independent assessment and monitoring of the LLW disposal activities at the site. The monitoring scheme includes regular reassurance monitoring of working areas for surface contamination such as the wheelwash, traffic routes, the site access and site offices. As part of the Environmental Permit for the deposition of LLW at the site emergency procedures have been prepared and agreed with the regulatory authorities.
- 8.3.9** All the current monitoring schemes will be extended to include the proposed western extension landfill and will be subject to details and approvals in the Environmental Permits which will need to be varied to include the extension landfill area.
- 8.3.10** The management and monitoring of the site will continue long after the site has ceased accepting waste. It is a requirement of the legislation that

appropriate management remains in place for the duration of the Environmental Permits. The Environmental Permits do not cease on a specified date but continue in force until an application for their surrender is submitted to and accepted by the Environment Agency. The Environment Agency will not accept the surrender of an Environmental Permit until there is no longer any need for active management and monitoring in the opinion of the Environment Agency and until the Environment Agency are satisfied that the site does not present a potentially significant risk to the environment.

8.3.11 As a requirement of the current Environmental Permits for the landfill site Augean make a Financial Provision which is available to the Environment Agency for the management of the site should Augean default on their site management and aftercare obligations. The sum provided is agreed with the Environment Agency. This Financial Provision will be extended to apply also to the activities in the proposed western extension landfill as part of the variation of the Environmental Permit.

9. Restoration proposals

9.1 Introduction

9.1.1 The approved restoration scheme for the existing ENRMF is shown on the plan at Appendix ES9.1. The restoration concept scheme design for the proposed development is shown on Figure ES9.1 and cross sections through the proposed restoration landform are shown on Figure ES9.2.

9.2 Landform

9.2.1 The proposed restoration landform for the current landfill area is a broad, curved ridge running from the east to the south west with slopes generally gentler on the southern side and steeper on the northern side. As explained further below, the proposed landform on the existing ENRMF would extend up to a height of 99m AOD.

9.2.2 The proposed restoration landform for the proposed western extension is a raised profile extending from north to south, rising up to a level of approximately 98m AOD at the northern end of the area and falling to the area of the drainage route across the site. The central area rises up to 97m AOD where it merges with the restored existing ENRMF landform, and then towards the south the landform dips down to existing ground to take account of the retained water pipelines and the diverted electricity cable route.

9.2.3 Two distinct areas of land, one to the south west of the water pipelines and one from the south of the gas pipeline to the southern boundary of the site would also be worked and restored to form two small mounded landforms, rising up to 98.5m AOD.

9.2.4 The design for the existing ENRMF takes into account various factors arising from best practice in terms of landfill restoration in order to maximise rainfall runoff and minimise rainfall infiltration.

9.2.5 As explained in the Preliminary Environmental Information Report (PEIR) that was circulated as part of the pre-application consultation, a number of

preliminary options were designed for the proposed restored landform including integration with the existing landfill area. The selected option reflects the extent of the constraints which have to be accommodated in the design based on the outcome of the various investigations and assessments and discussions with the regulatory authorities and utility and pipeline companies. The restoration profile follows the best practice principles for the design of restored landfill sites including in particular that the landform should be domed with slopes designed to shed water in order to minimise rainfall infiltration through the low permeability cap and into the waste. The gradients of the lower slopes across the western extension range between approximately 1:4 to 1:5.5. The gradients of the slopes across the existing ENRMF site generally follow the existing slopes adjusted to merge and integrate with the proposed western extension and are between approximately 1:3 (across the previously restored neutral/calcareous grassland area along the northern boundary) and 1:8 on the lower slopes. However, there are areas within the slopes that differ from this general pattern and that create local variations which are considered a desirable feature of the restored landforms.

9.3 Afteruse

- 9.3.1** The current approved afteruse scheme is for woodland, species rich neutral grassland, areas of scrubby planting and hedgerows with trees, along with the creation of a new footpath link from east to west.
- 9.3.2** Rather than blocks of woodland the proposed afteruse is to a structure of woodland with shrubby edges, flower meadow grassland, scattered trees, hedgerows and waterbodies. The design generally incorporates neutral/calcareous wildflower grassland interspersed with areas of scrub and trees. The woodland planting with shrubby edges together with the scrubby areas will establish and spread to form naturally regenerated woodland with glades and rides. The developing habitat is designed to complement and provide a substantive link between existing habitats, particularly the adjacent woodlands in the northern area of the proposed western extension by

extending woodland across the site between Collyweston Great Wood and Fineshade Wood. Development of these habitats will directly benefit wildlife such as amphibians, reptiles, invertebrates, including butterflies, and mammals, and provide connectivity for these fauna.

9.3.3 The tree and shrub planting will provide opportunities for nesting birds and saprophytic invertebrates and hopefully, in time, dormice. The opened drainage route will form a watercourse along the central section of the site which will provide a continuing drainage route from west to east with small ponds created within the route to develop as wet woodland. Waterbodies will be incorporated into the design at locations at the base of the raised landfill areas.

9.3.4 The restoration scheme principles follow those agreed for the existing ENRMF which were designed in discussion with the Northants Wildlife Trust in order to match their requirements for adoption as a Local Wildlife Site and to meet several of the Northamptonshire Biodiversity Action Plan habitat creation targets. Discussions have been held regarding the proposed restoration scheme with Natural England, Forest England, Butterfly Conservation/Back from the Brink (Roots of Rockingham), the Bedfordshire, Cambridgeshire and Northamptonshire Wildlife Trust and the North Northamptonshire Council Ecologist as well as friends of Fineshade Wood

Grassland areas

9.3.5 Areas of seeded neutral/calcareous grassland will be developed, predominantly on the existing ENRMF and interspersed with the woodland areas in the proposed western extension as shown on Figure ES9.1. The type of grassland developed in each area will be based on the nature of the soils used for the restoration. The calcareous soils present in the northern part of the proposed western extension will be husbanded for use in the creation of calcareous grassland areas. The grassland/plant mixes will be selected to include plenty of pollen/nectar supplying flowers for the important invertebrates. These grassland areas will provide habitat particularly suitable

for a wide range of invertebrates, particularly saproxylic species breeding in the adjacent Collyweston Great Wood, together with reptiles, feeding birds and ground-nesting birds such as skylark.

- 9.3.6** The grassland areas will be managed primarily by seasonal mowing. In areas where there is a mix of scrub and grassland a band of taller grass will be left around the edges of the scrub patches which will provide over-wintering habitat for invertebrates, cover for reptiles and an area into which woody plants can spread, achieving the longer-term aim of developing a natural open woodland.

Woodland/scrub/hedge planting

- 9.3.7** Discussions held with Natural England, the Forestry Commission and Friends of Fineshade Wood indicated that they would like to see the development of woodland in the western extension area linking the woods on both sides. However, planting a new woodland provides relatively low biodiversity benefit whereas initial planting with a high quality grassland with some trees and patches of scrub (essentially a wood pasture) provides greater biodiversity and also allows for a more natural woodland form to emerge over time. These woodland/scrub/hedge planted areas will provide habitat particularly suitable for nesting birds, dormice, butterflies and other invertebrates, and commuting and feeding bats.

- 9.3.8** The proposed western extension will be planted with habitat blocks in the order of three fifths grassland, one fifth trees edged with scrub and one fifth scrub with 1 to 3 trees in each block. This will be designed to provide a series of pleasing habitats and an assurance of future woodland. However, the final details of the design mix will be based on maximising the opportunities for biodiversity and continued discussions with interested local and national groups.

Access

- 9.3.9** Public access to the restored site is included in the restoration scheme. The approved afteruse for the existing ENRMF includes the creation of a new footpath from east to west. As shown on the Restoration Concept Scheme (Figure ES9.1) a maintenance track will be incorporated into the restored site and a number of new footpaths will be created including a route along the maintenance track. Footpath routes will include circular walks and a crossing over the central watercourse. The paths provide potential for future links with public rights of way to the west of the site which would provide connectivity with the wider rights of way network.
- 9.3.10** In response to requests received during the pre-consultation period a car park area will be retained for footpath users as part of the restored site. The car park will provide approximately 12 parking spaces and will be located to the south of the existing site access on Stamford Road. The surface will be formed of crushed granular material or grasscrete.

9.4 Restoration soils

- 9.4.1** The proposed restoration scheme comprising largely neutral/calcareous grassland, tree and scrub planting and hedgerows with trees will require the use of soils with low nutrient richness typical of unimproved grasslands and natural habitats. Agricultural soils and typical topsoils are inappropriate due to their relatively high nutrient status which would result in strong growth and competition by weed species to the detriment of the target species for the specific habitats. Soils can be sourced from inert material received through the gate but are typically highly variable giving uneven establishment and often importation of undesirable species in the soil seed banks. Use of imported soils will require a reliable source with good characterisation to ensure that the restoration objectives are not compromised. It is proposed to use on site soils and overburden materials as a soil forming material for the restoration of the site wherever possible.

9.4.2 Part of the northern area of the proposed western extension has soil which is classified as Grade 3A Best and Most Versatile agricultural land. This soil has been identified as having a high pH and calcium carbonate content and therefore will be husbanded for use in developing the areas of the site to be restored as calcareous grassland. The soil will be blended and adjusted as necessary to provide the appropriate components including nutrient mix to support the proposed calcareous grassland habitat.

9.4.3 The overburden present at the site generally is a clay rich material 76%-86% with 7%-15% sand. Examination in the field shows that the material is partly weathered and, at appropriate moisture content, can be cultivated. The overburden material will have a very low nutrient content which if necessary can be adjusted by low doses of fertiliser. The need for fertilisation and the specification for handling and cultivation will be determined on a phase by phase basis by testing and examination of the overburden as dug.

9.5 Landscaping and restoration scheme

9.5.1 The final details for the restoration of each phase of the site will be determined based on the principles set out in a Phasing, Landscaping and Restoration Scheme prior to the final restoration of each phase in accordance with a scheme to be submitted under a Requirement in the Development Consent Order (DCO). The Phasing Landscaping and Restoration Scheme will include details of all hard and soft landscaping such as the approach to the testing of soils and nutrient adjustment, details of the proposed planting (species and numbers) and maintenance and the implementation timescales. The principles of the restoration are set out in the Restoration Concept Scheme but the final details of planting species and patterns will be determined based on evolving knowledge at the site and the wider area regarding aspects such as observed benefits, survival rates and disease resistance.

9.5.2 The detailed Phasing Landscaping and Restoration Scheme will be developed in agreement with the local planning authority within 24 months of granting of the Development Consent Order. The scheme will be integrated with the

Ecological Management, Monitoring and Aftercare Plan (PINS document reference 6.5) and will be subject to regular reviews and updates in discussion with the local planning authority. The management and aftercare schemes will continue for a period of twenty years following the cessation of landfilling at the site.

9.6 Biodiversity gain

9.6.1 The restoration scheme for the site has been designed to meet the objective of achieving Biodiversity Net Gain. Biodiversity Net Gain is defined as development that leaves biodiversity at the development site in a better state than it was before the development took place. It is also an approach where developers work with local authorities, wildlife groups, land owners and other stakeholders in order to support their priorities for nature conservation. The approach being taken by Augean and their advisers for the development of the site is in accordance with good practice for achieving Biodiversity Net Gain.

9.6.2 The habitat creation and biodiversity enhancement proposals are set out in detail in the report at Appendix 3 to Appendix ES13.1. The biodiversity net gain has been calculated using the recently issued DEFRA Biodiversity Metric 3.0. The proposed measures will provide a biodiversity net gain of over 110% for habitats and 550% for hedgerows. There will also be a net gain in watercourses through the creation of Swallow Brook. The calculated net gain is substantially above the target which it is anticipated will be specified for Nationally Significant Infrastructure Projects of 10% which is included in the current draft of the Environmental Bill (14 July 2021).

10. The consideration of alternatives to the proposed development

10.1 Introduction

10.1.1 In this section the options and alternatives considered during the development of the final proposals are explained. This includes the assessment of the suitability of the site location and the identification of the constraints which affect and lead to the choices that have been made with respect to the design of the proposed operations, the containment engineering design, the restoration profile hence the void generated and the operational and management proposals. The selection of the final design parameters is described in the relevant sections of this Environmental Statement.

10.1.2 The overarching purpose of the proposed development is to continue to meet the established need nationally and in particular in the centre and south of the UK for the safe disposal of hazardous waste and low level radioactive waste (LLW) and the treatment and recycling of wastes beyond the consented life of the existing ENRMF. The proposals must satisfy all relevant International, European and National legal, policy and regulatory considerations to ensure that people and the environment are properly protected in the short, medium and long term and in order to proceed must be commercially viable and provide business security.

10.1.3 The consideration of the options and the need for the continuation of a facility in this area of the country has been carried out based on the relevant waste management policies and strategies in place as well as relevant planning policies. A detailed review of the policies and strategies and the need for the facility is provided in the Planning Statement which accompanies this application (PINS document reference 6.1) and a summary of the key issues is included in this section.

10.2 The continuing need for a facility in the central area of the country

10.2.1 At the time that the application was made for the original order the limit of extraction for the creation of landfill void was determined based on land

ownership boundaries. The designed landfill void took into account a number of factors including:

- the time needed to fill the remaining void in the previously consented landfill area in the east of the site (Phases 1 to 5),
- the need for additional landfill void for approximately a further 10 year period,
- the proposed landfill input rate of 150,000tpa, and
- constraints at the site such as the available clay, the presence of boundary features, the locations of proposed mitigation planting, existing facilities such as the gas flare, surface water management facility and the waste treatment facility.

10.2.2 The additional void created through the proposed landfill extension the subject of the original Order application of approximately 1.2million cubic metres (Mm³) was designed to allow site operations to continue to provide a facility for the disposal of hazardous waste and LLW for approximately 10 additional years which including completion of the previously consented void in the east of the existing ENRMF extended the life of the landfill site up to the end of December 2026.

10.2.3 The site lies in the south eastern corner of the East Midlands region and is geographically close to the West Midlands, East of England, Greater London and South Eastern regions. As shown in Tables ES10.1 and ES10.2 over 80% of the waste accepted at the waste treatment plant and approximately 98% of the waste accepted at the site for landfill disposal over the last five years originates from these five regions. The majority of the waste deposited in the landfill comprises residues from the treatment plant. As shown in Table ES10.3 the total quantity of hazardous waste produced in England has been rising steadily over the last 5 years and was almost 6.7 million tonnes in 2019. The data in Table ES10.4 show that in the regions nearest to ENRMF the quantity of hazardous waste generated each year is rising over time and in

2019 was approximately 3.5 million tonnes. A total of approximately 877,000 tonnes of hazardous waste was landfilled in England in 2019 as shown on Table ES10.5. No new hazardous waste landfill facilities have been developed in the south of the country since the proposals for the currently consented activities was submitted. Based on the data assessed there is a continuing need for the provision of a waste management facility for the treatment and disposal of hazardous waste able to serve the wastes arising in the West Midlands, East Midlands, East of England, South East and Greater London.

10.2.4 The ENRMF is centrally located for the wastes arising at the locations of the major LLW waste producers in the south and east of the country. The location of the site is well placed to serve the producers of LLW from the nuclear and non-nuclear industries. ENRMF will continue to provide a closer and more convenient alternative for the disposal arisings than the more distant alternative facilities in the north west. The need for a fit-for-purpose site for the landfill disposal of LLW from both the nuclear and non-nuclear industries in a central location that will contribute to the national need for capacity to address the identified shortfall and to conserve the capacity of the highly specialised facility at LLWR remains. The volumes of LLW deposited at the site to date is presented in Table ES10.6 and Table ES10.7 shows the predicted LLW arisings from the major producers of LLW although not all of this waste would be suitable for disposal at ENRMF. As shown in Table ES10.6 a total of approximately 42,796 tonnes of LLW was deposited at the existing ENRMF during 2015 to 2020.

10.2.5 The remaining void capacity at the existing ENRMF at the end of 2020 was approximately 700,000m³. At an input rate of 150,000m³ to 200,000m³ per annum this provides a remaining life of around 3.5 to 4.5 years. The treatment facility occupies the last phase of the landfill and must be removed before the area can be landfilled. Therefore, if it is intended to extend the site to the west to provide a continuous landform and to maintain the operation of the waste treatment facility while a western extension area is landfilled then the

remaining void available is significantly less. This is because the landfilling will need to stand away from the western boundary while the new phases immediately adjacent and to the west are excavated and constructed to provide a continuous landfill void as illustrated in Figure ES5.2.

10.2.6 There is a clear need for the provision of continuity of waste treatment and recovery facilities as well as continuity of void capacity for hazardous waste landfill, as well as for suitable void for the landfill of LLW to serve primarily the West Midlands, East Midlands, East of England, South East and Greater London.

10.2.7 The development of new waste facilities involves a number of steps which must be planned well in advance in order to provide continuity for the Augean business as well as for its customers. These steps include:

- identifying the options for alternative locations for the treatment facility,
- identifying the options for alternative locations for the landfill facility,
- assessing the feasibility of the alternative locations,
- carrying out investigations and surveys to further assess suitability and constraints,
- preparing and submitting the Development Consent Order (DCO) and Environmental Permit applications,
- timescales for determination of the DCO and Environmental Permit applications, and
- the time to carry out pre-operational mitigation and to construct the infrastructure and engineered landfill containment.

10.2.8 To accommodate these steps Augean has conducted studies of options over several years. In this section the alternatives to the proposed development

that have been considered and under each of the aspects listed below are explained:

- alternative waste management methods,
- alternative options for the co-location of the treatment facility and the landfill site,
- the development of alternative locations for the future waste management activities, and
- the consideration of alternatives for the design of the proposals at the ENRMF site.

10.3 Alternative waste management methods

10.3.1 The government policy for the management of hazardous waste is reviewed in the Planning Statement (PINS document reference 6.1) which accompanies this application and remains set out in the 2010 DEFRA Hazardous Waste Strategy⁵. While reviews of this strategy have been carried out since 2010 the principles remain the same. The Resources and Waste Strategy for England published in 2018⁶ takes forward the same principles and enhances the emphasis on minimising the use of hazardous materials in product design and manufacture wherever possible. In the Resources and Waste Strategy it is stated (Section 3.2.2) that based on data for 2016, waste infrastructure in England managed 203 million tonnes of waste, 5 million tonnes of which were hazardous. As noted above the total quantity of hazardous waste produced in England has been rising steadily and was almost 6.7 million tonnes in 2019.

10.3.2 The Resources and Waste Strategy (Section 3.2.6) states:

“Therefore, we will work with producers and waste management companies to explore these issues and

⁵ A strategy for Hazardous Waste Management in England. DEFRA March 2010.

⁶ Our Waste, Our Resources: A strategy for England (the Resources and Waste Strategy). DEFRA December 2018.

consider how we can encourage producers to implement the waste hierarchy in respect to hazardous waste alongside actions to implement the Best Overall Environmental Option for problematic wastes. This may include seeking views on requiring producers of hazardous waste to report annually on how much hazardous waste they produce, send for recycling or recovery, send for disposal and the steps they have taken to drive the management of hazardous waste up the waste hierarchy.”

10.3.3 The National Policy Statement (NPS) on hazardous waste⁷ sets out Government policy for nationally significant hazardous waste infrastructure. The NPS states that new, nationally significant infrastructure for the management of hazardous waste is needed to protect the environment and human health and to allow us to manage hazardous waste in a more sustainable way, recycling and recovering the waste where possible.

10.3.4 The principle which underpins all the waste strategies is that of sustainability and that the quantities of hazardous waste that are generated for disposal should be managed by waste producers and waste managers in accordance with the waste hierarchy. It is stated that the waste hierarchy shall be applied in the following priority order:

- Prevention
- Preparing for re-use
- Recycling
- Other recovery e.g. energy recovery
- Disposal

⁷ National Policy Statement for Hazardous Waste. DEFRA June 2013.

- 10.3.5** In accordance with the strategies and the waste hierarchy, before hazardous waste may be disposed of the producer of the waste must consider whether the generation of waste can be prevented in the first place and for the waste that is generated, to consider the alternative options for its re-use, recycling, use for the recovery of energy or treatment to reduce the hazardousness or volume of the waste. Only residues which remain after consideration and application of the alternatives are suitable for landfill disposal. The implementation of the hierarchy of waste management options means that the need for capacity for the treatment of hazardous waste will increase over time and the need for capacity for the direct landfill of waste is likely to decrease although the need for landfill of residues will remain. The waste hierarchy applies also to non-hazardous waste. One of the consequences of the increased treatment of non-hazardous waste is that the rate of generation of hazardous waste residues from the treatment of non-hazardous waste will increase with a resultant increase in the need for hazardous waste landfill capacity. The 2010 Strategy for Hazardous Waste Management and the NPS for Hazardous Waste recognise that for waste where there is no better recovery or treatment option landfill is the final end point.
- 10.3.6** The facilities operated by Augean at ENRMF manage wastes which cannot be managed appropriately in the upper levels of the waste hierarchy and remain to be managed safely for recovery or disposal using techniques which control environmental impacts. The majority of the wastes delivered to the ENRMF site are directed to the treatment facility where they are treated for recovery wherever possible or are treated to reduce their hazardous nature (particularly to reduce the leaching properties of these wastes) prior to their disposal in containment landfills. The proposals to increase the throughput of the waste treatment facility, to extend the area of the facility and to incorporate flexibility in the precise design of the treatment plant and associated infrastructure reflects the continued development by Augean of opportunities to recover a greater range of waste types for re-use off site following treatment rather than disposal.

- 10.3.7** The waste hierarchy is applied to LLW in a similar way as it is applied to other wastes. Before LLW is directed for disposal to landfill the producer of the waste must first have considered alternative options for its minimisation, re-use or treatment. The UK Government policy⁸ states that nuclear and non-nuclear sites which produce LLW must prepare a LLW Management Plan. The strategy for the management of LLW from the nuclear industry reiterates the commitment to the implementation of the waste hierarchy and the development of site specific LLW management plans. One of the principles of the management plans will be the minimisation of LLW in terms of both activity and mass. LLW producers are obliged to manage their waste in accordance with the waste management hierarchy in the same way as producers of other types of waste.
- 10.3.8** Waste treatment activities for LLW include waste compaction and incineration. However even though compaction can substantially reduce the volume of the waste the residual, compacted waste still will need to be disposed and the tonnage is not reduced.
- 10.3.9** The Government LLW policy (as reviewed in detail in the Planning Statement) recognises that for wastes that cannot be prevented, further minimised, diverted for recycling or re-used, final un-retrievable disposal is the end point for all LLW. The disposal of LLW is therefore considered the last option available to LLW producers. It is clear from the above that there will be a continuing need for LLW wastes which cannot be managed at a point higher in the waste hierarchy to be consigned for landfill disposal.
- 10.3.10** It is considered that even with continued and improved application of alternative waste management techniques to meet the waste hierarchy by waste producers, there remains a need for the continued provision in the east and south of England for an environmentally secure landfill and treatment

⁸ Policy for the Long Term Management of Solid Low Level Radioactive Waste in the United Kingdom. DEFRA March 2007.

facility for hazardous wastes and LLW in order to support the economic structure of UK business and services.

10.4 Alternative options for the location of the treatment facility

10.4.1 The particular advantage available at ENRMF is that the outputs from the waste treatment processes that necessitate disposal in a hazardous waste landfill can be deposited at the adjacent landfill site minimising the transportation associated with their final management. Similarly if the residues from the treatment process necessitate landfill in a non-hazardous waste landfill site they can be deposited at the Augean Thornhaugh Landfill Site which is only 5km by road from ENRMF. In addition the site infrastructure such as access, reception facilities, the site laboratory, offices and welfare facilities can be shared by the two integrated operations at the ENRMF site. There are therefore clear environmental and business benefits to co-locating the treatment and disposal facilities and the benefits of the co-location of waste management facilities are referred to in paragraph 4.13.3 of the NPS for hazardous waste.

10.4.2 Notwithstanding these co-location benefits, Augean carried out a review of the option of removing the waste treatment facility from its current location to a separate location in order to maximise the use of the lifetime of the consented landfill void at the site including the void in the area in which the treatment facility is located currently (Phase 11 of the landfill site). As explained above the majority of the inputs to the landfill arise at the treatment plant therefore the two facilities are closely integrated. Therefore, even if the treatment plant was located elsewhere the limited remaining landfill void created by moving the treatment plant at ENRMF still would need to be replaced in order to continue to provide a secure nearby disposal facility for the outputs.

10.4.3 Alternative locations for the treatment plant in the vicinity of the landfill which were considered included in particular:

- Thornhaugh Landfill Site,

- Land to the west or south of the existing ENRMF, and
- The vacant former MOD land located in Collyweston Great Wood to the north.

10.4.4 Consideration of these options was progressed in parallel with consideration of the options for the location for a new landfill area and the preference remained throughout for the identification of a location at which the two integrated facilities could be co-located.

10.4.5 The transfer of the treatment facility to Thornhaugh Landfill Site has the advantage that the land is owned by Augean however it has the significant disadvantage that the construction of a treatment facility at the site would substantially constrain the available consented landfill void as there are no unused or suitable restored areas at the Thornhaugh site that could be used for the treatment plant.

10.4.6 The land to the west or south of the existing ENRMF facility is not owned by Augean and in the early stages of the review of alternatives the land was not available to purchase adjacent to the site hence the use for treatment was non-viable. When the land to the west became available to Augean to acquire a sufficient land area was made available for extension of the landfill site. The preference was to acquire sufficient land to co-locate the treatment plant with the landfill on an extended acquired area rather than solely to acquire a small area for the short term relocation of the treatment plant.

10.4.7 It was established that the land to the south of the existing ENRMF will not be for sale. For commercial reasons it was not practical to progress the option of the development of the former MoD site which has planning permission for development as a transport yard.

10.5 The development of alternative locations for the future waste management activities

10.5.1 Since the original Order for the existing ENRMF was issued, Augean have been maintaining a watching brief for alternative suitable facilities that might become available to them for future use and in 2017 a proactive programme was developed to carry out a structured geographical search for a potential future site to follow on from the current ENRMF.

10.5.2 A set of search criteria was prepared against which potential sites would be assessed. The main criteria comprised:

- Site type: Existing permitted facilities, mothballed sites and suitable mineral workings considered as well as undeveloped sites with the potential for development subject to planning permission and relevant other permissions.
- Ownership: Freehold basis preferred as leasehold is unlikely to be acceptable due to long term liabilities associated with landfill developments.
- Location: Ideally less than 50 but up to 100 miles from the M25. In an area generally north of the M4, west of the M11 and south of Birmingham.
- Size: Potential for >2million m³ of void. Approximately 40ha dependent on the geology (which will affect the depth of landfill void). Minimum of 5ha available for the treatment facility and ancillary infrastructure.
- Access: Proximity to major A road or motorway access point. Good local access road suitable for HGV use without passing through villages/towns.
- Geology: Location with geology/hydrogeology that does not conflict with Environment Agency groundwater policy.

- Infrastructure: Water, electricity, telecoms to be in place. Gas not necessary. Potential location for discharge of effluent subject to consent.
- Planning policies: In an area where the planning authority has supportive policies for waste management development in the minerals and waste local plan.

10.5.3 The first phase of the alternative site search commenced in August 2017 and was based on location criteria and the geological and hydrogeological setting together with a search of directories of mineral sites and excavations as well as large waste facilities including existing landfill sites. Plans were generated from geological and hydrogeological maps showing the overall areas of unsuitable and potentially suitable locations based on the area of search. The overall findings of Phase 1 of the work resulted in the identification of areas as being identified as generally potentially suitable and unsuitable. Further work was carried out using GIS systems to exclude areas in groundwater source protection zones or in floodplains.

10.5.4 In general the potentially suitable areas of unproductive groundwater strata are underlain by principal aquifers. For example, the Oxford Clay overlies Great Oolite strata which includes the Lincolnshire Limestone Formation principal aquifer, the Gault Clay Formation is underlain by the Lower Greensand principal aquifer and the London Clay Formation is underlain by the Chalk principal aquifer. For a site to be deemed potentially feasible it was identified that there would need to be a significant thickness of unproductive strata above the principal aquifer. In order to consider the site feasibility further it was necessary to check the thicknesses of unproductive strata in each of the areas and, where available, to check information on groundwater levels from the British Geological Survey online borehole records in order to further refine the potentially suitable and unsuitable locations.

10.5.5 The second phase of the search commenced in January 2018 and comprised overlaying the locations of the following areas so that they could be excluded from the search areas.

- Flood Zone 2 or 3
- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- Ramsar sites
- Areas of Outstanding Natural Beauty (AONB)
- Greenbelt

10.5.6 The outputs from these two phases of work which included general areas of search as well as 85 specific sites identified from the databases were reviewed in further detail based on the further key criteria set out above and a shorter list of specific potential locations and specific search areas was provided in mid-2018 to a specialist land and estates surveyor for further review and assessment.

10.5.7 A desk based review for each specific site and area identified was carried out and resulted in the generation of a first shortlist of 43 sites and areas in Cambridgeshire, Bedfordshire, Buckinghamshire, Northamptonshire and Oxfordshire. The development potential of these sites and areas was further reviewed and a second shortlist of 8 sites was assessed in further detail including assessment of their planning and permitting status. A number of these sites were excluded for reasons such as land access arrangements and proposals in place for the development of large numbers of houses on the land. Of the 8 sites in the second shortlist, 2 were discounted due to development constraints/existing development, 2 were identified as having limited potential for development and 4 were identified as potentially worth further investigation to obtain additional detailed information.

10.5.8 In parallel to the wide ranging site search exercise, discussions were taking place with the owner of the land immediately adjacent to the existing ENRMF. At around the time that the site search exercise was narrowing, discussions with the landowner had progressed to a sufficiently positive stage that it was determined to undertake initial discussions with the Environment Agency regarding the suitability in principle of the area adjacent to the west of the existing ENRMF for an extension of the landfill. These discussions were held in late 2017 and resulted in an indication from the Environment Agency that the area was suitable in principle.

10.5.9 An extensive exercise was implemented by Augean to identify potentially suitable alternative locations for the future waste management activities. This wide area of search identified a few sites which were regarded as potentially suitable with a recommendation that they should be investigated further. Neither of those sites were under the control of Augean and discussions had not commenced with the landowners. At approximately the same time discussions between Augean and the owners of the land to the west adjacent to the current facility had progressed sufficiently to suggest that the land might become available. The following discussion explains the reasons that Augean determined to pursue the proposed option in preference to the potential alternatives.

10.5.10 No new hazardous waste landfill or treatment facilities are allocated in the Northamptonshire County Council Minerals and Waste Local Plan (adopted in July 2017). The national significance of the ENRMF facility is noted in the Northamptonshire Minerals and Waste Local Plan (MWLP) at paragraph 5.23 which states:

‘Hazardous treatment (soil treatment) and hazardous waste disposal capacity is provided at the nationally significant ENRMF; which is also used to dispose of LLW’.

10.5.11 The MWLP seeks to secure delivery of new waste capacity in two ways: (1) identification of specific industrial locations where waste management uses

would be acceptable in principle along with sites for waste management facilities; and (2) identification of locally specific policies on which the acceptability of proposals for waste-related development that come forward on unallocated sites can be determined.

10.5.12 Paragraph 5.48 of the MWLP states:

‘The development in Northamptonshire of facilities with a national or regional catchment area are only considered appropriate where these would be of a specialised nature, with a genuine specialist catchment area for the waste to be managed’.

10.5.13 As explained above and in earlier Sections of this report, the facilities at ENRMF provide specialist waste management provision and comprise nationally significant infrastructure which serves a regional and national need rather than just a local need. Policy 15 of the MWLP states:

‘Policy 15: Development criteria for waste disposal (non-inert and hazardous)

Proposals for the disposal of non-inert or hazardous waste must demonstrate that:

- additional capacity is needed to deliver waste disposal capacity requirements,*
- it clearly establishes a need for the facility identifying the intended functional role, intended catchment area for the waste to be disposed and where applicable the requirement for a specialist facility,*
- it is in general conformity with the principles of sustainability (particularly regarding the catchment area),*

- *the waste to be disposed of has undergone prior-treatment to ensure that only residual waste is disposed of, and*
- *disposal forms the last available management option.*

Where this can be demonstrated, preference will be given to extensions of existing sites unless it can be shown that a standalone site would be more sustainable and better located to support the management of waste close to its source.'

10.5.14 Accordingly, where the regional and national need for the capacity can be demonstrated, where it can be demonstrated that the provision of the facility does not conflict with sustainability principles and the application of the waste hierarchy and where the site location is shown to be suitable and does not result in unacceptable environmental and health impacts, the policy preference is for extensions of existing sites rather than the development of new sites.

10.5.15 The extension of the existing site can be achieved using the existing site access and infrastructure including laboratory facilities as well as the existing suitably qualified and experienced workforce who are trained in the assessment and handling of hazardous waste and LLW. Remaining at or close to the existing ENRMF location allows the specialised and experienced workforce to be retained. The necessary skill sets are not easily replicated in another location as most employees live locally. If the site was moved to another location employees potentially would either have to relocate or find other employment or travel longer distances which is not a sustainable approach.

10.5.16 The existing co-located treatment facilities and hazardous waste landfill and the nearby Augean Thornhaugh non-hazardous waste landfill which is consented to operate up to 2034 provide substantial sustainability benefits as a result of the short distance for the transfer of treatment residues which cannot be reused for their final disposal. The existing ENRMF setting has

been demonstrated to be suitable and to provide for the safe disposal of hazardous waste and LLW. The impact assessment sections of this report demonstrate that the proposed extension area also can be developed and operated without resulting in unacceptable impacts on the environment or human health. Accordingly, given that the adjacent land to the west of the existing ENRMF is available to Augean, the development of an extension to the existing, established site rather than a site at a new location provides substantial sustainability, environmental, policy and cost benefits.

10.6 Design constraints and the consideration of alternatives for the proposals at the ENRMF site

10.6.1 Careful consideration has been given to the selection of the area of adjacent land which is the subject of the proposed development. The potential for development of the land adjacent to the existing ENRMF was considered at an early stage taking into account the constraints in place. The land to the north of the existing ENRMF comprises protected woodland and therefore is not suitable, the land to the east is a road. The land to the west and south comprises agricultural fields. Given the topography of the field to the south it was considered that development of the southern field had the potential for a greater visual and landscape impact than development of the fields to the west which are generally more contained and likely to result in a lower potential visual and landscape impact. In addition to these limitations, the option of developing the fields to the south of the existing ENRMF has never been a viable alternative, as the land has not been for sale and the landowner has made it clear that it will not be for sale.

10.6.2 The landowner has confirmed that the sale of the western extension fields and their exclusion from use as part of their farming business does not affect the farm structure or viability of the farming business. The fields in the proposed western extension represent less than 6% of the total farming business landholding.

- 10.6.3** The option was considered of including the whole of the field to the south of the gas pipeline in the southern section of the proposed western extension. However, in order to provide continued easy access for the farmer whose landholding extends to the south of the existing ENRMF and west of the proposed western extension, the southern boundary of the proposed development does not extend to the full extent of the southern field.
- 10.6.4** The option of moving the waste treatment plant to the proposed western extension, particularly the self contained area to the south of the gas pipeline was considered. This would have the advantage that the final phase of the existing ENRMF landfill (Phase 11 and adjacent phases) could be landfilled at an earlier stage than if the treatment plant remains in its current location. It was determined that locating the treatment plant in the southern part of the southern field in the proposed western extension would result in a greater visual impact than the current location which is very well shielded from view by the natural topography and the surrounding landfilled areas. Moving the infrastructure and plant to this area would incur significant costs with limited environmental or operational benefit.
- 10.6.5** Consideration was given to the development of a new access to the site running northwards along an existing track from the northern extent of the proposed western extension to join the A47. It was determined that there were potentially significant ecological impacts associated with the development and use of a route for HGV traffic through the woodland area towards the A47 and that given the ecological constraints at the boundaries of the site there is limited space available at the northern end of the proposed western extension to develop new reception infrastructure. Furthermore it would result in greater distances for vehicles to travel over internal haul routes to reach the landfill area or treatment plant compared with the more centrally located existing access.
- 10.6.6** In developing a suitable design for the void in the landfill in the proposed western extension the physical and environmental constraints have been

taken into account to optimise the void space to provide a commercially viable operation and to meet the national and regional need for hazardous waste and LLW management without compromising environmental protection. The proposed design of the void in the proposed western extension is limited by the physical and environmental constraints at the site which are predominantly:

- The area of land controlled by Augean,
- the need for a standoff from the site boundary to provide space for ecological mitigation, planting, fencing and stable slopes,
- the presence of services,
- the site geology and hydrogeology, and
- the visual impact and effect on landscape character.

10.6.7 The design of the landfill site for the proposed extension area has been finalised taking into account the options that were set out in the Preliminary Environmental Information Report (PEIR) including the diversion of services, the standoff from boundaries in order to provide ecological mitigation, the design relative to the swallow hole and potential doline areas and the proposed restoration profile and scheme. Many of the design principles have been fixed by the technical requirements identified through the assessments.

10.6.8 The depth and horizontal extent of the excavation as well as the nature of the containment engineering including the capping at the consented landfill is specified in the current Environmental Permit and associated documents and will be specified in similar terms for the landfill in the proposed western extension. The geology underlying the site determines the extent of the excavation depth and to some extent the engineering needed.

10.6.9 A full description of the geology underlying the site is presented in Section 17 of this Environmental Statement (ES). In summary the proposed western

extension is formed predominantly of the silty mudstones of the Rutland Formation which overly the Lincolnshire Limestone. The materials which comprise the Rutland Formation are extracted to provide clays which are used to construct low permeability engineered containment seals to the existing ENRMF landfill and at the nearby Augean Thornhaugh Landfill Site. Excess material is exported for use off site. It is the extraction of the Rutland Formation materials which creates the below ground void and the profile of the restoration landform which defines the above ground void.

10.6.10 The depth of the excavation hence the base of the void is constrained by the depth of the underlying limestone. A layer of low permeability Rutland Formation will be left in-situ above the limestone as discussed in Sections 5 and 17 of this ES. The engineered containment layer and leachate drainage layer will be constructed over the base of the site as described in Sections 5 and 17 of this ES. A default specification for the lining, leachate drainage and capping systems for hazardous waste landfill sites is set in the EU Landfill Directive and in national legislation together with the circumstances under which alternative engineering proposals are accepted as equally protective including the risk assessment design criteria which must be met. These aspects of the design will be fixed by the technical requirements identified through the legislation and the quantitative risk assessment. The excavation depth and the design of the landfill containment is therefore controlled by the Environment Agency as summarised in Table ES5.2.

10.6.11 Extensive quantitative hydrogeological risk assessments have been carried out for hazardous wastes and for LLW for the existing ENRMF to confirm that the proposed engineering containment designs are suitably protective of the environment and, as a consequence, protective also of human health. The risk assessments are based on conservative, worst case assumptions and are not based simply on the design criteria and performance expectations. For example the values for variable parameters which are included in the risk assessments usually are set as ranges of values ranging from the minimum likely through the most likely to the maximum likely. The model is then run

through hundreds of iterations with randomly selected combinations of values to generate outputs that are probability based. The most likely outcomes generated by the models as well as the low probability outcomes are included in the assessment in order to determine the acceptability of each of the aspects of the design which are tested. Given the sensitivity analyses for key variables and the outputs from the models there is a high degree of confidence that the engineering containment design provides robust and long lasting protection to the environment. These assessments have been accepted by the Environment Agency and the Environmental Permits are in place for the existing ENRMF.

10.6.12 Similar models have been applied to the proposed western extension for the landfill disposal of hazardous waste and the Environmental Permit variation application has been submitted. The risk assessments and models for the disposal of LLW in the proposed western extension are in preparation and will be submitted to the Environment Agency in due course. The risk assessments and the outcomes will be scrutinised by the Environment Agency who will only grant an Environmental Permit if they are satisfied that the assessments demonstrate that there would be no unacceptable environmental impacts or risks to health.

10.6.13 The void available together with the anticipated input rate and the likely size of each vehicle load delivered to the site determines the traffic numbers that will be associated with the delivery of wastes to the site. The impacts of the predicted traffic numbers associated with the proposed development are assessed taking into account the capacity and safety of the critical roads and junctions. The traffic impact assessment presented in Section 19 of this ES explains that traffic impacts do not constrain the proposed development at the site. Continued restrictions on the routing of traffic are included in the proposed development in order to avoid the impact of traffic associated with the site on rural roads and villages.

10.6.14 A landscape baseline of the environment of the site and its surroundings has been established including the landscape character and visual context of the local area (Section 14 of this ES). An assessment of the development options was undertaken to determine the constraints with respect to the visibility of the proposed extension and the degree to which the landscape can accommodate the proposed development. It is also necessary to take into account the technical needs of the restoration profile which fix aspects of the overall design. In order to provide effective surface runoff from the site surface hence minimise infiltration and leachate generation it is necessary to design the restoration profile at suitable gradients. It is necessary to ensure that the designed gradients are stable for the proposed wastes and engineering components. It is necessary to take into account guidance on the design of minimum slopes for the restoration of landfill sites as well as maximum slopes for the maintenance of grassland areas and woodlands. It is necessary to ensure that there are no predicted residual significant adverse landscape and visual effects from the proposed scheme. The proposed height and shape of the final landform is designed taking into account the existing ENRMF profile and the impact of the extended restoration profile on the landscape character and visual setting of the area. The proposed restoration profile shown on Figures ES5.5 is derived from the criteria summarised above including taking into consideration the landscape character and visual setting.

10.6.15 As explained in Section 9 of this ES, the design of the Restoration Concept Scheme for the site (Figure ES9.1) has been established in discussion with a number of consultees and interested parties and is derived from a series of principles and objectives taking into account the landscape character, existing local habitats and discussions with local groups in order to understand and contribute to their objectives for the area and the Restoration Concept Scheme is designed to maximise the achievement of the identified ecological objectives and to achieve significant biodiversity benefits.

11. Introduction to the assessment of the environmental effects

11.1.1 As explained in Section 4 of this Environmental Statement the proposed development is to extend the landfilling and treatment operations which are carried out currently at the ENRMF facility to the proposed western extension and to continue those activities over a longer period up to 2046. The nature of the activities and the wastes accepted at the site will not change significantly and, while they will take place over a larger area overall, the active area of operations at any one time will not be significantly different to the currently consented activities.

11.1.2 In accordance with good practice the scope of the Environmental Impact Assessment has been determined by consultation with the local authority, statutory consultees and interested parties as well as the Secretary of State through the Planning Inspectorate (PINS). The proposed scope of the environmental impact assessments is set out in the Scoping Report which was circulated in July 2020. The Scoping Report (provided at Appendix ES2.1) was circulated to a wide range of consultees and the responses received were collated into a Scoping Opinion provided by PINS in August 2020, a copy of which is provided at Appendix ES2.2.

11.1.3 The issues raised in the Scoping Opinion and the responses from the consultees during the consultation process have been taken into account when undertaking and completing the environmental impact assessments. The responses to the issues identified in the Scoping Opinion are summarised in Table ES2.1. The specialists carrying out the technical assessments have liaised closely with the consultees and third parties where appropriate to make sure that the scope, methodology and results of the assessments are acceptable to the authorities. The details of the consultation, the responses received and a summary of the changes to the proposed development made in response to the consultation feedback is presented in the Consultation Report (PINS document reference 4.1). The findings of the completed

environmental impact assessments are presented in this Environmental Statement in support of the DCO application.

- 11.1.4** As explained in the Scoping Report and noted in the Scoping Opinion (paragraph 3.3.3), the baseline for the Environmental Impact Assessment (EIA) is the currently permitted activities at the site i.e. the operation of the waste treatment facility and landfill at the existing ENRMF with restoration to woodland and grassland by 31 December 2026. The EIA for the proposed development comprises an assessment of the additional and cumulative impacts or those that may change due to the proposed development. The likely evolution of the baseline scenario if the proposed development is not implemented is also considered as part of each assessment.
- 11.1.5** The Scoping Report, Scoping Opinion and consultee responses identified that the following environmental impact assessments should be carried out: impacts on the health and wellbeing of people living and working in the area, ecology and biodiversity, landscape and visual resources, soil resources, cultural heritage, water resources, flood risk, transport and traffic, noise, air quality, amenity including dust, and socio-economic impacts as well as impacts associated with future climate change and potential accidents.
- 11.1.6** Technical assessments have been carried out of the potential impacts of the proposed activities at the proposed locations and at the proposed rates and duration of operation. The assessments include the cumulative effects of activities at the site as well as the combined effects with any other relevant activities which currently take place or are known to be planned in the vicinity of the site. The technical impact assessment reports are presented as appendices to this Environmental Statement (ES). Summaries of each of the impact assessments and their findings are presented in the following sections.
- 11.1.7** Current operations at the existing ENRMF are the subject of Environmental Permits for the landfill of hazardous waste and LLW and the operation of the waste treatment and recovery facility. The assessment of the impact of the management of hazardous waste and LLW on people and the environment

have been assessed as part of the original Order and Environmental Permit applications for the existing ENRMF hazardous waste and LLW landfill site and the waste treatment and recovery facility and associated site infrastructure. The acceptability of the impacts associated with the effects of the current activities at the existing locations has been confirmed by the granting of the original Order and Environmental Permits for the existing ENRMF. The detailed risk assessments have been reviewed, updated and extended as part of the applications to vary the Environmental Permits for the waste treatment and recovery facility and the landfill disposal of hazardous waste to include the proposed western extension and the proposed changes to the activities. These permit variation applications were submitted to the Environment Agency in May 2021 and the risk assessments for the landfill disposal of LLW in the western landfill area are being carried out currently for submission to the Environment Agency in due course.

11.1.8 The disposal of hazardous waste and LLW and the treatment of waste must have both planning permission or a Development Consent Order (DCO) and an Environmental Permit in order to proceed. The Environment Agency is the regulator with responsibility for pollution control and for ensuring the safety of the public and the environment as a result of the proposed development, the Health and Safety Executive is responsible for overseeing the safety of the site workers and the Department for Transport is responsible for safety during transportation.

11.1.9 The nature of the hazardous wastes and LLW that will be accepted at the site will not change from that which is accepted currently. The LLW that will be accepted will be at the lower end of the range of LLW and typically each consignment will be below 200Bq/g. The overall radiological capacity of the landfill will not change substantially and will apply to the total LLW deposited in the proposed extended site (i.e. the LLW in the existing landfill and the proposed western extension summed together). The principles of the design of the engineered containment and the leachate and gas management infrastructure of the landfill site will not change and will be extended to the

proposed western extension. The principles of the phasing of the landfilling and restoration activities will remain the same and will be extended to the proposed western extension. The methods of operation and control of the waste treatment and recovery facility will remain the same. The exposure pathways which are considered for the landfill disposal and treatment of hazardous wastes are summarised in Table ES11.1.

11.1.10 As an integral part of the applications to extend the Environmental Permits to the proposed western extension detailed risk assessments are being provided to the Environment Agency. The risk assessments relating to the treatment and disposal of hazardous waste are assessed qualitatively except for emissions to water which are assessed quantitatively. Quantitative risk assessments using mathematical models are being carried out to assess the effects of the disposal of LLW. The level of detail in the assessments presented in this document to support the DCO application are intended to be appropriate to demonstrate the land use consequences of the proposals.

11.1.11 The Environmental Permit application for the disposal of LLW will include a detailed quantitative Environmental Safety Case (ESC) which will be based on the ESC submitted in 2015 to support the Environmental Permit application for the disposal of LLW at the existing ENRMF landfill site. Many of the exposure assessments in the revised ESC will be the same as those in the current risk assessment as they are for distinct situations or incidents. Other exposure assessments will be updated and amended in order to reflect the potential presence of a greater quantity of LLW as a result of the proposals for the extension of the landfill to the proposed western extension and the longer operating time. All activities and risk assessments associated with the deposition of LLW will be required to demonstrate that the design dose criteria set for the site will be met. The approach for setting the limit for the overall radiological capacity for the site will remain the same as that adopted for the existing ENRMF landfill in the 2015 ESC. The 2015 ESC and associated addendum for the disposal of LLW at the current landfill site is provided for reference at Appendix ES11.1.

11.1.12 The full and detailed risk assessments that are provided with the Environmental Permit variation applications will be scrutinised robustly by the Environment Agency. Risk assessments are carried out for a number of scenarios which cover the operational and post operational period of the site together with the period in the long term when management of the site may no longer be in place. The exposure routes which are assessed include direct exposure of site workers and members of the public as well as indirect exposure through ingestion and the water and air pathways.

11.1.13 For the disposal of LLW the scenarios which will be assessed include expected events as well as events and accidents which it is considered are unlikely to occur. The exposure pathways which will be assessed for the landfill disposal of LLW are summarised in Table ES11.2. The radiological activity of the LLW that will be accepted at the site typically will be below 200Bq/g for each consignment. The dose criteria against which the potential exposure of site workers and members of the public are assessed are based on the legislation and guidance which specify limits for the protection of the public. The exposure pathways for the acceptance and landfilling of LLW considered for the proposed development will be the same as those considered for the existing ENRMF consented landfill. The risk assessment (set out in the ESC) will be required to demonstrate to the Environment Agency that based on the proposed operational and engineering controls and the controls on the limits set for the overall radiological capacity for the material deposited at the site, the landfill disposal of LLW at the site will meet the dose criteria which are set by the regulatory authorities for the protection of human health and the environment.

11.1.14 The assessments of potential risks from the disposal of LLW will be carried out based on the nuclides which represent the worst case in terms of activity levels and decay rates. The risk assessments take into account the emissions from daughter nuclides that are generated as a result of nuclide decay. The exact mixture of radionuclides that will be sent to the landfill for disposal will not be known until waste producers identify the specific loads of waste that

will be sent to the site for disposal. As a consequence of the pre-acceptance procedures that are in place the exact mixture of radionuclides in any consignment will always be known prior to receipt at the site.

11.1.15 As in the current Environmental Permit for the disposal of LLW, limits will be set for the quantities of specific radionuclides or group of radionuclides and a total radiological capacity for the LLW deposited at the site. The capacity limit will take into account the LLW that has been deposited in the site already and will apply to the receipt of LLW from the date of issue of the permit up to the date of closure of the permitted landfill including the existing ENRMF and the extension area or the point at which the capacity limit is reached whichever is sooner. The landfill will not be permitted to receive any further LLW once the capacity limit is reached. The capacity limit cannot be expressed at the outset in terms of volume of material because it depends on the concentrations and exact mixture of nuclides received.

11.1.16 The risk assessments submitted with the Environmental Permit applications must demonstrate to the satisfaction of the Environment Agency that using cautious assumptions the potential exposure concentrations of chemical contaminants or the dose of radioactivity that could be received by the public and workers do not exceed thresholds set out in regulation and guidance for the protection of human health and the environment. Environmental Permits for the disposal of hazardous waste and LLW in the proposed western extension landfill and the proposed changes to the waste treatment plant will only be issued if the Environment Agency is satisfied that the site can be operated in the short, medium and long term without an unacceptable impact on human health and the environment.

11.1.17 Summaries of the scenarios that are used in the risk assessments prepared for submission to the Environment Agency with the Environmental Permit variation applications are presented in the relevant sections of this ES to demonstrate how the potential health and environmental effects will be assessed and controlled through the Environmental Permits and the pollution

control regime in order to support the conclusions reached with respect to the assessment of environmental effects that may result from the proposed development.

11.1.18 Emissions to the environment of contaminants associated with the hazardous wastes deposited in the landfill site and treated at the treatment facility will continue to be managed in accordance with best practice procedures using measures summarised in the relevant sections of this ES and which will be specified and regulated through the Environmental Permits in order to control the potential for emissions. Monitoring will continue to be carried out to confirm that the emissions to air and water remain below the levels which are set for the protection of human health and the environment. All waste management activities will be regulated through the pollution control regime set out in The Environmental Permitting (England and Wales) Regulations 2016.

11.1.19 All the work at the operational landfill site with respect to radioactive waste will continue to be undertaken in accordance with the Ionising Radiation Regulations 2017 (IRR17) and The Environmental Permitting (England and Wales) Regulations 2016 (EPR2016). The amount of radiation a person is exposed to is known as the dose and is measured in millisieverts (mSv) or microsieverts (μ Sv) per year. 1,000 μ Sv/yr is equivalent to 1mSv/yr. The dose limit for employees set in the legislation is 20 millisieverts (mSv) per calendar year. The dose limit set in the legislation for any person, such as members of the general public is 1mSv per calendar year.

11.1.20 In addition to the IRR17 and EPR2016 regulations, there is specific Environment Agency guidance on requirements for the authorisation of near-surface disposal facilities for solid radioactive wastes set out in The Near-surface Disposal Facilities on Land for Solid Radioactive Wastes - Guidance on Requirements for Authorisation (February 2009) (NS-GRA)⁹. The NS-GRA

⁹ *The Near-surface Disposal Facilities on Land for Solid Radioactive Wastes - Guidance on Requirements for Authorisation. The Environment Agency February 2009.*

specifies dose constraints that apply to doses that may arise to members of the public during the period of active management of the site; these are 0.3 mSv/yr from any single source from which radioactive discharges are made or 0.5 mSv/yr from the discharges from any single site.

11.1.21 In Table ES11.3 the dose criteria that will be applied at the site are set out in context with the exposure limits set in the legislation and guidance as well as other more familiar sources of radiation exposure. As shown in Table ES11.3 a design dose criterion has been adopted by Augean for the activities involving the disposal of LLW at the landfill site. Design dose criteria are adopted for normal operational activities as well as for accidents. The adopted design dose criterion for each circumstance is either the relevant dose constraint specified in legislation or regulatory guidance or a dose level proposed by Augean which is lower (i.e. more protective) than the dose constraint specified in legislation or regulatory guidance and which is achievable based on the proposed activities and waste types to be accepted. The radiation exposure risk assessments for the site which are described in the assessment sections of this ES compare the calculated potential exposure doses for workers and members of the public to the design dose criteria which have been adopted for the acceptance of LLW at the site.

11.1.22 As set out in Table ES11.3 the design dose criterion which has been set for the acceptance of LLW for disposal at ENRMF is for a maximum potential annual exposure of members of the public as a result of routine operational activities during the management period of 0.3mSv/yr. As detailed in supplementary guidance a maximum potential annual exposure of members of the public as a result of release to groundwater during the management period of 0.02mSv/yr¹⁰. The design dose criterion which has been set for the assessment of the acceptance of LLW for disposal at the ENRMF landfill is for a maximum potential exposure of workers a result of routine operational

¹⁰ Guidance note for developers and operators of radioactive waste disposal facilities in England and Wales. Near-Surface disposal facilities on land for solid radioactive wastes: Guidance on Requirements for Authorisation: Supplementary guidance related to the implementation of the Groundwater Directive. The Environment Agency, 2012.

activities during the management period of 1mSv/yr. For the long term following the cessation of receipt of waste and after the cessation of management at the site, the design dose criterion set for the exposure of all persons is 0.02mSv/yr for a number of the different expected events (i.e. normal activities) and unexpected events (i.e. accidents) which are assessed. A further design dose criterion is set for inadvertent intrusion or excavation into the site at some point well into the future of 3mSv/yr. This dose criterion is at the lower end of the dose range of 3mSv/yr to 20mSv/yr allowed in the regulatory guidance for inadvertent intrusion events.

12. Population including impacts on human health

12.1 Introduction

12.1.1 An assessment of population including impacts on human health has been undertaken by MJCA. The World Health Organisation defines health as “a state of complete physical, mental and social well-being and not merely an absence of disease or infirmity” (WHO, 1948). It is recognised that health and wellbeing is the result of a complex interaction of a wide range of different contributing factors. In the Public Health England advice on the assessment of the impacts of Nationally Significant Infrastructure Projects¹¹ (the PHE NSIP guidance) it is stated that:

‘The health and wellbeing of an individual or a population is the result of a complex interaction of a wide range of different determinants of health, from an individual’s genetic make-up, to lifestyles and behaviours, and the communities, local economy, built and natural environments to global ecosystem trends. All developments will have some effect on the determinants of health, which in turn will influence the health and wellbeing of the general population, vulnerable groups and individual people’.

12.1.2 It is recognised in the PHE NSIP guidance that there may be separate sections of the Environmental Statement (ES) that cover the assessments of impacts on air, land and water but PHE expect that a specific section is presented in the ES which summarises the potential impacts on population and health including the wider determinants of health.

12.1.3 In this section of the ES the potential for direct effects on the health of people living and working around the site as a result of emissions resulting from the management of hazardous waste and LLW at the site are assessed. An

¹¹ Public Health England ‘Advice on the content of Environmental Statements accompanying an application under the Nationally Significant Infrastructure Planning Regime’ 2020.

assessment of the impacts on water resources including water quality is presented in Section 17 of the ES. Assessments of the impacts associated with traffic and noise are presented in Sections 19 and 20 respectively of the ES. An assessment of the potential for broader direct and indirect effects on health and wellbeing is presented in Section 25 of this ES together with a summary of the assessments relevant to impacts on health in the other sections of the ES including this one.

12.2 Methodology

12.2.1 It is noted in the National Policy Statement for Hazardous Waste¹² (the NPS for hazardous waste) that:

'2.3.1 Stringent legislative controls are in place to control the management of waste with hazardous properties..... Permits are issued by the Environment Agency who set conditions for: the operation of the facility, such as the types and volumes of waste that may be accepted; how the waste is to be treated; how it is to be stored; and the specific emission limits and conditions relating to any need to keep activities away from sensitive receptors'.

12.2.2 It is also acknowledged in the NPS for hazardous waste that modern, appropriately regulated, well run and well regulated waste management facilities operated in line with current pollution control techniques and standards should pose very little risk to human health.

12.2.3 In this risk assessment, the elements of the activities which have the potential to result in adverse health impacts as a result of emissions from the waste are identified and the measures that are in place to control the emissions are identified together with the controls and emission limits that are imposed by the Environmental Permits.

¹² National Policy Statement for Hazardous Waste: A framework document for planning decisions on nationally significant hazardous waste infrastructure. DEFRA June 2013

12.2.4 As explained above, the assessment of risk including the identification and assessment of exposure pathways with the potential to affect the health of people directly is an integral part of the pollution control regulatory function and is carried out by the Environment Agency as part of the permit application process. The assessment of direct risks to the health of the population in terms appropriate to the DCO process is presented in this document. The term risk is used widely in many contexts and circumstances often with differing definitions. In a government publication about the environment¹³ which explains the approaches to and the assessments of risk for many types of activities the following definition of risk is provided:

‘The potential consequence(s) of a hazard combined with their likelihoods/probabilities’

It is explained that assessing a risk involves an analysis of the consequences and likelihood of a hazard being realised. In decision-making, low-consequence / low-probability risks are typically perceived as acceptable and therefore only require monitoring. In contrast, high-consequence / high-probability risks are perceived as unacceptable and a strategy is required to manage the risk. Other risks which fit in between the two extremes may require further structured risk assessment to better understand the features that contribute most to the risk and/or the implementation of further controls.

12.2.5 There are three essential elements to assessing risk associated with emissions:

- a contaminant source which has the potential to cause harm to human health or the environment;
- a receptor which in general terms is something that could be affected adversely by the contaminant such as people, a water body or an ecological system; and

¹³ DEFRA (2011) *Guidelines for Environmental Risk Assessment and Management. Green Leaves III.*

- a pathway or route by which a receptor can be exposed to and affected by the contaminant.

12.2.6 Each of the elements can exist independently but a risk can be present only where they are linked together so that a contaminant can affect a receptor by a pathway. The identification of risk in this way is referred to as the source-pathway-receptor methodology and the linked combination of contaminant-pathway-receptor is referred to as a pollutant linkage or exposure pathway. On an individual site and at a single facility it is likely that there will be interrelated exposure pathways. In order to understand and assess the potential risks associated with a proposed development it is necessary to identify the potential exposure pathways associated with emissions from the facility and to assess the effects that may result from the identified exposures.

12.2.7 The nature and level of risk are defined by the particular condition and circumstances of a facility or piece of land and its location. The design and operation of the facility, the use of the land and surrounding areas, the surrounding and underlying water environment and the site and nearby ecosystems determine the receptors and pathways present and the extent to which the receptors potentially may be affected by contamination. Because of the range of factors which contribute to the level of risk the same concentration of a contaminant can have widely differing effects. Risk assessment is the process of considering in a structured way the range of factors so that appropriate decisions are taken.

12.2.8 Without an exposure pathway there is no risk even if a contaminant is present. Where there is an exposure pathway and there is some degree of risk an assessment must be carried out to determine whether the level of risk is acceptable. In this section of the document the risks to the population are assessed.

12.2.9 Control and threshold limits for emissions are set in the Environmental Permits; these limits are based on applicable health-based guidelines or standard values for the appropriate media as specified in the PHE NSIP

guidance. It is and will continue to be a requirement of the Environmental Permits that these limits are achieved. The potential for compliance with these limits is assessed as part of the pollution control regime and Environmental Permits will not be issued unless the Environment Agency are satisfied that compliance will be achieved.

12.2.10 As all the waste management activities are covered by Environmental Permits, the assessment methodology comprises the identification of potential exposure pathways and consideration of whether emission control criteria are applied by the Environment Agency in the Environmental Permits for each exposure pathway. The pathways considered include those associated with direct contact with waste, emissions of vapours, gaseous contaminants, releases to the aqueous environment via groundwater and surface water, dust and odour.

12.2.11 Where there is no exposure pathway identified, the risks are assessed as negligible. Where there is the potential for emissions and the emission limits are set at a level which is protective of human health and the environment it is assessed that there will be no significant impact on human health or the environment.

12.2.12 For radiological emissions dose criteria are set by the Environment Agency at a level which is determined by the Environment Agency that is protective of human health. The dose criteria are protective of the health of adults and children and include workers at the site as well as nearby residents and workers. Where emissions can be maintained below these levels it is assessed that there will be no significant impact on human health.

12.3 Baseline

12.3.1 The site is located in a generally rural area with the majority of the surrounding land comprising open farmland or woodland. The village of Duddington is located approximately 1.1km to the north north west of the site and the village of Kings Cliffe is located approximately 2km to the south of the site. The

properties located closest to the site are shown on Figure ES1.2. The surrounding area has a mixed urban-rural based economy with an adaptable industrial and commercial structure and a strong tourist base. A wide range of businesses are located in the surrounding area and small companies are predominant. Activities in the general vicinity of the site include mineral extraction, landfill and haulage yards as shown on Figure ES1.2. Potentially sensitive receptors within 1km of the proposed development are described in Section 3 and shown on Figure ES1.2.

12.3.2 The ENRMF has a long history of extraction and landfill disposal. Clay extraction has taken place since 1957, landfill disposal commenced in 2000, the site has accepted only hazardous waste since 2004, the treatment plant was granted planning permission in January 2008 and LLW first was accepted at the site in December 2011. The site is the subject of a current DCO and Environmental Permits for the landfill of hazardous waste and LLW and for the treatment of waste. The issue of these consents demonstrates that the risks of carrying out these activities at the existing ENRMF are considered acceptable. As part of this application it is necessary to determine whether the risks remain acceptable if the activities are extended as proposed.

12.3.3 The receptors for the assessment are the people who are nearby residents and members of the public who live and work in the vicinity of the site or may use the facilities close to the site such as footpaths together with surface water and groundwater receptors which may in turn be used by people. Site visitors and workers are protected in accordance with Occupational Health legislation and therefore they are not assessed as receptors in this impact assessment. Nevertheless the site is operated at all times to protect the health of those working at the site and closest to the waste on a day to day basis. As the health of the site workers is protected by the design and operation of the site it follows that those measures will also provide protection to the health of all those living and working beyond the site boundary.

12.3.4 The baseline for the assessment of impacts on human health is the current permitted operations at the existing ENRMF. The potential sources and pathways for each of the existing elements of the development have been identified.

12.3.5 The site is located in an area of the country with natural background levels of radiation that are elevated compared with the average in the country due to the emission of radon from the underlying rocks. The average annual exposure in Northamptonshire from natural sources is 3.6 mSv/yr¹⁴ compared with an average annual exposure of the UK population from all significant sources of radiation of around 2.7 mSv/yr¹⁵. The variability in the background levels of radioactivity across the country is significantly greater than the dose criterion of 0.3 mSv/year used as the design criterion for the operational period of the site as shown on Table ES11.3.

12.4 Assessment of effects

12.4.1 At the design stage for all waste management facilities including landfill and treatment facilities such as those at the ENRMF potential exposure pathways are considered and operational methods are developed to eliminate or minimise exposure pathways hence to protect human health and the environment. These mitigation measures form an inherent part of the site design and operational controls. Monitoring schemes are designed and implemented to confirm that the design, construction and operating methods are effective in eliminating or controlling exposure pathways. The site construction and operational aspects that remove or minimise exposure pathways are described in Sections 5, 6 and 7 of this document. The main potential exposure pathways which are examined to assess the risks to human health from hazardous waste and radiological emissions are presented in Tables ES11.1 and ES11.2 respectively. The assessments cover the

¹⁴ *Ionising radiation exposure of the UK population: 2005 review. Watson S.J., Jones A.L., Oatway W.B. and Hughes J.S. (2005) HPA-RPD-001. Didcot, Oxfordshire.*

¹⁵ *Ionising Radiation Exposure of the UK Population: 2010 review Public Health England (2016). (PHE-CRCE-026).*

operational and post operational period of the site together with the period in the long term when there is no further management of the site and the Environmental Permit has been surrendered. The situations assessed include normal operational circumstances together with unlikely events and accidents. The assessments are based on conservative assumptions.

12.4.2 The risks relating to the treatment of waste and the potential for emissions associated with the disposal of hazardous waste are assessed qualitatively except for the assessment of emissions to water which are assessed quantitatively. Quantitative risk assessments using mathematical models are carried out to assess the effects of the disposal of LLW. The level of detail in the assessments presented in this document are intended to be appropriate to demonstrate the land use consequences of the proposals. The applications for the Environmental Permits for the extension areas are submitted with detailed risk assessments. The Environmental Permit application for the disposal of LLW will include a detailed quantitative Environmental Safety Case (ESC) which will be based on the ESC submitted in 2015 to support the Environmental Permit application for the disposal of LLW at the existing ENRMF landfill site. Many of the exposure assessments in the revised ESC will be the same as those in the current risk assessment as they are for distinct situations or incidents, other exposure assessments will be updated and amended in order to reflect the extended area of the landfill site and increase in LLW volume that could be disposed as a result of the proposals for the extension of the landfill in the proposed western extension. The approach to the use of design dose criteria set for the site and to setting a limit for the overall radiological capacity for the site will remain the same. The 2015 ESC and addendum for the disposal of LLW at the current landfill site is provided for reference at Appendix ES11.1.

12.4.3 The potential for indirect effects on health as a result of the migration of contaminants or radionuclides through the water pathway and effects on water resources are considered in Section 17 of this ES. The groundwater risk assessments take into account all the waste that has been and could be

disposed of at the site. The risk assessments are based on well-established models used nationwide and approved by the Environment Agency. They are based on highly conservative assumptions and consider the potential impacts of the site in the short and the very long term (thousands of years). They assume that the high density polyethylene liner (a heavy duty chemical resistant synthetic material) component of the engineered containment system degrades over time. The highly engineered clay component of the liner, being geological material, does not degrade and provides continued protection over geological time.

12.4.4 The assessment methodologies that are used in the Environmental Safety Case which presents the assessment of the impacts associated with the deposition of LLW for the Environmental Permit application draw on methodologies developed by the International Atomic Energy Agency. Additional approaches developed by the Health Protection Agency (which became Public Health England, which is now part of the National Institute for Health Protection), the UK Environment Agencies (SNIFFER), the LLW Repository Environmental Safety Case and a screening methodology developed by the Environment Agency for operational releases are used where appropriate. The SNIFFER methodology was developed with regulators, operators and wider stakeholders to provide the regulators and stakeholders with a consistent approach to assessing the potential of landfill sites to accept LLW. Model parameter values used in the ESC take into account site specific aspects and National Dose Assessment Working Group (NDAWG) recommendations concerning representative persons.

12.4.5 The LLW risk assessments are conservative in the assumptions made with respect to the long term management of the site. In the risk assessments it will be assumed conservatively that following closure of the landfill site management measures will be in place for a period of only 60 years. In practice the landfill will be the subject of an Environmental Permit and under management control and the subject of financial provision until the Environment Agency are satisfied that the site no longer represents a

potentially significant risk of harm to human health or pollution of the environment. This period will almost certainly be considerably longer than 60 years. In the risk assessments it will be assumed that after 60 years people may excavate into the landfill in a way that results in continuous exposure to the LLW without realisation of the radiological hazards present.

12.4.6 The results of the radiological assessments which will be presented in the ESC with the Environmental Permit application are compared with the design dose criteria explained above and summarised in Table ES11.3 and will be used to derive a limit for the quantity of each radionuclide that can be disposed to the landfills such that the design dose constraints and risk guidance levels are not exceeded in any of the assessed scenarios. The risk assessments take into account the emissions from daughter nuclides that are generated as a result of radioactive decay. The exact mixture of radionuclides that will be sent to the landfill for disposal will not be known until the site becomes operational and waste producers identify the specific loads of waste that will be sent to the site for disposal. As a consequence of the pre-acceptance procedures that will be in place the exact mixture of radionuclides in any consignment will always be known prior to receipt at the site.

12.4.7 The total quantity of radionuclides in LLW that can be disposed of at the landfill site, including that which has been deposited already, will be controlled through a “sum of fractions” approach which will be specified in the Environmental Permit. This approach maintains the flexibility to respond to future mixtures of radionuclides in LLW whilst maintaining the overall dose within accepted levels and is an approach that is used at other sites receiving low activity radioactive waste. The permit will specify the total capacity for each radionuclide and that the sum of fractions shall be less than unity.

12.4.8 The sum of fractions approach is implemented by calculating, for each radionuclide, the ratio of the activity of the radioactive waste disposed of at ENRMF to the relevant values specified in a disposal table which will be included in the Environmental Permit. This table will define the radiological

capacity of the site. The table will include a single column combining the capacity limiting scenarios examined in the risk assessments with a value for each radionuclide that can be disposed. Hence, the ratios (fractions) are calculated for each radionuclide and then these are summed to obtain the total sum of fractions for the cumulative disposals. It will be a permit condition that the sum of these ratios shall be less than 1. The sum of fractions approach allows the operator greater flexibility in determining the final radioactive waste inventory without compromising environmental safety whilst ensuring that the design dose criteria are met. The sum of fractions approach is used by the Environment Agency to regulate other LLW disposal permits.

12.4.9 The radiological capacity limits will apply from the date of issue of the Environmental Permit up to the date of closure of the operational landfill or the point at which the capacity limit is reached whichever is sooner. The landfill will not be permitted to receive any further LLW once the sum of fractions equals 1. As explained above, the capacity limit cannot be expressed as a single number because it depends on the exact mixture of nuclides received at each landfill.

12.5 Extraction and stockpiling of non-waste materials

12.5.1 Soils, clays and overburden will be removed at the commencement of each phase of the development. Without appropriate controls these operations can result in airborne dust generation. Dust can have two potential health impacts: chemical and physical. Due to the inert non-hazardous nature of these materials the extraction and stockpiling of soil, overburden and clay will have a negligible impact on the health of workers or local residents.

12.5.2 The potential air quality impacts from particulates generated as a result of the extraction and stockpiling of clay are assessed in Section 21 of this report. It is concluded that subject to the continuation of the current operational controls airborne dust generated by the proposed extension is unlikely to result in a significant health impact.

12.6 Site operations as part of the time extension and void extension

12.6.1 The potential impacts associated with the continuation of the operation of the consented and extended landfill and waste treatment and recovery facility to 2046 are similar to those for the existing ENRMF operations but will be present over a longer time. There will be no additional cumulative effects other than those which are an intrinsic part of the assessments and which are therefore taken into account in the risk and impact assessments.

Exposure to waste during waste handling

12.6.2 The potential for the exposure of workers at the site and the public beyond the site to hazardous waste is minimised through the implementation of specified waste handling and management procedures under the Environmental Permit. Workers wear personal protective equipment when working in the vicinity of wastes to minimise the potential for direct contact with hazardous waste. Members of the public are not allowed unaccompanied on the site and the site has security measure in place as described in section which prevent access to the waste.

12.6.3 All asbestos waste is delivered to the site in double bags, is placed at the working face and is covered immediately. Any particularly dusty waste is delivered in containers or is subject to special procedures for the damping down of the material prior to and after placement in the operational cell. All waste placed in the landfill is covered throughout the day and when complete each landfill cell is capped with a low permeability capping system which is covered in turn by restoration materials which removes the pathway for direct exposure to hazardous waste. All waste handled at the waste treatment and recovery facility is controlled during storage and treatment in accordance with specified waste handling and management procedures. Dusty wastes are stored in silos or enclosed containers such as bags or drums.

12.6.4 The exposure of site workers and members of the public to LLW while the waste is being accepted and deposited in the site has been assessed and is

presented in Section E3.2.1 at Appendix E of the ESC provided at Appendix ES11.1. The amount of exposure to site workers is based on the assumption that the waste is in a drum or in a bag and on conservative assumptions regarding the density of the waste and the type of isotope in the waste. It is assumed that the waste is dense and contains a greater mass of material than would be the case with less dense material and that the isotope present is that capable of having the greatest effect. No account is taken of any shielding that is afforded by the waste container that is the capacity of the container to absorb some of the radiation that is emitted. No account is taken in the assessment of the precautions that are a fundamental part of the routine operational procedures.

12.6.5 Calculations have been carried out of the risks of direct exposure of members of the public for 8 hours a day every day at a distance of 50m from LLW containing the maximum level of radioactivity (Section E3.2.1 at Appendix E of the ESC provided at Appendix ES11.1). No account is taken in the calculations of the significant shielding afforded by the visual screening bund constructed from soil and the buildings present at the eastern boundary of the site that would absorb radioactive emissions where they are present between the waste and the member of the public and restrict opportunities for exposure. It is highly unlikely that waste will be located in a direct line of exposure 50m from a member of the public for any length of time and the probability that a member of the public would remain static for 8 hours each day 50m from and directly exposed to waste is negligible.

12.6.6 All asbestos waste is delivered to the site in double bags, any particularly dusty hazardous waste is delivered in containers or is subject to special procedures for damping down of the material prior to and after placement in the operational cell. All LLW will be delivered to the site in containers or wrapped and will be placed in the landfill in the container or wrapping. On a limited number of occasions if there are specific arisings of loose wastes that might be deposited by direct discharge from a vehicle (which would be covered or sheeted for transport) then this would be discussed and agreed

with the EA based on specific risk assessments and with agreed additional measures in place including for dust control. Consequently the potential for the release of hazardous waste or LLW dust is low.

Dropped waste container resulting in spillage of hazardous waste or LLW

12.6.7 There is a low probability that containers may be split or dropped at some point during the unloading and placement of the waste. Procedures are in place and will continue to be implemented at the site in the event that any waste is spilled from a container or a container is dropped. The procedures are summarised as follows. The unloading will only take place in the landfill operating cell or at the treatment facility. A bowser will be on standby in the cell and at the treatment facility. If waste is dropped or spilled the waste will be immediately doused to suppress dust and covered with suitable soil material in the location where the waste is spilled. In the unlikely event the waste is spilled outside the landfill or contained area of the treatment facility the procedure will include measures for rapid collection and safe disposal of the waste and verification monitoring of the area at and around the spillage to confirm that all the spilled material has been retrieved.

12.6.8 The potential exposure of site workers and members of the public through exposure to spilled LLW has been assessed in the quantitative risk assessments in Section E3.7 at Appendix E of the ESC provided at Appendix ES11.1. The exposure assessment is based on the assumption that a one tonne load is dropped, breaks and dusty waste is dispersed. The waste containers are designed to withstand being dropped while being unloaded and handled therefore spillage is unlikely. It is assumed that the LLW in the container contains a single nuclide at an activity of 200Bq/g, that 10% of the container contents is released and that the spilled LLW is a loose dry material that disperses readily. Only a small proportion of the waste, if any, delivered to the site will meet these criteria. Most of the waste will not be at the maximum potential level of activity and the waste will be in lumps rather than dust. It is

assumed in the assessment that the worker does not respond appropriately and remains very close to the dropped waste without taking any precautions or retreating for 30 minutes. In practice all staff will be trained to respond rapidly to events such as spillages and a water bowser is available at all times to spray and damp down dust. It is assumed in the assessment that a member of the public is located 50m from the waste, remains at that location for 30 minutes and that atmospheric conditions are still which represents the worst case as dilution in the air is minimised. No account is taken in the calculations of the significant shielding afforded by the visual screening bund constructed from soil or the buildings present at the eastern boundary of the site that would absorb radioactive emissions where they are present between the waste and the member of the public and restrict opportunities for exposure. In the conservative risk assessments it is concluded that the doses of radiation to which the workers and members of the public would be exposed as a result of a dropped or spilled container of LLW are below the relevant dose criterion.

Contamination as a result of waste entering an open wound

12.6.9 No waste will be offloaded or handled in the vicinity of members of the public. There is no need for workers to touch waste or waste packages as they are being delivered and unloaded. Simple, standard personal protective equipment is worn by site workers including gloves to minimise the potential for wounds and for subsequent contamination of the wound. It is standard good practice that any open wounds are treated rapidly and covered. The implementation of standard good practice is considered acceptable to ensure that the risks to workers are minimised.

12.6.10 The potential exposure of site workers to radioactivity through an open wound has been assessed in the quantitative risk assessments in Section E3.2.3 at Appendix E and in Appendix H of the ESC provided at Appendix ES11.1. The risk assessment is based on the assumption that 0.1g of material at an activity level of 200 Bq/g becomes incorporated into a wound as a result of spillage from a dropped waste container. In the conservative risk assessment it is

concluded that the dose of radiation to which the workers would be exposed as a result of contamination through an open wound is below the relevant dose criterion.

Leachate treatment

12.6.11 As explained in Sections 5 and 7 of this document the generation of leachate at the site is limited by the placement of a low permeability cap over the completed site and the restoration of the site to a domed profile which encourages surface water runoff and minimises infiltration. Leachate levels at the site are maintained by pumping excess leachate from the site. During the operational period the leachate is used wherever possible at the site as a substitute for water at the waste stabilisation facility. The stabilised waste and the incorporated leachate are returned to the landfill as hazardous waste. Any excess leachate extracted during the operational period and leachate extracted following closure of the stabilisation plant will be transported from the site by tanker to a suitable treatment plant.

12.6.12 The concentrations of hazardous substances and the level of radioactivity in the leachate generated at the site will be determined by the nature of the wastes deposited. It is anticipated that the level of radioactivity in the leachate will be low and that the leachate will be exempt from regulatory control for the radioactivity content through exemption orders. The monitoring of leachate to date has confirmed that it does not contain radioactivity at a level which requires that it is subject to regulatory control due to its radioactivity. Exposure to hazardous substances in the leachate will be assessed and managed in accordance with the Environmental Permit which will be in place for the treatment and disposal facilities.

12.6.13 If the level of radioactivity in the leachate is sufficient that it is defined as a radioactive waste it will be necessary for Augean and the receiving treatment plant to obtain relevant Environmental Permits for discharge and treatment. As part of the applications specific exposure assessments would be carried

out to confirm that there are no unacceptable exposures associated with the treatment of the leachate as proposed at the time.

Fire at the site

12.6.14 Fires in landfill sites can result from the deposition of hot or burning loads of waste or can be associated with the collection and utilisation of methane in landfill gas at sites which accept significant quantities of biodegradable wastes. There will be insignificant amounts of biodegradable or combustible material in the hazardous waste and LLW deposited at the site and the waste treated at the treatment facility hence a fire starting in the site as a result of the ignition of combustible material is considered unlikely. The wastes in the landfill, the cover materials, the drainage materials which include shredded or baled tyres, the hazardous waste including the wastes to be treated and LLW have an extremely low combustibility. The current waste acceptance criteria for the landfill excludes material with an organic carbon content greater than 6% and flammable wastes are prohibited. It is considered that the potential for a fire in the hazardous wastes and LLW at the site is negligible.

Impact from an aircraft crash

12.6.15 There is a very low probability of an accident such as an aircraft crash at the site that may result in the release of contaminated material into the air. This scenario is included due to the proximity of RAF Wittering which was an operational Harrier aircraft base until the fleet was withdrawn from service in December 2010. RAF Wittering remains an active air base supporting a wide range of military flying activities. The ENRMF site western extension area is located approximately 2.3km south west of the runway which runs approximately east-west. The frequency of military aircraft crashes in the UK is very low but it is noted by the IAEA¹⁶ that most aircraft crashes occur within

¹⁶ IAEA, 2002. *External human induced events in site evaluation for nuclear power plants*. Vienna: International Atomic Energy Agency.

a semicircle of 7.5 km radius from the end of the runway. The scenario is included for this reason.

12.6.16 Procedures are in place at the site for any form of waste spillage and procedures will be in place at RAF Wittering and with the emergency services in the event of an aircraft crash. These procedures would be implemented rapidly at the site. A bowser is always available on standby at the site and if waste is released as a result of an aircraft crash the bowser will be deployed immediately to douse the area and suppress dust. If necessary the area of exposed waste will be covered with suitable soil or overburden material. If waste is spread outside the landfill the procedure includes measures for rapid collection and safe disposal of the waste and verification monitoring of the area at and around the spillage to confirm that all the spilled material has been retrieved. It is considered that the impacts resulting from the unlikely event of an aircraft crash will be managed to minimise and reduce to an acceptable level the risks to people.

12.6.17 A quantified risk assessment has been carried out for the release of LLW following an aircraft crash (Section E3.6 at Appendix E of the ESC provided at Appendix 11.1). In the risk assessment it is assumed that 300m³ or 460 tonnes of LLW is displaced as a result of the impact from a crashed military plane. The presence of a covering or capping layer over the waste is ignored in the risk assessment. Emergency procedures including the evacuation of personnel and the public to a safe distance would be implemented immediately by the site and the nearby RAF base. It is assumed that the duration of the event in which the displaced material can be inhaled is 30 minutes and that if they are present close to the site, the public will rapidly evacuate to a distance of at least 200m from the crash site. Worst case, still weather conditions are assumed in the risk assessment which minimises dilution from dispersion. The risk assessment demonstrates that as a result of this unlikely event the exposure of workers and members of the public will be below the relevant assessment criteria. Exposure to radioactivity as a result of fire is not assessed in this scenario as although an aircraft crash could lead

to a fire, the fire would consume the aircraft fuel and wreckage and not the waste as the waste will contain little combustible material.

Drilling through emplaced waste

12.6.18 During the operational life of the landfill site drilling works may be carried out for the purpose of installing new leachate monitoring or extraction wells or gas monitoring or extraction boreholes. As these works will be carried out only when the site is operated under the regulatory supervision imposed by the Environmental Permit drilling will be permitted only in accordance with appropriate and agreed controls with respect to exposure to hazardous waste and radiation. The controls will be determined by a process of risk assessment and based on conservative assumptions. It is highly unlikely that unacceptable risks will be presented by this activity.

12.7 Site restoration and closure

Direct exposure to waste through cover materials

12.7.1 Where waste has been placed in the landfill site and covered with non-hazardous material and a low permeability capping system there is no pathway for direct exposure to hazardous wastes and therefore no risks from exposure to these wastes. There is the potential for emissions of radioactivity from LLW through the cover and capping layers. Exposure assessments have been carried out for members of the public walking on the site following placement of the cover layer and capping layer and closure of the site (Section E4.2.1 at Appendix E of the ESC provided at Appendix ES11.1). It is assumed that the waste is covered by a 1.6m thick layer of non-LLW material and a further layer of cover material to a depth of 1m. The capping system will comprise a 300mm thick regulation layer, a 1m thick layer of clay, a drainage layer 300mm thick and at least 1m of restoration soils. In calculating the annual exposure it is assumed that members of the public spend no more than 2 hours per day every day for the whole of each year on the site. The risk

assessment demonstrates that the calculated exposures are below the relevant assessment criteria.

Site remediation activities

12.7.2 Deliberate intervention to maintain, remediate or re-engineer the landfill site could lead to the creation of contaminated dust. Records will be maintained of the location of the hazardous waste and LLW at the site and any remediation work would be carried out with the knowledge that there was hazardous waste and radioactive material present at the site. Planning permission and possibly an Environmental Permit will be necessary for significant remedial works. Remedial works would be carried out under the regulatory supervision imposed by the Environmental Permit and works will only be permitted in accordance with appropriate and agreed controls on exposure to hazardous waste and radiation. The controls will be determined by a process of risk assessment. It is highly unlikely that unacceptable risks will result from this activity.

Inadvertent activities

12.7.3 The exposure pathway which has been considered is the highly unlikely situation where it has been forgotten that hazardous waste and LLW have been deposited in the site and people may live on the landfill site or excavate into the landfill in a way that results in exposure to the waste without realisation of the hazards present. These situations are extremely unlikely, especially given that any excavations into the site would encounter the cap placed over the waste and a range of visually obvious waste types and containers therefore it would be highly likely that the presence of waste would be recognised and excavations would cease at an early stage. It is considered that the risks resulting from this unlikely event are low.

12.7.4 A quantitative risk assessment has been carried out of the exposure to radioactivity of a person who excavates LLW (Section E5.7 at Appendix E of the ESC provided at Appendix ES11.1). The calculations are based on the

assumption that LLW is disposed of in all of the cells at the site and therefore is present in all the excavated material. In practice it is unlikely that all of the materials excavated would include radioactive substances. Calculations have been carried out for excavation after 60 years and 150 years following closure.

12.7.5 It is assumed that following excavation of LLW the waste and cover materials are mixed together and re-deposited creating a soil layer contaminated with the radioactivity that was in the waste. It is assumed that contaminated material is incorporated into the surface soil in either a residential vegetable garden or in the soil in a small holding in which crops are grown and on which animals are grazed. Exposure to the smallholder is assessed for the ingestion of contaminated soil attached to crops, the ingestion of crops that may have absorbed contaminants, the consumption of livestock raised on contaminated ground and associated products such as milk, external irradiation while living and working on contaminated soil and the inhalation of contaminated dust. Exposure to the resident is assessed for the ingestion of vegetables that may have absorbed contaminants, ingestion of contaminated soil attached to vegetables, external irradiation while working on the contaminated soil and inhalation of contaminated dust.

12.7.6 Calculations have been carried out for residence on the excavated area after 60 years and 150 years following closure. Risk assessments have been carried out for the unlikely event of exposure to radioactivity of a resident living in a house built on top of the landfill cap immediately after closure. Irradiation doses have been calculated for a resident spending 80% of the time indoors and 20% outdoors. Doses from gas inhalation have been calculated for indoor exposure of the house resident to gas accumulating in the dwelling. Controls under the planning process would prohibit development of domestic property on the site unless it can be demonstrated that there is no unacceptable risk to residents. The conservative risk assessments show that there would be no exposures above the relevant exposure criteria.

12.8 Routine monitoring and regulation

12.8.1 The ENRMF will continue to be monitored and regulated through the Environmental Permits to confirm that it is operating in compliance with all appropriate international and national health and safety standards. Environmental monitoring during the operational and aftercare phases while the site is managed will check that the levels of contaminants and radiation in a range of potential exposure pathways such as landfill gas, air emissions, leachate, surface water, groundwater and dust will not exceed the environmental thresholds and radiation dose criteria that are set for the site. Samples are taken to an agreed programme specified in the Environmental Permits and follow protocols set by the Environment Agency, with the resulting monitoring data reported to it. The Environment Agency currently undertakes its own independent sampling programme for radioactivity. The monitoring regime provides assurance that the site is performing as expected and that the design, construction and operating standards of the site are effective in eliminating or controlling any exposure risks.

12.8.2 The results of the monitoring carried out at the site under the Environmental Permit for the last five years are reviewed as part of the specific impact assessment sections in this report. The data confirm that the monitored emissions of particulates, asbestos fibres, and gases are controlled and that there are no emissions which present an unacceptable risk to health. All site staff working in the vicinity of LLW received and deposited at the site wear radiation monitoring badges. The records of the dose badges show that they do not and have never exceeded the dose thresholds set in the guidance and regulations.

12.9 Mitigation and monitoring

12.9.1 The mitigation measures comprise the construction, operation, management and monitoring of the treatment facility and the landfill site in accordance with specifications and procedures set out through the Environmental Permits and

prepared and implemented by Augean through their certified management systems.

12.9.2 The principles of the design of the engineered containment and the leachate and gas management infrastructure of the landfill site will remain and will be extended to the proposed western extension. The principles of the phasing of the landfilling and restoration activities will remain and will be extended to the western extension area. The methods of operation and control of the waste treatment and recovery facility will remain the same.

12.9.3 The mitigation measures include regular monitoring of emissions from the site in accordance with the Environmental Permit and submission of the results to the Environment Agency as required by the Environmental Permits.

Cumulative impacts

12.9.4 The cumulative effects of the concurrent operations of all of the waste management activities are controlled by the threshold limits set in the Environmental Permits. The monitoring at the boundary of the site records the cumulative effect of all of the activities on the quality of the environmental medium sampled, including any contributions from other sources in the vicinity. The monitoring data are compared with the threshold quality criteria.

Conclusions

12.9.5 The potential for direct and indirect effects on the health of people living and working around the site has been assessed. The nature of the activities and the wastes accepted at the site will not change significantly and, while they will take place over a larger area overall, the active area of operations at any one time will not be significantly different to the currently consented activities. The potential impacts of hazardous waste and radiological effects on people and the environment have been assessed as part of the process for granting the current DCO and Environmental Permits for the current hazardous waste and LLW landfill site and the waste treatment and recovery facility. The acceptability of the impacts associated with the hazardous waste and

radiological effects of the current activities at the current locations has been confirmed by the granting of these consents. As part of the applications for variations to the Environmental Permits for the site to extend them to include the western extension area the detailed risk assessments have been reviewed, extended and updated and will be scrutinised by the Environment Agency.

12.9.6 A number of possible exposure pathways which might have the potential to expose people to contaminants which might affect their health have been identified and are assessed through risk assessments including for routine as well as unexpected events (accidents). It has been identified that where there is the potential for emissions, controls and emission limits are set in the Environmental Permit at a level which is protective of human health and the environment therefore it is concluded that there will be no significant impact on human health or the environment.

12.9.7 Where it has been identified that there is the potential for radiological emissions, dose criteria are set and managed through the Environmental Permit by the Environment Agency at a level which is protective of human health. The dose criteria are protective of the health of adults and children and include workers at the site as well as nearby residents and workers. It is therefore concluded that there will be no significant impact on human health.

13. Ecology and biodiversity

13.1 Introduction

13.1.1 An assessment of ecology and biodiversity has been undertaken by Ecological Services Limited (ESL). The ecology and biodiversity of the site and the surrounding area have been examined extensively to facilitate an assessment of the potential impacts on flora and fauna as a result of the proposed development. Surveys have been undertaken including a preliminary ecological appraisal, a Phase 1 habitat survey and a wide range of field surveys covering plant communities, invertebrates, amphibians, reptiles, birds, bats, badgers, dormice and other mammals. Desk studies, including requests for data to local record centres and societies have been carried out, and detailed discussions have been held with a wide range of consultees. The results of the baseline surveys, desk studies and consultations, together with an explanation of the assessment methodology and an assessment of the potential impacts of the proposed development are presented at Appendix ES13.1 and summarised in this section of the Environmental Statement (ES).

13.1.2 In August 2019, a tree survey to BS 5837 was carried out over the whole site. A detailed arboricultural impact assessment is presented at Appendix ES13.1.

13.1.3 A Biodiversity Net Gain (BNG) assessment for the proposed western extension has been carried out to determine the gain which will be achieved, both over the course of the whole development, and for each phase. The BNG which would be achieved from the approved restoration plan for the existing ENRMF site with the BNG which will be achieved by the proposed restoration plan is also compared. The BNG assessment is provided at Appendix ES13.2.

13.2 Methodology

13.2.1 A desk study has been undertaken to identify statutory designated sites within 5km and non statutory designated sites within 2km of the site. The Northamptonshire Biological Records Centre, Northamptonshire Bat Group and Natural England's 'Nature on the Map' website were consulted to identify

sites designated for nature conservation together with records for protected or notable species.

13.2.2 A preliminary ecological appraisal (PEA) was undertaken in 2018 including an extended Phase 1 habitat survey of the proposed western extension (Appendix 1 of the report at Appendix ES13.1). The zone of influence for the development is the area over which ecologically valuable sites, habitats or species may be significantly affected by environmental changes resulting from the proposed project and associated activities. It is not a set distance and is dependent on the sensitivity of the ecological features under consideration. The PEA established that the zone of influence for the proposed development was considered to be no more than 1km beyond the site boundaries for any feature. As a result of the PEA it was identified that it was necessary to undertake botanical surveys including hedgerow assessments, great crested newt surveys, reptile surveys, breeding bird surveys, wintering bird surveys, bat surveys, badger surveys, dormice surveys, invertebrate surveys and tree surveys.

13.2.3 The following surveys were undertaken between 2019 and 2021. The detailed methodology for each of the surveys is provided in the report presented at Appendix ES13.1.

- A Phase 1 habitat survey was undertaken as part of the PEA in October 2018 and was updated by monthly visits between April and August 2019 and in 2020. The Phase 1 habitat survey covered the whole area proposed western extension application boundary and the edges of adjacent woodland where access was permitted.
- Monthly invertebrate surveys were undertaken in the proposed western extension from May to August 2019 using a suite of standardised methods. In 2020 six additional visits were made between May and September using the same methods in areas of Fineshade Wood and Collyweston Great Wood adjacent to the site. Additional searches were

undertaken in Collyweston Great Wood for important dead-wood species with the use of flight-interception traps.

- Access was granted to eight waterbodies within 250m of the proposed western extension and water samples were taken from each for eDNA testing to determine the presence of Great Crested Newts (GCN). In addition the waterbodies were surveyed using a combination of methods in accordance with established guidance¹⁷ to determine a population estimate. Additional surveys were made in February-March and in late summer 2019/2020 to confirm GCN breeding.
- Habitats around the existing ENRMF are well known as suitable for reptiles and have been monitored for several years as part of the Environmental Management and Aftercare Plan (EMAP) for the existing ENRMF. The field boundaries of the proposed western extension were walked in early 2019 and assessed for their potential to support reptiles. Following the field walk, 130 artificial cover objects (ACOs also referred to as tins) were set out in suitable habitat¹⁸ which were later increased to 183 ACOs to include additional areas in and in the vicinity of the site.
- Three specific 'direct observation' visits were carried out in early March 2021 on habitat known to be preferred by adders. In addition tinning surveys were undertaken 10 times from April to September in 2019 and in 2020 and direct observation was carried out on each visit.
- 12 wintering bird surveys were undertaken between October 2018 and March 2019 which included walking round the site and scanning the proposed western extension and surrounding area from viewpoints.
- Six breeding bird surveys were undertaken between March and June 2019 and all birds seen or heard at the site or immediately adjacent

¹⁷ English Nature, 2001. *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.

¹⁸ Gent A H and Gibson S D, 2003. *Herpetofauna Workers Manual*. JNCC Peterborough

land were mapped. Further, during all survey visits and birds seen or heard were recorded.

- Surveys for bats were carried out during 2019, 2020 and 2021 with reference to the relevant guidelines¹⁹ and all trees at the proposed western extension were assessed for roosting potential. The species assemblage and habitat use were assessed by passive acoustic monitoring and walked transects.
- In February 2019 badger activity signs were searched for throughout the proposed western extension and a handheld GPS unit was used to map any sett locations. Badgers are subject to protection under the Protection of Badgers Act 1992. The legislation aims to protect the species from persecution, rather than being a response to an unfavourable conservation status, as the species is in fact common over most of Britain. Accordingly the detailed information on sett locations and associated search records are not included in this report but will be provided in a separate confidential report where requested by statutory consultees as appropriate.
- Surveys for dormice were carried out in 2019 and 2020 in accordance with the latest advice²⁰. 50 dormouse tubes were placed in the limited suitable habitat present within or bordering the proposed western extension and were checked six times in each year between April to September. 25 dormouse nesting boxes located in the woodland to the north of the existing ENRMF have been checked annually since 2014.
- Where other mammals such as fallow, roe and muntjac deer and brown hares were observed during survey visits all sightings were recorded. No specific surveys were undertaken.

¹⁹ Collins J (ed.), 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines*, 3rd edition. The Bat Conservation Trust, London.

²⁰ Natural England, 2015. *Online standing advice*: <https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects>

- 13.2.4** A walkover survey undertaken in December 2019 together with the habitat data collected at the proposed western extension throughout 2018-2020 has been used to characterise and assess the condition of the habitats present at the proposed western extension. All habitats have been assigned a classification using set definitions²¹ and their condition has been assessed using the Natural England biodiversity metric²². The metric has been used to determine the value of the site in 'biodiversity units'.
- 13.2.5** Based on the information collected in the surveys and the desk based research the potential impacts of the proposed development were assessed and mitigation measures were prepared and incorporated into the design of the proposed development including for implementation during the site operations as well as the restoration proposals. The methodology for assessing the impacts on features of ecological and nature conservation interest are those set out in the relevant guidelines²³. Further detail on the impact assessment methodology is presented at Appendix ES13.1.
- 13.2.6** The assessment of the potential impact of radiological emissions resulting from the disposal of LLW on non-human biota will be undertaken using the ERICA assessment tool using the version released in June 2019. The ERICA toolkit allows for consideration of three ecosystems: terrestrial, freshwater and marine. Each of these will be considered as appropriate for the existing ENRMF. Within these ecosystems, the ERICA assessment tool considers a range of wildlife groups. As explained in Section 11 of this ES the Environmental Safety Case carried out for the existing landfill of LLW (Appendix ES11.1) has demonstrated that the criteria set in the permit are protective of fauna. The Environmental Permit will be updated to reflect the proposals for the proposed western extension landfill and the same controls will be included.

²¹ UK Habitat Classification Working Group, 2018. UK Habitat Classification - Habitat Definitions V1.0. UK Habitat Classification Working Group.

²² Panks, S et al. 2021. Biodiversity Metric 3.0: auditing and accounting for biodiversity. User guide (July 2021). Natural England.

²³ CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater, Coastal and Marine 2019

13.3 Baseline

Statutory and non-statutory sites and protected species records

13.3.1 The closest sites in the National Sites Network as established in the Conservation of Habitats and Species Regulations 2017 (as amended), formerly known as 'European sites' are Rutland Water SPA/Ramsar site which is approximately 8.8km to the north west of the application boundary and Barnack Hills and Holes Special Area of Conservation which is 7.5km north east of the application boundary as shown on Figure ES1.1. Within 5km of the site there are seven statutory ecological sites with the closest being Collyweston Great Wood and Easton Hornstocks National Nature Reserve and Site of Special Scientific Interest located adjacent to the site to the north east as shown on Figure ES1.2. There are three non statutory sites within 2km of the site boundary the closest being Fineshade Woods Local Wildlife Site located adjacent to the western boundary of the proposed western extension.

13.3.2 A number of records for protected species in the vicinity of the proposed western extension were identified during the desk based study.

- There are many records for around 125 species of invertebrates, with the majority from Fineshade Woods.
- There are 51 records of Great Crested Newts between 2014-2020 with the majority from Fineshade Woods and 49 records for other amphibians including common toad, common frog, smooth newt and palmate newt with the closest record being 1.1km away.
- There are numerous records of reptiles including slow worm, common lizard, grass snake and adder within Fineshade Woods.
- There have been many records of 54 bird species including 11 on Schedule-1 of the Wildlife and Countryside Act 1981 and 23 Red List species within 1.1km of the site with many of the records from Fineshade Woods.

- There are 77 records including 11 roost records for at least eight species of bats with the closest record in Collyweston Great Wood.
- 24 records of dormouse were supplied from Fineshade Woods.

Plant communities and species

13.3.3 The habitats present within the proposed western extension comprise two arable fields, two hedgerows, strips of rough and semi-improved grassland, isolated trees and small areas of scrub and broadleaved woodland. The existing ENRMF includes boundary hedgerows, ditches, several waterbodies including managed GCN ponds and areas restored to species rich grassland. The hedgerow located at the centre of the proposed western extension and the hedgerow on the western side of the existing ENRMF site qualify as important under the Hedgerow Regulations²⁴. The field in the north of the western extension has three arable weeds of conservation interest present and Japanese knotweed was identified in the existing ENRMF site.

Invertebrates

13.3.4 There are a range of habitats at the proposed western extension including short turf with small flowers, taller grassy swards and scrub and woodland edge with deadwood features which have value to invertebrates. The most notable is the woodland edge and deadwood that is complemented by grasslands with flowers and ruderal fringes, particularly on the eastern edge. The hedgerows are generally of poor value for invertebrates due to a lack of woody species-richness and an apparently regular cutting regime, which tends to reduce variation in physical structures along a hedgerow.

13.3.5 The survey of Fineshade Wood recorded 238 species which included 11 species considered of higher than local value. As the diversity of species noted in Fineshade Wood is not particularly rich this demonstrates the value of the edge habitats at and surrounding the site to invertebrates. The

²⁴ Statutory Instrument 1997 No 1160. *The Hedgerow Regulations, 1997 HMSO.*

Collyweston Great Wood survey recorded 212 species with 18 species considered to be of higher than local value. Collyweston Great Wood supports a good proportion of scarce species due to the number of mature and degenerated trees.

- 13.3.6** The two woodlands are connected to one another by tree lines and hedgerows that also border the proposed western extension. There are similarities in the faunas present in the woodlands but also significant differences, largely around the suites of species associated with deadwood and to a lesser extent, the open habitats.

Amphibians

- 13.3.7** GCNs were recorded in seven of the eight ponds surveyed in the vicinity of the proposed western extension including confirmed breeding in ponds on both sides of the proposed western extension. The ponds within Fineshade Wood are considered to be less optimal and contained lower numbers of GCN. Smooth newts were found in every waterbody surveyed with larger numbers in the waterbodies at the eastern side of the proposed western extension which were created to provide amphibian habitat. Palmate newts were found to prefer the ponds within Fineshade Woods. Common toads and common frogs were found in relatively few ponds but were identified in ACOs on both woodland margins.

Reptiles

- 13.3.8** Adders are known to be present in Fineshade Wood and have also been found on road verges in this general area. Recent surveys have identified a good population in Fineshade Wood as well as adders at three sites in Collyweston Great Wood. Adders have also been recorded to the north and on the western edge of the existing ENRMF, and at the western end of the central hedge. The area surrounding the proposed western extension is considered to be of county or regional importance for adder. Common lizards and slow worms were found around all margins of the proposed western extension and are

recorded regularly to the north of the existing ENRMF. Small numbers of immature grass snakes have also been found on the southeast ditch bank of The Assarts, Fineshade Woods.

Birds

13.3.9 The existing ENRMF does not accept household waste so does not attract large numbers of birds such as corvids or gulls. No new waste types will be accepted at the proposed western extension as a result of the proposed development. The survey area as a whole is not known for large passage/wintering bird flocks and the 2018/19 survey confirmed this. The wintering bird surveys recorded 37 species feeding in the arable fields and hedgerows, on the proposed western extension and adjacent to it. No wintering waders such as lapwings or golden plover were recorded using the proposed western extension or adjacent fields. The breeding bird survey recorded 47 species across the proposed western extension with several of the noted species resident elsewhere and visiting the survey area to forage. It is considered that the assemblage of breeding birds recorded at the proposed western extension will be resilient to the proposed development as many of the birds are woodland and scrub species or conversely, need open habitats such as farmland therefore large areas of their preferred habitats will continue to be present throughout the site operations. The proposed restoration of the site with the development of new habitats will encourage a greater number of birds and a larger range of species than at present therefore breeding birds are not assessed further.

Bats

13.3.10 Emergence watches were carried out on all trees in the proposed western extension which had Potential Roost Features but no evidence of a roost site was recorded in any of these trees. Bat activity over the open arable fields in the proposed western extension away from the edge habitats was low. Seven species of bat were recorded during the surveys. There were peaks in activity in June at certain woodland and edge points. It is considered that maternity

roosts are located in the adjacent woodlands to the east and west of the proposed western extension including for barbastelle. Due to the assemblage of bats using the proposed western extension it is considered an important ecological feature however given their mobility and that the proposed western extension is being used for foraging and commuting around the margins only it is considered they will be generally resilient to any effects of the proposed development during the operational period.

Dormice

13.3.11 No dormice (or their activity signs) have been found during any of the surveys for this application or as part of the many years of monitoring at the existing ENRMF. The desk study indicated that there are no known records of dormice in Collyweston Great Wood but there are previous records from Fineshade Woods to the west.

Other mammals

13.3.12 Fallow, roe and muntjac deer are all known to be present in the area and have been recorded crossing the proposed western extension. Brown hare were occasionally seen using the arable fields within the proposed western extension and those adjacent to the site.

Ecologically important features of the site

13.3.13 The following aspects of the proposed western extension are considered ecologically important features:

- The habitats and plant communities comprising hedgerows and wood margin ditches and grassland that provide habitat for important species including amphibians, reptiles, invertebrates and potentially dormice as described above.
- The amphibian and reptile assemblage including GCNs and adders.
- Bats particularly in respect of the adjacent woodlands.

- Badgers.
- Whilst not recorded at the proposed western extension the potential for dormice as a protected species whose use of the site would help bolster local populations.

13.3.14 The following aspects of the proposed western extension are not considered to merit the need for significant consideration:

- Plants and plant communities as all species are common and widespread.
- The agricultural fields as they have a low biodiversity interest.
- Breeding and wintering birds, which are considered resilient to the impacts associated with disturbance of the site and are likely to benefit from the proposed restoration scheme.

13.4 Baseline evolution

13.4.1 It is necessary to outline the likely evolution of the baseline environment at the site without the implementation of the proposed development. If the proposed development was not implemented the existing ENRMF would continue to manage, treat and landfill hazardous waste as well as provide a disposal facility for LLW. There would be no changes to the site operational practices and the operations at the site would be completed by 2026 to the currently consented restoration scheme. The aftercare and maintenance period for the site would continue to 2036. The land in the proposed western extension would remain as agricultural land in its current ownership.

13.5 Assessment of environmental effects

13.5.1 Extensive avoidance and enhancement measures have been designed into the development and are set out in detail in the report at Appendix ES13.1. These measures are summarised below as well as in Section 5 of this ES and the assessment of effects takes into account these measures. The only

mitigation measures required on the proposed western extension are for removal of two hedges as set out in Paragraph 13.5.3 which will be implemented through the Restoration Concept Plan, and carried out in accordance with the Ecological, Management, Monitoring and Aftercare Plan which is secured through the proposed DCO in the DCO Environmental Commitments Document (PINS document reference 6.5).

Designated and locally important sites

13.5.2 Due to the distance from the site to the nearest sites in the National Sites Network and no potential impact pathways, as described in the Habitat Regulations Assessment (PINS document reference 5.5) there will be no significant effects on either associated with the proposed development. Collyweston Great Wood and Easton Hornstocks NNR and SSSI located to the east and Fineshade Wood LWS located to the west of the proposed western extension could experience some impacts from the proposed development. Potential impacts could occur as a result of the erection of fences along the site boundary, vehicle movements in close proximity to trees or over roots, hydrological changes, emissions to air and water and impacts associated with dust from general site activities. However, with the embedded protection of tree roots and the requirement to comply with Environmental Permits (EP) for the hazardous waste landfilling and treatment operations, described in Section 5 of this ES and Appendix 13.1 there will be no significant negative effect on any valued site and in the long term there will be a significant positive effect on the Rockingham Forests area, including both sites in the immediate vicinity of the proposed western extension. Mitigation measures associated with dust are set out in Section 22 of this ES.

Hedgerows

13.5.3 There are two hedgerows on the proposed western extension which will be removed in the course of the works. These are located in the centre of the proposed western extension and on the western boundary of the current ENRMF. Both of these hedgerows meet the criteria for S41 Habitats of

Principal Importance but only because the adjacent verges of both are used by all four common reptiles; both hedgerows are species-poor. It is necessary to remove both hedgerows. This will be done as late as possible at varying stages of the proposed development. Loss of these hedges to the hedgerow network will be mitigated by the creation of a number of new, species-rich hedges both crossing the field and running parallel to the edges as set out below. Since new and enhanced hedges will be created before either hedgerow is completely removed, their eventual loss will not be significant. In the medium and long term there would be a significant positive effect.

Invasive plant species

- 13.5.4** Japanese Knotweed is present in a small area of the ruderal vegetation on the northern edge of the existing ENRMF. Left untreated there is the potential for the Japanese Knotweed to spread through roots or by soil movement and would result in a significant negative effect. Treatment of the Japanese Knotweed currently is ongoing in accordance with Government guidance and a watching brief will be implemented to identify any recurrence. With these measures in place the threat to the wider area is removed and there will be no residual effect.

The site margins

- 13.5.5** The margins around the proposed western extension hold a good variety of invertebrates and support reptiles and amphibians. The site margins are considered to be essential to the many woodland species found in the vicinity of the site. Without avoidance measures in place the proposed development would result in the loss of the field margins and cause a significant negative impact. With the avoidance measures and planned enhancements as explained below very little of the site margins will be lost and all of the margins will be enhanced which will result in a significant positive residual effect.

Amphibians

13.5.6 There are no waterbodies on the proposed western extension however the survey results showed the woodland margin habitat located along the boundaries of the proposed western extension is used by amphibians. Without avoidance measures the loss of this habitat would result in a significant negative effect. With the conversion of this margin to a richer habitat, providing more invertebrate prey for the amphibians, and the provision of shelter and hibernating sites, together with a fence preventing damage to this habitat and preventing animals straying onto the active area, the current populations will be safe-guarded. Following restoration, connectivity of existing amphibian populations would be improved which would result in a significant positive effect.

Adders

13.5.7 Whilst existing records show that there is a strong adder population in Fineshade Woods, and a scattering of records within Collyweston Wood, and along its roadside boundary, there are no records in the margin or interior of Fineshade Wood where it abuts the northern field, or along the opposite boundary of Collyweston Great Wood. Apart from a sighting of one adder on the Fineshade edge of the central hedgerow, and despite surveys of the margins around both fields throughout 2019 and 2020, it therefore appears that connectivity between these habitats is currently minimal and not obviously likely to improve without intervention. With the planned enhancement and protection measures described below (and above, as for amphibians) connectivity of adder habitat would be greatly improved as would the likelihood of joining the two adder populations. This would result in a significant positive effect.

Birds

13.5.8 Surveys of the proposed western extension and surrounding area found that the proposed western extension supports a good range of probable or possible breeding species. Site clearance work during the active breeding season could result in damage to or destruction of nests which would be an

offence under the Wildlife and Countryside Act (WCA) and could result in a significant negative effect. Any necessary vegetation removal will therefore take place either outside the breeding season of these species or following inspection by an experience ecologist, with any nest found protected until the young have flown. There will therefore be no damage to nests or loss of eggs or young birds. There will be no reduction in breeding habitat since the planned enhancement measures will provide new hedges before the existing hedges are removed, and thus no loss of breeding species. The current population is thus judged to be resilient to the operations, and upon restoration of the site the higher biodiversity value of the site will result in a significant positive effect in species and numbers.

Bats

13.5.9 Currently, only five trees (one of which is already dead) are present inside the proposed western extension, none of these have roosting potential, and only one will need to be removed. This tree will be re-assessed before it is felled, and should any other tree need to be removed (e.g. for safety reasons) that tree will also be re-assessed. Light and dust controls will be implemented as described in Section 22 of this ES to minimise their impacts on bats using the site. The loss of the limited amount of foraging and commuting habitat in the operational areas of the proposed western extension would result in a temporary negative not significant impact, given the amount of good feeding habitat provided by the woods on both sides. However with the proposed restoration features planned the effect over the longer term (10-20 years) will be significant and positive.

Dormice

13.5.10 No dormice or signs of them were found on the proposed western extension or the surrounding area however monitoring surveys will continue so that protective measures can be implemented if necessary. The proposed new and enhanced hedges and the restoration of the site will include woody species known to provide nesting habitat, nuts, berries and other fruit

preferred by dormice, with brambles, honeysuckle and other flowering/fruited shrubs in the understorey.

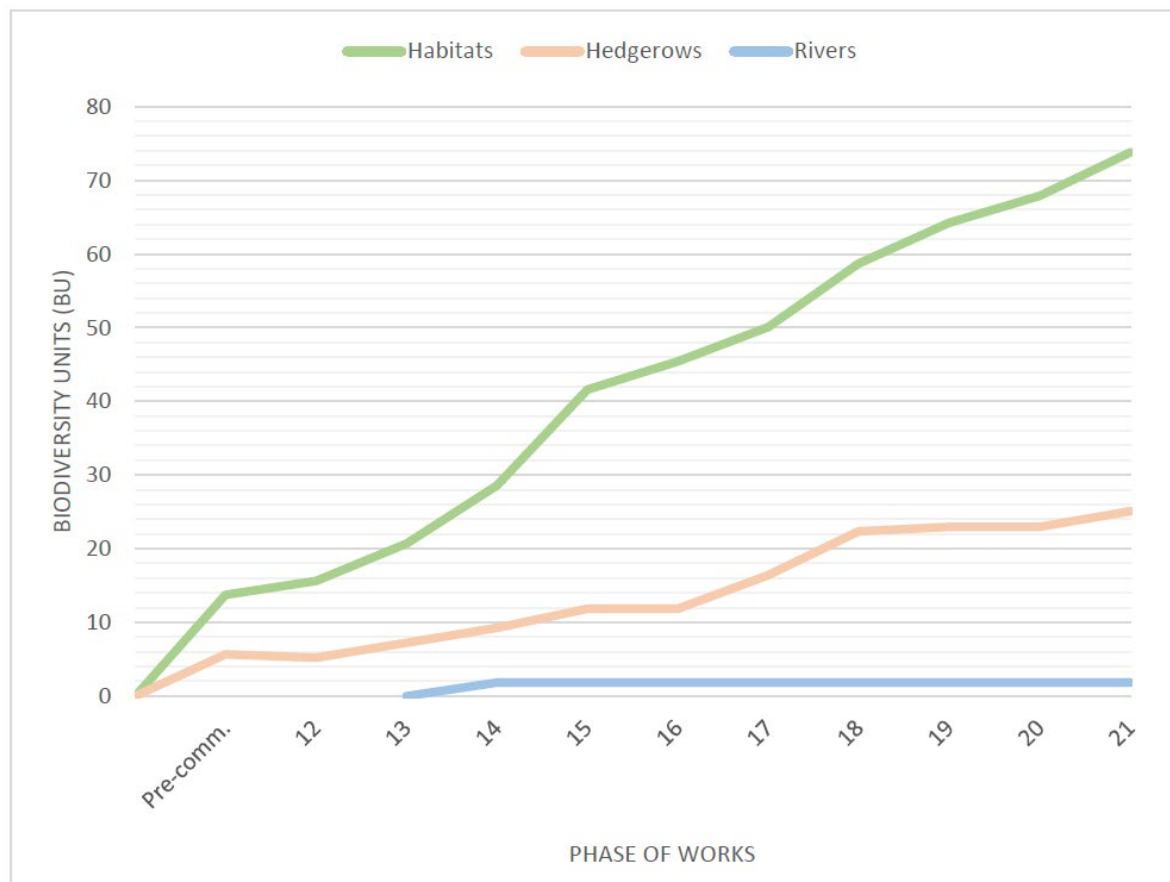
Summary of residual effects

13.5.11 A summary of the residual effects and the proposed mitigation and enhancement measures is provided in Table ES13.1. There will be no significant negative residual effects associated with the proposed development and for many of the ecological features, species and habitats there will be a significant positive effect in the long term. There are no identified cumulative effects associated with the proposed development.

Biodiversity net gain

13.5.12 The habitat creation and biodiversity enhancement proposals are set out in detail in the report at Appendix 3 to Appendix ES13.1. The biodiversity net gain has been calculated using the recently issued DEFRA Biodiversity Metric 3.0. The proposed measures will provide a biodiversity net gain of over 110% for habitats and 550% for hedgerows. There will also be a net gain in watercourses through the creation of Swallow Brook. The trend of loss and gain of biodiversity units through the development is shown below. The calculated net gain is substantially above the target which it is anticipated will

be specified for Nationally Significant Infrastructure Projects of 10% which is included in the current draft of the Environmental Bill (14 July 2021).



13.6 Avoidance of impacts, protection of species and enhancement of habitat

13.6.1 The measures proposed to enhance the ecology of the proposed western extension are planned to take part in three periods. The first measures are planned to take place prior to the operations consented by the proposed DCO. These works are likely to take place before the DCO is granted and comprise:

- Creation of a new species-rich hedgerow, running parallel to and 1-2m away from the existing grown-out tree-line and gappy hedgerow currently forming the western boundary of the proposed western extension. This will join The Assarts to Collyweston Great Wood around the north end of the proposed western extension, providing egg-

laying and larval feeding sites for butterflies, and a feeding and commuting corridor for bats and dormice.

- Creation of a bank and a new hedgerow/treeline along the southeast boundary of the southern field immediately adjacent and to the west of the existing farm track. This will in time provide wind-shelter and connectivity with the utility corridors which will cross the southern field.
- Gapping-up the southern boundary of the existing ENRMF, initially where work in this area is complete and continuing as these phases are completed to provide further connectivity, extending to the roadside hedgerow.
- Delineation of a 10m wide buffer-strip, measured from the top of the field-side ditch-top, around the whole of the northern field in the proposed western extension. This strip, part arable, part rough grassland, will all be converted to grassland, with wildflowers for pollinators and other invertebrates and tussocky grassland providing cover for amphibians and reptiles. This strip will include Root Protection Areas (RPA) for the adjacent woodlands, from which any operational works and traffic will be excluded.
- Management of this marginal strip by encouraging low scrub, including bramble and honeysuckle, to spread over the tussocky areas and using any available deadwood, bricks or rubble to create hibernacula and basking areas. These measures will benefit invertebrates, particularly butterflies, and also amphibians, adders, bats and badgers.

13.6.2 Works after the DCO is granted but prior to the commencement of site preparation works would comprise the following. There is currently no evidence that GCNs use the arable fields but since they have been recorded from the ditch on the eastern boundary of Collyweston Great Wood and are known to use ponds only 50-100m inside Fineshade Woods, as a protective measure they will need to be fenced out of the active working area. An initial

application has been made to Natural England Wildlife Licensing to obtain, if possible, a provisional acceptance that the plan is licensable or alternatively, an indication that district-level licensing would be more appropriate. No response has yet been received at the time of writing this ES. However, following grant of the DCO a full application for licensing will be submitted, and meanwhile the following measures will be carried out before work begins, to protect animals from accessing the active areas of the proposed western extension, to ensure they are not killed or injured:

- The planting of a double east-west hedgerow along the north and the south side of the doline area, to allow maturation of the hedging plants.
- Erection of fencing (around at least Phase 12 of the northern field) in order to protect deer from accidental death or injury. This fence will stand on the site-side of the 10m marginal strip and will also serve as the security fence. When a licence is available for exclusion of GCNs an exclusion fence for these animals will be included in the fence-line.
- Erection of protective fencing around the operational areas of the proposed western extension will be carried out in a phased manner as development proceeds, with the northern area of the proposed western extension developed and completed first from north (Phase 12) to south (Phase 14).
- Continuation of the western side of the GCN fencing south from the southeast corner of Phase 14 to the west end of the central fence, and from here, east to run north of the hedge to the approximate midpoint of the hedge. Here it will turn south to cut through the hedge.
- Removal of the eastern half of the central hedge from this point, under ecological supervision, with any amphibians and reptiles captured and removed to the refuge area. The western half of this hedge will be retained as long as possible.

- Removal of the northern half of the existing ENRMF western hedge under ecological supervision, with any amphibians and reptiles captured and removed to the refuge area. The haul road to the north field will then be created through the two fence gaps. The southern half of this hedge will be retained as long as possible.
- The implementation of dust control measures throughout the site operations (addressed further in Section 22 of this ES).

13.6.3 During continuation of development and restoration the measures planned to take place comprise:

- Removal of fencing as phases are complete, releasing restored areas to provide additional connectivity for wildlife and re-erection of fencing around the next phase of works,
- Progressive working and restoration of the proposed western extension so that the restoration of the northern section of the proposed western extension is achieved as soon as possible.
- Opening of the culverted drain and development of a new watercourse with ponds along the line of the doline feature between the two rows of double hedges planted prior to commencement of the works. The watercourse will be established following the completion of restoration in Phase 14.
- Treatment and removal of the current and any additional invasive species on site in accordance with approved methods as necessary and monitoring will be continued throughout the life of the development.
- Planting double east-west hedges along both sides of each services corridor as filling and restoration of each adjacent phase is completed, carrying out of embedded mitigation measures proposed to ameliorate any negative effects, and taking opportunities for other enhancements as they occur.

- The restoration of the site to a mosaic of woodland with shrubby edges, flower meadow grassland, scattered trees, hedgerows and waterbodies. This will complement and link existing habitats to give a greater area of woodland, with habitats also for amphibians, reptiles and invertebrates, including butterflies. The tree and shrub planting will provide future potential for roosting bats, nesting birds and saprophytic invertebrates and hopefully, in time, dormice.
- The maintenance and management of the restored site in order to achieve the planned benefits for an aftercare period of 20 years, implementing the Ecological Management, Monitoring and Aftercare Plan in which all the measures developed for species and habitat monitoring, for recognising the need for and planning the best means of management and for continuing with the aftercare planning are set out.

13.7 Conclusions

13.7.1 The ecological requirements of the species already present and the information and recommendations of many consultees has been carefully considered and taken into account during the design of the proposed development, enhancement and mitigation measures and restoration scheme. Based on the proposed site design and mitigation measures together with the progressive restoration of the site it is concluded that the development can be undertaken with minimal impact on the ecological interest at and in the vicinity of the site. In the long term the new and enhanced habitats will provide a great benefit to all of the species present at and in the vicinity of the site and to the whole of the Rockingham Forest area.

13.7.2 Detailed mitigation and enhancement measures have been embedded into the site design to minimise the short term negative effects and maximise long term biodiversity gain. The scheme provides substantial habitat creation, restoration and connectivity opportunity, with the restoration plans seeking to revert the entire application boundary from primarily arable land to natural

habitat. This is demonstrated by the 139.67% and 550.59% biodiversity net gain of habitats and hedgerows which is a 111.87% and 550.59% net change respectively. The proposals will provide a substantial biodiversity net gain of over 110% for habitats and 550% for hedgerows. There will also be a net gain in watercourses through the creation of Swallow Brook.

14. Landscape and visual effects

14.1 Introduction

14.1.1 In this section the assessment of the effects of the proposals on landscape and visual receptors is presented. An assessment of the baseline landscape features and character of the site and its environs, together with the baseline visibility of the site from a range of representative viewpoints within the surrounding area has been undertaken in accordance with current guidance. An assessment of the potential effects of the proposed development on landscape and visual receptors undertaken by DB Landscape Consultancy Ltd is presented at the report at Appendix ES 14.1.

14.2 Methodology

14.2.1 The Landscape and Visual Impact Assessment (LVIA) has been undertaken in accordance with the Guidelines for Landscape and Visual Impact Assessment²⁵. The viewpoint photographs to support the LVIA have been taken in accordance with the latest Landscape Institute and Institute of Environmental Management and Assessment guidance²⁶. The detail on the methodology followed is provided at Section 3 of the report at Appendix ES14.1. The LVIA was carried out using combined site and desk based survey and assessment. The assessment is focussed on a study area with a 3km radius centred on the site.

14.2.2 The Zone of Theoretical Visibility (ZTV) for the proposed development was created using Digital Surface Model data and used to determine the possible locations from where the development might be seen. In combination with fieldwork this information was used to identify a series of thirteen viewpoint locations representative of the view for a range of receptors including residents, users of public rights of way and roads. The viewpoints included in the assessment were agreed with the former Northamptonshire County

²⁵ *Landscape Institute and IEMA (2013) Guidelines for Landscape and Visual Impact Assessment 3rd Edition*

²⁶ *Landscape Institute (2019) TGN 06/19. Visual Representation of development proposals*

Council in February 2020. A field survey was carried out in February 2020 and photographs were taken from each of the representative viewpoints. Further photographs were taken in January and June 2021. The study area, ZTV map and the viewpoint locations are shown on Figure ES14.1.

14.3 Baseline

14.3.1 The baseline for the LVIA comprises the approved restoration profile and scheme for the existing ENRMF site and the current situation at the proposed western extension.

Landscape features

14.3.2 Landscape features are elements of the environment which contribute to the local character and setting of a site. The key landscape features across the western extension area that are likely to be directly affected by the proposed development include the topography of the area, which will be permanently changed by soil stripping, mineral working and landfilling followed by restoration. Further features include 5.9ha of Agricultural Land Classification (ALC) grade 3a Best and Most Versatile agricultural land in the northern part of the extension area together with the remaining land at ALC grade 3b, the hedgerow separating the northern area from the southern area in the proposed western extension, the hedgerow separating the existing ENRMF and the proposed western extension and the small scrubby area in the centre of the western extension area; which will all be affected. These features are mainly considered to have low sensitivity to the proposed development except for the topography (low – medium sensitivity) and the grade 3a soil (medium sensitivity).

14.3.3 The site does not lie within an area designated at a statutory/national or non statutory/local level for its landscape value or quality. At a national level the site lies within National Character Area (NCA) 92: Rockingham Forest as defined by Natural England, which consists of an undulating landform rising to a prominent northern scarp with large woodlands forming a prominent feature

on the skyline and remnants of unimproved grassland and large arable fields with low hedges. The settlement pattern is small villages with isolated farmsteads. The area is largely rural and tranquil in character. In the vicinity of the existing ENRMF and proposed western extension there are other minerals and waste operations and a haulage company to the east of the existing ENRMF.

Landscape character

- 14.3.4** The site lies within Landscape Character Type (LCT) 11: Wooded Limestone Hills and Valleys. Within that LCT the site is located in Landscape Character Area (LCA) 11a: King's Cliffe Hills and Valleys. Relevant key characteristics of this LCA include a series of broad valleys and broad low hills dipping gradually to the east with a generally enclosed character, a predominance of arable land with areas of improved pasture and calcareous grassland frequent along watercourses, limited limestone walls evident across the landscape, significant woodland cover of varying composition with large areas of designated ancient woodland. Communication routes are principally confined to minor roads connecting small settlements and individual dwellings.
- 14.3.5** The site includes two areas which are fundamentally different in terms of their existing character comprising the existing operational site and the proposed extension. The existing ENRMF is a disturbed and evolving landscape with built development such as offices and other plant and infrastructure combined with vehicle movement and various operations in progress such as engineering works, partly filled landfill cells and stockpiles. These active areas are not consistent with the character of the wider agricultural landscape except for a narrow, previously restored grassland area along part of the northern side of the existing ENRMF. Sensitivity of the existing ENRMF to the proposed development is rated as low.
- 14.3.6** The western extension area is broadly rural and agricultural with open fields flanked by mature woodland. The western extension area is generally typical of the key characteristics identified in the national and local character

assessments relevant to the locality, although it does not contribute in a special or irreplaceable way to local landscape character. The site is located within a predominantly arable landscape with species poor often gappy hedgerows with infrequent hedgerow trees. There is significant woodland cover providing a strong sense of enclosure, particularly in the northern part of the proposed western extension. The southern part of the proposed western extension is more noticeably influenced by the adjacent ENRMF. The sensitivity of the landscape character of the area of the proposed development is considered to be low – medium (southern part, adjacent to the ENRMF) and medium for the northern part, between Collyweston Great Wood and The Assarts.

Tranquillity

14.3.7 The site is located in an Area of Tranquillity (Policy 3 - North Northamptonshire Core Strategy). The Area of Tranquillity covers a wide area to the south of the A47 and includes the existing ENRMF and Collyweston Quarry. The degree of tranquillity varies across the application area. In spite of the disturbed nature of and the operational activities at the existing ENRMF it has been included with the tranquillity designation. The northern part of the proposed western extension is visually and physically separated from the existing ENRMF and is more typically associated with the adjacent woodland areas in terms of tranquillity. The central part of the proposed western extension is immediately adjacent to the ENRMF landfill so tranquillity influenced by the ongoing works in the existing landfill. The southern part of the proposed western extension has views of the existing ENRMF which influences tranquillity.

Visibility

14.3.8 The baseline visibility assessment addresses the extent and quality of views towards the site available to a range of visual receptors including settlements/residents, amenity/recreation users (including people using Public Rights of Way), road users and people at work. The site is visually well

contained so there are limited viewpoints from which the site can be seen. The photographs from each of the thirteen viewpoints are presented at Appendix A to the report at Appendix ES14.1.

- 14.3.9** There are no views towards the site from the north due to a combination of extensive mature woodland (Collyweston Great Wood) and an absence of any residential properties or publicly accessible locations within the land to the north.
- 14.3.10** The eastern boundary of the existing ENRMF is marked by an approximately 2m to 3m high, well established hedgerow which effectively screens the site all year round from Stamford Road, Westhay Cottages and Westhay Farm. The landform of the existing landfill prevents any views of the proposed western extension from Westhay Cottages and Stamford Road adjacent to the site. Further south on Stamford Road between Westhay Farm and Westhay Lodge views from Stamford Road towards the site including the existing ENRMF operations are severely restricted due to the low elevation of the road combined with the roadside hedgerow. Further to the east and southeast there is a lack of residential properties or public rights of way with views towards the site. Views from Cross Leys Farm and St John's Wood Farm restricted by distance and/or intervening landform and vegetation.
- 14.3.11** From the south there are partial views towards the existing ENRMF operations from a section of Stamford Road in the vicinity of Westhay Lodge, approximately 770m from the site boundary. It is considered that partial views of the operations at the existing ENRMF are available from Westhay Lodge and the garden. A triangular shaped block of conifer trees approximately 90m to the northwest of Westhay Lodge combined with agricultural buildings between the conifers and Westhay Lodge act as visual screens to severely restrict views from both the road and the property towards the proposed western extension. Approximately 80m to the north west of Westhay Lodge is another property Westhay Barn. Due to its location and the lack of substantial vegetation screening between the property, its garden and the existing

ENRMF landfill views of the southern side of the existing landfill are available including the unrestored areas, stockpiles and intermittent machinery movements. Views of Fineshade Wood adjacent to the southern part of the proposed western extension are available across intervening agricultural fields approximately 1.1km to the north west.

14.3.12 There are no views of the site from any properties within Kings Cliffe due to a combination of rising landform to the north of the village and a belt of woodland vegetation extending in an almost unbroken strip along the northern edge of the settlement.

14.3.13 From the west there are only very limited views of the site due to a combination of mature woodland flanking the site along most of its western boundary and landform, which slopes downwards towards Duddington, entirely screening the site from views from this settlement. There are glimpses of the site from Footpath MX15 which runs through Fineshade Wood where there is a break in the trees in the north western corner of the southern field. Views towards the site from public rights of way to the west of Collyweston Quarry are very restricted due to distance and intervening vegetation as well as soil and overburden bunds located around the quarry in places.

14.3.14 It is necessary to outline the likely evolution of the baseline environment at the site without the implementation of the proposed development. If the proposed development was not implemented the existing ENRMF would continue to manage, treat and landfill hazardous wastes as well as provide a disposal facility for LLW. There would be no changes to the site operational practices and the operations at the site would be completed by 2026 based on the consented restoration scheme. The aftercare and maintenance period for the site would continue to 2036. The agricultural fields in the proposed western extension would not change. The landscape character of the site and the surrounding environs would not change. It is considered that the views of the site would remain generally consistent with the current baseline until the restoration of the existing ENRMF is completed.

14.4 Assessment of environmental effects

14.4.1 The predicted effects of the proposed development have been assessed with respect to the existing landscape features on and around the site and the character of the local landscape and visual receptors. The LVIA addresses the effects on the landscape character and on visual receptors during mineral extraction and landfilling, waste treatment, and restoration 10 years following completion of restoration.

14.5 Effects on landscape receptors

Extension in time of the existing ENRMF landfill

14.5.1 Under The East Northamptonshire Resource Management Facility Order 2013 (as amended) (original Order) the existing ENRMF operations and restoration should be completed by 2026. The proposed development will extend operations to 2046. As a result of this some adverse effects on landscape character will be evident due to the unavoidable delay in the final restoration of the existing ENRMF which would prolong the duration of time that the site will be uncharacteristic of the surrounding landscape. A number of phases will be progressively restored during the 20 year extension including the majority of the existing ENRMF landfill excluding operational areas necessary for the ongoing operations such as the waste treatment and recovery facility, a limited temporary stockpile area, the site reception area and the haul road connecting these two operational parts of the site. This haul road will also extend into the western extension area.

14.5.2 The extension in time of operations at the existing ENRMF will not cause significant adverse effects on landscape features or character taking into account the existing site context as many areas across the existing ENRMF will be fully restored during the extension in time of the operations meaning that effects on the character of these areas will be limited. The effects will be temporary and mitigation will be provided by way of the enhanced restoration proposals for the existing ENRMF landfill combined with the proposed western

extension which together will provide substantial net gains in biodiversity and public amenity.

Construction of the new void including mineral extraction, material stockpiling and landfill cell construction

14.5.3 In the proposed western extension these works will cause significant adverse effects on the topography of the proposed western extension due to extraction operations and the resultant lowering of the land surface. The proposed development at this stage will cause significant effects on the landscape character of the northern part of the western extension area although due to the influence of the adjacent existing ENRMF effects on the character of the southern part of the western extension area will be of lower significance. Effects on the wider landscape character area LCA 11a: Kings Cliffe Hills and Valleys area will be limited and not considered significant.

14.5.4 The works will cause adverse effects of minor to minor - moderate significance on the soil resources as the soils will all be retained on site in storage bunds for later use in restoration. Effects on existing vegetation features (including the hedgerow across the middle of the proposed western extension, the hedgerow dividing the existing ENRMF from the proposed western extension and the scrubby vegetation in the central eastern part of the proposed western extension which are considered unremarkable and of limited landscape value) will also be of a minor – moderate significance. The loss of the mature oak tree at the eastern end of the hedgerow which crosses the proposed western extension will be of higher significance due to its age, good condition and landscape value, but considering the local context (mature woodlands predominating to the west and northeast) and the mitigation planting proposed, long term adverse effects will not be significant. There will be no effects on public rights of way (PRoW) due to these works.

Operation of the landfill to 2046

14.5.5 Operation of the landfill within the proposed western extension up to 2046 will have significant adverse effects on the landscape character the land within the northern part of the proposed western extension as the influence of the existing ENRMF landfill is relatively limited compared to the southern part of the proposed western extension. Effects on the character of the southern part of the western extension area will be reduced and effects are not considered significant partly due to the unremarkable nature of the southern part of the western extension area (it is not in a designated landscape, it doesn't contribute in a special or notable way to the wider landscape character, and it is influenced by the adjacent landfill operation).

Operation of the waste treatment and recovery facility up to 2046

14.5.6 The waste treatment and recovery facility is located in the north western corner of the existing ENRMF landfill, and includes four silos which extend up to 14m in height, with the elevation of the top of the structures at approximately 99.5m AOD. The proposed development will extend the operation of the facility by approximately 20 years but it is not considered that this will result in significant adverse effects on landscape features or character. While the waste treatment and recovery facility is uncharacteristic of the surrounding agricultural land and woodland blocks, it is characteristic of the existing ENRMF landfill in which it is located, the retention of which for an additional 20 years will not cause significant effects on landscape receptors.

Removal of the waste treatment and recovery facility in 2046

14.5.7 In accordance with the original Order, this facility is due to be removed by 2026 as part of the existing ENRMF landfill and restoration works. This would be beneficial to landscape receptors as it means that final restoration works would be able to take place across the footprint of the facility at that time. If the treatment facility is retained until 2046 and then removed the effects will still be beneficial for landscape features at that time although the delay would reduce the significance of this.

Restoration

- 14.5.8** When compared to the baseline (which is the current approved restoration scheme for the existing ENRMF landfill and the current appearance of the western extension area), the proposed development will result in substantial overall net gains in the length of hedgerows (in excess of 3km will be planted) with trees plus notable net benefits by way of proposed hedgerows with no trees and neutral/calcareous grassland. In addition, there will be net benefits in terms of permissive footpath routes as over 4km of permissive paths will be created on the restored site.
- 14.5.9** The more scattered and random distribution of woodland and scrubby planting across the restored site (as opposed to just across the existing ENRMF landfill) is considered to offer notable benefits to biodiversity and would enable eventual vegetation linkage between Fineshade Woods (The Assarts woodland) to the west of the proposed western extension and Collyweston Great Wood to the east of the western extension area.
- 14.5.10** The loss of approximately 26ha of agricultural land across the proposed western extension will be mitigated by the overall significant net gains in neutral/calcareous grassland, woodland/scrubby planting, hedgerows with trees, attenuation basins which may occasionally function as ephemeral ponds, other individual ponds for biodiversity enhancement along with the retention of the ALC grade 3a and 3b soils on site for use in restoration. New footpath routes would provide a net gain in terms of public access when compared to the baseline and these routes provide the potential for the creation of links to existing PRow to the west of the site subject to agreement. The rural landscape character of the surrounding area will be maintained and enhanced as the restored site integrates into the surroundings.

14.6 Effects on visual receptors*Extension in time of the existing ENRMF landfill*

14.6.1 The extended duration of works associated with the existing ENRMF landfill will have no or negligible effects on the vast majority of visual receptors with partial views or glimpses of the site from the surrounding area including those at a number of the representative viewpoints. Due to distance, landform and/or intervening elements the limited or very limited scale of visual disturbance at present is such that an extension of the operations at the existing ENRMF will not cause visual effects of notable significance. This will apply to PRoW users at viewpoints 2, 4, 9 & 11.

14.6.2 Residents at Westhay Lodge (represented by Viewpoint 5) and The Barn (represented by Viewpoint 13) have partial views of the southern side of the existing ENRMF with The Barn residents located to the west of Westhay Lodge having clearer, more direct views due to a lack of intervening screening elements. The triangular block of coniferous trees to the northwest of Westhay Lodge screens the vast majority of the central part of the landfill for the Westhay Lodge residents. Sensitivity of the residents to the view(s) is slightly reduced as they are accustomed to the presence of the evolving landfill to the northwest and the associated disturbed land and plant activity. The extension of time relating to the existing ENRMF landfill will not introduce additional visual disturbance into the views of the existing ENRMF although the existing levels of disturbance would be extended in duration which will result in effects of a minor – moderate significance level.

14.6.3 Visual disturbance for users of Footpath MX15 to the west of the site (represented by Viewpoint 3) will be extended. This will cause an adverse effect on visual amenity for footpath users but it would be fleeting, oblique to the direction of travel and similar in nature/scale to the existing 'disturbed' view.

Construction of the new void, including mineral extraction, material stockpiling and landfill cell construction

14.6.4 Due to the good screening provided by the surrounding woodlands and existing ENRMF landfill coupled with distance and the lack of publicly

accessible locations within approximately 700m of the site there will be limited visual effects of a negligible – minor significance on all other visual receptors as a result of these works including those represented by Viewpoints 2, 4, 9 and 11.

14.6.5 Residents at Westhay Lodge and Westhay Barn would receive visual effects of moderate significance as soil stripping and stockpiling in the proposed western extension will be partially visible above the existing hedgerow and proposed hedgerow flanking the access track along the eastern boundary of the southern part of the proposed western extension. Views of works beneath ground level including extraction and cell construction would be restricted due to distance and angle of view which reduces the significance of effects. The landfill construction works in the northern part of the proposed western extension will largely be screened by intervening landform and vegetation as well as distance.

14.6.6 Users of Footpath MX15 (Viewpoint 3) will experience partial views eastwards of the above ground landfill construction works in the southern part of the proposed western extension but the below ground activity would be screened from view. Views of the existing waste treatment and recovery facility and the partially restored western end of the existing ENRMF landfill would remain. It is considered that the visual effects would be noticeable but not significant.

Operation of the landfill to 2046

14.6.7 The visibility of the landfilling will be very limited for all other visual receptors within the surrounding area including those represented by a number of viewpoints due to distance, landform and intervening elements. Users of Footpath NE20 (Viewpoints 10 & 11) and Bridleways NE8 and NE25 (Viewpoints 6, 8 & 9) will have no views of the evolving landform in the northern part of the proposed western extension but may have glimpses of parts of the landform when it is constructed within the southern part of the western extension area. Significance of effects from these locations would be negligible to minor.

- 14.6.8** As the void is infilled with wastes and the landform rises above the existing and proposed hedgerows, the landfilling activity will become visible to residents of Westhay Lodge and Westhay Barn (Viewpoints 5 and 13 respectively). Due to the practice of landfilling within bunded operational areas the waste itself is unlikely to be visible. The impact will be moderate – major (i.e. classed as significant). This would be short term during the landfilling works in the southern part of the proposed western extension (Phases 15 – 17). Works in the northern part of the western extension area would be entirely screened by the existing landfill and works along the western side of the proposed western extension landfill would also be largely screened, once the eastern side of the landfill has been raised to a sufficient level. These visible works will be temporary in nature lasting only a few years.
- 14.6.9** The proposed development will bring visual disturbance closer to users of an approximately 50m length of Footpath MX15 between two woodland blocks (represented by Viewpoint 3) and will be significant although this will be restricted to when the landfill is being constructed in parts of Phases 19 -21 of the proposed western extension and would be fleeting and transient. At all other times during the development effects on footpath users will be less and would not be significant due to the current visual context. Construction in the northern part of the proposed western extension will not be visible at all from this section of Footpath MX15.
- 14.6.10** Users of Footpath MX18 (Viewpoint 2) will be able to view the restoration landform in the far distance through intervening tree vegetation within the northern part of the proposed western extension. The effects will not be significant due to the influence of distance, intervening elements and the temporary nature of the landfilling works.

Operation of the waste treatment and recovery facility up to 2046

- 14.6.11** The waste treatment and recovery facility is located in the north western part of the existing ENRMF landfill and as such it is very well screened mainly by established woodland and landform (the existing ENRMF landfill) from all

publicly accessible locations except for users of an approximately 50m length of Footpath MX15 to the west of the site. Users of this stretch of footpath are currently able to view the top half of the static buildings and silos at the western end of the waste treatment and recovery facility, but not the ground operations.

14.6.12 As a result of the proposals the plant will be present for a longer period but it will eventually be screened by the landfill within the southern part of the proposed western extension (Phases 20 and 21) as it is progressively constructed. The extended duration of the presence of the waste treatment and recovery facility in the view would be an adverse consequence but the effects would be of a minor level, and not significant.

Removal of the waste treatment and recovery facility by 2046

14.6.13 Removal of the infrastructure from the waste treatment and recovery facility will be one of the last operations to be undertaken at the site. The area of the waste treatment and recovery facility will then be extracted to create the final landfill phase which will be landfilled to achieve the final restoration contours. These works are consented under the original Order but will be undertaken later as a result of the proposed development.

14.6.14 Only users of Footpath MX15 will receive views of the facility removal which will include movements of a variety of plant and machinery including 360 degree excavators, dump trucks, dozers, cranes and other vehicles and equipment all of which were also used in the construction of the facility at various times when they are working above ground level in the vicinity. The works will be temporary and will be noticeable in the middle distance for footpath users although effects would be limited and not significant when compared to the baseline. There would be no or very limited visual effects due to these works on all other visual receptors within the surrounding area.

Restoration

14.6.15 The restored site will be visible from various locations within the surrounding area, including a number of the representative viewpoints. The proposed

development includes a more elevated final restoration landform than currently consented across the existing ENRMF Views of the restored landfill will comprise woodland blocks, scrubby planting areas and hedgerows with trees, all of which will extend across grassland slopes rising up to a level of 99m AOD. This will be similar to the views that would be available of the existing ENRMF if the approved restoration scheme were to be implemented for many visual receptors to the east and southeast of the site.

14.6.16 Views of the restored site for residents at Westhay Lodge and Westhay Barn will occupy a larger proportion of the view to the north west than would be the case with the approved restoration scheme for the existing ENRMF landfill. It is considered that the restored proposed western extension, specifically the southern part of this area, will visually integrate well with woodland within Fineshade Woods (The Assarts), to the rear of the restored landform. The proposed vegetation once sufficiently developed will be seen in conjunction with the woodland further to the northwest in the same way as the proposed woodland and scrubby planting on the restored ENRMF landfill landform will be seen once the restoration works have been completed.

14.6.17 Following restoration and vegetation establishment the views of the proposed development would be entirely in character with the surrounding landscape and the mature vegetation will blend in with the background elevation.

14.7 Cumulative effects

14.7.1 The potential for cumulative effects has been considered with respect to similar types of operations at Collyweston Quarry, Thornhaugh Landfill, Cooks Hole Quarry and Wakerley Quarry.

Assessment of cumulative landscape effects

14.7.2 Neither of the two other sites operated or owned by the applicant (Thornhaugh and Cooks Hole) will affect agricultural land during the proposed scheme duration and any vegetation loss would be minor and of negligible cumulative significance. It is considered that any effects on agricultural land or vegetation

at the other two sites listed above would be of a minor nature as these operations are either well established (Collyweston Quarry) or are sufficiently distant from the site (Wakerley Quarry). There will be no significant cumulative effects on landscape features as a result of the proposed development during the working stages.

- 14.7.3** As a result of the restoration proposals there will be minor beneficial cumulative effects on landscape features due to the substantial net gain in habitats to be established across the site along with the approved features that will be created as other quarry and landfill sites are restored in accordance with their restoration plans.
- 14.7.4** There would be no significant cumulative effects on landscape character in the area as a result of the proposed development. While the character within the western extension area would alter in a notable way it will largely affect the local area without having evident adverse effects on the wider landscape due in part to the well screened nature of the land particularly the northern part of the western extension area. The character of the surrounding land is influenced in places by haulage and mineral extraction operations.
- 14.7.5** While the proposed development will increase the total area of land affected by mineral extraction and/or landfilling activity within the study area, this will not result in significant cumulative effects on the overall character of the wider landscape during the working stages. It is considered that cumulative effects on character would instead be of minor significance especially when taking into account the progressive nature of site working and restoration schemes.
- 14.7.6** Following restoration the cumulative effects on landscape character caused by the proposed development will be generally positive but will not be significant in the context of the wider landscape within the study area. The defining characteristic of the area will remain as open agricultural land to the south and east with large woodland blocks to the west and north and few built elements.

Assessment of cumulative visual effects

- 14.7.7** There is only one location from which the proposed development may be able to be glimpsed along with other quarry and/or landfill operations. Viewpoint 2 is located on Footpath MX18 to the northwest of Collyweston Quarry and footpath users can glimpse sections of soil bunds and the upper section of faces associated with the quarry at present.
- 14.7.8** The proposed development is likely to be glimpsed through tall intervening tree belt vegetation as the landform is constructed although visibility will reduce to virtually nothing in spring and summer months due to leaves on the trees. When seen in combination with the Collyweston Quarry bunds and faces this will cause cumulative visual effects of no more than minor significance and may well be missed altogether by users.
- 14.7.9** The restored northern end of the western extension area will be visible through the intervening tall trees alongside views of the Collyweston Quarry bunds and faces which may at that time be fully or partially restored as well. Cumulative visual effects will be of minor significance and would generally be beneficial in nature.
- 14.7.10** There will be no other cumulative visual effects involving the proposed development in conjunction with other, similar operations within the study area. Footpath and/or road users may experience sequential views of the proposed development along with other developments as they travel along routes that take them within visible proximity of the operations but the distance and time between the visual experiences would be such that there would be no or negligible cumulative visual effects occurring.

14.8 Mitigation

- 14.8.1** The mitigation measures proposed to minimise the effects on landscape and visual receptors comprise:

- A number of hedgerows with trees will be planted in advance of works occurring in the proposed western extension including the northern/western boundary of the northern field, the hedgerows either side of the proposed water channel (Swallow Brook) and the eastern side of the southern field.
- The proposed western extension would initially be worked and restored from the northern boundary towards the centre of the area (Phases 12 – 14), in part to minimise the duration that Fineshade Wood would be separated from Collyweston Wood by operational works, to more quickly establish the restoration landform in this area and undertake restoration seeding/planting; The site will be restored in a progressive manner, in order to minimise the area of land under disturbance hence the adverse effects on landscape receptors and visual amenity.
- Mitigation for the permanent removal of agricultural land, the removal of hedgerows with small trees and mixed scrub habitat will be provided by the creation of areas of neutral/calcareous grassland along with the establishment of new woodland blocks, scrubby areas, attenuation basins, small individual ponds for biodiversity enhancement and new permissive footpath routes which may link with existing footpath routes (MX13 and MX15) to the west of the site subject to agreement.

14.9 Conclusions

14.9.1 It is concluded that the most significant effect of the proposed development would result during the operational life of the site. However when considered in the context of the approved restoration plan the long term effect is not considered to be significant. It is concluded that the landscape has the capacity to absorb the changes brought by the operations in the proposed development without any unacceptable adverse effects on landscape features. The proposed restoration scheme would deliver positive long term benefits for landscape features in terms of vegetation cover, habitat creation and public access.

- 14.9.2** Whilst the site is not located in an area designated for its landscape quality or value the proposed extension area lies within an area of tranquillity. It is concluded that there would be temporary effects on the character and tranquillity within the proposed extension area during the operational phase of the development. After the site is restored it is concluded that there would be beneficial effects on the character of the western extension area and tranquillity would be returned to current levels.
- 14.9.3** It is concluded that while there would be Significant though temporary visual effects for a very limited number of visual receptors at specific times during the life of proposed development, the lack of any other notable visual effects reinforces the selection of the land to the immediate west as being appropriate for an extension to the existing ENRMF landfill. The proposed development would be restored in a manner in character with the surroundings and which would be visually appealing in the long term.

15. Soil resources

15.1 Introduction

15.1.1 In this section the assessment of the effects on soil resources and agriculture is presented. The Agricultural Land Quality and Soils Resources impact assessment report has been undertaken by Askew Land and Soil and is presented at Appendix ES15.1.

15.2 Methodology

15.2.1 There are no undisturbed soils in the existing ENRMF. A desk based review and an investigation of the soils in the proposed western extension was undertaken in December 2018 to determine the agricultural land quality of the site. The soil survey was conducted at 28 locations using a hand auger and by examining one excavated soil profile pit. The locations of the auger sampling and soil pit are shown on Figure 1 of Appendix 1 to the report at Appendix ES15.1. Further information was obtained from information published by the Soil Survey of England and Wales (SSEW)^{27,28}.

15.2.2 The soil survey details have been interpreted to grade the land in the study area in accordance with the Ministry of Agriculture, Fisheries and Food (MAFF) Agricultural Land Classification of England and Wales²⁹. The main factors which are considered in order to establish the Agricultural Land Classification (ALC) in accordance with the MAFF guidelines are climate, geology and the soil. The climatic criteria are considered first when classifying land as climate can be overriding irrespective of soil and site conditions.

15.2.3 The ALC system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The ALC system divides agricultural land into five grades (Grade 1 'Excellent' to Grade 5 'Very Poor'), with Grade 3

²⁷ Soil Survey of England and Wales (1984) *Soil map of Midland and Western England (Sheet 3)*.

²⁸ J. M. Ragg et al, *Harpden (1984) Soils and their Use in Midland and Western England. Bulletin No10*

²⁹ MAFF (1988) *Revised Guidelines and Criteria for Grading the Quality of Agricultural Land*.

subdivided into Subgrade 3a 'Good' and Subgrade 3b 'Moderate'. Agricultural land classified as Grade 1, 2 and Subgrade 3a falls in the category defined as 'best and most versatile'.

15.2.4 The significance of a predicted impact is calculated according to the magnitude of the effect coupled with the sensitivity of the receptor. Each of these variables is determined based on site specific factors. Details on the assessment methodology is presented at Appendix ES15.1.

15.3 Baseline

15.3.1 The proposed western extension currently comprises two areas of arable land with grassy margins. A hedgerow forms the boundary between the two areas. There is an area of young scrubby woodland in the south eastern corner of the northern area. The proposed western extension is bordered by woodland and arable fields. The fields are under agricultural production.

15.3.2 A soil survey of agricultural land surrounding Duddington was undertaken by MAFF after 1988 when the ALC guidelines were introduced. The MAFF survey established that in the wider area including areas to the east and to the west of the site, soils in ALC Grade 3a and 3b³⁰ are extensive. There is a high proportion of Grade 3 land in Northamptonshire generally.

15.3.3 Based on maps of the area³¹ the solid geology of the site is mainly underlain by Rutland Formation (argillaceous rocks with subordinate sandstone and limestone) with a small area in the north underlain by Blisworth Limestone Formation and a small area in the south underlain by Lower Lincolnshire Limestone Member. The majority of the study area is not covered by superficial deposits. The southern part of the study area is covered by Mid Pleistocene Till. The soils in the study area are described in the Soil Survey of England and Wales Bulletin No 10. The report states that the soils within

³⁰ Multi Agency Geographic Information for the Countryside. Post 1988 Agricultural Land Classification. Available online @ www.MAGIC.gov.uk

³¹ British Geological Survey 'Geology of Britain Viewer'. Available online @ <http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html>

the study area are in the Ragdale Association. The eastern part of the study area is bordered by soils in the Evesham 1 Association. The Ragdale Association is described as clayey pelostagnogley soils. The Ragdale Association is developed in till which has grey clayey matrix containing chalk stones and some lenses of fine loamy material. Ragdale soils are seasonally waterlogged. The Evesham 1 Association consists of calcareous clays of variable depth and water regime and are formed on Jurassic clays. The soils are seasonally waterlogged when undrained.

- 15.3.4** The classification of soil in agricultural land can be limited by one or more of three main site factors: gradient, micro relief (complex change in slope angle over short distances) and risk of flooding. The quality of the agricultural land in the study area is not limited by gradient or micro relief. The study area is located in Flood Zone 1 which means it is at low risk of flooding by rivers or the sea. There is insufficient data to determine if the duration and frequency of flooding is limiting to the quality of the agricultural land in accordance with the ALC guidelines.
- 15.3.5** It has been determined from the published information together with the findings of the soil survey that the quality of the agricultural land in the northern part of the study area is limited by soil droughtiness where the soil profiles are developed over limestone. The clayey soil profiles over the remainder of the study area are limited by soil wetness. The majority of the study area comprises clayey soils and is limited by soil wetness to Grade 3b. The area in the north of the study area where there are shallow soils over limestone is limited by soil droughtiness to Grade 3a.
- 15.3.6** The climatic criteria have been reviewed for the site and it is considered that on the basis of a review of data on rainfall and accumulated temperature there is no overall climatic limitation at the site. The agricultural land within the study area is predicted to be near saturation point for 123 days per year mainly over late autumn, winter and early spring. In combination with topsoil texture this will cause limitations to agricultural land quality in the study area.

- 15.3.7** The depth of topsoil (calcareous heavy clay loam) in the Subgrade 3a area is approximately 30cm below ground level. Below the layer of topsoil, the depth of recoverable subsoil (calcareous clay) above the limestone rock is approximately 25cm, i.e. the layer 30cm-55cm below ground level. The depth of topsoil in the Subgrade 3b area is approximately 25cm below ground level. Below the layer of topsoil (clay), the depth of recoverable upper subsoil (clay) is approximately 30cm, i.e. the layer 25cm-50cm below ground level. Where required, the lower subsoil (clay), i.e. 50cm-120cm below ground level, could be recovered and stored on site for restoration purposes.
- 15.3.8** It is concluded that the majority of the study area is Grade 3b (comprising 77.3% of the study area) whilst the northern half of the northern field of the study area is Grade 3a (comprising 20.9% of the study area). There is a small area of land in the central eastern part of the study area that is classed as non-agricultural (comprising 1.8% of the study area). The agricultural land classification of the proposed western extension is shown on Figure ES15.1. The land in the existing ENRMF is classed as non-agricultural. The soil study area extended over a greater area than that which is included in the proposed western extension as it included the whole of the southern field including the area to the south of the application boundary. Within the proposed western extension there is 5.94ha of Grade 3a soils and 19.9ha of Grade 3b soils and approximately 0.5ha that is non agricultural (Figure ES15.1).
- 15.3.9** It is necessary to outline the likely evolution of the baseline environment at the site without the implementation of the proposed development. If the proposed development was not implemented the existing ENRMF would continue to manage, treat and landfill hazardous wastes as well as provide a disposal facility for LLW. There would be no changes to the site operational practices and the operations at the site would be completed by 2026. The aftercare and maintenance period for the site would continue to 2036. The agricultural land would be retained in the western extension area and the soils would remain in situ. The land would not be restored to habitats of nature conservation interest and there would be no net biodiversity gain.

15.4 Assessment of environmental effects

Agricultural Land Quality

15.4.1 As set out in Section 9 of this Environmental Statement the site will be restored to grass and woodland for nature conservation purposes and none of the site will be returned to agricultural use. This will result in the permanent loss of approximately 25.8ha of agricultural land 5.9ha of which is classed as Best and Most Versatile. This loss is considered to be a moderate significant impact on agricultural land quality based on the type and amount of land. The loss of agricultural land in the western extension area, of which there is no shortage in Northamptonshire, is offset in the longer term by the biodiversity benefits which will result from the proposed restoration scheme at the site.

15.4.2 While it is assumed for the purposes of this assessment that the land will not be used for agriculture the design of the restored site does not preclude a return to agricultural use at some point in the future should this be desired. Currently development of the site in this location to maximise biodiversity gain is determined as a more beneficial outcome than a return to agricultural use.

15.4.3 The farm business landowner has confirmed that the removal of the fields in the proposed western extension from agricultural use and their exclusion from use as part of their farming business does not affect the farm structure or viability of the farming business. The fields in the proposed western extension represent less than 6% of the total farming business landholding.

Soil resources

15.4.4 As the phases of the proposed western extension are constructed it will be necessary to strip the soils. Topsoil and subsoil will be stripped and stored separately. The soils will be handled, moved and stored progressively and in accordance with the Soil Handling and Management Scheme which has been

prepared in accordance with the MAFF Good Practice Guide for Handling Soils³² (PINS document reference 6.5).

15.4.5 The area of soil in the north of the proposed western extension site which is classified as Grade 3a Best and Most Versatile agricultural soil has been identified as having a high pH and calcium carbonate content and therefore will be husbanded for use in developing the areas of the site to be restored as calcareous grassland.

15.4.6 All stripped topsoil and subsoil will be stored and reused during restoration of the site. Without the mitigation measures set out below the stripping of the soil would result in a temporary adverse significant impact on soil resources. However, following the implementation of the mitigation measures set out below the proposed development will have a negligible impact on soil resources.

15.5 Mitigation and monitoring

15.5.1 Mitigation measures will be implemented to avoid, reduce or offset any adverse impacts of the proposed development. All stripped topsoil and subsoil will be stored and reused during restoration of the site. All soil handling, movement and storage will be undertaken in accordance with the Soil Handling and Management Scheme which is based on the MAFF Good Practice Guide for Handling Soils (PINS document reference 6.5). The area of BMV soil in the north of the proposed western extension which is identified as having a high pH and calcium carbonate content will be husbanded for use in developing the areas of the site to be restored as calcareous grassland.

15.6 Cumulative impacts

15.6.1 It is considered that there will be no cumulative impacts on Agricultural Land Quality and soil resources as a result of the proposed development.

³² MAFF's Good Practice Guide for Handling Soil, Sheets 1 – 4 (handling soil using backacters and dumptrucks). <http://www.defra.gov.uk/farm/environment/land-use/soilguid/index.htm>.

15.7 Conclusions

15.7.1 A total of 5.9ha of the proposed western extension falls within the definition of Best and Most Versatile agricultural land as set out in the relevant guidance. The site will be restored to grass and woodland for nature conservation purposes and will result in the permanent loss of the BMV agricultural land resulting in a moderate adverse impact in accordance with the adopted significance criteria. The area of soil in the north of the proposed western extension which is classified as BMV soil has been identified as having a high pH and calcium carbonate content and will be husbanded for use in developing the areas of the site to be restored as calcareous grassland. The loss of agricultural land in the proposed western extension, of which there is no shortage in Northamptonshire, is offset in the longer term by the biodiversity benefits which will result from the proposed restoration scheme at the site. All soils on the site will be managed according to an approved soils handling and management scheme which will result in a negligible impact on soils resources.

16. Archaeology and cultural heritage

16.1 Introduction

16.1.1 An assessment of cultural heritage including architectural and archaeological aspects has been undertaken by Andrew Josephs Associates. Archaeological evaluation comprising geophysical survey, the study of aerial photographs, desk based assessment and evaluation by trenching has been carried out to determine the archaeological potential of the site. The cultural heritage assessment is presented at Appendix ES16.1. An Archaeological Mitigation Strategy (AMS) has been prepared and agreed with the former Northamptonshire County Archaeological Service and is presented at Appendix ES16.2. The AMS defines the scope of the work required to mitigate the effects of the proposed development on archaeology and is provided as part of the DCO Environmental Commitments Document (PINS document reference 6.5).

16.2 Methodology

16.2.1 A desk based study has been undertaken in accordance with The Chartered Institute for Archaeologists guidance³³ and Historic England Guidance^{34, 35, 36} to provide an initial assessment of the potential effects upon archaeological and heritage resources within the site and the surrounding area that would result from the proposed development. The desk based study:

- Identifies and defines the extent of known heritage assets within the study area including the extent of the setting of the heritage asset;
- Establishes, from existing evidence, the likely archaeological potential of the site;

³³ *The Chartered Institute for Archaeologists' (1994 updated in 2014) Standard and Guidance for historic environment desk-based assessment*

³⁴ *Historic England (2008) Conservation Principles: Policies and Guidance for the Sustainable Management of the Historic Environment.*

³⁵ *Historic England (2017) The Setting of Heritage Assets (GPA3)*

³⁶ *Historic England (2020) Mineral Extraction and Archaeology (HE Advice Note 13)*

- Provides a preliminary assessment of the importance of the known archaeological resource;
- Makes a preliminary assessment of the potential for indirect effects on offsite designated heritage assets;
- Assesses the potential impact of the proposed development on known or potential heritage assets and resources; and
- As necessary, makes recommendations on the need for (and scope of) further evaluation and mitigation.

16.2.2 A search has been undertaken of the Historic England Archive, the Northamptonshire Historic Environment Record and DEFRA Magic Database to obtain information on designated heritage assets such as World Heritage Sites, listed buildings and other buildings of architectural or historic importance, scheduled monuments, Conservation Areas, archaeological sites, battlefields, historic parks and gardens and historic landscapes.

16.2.3 The details of the assessment methodology are presented at Appendix ES16.1.

16.3 Baseline

Desk Based Assessment

16.3.1 There is no surviving archaeology within the existing ENRMF as all areas of the site have been disturbed and were subject to previous investigation and recording. The proposed western extension has no upstanding heritage assets. It has been under arable cultivation for at least 150 years and prior to that it was partially located in Rockingham Forest. Ploughing has removed the surface evidence of any archaeology such as earthwork remains.

16.3.2 An initial search for designated heritage assets within 2km of the site was undertaken (Figure ES16.1 and Appendix ES16.3). There are no designated heritage assets within the application boundary. The nearest Scheduled

Monument is Duddington Bridge which is situated to the west of the village approximately 1.6km west north west of the site. One other Scheduled Monument sits on the limit of the 2km search area north north west of the site in Collyweston and is the site of a manor house and gardens. Based on the Zone of Theoretical Visual Influence (ZTVI) and the assessment of views from designated assets or groups of assets (such as within Conservation Areas) there would be no visual effects from the proposed development nor effects upon their historical context. Both Scheduled Monuments are separated from the site by distance, topography, woodland and a lack of visual connection. There would be no visual effects from the proposed development nor effects on their historical context. As their settings cannot be affected by the proposed development the impact on them is not assessed further.

16.3.3 There are two Grade II* listed buildings and structures and 32 Grade II listed buildings within 2km of the site. The closest are located within Duddington Village where there are twenty seven listed buildings located within a conservation area at a distance of over 1.2km west of the site. There are no views of the application site from the locations of the buildings. The buildings and structures are separated from the application site by distance and there is a lack of intervisibility due to topography and woodland. Their settings cannot be affected by the proposed development and therefore the impact on them is not assessed further. There are no other designated heritage assets within 2km of the site.

16.3.4 The Northamptonshire Historic Environment Record (HER) was consulted as part of the desk based study and the entries located within the proposed western extension or within 1500m of its boundary are presented in Table 8 of the Heritage Statement presented at Appendix ES16.1. Within the proposed western extension four entries have been recorded (references 6585, 9152/0/2, 9173/0/1 and 9173/0/7 on Table 8 in the report at Appendix ES16.1). They comprise Collyweston Great Wood, an area on the enclosure award map that was probably lawn, a fieldname and a crop mark of a field boundary that appears on the 1950s Ordnance Survey mapping.

- 16.3.5** The vicinity of the site has been examined during an extensive fieldwalking programme between 1960 and 1999. Numerous archaeological sites have been located including many of Roman date. The sites comprise possible settlements, buildings and ironworking locations. The National Aerial Photographic Mapping Programme has covered the area.
- 16.3.6** A large number of landscape features were identified from the Rockingham Forest Project. One excavation was recorded in Collyweston Great Wood 900m north north east of the proposed western extension. During 1953-4 a Romano-British temple of several periods of construction was identified including hexagonal and octagonal stone buildings and associated finds.
- 16.3.7** Prehistoric sites are rare. A possible cooking site identified during fieldwalking 340m north of the proposed western extension is marked by burnt and cracked pebbles. Two possible Bronze Age ring ditches lie towards the northwest limit of the study area lie 1km north west of the proposed western extension. In this same area there is evidence for an Iron Age smelting site (7181/1/1).
- 16.3.8** A further possible prehistoric barrow (9395/0/1) was identified in Westhay Wood to the south of the proposed western extension comprising a low mound about 15m in diameter. Two linear crop marks on the southern margin of the search area (9402/0/1 and 9402/0/2) were also interpreted as potential prehistoric boundaries.
- 16.3.9** Despite extensive fieldwalking and aerial photographic assessment, there are no known Roman sites nearer than 500m from the proposed western extension (9389), where a significant find scatter of Roman date including building stone and pottery was located.
- 16.3.10** A further probable settlement and ironworking site (2846) lies 1200m south-east of the proposed western extension. A similar Roman settlement including evidence of a building from aerial photographs and ironworking lies to the north-east of 2846 (2486 and 9400) and may be a continuation of 2846. Both

sites lie to the east of Westhay Lodge. A Romano-British iron smelting furnace (2886/1) and a possible section of a Roman road (3010/1) are also recorded.

16.3.11 A walkover survey has been undertaken within Fineshade Wood that lies to the west and south west of the proposed western extension. The survey identified ponds, ditches and banks, veteran trees and quarry pits.

16.3.12 The Peterborough HER (PHER) was also consulted and two records were found within 1500m of the proposed western extension.

- Knocker's Temple 900m east of the proposed western extension. Approximate position of stone foundations of a possible Roman temple found in 1953-54 by Captain Knocker. The description is the same as the Northants HER entry 2868/1/1 - MNN22442
- Pipeline watching brief (PHER 51109) 700m east of the proposed western extension. No features were observed.

Field Based Assessment

Geophysical survey

16.3.13 No archaeological investigations are known to have taken place within the proposed western extension prior to the current project. A geophysical survey of the proposed western extension was undertaken in November 2019 and May 2020. The geophysical survey found little that can be described as of archaeological interest with any certainty. Some of the anomalies identified by the survey may be ditch fills, others could be drains or former paths and some could only be tentatively identified. The main feature identified is the western part of a small rectilinear enclosure which due to the strength of the readings associated with the ground may suggest the presence of materials commonly associated with intensive use such as cultural debris and heated soils. The geophysical survey data is included in the report at Appendix ES16.1.

Trial trenching

- 16.3.14** Excavation of a series of trial trenches took place across the proposed western extension to verify the findings of the geophysical survey and identify any features of archaeological interest which may be present below ground. Discussions were held with the former Northamptonshire County Archaeologist and a Written Scheme of Investigation for the trial trenching was agreed and approved. The trial trenching work was undertaken by the Museum of London Archaeology, Northampton in October and November 2020. 51 trial trenches were excavated which targeted the geophysical anomalies to check their origin as well as blank response areas to act as controls.
- 16.3.15** The trial trenching identified low levels of activity at the proposed western extension from the Roman period onwards. Where present, archaeological preservation levels were high and the remains did not appear to have been significantly affected by the modern activities at the site such as ploughing. The majority of the finds were located within the northern half of the northern field and the north eastern extent of the southern field in the proposed western extension.
- 16.3.16** A sparse assemblage of archaeological artefacts were found during trial trenching the majority of which were unable to be dated however it is probable that the remains recorded represent a focus on the economy of the landscape, predominately in stock management. The square enclosure identified through the geophysical survey is considered to have functioned as a boundary for a field system and perhaps delineate an enclosed area related to farming management. Evidence of very small scale charcoal production, most likely for domestic purposes, was found in the northern area of the southern field. There is no clear relationship between the archaeological features located at the site during the trial trenching. The results of the trial trenching corroborated the findings of the geophysical survey as only a sparse number of archaeological features were identified.

16.3.17 It is necessary to outline the likely evolution of the baseline environment at the site without the implementation of the proposed development. If the proposed development was not implemented the existing ENRMF would continue to manage, treat and landfill hazardous wastes as well as provide a disposal facility for LLW. There would be no changes to the site operational practices and the operations at the site would be completed by 2026. The aftercare and maintenance period for the site would continue to 2036. The agricultural land would be retained in the proposed western extension and any below ground archaeology present in the proposed western extension would remain in situ. The proposed western extension would not be restored to habitats of nature conservation interest and there would be no net biodiversity gain. There would be no further contribution to the local archaeological knowledge of the area or potential further discovery of artefacts of archaeological interest.

16.4 Assessment of environmental effects

16.4.1 Many of the activities associated with the construction of the proposed western extension such as topsoil stripping, the creation of stockpiles, pre construction infrastructure works, movement of heavy machinery and mineral extraction could have an impact on known or potential archaeological or cultural features.

16.4.2 The baseline assessment demonstrates that there will be no adverse effects upon designated assets due to a combination of topography, distance, intervening woodland and built development.

16.4.3 The archaeological investigation at the proposed western extension identified only two areas of archaeological interest and then only of a local value. The findings of the geophysical survey were confirmed by the trial trenching carried out in the proposed western extension. It is considered that the proposed development would not have a significant effect on archaeology and cultural heritage.

16.5 Mitigation and monitoring

16.5.1 Discussions were held with the former Northamptonshire County Council Archaeologist (who now is the archaeological advisor for North Northamptonshire Council) following the trial trenching regarding the archaeological potential of the proposed western extension and the proposed approach to mitigation. An Archaeological Mitigation Strategy has been agreed with the archaeological advisor for North Northamptonshire Council (Appendix ES 16.2) which identifies two areas comprising the square enclosure in the north east and small scale charcoal production in the east of the western extension that will be subject to soil stripping under the direction of an archaeologist. The Archaeological Mitigation Strategy will be secured in the DCO through the DCO Environmental Commitments Document (PINS document reference 6.5). A watching brief will be undertaken by an archaeologist in the service corridors if the ground is to be disturbed for example during the excavations near the water pipes to bury the electricity cables alongside. A Written Scheme of Investigation for the works will be prepared by the appointed contractor and agreed with the Local Planning Authority prior to the commencement of the works in these specified parts of the western extension area.

16.5.2 Following the proposed mitigation measures it is considered that there would be no significant residual effects as a result of the proposed development.

16.6 Cumulative impacts

16.6.1 Due to the local topography and extensive woodland surrounding the western extension area it is considered that there would be no cumulative or combined effects on cultural heritage as a result of the proposed development.

16.7 Conclusions

16.7.1 The archaeological trenching investigation undertaken at the proposed western extension confirmed the results of the desk based research and the geophysical survey. Two areas of the proposed western extension were

identified as containing archaeological interest of only local value and an Archaeological Mitigation Strategy has been agreed. Prior to soil stripping in these areas a Written Scheme of Investigation will be prepared and agreed with the Local Planning Authority. There is no visual or contextual connection between the site and designated assets hence no mitigation is required. It is concluded that taking into consideration the baseline conditions and the nature of the proposed development together with the proposed mitigation measures that there will be no residual effects on cultural heritage and archaeology.

17. Water resources

17.1 Introduction

17.1.1 In this section of the report the potential for indirect effects on human health as a result of contaminant migration through the water pathway, the potential impacts on protected areas and potential impacts on water resources associated with the proposed development have been assessed by MJCA. The baseline geology, hydrology (surface water) and hydrogeology (groundwater) has been established at the site as part of the assessments carried out for the current and proposed waste management activities at the site. A Flood Risk Assessment for the site has been undertaken by MJCA and is presented in Section 18 of this Environmental Statement (ES).

17.2 Methodology

17.2.1 A quantitative hydrogeological risk assessment has been carried out for the disposal of hazardous waste at the existing ENRMF in support of the Environmental Permit application for the existing ENRMF landfill site. In addition a quantitative hydrogeological risk assessment was carried out of the radiological risks to the aqueous environment as part of the Environmental Permit application for the deposition of LLW in the remaining cells of the existing ENRMF. These hydrogeological impact assessments have been and are currently being reviewed and updated to incorporate the proposed western extension to the landfill and will be discussed and agreed with the Environment Agency.

17.2.2 The hydrogeological risk assessments take into account the cumulative impact from all the waste that has been disposed, and is proposed for disposal at the site. The risk assessments are based on well-established models used nationwide and approved by the Environment Agency. They are based on highly conservative assumptions and consider the potential impacts of the site in the short and the very long term (thousands of years). They assume that the high density polyethylene liner (a heavy duty chemical resistant synthetic

material) component of the engineered containment system degrades over time. The highly engineered clay component of the liner, being geological material, does not degrade and provides continued protection over geological time.

- 17.2.3** The groundwater pathways for the migration of radioactive contaminants will be assessed using a model implemented specifically for the site and surrounding area. The model is developed using the GoldSim software, which provides a flexible modelling framework that allows the effects of decay and ingrowth of radioactive isotopes to be accounted for. The hydrogeological risk assessments (HRAs) are reviewed regularly to determine whether the values used and assumptions made in the models remain valid and the results of the reviews are submitted to the Environment Agency.
- 17.2.4** A survey of the surface water drainage at and around the site has been carried out and a qualitative assessment is presented of the potential for contaminant migration to the surface water and of the potential for adverse effects on surface water quality as a result of the proposed development.
- 17.2.5** A qualitative assessment is presented of the potential impacts on groundwater levels, groundwater flows, groundwater resources and flows in nearby watercourses. The potential impacts on water dependant features of ecological importance and archaeological features of importance which may be affected by changes in the hydrogeological or hydrological regime of the site are included in the qualitative assessment. Mitigation measures are proposed as necessary to ameliorate any significant impacts identified.
- 17.2.6** The level of detail in the assessments presented in this ES are intended to be appropriate to demonstrate the land use consequences of the proposals.
- 17.2.7** An extensive site investigation has been undertaken in the proposed western extension, the scope of which was agreed with the Environment Agency. Between 18 November 2019 and 17 March 2020 twenty seven boreholes were drilled in the proposed western extension to investigate the ground conditions

in accordance with the scope of the site investigation agreed with the Environment Agency. The site investigation report is presented at Appendix ES17.1.

17.3 Baseline

Geology

17.3.1 Information on the geology of the site is taken from the British Geological Survey (BGS) 1:50,000 scale series Sheet 157 Stamford and the logs of boreholes drilled at the site. The geology at and in the vicinity of the site is shown on the geological map presented at Figure ES17.1 and the geological cross-sections presented at Figure ES17.2. Copies of the logs for the boreholes drilled in the vicinity of the proposed western extension in 2019 and 2020 are included in the site investigation report presented at Appendix ES17.1.

17.3.2 Drift deposits comprising glacial till (formerly boulder clay) overlie the solid geology across a thin strip from east to west in the central section and the south west corner of the current ENRMF site and across the majority of the southern part of the proposed western extension. The solid geology comprises a thin layer of limestone comprising the Blisworth Limestone Formation of the Jurassic Great Oolite Group in the south eastern corner of the current ENRMF site and the northern corner of the proposed western extension. The Blisworth Limestone Formation is underlain by clays and silty clays of the Rutland Formation (formerly referred to as the Upper Estuarine Series) of the Jurassic Great Oolite Group. The Rutland Formation overlies limestones and sandstones of the Lincolnshire Limestone Formation, sands, silts and clays of the Grantham Formation (formerly the Lower Estuarine Series) and sandstones and siltstones of the Northampton Sand Formation of the Jurassic Inferior Oolite Group. The Grantham Formation and the Northampton Sand Formation are not easily differentiated at the site. The Northampton Sand Formation is underlain by the fossiliferous mudstones and siltstones of the Whitby Mudstone Formation of the Jurassic Lias Group.

- 17.3.3** The existing ENRMF comprised in part a former clay quarry where the clays and mudstones of the boulder clay and Rutland Formation were extracted. The existing ENRMF landfill is located in the former clay extraction and void created by the extraction of clays for export and for use in the construction of the site engineered containment system.
- 17.3.4** There is a Regionally Important Geological Site (RIGS) in the vicinity of the site. The RIGS is located approximately 1.3km to the east north east of the existing ENRMF as shown on Figure ES1.2. There is a Local Geological Site approximately 0.5km to the north west of the proposed western extension. The sites comprise quarries within the Lincolnshire Limestone Formation with the designations relating to the geological exposures in the quarries. There will be no impact on the RIGS or the Local Geological Site as a result of the proposed development.

Hydrology

- 17.3.5** Information regarding the local hydrology is taken from the Ordnance Survey base maps at 1:10,000 (Figure ES17.3), 1:25,000 (Figure ES17.4) and 1:50,000 (Figure ES1.1) scales and from information provided by the Environment Agency, East Northamptonshire Council, Rutland County Council and Peterborough City Council. The site is located in the catchment of the River Nene which flows generally eastwards and is located approximately 6km east south east of the site at the closest point (Figure ES1.1).

Surface water management

- 17.3.6** The operational surface water management system for the existing ENRMF is designed to retain all potentially contaminated surface water on site where it is stored in ponds and used for dust suppression, in the wheel wash and in place of mains water in the treatment facility. As the completed areas of the site develop, the surface water management system at the existing ENRMF is progressing towards the approved post restoration surface water

management plan for the existing ENRMF which allows for the drainage of surface water from the capped phases to a drainage point at the south eastern corner of the existing ENRMF. This discharge point is the subject of consent under the Environmental Permit for the existing ENRMF landfill. Surface water discharge from the site commenced in January 2021. The ditch to which site runoff is discharged flows generally to the south and after joining a stream outfalls to the Willow Brook approximately 2.5km south of the current ENRMF site. The Willow Brook joins the River Nene approximately 9km south east of the site (Figure ES1.1).

17.3.7 The surface water management system for the operational areas of the existing ENRMF includes containment of the surface water from the waste treatment and recovery facility on the area of hardstanding which has an elevated kerbed edge. Surface water collecting in this area drains to a sump which is designed to have sufficient capacity to hold surface runoff from the treatment area. Fuel, lubricant and chemical reagents are stored in bunded areas to contain spillage. Vehicles are refuelled on areas of hardstanding with surface water drainage directed to a collection point or in the engineered and contained landfill area. Foul drainage from the site offices and welfare facilities is directed to a cess pit which is emptied by tanker as necessary and the contents are removed from site for treatment at a suitable sewage treatment works.

17.3.8 A surface water management plan for the proposed western extension and the existing ENRMF is presented at Appendix ES18.2. The surface water management plan sets out the principles of the surface water management for the operational areas of the site and for the restored landform and demonstrates that surface water can be managed on site without increased flood risk downstream of the site. The proposed restoration design for the site incorporates areas designed to function as attenuation basins. The rate at which water will leave the attenuation basins will be controlled so that during extreme rainfall events a significant proportion of runoff will be retained to attenuate the runoff peak. On this basis the surface water attenuation function

of the surface water management plan will be accomplished primarily by allowing water to accumulate in the basin areas temporarily during storm events and to be released from the basin areas in a controlled manner.

Surface water catchments

17.3.9 The proposed western extension to the landfill is located on a surface water divide with the majority within the catchment of the Willow Brook consistent with the current ENRMF site. Part of the northern section of the proposed western extension drains to the east to a drainage ditch which runs along the western and southern boundaries of Collyweston Great Wood. The drainage ditch continues eastwards from the site joining a tributary of the Wittering Brook where it issues approximately 2.0km north east of the current ENRMF site and approximately 2.7km east north east of the proposed western extension. The Wittering Brook joins White Water Brook near to the confluence between White Water Brook and the River Nene approximately 7.5km east of the site (Figure ES1.1).

17.3.10 Information on the surface water catchments at the site on the Environment Agency catchment data explorer website indicates that the majority of the proposed western extension is within the catchment of the Wittering Brook consistent with the majority of the current ENRMF site. The information shows the southern part of the proposed western extension and the southern part of the current ENRMF site only are within the catchment of Willow Brook. However, contrary to what is shown on the Environment Agency catchment data explorer website, it is known from site observations that runoff from the southern part of the northern section of the proposed western extension and the central area of the proposed western extension drains via field drains and drainage ditches to the swallow hole located approximately 10m to the north of the north western corner of the existing ENRMF site boundary. A number of drainage ditches from the west of the proposed western extension drain into the perimeter drainage ditches round the proposed western extension with a drainage ditch from the south culverted under the central part of the proposed

western extension towards the swallow hole. A culvert approximately 175m north of the southern culvert is located under the central part of the proposed western extension draining from the west towards the swallow hole. As it is likely that groundwater at the site feeds tributaries of the Willow Brook and the Willow Brook (see hydrogeology section below), for the purpose of this ES it is considered that the majority of the proposed western extension and the existing ENRMF are within the catchment of the Willow Brook.

17.3.11 The southern section of the proposed western extension drains to the south and south east to a drainage ditch that runs from west to east along the northern boundary of Little Wood approximately 50m south of the site. The drainage ditch continues eastwards to the east of Stamford Road and then south eastwards to where it is understood it joins a tributary of the Willow Brook (Figure ES17.3).

Surface water bodies

17.3.12 In addition to the water bodies at the existing ENRMF, there are a number of water bodies in the area of the proposed western extension. A pond is located adjacent to the south west corner of the proposed western extension. Three constructed ponds which are fenced and managed are located to the north of the proposed western extension with the closest pond approximately 80m from the northern boundary. A number of small ponds are located between approximately 200m and 400m east of the proposed western extension in the former Ministry of Defence site within Collyweston Great Wood. A small pond is located approximately 450m south of the proposed western extension to the south of Little Wood. A number of waterbodies associated with the Lincolnshire Limestone Formation workings at Collyweston Quarry are located approximately 500m west of the proposed western extension. Based on the 1:50,000 BGS map (Sheet 157, Stamford) (Figure ES17.1), with the exception of the Lincolnshire Limestone Formation workings at Collyweston Quarry, the waterbodies in the vicinity of the site are underlain by the glacial till (formerly

boulder clay) or the Rutland Formation comprising mainly clays and silty clays. Surface water features in the vicinity of the site are shown on Figure ES17.3.

Surface water abstractions

17.3.13 Based on information provided by the Environment Agency and the relevant local authorities there is one licensed and one deregulated surface water abstraction within a 3km radius of the site including the proposed western extension. The locations of the abstractions are shown on Figure ES17.4 with key details presented at Appendix ES17.2. The licensed abstraction is located approximately 1.4km west north west of the site and is from the River Welland for hydroelectric power generation. The deregulated abstraction is located approximately 2.7km north west of the site and is from the River Welland for general farming and domestic use. The River Welland is in a separate surface water catchment from the site hence the abstraction is not located downstream of the site. An abstraction from the River Nene is located approximately 7km east of the site where water is pumped to Rutland Water for public water supply. The abstraction is located approximately 8km downstream of the confluence between the River Nene and Willow Brook and approximately 0.7km upstream of the confluence between the River Nene and Wittering Brook.

Water Framework Directive classifications

17.3.14 The quality of the surface water at and in the vicinity of the site is classified by the Environment Agency under the Water Framework Directive (WFD). The WFD classifications and objectives are presented in the River Basin Management Plans (RBMP). The RBMP relevant to the site comprises the Anglian River Basin District. The Willow Brook (Nene) catchment which includes the tributary of the Willow Brook to the south of the site was classified by the Environment Agency in 2019 as “Moderate” for ecological quality and “Fail” for chemical quality with an overall classification of “Moderate”. It is understood that the failure of chemical quality is in respect of Macrophytes and Phytobenthos combined and phosphate from a continuous sewage

discharge by the Water Industry. It is predicted in the RBMP that the ecological quality remains “Moderate” up to 2027 having achieved this objective in 2013 and that the predicted chemical quality objective of “Good” will be reached by 2027 having been “Good” up to 2016.

17.3.15 The Wittering Brook catchment which includes White Water Brook and the tributary of the Wittering Brook to the east of the site was classified by the Environment Agency in 2019 as “Moderate” for ecological quality and “Fail” for chemical quality with an overall classification of “Moderate”. It is understood that the failure of chemical quality is in respect of phosphate from point source and diffuse emissions due to poor agricultural and rural land management, transport drainage and continuous sewage discharge. It is predicted in the RBMP that the ecological quality remains “Moderate” up to 2027 having achieved this objective in 2009 and that the predicted chemical quality objective of “Good” will be reached by 2027 having been “Good” up to 2016.

Discharge consents

17.3.16 Other than the permitted discharge at the site, there are no permitted water discharges within 500m of the site including the proposed western extension. There is one water discharge exemption within 500m of the site, which is located approximately 250m to the east of the existing ENRMF. The exemption was previously the subject of a discharge consent for the discharge of treated sewage effluent to an unnamed ditch.

Potential ecological or archaeological features of concern

17.3.17 It is understood that there are no water dependent features of ecological importance at or in the vicinity of the site (Section 13 of the ES). Protected woodlands are located adjacent to the site boundary. The surface water management scheme for the site is designed such that the points of surface water discharge from the proposed western extension will be consistent with pre-development discharge and at similar rates of discharge with minimal

impacts on the hydrological regime including in the vicinity of the woodlands to the west and east of the proposed western extension and north of the existing ENRMF.

17.3.18 It is understood that there are no archaeological features of importance which may be affected by changes in the hydrogeological or hydrological regime (Section 16).

Hydrogeology

17.3.19 Information on the hydrogeology of the site was provided by the Environment Agency, East Northamptonshire Council, Rutland County Council and Peterborough City Council and taken from logs of boreholes drilled at the site and groundwater level monitoring data for the period from 2003 to 2021.

Aquifer characteristics

17.3.20 The Blisworth Limestone Formation at the site was recorded as not water bearing during drilling of the boreholes at the site. The glacial till and the mudstones of the Rutland Formation have a low hydraulic conductivity and were recorded as not water bearing during drilling of boreholes at the site. The underlying limestones and sandstones of the Lincolnshire Limestone Formation and the Northampton Sand Formation are water bearing. The Lincolnshire Limestone Formation has a low to moderate primary permeability and a moderate to high secondary permeability due to the presence of fissures and fractures. The Northampton Sand Formation is considered to have a low to moderate primary permeability and a moderate to high secondary conductivity locally due to the presence of fractures. Given the often thin and locally discontinuous nature of the Grantham Formation, the Lincolnshire Limestone Formation and Northampton Sand Formation, they are considered to be in hydraulic continuity at the site and are considered to form a single aquifer unit.

17.3.21 Karst features such as swallow holes and doline depressions have been recorded in the vicinity of the site. A swallow hole is located approximately

10m to the north of the north western corner of the existing ENRMF. The swallow hole is one of a series of topographic depressions interpreted as dolines that trend east to west approximately 40m to the north of the existing ENRMF and that extend westwards beneath the proposed western extension. During the site investigation in 2019/2020 in the limestone stratum occasional features were observed which are considered to be attributable to dissolution activity. Where observed these features are recorded on the borehole logs presented at Appendix ES17.1. There are few discontinuities which are greater than 1cm and no discontinuities greater than 10cm were proven including in the area of the swallow hole and dolines. Three boreholes were drilled in the proposed western extension in the strip of land to the west of the swallow hole using rotary coring techniques through the Lincolnshire Limestone Formation to the top of the Whitby Mudstone Formation to facilitate the assessment of the nature of the Lincolnshire Limestone Formation in proximity to the swallow hole. In addition an electromagnetic induction (EMI) survey was carried out in this area. It is concluded in the EMI survey report that there is evidence of two areas of high electrical conductivity above the limestone suggesting trapped water hence vertical structures within the clay which may be acting as sinks in the area of the survey aligned with the approximate location of the swallow hole. A larger area of very high conductivity in the south west of the survey area was interpreted as relating to drainage. The survey was carried out in the wet Autumn of 2019 when the ground was saturated.

17.3.22 The area between the site investigation area (for the boreholes and EMI survey) and the swallow hole was inaccessible for investigation due to the dense tree and scrub vegetation together with topography. A topographical survey of the proposed western extension has been carried out (Figure ES18.1) and shows an area of depressions in the dense tree and scrub vegetation area to the west of the swallow hole. A small swallow hole feature was observed and surveyed in the north of the area of dense tree and scrub vegetation and west of the main swallow hole as shown on Figure ES18.1 at approximate coordinates 300250N 500400E. At the time of the survey the

small swallow hole was heavily vegetated and there was no evidence of surface runoff drainage entering the small swallow hole. As stated in Section 5.2.10 it has been agreed with the Environment Agency that the final design of the landfill in the proposed western extension in the vicinity of the swallow hole and potential other limestone solution features will be developed in detail following further targeted site investigations in this central area of the proposed western extension. It is proposed that an unfilled corridor will be retained in this area of the site to maintain continued surface water drainage from the land to the west of the proposed extension to the swallow hole. The width of the area which will not be the subject of landfilling with waste will depend on the further detailed assessment of the potential for solution features in this part of the site.

Aquifer designations

17.3.23 The Blisworth Limestone Formation and Lincolnshire Limestone Formation are designated as Principal aquifers by the Environment Agency. The glacial till is designated as a Secondary undifferentiated aquifer and the Rutland Formation is designated a Secondary B aquifer. The Grantham Formation is designated a Secondary undifferentiated aquifer and the Northampton Sand Formation is designated a Secondary A Aquifer.

Groundwater abstractions

17.3.24 The site is not located in a Source Protection Zones (SPZ) for a public water supply. The closest SPZ is located approximately 2.9km north north west of the site at the closest point and comprises a total catchment area zone for public water supplies located approximately 5.3km north east of the site at the closest point.

17.3.25 There is one licensed groundwater abstraction which abstracts from two borehole locations, twelve deregulated groundwater abstraction licences at fifteen locations and six private water supply groundwater abstractions within a 3km radius of the site including the proposed western extension. The

abstraction locations are shown on Figure ES17.4 with key details presented at Appendix ES17.2. The licensed groundwater abstraction is from a borehole approximately 1.6km east and a borehole approximately 2.5km south east of the site for general farming and domestic use with the borehole to the south east potentially down hydraulic gradient of the site in respect of groundwater flow (see next section). Of the deregulated abstractions three are located to the south and south east hence potentially down hydraulic gradient of the site in respect of groundwater flow. The closest deregulated abstraction to the site is located approximately 1.1km south east of the site at Law's Lawn and is for general farming and domestic use. It is assumed that the deregulated abstraction at Law's Lawn is the private water supply for domestic use now registered with the former East Northamptonshire Council at similar location coordinates. Two of the remaining five private water supplies are located to the south east hence potentially down hydraulic gradient of the site at distances of approximately 2.5km and 2.8km.

Groundwater flow, springs and issues

17.3.26 Based on the groundwater level information provided by the Environment Agency together with groundwater levels recorded at the boreholes at and around the site including the proposed western extension the direction of groundwater flow in the Lincolnshire Limestone Formation and Northampton Sand Formation is towards the south generally in the vicinity of the existing ENRMF and proposed western extension. Hydrographs showing the groundwater levels recorded in the vicinity of the current ENRMF site and proposed western extension are presented on Figures ES17.5 and ES17.6. The monitoring locations are shown on Figure ES8.1.

17.3.27 A number of springs are shown on the 1:25,000 Ordnance Survey map (Sheet 234, Rutland Water) within a 3km radius of the site (Figure ES17.4). In general the springs coincide with valley features. A spring is shown approximately 850m south east of the existing ENRMF located approximately 400m east of Westhay Lodge, springs are located to the immediate south east of Kings

Cliffe village approximately 2.6km south of the current ENRMF site, a spring is located approximately 2.8km south south east of the current ENRMF site, a spring is adjacent to Tixover Grange approximately 2.3km north west of the proposed western extension and springs are located to the west and south west of Collyweston between approximately 2.0km and 2.7km north north west of the proposed western extension.

17.3.28 On the 1:10,000 Ordnance Survey base data there are a number of issues identified in addition to the springs within a 3km radius of the site (Figure ES17.3). In general the issues coincide with valley features and usually comprise the start of a watercourse. Issues are shown at approximately 90m south of the proposed western extension in Little Wood as shown on Figure ES17.3, issues are located to the south of the site where the tributary of Willow Brook emerges and along the tributary at between 0.8km and 1.6km south of the site, issues are located between approximately 1.6km and 2.0km to the north east, east and south east of the current ENRMF site where tributaries of the Wittering Brook emerge, issues are located where a tributary of the River Nene emerges approximately 2.4km south east of the current ENRMF site, issues are located adjacent to Tixover Grange approximately 2.1km north west of the proposed western extension and along the Willow Brook approximately 2.9km south west of the proposed western extension.

17.3.29 Based on the general direction of groundwater flow in the vicinity of the site it is considered that the springs to the north west and north north west of the site are located up hydraulic gradient of the site, and the springs to the south, south south east and south east of the site are down hydraulic gradient of the site. All other springs and issues are neither up nor down hydraulic gradient of the site in respect of groundwater flow. Based on the 1:50,000 BGS map (Sheet 157, Stamford) (Figure ES17.1), of the springs and issues down hydraulic gradient of the site it is considered that the issue in Little Wood near the southern boundary is from the glacial till. It is considered that the northern most issue to the south where the tributary of the Willow Brook emerges and the issue along the tributary together with the springs to the south of the site

near Kings Cliffe village issue from the base of the Lincolnshire Limestone Formation and/or the Grantham Formation and feed into Willow Brook. It is considered that the southern most of the issues to the south where the tributary of the Willow Brook emerges is from the Blisworth Limestone Formation. It is considered that the spring to the south east of the site near Westhay Lodge issues from glacial sand and gravel deposits or from the Blisworth Limestone Formation and feeds a tributary of Willow Brook and the spring to the south south east of the site issues from the Blisworth Limestone Formation and feeds another tributary of Willow Brook. The remaining issues to the south east are from the Blisworth Limestone Formation.

17.3.30 It is considered that the springs and issues from the glacial deposits and from the Blisworth Limestone Formation are hydraulically separate from the site as where these deposits are recorded at the site they are laterally discontinuous and were recorded as not water bearing during the site investigations. On this basis the issue to the south where the tributary of the Willow Brook emerges and the issue along the tributary together with the springs to the south of the site near Kings Cliffe village issue from the Lincolnshire Limestone Formation and are considered to comprise down hydraulic gradient receptors for the site.

Groundwater discharge

17.3.31 The Rutland Formation and Lincolnshire Limestone Formation and the Northampton Sand Formation to the south, east and south east of the site are cut by several valley features which are coincident with the River Nene and its tributaries. Based on the direction of the regional and local groundwater flow and the valley features in the Lincolnshire Limestone Formation and Northampton Sand Formation to the south and south east of the site it is likely that groundwater beneath the site discharges to the River Nene directly or via tributaries.

Groundwater quality

17.3.32 Groundwater has been sampled routinely from boreholes across the existing ENRMF for the purpose of groundwater quality monitoring. The groundwater monitoring scheme is the subject of the Environmental Permits for the site issued and regulated by the Environment Agency and is designed to confirm that the landfill is not having an unacceptable impact on groundwater quality. The monitoring data are provided to the Environment Agency and are reviewed regularly by Augean to identify spatial and temporal patterns and to provide assurance that there are no adverse trends in groundwater quality. The monitoring locations are shown on Figure ES8.1.

17.3.33 The quality of the groundwater at and in the vicinity of the site is classified by the Environment Agency under the WFD with the classifications and objectives presented in the RBMP for the Anglian River Basin District. The groundwater in the Northampton Sands in the Nene Catchment in which the site is located was classified by the Environment Agency in 2019 under the WFD as “Good” with respect to quantitative status and “Poor” with respect to chemical quality with an overall classification of “Poor”. It is specified that the reason for not achieving good status with respect chemical quality is due to poor nutrient management under the agricultural and land management category. The quantitative status and chemical quality objectives are consistent with the current classifications with the current classifications predicted in the RBMP to remain up to 2027.

Baseline environment without implementation of the proposed development

17.3.34 It is necessary to outline the likely evolution of the baseline environment at the site without the implementation of the proposed development. If the proposed development was not implemented the existing ENRMF would continue to manage, treat and landfill hazardous wastes as well as provide a disposal facility for LLW. There would be no changes to the site operational practices and the operations at the site would be completed by 2026. The aftercare and maintenance period for the site would continue to 2036 and the Environmental

Permit would continue to be in force for as long as the Environment Agency determine that it is necessary. The agricultural land would be retained in the proposed western extension and the drainage of the site would be retained as existing. It is considered that in terms of water resources the baseline at the site would not alter significantly. The topography of the proposed western extension and surrounding environs would not change.

17.4 Assessment of environmental effects

17.4.1 Pre-application discussions were held at an early stage with the Environment Agency regarding their Groundwater Protection Position Statements³⁷ particularly with respect to the proposed western extension of the landfill site. The proposed western landfill area is not located in a source protection zone and site investigation data demonstrate that the naturally low permeability strata of the glacial till and Rutland Formation are present above the Lincolnshire Limestone Formation and the proposed development will be above the water table. As part of the discussions in preparation for the hydrogeological risk assessment submitted with the Environmental Permit application to vary the permit for the hazardous waste landfill, the Environment Agency have confirmed that, consistent with the status of the current ENRMF landfill site, the development of the proposed western extension landfill in a manner which is similar to that adopted for the current landfill site would comply with the Environment Agency Groundwater Protection Position Statement in respect of the location of landfills.

17.4.2 It is proposed that in the proposed western extension landfill a 2m or greater depth of the glacial till or Rutland Formation will be retained in-situ above the Lincolnshire Limestone Formation. The proposed site containment engineering including the formation level of the landfill and operations for the landfill site are described in Sections 5, 7 and 8 of this report and are regulated by the Environment Agency through the Environmental Permits (Table ES5.2). Consistent with the existing ENRMF landfill it is anticipated that the proposed

³⁷ <https://www.gov.uk/government/publications/groundwater-protection-position-statements>

western extension will be above rest groundwater levels at the site hence there will be no need for groundwater management during or post development. Consistent with the current landfill the proposed western extension landfill will have no significant impacts on groundwater levels or flows at and in the vicinity of the site. Leachate, surface water and groundwater will all continue to be monitored in accordance with the Environmental Permits. A leachate management system will continue to be operated in order to maintain leachate at permitted levels. Site operations are and will continue to be conducted in accordance with the Environmental Permits and under Environment Agency regulation.

17.4.3 The potential effect on groundwater quality of the proposed western extension landfill has been considered as part of the updated hydrogeological risk assessment (HRA) of the impacts associated with the deposition of hazardous waste. In the updated HRA it is concluded that there will be no significant impact on groundwater quality beneath the site or at receptors down hydraulic gradient of the site as a consequence of the proposed western landfill extension landfill. It is concluded in the updated assessment that operation of the proposed western extension landfill will not affect the current or predicted groundwater quality status designated under the WFD in the RBMP. The updated HRA has been submitted to the Environment Agency with the Environmental Permit application for the landfill of hazardous waste in the proposed western extension. The Environment Agency are reviewing the HRA currently and will not issue an Environmental Permit for the area unless they are satisfied that the site can be operated without a significant impact on water resources.

17.4.4 As explained in Sections 11 and 12 of this ES the detailed quantitative radiological HRA for the landfill disposal of LLW prepared as part of the Environmental Safety Case for the existing landfill (provided at Appendix ES11.1) is being updated to reflect the extended disposal area of the proposed western extension. The exposure pathways and risks that will be assessed together with the exposure limits will be similar to those assessed in the report

presented at Appendix ES11.1. The limits on the total radioactivity capacity for the LLW that will be included in the Environmental Permit will be set based on the conservative risk assessments to maintain the dose to people using or exposed to groundwater or surface water below the design criteria which are set for the protection of human health as set out in Table ES11.3. The capacity limit will apply from the date of issue of the permit for the existing site up to the date of closure of the landfill including the proposed western extension to the receipt of LLW waste, or the point at which the capacity limit is reached whichever is sooner and therefore takes into account the LLW that has been deposited in the existing ENRMF landfill. Any change in the consented capacity compared with the current Environmental Permit for the disposal of LLW will only be allowed on the basis that the increase in capacity will not result in a dose which exceeds the protection criteria set in the legislation and guidance. The Environment Agency will not issue an Environmental Permit unless it is satisfied that the proposed disposal of LLW will not result in significant harm to human health or the environment including water resources.

17.4.5 There is a potential risk to the quality of surface water and groundwater from the continuing use of the waste treatment and recovery plant and the use and storage of fuel, lubricants and chemical reagents together with the refuelling of vehicles at the site therefore containment measures and other precautions are in place as explained above to minimise the risks of and consequences resulting from spillages. The operation of the waste treatment and recovery plant is the subject of an Environmental Permit regulated by the Environment Agency. It is considered that there will be no significant impact on the surface water and groundwater resources from the continued use of the waste treatment and recovery plant based on the procedures and controls the subject of the Environmental Permit including the management of the self-contained surface water management system including the collection sump. It is considered that there will be no significant impact on the surface water and groundwater resources from the continued use and storage of fuel, lubricants and chemical reagents at the site and the refuelling of vehicles at

the site provided that the procedures for the storage of fuel, lubricants and chemical reagents and refuelling continue to be followed.

17.4.6 The surface water management plan for the proposed extended ENRMF (Appendix ES18.2) sets out the principles of the surface water management in the operational areas of the proposed extended site and the restored landform and demonstrates that surface water can be managed on site without increased flood risk downstream of the site. The existing controls regarding the quality of surface water from the waste treatment area, the operational landfill area and the restored landfill areas will continue to be included in the surface water management system for the operational period and the principles of control will be extended to the landfill extension area.

17.4.7 The proposed restoration design for the site incorporates areas designed to function as attenuation basins. The rate at which water will leave the attenuation basins will be controlled so that during extreme rainfall events a significant proportion of runoff will be retained to attenuate the runoff peak. On this basis the surface water attenuation function of the surface water management plan will be accomplished primarily by allowing water to accumulate in the basin areas temporarily during storm events and to be released from the basin areas in a controlled manner. The existing outlet for the discharge of water from the surface water management system will be maintained so that water can drain by gravity and in a controlled manner to the permitted discharge point at the southern east corner of the current ENRMF site. Suitable outlets for the discharge of water from the surface water management system will be created so that water can drain passively by gravity and in a controlled manner to the swallow hole, to the eastern drainage ditch round Collyweston Great Wood which joins a tributary of the Wittering Brook and to the southern drainage ditch which joins a tributary of the Willow Brook consistent with the pre-development conditions at the site. Surface water and groundwater quality will continue to be monitored in accordance with schemes agreed with the Environment Agency through the Environmental Permits.

17.4.8 It is considered that based on the controls which will be implemented the proposed development and restoration of the site will not have a significant impact on water quality or flow in the Willow Brook, Wittering Brook or River Nene or on the surface water quality status as designated under the Water Framework Directive in the River Basin Management Plan. As stated at Paragraph 17.3.17, the surface water management scheme for the site is designed such that the points of surface water discharge from the proposed western extension will be consistent with pre-development discharge and at similar rates of discharge with minimal impacts on the hydrological regime including in the vicinity of the woodlands to the west and east of the western extension and north of the current ENRMF site. It is considered that the proposed development and restoration of the site will have no significant adverse impact on groundwater quality or flow beneath the site or at receptors down hydraulic gradient of the site.

17.4.9 As explained above, regular monitoring of surface water and groundwater quality at and around the site is carried out as specified in the Environmental Permits and the results are provided to the Environment Agency. The monitoring data have shown that the site operations have not resulted in adverse impacts on groundwater or surface water with one exception. The exception relates to an isolated incident in February 2020 during the extreme and unprecedented rainfall conditions when there was a surface water overflow associated with the waste treatment and recovery facility and haul road in the north west of the existing site which resulted in a localised impact adjacent to the site. The issue was fully investigated and corrective and preventative actions were taken in consultation with the Environment Agency including implementing improved surface water containment measures taking into account long-term climate change.

17.5 Mitigation and monitoring

17.5.1 The mitigation measures for the controls on emissions to the water environment are an integral part of the design and operation of the waste

treatment and recovery facility and the landfill site as well as the associated processes of waste assessment, acceptance, delivery, treatment and deposit at the site. The mitigation measures for the landfill site comprise in particular the construction of the site containment engineering as well as the operation of the site in accordance with specifications and procedures set out through the Environmental Permits. The mitigation measures for the surface water comprise the design and implementation of surface water management systems as described at Appendix ES18.2 to this Environmental Statement. Additional procedures are prepared and implemented by Augean through their certified management systems.

17.5.2 Monitoring programmes that are agreed with the Environment Agency and regulated through the Environmental Permits will be extended to include the proposed development and will be implemented. Monitoring data will continue to be provided to the Environment Agency and presented for review by the public on the Augean web site. The regular monitoring provides confirmation that the mitigation measures are effective.

17.5.3 The routine monitoring of leachate, groundwater and surface water also provides an early warning system in that if any monitoring results exceed the control or action limits specified in the permit this is recognised at an early stage and measures can be implemented to identify and rectify the source or cause of the contaminants. If exceedances are observed these may be due to external factors which are not under the control of Augean, for example fertilisers applied to agricultural land or road salt used on the adjacent highway in the winter. Where site activities may be or are the source of the exceedances investigations and improvement actions are implemented and reported to the Environment Agency. These improvement actions may comprise changes to the systems for the management of wastes being treated at the site, improvements in the surface water management system, improvements in leachate management and control or improvements in the containment systems.

17.6 Cumulative impacts

17.6.1 The cumulative effects of the proposed extensions to the development and the currently consented activities are integral to the risk assessments that are carried out. The upgradient quality of groundwater and surface water is taken into account in the risk assessments and in determining water quality monitoring threshold criteria. It is concluded that there will be no significant impact on groundwater quality beneath the site or at receptors down hydraulic gradient of the site as a result of the combined operations. It is considered that there will be no significant impact on surface water quality including at springs and issues, in the Willow Brook, the Wittering Brook or the River Nene as a result of the combined effects of these activities. It is considered that there will be no adverse effect on the groundwater or surface water quality status in the vicinity of the site as designated under the Water Framework Directive in the River Basin Management Plan.

17.6.2 It is considered that due to the controls and mitigation measures in place as part of the existing management systems at ENRMF that will continue to be implemented and will be extended to the western area, the proposed development can be undertaken without significant individual or cumulative adverse impacts on surface water or groundwater flow or quality.

17.7 Conclusions

It is concluded that there will be no significant impact on groundwater quality or flows beneath the site or at receptors down hydraulic gradient of the site and no significant impact on surface water flows and quality including at springs and issues, in the Willow Brook, the Wittering Brook or the River Nene as a result of the development in the proposed western extension either singularly or cumulatively with the existing ENRMF. It is concluded that taking into consideration the baseline conditions and the nature of the proposed development together with the proposed mitigation measures that there will be no residual significant effects on surface water or groundwater flow or quality at or in the vicinity of the site.

18. Flood risk assessment

18.1 Introduction

18.1.1 An assessment of the potential impacts of the proposed development on surface water flow and flood risk in the vicinity of the site has been undertaken by MJCA.

18.2 Methodology

18.2.1 The potential impacts of the proposed development as a result of flood risk have been assessed in accordance with the National Policy Statement (NPS) on Hazardous Waste, the NPPF and the Planning Practice Guidance (PPG) to the NPPF. Consistent with the NPS, NPPF and the PPG on flood risk it is necessary to undertake a site specific flood risk assessment for all developments over 1ha in Flood Zone 1 to demonstrate that the proposed development will be safe from flooding and will not increase the risk of flooding elsewhere.

18.3 Baseline

18.3.1 The hydrology of the site is described in Section 17 of this Environmental Statement (ES). The site is located in the catchment of the River Nene which flows generally eastwards and is located approximately 6km east south east of the site at the closest point. The operational surface water management system for the existing ENRMF is designed to retain all potentially contaminated surface water on site where it is stored in ponds and used on site including in the treatment plant to replace mains water, in the wheel wash and for dust suppression. As the completed areas of the site develop, the surface water management system at the site is progressing towards the approved post restoration surface water management plan for the existing ENRMF which allows for the drainage of surface water from the capped phases to a drainage point at the south eastern corner of the existing ENRMF. This discharge point is the subject of consent under the Environmental Permit for the hazardous waste landfill. Surface water discharge from the existing

ENRMF commenced in January 2021. The ditch to which site runoff is discharged flows generally to the south and after joining a stream outfalls to the Willow Brook approximately 2.5km south of the current ENRMF site. The Willow Brook joins the River Nene approximately 9km south east of the site.

18.3.2 The topography of the proposed western extension generally is gently sloping downwards towards the central boundary between the northern and southern areas. The ground elevation of the northern area ranges from 89m Above Ordnance Datum (AOD) in the north to 80mAOD in the south. The ground elevation in the southern area ranges from 86mAOD in the south to 81mAOD in the north with a high point of 88mAOD in the centre of the southern area (Figure ES18.1). The proposed western extension is located on a surface water divide with the majority within the catchment of the Willow Brook consistent with the current ENRMF site including drainage via the swallow hole or the drainage ditch to the south of the proposed western extension. Part of the northern section of the proposed western extension drains to the east to a drainage ditch which runs along the western and southern boundaries of Collyweston Great Wood. The drainage ditch continues eastwards from the site joining a tributary of the Wittering Brook where it issues approximately 2.0km north east of the current ENRMF site and approximately 2.7km east north east of the proposed western extension. The Wittering Brook joins the River Nene approximately 7.5km east of the site.

18.3.3 The River Nene and the Willow Brook comprise “Statutory Main Rivers” as defined on the Environment Agency Main Rivers Map³⁸. The Environment Agency carries out maintenance, improvement or construction works on main rivers to manage flood risk. Wittering Brook and its tributaries and the tributaries of Willow Brook comprise “Ordinary Watercourses”. Lead Local Flood Authorities (LLFA), District Councils and Internal Drainage Boards carry out flood risk management work on ordinary watercourses. North

³⁸ <https://environment.maps.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386>

Northamptonshire Council comprises the LLFA for the ordinary watercourses in the vicinity of the site.

Flood zone designation

18.3.4 Based on the Flood Map for Planning³⁹ presented on the Gov.uk website the site is located in Flood Zone 1 which is defined as land having less than a 1 in 1,000 annual probability of river or sea flooding which is confirmed in the East Northamptonshire Council Strategic Flood Risk Assessment (SFRA) 2020 Review and Update⁴⁰ (2020 SFRA). The Environment Agency have provided a Product 1 Flood Map (including flood zones, defences and storage areas and areas benefiting from flood defences) for the site⁴¹ (Appendix ES18.1). No more detailed product was available in respect of flood risk at the site reflecting the low risk of flooding at the site.

History of flooding and flood defences

18.3.5 Based on the recorded historical flood locations presented in the East Northamptonshire Council 2011 Level 1 SFRA Review⁴² (2011 SFRA), there is no history of flooding at the site and no flood incidents reported within 500m of the site. The 2020 SFRA confirms that no flooding at the site has been recorded since the 2011 SFRA was published and no flood incidents reported within 500m of the site.

18.3.6 Based on the information presented in the 2011 SFRA and 2020 SFRA there are no flood defences located at or within the vicinity of the site and the site is located in an area which does not benefit from flood defences.

Flooding from surface water, sewer, drains, canals and reservoirs

³⁹ HM Government (2020). Flood Map for Planning <https://flood-map-for-planning.service.gov.uk/>

⁴⁰ East Northamptonshire Council (2020). Strategic Flood Risk Assessment (SFRA) Level 1. Review and update of 2011 Level 1 SFRA.

⁴¹ HM Government (2020). <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>

⁴² East Northamptonshire Council (2011). Level 1 Strategic Flood Risk Assessment. Review and Update

- 18.3.7** Based on the extent of flooding from surface water map⁴³ presented on the Gov.uk website the majority of the site is at a very low to low risk of flooding from surface water with areas of medium to high risk in the central area of the western extension at the extremities of culverts and in the vicinity of the swallow hole. The surface water map is consistent with the information provided on the North Northamptonshire Council Flood Toolkit webpages⁴⁴.
- 18.3.8** There are no large surface water bodies in the vicinity of the proposed western extension. The surface water body closest to the site with the exception of on-site drainage, lagoons and the pond adjacent to the south west corner of the proposed western extension are three small ponds located north of the proposed western extension with the closest pond approximately 80m from the northern boundary. The only potential cause of flooding from these ponds is from surface water run-off the risk of which would be included on the flooding from surface water map.
- 18.3.9** As described in Section 17.4.9, there was an isolated incident in February 2020 during the extreme and unprecedented rainfall conditions when there was a surface water overflow associated with the waste treatment and recovery facility and haul road in the north west of the existing ENRMF which resulted in a localised impact adjacent to the site. The issue was fully investigated and corrective and preventative actions were taken in consultation with the Environment Agency including implementing improved surface water containment measures taking into account long-term climate change.
- 18.3.10** Based on the information presented in the 2011 SFRA and 2020 SFRA there is no history of flooding from sewers at or in the vicinity of the site. There are no canals located at or in the vicinity of the site. Based on the extent of flooding from reservoirs map⁴⁵ presented on the Gov.uk website and the

⁴³ HM Government (2020). <https://flood-warning-information.service.gov.uk/long-term-flood-risk/>

⁴⁴ <https://www.floodtoolkit.com/risk/>

⁴⁵ ESI LTD (2016). *Groundwater Flood Risk Study for Northamptonshire. Prepared for Northamptonshire County Council. Report reference 63381 R1 Rev1, April 2016.*

information presented in the 2020 SFRA the site is not located in an area at risk of flooding from reservoirs. The closest reservoir to the site comprises Rutland Water located approximately 18km north west of the site (Figure ES1.1).

Flooding from groundwater

18.3.11 Based on the information presented in the 2020 SFRA the site is located in an area of negligible to very low risk of flooding from groundwater. There is a small area to the north of the eastern part of the existing ENRMF that is defined as at high risk of flooding. It is understood that the risk of flooding from groundwater presented in the 2020 SFRA is taken from a groundwater flood risk study prepared in 2016⁴⁶. It is understood from the 2016 report that the area of very low risk of flooding from groundwater is based on spring flow and that the area in the vicinity of the site defined as at high risk of flooding is based on the bedrock aquifer located at ground level. The area of very low risk of flooding from groundwater based on spring flow coincides with the limit of outcrop of the Blisworth Limestone Formation at the site (Figure ES17.1). The area in the vicinity of the site defined as at high risk of flooding based on the bedrock aquifer coincides with an area of outcrop of the Blisworth Limestone Formation to the north of the site (Figure ES17.1).

18.3.12 The Blisworth Limestone Formation at the site was recorded as not water bearing during drilling of the boreholes at the site. Based on the results of the 2019/2020 site investigation (Appendix ES17.1) undertaken in and around the proposed western extension the Blisworth Limestone Formation where it is present in the north of the northern part of the proposed western extension is between approximately 0.5m and approximately 2m thick. Based on the information presented in the HRA for the existing ENRMF site the Blisworth Limestone Formation, where it is present at the site, is approximately 0.5m and thick. The Blisworth Limestone Formation is not a significant water

⁴⁶ ESI LTD (2016). *Groundwater Flood Risk Study for Northamptonshire. Prepared for Northamptonshire County Council. Report reference 63381 R1 Rev1, April 2016.*

resource at the site hence comprises a low risk of flooding from groundwater at the site. The Blisworth Limestone Formation is and will be excavated at the site hence will not comprise a potential source of groundwater flooding at the site following development of the landfill in the proposed western extension.

The sequential and exceptions tests

18.3.13 The sequential test, which is set out in the NPPF, has the objective of steering new development to areas with the lowest probability of flooding. The site is located in Flood Zone 1 comprising the lowest flood risk hence meets the requirement of the sequential test. The flood risk vulnerability of various land uses are defined in Table 2 of the PPG on flood risk and the appropriate land uses for different flood zones are defined in Table 3 of the PPG on flood risk. Based on Table 2 of the PPG on flood risk mineral workings (except for sand and gravel workings) is classed as “less vulnerable” and landfill and sites used for waste management facilities for hazardous waste is classed as “more vulnerable”. Based on Table 3 of the PPG on flood risk all classes of development are appropriate in Flood Zone 1 and it is not necessary to apply the exceptions test.

Baseline environment without implementation of the proposed development

18.3.14 It is necessary to outline the likely evolution of the baseline environment at the site without the implementation of the proposed development. If the proposed development is not implemented the existing ENRMF would continue to manage, treat and landfill hazardous wastes as well as provide a disposal facility for LLW. There would be no changes to the site operational practices and the operations at the site would be completed by 2026. The aftercare and maintenance period for the site would continue to 2036. The agricultural land would be retained in the proposed western extension and the drainage of the site would be retained as existing. It is considered that the baseline for flood risk at the site would not alter significantly. The topography of the proposed western extension would not change.

18.4 Assessment of environmental effects

- 18.4.1** The proposed development is described in detail in Sections 5 to 9 of this ES. The topographical survey of the proposed western extension together with the proposed phasing of the development is presented on Figure ES18.1. The proposed concept restoration scheme is shown on Figure ES9.1.
- 18.4.2** Other than the proposed restored landform no permanent buildings or structures will be constructed at the proposed development. The surface water management plan presented at Appendix ES18.2 sets out the principles of the surface water management in the waste treatment and recovery facility and in the operational areas of the site including the restored landform and demonstrates that surface water can be managed on site with discharge at the pre-development greenfield runoff rate or 2l/s/ha whichever is greater or at the permitted discharge rate without increased flood risk downstream of the site.
- 18.4.3** The principles of the management of surface water for the existing ENRMF will be extended to proposed western extension with the installation of a system of drains and attenuation basins with potentially contaminated surface water runoff from waste management operational areas and haul roads retained on site and kept separate from clean water runoff from capped areas.
- 18.4.4** The restoration profile follows the best practice principles for the design of restored landfill sites including in particular that the landform should be raised with slopes designed to shed water in order to minimise rainfall infiltration through the low permeability cap and into the waste. The proposed restoration landform for the proposed western extension is a raised profile extending from north to south, rising up to a level of approximately 98m AOD at the northern end of the area and falling to the area of the drainage route across the site. The central area rises up to 97m AOD where it merges with the restored existing ENRMF landform, and then towards the south the landform dips down to existing ground to take account of the retained water pipelines and the diverted electricity cable route. Two distinct areas of land, one to the south

west of the water pipelines and one from the south of the gas pipeline to the southern boundary of the site would also be worked and restored to form two small mounded landforms, rising up to 98.5m AOD. The design for the existing site takes into account various factors arising from best practice in terms of landfill restoration in order to maximise rainfall runoff and minimise rainfall infiltration.

18.4.5 The current outlet for the discharge of water from the surface water management system will be maintained so that water can drain by gravity and in a controlled manner to the permitted discharge point at the southern east corner of the existing ENRMF. Suitable outlets for the discharge of water from the surface water management system will be created so that water can drain passively by gravity and in a controlled manner to the swallow hole, to the eastern drainage ditch round Collyweston Great Wood which joins a tributary of the Wittering Brook and to the southern drainage ditch which joins a tributary of the Willow Brook consistent with current drainage routes from the proposed western extension.

18.4.6 The proposed restoration design for the proposed western extension incorporates areas designed to function as attenuation basins. The rate at which water will leave the attenuation basins will be controlled so that during extreme rainfall events a significant proportion of runoff will be retained to attenuate the runoff peak. On this basis the surface water attenuation function of the surface water management plan will be accomplished primarily by allowing water to accumulate in the basin areas temporarily during storm events and to be released from the basin areas in a controlled manner. The design of the surface water management scheme includes the necessary provisions for climate change in particular the predicted increase in frequency and intensity of rainfall storm events. Consistent with guidance, the design rainfall event used in the surface water management plan (Appendix ES 18.2) comprises the 1 in 30 year rainfall event plus a 20% allowance for climate change. The extreme rainfall event assumed for the purpose of the

calculations presented in the surface water management plan is the 1 in 100 year rainfall event plus a 40% allowance for climate change.

18.4.7 The site is located approximately 55km south west of the nearest coast at the Wash and is approximately 80m above mean sea level and therefore is highly unlikely to be affected significantly by the predicted sea level rise of up to 1.6m by 2125 assuming an upper end allowance based on the 95th percentile scenario for the Anglian river basin district. The site is not located in an area which is identified as sensitive to flooding from rivers or the sea hence it is considered that based on the implementation of an effective surface water management plan the proposed development can be undertaken without increasing the risk of flooding at or in the vicinity of the site.

18.5 Mitigation and monitoring

18.5.1 As the site is not located in an area which is identified as sensitive to flooding from rivers or the sea and at negligible to low risk of flooding from other sources it is considered that no other mitigation with respect to flood risk will be necessary other than the measures that are specified in the surface water management plan presented at Appendix ES18.2. The surface water management plan demonstrates that surface water can be managed on site without increased flood risk downstream of the site including an allowance for climate change using drainage routes consistent with current drainage routes from the existing ENRMF and the proposed western extension. The surface water management plan is included in the DCO Environmental Commitments Document (PINS document reference 6.5).

18.6 Cumulative impacts

18.6.1 It is considered that due to the location of the site in Flood Zone 1 and the measures proposed in the surface water management plan (Appendix ES18.2) that the proposed development can be undertaken without significant individual or cumulative adverse impacts on flood risk.

18.7 Conclusions

18.7.1 It is concluded that due to the location of the site in Flood Zone 1 and the measures proposed in the surface water management plan (Appendix ES18.2) that the proposed development can be undertaken without significant residual effects on flood risk at or in the vicinity of the site.

19. Transport and traffic

19.1 Introduction

19.1.1 A Transport Assessment for the proposed development has been prepared by Cannon Consulting Engineers and is presented at Appendix ES19.1. Due to existing embedded mitigation comprising a Routing Agreement in the existing Section 106 Agreement whereby HGV traffic associated with the site must travel north on Stamford Road to the A47, there is no need for the assessment of traffic travelling to the south from the site on Stamford Road. The scope of the Transport Assessment has been agreed with Northamptonshire Highways (NH) as the local highways authority and Highways England (HE) through extensive consultation and pre-application discussions. The assessment of potential impacts on air quality associated with traffic is addressed in Section 21 of the Environmental Statement (ES) and the potential impacts on noise and vibration associated with traffic is addressed in Section 20 of the ES.

19.2 Methodology

19.2.1 Traffic numbers associated with the currently consented activities at the site have been reviewed to determine whether there will be any significant changes as a result of the proposed development. Heavy Goods Vehicles (HGVs) use the site for the delivery of wastes to the waste treatment and landfill facilities, to remove treated waste for recovery or disposal elsewhere and to remove excavated clay and overburden for use elsewhere. Personnel working at and visiting the site travel to the site in cars or light goods vehicles. In the assessment for the existing ENRMF activities which was carried out to support the application for the current Development Consent Order (DCO) in 2012, HGV vehicle numbers were estimated for the maximum potential combination of vehicles using the site. This estimation together with site operational data from 2019 and the proposed increase in waste input to the site as well as estimates of clay and overburden removal and removal of treated wastes, was used to estimate the maximum number of HGV vehicle movements associated with the proposed development. The calculations are

presented at Appendix J to the report at Appendix ES19.1 and summarised below.

	2012 Traffic Assessment	2021 Traffic Assessment	Change
Total HGV movements⁴⁷ (trips)	196 per day	232 per day	+36 per day

19.2.2 As stated above extensive pre-application consultation was undertaken with NH and HE. It was agreed during the consultation that due to the limited increase in traffic numbers associated with the proposed development it was not necessary to carry out junction capacity assessments or a detailed assessment of the road network. As explained in the report at Appendix ES19.1 in accordance with the National Policy Statement for Hazardous Waste and the Department of Communities and Local Government Guidance on Transport Assessments a Transport Assessment has been carried out based on the agreed scope.

19.3 Baseline

19.3.1 ENRMF is situated immediately west of the minor road Stamford Road and has a single access by a priority junction. Approximately 40 metres to the south of the site access on the opposite side of the road is an access to the premises of P.C. Howard Ltd, a haulage and warehousing firm. To the north of the site, Stamford Road continues another 1.25km to a priority junction with the A47. This junction is known as Collyweston Cross Roads but the north eastern arm is a private and gated access to RAF Wittering Airfield which is infrequently used.

⁴⁷ A visit from one HGV counts as two movements (or trips), one movement in and one movement out.

- 19.3.2** Waste delivery and collection vehicles using the site access are not permitted to travel to the south of the site access on Stamford Road towards the village of Kings Cliffe unless they are delivering wastes collected locally or delivering excavated materials for local uses.
- 19.3.3** Approximately 500 metres south of Collyweston Cross Roads there is an access road off Stamford Road which leads to a former RAF storage area for Wittering Airfield. Planning permission (which is unrelated to this application and does not involve the Applicant for this DCO) to develop the site as a general storage and distribution facility was granted in 2009. It is understood that the planning permission has been implemented although the land has not been used or developed for this purpose over at least the last 10 years. Works associated with this permission have however been carried out to straighten a section of Stamford Road in the vicinity of the entrance and to widen the access.
- 19.3.4** To the east the A47 links with the A1(T) via a grade-separated interchange at Wansford, giving the shortest access route to the trunk road network. To the west the A47 continues towards Leicester. At a roundabout near Duddington the A47 intersects with the A43 Northampton – Stamford Road giving a possible but longer alternative route to the A1 at Stamford.
- 19.3.5** The personal injury accident (PIA) database for the area for the past five years has been examined. There have been no recorded personal injury accidents on Stamford Road, including at its junctions with the site access and the A47. However Augean is aware of two damage only accidents which occurred on Stamford Road, one in October 2019 and one in September 2020. An image showing the condition of the carriageway at the time of the September 2020 accident has been reviewed, the centre line and edge of carriageway markings are visible, the road surface is dry and there is no mud on the road, other than debris which appears to be from the accident (Appendix ES19.1).
- 19.3.6** Five accidents were recorded on the PIA database over the last five years for the A47 junction with the A43, one of which was serious and four were slight

in severity. In addition there was one severe accident on the A47 within the vicinity of the A43/A47 junction. Of the six accidents occurring in the vicinity of the A47 / A43 junction, four occurred on the A47. None of the accidents involved vehicles from the site. The Department for Transport (DfT) permanent count for this area of the A47 (site 16482) has been used to estimate the total traffic flow over the five year period. This has been calculated to be 19,191,355. Based on the six accidents this would equate to an accident rate of 0.00003%. The proposed development will result in a negligible change in trips which is not expected to impact road safety on the A47.

19.3.7 Ten accidents were recorded on the PIA database over the last five years on the A47 east of Stamford Road none of which were associated with the Augean site. The DfT traffic count data for this section of the A47 (site 2870) has been used to estimate that there have been 20,130,115 vehicle trips over the last five years. The ten accidents within this period equates to an accident rate of 0.00005%.

19.3.8 Augean has had a commitment and has paid an agreed annual contribution to the local authority for highways maintenance since 2013 as part of the current Section 106 Agreement for the site operations. Prior to late 2020 no substantial maintenance works had been carried out to the highway by the former Northamptonshire County Council for some years. Over recent years Augean has regularly notified Northamptonshire County Council that the road surfacing on Stamford Road in the vicinity of the site and the nearby haulage yard needed to be improved. These surface improvement works were carried out by the local authority in late 2020.

19.3.9 The current entrance to the site is approved under the original Order and was assessed as part of that application as being suitable for the development. Notwithstanding this, approval has been gained for widening of the site entrance including the associated design and the proposed works currently are in the process of being constructed. The improvement works include

increasing the radius on the northern kerb line to widen the junction. The scheme also includes removal of some vegetation to improve visibility and a new site entrance gate. Drainage will be improved to prevent ponding in the site entrance. The improvements are not provided as mitigation in response to any significant adverse impact from the development but are planned by Augean improve the junction for vehicles turning left onto Stamford Road. In addition to the widening of the site access it is proposed that the weighbridge and reception location for HGVs entering the site will be moved further within the site to allow a longer queuing area on the site and the easier circulation of vehicles within ENRMF if the DCO is granted.

19.3.10 Detailed vehicle logs collated at the site for 2019 and 2020 were reviewed.

The results show that the 2020 HGV trip numbers (a weekday daily average and maximum of 104 and 180 movements respectively in 2020) were lower when compared to 2019 (a weekday daily average and maximum of 123 and 214 movements respectively in 2019). These changes are likely to be as a result of the Covid 19 pandemic as well as normal fluctuations in the operation. Therefore for the purposes of this assessment the 2019 figures were used to estimate the existing trips because they represent greater vehicle numbers. The data show that on the majority of days there are approximately 158 HGV movements associated with the site in addition to 36 vehicle movements per day for staff.

19.3.11 The transportation of wastes including hazardous waste and Low Level Radioactive waste (LLW) is controlled by a range of legislation and guidance. The transportation of dangerous goods including products with potentially hazardous properties as well as hazardous waste and LLW is controlled under The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (as amended) which implements the requirements of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). The Department for Transport (DfT) is the UK Competent Authority under these regulations. The emphasis of the regulations is to identify the types of materials where specific packaging

is necessary for transportation and for the appropriate package design to provide the main element of safety in normal and accident conditions. The regulations for the transportation of potentially hazardous materials, including hazardous wastes and LLW, specify that all drivers need to have appropriate training and an appropriate class of licence.

19.3.12 The packaging necessary for the hazardous wastes delivered to the site typically is designed to minimise uncontrolled emissions which ranges from sheeting on lorries transporting contaminated soils or filter cakes to double bagged packages for wastes containing asbestos. Wastes in fine powder form such as air pollution control residues are delivered by tanker or in enclosed bags.

19.3.13 LLW is normally delivered in enclosed containers such as bulk bags, drums or other containers. Some large items of waste such as metal sheeting may not be transported in containers but will be wrapped. Some materials may be unpackaged if the activity levels are low enough. Appropriate packaging will be used based on the hazards presented by the wastes being transported and, in accordance with the legislation, the specified packaging will include appropriate protection of the wastes in the event of an accident.

19.3.14 It is necessary to outline the likely evolution of the baseline environment at the site without the implementation of the proposed development. If an extension to the existing ENRMF is not undertaken then the agricultural land in the proposed western extension would remain. It is considered that over time there would be a growth in traffic numbers on the wider traffic network in the vicinity of the site in line with national projections. The current operations would cease at the site in 2026 as set out in the original Order and traffic movements associated with the waste operations and the restoration of the site would end.

19.4 Assessment of environmental effects

19.4.1 The proposed total waste importation rate to the site will increase to 300,000tpa. Notwithstanding this overall increase in waste input, the traffic numbers associated with the proposed development will not increase significantly compared with the traffic levels associated with the current operations at the existing ENRMF. HGV numbers are not just associated with the delivery of waste to the site. They arise also from the removal of waste treatment residues for recovery or for disposal elsewhere as well as from the removal of the excavated clay and overburden for use elsewhere. Based on the calculations used in the 2012 assessment, the assessment of HGV movements associated with the proposed changes in vehicle numbers as a result of the proposed development (Appendix J of the report at Appendix ES19.1) and the review of the detailed vehicle logs from 2019, it is estimated that the maximum number of movements associated with the proposed development is 232 per day which is an increase of 36 HGV vehicle movements per day.

19.4.2 The site operates between the hours of 0700 and 1730 during the week, which equates to a 10.5 hour operating period which would result in an hourly increase of four vehicle movements. The calculated number of trips assessed in the 2012 assessment are higher than the actual vehicle numbers based on the review of the vehicle logs. This provides confidence that the 2012 forecast methodology is robust and allows the assessment of worst case figures and therefore that the similar method of calculation used for the proposed development is appropriate.

19.4.3 The trip generation and proposed increase in HGV trips was presented in the Scoping Note submitted to NH and HE for consideration. Both NH and HE were satisfied that the trips associated with the proposed development would not result in a severe impact, as set out in the National Planning Policy Framework (NPPF) and HE's Protocol for Planning Development⁴⁸. The HE's

⁴⁸ *Highways England (formerly Highways Authority) Protocol for Planning Development, November 2012.*

protocol identifies that an assessment of the strategic road network is required if the development proposals result in an increase of 30 trips through the junction in the AM or PM peaks. As the proposed development will result in four trips in the AM and PM peak hours no further assessment is required.

19.4.4 It is considered that the proposed development will result in a negligible change in trips which is not expected to result in an impact on road safety on Stamford Road or the A47.

19.4.5 During the extensive pre application consultation with NH and HE it was agreed that the estimated increase in HGV movements would not result in a severe impact as defined in the protocol and therefore that no further assessment of the highway network was necessary.

19.4.6 The record of the complaints relevant to traffic which have been received at the site over the last five years have been reviewed along with the record of how the comments have been addressed. A summary of the details of these complaints is provided in the report at Appendix ES19.1. In summary, there were no complaints up to and including 2019, and seven complaints in 2020 and two in the first six months of 2021. The complaints relate to the condition of the road surface including at the site access, mud on the road and signage on Stamford Road. The response to these complaints was as follows:

- *Condition of the road surface on Stamford Road including at the site access.* The maintenance and resurfacing of the road are the responsibility of the Local Highway Authority and are the purpose of the annual contribution from Augean. These resurfacing works have now been completed by North Northamptonshire Council (NNC);
- *Mud on the road.* Complaints have been received regarding the perception of mud on the road which, on inspection, is generally dirty water being carried onto the highway network. Augean minimises the potential for vehicles leaving the site to carry mud onto the highway by operating a three-stage wheel cleaning facility, pressure washers to

clean the wheels and chassis of vehicles prior to leaving the site as well as operating a road sweeper which regularly cleans the on site tarmac surfaced road as well as Stamford Road.

- *Signage.* A complaint was received suggesting improved signage on Stamford Road. Augean has liaised with NNC regarding the procurement of additional signs, which would need to be provided by the highway authority, particularly on the approaches to the bends located to the north of the site on Stamford Road. Augean has provided a commitment that although the signage is not needed as a result of the operations at the site, they are prepared to fund the additional signage.

19.4.7 It is considered that the summary above demonstrates that Augean are actively managing their operations to reduce any perceived or actual impacts associated with traffic.

19.4.8 There are no footways, cycleways or bus stops/services within the vicinity of the site, reflecting its rural location. NH has accepted that although the accessibility by sustainable modes (walking, cycling and public transport) was poor, there is no reason for objection given the type of development which is predominantly HGV based.

19.4.9 Once the site is restored at the end of its operation a small car park area will be provided for visitors using the site for amenity. The details regarding the size of the car park will be agreed with the Local Planning Authority. The daily visitor numbers to the site once it is restored are expected to be considerably less than staff numbers working at the site including during the proposed development and any associated traffic impact therefore will be low

19.4.10 The site is located within an area of tranquillity identified in Policy 3 of the North Northamptonshire Core Strategy 2011-2031 (NNCS) adopted in July 2016. The NNCS states that it is important to protect tranquillity from excessive levels of traffic, among other factors. As stated above as a result

of the proposed development it is calculated that there will be an increase of an average of 36 HGV movements a day. Given the low potential increase in vehicle numbers associated with the proposed development it is considered that there will be no impact on the tranquillity of the area as a result of traffic.

19.5 Mitigation and monitoring

19.5.1 The mitigation measures comprise continuation of the existing Routing Agreement for traffic travelling to and from the site together with an annual contribution for highway maintenance from Augean to the Highways Authority for the maintenance of the roads in accordance with a Section 106 Agreement. It is intended that the principles in the existing agreement are extended and applied to the proposed activities.

19.5.2 The current routing agreement specifies that all HGVs entering and leaving the site travel directly to and from the A47 via Stamford Road to the north of the site and do not travel south along Stamford Road towards Kings Cliffe unless wastes are being collected or clay or overburden is being delivered locally. Signs informing drivers of these requirements are located near the site entrance and CCTV cameras are located so that site staff can observe the direction of vehicle entry and exit. Any reports of vehicles travelling south on Stamford Road are followed up using the recorded CCTV data and drivers and their operating companies are contacted directly if they do not observe the instructions. This routing requirement will be continued for the extended operations at the site. A Traffic Management Plan is included in the DCO Environmental Commitments Document (PINS document reference 6.5). The Traffic Management Plan includes a requirement that all HGVs leaving the site will use the wheel cleaning facilities provided prior to departure.

19.6 Cumulative impacts

19.6.1 No other new or planned developments in the vicinity of the site have been identified which may result in a cumulative impact on the local highway. The changes to the traffic flows on the A47 as a result of the proposed

development are substantially below the normal daily variation of 5% therefore any cumulative effect is negligible. Enquiries have not identified any planned significant developments of a type or at locations which would affect the conclusions regarding the impacts resulting from traffic associated with the site.

19.7 Conclusions

19.7.1 It is estimated that as a result of the proposed development HGV movements could increase by approximately 36 movements per day. It is considered and agreed with Northamptonshire Highways and Highways England that there will be no severe impact as a result of the proposed development. In accordance with the guidance no further assessment of impact is necessary. Existing obligations relating to the traffic routing agreement and the provision of an annual contribution to highways maintenance will be continued throughout the life of the proposed development.

20. Noise and vibration

20.1 Introduction

20.1.1 A noise and vibration impact assessment has been undertaken by Vibrock Limited and is presented at Appendix ES20.1. In the report the results of the assessment of the noise and vibration impact of the proposed development at the nearest sensitive receptors are presented.

20.2 Methodology

20.2.1 The approach to the assessment has been discussed with the Environmental Health Officer at the former East Northamptonshire District Council. The former Northamptonshire County Council and the Environment Agency have also had the opportunity to review the assessment approach and provide comments. Full details of the consultations are provided at Appendix 1 of the report at Appendix ES20.1.

20.2.2 The Covid-19 pandemic has presented new challenges in obtaining representative baseline sound levels because typical road, air and rail transport usage have been reduced by travel restrictions and social distancing measures. For the purposes of carrying out the preliminary assessment included in the Preliminary Environmental Information Report prepared in October 2020 it was agreed with the former Northamptonshire County Council that background noise data from a survey undertaken in 2011 would be used to determine the effects of the proposed development. For the purpose of the assessment presented in this Environmental Statement (ES) a new baseline noise survey was undertaken in February 2021 when it was considered that the acoustic environment in the vicinity of the ENRMF site was more representative of normal conditions. The survey was conducted in accordance with the guidance presented with BS 7445-1:2003⁴⁹.

⁴⁹ BS 7445:2003 *Description and measurement of environmental noise. Guide to quantities and procedures.* BSI 2013.

20.2.3 Noise from the proposed development has been assessed with reference to current noise policy in England including the National Policy Statement for Hazardous Waste (NPS HW), the Noise Policy Statement for England, the NPPF and associated planning practice guidance along with any relevant local policies. In terms of technical guidance on the assessment of noise and vibration impacts, emissions from operations associated with the proposed development have been assessed primarily with reference to BS4142:2014+A1:2019⁵⁰ 'Methods for rating and assessing industrial and commercial sound' along with other relevant guidance and criteria as appropriate.

20.2.4 In order to assist in the calculation of noise levels from the construction and operation of the proposed development, three-dimensional noise modelling software has been used. The prediction method used is that outlined within Annex F of BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'⁵¹. This guidance details methods to estimate noise from 'open sites' which can include quarries, waste sites and long-term construction projects. Screening has been calculated in accordance with Figure F.3 of BS 5228-1. For all noise prediction calculations, the ground absorption coefficient has been estimated according to the combination of soft and hard ground conditions present between the source and receiver position.

20.2.5 Predictions have been made for locations representing private external amenity areas at a height of 1.5 metres above ground level and at least 3.5 metres from any reflecting surface other than the ground. Night-time noise levels have been predicted at a height of 4m above ground level to represent bedroom windows of two-storey dwellings. The predictions made are 'freefield' sound levels to allow for an appropriate comparison with the measured free-field background sound levels. The inputs used within the modelling software are presented at Section 2.4.3 of the report at Appendix ES20.1.

⁵⁰ BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*, British Standards Institution 2019.

⁵¹ BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites. Part 1: Noise*. British Standards Institution 2014.

20.2.6 In order to consider the worst case scenario in the noise impact assessment the noise level predictions have been calculated with the combinations of plant working at the closest point to the receptor location. The predictions are worst case scenarios which may be of relatively short duration. The predictions indicate the potential highest $L_{Aeq,1h}$ (free-field) noise level to which a particular property or group of properties may be exposed during the operations at the site. The worst-case situation may occur intermittently over the lifetime of the site, but longer term noise levels perceived outside of the site boundary will be significantly less under normal situations than the calculated predicted levels.

20.3 Baseline

20.3.1 As stated above the Covid-19 pandemic has presented challenges in obtaining representative baseline sound levels because typical road, air and rail transport usage, the main source of background noise, has been restricted by travel restrictions and social distancing measures. The baseline noise monitoring survey used for this assessment was undertaken in February 2021 when it was considered that the acoustic environment in the vicinity of the ENRMF site was starting to return to normal. Notwithstanding this, statistics from the Department for Transport indicate that motor vehicle usage was at 67% of pre-covid flows during the period of the noise survey. As a result the noise background levels used for the noise assessment whilst still being reasonably representative of the longer term prevailing acoustic environment should be viewed as being on the conservative side where assessments are made based on the increase in noise above the background level.

20.3.2 Baseline noise monitoring was undertaken by Vibrock Limited in February 2021. Monitoring was conducted at 4 locations selected to represent noise sensitive premises in the vicinity of the site. The locations are shown on Figure ES3.3 Noise levels were measured by Vibrock Limited during a 24 hour period on Monday 15 February 2021 to Tuesday 16 February 2021. Weather conditions during the survey were dry and settled with a light south westerly

breeze. A summary of the measured sounds levels at the noise sensitive property locations is presented in Table ES20.1. The acoustic environment in Duddington Village and at Cuckoo Lodge consists primarily of road traffic noise associated with the A47 and A43. At Westhay Lodge, Westhay Cottages and Westhay Farm, the acoustic environment comprises distant road traffic, local vehicle movements along Stamford Road and birdsong along with occasional noise from aircraft, agricultural activity and operations at PC Howard Ltd and the existing ENRMF.

- 20.3.3** A site inspection and acoustic survey of the existing ENRMF was performed on 16 July 2020 during which the site was operating normally. The purpose of this monitoring was to obtain site specific sample measurements for use within this assessment to estimate noise from the proposed development. The main noise generating activities observed during the survey included: the placement of materials; the loading and unloading of materials by mobile plant such as telehandlers, excavators and loading shovels; HGV and dumptruck movements, the operation of the waste treatment and recovery facility and engineering works including cell construction and capping.
- 20.3.4** Site activities occurring during the on-site sample measurements were considered to be representative of typical operating conditions and the measurement durations were considered to be representative of any longer term fluctuations in the specific sound. The influence of sound from other sources was minimised by measuring at times when the residual sound had subsided to a relatively low level. Sample measurements of the sound pressure level obtained at known distances from plant and activities at the site have been used to calculate the sound power level of each noise source or noise-generating activity at the site with reference to the method outlined in BS 5228-1. The results of the noise survey are presented at Table ES20.2.
- 20.3.5** To inform the assessment of the baseline acoustic environment on the public right of way located closest to the site, observations were made along Footpath MX13 and MX15 which pass through an area of woodland in The

Assarts to the west of the proposed extension area. Footpath MX15 lies approximately 100 metres from the proposed western extension boundary at its closest approach. Observations were made at 3 locations to characterise the acoustic environment in this area. Observation points FP1 – FP3 are shown on Figure ES3.3 and a description of the acoustic environment at each observation point is presented in Table ES20.3.

20.3.6 To further inform this DCO application, a compliance monitoring survey was also conducted to assess noise emission levels from the existing ENRMF. In accordance with the current Noise Monitoring and Management Plan, noise level measurements were made during a 1 hour period from 15:20 to 16:20 on 16th February 2021 at a location representing the nearest noise-sensitive premises to the site, namely Westhay Cottages. Measured noise levels during the survey were influenced by a variety of sound sources including road traffic and birdsong. Site activities at ENRMF and PC Howard Ltd (a distribution and warehousing company located off Stamford Road to the east of the ENRMF site) were also frequently audible. Vehicles travelling to and from these two sites also made a contribution to the measured noise levels. The results of the monitoring and post survey analysis demonstrate that the noise level was 53 dB $L_{Aeq,1h}$ which is below the threshold of 55dB $L_{Aeq,1h}$ that is set in the current Noise Management and Monitoring Scheme. The last 5 years of records have been reviewed and there have been no complaints regarding noise generated by the site activities over that time.

20.3.7 It is necessary to outline the likely evolution of the baseline environment at the site without the implementation of the proposed development. If the proposed development was not implemented the existing ENRMF would continue to manage, treat and landfill hazardous wastes as well as provide a disposal facility for LLW. There would be no changes to the site operational practices and the operations at the site would be completed by 2026. The aftercare and maintenance period for the site would continue to 2036. Following completion of the restoration of the existing ENRMF, in the absence of any significant development in the vicinity of the site it is considered that the background

noise levels would not be expected to increase significantly and is assumed the adjacent areas including the proposed western extension would remain as farmed agricultural land.

20.4 Assessment of environmental effects

20.4.1 The noise impacts associated with the proposed development have been assessed in accordance with BS 4142. In accordance with this standard the background sound level, the specific sound level and the rating levels have been established.

20.4.2 A worst case scenario for each receptor location has been assessed based on the proposed phasing sequence for the proposed development which demonstrates which noise-generating activities will be occurring concurrently at the existing ENRMF and across the proposed western extension and include excavation, engineering, landfilling, capping and restoration operations on the landfill along with the continued operation of the waste treatment and recovery plant.

20.4.3 Table ES20.4 presents an initial estimate of the potential impact of the proposals during the daytime in accordance with BS 4142 and Table ES20.5 presents an initial estimate of potential night time noise emissions. The site is not operational at night however the gas abstraction plant and a generator used for security lighting on the concrete pad at the waste treatment and recovery facility and a generator associated with the engineering contractor's compound could be operating at night. The night time assessment therefore is based on the assumption that all these items of plant are operating with the contractor's generator placed at the nearest phase boundary relative to each receptor.

20.4.4 The initial worst case estimate of impact demonstrates that the rating level is likely to be no more than 3dB above the daytime background noise level depending on the assessment location. Night-time rating levels are estimated to be at least 4dB below the background noise level.

20.4.5 BS 4142 states that where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact. A difference of around +5 dB is likely to be an indication of an adverse impact. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context. It should be noted that the initial estimate is not to be considered in isolation and due regard to the following sections on context and uncertainty should also be made.

Context

20.4.6 In addition to the initial estimate of noise impact which has determined the excess of rating level over the background sound level it is necessary to take the following points into account in the noise assessment:

- The most significant noise sources associated with the site operate during the daytime period only when there is a lower likelihood of adverse impact compared to operations during more sensitive periods such as the night-time.
- Absolute noise levels from site operations are expected to remain within the noise limits specified within the approved noise management and monitoring scheme currently in operation at the site which will be extended to include the proposed western extension operations. The assessment has demonstrated that external worst-case rating levels in the region of 30 - 48 dB could be experienced at noise sensitive premises in the vicinity of the proposed development. This equates to internal sound levels of less than 35 dB during the daytime and 30dB during the night time with windows open and suggests that there are unlikely to be any significant adverse effects on residents within their homes or using private external amenity areas during the daytime.
- The site operates in accordance with a number of control measures set out in a noise management and monitoring scheme which has been reviewed and updated as part of this application.

- As part of the assessment the character of the proposed sound has been assessed and it is not considered that any acoustic features will increase the significance of noise impact. The potential for acoustic features to increase impact will be minimised via the continued implementation of effective noise and vibration control measures which will be detailed in the updated management plan.
- All noise level predictions have been calculated with the combinations of plant working at the closest point to the receptor location. The calculations are therefore worst case scenarios which may be of relatively short duration.
- The western extension of the site will move some operations further away from the nearest noise-sensitive receptor locations which are to the east of the existing site.

20.4.7 Whilst it is accepted that uncertainty can occur throughout all aspects of the noise measurement and assessment process, the approach undertaken at all stages has been adopted with the aim of reducing uncertainty via the implementation of good practice. In addition, as this is an operational site there is less likely to be significant uncertainty associated with the proposed activities. Details of the measures to minimise uncertainty are presented in Section 4.1 of Appendix ES20.1.

20.4.8 Following an initial estimate of noise impact along with consideration of the context and any potential effects of uncertainty it is considered that, with the implementation of an updated Noise and Vibration Management Plan, the proposed development is not likely to result in 'adverse' or 'significant adverse' impacts in accordance with BS 4142. The Noise and Vibration Management Plan is presented in the DCO Environmental Commitments Document (PINS document reference 6.5).

Planning Practice Guidance

20.4.9 Planning authorities often take account of the Government guidance relating to noise emissions from mineral sites⁵² when evaluating the noise impact of waste development as the activities have many similarities. The potential noise levels associated with the proposed development are estimated to exceed the daytime background level by considerably less than the 10dB limit recommended in the Planning Practice Guidance nor exceed the recommended maximum daytime limit of 55dB. Night-time noise levels during night-time periods are expected to remain well within the recommended 42dB limit. When noise associated with the proposed development is considered against this guidance, it is demonstrated that the potential noise impacts are not likely to be significant.

20.4.10 In relation to the noise exposure hierarchy outlined in PPG-Noise which supports the NPS HW, the NPPF and NPSE it is suggested that potential noise at the most affected noise-sensitive premises is likely to be occasionally present but not intrusive and therefore considered to be at or below the Lowest Observed Adverse Effect Level (LOAEL). At this level noise can be heard but does not cause any change in behaviour, attitude or other physiological response. It can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.

Road traffic noise and vibration

20.4.11 The potential impact of additional HGV movements associated with the proposals on the wider road network has been considered. In general terms a change in road traffic noise of 1dB is typically considered to be just perceptible and is approximately equivalent to a 25% increase in traffic flow. The percentage of increase in HGV movements to and from the site that are associated with the proposed development will be approximately 18% which is significantly lower than the 25% change considered necessary to cause a perceptible change in HGV traffic noise. The potential increase in traffic noise

⁵² *Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014.*

associated with the proposed development therefore is considered to be not significant.

20.4.12 Research by the Transport Research Laboratory^{53, 54} (TRL) has found that the reaction of people to traffic vibration is similar to their reaction to traffic noise but less marked. As such it is regarded that any potential increase in vehicle induced vibration is acceptable provided that any corresponding noise increase is also considered acceptable. Significant impacts from traffic vibration are typically associated with vibration sensitive premises which are sited in close proximity to a road. The closest potential receptors to ENRMF traffic are Westhay Cottages which are set back approximately 12m from the road which provides a reasonable buffer relative to vibration associated with HGV movements. Furthermore vibrations from vehicles are typically generated by irregularities in the road surface such as pot holes. Stamford Road is subject to maintenance work and has recently been resurfaced in the vicinity of the site access. Augean will continue to provide an agreed sum for highway maintenance to the Local Authority annually as set out in the Section 106 Agreement. The purpose of this sum is for the Local Authority to provide any additional maintenance needed as a result of the use associated with activities at ENRMF of the surface of the road between the site access and the junction with the A47. In addition, according to the routing agreement which will remain in place for the life of the proposed development, all HGVs must turn left out of the site to travel to the A47. It is therefore considered unlikely that road traffic noise and vibration associated with the proposed development will cause significant adverse effects. No complaints regarding noise or vibration have been received at the site in the records reviewed for the last five years.

Construction noise and vibration

⁵³ TRRL Laboratory Report 1020 – Vibration nuisance from road traffic at fourteen residential sites. Transport and Road Research Laboratory. Department of Environment. Department of Transport. 1981

⁵⁴ TRRL Laboratory Report 1119 – Vibration nuisance from road traffic – results of a 50 site survey. Transport and Road Research Laboratory. Department of Transport. 1984

20.4.13 Noise associated with the construction phase of the development has also been considered with reference to Annex E.3.2 of BS 5228-1.

20.4.14 It should be noted that the construction phase is not considered as a separate stage to the operation of the development in this assessment as the operations of extraction, construction of the engineered void, landfilling, construction of the engineered cap and restoration are sequential and take place concurrently in different phases of the site as the development proceeds. Accordingly the potential noise levels calculated take into account all these activities operating at the same time. Nevertheless, when the indicative worst-case site noise levels (presented in Table ES20.4) are compared to the noise threshold levels of 65 or 70 dB(A) for construction activities it is evident that the potential noise and vibration levels associated with the activities including the construction phase of the application are likely to remain within the recommended threshold values and are therefore not considered to be significant.

Public rights of way

20.4.15 The site is located adjacent to Fineshade Wood/The Assarts along the western boundary. The woodland is located in the Kings Cliffe Hills and Valleys Landscape Character Area which is recognised in local policy as an area of tranquillity. Tranquillity should be preserved in this area by minimising light and noise pollution and minimising the visual and traffic impacts of development. There are no numerical threshold values which are set in the guidance relating to noise impacts for public amenity areas including footpaths.

20.4.16 During the baseline noise survey the character of the acoustic environment at 3 locations on Footpath MX13 and MX15 which passes through the area defined as the Kings Cliffe Hills and Valleys Landscape Character Area was observed and is summarised on Table ES20.3. Footpath MX15 is located approximately 100m to the west of the proposed western extension at its closest point. The observed character of the noise environment at each

monitoring location included audible road traffic noise and birdsong at all locations with activities at Collyweston Quarry or the existing ENRMF site also audible depending on the location.

20.4.17 Whilst operations in the proposed western extension would bring noise-generating activities closer to footpaths in Fineshade Woods including the Assarts, the closest footpath (Footpath MX15) will still benefit from a minimum 100 metre buffer zone with most of the footpath located at much greater separation distances. The continued implementation of best practice noise control measures would minimise any potential adverse impacts. Although the noise level from ENRMF may increase during certain stages of the proposed development it is considered that the character of the acoustic environment along the footpaths in the area of tranquillity will remain largely unchanged. Birdsong and road traffic noise will remain and the operations at Collyweston Quarry and ENRMF will range from audible to not-audible depending on the location. Overall it is considered that the noise associated with the proposed western extension will not have a significant impact on the tranquillity of the area.

20.5 Mitigation and monitoring

Noise and vibration management and monitoring

20.5.1 Noise emissions from the site are currently controlled via a Noise Management and Monitoring Scheme (MJCA Report Ref: AU/KCE/SPS/1604/01 dated March 2012). The compliance monitoring carried out as part of the noise survey demonstrates that the noise levels associated with the existing ENRMF activities at the nearest approved monitoring location (Westhay Cottages) were within the noise limit that is set. The last 5 years of records have been reviewed and there have been no complaints regarding noise or vibration generated by the site activities recorded. The existing scheme has been reviewed as part of the application for the DCO and an updated Noise and Vibration Management Plan is presented at Appendix 2 of the report at Appendix ES20.1 and forms part of

the DCO Environmental Commitments Document (PINS document reference 6.5).

Noise and vibration minimisation and control

20.5.2 The following noise and vibration control measures will continue to be implemented at the site to minimise any potential noise impacts:

- The permitted operating hours of the site are strictly adhered to and effectively communicated to all site staff and subcontractors;
- Machinery is well maintained and where appropriate fitted with exhaust silencers;
- Vehicle routes through the site are regularly inspected and maintained so that they are free from defects such as pot-holes;
- Unnecessary horn usage, revving of engines, rapid acceleration and sharp breaking is avoided;
- Equipment is switched off or throttled-down when not required;
- Any cladding or enclosures around noise-generating plant is regularly inspected and repairs carried out in a timely manner and covers, panels or enclosure doors are kept closed when the equipment is in use;
- Drop heights of materials are minimised where possible;
- Where reasonably practicable, noisy equipment is located as far from sensitive premises as possible and where practicable be orientated so that the noise is directed away from sensitive receptors;
- Plant and vehicles are started up sequentially rather than all together. Any period of idling required to warm up mobile plant at the start of the working day is undertaken in locations away from residential premises where practicable;

- In the event of any emergency or unforeseen circumstances arising every effort will be made to ensure any necessary work is completed as quickly and quietly as possible;
- Operatives are trained to employ techniques to keep site noise to a minimum.

20.5.3 These measures are included in the site Noise and Vibration Management Plan which is included in the DCO Environmental Commitments Document (PINS document reference 6.5) and, as with all site management procedures, will form part of the externally certified site Environmental Management System.

20.6 Cumulative impacts

20.6.1 Similar sites in the local area include Cooks Hole Quarry and Thornhaugh Quarry/Landfill located approximately 3.5 km to the east and Wakerley Quarry located approximately 5 km to the west. These sites are too distant from the ENRMF site to warrant the need to consider the potential cumulative impacts of noise.

20.6.2 Collyweston Quarry lies approximately 500m to the west of the proposed western extension. Noise-sensitive premises that could be considered common to both Collyweston Quarry and the existing ENRMF comprise Duddington Village and Cuckoo Lodge. As part of the assessment the worst-case external noise levels associated with the proposed DCO application are estimated to be around 30 dB $L_{Aeq,1h}$ (free-field) at residential premises on the east side of the village and up to 38dB at Cuckoo Lodge. Noise levels of this magnitude, which are estimated to be at least 13dB below the typical daytime background sound levels, will make no significant contribution to cumulative noise levels associated with the operation of both Collyweston Quarry and the ENRMF.

20.6.3 Observations made during the assessment of the noise environment in Fineshade Wood to the west of the site suggest that due to the curved

geometry of footpath MX15, noise associated with operations at the proposed development site and Collyweston Quarry are considered to be audible independently of each other, rather than cumulatively, as the route is traversed.

20.6.4 Overall, the cumulative impacts of noise are not considered to be significant as a result of the proposed development.

20.7 Conclusions

20.7.1 The potential noise levels likely to be generated by the proposed development during construction and operation have been evaluated and assessed in accordance with the approved assessment methodology. It is considered that there will be no significant or unacceptable adverse noise impacts at noise sensitive locations resulting from the proposed development including the current ENRMF site. Noise mitigation has been included into the design of the development to reduce to a minimum any potential noise emissions associated with the operation of the site.

20.7.2 The overall potential impact of the development is considered to be in line with national and local planning policy which seeks to prevent and avoid any significant or unacceptable adverse impacts and, where necessary, mitigate and reduce to a minimum other adverse impacts.

21. Air quality

21.1 Introduction

21.1.1 An assessment has been carried out by MJCA of the potential impacts of the proposed development on local air quality which have the potential to affect human health and the results are presented in this section of the Environmental Statement (ES). The potential impacts as a result of odour associated with the proposed development are also addressed. The potential impacts associated with fine particulates with the potential for a significant effect on health are considered in this section of the document whereas the potential impacts of nuisance dust which is associated with larger size particulates are addressed in Section 22.

21.2 Methodology

21.2.1 Air quality data for the site has been obtained from the UK Air Quality Archive in respect of the most common atmospheric pollutants comprising fine particulate matter (PM_{2.5}, PM₁₀) and nitrogen oxides (NO_x). Particulate matter (PM) is a term used to describe the mixture of solid particles and liquid droplets in the air. Particulate matter varies in size (i.e. the diameter or width of the particle). PM_{2.5} and PM₁₀ means the mass per cubic metre of air of particles with a size (diameter) generally less than 2.5 micrometres (µm) and 10 µm respectively. These particle sizes have the most potential for significant impacts on health as they are breathable and can enter the lungs. NO_x is the combined total of nitrogen oxides which includes nitric oxide (NO) and nitrogen dioxide (NO₂).

21.2.2 The Environmental Permit for the existing ENRMF site specifies routine monitoring of ambient air quality at the site boundary for the gases which have the potential to be emitted from the site activities including the landfill site and treatment plant. The routine monitoring includes methane, hydrogen sulphide, oxides of nitrogen, carbon dioxide, carbon monoxide, suspended particulates (PM₁₀), asbestos fibres and volatile organic compounds (VOCs). The

emissions from the landfill gas flare stack are controlled and gas concentrations in the ground are recorded in the monitoring boreholes surrounding the site. All monitoring is carried out based on schemes prepared in accordance with the Environmental Permit. Radon and tritium in the landfill gas are monitored at the flare stack in accordance with the Environmental Permit for the disposal of LLW. The concentrations of the parameters that are monitored are compared with emission or compliance limits and assessment limits which are specified by the Environment Agency and are protective of human health and the environment.

21.3 Baseline

21.3.1 Each local authority in the UK monitors, reviews and assesses the air quality in their area. The aim of the review is to make sure that the national air quality objectives are achieved throughout the UK. These air quality objectives have been put in place to protect people's health and the environment. If a local authority identifies any locations where the objectives are not being met or are not likely to be achieved, it must declare an Air Quality Management Area there. The local authority must then put together a plan to improve the air quality (a Local Air Quality Action Plan). The site is not located in an Air Quality Management Area⁵⁵. Air quality data for the site area from the UK Air Quality Archive is presented in Table ES21.1. The data show that the air quality at the site location for PM_{2.5}, PM₁₀, NO₂ and NO_x is better than the national air quality objective annual mean concentrations.

21.3.2 The monitoring of air quality including PM₁₀ particulates and gas in the ground at the site is undertaken in accordance with the Environmental Permit. The monitoring results are collated by Augean and submitted to the Environment Agency. Monitoring results for key parameters also are provided on the Augean web site for review by members of the public.

⁵⁵ DEFRA (2020) UK Air: Air Information Resource <https://uk-air.defra.gov.uk/aqma/maps/>

21.3.3 During the construction, operational and post-operational phases the site including the extension areas will continue to be monitored in accordance with the Environmental Permits to confirm that the process control, landfill containment and gas extraction measures are effective. Monitoring of gaseous emissions will continue following completion and restoration of the site until such time as in the opinion of the Environment Agency the site no longer represents a potential risk to the environment.

21.3.4 Odour emissions may be generated from the importation and landfilling or treatment of odorous wastes. The hazardous wastes, LLW and wastes for treatment which are received at the site contain minimal quantities of putrescible material which mean it is unlikely that significant odorous emissions will be generated by the biodegradation of organic matter in the imported wastes. Some industrial wastes may contain odorous chemical contaminants and Augean implement an odour assessment as part of their pre-acceptance waste checks and waste with significant odour potential will not be accepted for delivery to the site. The complaints records for the site for the last 5 years have been reviewed. No complaints regarding odour emissions from the site are recorded.

21.4 Assessment of environmental effects

21.4.1 The impacts on air quality of the proposed increase in throughput and extension of time for the operation of the waste treatment and recovery facility and the associated storage area have been considered. The controls on the emissions of gases and vapours as well as particulates from the treatment processes will continue to be implemented and regulated through the Environmental Permit as described in Section 8 of this document. The operating techniques used at the site will be regularly reviewed through the permit to confirm that they meet the Best Available Techniques as set out in European and national guidance. The monitoring of ambient air undertaken at the site in accordance with the Environmental Permit for the soil treatment facility and the site Particulate Monitoring Action Plan will provide assurance

that the control measures in place at the site continue to remain effective. It is considered that the proposed development of the waste recovery and treatment facility will have negligible impact on air quality in the locality.

21.4.2 The hazardous wastes and the LLW disposed of in the landfill at the site have a negligible potential to generate landfill gas or volatile compounds. Waste with a total organic carbon content (TOC) of greater than 6% is not permitted for disposal at hazardous waste landfill sites therefore there is minimal potential for the deposited waste to generate landfill gas or other vapours. The limit on TOC in hazardous waste was imposed in the UK in 2004 so there are two phases at the site where waste with higher concentrations of organic carbon were deposited (areas of Phases 1 and 2). The gas generated in these phases is collected and combusted in the flare stack which is controlled and monitored through the Environmental Permit to confirm that it is operating effectively. Gas emissions from all the other phases of the landfill are monitored regularly but volumes are so low that there is insufficient to warrant connection to the active gas collection system. All new phases of the landfill in the proposed extension will be subject to the restriction on TOC content and therefore substantial volumes of gas are highly unlikely to be generated. The quantity of gas generated in Phases 1 and 2 already is declining and this decline will continue. Accordingly, it is unlikely that significant quantities of landfill gas or vapours will be generated. Any significant gas or vapours that are generated at the site will be contained by the low permeability perimeter seals and the low permeability capping layer and, where necessary, collected by the gas extraction and management system and directed to the gas flare for combustion.

21.4.3 Based on the proposed continuation of the current controls on the acceptance of odorous waste including those that will be specified and implemented through the Environmental Permits, and based on the nature of the current and proposed wastes accepted at the site it is considered that there will be no significant impacts associated with odour generated as a result of the site activities. Procedures for the acceptance and management of waste at the

site, which includes the management of wastes with the potential to generate odour are the subject of the Environmental Permits which are regulated by the Environment Agency.

- 21.4.4** Any complaints received at the site will continue to be investigated and responded to in accordance with the Augean externally certified Environmental Management System.
- 21.4.5** The monitoring data reviewed for the last 5 years for gaseous emissions in the boundary boreholes and in the atmosphere show that there have been no exceedances of the thresholds set in the Environmental Permit for the protection of human health and the environment. The data show that there have been no exceedances of the thresholds set for asbestos fibres in the air at the boundary of the existing ENRMF.
- 21.4.6** Dust in the air is monitored at the boundary of the existing ENRMF including PM₁₀. No PM₁₀ concentrations have been recorded at the boundary of the site above 10micrograms/m³. No air quality threshold is set for PM₁₀ for the protection of ecosystems however the concentrations of PM₁₀ particulates recorded in the air at the boundary of the site are well below 40micrograms/m³ which is the annual mean air quality target concentration.
- 21.4.7** The monitoring of gaseous emissions and particulate matter will continue at the site in accordance with the current and future Environmental Permits in order to confirm that the control measures in place remain effective. The site will continue to be managed and waste inputs will continue to be limited to control emissions such that they remain below the environmental concentrations that are determined by the Environment Agency for the protection of human health and the environment.
- 21.4.8** As explained in Sections 11 and 12, risk assessments of the emissions of radioactive isotopes in the gas generated at the site are carried out and the capacity of the LLW accepted at the site is and will continue to be controlled in order that the doses that result from radioactivity in gaseous emissions from

the site do not exceed the design criteria. While a limited quantity of carbon based gases such as methane and carbon dioxide may be generated by the biodegradation of the negligible proportion of biodegradable wastes deposited with the hazardous wastes at the site it is highly unlikely that carbon based gases will be generated from the LLW deposited at the site. The results of the site radiation monitoring are reviewed regularly by Public Health England (PHE) as the contracted independent Radiation Protection Adviser. In the most recent review PHE have confirmed that the results from the various samples routinely taken on site demonstrate low recorded levels of activity and compliance with the thresholds in the permit and guidance.

21.4.9 The effect on air quality of the stripping and stockpiling of soil as well as the extraction and stockpiling of clay and overburden for the purpose of creation of void space and provision of engineering material has been considered. The movement of soil, clay and overburden has the potential to generate nuisance dust but also a proportion of fine particulates. The control measures to minimise the generation of dust and fine particulates are described in Section 22 and will continue to be implemented. As explained above, monitoring of particulate matter at the site in accordance with the Environmental Permit and the site Particulate Monitoring Action Plan will continue to be carried out to confirm that the control measures in place at the site remain effective. Based on the control measures which will continue to be implemented and the evidence of the monitoring records for the current activities, it is considered that the extraction and stockpiling of soils, clay and overburden will have no significant impact on air quality in the locality.

21.4.10 During restoration of the site the control and monitoring of gaseous emissions and particulate matter will continue in accordance with the Environmental Permit to confirm that the control measures in place remain effective. It is considered that the restoration of the site will have a negligible impact on air quality at the site.

21.4.11 The potential impacts on air quality associated with the increase in traffic as a result of the proposed development have been assessed. As explained in Section 19, it is anticipated that there will be an increase of 36 HGV movements per day as a result of the proposed development. Under the IAQM/EPUK guidance⁵⁶ a traffic air quality assessment is necessary only if there is a change of HGV flows of more than 100 Annual Average Daily Traffic movements. As the change in HGV movements is well below this threshold it is considered that there will be no significant impact on air quality as a result of the traffic associated with the proposed development. As explained above the air quality data for the area of the site is well within the standards which are protective of human health therefore there is no indication that existing traffic is having a significant adverse effect on air quality.

21.5 Mitigation and monitoring

21.5.1 The mitigation measures for the controls on emissions to the atmosphere are an integral part of the design and operation of the waste recovery and treatment facility and landfill site as well as the associated processes of waste assessment, acceptance, delivery, treatment and deposit at the site. Monitoring programmes that are agreed with the Environment Agency and regulated through the Environmental Permits will be extended to include the proposed development and will continue to be implemented. Monitoring data will continue to be provided to the Environment Agency and presented for review by the public on the Augean web site. The regular monitoring provides confirmation that the mitigation measures are effective.

21.5.2 The routine monitoring also provides an early warning system in that if any monitoring results exceed the control or action limits specified in the permit this is recognised at an early stage and measures can be implemented to identify and rectify the source or cause of the emissions before they become significant. If exceedances of control limits are observed these may be due to

⁵⁶ Institute of Air Quality Management (2017) Land-Use Planning & Development Control: Planning For Air Quality <http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf>

external factors which are not under the control of Augean, for example high concentrations of suspended particulates as a result of nearby agricultural activity or storms which deposit dust transferred over great distances. Where site activities may be or are the source of the exceedances investigations and improvement actions are implemented and reported to the Environment Agency. These improvement actions may comprise changes to the systems for the review and checking of wastes being accepted at the site or for managing the wastes delivered to the site, improvements in the gas management system, improvements in dust and particulate control or improvements in the capping system. As a consequence no further controls are necessary under the DCO.

21.6 Cumulative impacts

21.6.1 The background air quality in the area of the site meets the national Air Quality Objectives. There are no activities in the area that have the potential for a significant cumulative effect on air quality at or in the vicinity of the site.

21.6.2 The combined effect of the individual elements of the proposed development has been considered. Emissions from the site as a whole will continue to be controlled to levels which are below the relevant exposure criteria which are protective of human health. The management and monitoring of emissions to atmosphere will continue to be implemented in accordance with the Environmental Permits and regulated by the Environment Agency. It is concluded that the proposed development will have a negligible impact on air quality.

21.7 Conclusions

21.7.1 Air quality data for the site has been reviewed and consideration has been given to the ongoing and proposed operations at ENRMF and their potential to cause a significant detrimental effect on air quality. During the construction, operational and post-operational phases the site including the extended areas will continue to be monitored in accordance with the Environmental Permits to

confirm that the process control, landfill containment and gas extraction measures are effective. The hazardous wastes, LLW and wastes for treatment which are received at the site contain minimal quantities of putrescible material which mean it is unlikely that significant odorous emissions will be generated by the biodegradation of organic matter in the imported wastes. It is concluded that there will be no significant impacts associated with air quality as a result of the proposed site activities.

22. Amenity

22.1 Introduction

22.1.1 An assessment has been carried out by MJCA of the potential effects on amenity of dust, mud on the road and lighting as a result of the proposed development and the results are presented in this Section of the Environmental Statement (ES). A noise assessment is presented in Section 20 of this ES. The assessment of impacts on air quality including odour is presented in Section 21 of this ES. The potential for impacts on amenity associated with the proposed development generally is present only in the immediate vicinity of the site.

22.1.2 The activities associated with the proposed development with the potential to generate dust are soil stripping, mineral extraction operations, landfill cell construction, materials handling, on site transportation, waste processing at the waste recovery and treatment facility, stockpiles and off-site transportation. HGVs leaving the site have the potential to result in the deposition of mud on the road.

22.1.3 The need for and locations of lighting at the site are described in Section 7 of this report. The lighting is located in key areas at the main reception and office areas for both security and health and safety considerations. The key locations are the site entrance and visitors' car park, the main site office to provide light to the staff car park and weighbridge area and around the laboratory and vehicle inspection area. Mobile lighting is provided on the landfill and down-facing shielded lighting units are fixed to appropriate points on the waste treatment plant. The site lighting at the site infrastructure will not change as a result of these proposals. Mobile lighting will be used as necessary for operational areas on the proposed western extension.

22.2 Methodology

22.2.1 The methodology used for the assessment of impacts from dust is summarised below and presented in detail at Appendix ES22.1. A qualitative

assessment is carried out of the impacts associated with mud on the road and lighting.

22.2.2 The dust assessment has been undertaken generally in accordance with the Planning Practice Guidance Note for Minerals⁵⁷ and the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Mineral Dust Impacts for Planning⁵⁸ together with MJCA experience of undertaking dust assessments for extraction operations, landfill sites and waste processing facilities.

22.3 Baseline

Dust

22.3.1 The annual mean air quality objective for PM₁₀ is 40µg/m³. The estimated annual mean PM₁₀ background concentration obtained from DEFRA for 2019 for the area of the site is between 14.90µg/m³ and 16.19µg/m³ with a mean value of 15.45µg/m³⁵⁹ as summarised in Table ES22.1. The background concentrations of PM₁₀ at the site are considerably below (i.e. better than) the annual mean air quality objective of 40µg/m³.

22.3.2 Regular boundary monitoring for deposited dust is carried out at the site as specified in the Environmental Permit. The monitoring data for the last five years has been reviewed and the data show that on the limited number of occasions in 2018 and in 2020 when the permit threshold of 200mg/m² /day was exceeded this was as a result of agricultural activity on neighbouring fields.

22.3.3 An all hours wind rose and a dry hours wind rose prepared by ADM Limited based on data from the Meteorological Office for Wittering weather station

⁵⁷ HM Government (2014) Planning Practice Guidance Note for Minerals <https://www.gov.uk/guidance/minerals>

⁵⁸ Institute of Air Quality Management (2016) Guidance on the Assessment of Mineral Dust Impacts for Planning v1.1

⁵⁹ DEFRA (2020) UK Ambient Air Quality Interactive Map <https://uk-air.defra.gov.uk/data/gis-mapping> Accessed May 2020

located approximately 3.3km north east of the site for the period 2000 to 2019 are presented at Appendix ES22.2 and ES22.3 respectively.

22.3.4 The wind roses show that the prevailing wind is from the west. Based on the all hours wind rose data wind speeds for 54.06% of the year are between 0.5m/s and 5m/s which is classed as calm through to gentle breeze on the Beaufort Scale. Wind speeds between 5m/s and 9m/s occur for 36.02% of the year which is classed as gentle breeze through to fresh breeze on the Beaufort Scale. Wind speeds greater than 9m/s occur for 7.19% of the year. During the remaining 2.73% of the year the weather was either calm when no wind was observed or data was not collected at the Wittering weather station.

22.3.5 Based on the dry hours wind rose data (as a percentage of the total dry hours) wind speeds for 54.72% of the dry hours are between 0.5m/s and 5m/s. Wind speeds between 5m/s and 9m/s occur for 35.5% of the dry hours. Wind speeds greater than 9m/s occur for 6.94% of the dry hours. During the remaining 2.84% of the dry hours the weather was either calm when no wind was observed or data was not collected at the Wittering weather station. The dry hours wind data for the site is summarised in Table ES22.1. A copy of the Beaufort Scale is presented at Appendix ES22.4.

22.3.6 The locations of the receptors considered in the assessment are shown on Figure ES22.1 and presented in Table ES22.2.

Mud on the road

22.3.7 The access to the site will be via the access to the existing ENRMF from Stamford Road. The site access road is surfaced with tarmac along the length to the wheelwash in the site reception area. The operation and restoration of the site including the proposed western extension has the potential to result in mud being tracked onto the public highway if appropriate controls are not implemented. The controls applied routinely are described below.

Lighting

22.3.8 There is external lighting at the existing ENRMF at the site reception facilities and the waste recovery and treatment facility. All lighting is directed downwards and shielded and other than security lighting is switched off at the end of the working day. There is no evidence of adverse impact on amenity as a result of existing lighting at the site and no complaints regarding lighting have been received.

22.3.9 The lighting at the existing site infrastructure including at the site reception area and the waste treatment facility will not change as a result of these proposals. Mobile lighting is used currently on the operational area of the landfill site during operational hours only and will be used as necessary during operational hours only in the operational areas and haul roads on the western landfill extension area.

22.3.10 It is necessary to outline the likely evolution of the baseline environment at the site without the implementation of the proposed development. If the proposed development was not implemented the existing ENRMF would continue to manage, treat and landfill hazardous wastes as well as provide a disposal facility for LLW. There would be no changes to the site operational practices and the operations at the site would be completed by 2026. The aftercare and maintenance period for the site would continue to 2036. Following the completion of the operations there would be no potential for mud on the road or dust as a result of the waste management operations and all lighting would be removed from the site.

22.4 Assessment of environmental effects

Dust

22.4.1 To result in an impact dust must be generated by the proposed development and carried in sufficient quantities from the source to a sensitive receptor, which is dependent upon site activities and meteorological conditions including wind speed, wind direction and rainfall. Dust impacts have the

potential to occur mainly within 400m of the operation, even at the dustiest of sites.

22.4.2 For the purpose of this assessment and in accordance with the guidance it is assumed that significant dust blow will not occur below wind speeds of 5m/s or in the hours with rainfall on average greater than 0.2mm. Based on the dry hours wind rose data presented in Table ES22.1, during 42.44% of the dry hours wind speeds are above 5m/s.

22.4.3 The generation of dust at the site is associated with cell excavation and engineering, soil stripping and restoration, mineral extraction operations, materials handling, on site transportation, waste processing, stockpiles and exposed surfaces together with off-site transportation. The residual source emissions for each of the site activities have been determined based on the IAQM Guidance including Table A3-1. As explained above the residual source emissions are the potential emissions without any operational controls in place. The existing ENRMF has and will continue to implement operational controls in order to minimise the emissions of dust.

Activity	Residual Source Emissions with no controls in place
Site Preparation/Restoration	Medium
Mineral extraction	Medium
Materials handling	Large
On site transportation	Medium
Waste processing	Medium
Stockpiles and exposed surfaces	Large
Off site transportation	Medium

22.4.4 Site preparation and restoration operations comprising the stripping of soils and the placement of soils during restoration operations will be undertaken periodically throughout the life of the development due to the phased nature

of the operations. Simultaneous soil stripping and restoration works may be undertaken for short periods during the operation of the site with the development of new areas and areas under restoration moving through the site sequentially. The eastern area of the existing ENRMF has been capped and partially restored. An overburden and clay stockpile located on the central and eastern area of the existing ENRMF will be in place for several years. The faces of the stockpile which were likely to remain undisturbed for more than six months were hydroseeded in spring 2021 in order to minimise the potential for dust generation from the stockpile as well as to minimise the visual impact. Based on the categories provided in the IAQM Guidance there will be a medium working area associated with the extraction and restoration operations at the site, a high volume of material movements (over 100,000m³) and a medium number of mobile plant. Soil stockpiles will be seeded as soon as possible following placement. The soils that will be placed during restoration have the potential to generate dust. On the basis of these factors the residual source emissions from the site during preparation/restoration (i.e. extraction and restoration operations) without any operational controls are categorised as medium.

22.4.5 Mineral will be extracted in phases from a total area of approximately 30ha over the life of the western extension area with each phase approximately 4ha which is classed as a small working area in the IAQM Guidance. Mineral will be extracted using an excavator at a rate of greater than 200,000 tonnes per annum but less than 1,000,000 tonnes per annum. The clay that will be extracted from the site has a low potential for dust as the moisture content is high. The mineral will be loaded directly to HGVs to travel along haul roads where it will then either be reused directly or direct tipped to form stockpiles or exported off site. The mineral extraction operations will take place within 50m of western site boundary of the proposed western extension in some phases of the site in close proximity to low sensitivity receptors such as footpaths. The residual source emission category for mineral extraction for these areas is medium, the residual source emission category for materials handling is large

and the residual source emission category for on site transportation is medium.

22.4.6 Based on the categories in the guidance, the length of the access road from the wheelwash to the site access point is greater than 200m and there is a high total length of haul roads on site. Both the access road and haul roads are hard surfaced. The number of HGV movements associated with activities on site are categorised as high (in the order of 200 HGV movements per day). There are wheel wash facilities at the site and a speed restriction of 15mph is enforced on site. The residual source emissions for on and off site transportation are categorised as medium.

22.4.7 The waste treatment and recovery operations will involve a combination of processes and will process waste at a rate of up to 250,000 tonnes per annum. The waste being processed has an overall dust potential categorised as medium. The end product of the waste processing is of low dust potential. The residual source emissions for waste processing are categorised as medium.

22.4.8 Stockpiles on site generally will not exceed 5m in height, will predominantly consist of material of low dust potential and will be sprayed with a water bowser where necessary. The stockpiles may be located close to the site boundary and it is anticipated that there could be frequent material transfer to and from the stockpiles during mineral extraction and cell construction operations. The area of exposed surfaces is categorised as medium as the ground surface is hardstanding at the waste treatment and recovery plant and site reception area however the ground surface at the landfill area is categorised as exposed. The exposed surfaces at the site are categorised as having a medium dust threshold however the wind speeds at site are predominately low (less than 5mph). The residual source emissions from exposed surfaces are categorised as large.

22.4.9 The magnitude of the potential dust impact at each of the receptors within 400m of the site boundary without the application of any dust control measures has been assessed and the results of the assessment are presented in Table

ES22.2. The locations of the receptors are shown on Figure ES22.1. Based on the assessment and the information presented in Table ES22.2 it is concluded in the assessment that based on the wind direction during dry hours together with the location of sensitive receptors, without the implementation of specific mitigation or dust controls there is the potential for a negligible to moderate adverse effect of dust impact on receptors within 400m of the site boundary. As a standard operating measure at ENRMF, good practice, effective dust management controls will be implemented at the site to minimise the potential for impacts associated with dust. The dust management controls that are and will continue be implemented at the site together with an assessment of their effectiveness are presented in Table ES22.3.

22.4.10 Based on the qualitative assessment of the proposed activities it is concluded that without appropriate management there is the potential for a negligible to moderate adverse effects associated with impacts from dust on receptors within 400m of the site boundary. Regular boundary monitoring for deposited dust is carried out at the site as specified in the Environmental Permit. The monitoring data for the last five years has been reviewed and the data show that on the limited number of occasions in 2018 and in 2020 when the permit threshold of 200mg/m² /day was exceeded this was as a result of agricultural activity on neighbouring fields. A review of the complaints records for the previous five years show that there was only one complaint regarding dust which was received in August 2020 and was associated with mud on the road. It is concluded that dust emissions have been and will continue to be controlled effectively using well tried and tested methods to a standard such that it is unlikely that there will be significant dust emissions from the site. In government guidance it is stated that dust generation from these activities can continue to be controlled effectively and the effectiveness of the dust control measures are dependent on good site management.

Mud on the road

22.4.11 The wheel cleaning facilities will continue to be used for all HGVs visiting the site before leaving the site onto the public highway. The access road from the wheel wash to the highway is hard surfaced which minimises the potential for mud and debris to be tracked onto the road network. The drainage improvements being installed at the site access will minimise the potential for silt laden runoff to run onto the highway. A review of the complaints records for the previous five years show that there were no complaints from 2015 to 2019, seven complaints in 2020 and two in the first six months of 2021 regarding mud on the road and the condition of the road surface. On each occasion the condition of the road was examined and it was established that colouration which may be perceived as mud on the road can occasionally be present as a result of a puddle forming at the site entrance and dirty water being pulled on to the highway by vehicle wheels. The ongoing improvement of the drainage at the site entrance will minimise further the potential for runoff of silty water from the site road.

22.4.12 The site internal access road will continue to be cleaned regularly by a road sweeper and maintained in good condition and the surface of Stamford Road will continue to be cleaned regularly using a road sweeper. Based on the wheel cleaning facilities and the proposed cleaning and maintenance regime the risk of nuisance from the proposed development associated with mud and debris on the local road network is low.

Lighting

22.4.13 It is considered that there will not be an unacceptable impact on amenity as a result of the continued use of lighting as part of the proposed development. With the exception of security lighting the lighting will only be used when the site is operational and all lighting will be directed downwards and shielded to minimise the visibility of light. A review of the complaints records for the previous five years show that there were no complaints regarding lighting at the site.

22.4.14 The site is located within an area of tranquillity identified in Policy 3 of the North Northamptonshire Core Strategy 2011-2031 (NNCS)⁶⁰ adopted in July 2016. The NNCS states that development should preserve tranquillity by minimising light pollution, among other factors. As stated above it is considered that there would not be an unacceptable impact on amenity as a result of the continued use of lighting at the site hence it is concluded that there will be no impact on the tranquillity of the area as a result of lighting.

22.5 Mitigation and monitoring

22.5.1 The mitigation measures proposed to minimise the impacts of dust are described in this section of the ES and will continue to be implemented for the proposed development. The mitigation measures proposed to minimise the impacts of dust and mud on the road are summarised in Table ES22.3. The operational measures undertaken to minimise impacts from lighting comprise the continued use only of necessary lighting and, where it is used it will be downward facing and shielded. All HGVs are required to use the wheelwash before departing the site in accordance with a requirement in the DCO.

22.5.2 The dust management and monitoring plan that is currently in use at the existing ENRMF has proven effective. A Dust Management Scheme will be implemented through a requirement in the DCO. This will be extended to include the proposed western extension. Boundary dust monitoring is carried out in accordance with the Environmental Permit to confirm that dust and particulates are being adequately controlled and this monitoring will continue for the proposed development. In the event that significant dust levels are detected corrective action will be taken.

22.6 Cumulative impacts

22.6.1 There is the potential for cumulative effects with respect to dust from the continued operations at the existing ENRMF in combination with other land uses in the vicinity. It has been demonstrated in this assessment that dust

⁶⁰ North Northamptonshire Joint Core Strategy. North Northamptonshire Joint Planning Unit. July 2016.

emissions from the operations at the existing ENRMF and proposed western extension can be suitably controlled. It is therefore considered unlikely that there will be an unacceptable cumulative impact with respect to dust emissions from the site in combination with dust emissions from surrounding land uses.

22.7 Conclusions

22.7.1 The potential impact of the proposed development on amenity arising from dust, mud on the road and lighting has been considered. Subject to the proposed controls it is unlikely that there will be significant dust emissions from the site and there will not be a significant impact on air quality or PM₁₀ concentrations in the vicinity of the site as a result of the proposed development. It is concluded that dust emissions can be controlled to a standard such that the development will not cause a significant impact with respect to nuisance relating to dust. It is demonstrated that potential nuisance from the proposed development associated with mud and debris on the local road network is limited. There will not be any unacceptable impacts on amenity as a result of the lighting installed as part of the proposed development.

23. Socio-economic impacts

23.1 Introduction

23.1.1 An assessment has been carried out by MJCA of the potential effects on socio-economic impacts. The potential for socio-economic impacts has been assessed at the national, regional and local level. The national impacts have been considered in the context of the role of the ENRMF in the Augean business and the significance of the business in respect of the management of hazardous waste and low level radioactive waste (LLW) in the UK. The local impacts have been considered in respect of the site presence and its contribution to the local socio-economic climate as well as its compatibility with surrounding land uses.

23.2 Methodology

23.2.1 Consideration of the socio-economic impacts of the development should take into account the type, spatial extent and duration of potential impacts. The scope of the assessment includes a review of the aspects which will be assessed, definition of the geographical area of consideration, definition of the timescale over which the assessment is relevant, establishment of the baseline position and assessment of the impacts resulting from the proposed development.

23.2.2 In accordance with the National Policy Statement (NPS) for Hazardous Waste⁶¹ potential socio-economic impacts as a result of the proposed development have been considered at a national, regional (where possible) and local level. Based on a review of the adopted development plan documents including the Northamptonshire Minerals and Waste Local Plan (2017)⁶², North Northamptonshire Joint Core Strategy (2016)⁶³, East

⁶¹ DEFRA (2013) *National Policy Statement for Hazardous Waste: A framework document for planning decisions on nationally significant hazardous waste infrastructure*

⁶² *Northamptonshire Minerals and Waste Local Plan, July 2017*

⁶³ *North Northamptonshire Joint Core Strategy 2011 – 2031, July 2016*

Northamptonshire Local Plan Part 2 (2021)⁶⁴ and the Rural North, Oundle and Thrapston Plan (2008)⁶⁵ it is considered that the key socio-economic factors for the area which need to be considered include employment and economy, housing and house prices, village infrastructure and services, tourism together with green infrastructure and accessibility.

23.2.3 An assessment has been carried out of the socio-economic impacts up to the closure of the treatment facilities and estimated completion date for the restoration of the landfill of December 2046 as well as the period beyond.

23.3 Baseline

National Context

23.3.1 The generation of waste is an inevitable consequence of the socio-economic cycle even with the effective implementation of policies for the minimisation of the amount of waste which is generated. To sustain a high standard of living and environmental quality it is essential that a network of safe and secure facilities is established for the sustainable management of all wastes including hazardous waste and LLW.

23.3.2 Augean is a national waste management business operating from 15 locations across the UK. The company employs around 300 people and has an annual turnover of approximately £90M. Each of the company facilities operate as a profit centre that is essentially as a local business on its own. Where practicable it sources employment and services locally and thereby contributes to the local economies in the areas in which it operates as well as the national economy. Augean provides specialist services in the treatment and disposal of our more difficult to manage wastes including hazardous waste, certain non-hazardous wastes and LLW. The company is primarily a treatment business seeking to drive waste management practices up the waste management hierarchy towards more sustainable practices. The

⁶⁴ East Northamptonshire Local Plan Part 2 2011-2031 Submission Plan – March 2021

⁶⁵ Rural North, Oundle and Thrapston Plan, July 2011

company is a market leader in investment in new technology and modernisation of the sector.

23.3.3 The existing ENRMF is already part of an integrated network of waste recovery and disposal installations. The landfill and the waste treatment and recovery facility provide an integrated solution to hazardous waste management in the south and east of the UK and provides a suitable disposal facility for LLW. The modernisation of existing facilities and introduction of new hazardous waste management technologies continues to be a core element of the company's business strategy. The locations of hazardous waste landfill sites that can accept a wide range of wastes are shown on Figure ES23.1. The availability of safe, secure waste treatment and recovery facilities as well as hazardous waste and LLW disposal capacity for residues from treatment and recycling is essential to support the investment in the sustainable management of wastes generated by UK industry.

23.3.4 The increase in the throughput of the treatment facilities reflects the increasing need for waste treatment prior to recovery or disposal in preference to direct landfill disposal. The increased landfill void created will provide a hazardous waste disposal facility available for use by local, regional and national businesses for an additional 20 years. The continued provision of this hazardous waste treatment and disposal facility underpins the economy of the wider business community in supporting their activities which rely upon the availability of hazardous waste treatment and disposal facilities which are readily accessible.

23.3.5 The provision of an effective and secure supply chain to safely and sustainably manage and dispose of LLW is critical to the timely and cost effective decommissioning of electricity generation and off-shore drilling sites managed on behalf of the government and private industry. These sites have contributed to the UK economy over many decades and the current priority is to manage their closure and decommissioning in a safe, sustainable and cost effective way.

23.3.6 Thus the impact of the site on its local environment must be assessed and demonstrated as acceptable but its benefits must be considered primarily in terms of the wider regional and national economic environment.

Regional context

23.3.7 The overarching purpose of the proposed development is to continue to meet the established need of regional businesses particularly in the central, eastern and southern regions of the UK for the safe disposal of hazardous waste and LLW and the treatment and recycling of wastes beyond the consented life of the existing ENRMF. The site lies in the south eastern corner of the East Midlands region and is geographically close to the West Midlands, East of England, Greater London and South Eastern regions. As discussed in Section 10 of this Environmental Statement (ES) and as shown in Tables ES10.1 and ES10.2, over 80% of the waste accepted at the waste treatment plant and approximately 98% of the waste accepted at the site for landfill disposal over the last five years originates from these five regions. As shown in Table ES10.3 the total quantity of hazardous waste produced in England has been rising steadily over the last five years and was almost 6.7 million tonnes in 2019. The data in Table ES10.4 show that in the regions nearest to ENRMF the quantity of hazardous waste generated each year is rising over time and in 2019 was approximately 3.5 million tonnes. A total of approximately 877,000 tonnes of hazardous waste was landfilled in England in 2019 with the quantity falling generally over the five years of data shown on Table ES10.5. No new hazardous waste landfill facilities have been developed in the south of the country since the proposals for the currently consented activities was submitted. Based on the data assessed there is a continuing need for the provision of a waste management facility for the treatment and disposal of hazardous waste able to serve the businesses which generate wastes arising in the West Midlands, East Midlands, East of England, South East and Greater London.

23.3.8 The ENRMF is centrally located for the wastes arising at the locations of the major LLW waste producers in the south and east of the country. The location of the site is well placed to serve the producers of LLW from the nuclear and non-nuclear industries. ENRMF will continue to provide a closer and more convenient alternative for the disposal arisings than the more distant alternative facilities in the north west to support these public and private business activities.

Local context

23.3.9 The site is located in a generally rural area with the majority of the surrounding land comprising open farmland or woodland. The proposed application boundary lies approximately 1.1km east south east of Duddington village and approximately 2km north north west of Kings Cliffe village at its closest points. The properties located closest to the site are shown on Figures ES1.2.

23.3.10 An overview of the local socio-economic context of the site is drawn from the Northamptonshire Minerals and Waste Local Plan (2017), North Northamptonshire Joint Core Strategy (2016)⁶⁶ and the Rural North, Oundle and Thrapston Plan (2008).

23.3.11 The North Northamptonshire Joint Core Strategy (NNJCS) covers East Northamptonshire, Corby, Kettering and Wellingborough. There is a network of settlements within North Northamptonshire and the population at the time of the 2011 Census was 316,800⁶⁷. It is anticipated that the population will grow to at least 370,600 by 2031⁶⁸. The age structure of the population is forecast to change over the plan period with significant expansion in the 60+ age group and the 0-14 age group⁶⁹. North Northamptonshire has around 0.85 jobs for each worker (economically active residents excluding those in full time education). It has become less self-reliant in terms of employment since 2001

⁶⁶ North Northamptonshire Joint Core Strategy 2011 – 2031, July 2016

⁶⁷ North Northamptonshire Joint Core Strategy 2011 – 2031, July 2016. Paragraph 2.19

⁶⁸ North Northamptonshire Joint Core Strategy 2011 – 2031, July 2016 Paragraph 2.21

⁶⁹ North Northamptonshire Joint Core Strategy 2011 – 2031, July 2016 Paragraph 2.23

with 69% of the labour force living and working in North Northamptonshire compared to 76% at the 2001 census⁷⁰. 22 wards within Corby, Kettering, Wellingborough and East Northamptonshire have been designated by the government as Assisted Areas for the period 2014 to 2020. These comprise a mixture of urban and rural areas identified because they are less economically advantaged places that would benefit from additional support for development⁷¹.

23.3.12 The site is located in the Rural North area in the Rural North, Oundle and Thrapston Plan (RNOT) (2011). The Kings Cliffe area is described in the plan as a rural area with farmland, open pasture, pockets of woodland and villages built from local stone and stone slate. The area covered by the RNOT Plan is 42,174 hectares and the population at the time of the Census in 2001 was 25,116. The population density was 1.6 people per hectare and the average age was approximately 40 years. Around 19,000 people were economically active; of these approximately 8,200 are in full time employment. In 2011 nearly 75% of dwellings in the RNOT Plan area were owner occupied and 13% are socially rented.

23.3.13 Based on the Rural North Plan it is considered that the key socio-economic factors for the area are employment and economy, housing and house prices, village infrastructure and services, tourism together with green infrastructure and accessibility. The employment and economy in the Rural North area is mixed, with an established agricultural and forestry base, mineral working and waste management, distribution and transport, light industrial and small businesses and military activities. The agricultural use is progressively diversifying into the service and tourism industries.

23.3.14 It is necessary to outline the likely evolution of the baseline environment at the site without the implementation of the proposed development. If the proposed development was not implemented the existing ENRMF would continue to

⁷⁰North Northamptonshire Joint Core Strategy 2011 – 2031, July 2016 Paragraph 2.31

⁷¹North Northamptonshire Joint Core Strategy 2011 – 2031, July 2016 Paragraph 2.39

manage, treat and landfill hazardous wastes as well as provide a disposal facility for LLW. There would be no changes to the site operational practices and the operations at the site which support local jobs and services as well as regional and national businesses as well as contributions to the local community based on the tonnage of waste deposited would cease by 2026. The aftercare and maintenance period for the site would continue to 2036.

23.4 Assessment of effects

Assessment of effects at a national and regional level

23.4.1 The extension of the operating period and increase in the throughput of the waste treatment and recovery facility at ENRMF together with the extension of the landfill into the proposed western extension will provide extended security for the treatment and recovery of waste and for the disposal of residues generated by waste treatment processes including the Augean treatment business. The continued availability of hazardous waste and LLW landfill capacity facilitates safe disposal of hazardous wastes and LLW for local, regional and national businesses. In the event that the facility was no longer available these businesses would need to transport the waste over greater distances to the other suitable sites resulting in additional costs to those businesses and the UK economy notwithstanding additional transport impacts.

23.4.2 There are wider environmental and economic benefits as the use and extension of appropriate existing assets is preferable to the development of new facilities in undeveloped areas. In addition there is policy preference in the Northamptonshire Minerals and Waste Local Plan for extensions of existing sites rather than the development of new sites.

23.4.3 The continuation and extension of the facilities for the disposal of LLW will assist the programme of nuclear decommissioning by not imposing unnecessary costs and reducing the distance that legacy wastes have to be transported from where they originate in the south of England given that the

only alternative disposal facilities are in Lancashire and Cumbria (Figure ES23.2).

- 23.4.4** The development of facilities for the management and disposal of LLW is a key element of national policy for the decommissioning of power stations and oil and gas extraction facilities. The Augean proposals will also support the many industries, research facilities and hospitals in the region and nationally that generate and use radioactive materials.
- 23.4.5** The nuclear decommissioning supply chain industry is valued at £3billion a year⁷². The NDA Strategy 2019 states that there is a 120 year programme to clean up 17 of the earliest UK nuclear sites⁷³.
- 23.4.6** The cost of the continued maintenance of the nuclear estate is a major cost to the nation and the sooner the decommissioning programme is delivered the sooner the cost burden will be diminished. The provision of alternative disposal routes to the Low Level Radioactive Waste Repository (LLWR) such as the extension of ENRMF represents a significant financial saving to the nation as the void at LLWR, which engineered to receive wastes with a much higher level of radioactivity than ENRMF, is preserved for these wastes where there is no other option for their disposal currently. The objective of the NDA waste management strategy including the use of disposal locations other than the LLWR in Cumbria (LLWR) for LLW at the lower end of the activity range is to achieve a cost reduction of approximately £1billion⁷⁴. The provision of alternative disposal routes to the LLWR such as ENRMF therefore represents a significant financial saving to the nation. In addition the proposed development will facilitate the overall decommissioning programme thereby helping to secure the development and growth of businesses that support the decommissioning works. The proposals will provide for the continuation of the

⁷² DECC (2015) *Strategic Environmental Assessment. Environmental and Sustainability Report, Consultation draft. Volume 2 – the appendices.*

⁷³ NDA (2019) *Integrated Waste Management: Radioactive Waste Strategy. Page 5.*

⁷⁴ Letter from the Nuclear Decommissioning Authority dated 15 September 2010

existing LLW business at Augean and support the continued growth of Augean plc.

23.4.7 It is a requirement of national legislation that the waste management network for all types of waste shall enable waste to be recovered or disposed of in one of the nearest appropriate installations, by means of the most appropriate methods and technologies, in order to ensure a high level of protection for the environment and public health. Inevitably, where the management measures are more specialist, as they are at ENRMF, there will be fewer such facilities therefore each such facility will serve a wider area.

Assessment of general employment and economic effects at a local level

23.4.8 The proposed development will help secure the continued employment of the 23 full time staff who currently work at ENRMF and 10 support staff based from the Head Office in Wetherby. The total amount that Augean spends on wages per annum for the existing ENRMF site is approximately £590,000. The site employs almost entirely skilled staff either with appropriate scientific degrees or specialised plant operating skills. Most of the staff live within a 10 mile radius of the site with the majority in the Peterborough area and a few from Corby, Oakham and Stamford. Some employees from the site live or have lived in the immediate area, such as Kings Cliffe, Easton on the Hill and Orton but most commute from the nearby urban areas where house prices are more affordable.

23.4.9 The site uses a range of local services contributing significantly to the local economy. In the period January 2020 to December 2020 the existing ENRMF site spent approximately £787,000 on local services within Northamptonshire and/or a 15 mile radius of the site. A summary of the local services supported in the period January 2019 to December 2020 is presented in Table ES23.1.

23.4.10 It may be of concern to local residents and businesses that the continued presence of the site accepting hazardous waste and LLW may discourage companies from investing in the area. It may be argued that the community

around ENRMF has not enjoyed the economic benefits of the employment and services of communities living in proximity to the businesses that generate hazardous waste or to nuclear power stations. However the local community together with the rest of the nation has enjoyed the socio-economic benefits of the products of those businesses and of reliable power supply for the past 60 years. As explained in the other impact assessment sections of this report, the physical presence of the ENRMF facility in the landscape has a limited impact due to its relatively small size and well contained location and the environmental impacts are well controlled to acceptable levels.

23.4.11 While the presence of the site may be evident from the lorry traffic on Stamford Road there is a negligible effect on local villages from operations at the site. The site is visually well screened, it is not noisy and its presence is absorbed in the surroundings. The presence of the treatment and landfill operations at the site have not stopped other business or housing developments in the vicinity from applying for and being granted planning permission. The area around the site continues to have a thriving rural economy.

23.4.12 Since the current DCO was granted in 2013 a number of applications have been submitted for dwellings in Kings Cliffe together with extensions to existing dwellings. A planning application for a caravan and camping facility (Planning permission reference 14/02225/FUL) located 200m south of Kings Cliffe Industrial Estate was granted by East Northamptonshire Council in November 2015. The conditions of the planning permission are in the process of being discharged. These applications indicate that the continued operation of ENRMF as an integrated waste management facility with a hazardous waste and LLW landfill and a waste treatment and recovery facility has had no significant adverse effect on these nearby developments and the associated local economy.

Assessment of effects on agriculture and forestry

23.4.13 There has been no evidence that indicates that there would be or has been any adverse effect on plant growth or the quality of crops or stigma associated

with the nature of the site operations which could subsequently harm agricultural or forestry businesses as a result of the existing ENRMF site. The environmental protection measures that are in place will continue to provide protection to the whole environment surrounding the site including vegetation. The location of the woodland to the west and east of the proposed western extension is considered in detail in the design of the landfill extensions and measures specifically to protect the trees are integral to the design.

23.4.14 The land for the proposed western extension will be taken out of agricultural production. The farm business landowner has confirmed that the removal of the fields in the proposed western extension from agricultural use and their exclusion from use as part of their farming business does not affect the farm structure or viability of the farming business. The western extension fields represent less than 6% of the total farming business landholding.

Assessment of effects on mineral working and waste management

23.4.15 Mineral can only be worked where it is found. In the local area there are clay resources (e.g. ENRMF), limestone (e.g. Collyweston Quarry, Cross Leys Quarry, Wakerley Quarry, Ketton Limestone and Cement Works, Thornhaugh Quarry and Cooks Hole Quarry). Quarries are the source of the limestone and ironstone that provides the distinctive building stone used in the construction of the surrounding villages. While not necessarily a popular element of the rural environment quarries are an intrinsic part of the historic landscape and economy of the area.

23.4.16 The use of residual waste to restore quarries is a sustainable solution and one of the primary options for bringing exhausted mineral workings back into beneficial use with the consequence that landfilling is an inherently rural activity. In the vicinity there are several landfill sites including Collyweston Quarry, Cross Leys Quarry and Thornhaugh Quarry. These sites provide services to the local authority, businesses and the construction industry contributing to the local infrastructure and economy.

23.4.17 Given the above context the operations at ENRMF are not an alien activity in the locality. However, this does not detract from the need to ensure such facilities do not unacceptably affect the character of the countryside. As is identified in Section 14 of this report on the assessment of impacts on landscape, the existing and proposed extension to ENRMF is well contained and has a generally limited profile in the landscape.

Assessment of effects on distribution and transport

23.4.18 The major road network locally comprises the A47, A1, A43 and the A14 and is attractive for distribution and transport businesses. On the Stamford Road opposite entrance to the ENRMF site there is the established Howard's Transport yard which is a former farm diversification scheme. In addition planning permission has been granted for the development of a transport yard at the former Ministry of Defence depot approximately 300m to the north of the existing ENRMF site. No evidence has been identified of any adverse effects of the existing ENRMF site on these businesses or of potential impacts as a result of extension either in time or void. To the contrary, there is the potential for synergies between Augean and local distribution businesses of benefit to the local economy.

Assessment of effects on housing provision and prices

23.4.19 It is identified in the Rural North Plan that attractiveness of the area to newcomers and therefore to house builders, has led to increases in both land and house prices. It is indicated that house prices in the area are high by Northamptonshire and East Midlands standards. In consequence, housing in the area has become less affordable to local people, making it harder for first time buyers in particular to access the housing market. As a result few of the employees at ENRMF live in the immediate area around the site but most live to the east where property is more affordable such as in Peterborough and the surrounding areas.

23.4.20 A review of average house prices between 1999 – 2019 in Kings Cliffe and Duddington has been undertaken based on data obtained from the Land Registry. In the period 1 January 1999 to 31 December 2019 a total of 483 house sales took place in Kings Cliffe and Duddington. This figure does not include the initial sales at Sovereign Grange, a substantial new build development in Kings Cliffe between 2012 and 2016. If Sovereign Grange is included then the total number of house sales in this period rises to 597. There is a broad mixture of house types, both period and modern, available in both villages, with sold house prices ranging from below £100,000 to over £1.5 million. When comparing the average house price in Kings Cliffe between 1999 and 2019 to the national average and to the wider area of the former county of Northamptonshire the average prices show broadly similar trends over the same period. The average sales price for Kings Cliffe and Duddington is well above the UK average and never falls below this benchmark even at the lowest points. In comparison to the rest of Northamptonshire, Kings Cliffe and Duddington are well above the average for the county which falls below the national average (Figure ES23.3). In recent years the rate of increase in the price for Kings Cliffe and Duddington is faster than the UK or Northamptonshire average. This demonstrates that house prices in the area have continued to rise in accordance with national trends despite the presence of the existing ENRMF facility. There is no reason to anticipate that the proposed development will change this situation.

Assessment of effects on the village infrastructure and services

23.4.21 It is reported in the Rural North Plan that evidence based studies clearly demonstrate that Kings Cliffe functions as a local service centre to the network of surrounding villages. Kings Cliffe has a doctor's surgery, primary school which draws pupils from several other villages in the area, village hall, post office and community sports facility providing services to the surrounding network of villages but secondary school pupils need to travel by bus to Oundle. Other villages, notably Collyweston, Nassington, Wansford and Easton on the Hill have local rural services such as village shops and village

halls. There are community halls in just over half the local villages. Duddington is a small village with a community hall but no other local services.

23.4.22 The Rural North Plan emphasises the need to enhance the service centre roles of Oundle, Thrapston and Kings Cliffe thus enabling villages to thrive by ensuring that vital services are retained and local infrastructure deficiencies are resolved. For this to be achieved, appropriate opportunities must be available to meet housing and employment needs, including those of the farming communities.

23.4.23 Since 2004 Augean have invested more than £4.5 million into the local community through the Landfill Tax Credit scheme from the ENRMF and Thornhaugh Landfill Sites. The Landfill Tax Credit scheme allows Augean to give to the local community a proportion of its landfill tax obligation which was over £432,000 in 2020. Since 2011 the separate LLW community fund has produced over £197,000. The LLW community fund has been administered to date by Northamptonshire County Council and will now be administered by North Northamptonshire Council.

23.4.24 Projects within a 10 mile radius of the site may apply for grants which are allocated by the Kings Cliffe Environmental Association. In 2020 21 projects were given grants for between £4,000 and £50,000⁷⁵. The projects included upgrades to halls, churches and sports facilities and recreation ground improvements. The full list is presented at Table ES23.2.

23.4.25 In addition Augean has directly funded a number of projects including improvements to the Kings Cliffe Sports Club House, improvements to Oundle Rugby Club, improvements to All Saints and St James' church and contributions to the Kings Cliffe and Area Community Sports Project. These contributions are an important factor in maintaining the viability of these important community facilities.

⁷⁵ Grantscape (2020) Augean Community Fund Grants <https://www.grantscape.org.uk/fund/augean-community-fund/augean-community-fund-grants-awarded/> Accessed 02.07.21

23.4.26 One key constraint of the Landfill Tax Credit scheme is that the funds cannot be used to pay for salaries. As part of the consent for the deposition of LLW at the site Augean entered into a Section 106 legal agreement to set aside for the community £5 per tonne of LLW deposited at the site to be deposited into a fund for the community. This money is not subject to the use restrictions for Landfill Tax credits and is available for uses other than capital expenditure including the payment of salaries hence this fund overcomes one of the principal constraints in providing support to the development of village services. This commitment will be continued for the future deposition of LLW if the Development Consent Order is granted. This fund has been used to fund community services such as after school clubs. Since 2011 the LLW community fund has produced over £197,000. In 2019 this fund raised £72,500 for the local community.

23.4.27 Augean works with educational establishments including Kings Cliffe Endowed School where presentations about waste management activities have been given, competitions organised, placements and field trips carried out and assistance with careers fairs has been provided. Augean also hosts visits from Nottingham and Northampton Universities from time to time and encourages local residents to attend site engineering days to see the cell containment construction works taking place and to speak to contractors and CQA engineers. Augean remains committed to continuing to contribute to education around topics related to their activities although there has been little activity in 2020 due to the Covid-19 pandemic restrictions. Through consultation events, open days, presentations, newsletters and information on the company website including site monitoring data, Augean has and continues to inform and promote understanding of waste management in respect of policy, strategy, technology and impact. The company is committed to continuance of its open door policy, regular open days, the reception of visits from educational establishments and presentations to stakeholders.

23.4.28 As explained further in Section 19 of this Environmental Statement, Augean have contributed a sum of £5,000 per year to Northamptonshire County

Council Highway Authority for the maintenance of the road in the vicinity of the site access and will continue with this contribution to North Northamptonshire Council.

23.4.29 No evidence has been identified of negative impacts on the village infrastructure and function of Kings Cliffe as a service centre as a result of the presence of the waste management facilities at ENRMF and there is no evidence that this will change as a result of the proposed development including the extension in time and void for the consented facilities. Augean has made positive contributions to the community through Landfill Tax and the LLW fund as well as directly to support the service function of village centres. These investments have the potential for long term benefit to the community well beyond the operational life of the site.

Assessment of effects on tourism

23.4.30 The northern part of East Northamptonshire is described in the Rural North Plan as having many assets which attract visitors who contribute to the local economy. Visitor accommodation includes hotels, bed and breakfast accommodation, caravan parks, self catering accommodation and other places to stay overnight or for longer breaks. Tourist attractions, including a wide range of restaurants and public houses, can be found in the towns and in the countryside. As stated above, a new camping and caravan facility is currently being constructed near Kings Cliffe.

23.4.31 Given the visually contained nature of the site it is considered that the proposed development including the extended operating period and the western landfill extension at ENRMF is unlikely to have a significant negative impact on tourism in the locality now or in the future.

Assessment of effects of green infrastructure and accessibility

23.4.32 The green infrastructure comprising the network of nature conservation and biodiversity, landscape and heritage assets together with accessibility of those assets to the village communities is an important element of the socio-

economic fabric of the area. The nature conservation and biodiversity assets of the area are described in Section 13, the landscape assets are described in Section 14 and the heritage assets are described in Section 16 of this report. The NNJCS⁷⁶ states that:

‘Compared to most of the country, North Northamptonshire has a low biodiversity offer, with habitats fragmented or degraded as a result of settlement expansion, infrastructure developments and agriculture.’

23.4.33 The assessments presented in the identified section of this report demonstrate that the proposals will not result in a significant cumulative adverse impact on these assets. In the long term based on the lifespan of the development until 2046 the restoration of the site will deliver significant biodiversity improvements and make space available for recreation with the potential for enhancement of the Local Rights of Way network. Further details on the restoration and biodiversity improvement proposals are provided in Sections 13 and 14 of this report. In addition, as is evident from the nature of a number of the projects which are supported by funding from Augean (as shown in Table ES23.2) the development provides a significant contribution to the creation and maintenance of green infrastructure.

23.5 Mitigation and monitoring

23.5.1 The high standards of engineering and operational practice will continue to be applied at the site so that the activities do not result in significant environmental impact in the short or long term as demonstrated in the environmental impact assessment sections of this document.

23.5.2 The site will be restored to blend with the surroundings and enhance the ecology and biodiversity of the site resulting in biodiversity improvements and

⁷⁶ North Northamptonshire Joint Core Strategy 2011 – 2031, July 2016 Paragraph 2.16

a long term benefit in respect of green infrastructure well beyond the operational life of the site.

23.5.3 The following continued commitments are proposed by Augean as part of the proposed development:

- To continue to make available community funding from the Landfill Tax Credits as permitted by Government legislation.
- To continue to provide contributions to a community fund based on the quantity of LLW inputs to the landfill.
- To continue to use and give preference to local services.
- To continue to make a contribution of funding to the Local Highway Authority for the maintenance of Stamford Road.
- To continue to take part in and support educational activities and promotion of understanding of waste management through the open door policy, regular open days, periodic community newsletters, the reception of visits from educational establishments and presentations to stakeholders.

23.6 Cumulative impacts

23.6.1 The cumulative impacts of all aspects of the collective proposals are taken into account in the assessments of the impacts on the local, regional and national socio-economic environment. No additional planned developments have been identified which has the potential for further cumulative effects.

23.7 Conclusions

23.7.1 The proposed development represents a significant national and regional socio-economic benefit underpinning the need for the safe treatment of wastes and the safe disposal of hazardous wastes and LLW. It provides a potentially substantial saving to the cost of the delivery of the NDA strategy. It is evident

that the activities at the site result in a positive contribution to the local economy and provide significant support to the function of the Kings Cliffe village as a service centre.

23.7.2 It is concluded that based on the existing operations at ENRMF the proposed development will not give rise to any significant adverse socio-economic impacts on the local community and by the continued provision of safe, sustainable and cost effective waste management facilities will provide a beneficial socio-economic impact to local, regional and national businesses. The presence of the site and the Augean business will continue to result in support and contributions to the local community.

24. Climate change and major accidents or disasters

24.1 Introduction

24.1.1 Under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017⁷⁷ it is necessary to assess the impact of the development on climate change and the vulnerability of the project to climate change in addition to the vulnerability of the development to risks of major accidents and/or disasters.

24.2 Climate change

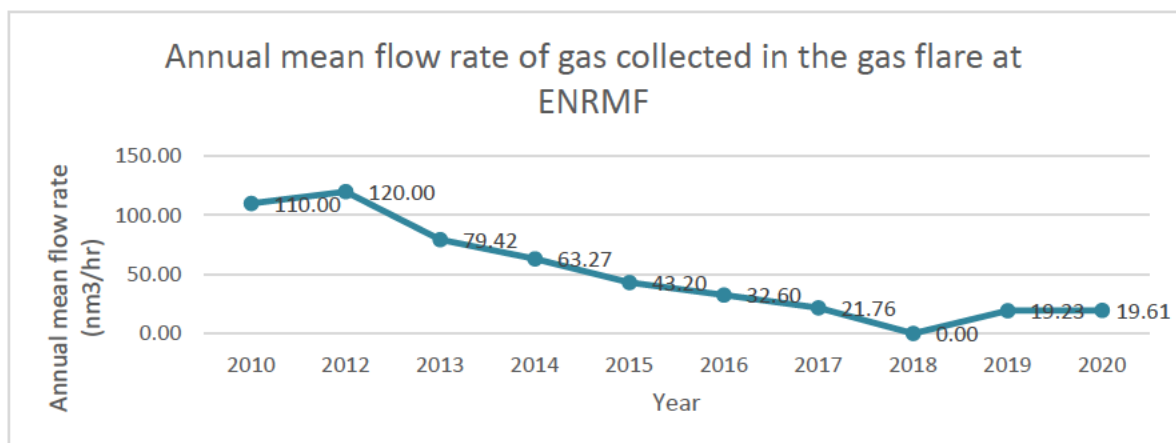
24.2.1 It is considered that the proposed development will have a limited impact on climate change with the biggest potential impact resulting from the release of greenhouse gases from plant and machinery. The site will continue to operate to the Best Available Techniques (BAT) in accordance with the requirements of the Environmental Permits. It is a standard condition in permits for these types of waste activities that the operator shall take all measures to ensure that energy and raw materials are used efficiently in all activities and to review and record at least every 4 years whether there are suitable opportunities to improve the energy efficiency of the activities and to consider whether suitable alternative materials can be used to reduce the impacts associated with the use of raw materials. Actions already implemented by Augean at the site include the use of leachate and surface water runoff to replace the use of mains water in the treatment and recovery facility and the use of the alkaline air pollution control residue waste which has cement-like properties to treat and stabilise other wastes instead of using the raw materials such as cement or lime.

24.2.2 Many landfill sites generate significant quantities of methane and carbon dioxide which are greenhouse gases which contributes to global warming and consequently affect climate change. As explained in Section 5 of this report,

⁷⁷ Statutory Instrument 2017 No.572 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

landfill gas (which includes methane and carbon dioxide) is generated as a result of the biodegradation of materials formed of organic carbon, typically food waste and vegetation. Materials such as paper, textiles and wood are also biodegradable but generally only at very slow rates. The hazardous waste and LLW that will continue to be disposed of at the site will contain a very limited amount of biodegradable materials and there is a limit of 6% of total organic carbon in the hazardous waste which can be accepted at the site. Consequently negligible quantities of landfill gas are generated when compared to typical non-hazardous waste landfill sites.

24.2.3 The waste types accepted in the initial cells at the current landfill site prior to July 2004, which is when the limitation on the organic content of landfilled hazardous wastes was implemented, have the potential to generate significant quantities of landfill gas. Therefore there is a gas collection and control system installed in these areas of the site. The gas is pumped from the waste and delivered to a gas flare where the gas is combusted. The volume of gas being collected is reducing over time, as shown in the graph below, and is likely to continue to fall as no new high organic carbon wastes are accepted.



24.2.4 Significant numbers of HGVs visit the site in order to deliver wastes and remove treatment residues and clay and overburden for use elsewhere. The increase in traffic associated with the proposed western extension compared with the existing ENRMF activities is limited as explained in Section 19 of this

Environmental Statement (ES). The continued provision in the east and south of England of an environmentally secure landfill and treatment and recovery facility for hazardous wastes and LLW will reduce the distances that these wastes would otherwise have to travel for management at facilities a greater distance from their point of arising thus minimising the emissions of carbon dioxide and fuel energy used associated with these journeys.

24.2.5 The restoration of the site will create a biodiversity net gain through the creation and enhancement of habitats which will include blue and green infrastructure. The provision of substantial planting on the restored site and the long term development of new woodland areas will provide a contribution to minimising the impact of climate change.

24.2.6 It is considered that the proposed western extension has limited vulnerability to climate change. It is considered that the proposed development will be vulnerable to changing patterns in weather specifically to anticipated changes in rainfall intensity. The potential effects on the operations and consequential impacts on the development site as a result of the predicted effects of climate change on rainfall are addressed as described in Sections 17 and 18 of this ES as part of the hydrogeological risk assessment and flood risk assessment. The surface water management scheme is designed to take into account predicted rainfall increases and to accommodate these in the design of the scheme. It is considered that the proposed development is not vulnerable to any other identified impacts as a result of climate change.

24.3 Major accidents and disasters

24.3.1 The risks and potential impacts resulting from possible accidents associated with the manmade and natural environments at and around the site are addressed in Sections 11 and 12 of this ES. The impact assessments include scenarios which reflect expected events as well as events and accidents which it is considered are unlikely to occur.

24.3.2 A mains gas pipeline runs parallel to the southern boundary of the existing ENRMF and crosses the southern section of the proposed western extension in an east to west direction (Figure ES5.1) and is identified as a potential major accident hazard. The gas pipeline will not be diverted and it will not be possible to landfill over the pipeline as access must be maintained. The area to the south of the gas pipeline in the proposed western extension (Phases 15 to 17) will be developed as a separately constructed, fully contained landfill area. A minimum easement distance from the gas pipeline has been agreed with the pipeline authority as described in Appendix ES5.1. The area along the gas pipeline corridor will be developed for ecological benefit. The existing ENRMF has operated within the same easement distance to the north of the gas pipeline for many years. It is considered that the measures in place as set out above there will be a limited major accident risk associated with the gas pipeline.

24.3.3 The site location is not considered potentially vulnerable to major natural hazards such as severe earthquakes, tsunamis, avalanches or natural events such as drought, flooding and sea level rises hence no further assessment of these aspects is considered necessary.

24.4 Conclusions

24.4.1 The impact of the development on climate change and the vulnerability of the project to climate change in addition to the vulnerability of the development to risks of major accidents and/or disasters has been considered. It is considered that the proposed development will have a limited impact on climate change with the biggest potential impact resulting from the release of greenhouse gasses from plant and machinery. It is concluded that the proposed development has limited vulnerability to climate change. It is considered that the proposed development is at very low risk of disasters relating to manmade and natural disasters. The site is not located in an area considered to be potentially vulnerable to major natural hazards.

25. Assessment of the overall direct and indirect effects on health and wellbeing

25.1 Introduction

25.1.1 An assessment has been carried out by MJCA of the potential overall direct and indirect effects on health and wellbeing. The World Health Organisation defines health as “*a state of complete physical, mental and social well-being and not merely an absence of disease or infirmity*” (WHO, 1948). It is recognised that health and wellbeing is the result of a complex interaction of a wide range of different contributing factors. In the Public Health England advice⁷⁸ on the assessment of the impacts of Nationally Significant Infrastructure Projects it is stated that:

‘The health of an individual or a population is the result of a complex interaction of a wide range of different determinants of health, from an individual’s genetic make-up, to lifestyles and behaviours, and the communities, local economy, built and natural environments to global ecosystem trends. All developments will have some effect on the determinants of health, which in turn will influence the health and wellbeing of the general population, vulnerable groups and individual people’.

25.1.2 Various aspects of the proposed development which have the potential for impacts on health and wellbeing are considered in a number of sections of this Environmental Statement (ES) report including in particular Section 12 on direct impacts on health, Section 17 on water resources, Section 19 on transport and traffic, Section 21 on air quality and Section 22 on amenity. In their response to the Scoping Report and in subsequent discussions held in February 2021, Public Health England (PHE) acknowledged that many issues relevant to public health would be covered in individual sections of the ES and

⁷⁸ Public Health England ‘Advice on the content of Environmental Statements accompanying an application under the Nationally Significant Infrastructure Planning Regime’ March 2021.

that there is a preference to avoid duplication. However, it was specifically requested that the issues relevant to impacts on health are summarised in a discrete section of the ES in order to provide a focus for the key information. Accordingly, in this section of the ES, the assessments of the aspects relevant to public health presented in earlier sections of the ES are summarised. In addition further assessments are presented on the potential impact of the proposed development on the wider determinants of health and wellbeing. This section of the ES therefore presents an overall assessment of the potential effects on health and wellbeing as a result of the proposed development.

25.2 Methodology

Aspects assessed in earlier sections of the ES

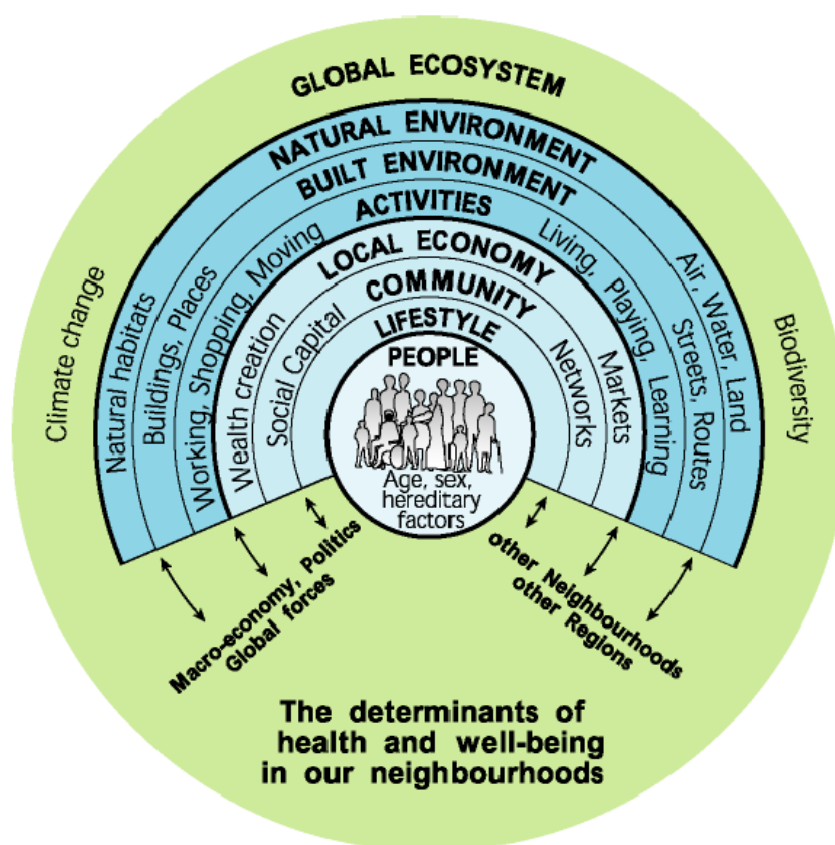
25.2.1 The approach followed in the assessment reported in this section of the ES follows the guidance given by PHE for Nationally Significant Infrastructure Projects⁷⁹. Where impact assessments have been carried out of the proposed development for specific aspects which may result in effects on health, the methodology followed for each aspect is reported in the relevant section of this ES. In accordance with PHE advice and requests a summary is provided in this section of the ES of the assessments of the potential impacts on health as a result of:

- Direct impacts on human health which are considered in Section 12, Section 21 on air quality and Section 17 on water quality
- Transport and traffic (Section 19).
- Noise and vibration (Section 20).
- Amenity (Section 22).

⁷⁹ Public Health England 'Advice on the content of Environmental Statements accompanying an application under the Nationally Significant Infrastructure Planning Regime' March 2021.

Assessment of the wider determinants of health and wellbeing

25.2.2 As set out in the WHO definition of health, the health of an individual or a population is the result of a complex interaction of a wide range of different determinants of health, from an individual’s genetic make-up, to lifestyles and behaviours, and to the communities, local economy and built and natural environments in which they live as well as global ecosystem trends. All developments will have some effect on the determinants of health, which in turn will influence the health and wellbeing of the general population, vulnerable groups and individual people. These wide ranging interactions are summarised in the illustrative diagram⁸⁰ below:



25.2.3 PHE has developed a list of 21 wider determinants which have the potential for impacts on health and wellbeing which are presented at Appendix 1 of the

⁸⁰ Barton H, Grant M. A health map for the local human habitat. *The Journal of the Royal Society for the Promotion of Health* 2006; 126(6)

PHE guidance and are reproduced in Table ES 25.1 to this report. The determinants are presented by PHE under the four themes of Access, Traffic and transport, Socioeconomic and Land use. The meaning in which these terms are applied in the context of health and wellbeing is explained below and the ability of the proposed development to affect each of these determinants is considered in turn as a screening exercise. This screening exercise identifies the determinants which have the potential to be affected hence are reviewed further in this assessment.

Access

- 25.2.4** Access to local facilities can increase mobility and social participation, access to recreational facilities can increase physical activity with the associated health benefits. Accordingly, access to services and facilities is important to both physical and mental health and wellbeing. Access is affected by factors such as availability, proximity to people's place of residence, existence of transport services or active travel infrastructure to the location of services and facilities, and the quality of services and facilities.
- 25.2.5** The proposed development does not affect the availability of access to local, public and key services and facilities in that it does not introduce any new users of those facilities putting further burden on those services. The only traffic route which is affected by the proposed development is the northern section of Stamford Road and the highway infrastructure beyond and the proposals do not constrain use of the road. The proposed development therefore does not affect the physical access routes to the available services and facilities.
- 25.2.6** The continuing use and support of local businesses and the funding provided by Augean to many of these local service centres and facilities helps to maintain these local services. The impacts associated with the support of local services and facilities is considered further below.

- 25.2.7** Access to housing meets a basic human need, although housing of itself is not necessarily sufficient to support health and wellbeing: it is also important that the housing is of good quality and affordable. As the site is in open countryside where development is generally restricted by policy the proposed development will not affect access to good-quality affordable housing.
- 25.2.8** Access to healthy food is related to the provision of public and active transport infrastructure and the location and proximity of outlets selling healthier food such as fruit and vegetables. The proposals do not affect the availability of suitable food outlets or the availability of affordable healthy food. The site is located some distance from locations where people grow their own fruit and vegetables. Availability of and access to safe open green space is associated with increased physical activity and improved physical and mental health outcomes. As the development is in the countryside, it does not affect physical access to the natural environment or green spaces within the urban environment. The proposed development does not remove any natural environments within any urban environments. The continued support and funding of local facilities by Augean includes support for local green spaces within urban environments. The impacts associated with the support of local facilities, including local green spaces and local green urban environments, is considered further below.
- 25.2.9** Access to leisure, recreation and physical activity opportunities within the urban and natural environments has a number of well recognised physical and mental health benefits as well as enhancing social cohesion. The proposed development will provide enhanced access to the natural environment through the delivery of the proposed restoration scheme for the site which will include public access and the provision of a car park and footpaths within the site. The potential impacts associated with this provision of new green space and recreational facilities are considered further below. The western extension to the site is located adjacent to Fineshade Wood and The Assarts. The area includes public rights of way and is used currently for recreation and leisure activities. The potential impacts of the proposed development on users of the

existing natural environment including in particular the rights of way in Fineshade Woods and The Assarts are considered further below.

Traffic and Transport

25.2.10 Accessibility in relation to transport and travel has several aspects including whether potential users can gain physical access to the infrastructure and access to the services the infrastructure provides. As the proposed development will not be visited by members of the public on a regular basis during the operational period, its accessibility to the public is not a relevant factor for consideration.

25.2.11 The accessibility of the site to those who work on the site by modes other than by car such as by cycling or walking, or through the use of public transport, is considered in Section 19 of this ES and summarised below. The accessibility of the restored site by future users of the green space which will be developed is considered further below as part of the assessment of the impacts associated with this provision of new green space and recreational facilities.

25.2.12 The wider determinants include consideration of links between communities and the potential for community severance which can occur where there are high volumes of traffic associated with a development. As established in Section 19 of this ES, the increase in traffic movements associated with the proposed development is less than four HGV movements per hour (i.e. including trips into and out of the site) and the traffic flow is not concentrated during the usual peak hours therefore there will be no potential for affecting community links including connections to jobs, services, facilities or leisure opportunities, or which might result in community severance therefore this aspect is not considered further.

Socioeconomic

25.2.13 Employment is generally good for physical and mental health and well-being. As presented in Section 23 of this ES, the proposed development will provide continued employment for those who work at the site as well as those

employed in the businesses in the vicinity which provide services to the site. The impact of the proposed development on employment and training opportunities and local business activity is considered further below.

25.2.14 The regeneration of neighbourhoods can result in the demolition of poor quality housing stock and the generation of better planned neighbourhoods with improved quality housing and its associated physical and mental health benefits. The location of the site is not in a regeneration area and no built development will be removed as part of the proposed development. However, the waste management services provided by the current and proposed development support the redevelopment of many sites and areas which are the subject of regeneration by accepting the contaminated wastes that arise for safe and appropriate management in order to facilitate the redevelopment works. The role of the site in providing waste management services to support the regional and national need of businesses is discussed in Section 23 of this ES but is not considered further here.

25.2.15 Areas in the vicinity of the site, in particular the nearby Fineshade Wood and associated visitor facility and public rights of way are used for rural tourism. The potential impacts of the proposed development on those who use these facilities, open space and recreational opportunities are considered further below as part of the assessment of the impacts of the proposed development on users of the existing natural environment.

25.2.16 Community and social cohesion and access to social networks can be associated with access to open space and recreational opportunities. The contributions to the local communities and local facilities as a result of the existing ENRMF operations and the proposals for the continuation of these opportunities for the regeneration, creation and maintenance of community facilities are presented in Section 23 of this ES. The impacts associated with the support of local facilities and services, including local green spaces, is considered further below

25.2.17 However, even where it has been demonstrated that development will not result in harm to the environment or direct impact on human health it is recognised that for some perceptions can affect the quality of life of communities living in the vicinity, including feelings of threat and anxiety, which can lead to psychosocial stress. The potential for the proposed development to result in feelings of anxiety in people and communities living in the vicinity of the proposed development is considered further below.

25.2.18 The approach to ongoing community engagement is discussed in Section 23 of this ES and the engagement of and responses from the community as part of the preparation of the application for the proposed development are set out in the Consultation Report (PINS document reference 4.1). The potential impacts of the current and proposed community engagement on the acceptability of the proposed development are considered further below in the context of wellbeing.

Land Use

25.2.19 The site is in a rural setting. The land use associated with the proposed development comprises the current ENRMF landfill site and waste treatment and recovery facility together with the fields to the west which currently are used for agriculture. The proposed western extension is well contained and currently not available for public access. The change in land use therefore affects only the agricultural use of the western extension area. As explained in Section 10 of this ES, the landowner has confirmed that the sale of the western extension fields and their exclusion from use as part of their farming business does not affect the farm structure or viability of the farming business. The fields in the western extension represent less than 6% of the total farming business landholding.

25.2.20 The future land use of the restored site is designed to enhance the quality of the natural environment at the site and the adjoining woodlands. The provision of this new recreational facility is considered further below.

Outcome of the screening of the wider determinants of health and identification of those that are assessed further

25.2.21 Based on the screening set out above of the PHE 21 wider determinants of health and wellbeing and as summarised on Table ES25.1 the determinants identified for further assessment have been assessed under the following headings:

- The impacts associated with the support of local services and facilities.
- The potential impacts associated with the provision of the new green space and recreational facilities.
- The potential for impacts of the proposed development on users of the existing natural environment.
- The impact of the proposed development on employment and training opportunities and local business activity.
- The potential for the proposed development to result in feelings of anxiety in people and communities living in the vicinity.
- The potential impacts of the current and proposed community engagement on the acceptability of the proposed development in the context of wellbeing.

25.3 Baseline

25.3.1 The setting of the proposed development is described in detail in Section 3 of this report. The site is located in a generally rural area with the majority of the land surrounding the site comprising open farmland or woodland as shown on the aerial photograph at Figure ES3.1.

25.3.2 The closest settlements are Duddington which is located approximately 1.1km to the north west of the western extension area, Collyweston which is located approximately 1.6km to the north north west of the western extension area,

Kings Cliffe which is located approximately 2km to the south east of the site boundary and Fineshade which is located approximately 2.4km to the west south west of the western extension area.

- 25.3.3** The existing access to the site will continue to be used. The access is gained from Stamford Road which leads to the A47 approximately 1.25km to the north. Stamford Road leads to Kings Cliffe to the south. Site vehicles are subject to a traffic management plan and HGVs are not permitted to travel south from the site access unless they are collecting or delivering materials locally. There are no pavements, marked cycle lanes or street lighting on Stamford Road in the vicinity of the site access.
- 25.3.4** Access to Collyweston, Duddington and Fineshade is from the A47 or the A43 and not from or via Stamford Road. The A47 is a distributor road which joins the A1 to the east and the A43 to the west of the junction with Stamford Road.
- 25.3.5** There are scattered properties within 1km of the application area. The closest properties to the application area are the properties at Westhay Cottages located approximately 25m to the east of the application boundary and the existing site and approximately 815m to the east of the proposed western extension. Westhay Farm is located approximately 75m east of the application boundary and approximately 865m to the east of the proposed western extension. Westhay Farm is adjacent to the south and east of Westhay Cottages and is operated as a haulage yard and a farm with associated agricultural and commercial buildings. A cleared area in the centre of the woodlands located to the north of the existing site was used formerly by the Ministry of Defence for storage associated with the Wittering Airfield. This area has been granted planning permission for development as a transport facility but is unused currently.
- 25.3.6** Westhay Lodge Farm is located approximately 615m to the south of the application boundary. There are currently two distinct properties at this location, Westhay Lodge which comprises the original farmhouse and Westhay Barn which was formerly one of the agricultural buildings. There are

a number of properties between 750m and 955m to the north of the application boundary including an unnamed property approximately 750m north of the application boundary and Cuckoo Lodge which is approximately 875m to the north of the application boundary.

- 25.3.7** No public rights of way cross the application area. There are a number of public rights of way in the vicinity of the site as shown on Figure ES3.3. The closest right of way is Footpath MX15 which is approximately 100m to the west of the boundary of the application area at its closest point. Footpath MX15 runs in a north westerly and south westerly direction and connects into the wider public rights of way network. The Jurassic Way bridleway (NE12) is located approximately 845m to the west of the application area at its closest point.
- 25.3.8** Fineshade Woods visitor centre is accessed from the A43 and is located approximately 2.5km to the south west of the proposed extension area. A caravan and camping facility, at Rockingham Forest Park, is being developed approximately 3.4km to the south east of the application boundary off Wansford Road.
- 25.3.9** Information on the population in the local area including an overview of the local socio-economic context is provided in Section 23 of this report. The site is located in the Rural North area in the 2011 Rural North, Oundle and Thrapston Plan (RNOT). The Kings Cliffe area is described in the plan as a rural area with farmland, open pasture, pockets of woodland and villages built from local stone and stone slate. The area covered by the RNOT Plan is 42,174 hectares and the population at the time of the Census in 2001 was 25,116. The population density was 1.6 people per hectare and the average age was approximately 40 years. Around 19,000 people were economically active; of these approximately 8,200 are in full time employment. In 2011 nearly 75% of dwellings in the RNOT Plan area were owner occupied and 13% were socially rented.

25.3.10 The data available from PHE⁸¹ on the general health profile of the population in the area has been reviewed. Data are available for East Northamptonshire but are not provided for individual areas within the district. The factors which are of most relevance to provide a general indication of the overall state of health, deprivation and wellbeing of the population have been reviewed. For the majority of the indicators for which data are available, the data for East Northamptonshire shows that the status is similar or better than the overall status for England. The life expectancy at birth for people living in East Northamptonshire is 80.6 for males which is better than the national average and 83.4 for females which is similar to the national average. The under 75 mortality rate from all causes in East Northamptonshire is 291 per 100,000 which is better than the national average. For the relevant published wider determinants of health, there are 11.2% of children in low income families in East Northamptonshire which is better than the national average of 17.0%, the 'average attainment 8' score is 48.9 which is below the national average of 50.2 and the percentage of people aged 16-64 in employment is 85.1% which is above the national average of 76.2%. The data show that the population health profile in East Northamptonshire is generally at or above the national average.

25.3.11 The data available from the Consumer Data Research Centre on the Index of Multiple Deprivation in 2019⁸² (IMD2019) has been reviewed for the villages in the area. The IMD is calculated from a suite of other indicators that form the Indices of Deprivation (IoD2019)⁸³. It follows an established methodological framework in broadly defining deprivation to encompass a wide range of an individual's living conditions. People may be considered to be living in poverty if they lack the financial resources to meet their needs, whereas people can be regarded as deprived if they lack any kind of resources, not just income.

⁸¹ Public Health England Local Authority Health Profiles <https://fingertips.phe.org.uk/profile/health-profiles/data> last accessed 12/07/21

⁸² Consumer Data Research Centre <https://maps.cdrc.ac.uk/#/geodemographics/imde2019/default/BTTTTFT/14/-0.5155/52.6118/> last accessed 12/07/21

⁸³ Ministry of Housing, Communities and Local Government. English indices of deprivation 2019 <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019> last accessed 12/07/21

The IoD2019 is determined from seven domains of deprivation which, when combined and appropriately weighted, form the IMD2019. The domains include income, employment, health deprivation and disability, education, skills and training, crime, barriers to housing and services and the living environment. The data show that the villages in the area (Duddington, Collyweston and Kings Cliffe) are in the 7th least deprived decile for the population as a whole. This means that the areas are not identified as having a high general level of deprivation.

25.3.12 The employment and economy in the Rural North area is recorded in the RNOT Plan as mixed, with an established agricultural and forestry base, mineral working and waste management, distribution and transport, light industrial and small businesses and military activities. The agricultural use is progressively diversifying into the service and tourism industries.

25.3.13 Minerals can only be worked where they are found and there are a number of mineral extraction sites in the area. In the local area there are clay resources (e.g. ENRMF), limestone (e.g. Collyweston Quarry, Cross Leys Quarry, Ketton Limestone and Cement Works, Thornhaugh Quarry and Cooks Hole Quarry). Quarries are the source of the limestone and ironstone that provides the distinctive building stone used in the construction of the surrounding villages. While not necessarily a popular element of the rural environment quarries are an intrinsic part of the historic landscape and economy of the area. Their on-going operations are necessary, among other things, for the restoration and maintenance of existing properties and places of worship in the area as well as building new homes in the local vernacular. The use of residual waste to restore quarries is a sustainable solution and one of the primary options for bringing exhausted mineral workings back into beneficial use with the consequence that landfilling is an inherently rural activity. In the vicinity there are several landfill sites including Collyweston Quarry, Cross Leys Quarry and Thornhaugh Quarry. These sites provide services to the local authority, businesses and the construction industry contributing to the local infrastructure and economy.

25.3.14 As described in the Planning Statement which accompanies this application, the site is located in an Area of Tranquillity as identified in Policy 3 (Landscape Character) of the North Northamptonshire Joint Core Strategy⁸⁴. The Area of Tranquillity covers a wide area to the south of the A47 and includes the current ENRMF site as well as the nearby Collyweston Quarry, the Howards Haulage Yard on Stamford Road and the Haulage Yard located within Collyweston Great Wood to the north of ENRMF.

25.4 Assessment of effects on health

25.4.1 As explained in the introduction to this Section, the assessments of the impacts which are relevant to public health that are presented under specific sections of the ES are summarised here. An assessment of the impacts of the wider determinants of health as identified by PHE is then presented for each of the factors identified in the screening process set out in above.

Aspects assessed in earlier sections of the ES

Impacts on human health (Section 12), air quality (Section 21) and water quality (Section 17)

25.4.2 Assessment of the impacts associated with emissions of contaminants and radiation to air and water as a result of the waste management, treatment and landfilling activities are considered in Sections 12 (impacts on human health), 17 (water resources) and 21 (air quality) of this ES. As the waste management activities at the site are and will continue to be the subject of Environmental Permits, the assessment of risks including the identification and assessment of exposure pathways with the potential to affect the health of people is an integral part of the pollution control regulatory function and is reviewed by the Environment Agency as part of the permit application process.

25.4.3 The potential is assessed for the exposure to contaminants of people who are nearby residents and members of the public who live and work in the vicinity

⁸⁴ North Northamptonshire Joint Core Strategy 2011-2031. Adopted July 2016.

of the site or may use the facilities close to the site such as footpaths. The effect on surface water and groundwater quality is assessed in order to determine the impact if contaminants are present in the water and these water resources are used by people. Site visitors and workers are protected in accordance with Occupational Health legislation and therefore the impacts on these people are not assessed in the impact assessment reported in this document. Nevertheless the site is operated at all times to protect the health of those working at the site and the site workers will be closer to the waste itself and to emissions from waste handling and treatment processes on a day to day basis. As the health of the site workers is protected by the design and operation of the site it follows that the health of all those living and working beyond the site boundary will also be protected as they are further away from the site during the operational period.

25.4.4 At the design stage for all waste management facilities including landfill and treatment facilities such as those at ENRMF potential contaminant or radiation exposure pathways are considered where relevant and containment design and operational methods are developed to eliminate or minimise exposure pathways hence to protect human health and the environment. These mitigation measures form an inherent part of the site design and operational controls. Monitoring schemes are designed and implemented to confirm that the design, construction and operating methods are effective in eliminating or controlling exposure pathways. The site construction and operational aspects that remove or minimise exposure pathways are described in Sections 5, 6 and 7 of this ES. The main potential exposure pathways which are examined to assess the risks to human health from contaminant and radiological emissions are presented in Tables ES 11.1 and ES 11.2 respectively. The assessments cover the operational and post operational period of the site together with the period in the long term when there is no further management of the site and the Environmental Permit has been surrendered. The situations assessed include normal operational circumstances together with unlikely events and accidents. The assessments are based on conservative assumptions.

- 25.4.5** The risks relating to the treatment of waste and the potential for contaminant emissions associated with the disposal of hazardous waste are assessed qualitatively except for the assessment of emissions to water which are assessed quantitatively. Quantitative risk assessments are carried out to assess the effects of the disposal of LLW. The level of detail in the assessments presented in this document are intended to be appropriate to demonstrate the land use consequences of the proposals. The applications for the Environmental Permits for the extension areas are submitted with detailed risk assessments and will be subject to detailed review by the Environment Agency.
- 25.4.6** Emissions from the site are controlled so that during the operational period they meet criteria at the boundary of the site that are protective of human health and the environment. The assessments for the period following the restoration of the site also consider the impacts on people using the site for recreation. The exposure criteria comprise standards or guidance levels set by the government which are protective of human health. The measures that will be used to control both point source and fugitive emissions are regulated through the Environmental Permits and emission thresholds will continue to be specified in the Environmental Permits based on standards, guideline values or health-based values. As emissions will be maintained below the levels which are protective of human health and the environment it is assessed that there will be no significant impact on the environment or the health of people living adjacent or near to the site or visiting the site following its restoration.
- 25.4.7** The ENRMF will continue to be monitored and regulated to confirm that it is operating in compliance with all appropriate international and national health and safety standards. Environmental monitoring during the operational and aftercare phases while the site is managed will check that the levels of contaminants and radiation in a range of potential exposure pathways such as landfill gas, air emissions, leachate, surface water, groundwater and dust will not exceed the environmental thresholds and radiation dose criteria that are

set for the site. Samples are taken to an agreed programme specified in the Environmental Permits and follow protocols set by the Environment Agency, with the resulting monitoring data reported to it. The monitoring regime provides assurance that the site is performing as expected and that the design, construction and operating standards of the site are effective in eliminating or controlling any exposure risks.

- 25.4.8** The assessments demonstrate that the proposed development will be operated to minimise and control the potential for direct effects on health such that they do not present an unacceptable risk. The review of the data available on the indices which provide an indication of the general health and status of the population in the area in which the site is located do not identify any specific vulnerabilities which need to be taken into account in the assessment.

Transport and traffic (Section 19)

- 25.4.9** The numbers of HGVs using the local roads and their effect on road safety, air quality and congestion can have a direct and indirect effect on health and wellbeing. A Transport Assessment for the proposed development has been prepared and the findings are presented in Section 19 of this report. Calculations have been carried out to estimate the potential change in HGV movements associated with the proposed development. It is estimated that the maximum number of movements (a vehicle travelling into and out of the site counts as two movements) associated with the proposed development is 232 per day which is an increase of 36 HGV vehicle movements per day compared with those estimated and assessed as part of the currently consented site activities. The site operates between the hours of 0700 and 1730 during the week, which equates to a 10.5hour operating period which would result in an hourly increase of 4 vehicle movements.

- 25.4.10** With respect to highway safety and the impacts of vehicle emissions, the traffic assessment protocol identified by Highways England and discussed in Section 19 of this ES identifies that an assessment of the strategic road network is required if the development proposals result in an increase of 30

trips through a junction in either of the morning or evening peak traffic hours. As the proposed development will result in four trips for either the morning or evening peak traffic hours no further assessment is required in accordance with the protocol.

25.4.11 The safety of the road has been reviewed based on accident data and it is concluded that the proposed development will result in a negligible change in trips which is not expected to result in an impact on road safety on Stamford Road or the A47.

25.4.12 The potential impacts on air quality associated with the increase in traffic as a result of the proposed development have been assessed. As explained in Section 19, under the IAQM/EPUK guidance⁸⁵ a traffic air quality assessment is necessary only if there is a change of HGV flows of more than 100 Annual Average Daily Traffic movements. As the change in HGV movements is well below this threshold (an increase of 36 HGV movements per day) it is considered that there will be no significant impact on air quality and therefore health as a result of the traffic associated with the proposed development.

25.4.13 The record of complaints relevant to traffic which have been received at the site over the last five years have been reviewed along with the record of how the comments have been addressed. In summary, there were no complaints up to and including 2019 and there were seven complaints in 2020 and two in the first six months of 2021. The complaints relate to the condition of the road surface, to the perceived presence of mud on the road and to queuing lorries. The records show that Augean are actively managing their operations to reduce any perceived or actual impacts associated with traffic. The active management of the site and responses to complaints can be effective in reinforcing confidence that the site activities are well controlled.

25.4.14 No other developments in the vicinity of the site have been identified which may result in a cumulative impact on Stamford Road. The changes to the

⁸⁵ Institute of Air Quality Management (2017) *Land-Use Planning & Development Control: Planning For Air Quality* <http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf>

traffic flows on the A47 as a result of the proposed development are substantially below the normal daily variation of 5% therefore any cumulative effect is negligible. Enquiries have not identified any planned significant developments of a type or at locations which would affect the conclusions regarding the impacts resulting from traffic associated with the site.

25.4.15 The accessibility of the site to those who work on the site by modes other than by car including cycling and walking and the use of public transport, is considered in the transport assessment. The dominant traffic associated with the site is HGVs needed for the transport of waste and clay materials; there are few trips associated with the current or proposed development which could take place by other means. There are no pavements or cycleways on the length of Stamford Road between the site access and the A47 and there are no regular bus services which go past or close to the site. This reflects the rural location of the site. The accessibility of the site by sustainable modes is limited. Site staff could cycle to work but none live in the local villages. Most of the staff live within a 10 mile radius of the site with the majority in the Peterborough area and a few from Corby, Oakham and Stamford. There are limited opportunities therefore to improve non-car modes of access to the operational site.

Noise and vibration (Section 20)

25.4.16 Environmental noise can cause stress and disturb sleep, which over the long term can lead to a number of adverse health outcomes. The National Policy Statement for Hazardous Waste and the Noise Policy Statement for England (NPSE)⁸⁶ sets out the government's overall policy on noise. Its aims are to:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and

⁸⁶ DEFRA, *Noise Policy Statement for England*. 2010

- contribute to the improvement of health and quality of life.

25.4.17 In order to determine the potential impacts of noise and vibration associated with the proposed development, an impact assessment has been prepared and the findings are presented in Section 20 of this ES. The results of the assessment are compared with standards for noise rating levels which are considered unlikely to cause significant disturbance.

25.4.18 In order to consider the worst case scenario in the noise impact assessment the noise level predictions have been calculated with the combinations of plant working at the closest point to the receptor location. The predictions are worst case scenarios which may be of relatively short duration. The predictions indicate the potential highest LAeq,1h (free-field) noise level to which a particular property or group of properties may be exposed during the operations at the site. The worst-case situation may occur intermittently over the lifetime of the site, but longer term noise levels perceived outside of the site boundary will be significantly less under normal situations than the calculated predicted levels. The site will only be operational during the day but there are some background operations such as pumps and generators which will continue to operate during the night.

25.4.19 The worst case assessment demonstrates that the rating level is estimated to be up to 3dB above the daytime background sound level depending on the assessment location. Night-time rating levels are estimated to be at least 5dB below the background sound level. As explained in Section 20 it is stated in BS 4142 that where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact. A difference of around +5 dB is likely to be an indication of an adverse impact. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

25.4.20 The potential noise levels associated with the proposed development are not expected to exceed the daytime background level by more than 10dB as

recommended in the Planning Practice Guidance⁸⁷ nor exceed the recommended maximum daytime limit of 55dB. Night-time noise levels during night-time periods are expected to remain well within the recommended 42dB limit. When noise associated with the proposed development is considered against this guidance, it is demonstrated that the potential noise impacts are not likely to be significant.

25.4.21 To inform the assessment of the baseline noise environment on the public right of way located closest to the site, was an assessment of the acoustic environment was carried out at a number of locations along Footpath MX15 and MX 13 which passes through an area of woodland in The Assarts to the west of the proposed western extension. The footpath lies approximately 100 metres from the proposed western extension boundary at its closest approach. Assessments were carried out at three locations to quantify and characterise the acoustic environment in this area. The observed character of the noise environment at each monitoring location included audible road traffic noise and birdsong at all locations with activities at Collyweston Quarry or the existing ENRMF site also audible depending on the location.

25.4.22 Whilst operations in the proposed western extension would bring noise-generating activities closer to footpaths in Fineshade Woods including the Assarts, the closest footpath (Footpath MX15) will still benefit from a minimum 100 metre buffer zone of dense forestry with most of the footpath located at much greater separation distances. The continued implementation of standard noise measures would minimise any potential adverse impacts. Although the noise level from ENRMF may increase during certain stages of the proposed development it is considered that the acoustic environment along the footpaths in the area of tranquillity will remain unchanged. Birdsong and road traffic noise will remain and the operations at Collyweston Quarry and ENRMF will range from audible to not-audible depending on the location.

⁸⁷ *Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government. March 2014.*

25.4.23 The potential impact of noise impacts from the additional HGV movements associated with the proposals has been considered. In general terms a change in road traffic noise of 1dB is typically considered to be perceptible and is approximately equivalent to a 25% increase in traffic flow. The percentage of increase in HGV movements to and from the site that are associated with the proposed development will be approximately 18% which is significantly lower than the 25% change considered necessary to cause a perceptible change in HGV traffic noise. The potential increase in traffic noise associated with the proposed development therefore is considered to be not significant.

25.4.24 It is considered that there will be no significant or unacceptable adverse noise impacts at noise sensitive locations resulting from the proposed development including the current ENRMF site. Noise mitigation has been included into the design of the development to reduce to a minimum any potential noise emissions associated with the operation of the site.

Amenity (Section 22)

25.4.25 An assessment of the potential effects on amenity of dust, mud on the road and lighting are presented in Section 22 of this ES. An assessment of the potential for odour impacts is considered in Section 21 of this ES.

25.4.26 Based on the qualitative assessment of the proposed activities presented in Section 22, it is concluded that without appropriate management there is the potential for a negligible to moderate adverse effects associated with impacts from dust on receptors within 400m of the site boundary. As a standard operating measure at ENRMF good practice, effective dust management controls will continue to be implemented at the site to minimise the potential for impacts associated with dust.

25.4.27 Regular boundary monitoring for deposited dust is carried out at the site as specified in the Environmental Permit. The monitoring data for the last five years has been reviewed and the data show that on the limited number of

occasions in 2018 and in 2020 when the permit threshold of 200mg/m²/day was exceeded this was as a result of agricultural activity on neighbouring fields.

25.4.28 A review of the complaints records for the previous five years show that there was only one complaint regarding dust which was received in August 2020 and this related to concerns regarding the potential for dust generated from mud on the road. It is concluded that dust emissions have been and will continue to be controlled effectively using well tried and tested methods to a standard such that it is unlikely that there will be significant dust emissions from the site.

25.4.29 In order to minimise the potential for mud on the road, the wheel cleaning facilities at the site will continue to be used by all HGVs before leaving the site onto the public highway. The access road from the wheel wash to the highway is hard surfaced which minimises the potential for mud and debris to be tracked onto the road network. The drainage improvements which are being installed at the site access during July and August 2021 will minimise the potential for silt laden runoff to run onto the highway. The improvement of the drainage at the site entrance will minimise further the potential for runoff of silty water from the site road thus reducing concerns that the visual evidence of silty water may reflect mud on the road and poor site controls.

25.4.30 The site internal access road will continue to be cleaned regularly by a road sweeper and maintained in good condition and the surface of Stamford Road will continue to be cleaned regularly using a road sweeper. Based on the wheel cleaning facilities and the proposed cleaning and maintenance regime the risk of nuisance from the proposed development associated with mud and debris on the local road network is low.

25.4.31 It is considered that there will not be an unacceptable impact on amenity as a result of the continued use of lighting as part of the proposed development. As is the case currently, with the exception of security lighting the lighting will only be used when the site is operational and will be directed downwards to

minimise the visibility of light. A review of the complaints records for the previous 5 years show that there were no complaints regarding lighting at the site therefore there is no evidence that lighting at the site gives rise to concerns.

25.4.32 Odour emissions may be generated from the importation and landfilling or treatment of odorous wastes. The hazardous wastes, LLW and wastes for treatment which are received at the site contain minimal quantities of putrescible material which mean it is unlikely that significant odorous emissions will be generated by the biodegradation of organic matter in the imported wastes. Some industrial wastes may contain odorous chemical contaminants and Augean implement an odour assessment as part of their pre-acceptance waste checks and waste with significant odour potential will not be accepted for delivery to the site. The site records for the last five years show that no complaints about odour emissions from the site are recorded. Due to the nature of the waste received at the site and the controls that will continue to be implemented, it is concluded that the odour management measures are effective and that there is no evidence that odour at the site gives rise to concerns. Accordingly it is considered that there will be no significant impacts associated with odour as a result of the proposed site activities.

The assessment of the impacts of the proposed development on the wider determinants of health and wellbeing

The impacts associated with the support of local services and facilities

25.4.33 The activities at the site support supports the use of services that are based locally wherever possible and there is no evidence that the presence of the site has a detrimental effect on the development of other businesses or the development of services and facilities. In addition, Augean provide a variety of forms of financial support to local community services and facilities, including green infrastructure.

25.4.34 The site uses a range of local services contributing significantly to the local economy. In the period January 2020 to December 2020 the existing ENRMF site spent approximately £787,000 on local services within Northamptonshire and/or a 15 mile radius of the site. A summary of the local services supported in the period January 2019 to December 2020 is presented in Table ES23.1.

25.4.35 It may be of concern to local residents and businesses that the continued presence of the site accepting hazardous waste and radioactive waste may discourage companies from investing in the area. It may be argued that the community around ENRMF has not enjoyed the economic benefits of the employment and services of communities living in proximity to the businesses that generate hazardous waste or to nuclear power stations. However the local community together with the rest of the nation has enjoyed the socio-economic benefits of the products of those businesses and of reliable power supply for the past 60 years. As explained in the other sections of this ES, the physical presence of the ENRMF facility in the landscape has a limited impact due to its relatively small size and well contained location and the environmental impacts are well controlled.

25.4.36 While the presence of the site may be evident from the lorry traffic on Stamford Road there is a negligible effect on local villages from operations at the site. The site is visually well screened, it is not noisy and its presence is absorbed in the surroundings. The presence of the treatment and landfill operations at the site have not stopped other business or housing developments in the vicinity from applying for and being granted planning permission. The area around the site continues to have a thriving rural economy. Since the current DCO was granted in 2013 a number of applications have been submitted for dwellings in Kings Cliffe together with extensions to existing dwellings as well as tourism facilities such as a caravan and camping facility near Kings Cliffe. These applications indicate that the continued operation of ENRMF as an integrated waste management facility with a hazardous waste and LLW landfill and a waste treatment and recovery facility has had no significant adverse

effect on these nearby developments and the associated local economy and that people have confidence to make their homes in the local area.

25.4.37 Contributions are made by Augean to local communities for a wide range of uses including the provision of opportunities for the regeneration, creation and maintenance of community facilities as explained in Section 23 of this ES.

25.4.38 Since 2004 Augean have invested more than £4.5 million into the local community through the Landfill Tax Credit scheme from the ENRMF and Thornhaugh Landfill Sites. The Landfill Tax Credit scheme allows Augean to give to the local community a proportion of its landfill tax obligation which was £432,000 in 2020.

25.4.39 Projects within a 10 mile radius of the site may apply for grants which are allocated by community representatives on the Augean Environmental Association. In 2020 21 projects were given grants for between £4,000 and £50,000. The projects included upgrades to halls, churches and sports facilities and recreation ground improvements. The full list is presented at Table ES 23.2 and includes the support of a number of green space facilities including urban green space.

25.4.40 One key constraint of the Landfill Tax Credit scheme is that the funds cannot be used to pay for salaries. As part of the planning consent and Development Consent Order for the deposition of LLW at the site Augean entered into a Section 106 legal agreement to set aside for the community £5 per tonne of LLW deposited at the site to be deposited into a fund for the community. This money is not subject to the use restrictions for Landfill Tax credits and is available for uses other than capital expenditure including the payment of salaries hence this fund overcomes one of the principal constraints in providing support to the development of village services. This commitment will be continued for the future deposition of LLW if the DCO is granted. This fund has been used to fund community services such as after school clubs. Since 2011 the LLW community fund has produced over £197,000 and in 2020 this fund raised £72,500 for the local community. The LLW community fund has

been administered to date by Northamptonshire County Council and will now be administered by North Northamptonshire Council.

25.4.41 In addition Augean has directly funded a number of projects including £50,000 spent on improvements to the Kings Cliffe Sports Club House and improvements to Oundle Rugby Club and All Saints and St James' Church and contributions to the Kings Cliffe and Area Community Sports Project.

25.4.42 Funding provided from Augean has helped maintain services such as the Underground Youth Club, helped maintain many local facilities such as community halls and churches and notably provide significant financial support to the Kings Cliffe Active sports facilities which are recognised as an important local service in Rural North, Oundle and Thrapston Plan⁸⁸.

25.4.43 It is evident therefore that the current and proposed continuation of the activities at ENRMF provide significant benefits to local businesses and the community including the provision of community services and facilities which supports access to facilities and to green space. This support results in a tangible benefit to the wider determinants of public health identified by PHE.

The potential impacts associated with the provision of the new green space and recreational facilities.

25.1.1 The site will be restored to a mosaic of woodland with shrubby edges, flower meadow grassland, scattered trees, hedgerows and waterbodies. The woodland blocks with shrubby edges together with the scrubby areas will develop and spread to form naturally regenerated woodland with glades and rides. The developing habitat will complement and link existing habitats, particularly the adjacent woodlands to give a greater area of woodland, with habitats also for amphibians, reptiles and invertebrates, including butterflies. A watercourse will be formed across the central section of the western part of the

⁸⁸ East Northamptonshire Council: Rural North, Oundle and Thrapston Plan. Adopted July 2011

site with small ponds created to develop as wet woodland. Waterbodies will be incorporated into the design at locations at the base of the raised landfill areas.

25.1.1 There is no public access to the site currently or to the agricultural fields in the proposed western extension. Public access to the restored site is included in the restoration scheme. As shown on the Restoration Concept Scheme (Figure ES9.1) a maintenance access track and permissive footpaths will be developed. The paths provide the potential for future links with Footpath MX15 to the west of the site which would provide connectivity with the wider rights of way network.

25.1.2 The provision of permissive footpath routes on the restored site will open the site for public access. Due to the rural location and in order to maximise accessibility following requests made during public consultation, a car park will be provided at the site entrance. While the site is accessible by cycling from the nearby villages, the provision of a car park will improve accessibility for future users who may not be able to travel by bike. Inclusion of a car park in the restoration design will allow a wider range of potential users to gain physical access to the green space which will be created.

25.1.3 The future land use of the restored site is designed to maximise the quality of the natural environment at the site and the adjoining woodlands. It is increasingly recognised that green space such as parks, woodlands and fields are an important asset for supporting health and wellbeing. Evidence^{89,90} shows that living in a greener environment can promote and protect good health, and aid in recovery from illness and help with managing poor health. People who have greater exposure to greenspace have a range of more favourable physiological outcomes. Greener environments are also associated with better mental health and wellbeing outcomes including reduced levels of depression, anxiety, and fatigue, and enhanced quality of life for both children and adults. Green space can help to bind communities together and reduce

⁸⁹ Public Health England (2020) *Improving access to greenspace. A new review for 2020.*

⁹⁰ Forestry Commission (2011) *Greenspace design for health and well-being*

loneliness. It is also becoming increasingly evident that time spent in 'blue space' (near water) may also improve our mental and physical health.

25.1.4 Some of the positive effects of the natural environment may be increased when there are higher levels of species or ecosystem diversity⁹¹. Habitats will be enhanced and created during the development which will be intertwined with opportunities for access. Biodiversity net gain is forecast to be well in excess of 110% as explained in Section 13 of this ES. A scheme for the long term stewardship and landscape and ecological management and monitoring of the site will be implemented through the DCO.

25.1.5 It is considered that the restored site will bring significant positive health and wellbeing impact to the public through the provision of green infrastructure and areas of open water into a new area which is developed to maximise diversity and to be open and accessible.

The potential for impacts of the proposed development on users of the existing natural environment.

25.4.44 The potential for impacts of the proposed development on users of existing natural environment including the facilities, open space and recreational opportunities, including in particular rights of way, in Fineshade Woods and The Assarts have been considered in the assessments presented in this report.

25.4.45 The site is located adjacent to Fineshade Wood and The Assarts along the western boundary. As explained in above the site is located in the Kings Cliffe Hills and Valleys Landscape Character Area which is recognised in local policy as an Area of Tranquillity. The Area of Tranquillity covers a wide area to the south of the A47 and includes the current ENRMF site as well as the nearby Collyweston Quarry and the two haulage yards on Stamford Road, and

⁹¹ Aerts, R. and others. (2018). Biodiversity and human health: Mechanisms and evidence of the positive health effects of diversity in nature and green spaces. *British Medical Bulletin* 127:5-22

Fineshade Wood and The Assarts. The policy⁹² states that the tranquillity in the area should be preserved by minimising light and noise pollution and minimising the visual and traffic impacts of development.

25.4.46 Notwithstanding that the existing operational site already is located in the designated area of tranquillity, the site operations are designed to minimise noise and light and the visual and traffic impacts. The closest footpath to the site is footpath MX15 which is approximately 100m to the west of the boundary of the application area at its closest point (Figure ES3.3).

25.4.47 Views of the existing ENRMF have been available for many years from an approximately 50m stretch of Footpath MX15 to the west of the site, which passes from north to south through a gap within the woodland. The proposed development would bring the operations further towards users of this footpath and would mean that visual disturbance is evident for a longer duration and until operations in this part of the site are complete. However, due to the woodland blocks either side of the view, which extend right to the edge of the proposed western extension, views of the site are restricted through a narrow window and views of most of the western extension area are not available so the vast majority of the proposed works would be out of view. Once footpath users are back within the woodland itself, there would be no or very obscured views of the proposed works due to the mass of intervening woody and (in summer) leafy vegetation. Any temporary impacts on amenity users of this part of Fineshade Wood, including on the tranquillity of the setting would therefore be transitory, limited to a short part (approximately 50m) of a long footpath walk (approximately 1.5km for MX15 in Fineshade Wood). Footpath MX15 leads to MX18 and other footpaths beyond. Footpath MX18 is not located in woodland and is close to the active mineral extractions at Collyweston Quarry therefore the current and proposed operations at ENRMF are not entirely out of keeping with the other activities in the vicinity and the current area of tranquillity. In addition, operations in the area closest to

⁹² Policy 3 of the North Northamptonshire Core Strategy 2011-2031 adopted July 2016

footpath MX15 will only take place while the nearby phases are being prepared, filled and capped; the area will not be operational for the whole duration of the proposed DCO. The overall restoration proposals as explained above will bring improved opportunities for the amenity use of the site.

25.4.48 Whilst operations in the proposed western extension would bring noise-generating activities closer to footpaths, the closest footpath (Footpath MX15) will still benefit from a minimum 100 metre buffer zone with most of the footpath located at much greater separation distances. There are no numerical threshold values which are set in the guidance relating to noise impacts for public amenity areas including footpaths. The continued implementation of standard noise measures will minimise any potential adverse impacts. As explained in Section 20 of this ES, although the noise level from ENRMF may increase during certain stages of the proposed development it is considered that the acoustic environment along the footpaths in the area will remain unchanged. Birdsong and road traffic noise will remain and the operations at Collyweston Quarry and ENRMF will range from audible to not-audible depending on the location. Overall it is considered that the noise associated with the proposed western extension will not have a significant impact on the tranquillity of the area.

25.4.49 The site is not operational at night and the use of lighting is restricted during hours of darkness to that needed for operational areas during the shorter winter days and for site safety and security. If visible at all the light would only be visible from the 50m gap on footpath MX15, hence is transitory. As it is rare that the footpaths would be used during the hours of darkness it is unlikely that light impact would be significant. Notwithstanding this, outside operational hours there will be no need for lighting on the western extension area as all built infrastructure including the waste treatment and recovery facility and site offices will remain in their current locations in the eastern area of the extended site and screened from view. It is considered that there would not be an unacceptable impact on amenity as a result of the continued use of

lighting at the site hence it is concluded that there will be no impact on the tranquillity of the area as a result of lighting.

25.4.50 As explained above the increase in traffic associated with the proposed development is low (four HGV movements per hour). The traffic will continue to use the existing ENRMF access and Stamford Road which are distant from the nearest footpath. Leisure traffic seeking to access Fineshade Wood Visitors' Centre would travel on the A43 and not via Stamford Road and therefore would be unaffected by traffic associated with the site activities.

25.4.51 It is concluded that the impacts of the proposed development on users of the nearest area of existing natural environment which is used for leisure and recreation, Fineshade Wood and The Assarts, will be minimal and will not result in a significant change in the character of the tranquillity in the area.

The impact of the proposed development on employment and training opportunities and local business activity.

25.4.52 The extension of the operating period and increase in the throughput of the waste treatment and recovery facility at ENRMF together with the extension of the landfill into the western extension area will provide security for the treatment and recovery of waste and for the disposal of residues generated by waste treatment processes including the Augean waste management business. The continued availability of hazardous waste and LLW landfill capacity facilitates safe disposal of hazardous wastes and LLW for local, regional and national businesses. In the event that the facility was no longer available these businesses would need to transport the waste over greater distances to the other suitable sites resulting in additional costs to those businesses and the UK economy.

25.4.53 The proposed development will help secure the continued employment of the 23 full time staff as well as additional agency staff who currently work at ENRMF and 10 support staff based at the Head Office in Wetherby. The total amount that Augean spends on wages per annum for the existing ENRMF site

is approximately £590,000. The site employs almost entirely skilled staff either with appropriate scientific degrees or specialised plant operating skills. Most of the staff live within a 10 mile radius of the site with the majority in the Peterborough area and a few from Corby, Oakham and Stamford.

25.4.54 Augean works with educational establishments including Kings Cliffe Endowed School where presentations about waste management activities have been given and competitions organised. Placements and field trips have been carried out and assistance with careers fairs has been provided on request from schools and individuals. Augean also host visits from Nottingham and Northampton Universities from time to time and encourages local residents to attend site engineering days to see the cell containment construction works taking place and to speak to contractors and CQA engineers. Augean remains committed to continuing to contribute to education around topics related to their activities.

25.4.55 The proposed development therefore results in a beneficial impact on employment and training opportunities as well as supporting local businesses as explained above.

The potential for the proposed development to result in feelings of anxiety in people and communities living in the vicinity

25.4.56 The broad definition of health by the World Health Organisation provided at the beginning of this section emphasises that mental well-being is fundamental to achieving a healthy, resilient and thriving population. It underpins healthy lifestyles, physical health, educational attainment, employment and productivity, relationships, community safety and cohesion and quality of life. PHE has identified that Nationally Significant Infrastructure Project schemes can be of such scale and nature that they will:

'...impact on the overarching protective factors which are:

- *Enhancing Control.*

- *Increasing resilience and community assets*
- *Facilitating participation and promoting inclusion.'*

25.4.57 It is recognised that perceptions about the proposed development may increase the risk, for some people, of anxiety or stress and associated health effects. Often these perceptions are borne of misunderstandings relating to the development what it actually is and how it is designed, managed and regulated. In order to provide an opportunity for people to understand clearly the proposals and the controls that are in place together with the reality of the potential risks and impacts, Augean have expended and continue to expend considerable effort and resource to facilitate participation and promote inclusion as explained further below.

25.4.58 The proposals will not be permitted unless they are fully compliant with official guidance and criteria and the risk assessments demonstrate to the satisfaction of all the statutory technical consultees in particular the Environment Agency that the proposals do not present any unacceptable risks to human health or the environment. The site will continue to be monitored and regulated to confirm that it is operating in compliance with appropriate International and national health and safety standards. The primary role of the Environment Agency at the site is to satisfy themselves before the proposals are granted Environmental Permits and on an ongoing basis thereafter that the operations satisfy all legal, policy and regulatory considerations to ensure that people and the environment are properly protected. On this basis it is concluded that there is no objective reason for significant indirect effects on health as a result of anxiety.

25.4.59 There is no evidence based on the extensive ongoing engagement and communications with people and their representatives in the area around the site that the day to day activities at the site currently give rise to consistent significant concerns or anxiety regarding health or environmental impacts.

The potential impacts of the current and proposed community engagement on the acceptability of the proposed development in the context of wellbeing.

25.4.60 The ongoing engagement with the community as part of the routine site operations, the inclusive approach to community engagement as the plans for the proposed development were being developed and the proposed continued means of including and engaging with the community are discussed in Section 23 of this ES and in the Consultation Report submitted with this application (PINS document reference 4.1) and are summarised here. Augean has for many years, and will continue to engage with the local community through the Kings Cliffe Liaison Group (KCLG) and, when Covid 19 related restrictions allow, through the resumption of regular site open days including during engineering works to show how engineering of the site is undertaken, the provision of newsletters and maintenance of a register of stakeholders who are kept informed of site activities and new developments.

25.4.61 The KCLG which includes representative from a number of local Parish Councils has been kept up to date with all the stages in the programme for this application to extend the area of the site. In order to provide regular reassurance that the site is operating as anticipated, Augean has for many years and will continue to make available through publicly accessible media such as the company website site monitoring data in a simplified and accessible form. Augean will also continue to make public data from passive dosimeters worn by site workers at the site to reassure the local community that the recorded radiation on site is within permitted levels.

25.4.62 As explained above, where the concerns of local residents or third parties are strongly felt they have the potential to give rise to anxiety. In order to allay the concerns and to provide local residents and other interested third parties with the opportunity to understand fully the facts and potential impacts regarding the proposals Augean has carried out extensive consultation prior to the finalisation of the proposals and submission of the application for the DCO. In some cases, anxiety may result from concerns arising from simple

misunderstanding, misconceptions or misinterpretations of technical information. Misleading information presented in the media or circulated locally can in itself result in an increase in concerns without there being any factual basis for that concern. The purpose of the detailed consultation process as well as the ongoing community engagement programme is to understand the nature and source of the concerns of the public and to allay the concerns based on the facts available or, where possible and practical, to implement changes or adaptations to the development proposals or operational matters to address the concerns.

25.4.63 The following continued commitments for community engagement and support are proposed by Augean:

- To continue to make available community funding from the Landfill Tax Credits as permitted by Government legislation.
- To continue to provide contributions to a community fund based on the quantity of LLW inputs to the landfill.
- To continue to use and give preference to of a range of local services.
- To continue to make a contribution of funding to the Local Highway Authority for the maintenance of Stamford Road.
- To continue to take part in and support educational activities and promotion of understanding of waste management through the open door policy, regular open days, periodic community newsletters, the reception of visits from educational establishments and presentations to stakeholders.

25.4.64 Through consultation events, open days, presentations, newsletters and information on the company website including site monitoring data, Augean have and continue to inform and promote understanding of waste management in respect of policy, strategy, technology and impact. The company is committed to continuance of its public engagement activities. The

company will continue to review and respond in a meaningful way to any concerns or complaints that are raised and to respond to the initiator with feedback on how their comments have been addressed. Low numbers of complaints have been received historically and to date. The numbers of comments or complaints that are received will be monitored as this provides an indication of the level of concern in the community.

25.5 Conclusions

25.5.1 A proportionate assessment of the anticipated direct and indirect effects on health and wellbeing has been carried out with reference in particular to guidance provided by PHE. The proposed development includes an ongoing sequence of mineral extraction, landfill cell construction, landfilling, capping and restoration therefore the assessments include impacts during the construction, operation and restoration (akin to decommissioning for typical built structures) of the proposed development. The potential for direct impacts on health have been assessed as well as the potential for impacts on the wider determinants of health including wellbeing. Consideration has been given to the avoidance or mitigation of potential negative impacts on health and wellbeing, as well as to the design of the development to maximise potential positive benefits on health and wellbeing. It is concluded that the impacts from the proposed development on the health of people and the community including impacts on the wider determinants of public health will not result in any significant negative impacts and will result in significant positive impacts.

26. Conclusions

26.1.1 The existing ENRMF site is an established operational landfill site which accepts hazardous waste and low level radioactive waste (LLW). The site also includes an established waste treatment and recovery facility. The ENRMF site is the subject of a Development Consent Order (DCO) which was granted in July 2013 and amended in June 2018 (the original Order). The original Order specifies the completion and restoration of the site by 31 December 2026. The facilities at ENRMF are an acknowledged part of the nationally significant infrastructure for the management of hazardous waste and LLW and as such it serves more than just a local need. In order to secure continuity of its operations and the provision of these specialist waste management facilities, Augean is submitting an application for a new DCO for an extension in the area and timescales for the operation of ENRMF including a proposed western extension and increasing the throughput of the waste treatment and recovery facility.

26.1.2 An Environmental Impact Assessment (EIA) has been carried out of the proposal. Technical studies have been undertaken to establish the baseline environment of the application site and the surrounding areas and an assessment has been carried out of the potential impacts associated with the proposed development. The findings of the impact assessments are presented in this Environmental Statement (ES) which is submitted with the application for the DCO. This ES presents the likely significant environmental effects of the proposals identified in the EIA, the appropriate mitigation measures to be put in place where necessary and any residual effects. The extensive control measures that form an important and integral part of the proposals to prevent or minimise the effects of the proposed development on the environment and people are described in this report. In addition to a DCO, the operations at the site will be controlled through Environmental Permits which are regulated by the Environment Agency. The Environment Agency is the regulator with responsibility for pollution control and for ensuring the safety of the public and the environment as a result of the proposed development,

the Health and Safety Executive is responsible for overseeing the safety of the site workers and the Department for Transport is responsible for safety during transportation.

26.2 Alternatives

26.2.1 The options and alternatives that have been considered during the development of the proposals are explained. This includes assessment of the suitability of potential alternative sites as well as the existing ENRMF location. Consideration has also been given to alternative locations for the treatment facility within the footprint of the site. For the proposed location for the landfill site the alternatives considered are set out and the constraints are identified which affect and lead to the choices that have been made with respect to the design of the proposed operations, the containment engineering design, the restoration profile hence the void generated, the operational and management proposals and the design of the restored site.

26.2.2 The existing co-located treatment facilities and hazardous waste landfill and the nearby Augean Thornhaugh non-hazardous waste landfill provide substantial sustainability benefits as a result of the short distance for the transfer of treatment residues which cannot be reused for their final disposal. The extension of the existing site can be achieved using the existing site access and infrastructure including laboratory facilities as well as the existing suitably qualified and experienced workforce who are trained in the assessment and handling of hazardous waste and LLW. The existing ENRMF setting has been demonstrated to be suitable and to provide for the safe disposal of hazardous waste and LLW. The impact assessment sections of this report demonstrate that the proposed western extension also can be developed and operated without resulting in unacceptable impacts on the environment or human health. Accordingly, given that the proposed western extension is available to Augean, the development of an extension to the existing, established site rather than a site at a new location provides substantial sustainability, environmental, policy and cost benefits.

26.3 Population including impacts on human health

- 26.3.1** The potential for direct and indirect effects on the health of people living and working around the site has been assessed. The nature of the activities and the wastes accepted at the site will not change significantly and, while they will take place over a larger area overall, the active area of operations at any one time will not be significantly different to the currently consented activities. The potential impacts of hazardous waste and radiological effects on people and the environment have been assessed as part of the process for granting the original Order and Environmental Permits for the current hazardous waste and LLW landfill site and the waste treatment and recovery facility. The acceptability of the impacts associated with the hazardous waste and radiological effects of the current activities at the current locations has been confirmed by the granting of these consents. As part of the applications for variations to the Environmental Permits for the site to extend them to include the proposed western extension the detailed risk assessments have been reviewed, extended and updated as necessary.
- 26.3.2** The principles of the design of the engineered containment and the leachate and gas management infrastructure of the landfill site will remain and will be extended to the proposed western extension. The principles of the phasing of the landfilling and restoration activities will remain and will be extended to the proposed western extension. The methods of operation and control of the waste treatment and recovery facility will remain the same.
- 26.3.3** A number of possible exposure pathways which might have the potential to expose people to contaminants which might affect their health have been identified and are assessed through risk assessments including for routine as well as unexpected events (accidents). The full and detailed risk assessments that have been provided with the Environmental Permit applications will be scrutinised robustly by the Environment Agency and Environmental Permits will not be issued unless the Environment Agency is satisfied that the site can

be operated safely and that the health of those living and working at or near the site is protected.

26.3.4 The potential impacts associated with the continuation of the operation of the consented and extended landfill and waste treatment and recovery facility to 2046 are similar to those for the existing ENRMF operations but will be present over a longer time.

26.3.5 The ENRMF will continue to be monitored and regulated through Environmental Permits to confirm that it is operating in compliance with all appropriate International and national health and safety standards. Environmental monitoring during the operational and aftercare phases will include the levels of contaminants and radiation in a range of environmental media such as landfill gas, air emissions, leachate, surface water, groundwater and dust. Samples are taken to an agreed programme specified in the Environmental Permits and follow protocols set by the EA, with the resulting monitoring data reported to it. The results of the monitoring will continue to be made available on the company web site to provide confidence that the site is being managed effectively.

26.4 Ecology and biodiversity

26.4.1 The ecological requirements of the species already present and the information and recommendations of many consultees has been carefully considered and taken into account during the design of the development, mitigation measures and restoration scheme. Based on the proposed site design and mitigation measures together with the progressive restoration of the site it is concluded that the development can be undertaken with minimal impact on the ecological interest at and in the vicinity of the site. In the long term the new and enhanced habitats will provide a great benefit to all of the species present at and in the vicinity of the site and to the whole of the Rockingham Forest area.

26.4.2 Detailed mitigation and enhancement measures have been embedded into the site design to minimise the short term negative effects and maximise long term biodiversity gain. The scheme provides substantial habitat creation, restoration and connectivity opportunity, with the restoration plans seeking to revert the entire application boundary from primarily arable land to natural habitat. This is demonstrated by the 139.67% and 550.59% biodiversity net gain of habitats and hedgerows which is a 111.87% and 550.59% net change respectively. The proposals will provide a substantial biodiversity net gain of over 110% for habitats and 550% for hedgerows. There will also be a net gain in watercourses through the creation of Swallow Brook.

26.5 Landscape and visual effects

26.5.1 It is concluded that the most significant effect of the proposed development would result during the operational life of the site. However when considered in the context of the approved restoration plan the long term effect is not considered to be significant. It is concluded that the landscape has the capacity to absorb the changes brought by the operations in the proposed development without any unacceptable adverse effects on landscape features. The proposed restoration scheme would deliver positive long term benefits for landscape features in terms of vegetation cover, habitat creation and public access.

26.5.2 Whilst the site is not located in an area designated for its landscape quality or value the proposed extension area lies within an area of tranquillity. It is concluded that there would be temporary effects on the character and tranquillity within the proposed western extension during the operational phase of the development but any effects beyond the boundary would be transient. After the site is restored it is concluded that there would be beneficial effects on the character of the proposed western extension and tranquillity within the site would be returned to current levels.

26.5.3 It is concluded that while there would be significant though temporary visual effects for a very limited number of visual receptors at specific times during

the life of proposed development, the lack of any other notable visual effects reinforces the selection of the land to the immediate west as being appropriate for an extension to the existing ENRMF landfill. The proposed development would be restored in a manner in character with the surroundings and which would be visually appealing in the long term.

26.6 Soil resources and agricultural land classification

26.6.1 A total of 5.9ha of the proposed western extension falls within the definition of Best and Most Versatile agricultural land as set out in the relevant guidance. The site will be restored to grass and woodland for nature conservation purposes and will result in the permanent loss of the BMV agricultural land at the site resulting in a moderate adverse impact in accordance with the adopted significance criteria. The area of soil in the north of the site which is classified as BMV soil has been identified as having a high pH and calcium carbonate content and will be husbanded for use in developing the areas of the site to be restored as calcareous grassland. The loss of agricultural land in the western extension area, of which there is no shortage in Northamptonshire, is offset in the longer term by the biodiversity benefits which will result from the proposed restoration scheme at the site. All soils on the site will be managed according to an approved soils handling and management scheme which will result in a negligible impact on soils resources.

26.7 Archaeology and cultural heritage

26.7.1 The archaeological trenching investigation undertaken at the site confirmed the results of the desk based research and the geophysical survey. Two areas of the proposed extension area were identified as containing archaeological interest of only local value and an Archaeological Mitigation Strategy has been agreed. Prior to soil stripping in these areas a Written Scheme of Investigation will be prepared and agreed with the Local Planning Authority. There is no visual or contextual connection between the site and designated assets hence no mitigation is required. It is concluded that taking into consideration the baseline conditions and the nature of the proposed development together with

the proposed mitigation measures that there will be no residual effects on cultural heritage and archaeology.

26.8 Water resources

26.8.1 It is concluded that there will be no significant impact on groundwater quality or flows beneath the site or at receptors down hydraulic gradient of the site and no significant impact on surface water flows and quality including at springs and issues, in the Willow Brook, the Wittering Brook or the River Nene as a result of the development in the proposed western extension either singularly or cumulatively with the existing ENRMF. It is concluded that taking into consideration the baseline conditions and the nature of the proposed development together with the proposed mitigation measures that there will be no residual significant effects on surface water or groundwater flow or quality at or in the vicinity of the site.

26.9 Flood risk assessment

26.9.1 It is considered that due to the location of the site in Flood Zone 1 and the measures proposed in the surface water management plan that the proposed development can be undertaken without significant individual or cumulative adverse impacts on flood risk.

26.10 Transport and traffic

26.10.1 It is estimated that as a result of the proposed development HGV movements could increase by approximately 36 movements per day. It is considered, and has been agreed with Northamptonshire Highways and Highways England, that there will be no severe impact as a result of the proposed development. In accordance with the guidance no further assessment of impact is necessary. Existing obligations relating to the traffic routing agreement and the provision of an annual contribution to highways maintenance will be continued throughout the life of the proposed development.

26.11 Noise and vibration

26.11.1 The potential noise levels likely to be generated by the proposed development during construction and operation have been evaluated and assessed in accordance with the approved assessment methodology. It is considered that there will be no significant or unacceptable adverse noise impacts at noise sensitive locations resulting from the proposed development including the existing ENRMF. Noise mitigation has been included in the design of the development to reduce to a minimum any potential noise emissions associated with the operation of the site.

26.12 Air quality

26.12.1 Air quality data for the site has been reviewed and consideration has been given to the ongoing and proposed operations at ENRMF and their potential to cause a significant detrimental effect on air quality. During the construction, operational and post-operational phases the site including the extended areas will continue to be monitored in accordance with the Environmental Permits to confirm that the process control, landfill containment and gas extraction measures are effective. The hazardous wastes, LLW and wastes for treatment which are received at the site contain minimal quantities of putrescible material which mean it is unlikely that significant odorous emissions will be generated by the biodegradation of organic matter in the imported wastes. It is concluded that there will be no significant impacts associated with air quality as a result of the proposed site activities.

26.13 Amenity

26.13.1 The potential impact of the proposed development on amenity arising from dust, mud on the road and lighting has been considered. Subject to the proposed controls it is unlikely that there will be significant dust emissions from the site and there will not be a significant impact on air quality or PM₁₀ concentrations in the vicinity of the site as a result of the proposed development. It is concluded that dust emissions can be controlled to a

standard such that the development will not cause a significant impact with respect to nuisance relating to dust. It is demonstrated that nuisance from the proposed development associated with mud and debris on the local road network is negligible. There will not be any unacceptable impacts on amenity as a result of the lighting installed as part of the proposed development.

26.14 Socio-economic impacts

26.14.1 The proposed development represents a significant national and regional socio-economic benefit underpinning the need for the safe treatment of wastes and the safe disposal of hazardous wastes and LLW. It is evident that the activities at the site result in a positive contribution to the local economy and provide significant support to the function of Kings Cliffe village as a service centre.

26.14.2 It is concluded that based on the existing operations at ENRMF the proposed development will not give rise to any significant adverse socio-economic impacts on the local community and by the continued provision of safe, sustainable and cost effective waste management facilities will provide a beneficial socio-economic impact to local, regional and national businesses. The presence of the site and the Augean business will continue to result in support and contributions to the local community.

26.15 Climate change and disasters

26.15.1 The impact of the development on climate change and the vulnerability of the proposed development to climate change in addition to the vulnerability of the development to risks of major accidents and/or disasters has been considered. It is considered that the proposed development will have a limited impact on climate change with the biggest potential impact resulting from the release of greenhouse gasses from plant and machinery. It is concluded that the proposed development has limited vulnerability to climate change. It is considered that the proposed development is at very low risk of disasters

relating to manmade and natural disasters. The site is not located in an area considered to be potentially vulnerable to major natural hazards.

26.16 Assessment of the overall direct and indirect effects on health and wellbeing

26.16.1 A proportionate assessment of the anticipated direct and indirect effects on health and wellbeing has been carried out. The proposed development includes an ongoing sequence of mineral extraction, landfill cell construction, landfilling, capping and restoration therefore the assessments include assessments of impacts during the construction, operation and restoration (akin to decommissioning for typical built structures) of the proposed development. The potential for direct impacts on health have been assessed as well as the potential for impacts on the wider determinants of health including wellbeing. Consideration has been given to the avoidance or mitigation of potential negative impacts on health and wellbeing, as well as to the design of the development to maximise potential positive benefits on health and wellbeing. It is concluded that the impacts from the proposed development on the health of people and the community including impacts on the wider determinants of public health will not result in any significant negative impacts and will result in significant positive impacts.

26.17 Cumulative impacts

26.17.1 The cumulative impacts of all the aspects of the collective proposals have been taken into account in the assessments of impacts on people and the environment. It has been demonstrated that the proposed development will not have an unacceptable impact on any of the receptors that have been assessed in the Environmental Impact Assessment. It is considered that in combination there will not be any unacceptable cumulative impacts as a result of the proposed development.

26.18 Overall conclusions

26.18.1 Augean has carried out an Environmental Impact Assessment of the proposed development and technical studies have been undertaken to establish the potential effects of the proposed development. The assessments conclude that the proposed western extension to the existing ENRMF site can be undertaken in a manner that will not result in any significant negative impacts.

27. Glossary

Abstraction	The removal of water or gas from any source either permanently or temporarily.
Acoustic Environment	Sound from all sound sources as modified by the environment.
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road. The European Agreement governs the safety standards needed for the transport of hazardous materials by road. The Agreement was created following a United Nations Treaty.
Aerial Photographs (APs)	Photographs taken from the air and used to identify archaeological sites either by low light for upstanding monuments or by differential crop growth on sites within arable fields.
Aftercare	The steps necessary to manage the land following restoration including sowing and planting so that the quality of the land is at a satisfactory standard for the planned afteruse and that vegetation is sustainably established.
Agricultural Land Classification (ALC)	Provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The ALC system divides agricultural land into five grades (Grade 1 'Excellent' to Grade 5 'Very Poor').
Ambient Sound Level $L_{Aeq,T}$	Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.
Appraisal (archaeology)	Brief review (often with the planning framework) of the Sites and Monuments Records and Historic Maps etc. to decide whether a development application has the potential for archaeology. The appraisal may or may not become a condition.

Archaeological Monitoring	Archaeological monitoring involves an archaeologist being present in the course of carrying out development works (which may include conservation works), to identify and protect archaeological deposits, features or objects which may be uncovered or otherwise affected by the works. (See Watching brief).
Archaeology	The scientific study of past human life and change through analysis of material remains that humans have left behind (from the Greek root archaeo, meaning ancient and logos, meaning study).
Artefact	An object or part of an object which has been used or created by a human and provides physical clues to the activity carried out by humans in the area of discovery (This can range from Pottery, Metalwork, Woodwork, Worked Stones through to mortar samples).
As Low as Reasonably Practicable (ALARP)	A principle applied to ensure that all practicable steps are taken to minimise exposure to radioactivity or contaminants.
Assemblage (archaeology)	A group of artefacts found together in a single context such as a grave or pit.
Assemblage (ecology)	The list of all species recorded in a specified habitat over a specified period or on a specified date.
A-weighting	The human ear is most sensitive to frequencies in the range 1 kHz to 5 kHz. On each side of this range the sensitivity falls off. A-weighting is used in sound level meters to replicate this sensitivity and respond in the same way as the human ear.
Background Sound Level $L_{A90,T}$	The A-weighted sound pressure level of the residual sound at the assessment position that is exceeded for 90% of a given time interval, T, measured using time weighting F.

Baseline Scenario	A description of the state of the environment without implementation of the project.
Baseline Studies	Work done to determine and describe the environmental conditions of the baseline scenario against which any future changes can be measured or predicted and assessed.
Basic Noise Level (BNL)	A measure of source noise.
Becquerels per gram (Bq/g)	A Becquerel (abbreviated as Bq) is the unit for the specific activity of radioactive material. A Gram (abbreviated as g) is a unit of mass. A Becquerel per Gram (Bq/g) is therefore a measure of the concentration of radioactivity in a given mass of material.
Best Available Technique (BAT)	The available techniques which are the best for preventing or minimising emissions and impacts on the environment.
Biodegradable	Materials which will be broken down by bacteria or other biological means.
Biodiversity	Range of variation in living organisms including genetic variation and ecosystem variation.
Biodiversity Net Gain (BNG)	Calculated by assigning a value to all habitats which will be lost and new habitats to be created and expressing the latter as a percentage of the former. Scores are determined by a DEFRA metric, with a minimum percentage positive value to be made statutory for all future development.
Bioremediation	The use of biological methods, similar to composting, to remediate contaminated material, especially the addition of bacteria and other organisms that consume or neutralise contaminants in the soil.
British Geological Survey (BGS)	An independent research organisation providing expert geoscientific data, information and knowledge.
Bund	A low bank or wall of material used to store soils or to provide a visual or acoustic screen.

Chartered Institute for Archaeologists (CIFA)	An organisation for archaeologists in the United Kingdom that promotes professional standards and ethics for conserving, managing, understanding and promoting heritage.
Chartered Institute of Highways and Transportation (CIHT)	The professional body for highways engineers. CIHT represents and qualifies professionals who plan, design, build, manage, maintain and operate transport and infrastructure.
Collyweston Great Wood and Easton Hornstocks	Collyweston Great Wood is located to the north of the existing ENRMF and to the east of the proposed western extension. Easton Hornstocks is located to the east of Stamford Road. Parts of these areas are designated as a Site of Special Scientific Interest and National Nature Reserve.
Conservation Area	An area (usually urban or the core of a village) considered worthy of preservation or enhancement because of its special architectural or historic interest, "the character or appearance of which it is desirable to preserve or enhance," as required by the Planning (Listed Buildings and Conservation Areas) Act 1990.
Construction Exclusion Zone (CEZ)	The zone defines the limits of the land take from the development.
Construction Quality Assurance (CQA)	A system of managing construction to ensure specified standards are met.
Consultant	An expert providing objective and independent advice on the basis of professional standards.
Contractor (archaeology)	A person or organisation commissioned to undertake archaeological research and fieldwork either to a brief or general requirement for archaeological investigation set by a planning archaeologist.

Control of Major Accident Hazards (COMAH)	A regulatory system used to ensure the safe storage of certain hazardous chemicals.
Cropmark (archaeology)	An archaeological site no longer visible on the ground due to human activity such as the removal of upstanding remains (often by ploughing). The sites are recorded from Aerial Photographs by differential crop growth over buried features such as pits, ditches and walls.
Cultural resource	Broad definition of a feature, site, structure or other form of heritage element that is deemed to be of value to the country either on a local, regional or national level. As with all resources, this term relates to both the fragile and irreplaceable nature of the resource.
Cumulative impact	Also referred to as cumulative environmental effects and cumulative effects. Can be defined as changes to the environment caused by the combined impact of past, present and future human activities and natural processes.
Curatorial Archaeologist	An archaeologist with responsibility for management of the archaeological resource. The work of such organisations or individual is one of cultural resource management. County Archaeologists, Planning Archaeologists, Sites and Monuments Record staff, English Heritage, Historic Scotland and CADW are all within this role.
Department for Business, Energy and Industrial Strategy (BEIS)	A government department. In respect of the development the Department is responsible for nuclear wastes strategy.
Department for Environment, Food and Rural Affairs (DEFRA)	Government department in particular responsible for environmental standards.

Department of Communities and Local Government (DCLG)	A government department. In particular responsible for planning and decision making in respect of the application.
Designated landscape	Areas of landscape identified as being of importance at international, national or local levels, either defined by statute or identified in development plans or other documents.
Designation	The various pieces of legislation used for legally protecting particular assets from damage and destruction (e.g. heritage, ecological, environmental) are grouped under the term 'designation'
Desk-based Assessment. (DBA) (archaeology)	An assessment of both the known and potential archaeological resource within a specified area. A study is carried out on available sources such as Sites and Monuments Records, Map Evidence, Documentary Sources and Aerial Photographs. The study will provide a background for a decision to be reached on the potential archaeological resource in a local, regional, national context within the review area.
Development Consent Order (DCO)	The process for obtaining permission for developments categorised as Nationally Significant Infrastructure Projects legislated under the 2008 Planning Act.
Disposal	Emplacement of waste in an appropriate facility without the intention of retrieval.
Doline	Formed where the underlying limestone has dissolved and the overlying soil subsides into the cavity and leaves a depression in the landscape.
Dose	General term for a measure of the energy deposited by radiation in a receptor as a result of exposure to ionising radiation.
English Heritage (EH)	A charity that cares for over 400 historic monuments, buildings and places.

Environment Agency (EA)	The national environmental regulator.
Environmental Archaeology	The study of the interface between the environment of a locality and the human activity within the area, accomplished through the study of soils, plant and animal remains.
Environmental DNA (eDNA) testing	The analysis of a water sample (at a Natural England approved laboratory) for the presence of environmental DNA (eDNA) of a specific species which has been released into the water by the activities of the animal.
Environmental Impact Assessment. (EIA)	A process to assess the environmental implications of proposals.
Environmental Management System (EMS)	A documented system of procedures and processes by which businesses can ensure environmental standards are implemented effectively and seek continuing improvement. The system can be certified to the international standard ISO14001.
Environmental Permit (EP)	The authorisation issued by the Environment Agency when it is satisfied that a specified operation can be carried out without pollution of the environment or harm to human health.
Environmental Risk from Ionising Contaminants: Assessment and Management (ERICA) tool	A tool used to assess the radiological risk to terrestrial, freshwater and marine plants and animals.
Environmental Safety Case (ESC)	The document in which are reported the full risk assessments for the management of radioactive material at a facility.
Environmental Statement (ES)	The document that reports the findings of an Environmental Impact Assessment.
Equivalent continuous A-	Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval

weighted sound pressure level $L_{Aeq,T}$	T, has the same mean square sound pressure as a sound under consideration whose level varies with time.
Evaluation (archaeology)	A limited programme of non-intrusive and/or intrusive fieldwork, which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area. This may take the form of an intrusive investigation of a percentage of the site, geophysical or topographical survey. The results of this investigation will establish the requirements for any further work.
Excavation (archaeology)	Intrusive fieldwork with a clear purpose, which examines and records archaeological deposits, features and structures and recovers artefacts, ecofacts and other remains within a specified area or site. This will lead to both a further programme of Post Excavation and Publication and perhaps further excavation.
Existing ENRMF	This is the boundary of the East Northamptonshire Resource Management Facility Order 2013 as amended by the East Northamptonshire Resource Management Facility (Amendment) Order 2018 (the original Order). The existing ENRMF comprises the existing landfill facility and the existing waste treatment and recovery facility.
Exposure	The experience of coming into contact with an environmental condition that has a harmful or beneficial effect. Exposure can be either external exposure to sources outside the body or internal exposure due to sources inside the body.
Fieldwalking (archaeology)	A form of evaluation that provides details of surface features visible during a physical search of the site area and is a systematic observation of the ground surface during archaeological monitoring. The recovery of artefacts that

	may indicate periods of occupation is also an important part of this evaluation (also termed walkover survey).
Forestry England (FE)	An executive agency of the Forestry Commission, responsible for managing England's forests.
Free-field Level	The sound pressure level away from reflecting surfaces. Measurements made 1.2 - 1.5 metres above the ground and at least 3.5 metres away from other reflecting surfaces are usually regarded as free-field.
Geophysical Survey	A method of seeing beneath the ground surface using a number of methodologies, including Ground Penetrating Radar (GPR), Resistivity and Magnetometry. It takes a specialist to both use the field equipment and interpret the data. When used with topographic survey data the results can be very effective, though it is very dependent on soil and geological conditions within the search area.
Groundwater	Refers to all subsurface water as distinct from surface water. It is considered generally that groundwater is water which is in the zone of saturation and contained in porous soil or rock stratum (aquifer).
Habitats Regulations Assessment (HRA)	An assessment to test if a plan or project proposal could significantly harm the designated features of a European site.
Hazardous waste	Waste which has properties which may make it harmful to human health or the environment as defined in legislation.
Hectare (ha)	A unit of area of 10,000m ² equivalent to 2.47 acres.
HGV	Heavy Goods Vehicle.
High Density Polyethylene. (HDPE)	A highly robust, chemically resistant material use in the construction of landfill sites as well as in other containment structures.
Highway	Road forming part of the publicly maintained network.

Highways England (HE)	Formerly the Highways Agency, Highways England is the Government agency charged with operating, maintaining and improving England's motorways and major A roads.
Historic England (HE)	The government agency charged with the protection and care of the monuments and heritage resources of England.
Historic environment record (HER)	A database (usually computerised and sometimes online) of all archaeological sites and find locations from a given area, usually a county, maintained by the County Council, and adopted by formal resolution.
Hydraulic gradient	The change in total hydraulic head per unit distance of flow in a given direction.
Hydrogeological Risk Assessment (HRA)	Undertaken to ensure that the landfill will not compromise groundwater quality.
Hydrogeology	The quality, quantity, storage and movement of water in rock and the interaction with geology.
Hydrology	The surface water system and its operation.
In situ	In its original place.
Inert	Materials that will not dissolve, burn or react physically or chemically or undergo biodegradation.
Institute for Archaeologists (IFA)	It is an organisation for archaeologists in the United Kingdom that promotes professional standards and ethics for conserving, managing, understanding and promoting heritage.
Ionising Radiation Regulations 2017 (IRR17)	The legislation which defines the standards of safety for working with radiation.
Irradiation	Exposure to radiation.
LA_{10,18hr}	The noise level, in dB, that is exceeded 10% of the time between 0600 and 2400.

Landfill gas	An end product of the degradation of biodegradable wastes in a landfill site comprising largely methane and carbon dioxide.
Landscape	An area, as perceived by people, the character of which is the result of the action and interaction of natural and/or human factors.
Landscape and Visual Impact Assessment (LVIA)	A tool used to identify and assess the likely significance of the effects of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenity.
Landscape character	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different to another, rather than better or worse.
Landscape character areas (LCAs)	These are single unique areas which are the discrete geographical areas of a particular landscape type.
Landscape Character Assessment	The process of identifying and describing variation in the character of the landscape and using this information to assist in managing change in the landscape. It seeks to identify and explain the unique combination of elements and features that make landscapes distinctive. The process results in the production of a Landscape Character Assessment.
Landscape effects	Effects on the landscape as a resource in its own right.
Landscape receptors	Defined aspects of the landscape resource that have the potential to be affected by a proposal.
Landscape values	The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons.
Leachate	Liquid which results from seepage of incident rainfall through waste in a landfill and becomes contaminated. The leachate

	is collected in a drainage layer constructed below the waste so that it can be controlled and removed as necessary.
Listed building	A building that has been placed on the Statutory List of Buildings of Special Architectural or Historic Interest. In England and Wales the authority for listing is granted to the Secretary of State by the Planning (Listed Buildings and Conservation Areas) Act 1990.
Local Road Network (LRN)	Local roads are largely the neighbourhood street system mostly handling local traffic to access to neighbourhood services and facilities.
Local Wildlife Site (LWS)	Wildlife-rich sites selected for their local nature conservation value.
Low Level Radioactive Waste (LLW)	With certain specific exceptions LLW is defined as waste which has an activity concentration in the range 0.4 – 4,000 Bq/g for alpha emitters and up to 12,000 Bq/g for beta-gamma emitters.
Low Level Waste Repository (LLWR)	The limited company that manages the national low level radioactive waste repository in Cumbria and promotes the Low Level Waste Strategy on behalf of the Nuclear Decommissioning Authority.
Lowest observed adverse effect level (LOAEL)	The lowest dose where the effects observed in the treated group imply an adverse effect to the subject.
Magnitude (of effect)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration.
Materials Recovery Facility (MRF)	An industrial plant that receives, separates and prepares waste materials recovery and recycling for marketing to end-user manufacturers.

Metres Above Ordnance Datum (mAOD)	The actual elevation of the groundwater level referenced to the mean sea level at the UK Ordnance datum at Newlyn, Cornwall.
Micrograys per hour ($\mu\text{Gy/hr}$)	Dose measurement for plants and animals.
Microsieverts (μSv)	One millionth of a Sievert. Dose measurement for people.
Millisievert (mSv)	One thousandth of a Sievert. Dose measurement for people.
Ministry of Agriculture, Fisheries and Food (MAFF)	Ministry superseded by DEFRA.
National Dose Assessment Working Group (NDAWG)	The group was established to promote the use of best practice and consistent methodologies for assessing radiation doses from discharges of radionuclides to the environment.
National Grid Reference (NGR)	Describes a position of any point in Great Britain. These references are often used in conjunction with Ordnance Survey (OS) maps.
National Planning Policy Framework (NPPF)	Document which provides the primary Government policy basis for planning decisions.
National Sites Network	Special Protection Areas (SPAs) together with Special Areas of Conservation (SACs) form the UK's national site network.
Natural (archaeology)	In archaeological terms this refers to the undisturbed natural geology of a site.
Natural England (NE)	The government agency for the natural environment in England. An executive non-departmental body sponsored by the Department for Environment, Food & Rural Affairs (DEFRA).
Naturally Occurring	Geological material that is inherently radioactive.

Radioactive Material (NORM)	
No observed effect level (NOEL)	The highest dose level that does not produce a significant increase in adverse effects in comparison to the control group.
Noise Policy Statement for England (NPSE)	Document that sets out the long term vision of government noise policy, to promote good health and a good quality of life through the management of noise.
Ordnance datum; (OD)	The datum line or mean sea level to which all heights are referred to in the Ordnance Survey (OS).
Ordnance Survey (OS)	An organisation that creates, maintains and distributes detailed location information for Great Britain.
Particulates	Extremely small particles of a substance or substances.
Peak Hour	The time period or part of the day, where traffic volumes and/or congestion is at its highest.
Peak Particle Velocity (PPV)	The instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position.
Permeability	A measure of the rate at which a fluid will pass through a solid medium.
Personal Injury Accident Data (PIA)	Records of accidents involving a casualty.
Photomontage	A visualisation which superimposes an image of a proposed development upon a photograph or series of photographs. The image can vary depending on the stage at which the development is illustrated.
Planning Practice Guidance (PPG)	Planning Practice Guidance adds further context to the National Planning Policy and guidance on its interpretation.

PM₁₀	Particulates of less than 10 micron in diameter (1 micron = one millionth of a metre or 0.001 mm).
Potential (bat) Roost Features (PRF)	Physical features such as cracks and holes in trees, cliffs or other structures that have the potential as roosts for bats.
Potential Wildlife Site (PWS)	Sites that are either known or thought to be of higher biodiversity value than the average countryside but have not been confirmed to be of Local Wildlife Site (LWS) standard.
Preliminary Ecological Appraisal (PEA)	The first stage in any ecological site assessment.
Prior Radiation Risk Assessment (PRRA)	A risk assessment carried out to identify the radiation hazards present and evaluate the extent of the risks involved. The findings are used to identify the measures and controls needed to restrict exposure to ionising radiation.
Proposed western extension	This is the proposed additional landfill area to the west of the existing ENRMF.
Radiation	Energy in the form of waves or particles propagated through space.
Radiation Protection Advisor (RPA)	Trained and experienced advisor on the application of IRR 2017. Augean engages the national organisation Public Health England in this role.
Radiation Protection Supervisor (RPS)	Personnel trained to supervise work with radioactive material.
Radiation Risk Assessment (RRA)	A risk assessment to determine the potential for exposure to radiation.
Radioactive Waste Adviser (RWA)	An RPA who gives specific advice in respect of radioactive waste.
Radioactivity	The phenomenon whereby atoms undergo spontaneous random disintegration, usually accompanied by the emission of radiation.

Radiolysis	The process by which molecules are destabilized by ionising irradiation particles.
Radiolytic hydrogen	A hydrogen molecule that has undergone radiolysis.
Radionuclide	A nucleus (of an atom) that possesses properties of spontaneous disintegration (radioactivity).
Rating Level $L_{Ar,Tr}$	The specific sound level plus any adjustment for the characteristic features of the sound.
Reference Time Interval, T_r	The specified interval over which the specific sound level is determined. This is 1hr during the day (07:00-23:00) and a shorter period of 15 min at night (23:00-07:00).
Regionally Important Geological and Geomorphological Sites (RIGS)	Designated sites of local, regional, or national importance for geodiversity.
Residual Sound Level $L_{Aeq,T}$	Ambient sound remaining at a given position in a given situation when the specific sound source is suppressed to a degree such that it does not contribute to the ambient sound.
Respiratory Protective Equipment (RPE)	Respiratory Protective Equipment (RPE) is a particular type of Personal Protective Equipment (PPE), used to protect the individual wearer against the inhalation of hazardous substances in the workplace air.
Root Protection Area (RPA)	The ground area around the base of a tree in which works are constrained or excluded to ensure protection of the roots of the tree.
Saprophytic Invertebrates	Typically insects which break down and feed off decaying debris left by dead plants and animals.
Scheduled Monument	A 'nationally important' archaeological site or historic building, given protection against unauthorized change. The protection to scheduled monuments is given under the Ancient Monuments and Archaeological Areas Act 1979.

Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.
Sievert	Symbol Sv. The unit of effective dose and equivalent dose for people.
Significance	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.
Significant observed adverse effect level (SOAEL)	The level of noise exposure above which significant adverse effects on health and quality of life occur.
Site of Special Scientific Interest (SSSI)	Sites of national importance designated under the Wildlife and Countryside Act 1981. Sites may be designated to protect wildlife, geology or land forms.
SNIFFER	Scotland and Northern Ireland Forum for Environmental Research particularly relevant for developing a radioactive risk assessment model.
Soil resource strategy (SRS)	The approach to preserving the quantity and quality of soils disturbed as a result of development.
Sound Power Level, LWA	The total amount of sound energy per unit of time generated by a particular sound source independent of the acoustic environment that it is in. It is a logarithmic measure of the sound power in comparison to a specified reference level.
Special Area of Conservation (SAC)	Conservation designation under EU Directive to protect natural habitats and wild flora and fauna
Special Protection Area (SPA)	Site of international importance for nature conservation of birds.
Specific Sound Level (also referred	Sound in the neighbourhood of a site that originates from the site i.e. the sound being assessed. The equivalent

to as 'site noise') L_{Aeq,Tr}	continuous A-weighted sound pressure level produced by the specific sound source at the assessment position over a given reference time interval.
Stamford Road	This is the road which runs adjacent to the eastern boundary of the existing ENRMF and the road from which the site is accessed. The road links to the A47 to the north.
Strategic Road Network (SRN)	Parts of the highway network managed by Highway England comprising the motorways and major A roads.
Stratigraphy	The building block of archaeology, where careful excavation and recording determines the precise sequence of events that took place to create the deposits, cuts and features that have been uncovered. The term is also used to describe the deposited layers of geological materials.
Strip map and sample	A method of archaeological excavation involving machine stripping of an area, plotting observed features onto a site plan and then partially excavating those features (sampling).
Surface water	Whole or part of any river, stream, other watercourse natural or artificial, lake, pond, creek, estuary or arm of the sea except for certain sewers and water mains. In effect generally all waters that are not groundwater.
Sustainable Development	Development which meets the needs of the present without compromising the ability of future generations to meet their own needs.
Swallow hole	Formed by local chemical weathering of the limestone where water accumulates around a fissure or joint in the rock. This may be underneath the soil or on the ground surface. The hollow that is formed is drained of water through the fissure or joint, but not before it has dissolved some of the limestone.
Test pits	A series of small (usually 1 m x 1 m) excavations to give an indication of the underlying soil/ deposit profiles. These may take place prior to full evaluation, or may be all that is required on the site.

The Assarts and Fineshade Wood	This is a Local Wildlife Site to the west of the proposed western extension.
The Environmental Permitting (England and Wales) Regulations 2016. (EPR2016)	The principal regulations controlling waste management, water protection, the management of radioactive waste and industrial activities with the potential for significant emissions.
The Near-surface disposal facilities on land for solid radioactive wastes (NS-GRA)	Environment Agency (EA) guidance on Requirements for Authorisation.
The site	The site comprises the area within the DCO application boundary and includes the existing ENRMF and the proposed western extension.
Topographic survey	A detailed analysis of the ground surface of the site, a contour plan (from a flat 2D plan to a 3D computer model) is produced and can help to recognise buried landscape features or features that are too slight or too large to see with the naked eye.
Total organic carbon (TOC)	An indicator of the amount of organic matter in a material.
Tranquillity	A state of calm and quietude associated with peace, considered to be a significant asset of landscape.
Trial trenches	See Evaluation.
Trips	These are new trips on the road network where 1 trip is equal to 1 vehicle movement either to or from the site.
Very Low Level Waste (VLLW)	Radioactive waste considered suitable by the regulatory body for authorised disposal (<100Bq/g), subject to specified conditions, with ordinary waste in facilities not specifically designed or authorised for radioactive waste disposal.

Vibration	A to-and-fro motion which oscillates about a fixed equilibrium position.
Vibration Dose Value (VDV)	A measure of the total vibration experienced over a specified period of time.
Visual amenity	The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area.
Visual effects	Effects on specific views and on the general visual amenity experienced by people.
Visual receptors	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Watching brief (archaeology)	A formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons within a specified area or site on land or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive.
Westhay Cottages and Westhay Lodge	These are the closest residential properties to the site. They are located to the east and south east of the site.
Westhay Farm	This is a haulage business located to the east of the site.
Zone of Theoretical Visibility (ZTV)	A map, usually digitally produced, showing areas of land within which a development is theoretically visible. The map can be produced using either DTM (digital terrain model or 'bare ground) 3d data or DSM (digital surface model, which includes built development, woodland canopies etc. to varying levels of accuracy) 3d data, often with a 3d representation of the proposed development inserted into the model.

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TABLES

Table ES2.1

A summary of the issues raised in the Scoping Opinion and the way in which the issues are addressed in the Environmental Impact Assessments and the Environmental Statement

Main likely significant impacts	Extract from the Scoping Opinion	Summary of the way in which the issues are addressed in the Environmental Statement
Population including impacts on human health	The Scoping Report identifies that assessments of risk to the public and workers at the site will be undertaken. The ES should identify and provide justification for the study area and Zone of Influence (Zoi) used to determine the sensitive receptors for the assessment.	All waste management activities at the site, including at the existing EMRMF landfill, the proposed western extension landfill area and the waste treatment and recovery facility will be regulated through the pollution control regime set out in The Environmental Permitting (England and Wales) Regulations 2016 as these activities are the subject of Environmental Permits regulated by the Environment Agency. An assessment of the potential impacts on human health is presented in Section 12 of the Environmental Statement (ES) and the overall approach is presented in Section 11. Potential exposure pathways have been identified which determine the Zone of Influence. The exposure pathways which are considered for the landfill disposal and treatment of hazardous wastes are summarised in Table ES11.1 and the exposure pathways considered assessed for the landfill disposal of LLW are summarised in Table ES11.2. The exposure routes which are assessed include direct exposure of members of the public as well as indirect exposure through ingestion and the water and air pathways. The scenarios which are assessed include expected events as well as events and accidents which it is considered are unlikely to occur.
	The ES should include appropriate cross-references to relevant assessments presented in other aspect chapters that have been used to inform the assessment of effects to population and human health, such as effects of dust, to be presented in the Air Quality and Dust aspect chapter and effects to surface water and groundwater, to be presented in the Water Resources aspect chapter. Other relevant aspect chapters may include Noise, Transport and Traffic, and Socioeconomic impacts.	Public Health England (PHE) acknowledge in their comments that many issues relevant to public health would be covered in individual sections of the ES and that there is a preference to avoid duplication. However, it was requested that the issues relevant to impacts on health are summarised in a specific section of the ES in order to provide a focus for the key information. Accordingly, the assessments of the aspects relevant to public health presented in several separate sections of the ES are summarised in a single section. In addition further assessments are presented on the potential

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		<p>impact of the proposed development on the wider determinants of health and wellbeing. An assessment of the overall potential for effects on health and wellbeing as a result of the proposed development is presented in Section 25 of the ES.</p>
<p>Ecology and biodiversity</p>	<p>The Inspectorate notes reference to bird surveys undertaken at the Proposed Development to date and the intention to include an assessment of impacts within the site and immediate vicinity. The Applicant's attention is directed to the comments of the Ministry of Defence (MoD) at Appendix 2 in relation to the proximity of the Proposed Development to RAF Wittering. The ES should assess the impact to the aerodrome's operations from increased numbers of birds/flocking birds to the area during construction, operation and/or restoration, particularly where exposed earthworks are created. If the Proposed Development results in increased bird numbers in proximity to the aerodrome this should be assessed. The Applicant should address the need for a Bird Hazard Management Plan (BHMP) to ensure that appropriate measures are in place to address any significant effects. There is also the potential for significant effects of this sort associated with the restoration plans. The Applicant should make effort to agree the restoration plans with relevant consultation bodies including the MoD.</p>	<p>It has been agreed with the Ministry of Defence (MoD) that the site will not handle any putrescible wastes and as that will not change as part of the proposed western extension, the wastes being handled should not attract hazardous birds.</p> <p>It is considered by the MoD that stripping of topsoil and storing on site can result in an attractant both from the stripped areas and stored soils and from puddling and ponding on the bare surface. A Bird Hazard Management Plan for the period of soil stripping has been prepared and is included in the DCO Environmental Commitments Document (PINS document reference 6.5).</p> <p>The amount of open water included in the Restoration Concept Scheme has been minimised as requested by the MoD and the ponds will be surrounded by tall marginal and emergent vegetation or scrub in order to further reduce the attraction posed to hazardous birds by open water. The Restoration Concept Scheme has been discussed with the MoD.</p>
	<p>The ES should include or refer to an appropriate draft restoration and management plan and/or action plan with respect to ecology and biodiversity, such as a draft Ecological and Landscape Management Plan and/or Biodiversity Action Plan. The plan(s) should include information on proposed ecological mitigation and enhancement measures for the Proposed Development, together with proposed management and monitoring measures.</p> <p>The Applicant should make effort to ensure the landscape design avoids habitat fragmentation and provides green corridors for the movement of species where possible.</p> <p>The Inspectorate welcomes the intention to discuss the habitats to be included in the restoration proposals with Natural England. The Applicant should also make effort to agree the</p>	<p>Extensive consultation has taken place with bodies and groups including Natural England, the Forestry Commission, Forestry England, the former Northamptonshire County Council, the local Wildlife Trust and Back from the Brink Roots of Rockingham. The ecological mitigation and enhancement measures together with the proposed Restoration Concept Scheme have been developed in consultation with these organisations. The Restoration Concept Scheme has been discussed with the MoD. The design of the Restoration Concept Scheme avoids habitat fragmentation and enhances and provides green corridors for the movement of species.</p>

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	restoration with other relevant consultation bodies, such as the County Ecologist at Northamptonshire County Council (NCC) and the MoD.	An Ecological Management, Monitoring and Aftercare Plan for mitigation and enhancement before the development and habitats created during the operation and restoration of the site has been submitted with the application (PINS document reference 6.5). A Phasing, Landscaping and Restoration Scheme will be prepared as specified in Requirement 4 of the Development Consent Order (DCO).
	<p>The Scoping Report states the assessment will include impacts within the area of the site and in the immediate vicinity of the site, as well as potential for impacts on designated sites in the vicinity as shown on Figure 2. It is noted that Appendix A lists also statutory and non-statutory designated sites within a wider area.</p> <p>The ES should clearly define the study area and Zol for the Proposed Development, with reference to potential effect pathways.</p>	The methodology for the Ecological Impact Assessment including the area of study and the potential effect pathways is summarised in Section 13 of the ES and set out in full at Appendix ES13.1.
	The ES should include an assessment of effects on woodland, PAWS and veteran trees, where likely significant effects could occur. The Applicant is directed to the standing advice of the Forestry Commission and Natural England, as linked within their consultation responses at Appendix 2 to this Opinion. The ES should consider potential effects such as root damage, water availability to woodlands, potential contamination of groundwater, and effects on sensitive species within the woodlands. Appropriate cross-referencing to assessments within other relevant aspect chapters, such as the Water Resources and Soil Resources and Agricultural Land Classification, should be included.	An arboricultural impact assessment has been undertaken in accordance with BS5837: 2012 and is presented at Appendix ES13.1. The assessment of the impacts on adjacent woodland and trees has been informed by the assessments of impacts on water resources (presented in Section 17 of the ES) and the impacts associated with soil resources (Section 15 of the ES). The surface water management plan has been designed to maintain the pattern and quantities of surface water catchment flows to that which exists currently (ES Section18 and Appendix ES18.2 and PINS document reference 6.5).
	<p>The results of the tree survey undertaken in accordance with BS5837: 2012 (Trees in relation to construction), Arboricultural Impact Assessment, including tree schedule and constraints plan, should be appended to the ES where it is relevant to the assessment of significant effects.</p> <p>The ES should include figures presenting retained vegetation (including hedgerows and trees) and information on the protection of existing vegetation during construction, operation and restoration activities.</p>	Information relating to the protection of retained vegetation is set out in Section 13 of the ES (ecology and biodiversity) and in the Ecological Management, Monitoring and Aftercare Plan (PINS document reference 6.5).

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	<p>The ES should clearly explain whether and how the current permitted proposals for restoration to woodland and grassland at the existing ENRMF site will differ as a result of Proposed Development. The proposals for restoration at the Proposed Development in its entirety should be described and assessed where significant effects are likely.</p>	<p>An assessment of the proposed development including a comparison of the currently consented restoration scheme for the existing ENRMF (the baseline) and the beneficial effects of the overall restoration proposals on biodiversity has been undertaken and is summarised in Section 13 of the ES and set out in full at Appendix ES13.1 as well as in the calculations of Biodiversity Net Gain (Appendix ES13.2).</p>
<p>Landscape and Visibility / Visual Resources</p>	<p>The ES should include details of the relevant local landscape character areas and National Character Areas, and these should be presented on figures at an appropriate size and scale relevant to the Proposed Development. Relevant management plans or strategies for the local character areas should also be referenced. A Landscape Character Assessment should be undertaken, following the Landscape Institute and the Institute of Environmental Assessment and Management Guidelines for Landscape and Visual Impact Assessment (2013, 3rd edition).</p>	<p>An assessment of the landscape and visual effects resulting from the proposed development including details of the relevant local landscape character areas and National Character Areas has been undertaken and is summarised in Section 14 of the ES and set out in full at Appendix ES14.1. The Landscape and Visual Impact Assessment has been undertaken, following the Landscape Institute and the Institute of Environmental Assessment and Management Guidelines for Landscape and Visual Impact Assessment (2013, 3rd edition).</p>
	<p>The Scoping Report outlines discussions undertaken with NCC to agree representative viewpoint locations. These are illustrated in Figure 7 to the Scoping Report. The Inspectorate also notes that a ZTV has been prepared.</p> <p>The Inspectorate welcomes the discussion with the Local Authority in effort to agree the landscape and visual impact assessment viewpoints and their illustration. The Inspectorate considers that effort should also be made to agree the ZTV. The ES should include a figure showing the ZTV for the Proposed Development and include viewshed analysis; with all individual residential properties, Public Rights of Way (PRoW) and roads within the ZTV identified, named and recorded with the level of visual impact attributed.</p>	<p>The ZTV and representative viewpoint locations have been agreed with the former Northamptonshire County Council (NCC). The Landscape and Visual Impact Assessment summarised in Section 14 of the ES and set out in full at Appendix ES14.1 includes figures showing the ZTV for the proposed development, all individual residential properties, Public Rights of Way and roads and viewshed analysis. The relevant consultation has been identified and included in the assessment.</p>
	<p>The Scoping Report states that initial viewpoint photographs have been taken and that work is continuing to establish the baseline. The ES should include suitable viewpoint photographs, along with 3-D wireframe views. The Applicant should consider the approach set out in the Landscape Institute Technical Guidance Note 06/19 when submitting visual representations.</p>	<p>Photomontage viewpoint locations were agreed with the former NCC and the photomontages have been prepared in accordance with the appropriate guidance using 3D models. The photomontages are provided in the LVIA report at Appendix ES14.1.</p>

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	<p>Appropriate consideration should be given to seasonal variations when preparing photographs and visualisations to inform the ES.</p> <p>The Applicant should make effort to agree with relevant consultation bodies the need for a figure and/or pictorial 3-D rendering of the operational and reinstated development. The inclusion of which may give greater appreciation of the likely visual impacts and proposed mitigation. Details of proposed screen planting, bunding (including slope profiles/sections) and screening should be provided. The mitigation relied upon in the assessment should be specified in the ES and appropriately secured.</p>	
<p>Soil Resources and Agricultural Land Classification</p>	<p>The Scoping Report states that all soils in the extension area will be stripped and stored in accordance with best practice. The ES should reference the best practice guidance to be followed and how these measures are secured. The measures should be specified in appropriate management plans for the Proposed Development. The ES should include or refer to relevant Outline Management Plans applicable to the DCO. The Applicant should make effort to agree appropriate measures with relevant consultation bodies.</p> <p>The Scoping Report explains that the Proposed Development will ultimately be restored to habitats with a nature conservation interest rather than to agriculture which has a lower biodiversity potential. The ES should ensure appropriate cross referencing is included between the Soil Resources and Agricultural Land Classification and Ecology and Biodiversity aspect chapters, as required.</p>	<p>A soil resources assessment has been undertaken and is summarised in Section 15 and set out in full at Appendix ES15.1 to the ES. The assessment includes details on soil handling and management. A soil management scheme has been prepared based on best practice methods and submitted with the application (PINS document reference 6.5). Compliance is secured by requirement 6 of the draft DCO PINS document reference 3.1.</p> <p>The Restoration Concept Scheme for the site has been informed by the findings of the soil resources assessment and the appropriate reuse of the soils is included in the restoration proposals which have been discussed and agreed with a wide range of bodies as explained above.</p>
<p>Cultural Heritage</p>	<p>The Scoping Report notes that potential impacts on the setting of designated heritage assets will be assessed but provides no details of how such assessment will be undertaken. The ES should detail the assessment methodology applied to the setting of heritage assets. The assessment should be undertaken in conjunction with the landscape and visual impact assessment and appropriate cross-references between the aspect chapters should be included. The assessment should make reference to the ZTV Modelling undertaken for the landscape and visual impact assessment. The Applicant should also seek to agree any photo viewpoint locations with relevant statutory consultation bodies, such as Historic England and the local authority archaeological advisor, as appropriate. Depending on the results of the</p>	<p>An assessment of the proposed development on cultural heritage has been undertaken and is presented at Appendix ES16.1 and summarised in Section 16 of the ES including a methodology for the assessment. The ZTV has been used to assess the impacts of the proposed development on designated heritage assets. The approach to and the scope of each stage of the assessment has been discussed and agreed with the local authority archaeological advisor.</p>

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	<p>further investigation it may also be necessary to consider impacts on settings of non-designated heritage assets too.</p>	
	<p>The Inspectorate notes reference to the geophysical survey that has been undertaken to date, including the presence of a rectangular enclosure in the northern part of the Proposed Development. The ES should be accompanied by the geophysical data and interpretation.</p>	<p>The results of the geophysical survey, including a copy of the survey report, are presented at Appendix ES16.1 and summarised in Section 16 of the ES.</p>
	<p>The Scoping Report mentions the EIA Regulations 2017, National Planning Policy Framework 2019, and <i>The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3 (2nd Edition)</i> (Historic England 2017). The ES should also refer to the Design Manual for Roads and Bridges (DMRB) <i>LA 104 Environmental Assessment and Monitoring</i>, and <i>LA 106 Cultural Heritage Assessment (2020)</i>, <i>Standard and Guidance for Historic Environment Desk-Based Assessment (Chartered Institute for Archaeologists 2014, revised 2017)</i>, and <i>Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (Historic England 2008)</i>. Other relevant regional sources include <i>The Archaeology of the East Midlands: An Archaeological Resource Assessment and Research Agenda (2006, revised 2012)</i>, <i>The Northamptonshire National Mapping Programme (2003, revised 2008)</i>, and <i>Mapping Ancient Landscapes in Northamptonshire (Deegan and Foard 2008)</i>.</p>	<p>The assessment report provided at Appendix ES16.1 includes in section 1.6 a full list of relevant legislation, policy and guidance which has been taken into account in the assessment. The list includes the documents listed in the Scoping Opinion</p>
<p>Appendix C of the Scoping Report outlines the proposed cultural heritage assessment methodology. In paragraph C6 of Appendix C there is a matrix setting out categories of sensitivity, in paragraph C8 one illustrating criteria for assessing magnitude of change, and paragraph C9 a matrix for assessing significance. The system for assessing sensitivity and significance of effect on heritage assets is different to standard matrixes based on that used in the Design Manual for Roads and Bridges (e.g. DMRB – LA 104 Environmental Assessment and Monitoring, Table 3.8.1). The proposed matrix in C9 appears to place greater emphasis on nonsignificant effects, whilst having no Slight and no Medium/Moderate impacts at all. The Applicant should ensure that the assessment the ES addresses impacts fairly and does not disproportionately favour the reporting of non-significant effects.</p>	<p>In Section 1.7 of the assessment report presented at Appendix ES16.1 a detailed description and justification for the methodology used is provided together with references to the guidance on which the methodology is based, including the DMRB guidance.</p>	

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	The Scoping Report does not mention key heritage legislation including The Ancient Monuments and Archaeological Areas Act 1979, The Planning (Listed Buildings and Conservation Areas) Act 1990, The Burial Act 1997, and The Treasure Act 1996. The ES should also refer to these.	Section 1.6 of the assessment report provided at Appendix ES16.1 includes reference to the heritage legislation referred to in the Scoping Opinion
Water Resources	At this stage, the Scoping Report does not expand on the likely sensitive receptors for the Water Resources aspect chapter. The ES should clearly identify the sensitive receptors, with reference to the Zol for the Proposed Development.	An assessment of the proposed development on water resources has been undertaken and is presented at Section 17 of the Environmental Statement. The assessment includes the identification of the sensitive receptors.
	The Inspectorate notes and welcomes the current and ongoing studies, surveys and site investigations proposed to inform the baseline, design, and impact assessment (including mitigation measures and monitoring) for the Proposed Development. The ES should present the information used to inform the assessment, including figures at an appropriate size and scale.	The site investigation report is provided at Appendix ES17.1 and the findings have been used to design the landfill in the proposed western extension and to undertake the water resources impact assessment presented at Section 17 of the ES.
	The Applicant's attention is directed to advice contained in the Planning Inspectorate's Advice Note 18 in respect of WFD. The Inspectorate supports the preparation and submission of separate WFD assessment reports by Applicants, which clearly explain how the requirements of WFD have been met.	An assessment has been undertaken and is presented at Section 17 of the Environmental Statement. The assessment of the impact of the proposed development on water resources (Section 17 of the ES) includes consideration of the classification of water bodies under the Water Framework Directive. The assessment concludes that there will be no adverse effect on the groundwater or surface water quality status in the vicinity of the site as designated under the Water Framework Directive in the River Basin Management Plan. A quantitative hydrogeological risk assessment (HRA) has been submitted to the Environment Agency in support of the Environmental Permit application for the landfill in the proposed western extension. The Environment Agency are reviewing the HRA currently and will not issue an Environmental Permit for the area unless they are satisfied that the site can be operated without a significant impact on water resources.
Flood Risk Assessment	The Scoping Report states that an FRA will be prepared, which will focus on surface water flows and movement as a result of the Proposed Development. No further information is	An assessment of the proposed development on flood risk is presented at Section 18 of the ES and sets out baseline conditions, sensitive receptors,

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	<p>provided on the proposed methodology and no figure is provided to show existing watercourses/waterbodies.</p> <p>The ES should be supported by the results of the FRA. The ES should present the baseline conditions, sensitive receptors, assessment methodology, and the potential effects on the receiving environment from the Proposed Development, together with impacts to the Proposed Development from flood risk. The ES should be informed by the FRA and consider all potential sources of flooding, including sewer flooding, where likely significant effects could occur. Mitigation measures, including the proposed drainage for the Proposed Development should also be presented.</p> <p>The Scoping Report states that in undertaking the assessment, consideration will be given to the potential effect of climate change on the intensity of storm events. No mention is made of UK Climate Change Projections (UKCP18) – the most up-to-date assessment of climate change used in National Planning Policy Guidance (NPPG) on Flood Risk Assessment and Climate Change Allowances.</p> <p>The ES should include detailed reference to these projections and associated data, in particular the regional studies, and effort should be made to agree the approach adopted with the relevant consultation bodies, including the Environment Agency (EA).</p>	<p>assessment methodology, and the potential effects from and on the proposed development as a result of flood risk. Where necessary mitigation measures have been identified.</p> <p>A surface water management plan (SWMP) has been designed to maintain the pattern and quantities of surface water catchment flows to that which exists currently (ES Section18 and Appendix ES18.2 and PINS document reference 6.5).</p> <p>The assessment of flood risk and the design of the SWMP includes consideration of the potential effect of climate change in respect of increases in rainfall and storm intensity. Relevant guidance, including National Planning Policy Guidance on Flood Risk Assessment and Climate Change Allowances and that of the Environment Agency has been taken into account throughout the assessment and the preparation of the SWMP.</p>
<p>Transport and Traffic</p>	<p>The Scoping Report refers to the production of a Transport Assessment, which will be carried out in accordance with the Ministry of Housing, Communities and Local Government (2014) <i>Travel Plans, Transport Assessments and Statements Guidance</i>. The ES should use the Institute of Environmental Assessment (IEA) <i>Guidelines for the Assessment of the Environmental impact of Road Traffic</i> and relevant traffic and transport assessment advice contained in the NPSHW to inform the assessment. Additionally, Highways England (HE) recommend the Transport Assessment be carried out with reference to the Department for Transport (DfT) '<i>Guidance on Transport Assessment (GTA)</i>' and in accordance with DfT Circular 02/2013 (<i>The Strategic Road Network and the Delivery of Sustainable Development</i>).</p>	<p>A Transport Assessment for the proposed development is presented at Appendix ES19.1 and summarised in Section 19 of the ES. Consultation with the relevant consultees has been undertaken and the scope of the Transport Assessment has been agreed with the former NCC and Highways England (HE).</p> <p>It was agreed during the consultation with NCC and HE that due to the limited increase in traffic numbers associated with the proposed development it was not necessary to carry out junction capacity assessments.</p>

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	<p>The Inspectorate welcomes the proposal to agree the scope of the Transport Assessment with NCC. The Applicant should make effort to agree the approach to the Transport Assessment with all relevant consultation bodies, including both NCC and HE.</p> <p>The Inspectorate notes the consultation response from HE in relation to the proximity of the A47 and A1 (specifically the A1/A47 dumbbell roundabout and the A1/A43 junction). The ES should assess any likely significant effects resulting from increased traffic at these junctions. The Applicant should make effort to agree the approach to the assessment with relevant consultation bodies.</p>	
	<p>The Scoping Report does not identify the chosen study area or Zol. The ES should provide a clear justification as to why the study area chosen is sufficient to address the extent of the likely Zol and impacts resulting from the Proposed Development. The Applicant should make effort to agree the study areas with relevant consultation bodies including, NCC and HE.</p>	
	<p>The ES should clarify whether impacts to PRoW, including bridleways and byways, would occur as a result of the Proposed Development. Any impacts on PRoW and the wider network of routes which could result in significant effects should be assessed. The aspect chapter should also cross-refer to the assessment of effects on PRoW where presented in other relevant ES chapters, such as the Population including impacts on human health, Landscape and Visual Resources, Air Quality and Dust, and Noise aspect chapters, as appropriate.</p>	<p>Assessments of impacts on users of Public Rights of Way are considered in the assessments of impacts on health (including air quality (Section 21), landscape and visual effects (Section 14) and amenity (Section 22), impacts from noise and vibration (Section 20) and impacts associated with wider determinants on health including tranquillity (Section 25).</p>
	<p>The Scoping Report does not contain any details of the baseline traffic and transport movements, nor does it identify the potential sources of such information. The baseline environment should be provided within the ES, along with a justification for the study area and details of the data used to inform the baseline.</p>	<p>In the Transport Assessment for the proposed development presented at Appendix ES19.1 and summarised in Section 19 of the ES, the derivation of the traffic numbers associated with the proposed development compared with the baseline which comprises the currently consented development is presented. The operation of the proposed development will be as a single operational site therefore there is no overlap between the current and proposed operations. The derivation includes consideration of the traffic associated with waste deliveries and residue removals as well as the removal of clay and overburden which is associated with the extraction of mineral during the construction of the landfill containment cells. Worst case (i.e.</p>
	<p>The ES should explain how many vehicle movements are expected to be generated during operation, both from staff travelling to and from the Proposed Development and the Heavy Goods Vehicles (HGVs) used for the import of wastes and export of soils during operation and construction, and assess impacts where a likely significant effect may occur.</p> <p>An assessment should also be provided, for the construction and operational period, of other vehicle trips that will be generated, including employees' vehicles and ancillary vehicle</p>	

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	<p>movements. A clear breakdown should be provided of the numbers of trips that will be generated by vehicle type.</p> <p>A comparison should be presented between the existing operations and the future operations.</p> <p>The Inspectorate welcomes the assessment of transport impacts based upon the likely transport movements associated with the development working at its maximum capacity. Where uncertainty exists, the ES should assess the maximum parameters of the Proposed Development to ensure a worst-case scenario has been captured and this should reflect the maximum parameters permitted in the DCO.</p> <p>The Inspectorate notes that there will be overlap with operational traffic associated with the current site and construction traffic associated with the Proposed Development. It is also noted that the existing ENRMF site and proposed waste management facilities will be operational at the same time. The ES should describe and assess the transport impacts that could occur during these scenarios. The potential for cumulative traffic impacts with other developments should also be assessed, where significant effects are likely.</p> <p>Impacts from transport and traffic overlap with impacts from other aspects such as air quality, noise, and ecology. It should be clear within the ES how the outcomes of the traffic modelling have informed other relevant assessments and appropriate cross-referencing should be between relevant aspect chapters. The ES should explain the nature of the interaction and where potential impacts have been assessed.</p>	<p>highest numbers) of traffic movements are calculated associated with the maximum proposed input rates and maximum anticipated mineral extraction rates. An estimate of employee trips is included but these are minimal compared with the HGV traffic.</p> <p>It is noted in the Air Quality assessment (Section 21) that under the IAQM/EPUK guidance a traffic air quality assessment is necessary only if there is a change of HGV flows of more than 100 Annual Average Daily Traffic movements. As the change in HGV movements is well below this threshold it is concluded that no further assessment is necessary and there will be no significant impact on air quality as a result of the traffic associated with the proposed development.</p> <p>The assessment of the impacts of the increase in traffic associated with the proposed development on noise and vibration is considered in Section 19 of the ES.</p>
<p>Noise and Vibration</p>	<p>The Inspectorate does not consider that the Scoping Report provides a robust justification supporting a decision to scope this matter out of the assessment. The Inspectorate notes that vibration effects are created by sources other than blasting, such as HGV movements. The traffic movements during construction have not yet been established and therefore impacts</p>	<p>A noise and vibration impact assessment has been undertaken and is presented at Appendix ES20.1 and summarised in Section 20 of the ES. The assessment includes an assessment of vibration from plant and machinery including HGVs.</p>

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	<p>from vibration may occur in proximity to sensitive receptors. The ES should assess impacts associated with operational vibration from increased HGV movements where significant effects are likely to occur.</p>	
	<p>The Inspectorate does not consider that the Scoping Report provides a robust justification to support a decision to scope this matter out of the assessment, as no indication of traffic movements has been provided. The Applicant should provide an assessment of road traffic noise where significant effects are likely to occur.</p>	<p>The potential impact on noise and vibration of additional HGV movements associated with the proposals has been considered in the noise and vibration impact assessment presented at Appendix ES20.1 and summarised in Section 20 of the ES.</p>
	<p>The study area used to identify the sensitive receptors should be determined based on the extent of the likely impacts (i.e. Zol) rather than set distances, which may result in receptors being omitted from consideration in the assessment. The ES should include a justification in support of the selected study area with reference to the Zol for the Proposed Development.</p>	<p>The approach to the noise and vibration impact assessment including the identification of sensitive receptors, the methodology and the scope of the assessment has been discussed and agreed with the Environmental Health Officer at the former East Northamptonshire District Council, the former Northamptonshire County Council and the Environment Agency Full details of the consultations are provided at Appendix 1 of the report at Appendix ES20.1.</p> <p>The approach to baseline noise monitoring was agreed with the consultees and baseline monitoring from 2011 has been used in the assessment together with noise monitoring data collected in 2021 in accordance with appropriate standards.</p>
	<p>The Inspectorate welcomes the proposal for the scope of the assessment to be agreed with East Northamptonshire District Council, NCC and the EA. The Applicant should seek to agree the methodology, study area and choice of noise receptors with relevant consultation bodies.</p>	
	<p>The Applicant should make effort to agree the approach to the assessment with relevant consultation bodies, however, the Inspectorate agrees with the guidance outlined in Paragraph 4.10.6.</p>	
	<p>The Scoping Report proposes to use the 2011 monitoring locations for the noise assessment. Additionally, the Scoping Report states that the 2011 monitoring data would be used, should monitoring of representative baseline noise levels for the current baseline conditions be not possible.</p> <p>The Inspectorate considers that baseline conditions for the assessment should be accurate and based on reliable and up-to-date data, but as noted in Section 3.4 of the Opinion above, also recognises the potential difficulties associated with the collection of representative data in the current circumstance.</p> <p>The Applicant’s attention is directed to the Joint Guidance produced by the Association of Noise Consultants (ANC) and the Institute of Acoustics (IoA) ‘Joint Guidance on the Impact of COVID-19 on the Practicality and Reliability of Baseline Sound Level Surveying and the</p>	

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	<p>Provision of Sound & Noise Impact Assessments during the current COVID-19 pandemic', which is included in the response from East Northamptonshire District Council at Appendix 2 to this Opinion. The ES should provide a clear justification with regards to the baseline monitoring used for the impact assessment. The ES should also explain whether noise monitoring has been carried out to the relevant British Standards guidelines (e.g. BS7445).</p>	
	<p>It is unclear whether the Applicant intends to carry out an assessment of construction noise as part of the assessment. The Scoping Report states that the Proposed Development will comprise the construction of the existing and new landfill void, and that the voids will be constructed in phases. There is limited information in the Scoping Report to identify what the construction activities will precisely comprise, over what duration, and whether these will generate significant construction noise. The definition of construction activities, their extent and duration should be defined in the ES. Where construction activities have the potential to result in likely significant effects, the Inspectorate would expect to see a construction noise assessment within the ES. The ES should include a full description of noise generating works likely to occur during the construction of the Proposed Development.</p>	<p>The extraction of the mineral, construction of the engineered landfill cells, the placement of waste in adjacent cells, and the capping and restoration of adjacent cells all take place concurrently. Accordingly construction and operation activities do not take place at separate times; they take place concurrently. In the noise and vibration impact assessment a worst case scenario for each receptor location has been assessed based on the proposed phasing sequence for the ENRMF which demonstrates which noise-generating activities will be occurring concurrently at the existing site and across the proposed western extension including construction, landfilling and restoration operations across the landfill facilities along with the continued operation of the waste treatment and recovery plant.</p>
	<p>Noise sources generated during operation should be identified and assessed. Where appropriate, effective measures should be provided to mitigate against noise nuisance.</p>	<p>The site is not operational at night however the gas abstraction plant and a generator used for security lighting and a generator associated with the engineering contractor's compound could be operating at night. The assessment of night time noise impacts is based on the assumption that all these items of plant are operating with the contractor's generator placed at the nearest phase boundary relative to each receptor and is summarised in Section 20 of the ES.</p>
	<p>The Inspectorate notes the statement in the Scoping Report that the operational hours of the site will not change from those already permitted. The ES should describe the proposed hours of operation, and in particular, assess any potential noise impacts at night and other unsocial hours such as weekends and public holidays.</p>	
	<p>The ES should clearly explain any assumptions made relevant to the assessment, particularly those that relate to the Transport Assessment and the inclusion of other developments in the cumulative impact assessment, and how these have been considered in the Noise aspect chapter.</p>	<p>Where appropriate cross references are included between different assessments in the ES.</p>

Main likely significant impacts	Extract from the Scoping Opinion	Summary of the way in which the issues are addressed in the Environmental Statement
	<p>The inter-relationship between identified noise effects and other relevant environmental aspects (e.g. Ecology and Biodiversity) should be described and assessed. Appropriate cross-referencing between aspect chapters should be included.</p> <p>The Inspectorate welcomes the proposal for a noise management and monitoring scheme. The ES should describe any mitigation measures required to reduce noise impacts from the Proposed Development. In addition, consideration should be given to monitoring noise complaints. Mitigation measures should be detailed in the ES and secured, as appropriate, through the Requirements of the DCO. The Applicant is encouraged to submit Outline Management Plans, such as an Outline Construction Environmental Management Plan (CEMP) to ensure the delivery of noise mitigation measures of this nature.</p>	<p>A noise management and monitoring scheme (PINS document reference 6.5) has been submitted as part of the application and compliance is secured by requirement 5 of the draft DCO.</p>
<p>Air Quality and Dust</p>	<p>The Scoping Report proposes to scope out an assessment of the effects associated with operational traffic. The Inspectorate considers that there is currently insufficient evidence provided within the Scoping Report with regards to the likely vehicle movements associated with the Proposed Development to support the scoping out of an air quality assessment associated with traffic.</p> <p>The need for an air quality assessment should be informed by the Transport Assessment and the Transport and Traffic ES chapter, particularly with regards to the potential impact from vehicle movements during both construction and operation of the Proposed Development. An assessment of air quality effects associated with traffic should be presented, where significant effects are likely to occur.</p> <p>The Scoping Report proposes to scope out consideration of particulate matter. The Inspectorate does not consider that there is sufficient evidence provided in the Scoping Report to support a decision to scope this matter out of the assessment.</p> <p>The Inspectorate considers that the ES should include an assessment of impacts associated with all relevant pollutants under the EU ambient air quality directive, including increased particulate matter (PM10 and PM2.5), resulting from the Proposed Development. In</p>	<p>An assessment of the potential impacts of the proposed development on local air quality which have the potential to affect human health has been carried out and is presented at Section 21 of the ES and includes an assessment of the likely impact on air quality resulting from traffic associated with the proposed development.</p> <p>It is noted in the Air Quality assessment (Section 21) that under the IAQM/EPUK guidance a traffic air quality assessment is necessary only if there is a change of HGV flows of more than 100 Annual Average Daily Traffic movements. As the change in HGV movements is well below this threshold it is concluded that no further assessment is necessary and there will be no significant impact on air quality as a result of the traffic associated with the proposed development.</p> <p>The potential impacts associated with fine particulates with the potential for a significant effect on health are considered Section 21 of the ES (air quality) whereas the potential impacts of nuisance dust which is associated with larger size particulates are addressed in Section 22 of the ES (amenity). An assessment if the impacts is carried out against compliance with relevant limit</p>

Main likely significant impacts	Extract from the Scoping Opinion	Summary of the way in which the issues are addressed in the Environmental Statement
	determining significance, the assessment should consider performance against relevant limit values.	values including those set by the Environment Agency in the Environmental Permit.
	<p>The Scoping Report does not outline the methodology that will be used within the ES air quality assessment. The methodology in the ES should clearly state how significant effects will be determined and the Applicant should make effort to agree the methodology with the relevant consultation bodies.</p> <p>In addition to using the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Mineral Dust Impacts for Planning 2016 v1.1 as stated in the Scoping Report, the Applicant should also consider utilising the IAQM Guidance on land-use planning and development control: Planning for air quality 2017 v1.2 and the IAQM Assessment of dust from demolition and construction 2014 Guidance when assessing the impact from dust and particulate matter during construction and decommissioning.</p>	<p>All waste management activities at the site, including at the existing EMRMF landfill facility, the proposed western extension and the waste treatment and recovery facility will continue to be regulated through the pollution control regime set out in The Environmental Permitting (England and Wales) Regulations 2016 as these activities are the subject of Environmental Permits regulated by the Environment Agency. An assessment of the potential impacts on human health including as a result of impacts on air quality is presented in section 12 of the ES and the overall approach is presented in Section 11. The exposure pathways which are considered for the landfill disposal and treatment of hazardous wastes are summarised in Table ES11.1 and the exposure pathways considered assessed for the landfill disposal of LLW are summarised in Table ES11.2. The exposure routes which are assessed include indirect exposure of members of the public through air pathways. The scenarios which are assessed include expected events as well as events and accidents which it is considered are unlikely to occur. Threshold limits for air quality which are protective of human health and the environment are set for monitoring locations at the boundary of the site or at emission points by the Environment Agency in the Environmental Permits.</p> <p>The assessment of impacts associated with emissions of dust are considered in the section in the ES on impacts on amenity (Section 22) as explained in response to the section on Nuisance below.</p>
	<p>The Scoping Report does not identify any human receptors which may be affected by the impacts of the Proposed Development on air quality. The ES should clearly set out the type and quantity of both human and ecological receptors that could be affected and identify their locations by reference to a figure.</p> <p>The Applicant should make effort to agree the receptors to be included in the impact assessment with East Northamptonshire District Council, NCC and other relevant consultation bodies, such as Natural England. If no human receptors are likely to be affected, then the ES should provide adequate justification.</p> <p>The assessment should assess the implications on nearby designated sites, including the Collyweston Great Wood and Easton Hornstocks Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR) and the Wittering Coppice Ancient Woodland. Appropriate cross-reference should be made to the Ecology and Biodiversity aspect chapter of the ES.</p>	
	The Applicant should make effort to agree the study area with the relevant consultation bodies.	The study area is defined by the Environment Agency as the site boundary as this is where emission limits are set in the Environmental Permit.
	The Inspectorate notes that monitoring is already undertaken at the existing ENRMF site and there is an expectation that monitoring of air quality will continue for the Proposed	Monitoring will continue at the site as set out in the current Environmental Permit and in accordance with any future Environmental Permits. The results

Main likely significant impacts	Extract from the Scoping Opinion	Summary of the way in which the issues are addressed in the Environmental Statement
	Development. The ES should detail the scope of the monitoring at the Proposed Development, together with any measures that will be in place to avoid or reduce adverse air quality effects.	of the air quality monitoring undertaken under the Environmental Permits over the past 5 years has been reviewed and is summarised in Section 21 of the ES.
	The ES should clearly describe the anticipated waste types and quantities expected at the landfill and explain how these have been factored into the landfill gas and odour assessments on a worst-case basis.	The anticipated emissions that are assessed are based on the waste types which will continue to be accepted at the site and this is described in Section 21 of the ES.
	The Scoping Report does not mention an assessment of air quality impacts during construction. Noting the current lack of clarity with regards to construction activities, the Inspectorate considers that an assessment of air quality impacts during the construction phase, including impacts from construction traffic, should be provided in the ES where likely significant effects could occur. The Scoping Report does not mention an assessment of air quality impacts during construction. Noting the current lack of clarity with regards to construction activities, the Inspectorate considers that an assessment of air quality impacts during the construction phase, including impacts from construction traffic, should be provided in the ES where likely significant effects could occur.	The extraction of the minerals, construction of the engineered landfill cells, the placement of waste in adjacent cells, and the capping and restoration of adjacent cells all take place concurrently. Accordingly construction and operation activities do not take place at separate times; they take place concurrently. In the air quality and dust impact assessments it is assumed that all potential emission generating activities will be occurring concurrently including construction, landfilling and restoration operations on the landfill along with the continued operation of the waste treatment and recovery plant. The ongoing monitoring reflects the impacts of this concurrent operation.
	The Scoping Report does not mention the number, size and type of plant machinery required for construction and therefore the potential air quality impacts of this machinery are unknown. The Inspectorate considers that impacts to air quality from construction plant should be assessed where significant effects are likely to occur.	
	The ES should provide an estimate of the frequency and duration of emissions through the gas flare.	The Environmental Permit include emission limits for the gas flare therefore impacts on air quality as a result of the operation of the flare are controlled through the permit.
	The ES should include appropriate cross-referencing between the Air Quality and Dust aspect chapter and aspect chapters such as Ecology and Biodiversity and Population including impacts on human health.	Where appropriate cross references are included in the relevant sections of the ES.

Main likely significant impacts	Extract from the Scoping Opinion	Summary of the way in which the issues are addressed in the Environmental Statement
Climate Change	<p>The Inspectorate notes the Applicant's intention to not provide a separate chapter on climate change, but that "<i>the potential effects on the operations and consequential impacts of and on the development site as a result of the predicted effects of climate change will be addressed in the relevant sections as part of the flood risk assessment and the hydrological risk assessment.</i>" The Scoping Report also states that "<i>measures which are included in the development design which comprise or allow adaptation to climate change will be identified and assessed.</i>"</p> <p>The Inspectorate agrees that a separate climate change aspect chapter can be excluded from the ES, provided that an assessment of the likely significant effects on climate arising from the Proposed Development and the vulnerability of the Proposed Development to climate change is clearly described and identified in the relevant aspect chapters of the ES.</p>	<p>An assessment of the likely significant effects on climate arising from the proposed development and the vulnerability of the proposed development to climate change is described and identified in the relevant aspect chapters of the ES. In addition an assessment of the impact of the development on climate change and the vulnerability of the project to climate change as well as the vulnerability of the development to risks of major accidents and/or disasters is provided at Section 24 of the ES.</p>
Nuisance	<p>The Inspectorate does not believe that sufficient justification has been provided at this stage to conclude that there would be no likely significant effects from odour, and as such does not agree that it can be scoped out. The ES should clearly identify the relevant receptors that could be affected by odour, and clearly explain the design and good practice measures that would be in place to mitigate the odour impacts of the Proposed Development. Where significant effects are likely to occur, these should be assessed. For the assessment of odour impacts, the Inspectorate would expect the assessment to follow the methodology set out in the IAQM 'Guidance on the assessment of odour for planning' (2014).</p> <p>Where potentially significant adverse effects are identified appropriate mitigation measures to monitor and address odour complaints during construction and operation should be proposed. The Inspectorate notes from Appendix 4 to the Scoping Report that no separate Nuisance chapter is proposed. The Applicant may wish to consider effects of odour within the Air Quality and Dust aspect chapter and/ or the Population including impacts on human health aspect chapter, as appropriate.</p> <p>The Inspectorate considers that the Proposed Development would not attract vermin in numbers sufficient to result in a likely significant effect and agrees that this matter can be scoped out. However, as noted in the MoD's response at Appendix 2 and at point 4.2.2 to this</p>	<p>It is explained in the air quality assessment (Section 21 of the ES) that putrescible waste is not accepted at the site and no wastes with significant odour potential are accepted at the site. The controls on the emissions of gases and vapours including any which may have the potential to generate an odour will continue to be implemented and regulated through the Environmental Permit.</p> <p>It has been agreed with the Ministry of Defence (MoD) that the site will not handle any putrescible wastes and as that will not change as part of the</p>

Main likely significant impacts	Extract from the Scoping Opinion	Summary of the way in which the issues are addressed in the Environmental Statement
	Opinion above (Ecology and Biodiversity), the ES should consider the potential for attracting birds to the site which could pose a bird strike risk to nearby RAF Wittering. If the Proposed Development results in increased bird numbers in proximity to the aerodrome this should be assessed.	proposed western extension, the wastes being handled should not attract hazardous birds. It is considered by the MoD that stripping of topsoil and storing on site can result in an attractant both from the stripped areas and stored soils and from puddling and ponding on the bare surface. A Bird Hazard Management Plan for the period of soil stripping has been prepared and submitted with the application (PINS document reference 6.5).
	The Inspectorate is content that the Proposed Development is unlikely to produce litter that would generate a significant effect and that an assessment of the impact of litter can be scoped out of the ES.	Noted.
	Should the ES determine that effects of odour require mitigation measures, these should be specified in the ES and be appropriately secured. The Applicant is encouraged to submit an Outline Odour Management Plan for site operations to include the proposed mitigation measures.	The hazardous wastes, LLW and wastes for treatment which are received at the site contain minimal quantities of putrescible material which mean it is unlikely that significant odorous emissions will be generated by the biodegradation of organic matter in the imported wastes. No other wastes with significant odour potential are accepted at the site. The controls on the emissions of gases and vapours including any which may have the potential to generate an odour will continue to be implemented and regulated through the Environmental Permit.
	Consideration should be given to appropriate mitigation measures and to monitoring of dust and odour. Consideration should also be given to monitoring of dust and odour complaints during construction and operation.	A dust impact assessment has been undertaken in accordance with the HM Government (2014) Planning Practice Guidance Note for Minerals and the Institute of Air Quality Management (2016) Guidance on the Assessment of Mineral Dust Impacts for Planning v1.1. The methodology is set out Appendix ES22.1 and the assessment is reported in Section 22 of the ES. The dust control measures are secured by requirement 6 of the draft DCO. Dust monitoring is carried out under the Environmental Permit. Procedures for the acceptance and management of waste at the site, which includes the management of wastes with the potential to generate odour are

Main likely significant impacts	Extract from the Scoping Opinion	Summary of the way in which the issues are addressed in the Environmental Statement
		<p>the subject of the Environmental Permits which are regulated by the Environment Agency.</p> <p>Any complaints received at the site will continue to be investigated and responded to in accordance with the Augean externally certified Environmental Management System as set out in the Environmental Commitments Document (PINS document reference 6.5).</p>
Material Assets	<p>The Inspectorate notes and welcomes the intention to assess impacts on material assets, both built and natural assets, in the relevant aspect chapters such as Cultural Heritage, Ecology and Biodiversity, Landscape and Visual Resources, and Soil Resources and Agricultural Land Classification. Appropriate cross-referencing should be included between relevant aspect chapters.</p>	<p>Assessments of impacts on Cultural Heritage (Section 16), Ecology and Biodiversity (Section 13), Landscape and Visual Resources (Section 14), and Soil Resources and Agricultural Land Classification (Section 15) have been undertaken and are presented in the ES.</p>
Socioeconomic Impacts	<p>In addition to a review of local and national data in a socioeconomic context, the baseline should include regional information, as available.</p> <p>The ES should provide an assessment of the potential impacts during the entire lifespan of the Proposed Development.</p> <p>This aspect chapter should include appropriate cross-reference to other aspect chapters, such as Landscape and Visual Resources, as relevant to the assessment of socio-economic effects.</p>	<p>The potential for socio-economic impacts has been assessed at the national and local level and is presented at Section 23 of the ES.</p> <p>Where appropriate cross references have been included for other sections in the ES including the assessment of the effects of wider determinants on public health (Section 25).</p>
Major Accidents	<p>These matters are proposed to be scoped out of the ES on the basis that the site location is not considered potentially vulnerable to these events. The Scoping Report provides no explanation as to why the site is not vulnerable to such events and there is a potential contradiction between this paragraph and paragraph 4.8.1 in respect to the FRA, which states that consideration will be given to the potential effect of climate change on the intensity of storm events.</p> <p>The ES should address the vulnerability of the Proposed Development to risks of major accidents and/or disasters to the extent that it is relevant to the nature of the development, and where likely significant effects could occur.</p> <p>The Inspectorate notes the intention to include an assessment of potential impacts associated with possible events and accidents associated with the man-made and natural environments at</p>	<p>An assessment of the vulnerability of the development to risks of major accidents and/or disasters including climate change is provided at Section 24 of the ES.</p> <p>The scenarios which are assessed during consideration of the potential impacts on human health include expected events as well as events and accidents which it is considered are unlikely to occur.</p>

Main likely significant impacts	Extract from the Scoping Opinion	Summary of the way in which the issues are addressed in the Environmental Statement
	<p>and around the Proposed Development. It is noted that Appendix D to the Scoping Report does not include a separate Major Accidents aspect chapter and therefore it is not clear where such an assessment would be presented within the ES. The ES should clearly identify where the assessment of major accidents in this context is presented.</p>	
<p>Cumulative Impacts</p>	<p>With reference to paragraph 3.3.4 of this Opinion above, the Inspectorate considers that reference to “cumulative impacts” between the existing ENRMF site and the western extension should be considered as interrelated impacts, forming part of the assessment of the Proposed Development as a whole rather than sitting within the cumulative effects chapter. The cumulative impacts aspect chapter should focus on the cumulative effects of the Proposed Development with other development.</p>	<p>Where identified, the potential for cumulative impacts with other developments have been assessed in each of the assessment sections. The way in which the cumulative assessments are addressed is explained where each one is assessed.</p>
	<p>The Scoping Report does not explain the proposed cumulative effects assessment methodology or how other developments relevant to the assessment of cumulative effects will be identified, including how the ZoI of ‘in the vicinity’ has been selected and defined. The ES should set out the proposed methodological approach for the assessment of cumulative effects, taking into account relevant advice (e.g. the Inspectorate’s Advice Note Seventeen: Cumulative Effects Assessment).</p>	<p>As a result of the nature of the proposed activities and the limited potential for effects beyond the close vicinity of the site, together with the nature of the activities in the generally rural surrounding areas the assessments have demonstrated that there is a minimal potential for the proposed development to result in significant impacts as an overall result of cumulative development. Accordingly it has been determined that it is not necessary to include a separate chapter in the Environmental Statement.</p>
	<p>The Inspectorate notes the statement at paragraph 5.2 that each technical aspect chapter will include sub-sections on cumulative effects, but also that the ES will include a separate chapter for cumulative effects. The ES should clearly present the cumulative impact assessment for the Proposed Development and include appropriate cross-references between aspect chapters.</p>	

Table ES2.2

Summary of the comments on the PEIR and pre-submission consultation from the Section 42, Section 43 and Section 44 consultees and the responses from the applicant

S42 consultee	Summary of the key comments on the PEIR.	Responses to the key comments and issues
Health and Safety England	<p>According to HSE's records there are no major accident hazard sites but there is one major accident hazard pipeline within the proposed DCO application boundary of the East Northants Resource Management Facility for this nationally significant infrastructure project. The major accident hazard pipelines is:</p> <p>1)HSE ref 6909, operated by National Grid PLC; 2 Feeder A47(T) / Duddington</p> <p>The presence of hazardous substances on, over or under land at or above set threshold quantities (Controlled Quantities) will probably require Hazardous Substances Consent (HSC) under the Planning (Hazardous Substances) Act 1990 as amended. The substances, alone or when aggregated with others for which HSC is required, and the associated Controlled Quantities, are set out in The Planning (Hazardous Substances) Regulations 2015 as amended. HSC would be required to store or use any of the Named Hazardous Substances or Categories of Substances at or above the controlled quantities set out in Schedule 1 of these Regulations.</p>	<p>Augean is aware of the high pressure gas transmission pipeline (FM02 Wisbech NW to Duddington) which crosses the southern section of the proposed western extension in an east to west direction. The pipeline will not be disturbed or covered.</p> <p>The proposed landfill areas to the south and north of the gas pipeline will be developed as separately constructed, fully contained landfill areas with suitable stand off distances from the gas pipeline as agreed with the pipeline authority. The standoffs are secured under Requirement 3 of the draft DCO (PINS document reference 3.1) Augean has consulted with National Grid regarding the proposed development and have agreed in principle the necessary safety provisions.</p> <p>The proposed development is for a waste landfill site and a waste treatment and recovery plant. With respect to the landfill site, as specified in Regulation 4, Schedule 2(6) hazardous waste deposited in a landfill site does not require Hazardous Substances Consent. The activities at the waste treatment plant do not meet the thresholds for the requirement of a Hazardous Substances Consent.</p> <p>Following receipt of the consultation response from The Health and Safety Executive Augean has reviewed further the types and quantities of waste associated with the treatment operations at the site and confirm that the proposed change to the operations will not result in a need for the site to obtain a Hazardous Substances Consent under The Planning (Hazardous Substances) Regulations 2015.</p>
Buckinghamshire Council	<p>The management of hazardous waste and LLW outside of Buckinghamshire is consistent with the Council's overall net self- sufficiency principle for managing the totality of waste produced in the county. The Council's Minerals and Waste Local Plan 2019-2036 does though identify a potential need for hazardous waste recovery and treatment. This future provision is at low volumes (approximately 2,000tpa for treatment and 11,000tpa for recovery by 2036), which suggests management will continue to be met by facilities outside the county.</p>	<p>It is noted that there is currently no capacity for hazardous waste treatment and no active hazardous waste landfill sites within Buckinghamshire and that the majority of hazardous waste is exported to appropriate facilities outside of the county. LLW arising in Buckinghamshire is currently managed at appropriate facilities outside the county including at ENRMF.</p>

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	<p>With reference to the 'approximate' areas shown on plans is this because the areas will be fixed after the consultation responses have been reviewed or is it intended that the areas will not be known at the point the application is submitted? If it is the later how will the Examining Authority be invited to consider the unknown aspects of the development and the application of the Rochdale principle?</p>	<p>The Preliminary Environmental Information Report was prepared for consultation on the proposals prior to the finalisation of the detailed design of the western extension area hence the term 'approximate' is used with respect to the DCO application boundary and internal site layout plans. As part of the application process the proposals and plans have been refined since the consultation to contain more detail where necessary. Where flexibility is necessary such as the layout of the waste treatment and recovery plant the Rochdale envelope principle is used and the maximum extent of the plant is used in the impact assessments. As the proposed development is a hazardous waste facility, a lot of the detailed design is controlled and secured under the Environmental Permits and must be approved by the Environment Agency.</p>
	<p>It is suggested that the traffic assessment should set out the origin and destination of waste vehicles and consider options including bulking waste to reduce the number of trips generated.</p>	<p>Between 2015 to 2019 2.81% of the hazardous waste landfilled at ENRMF came from the south east (including Buckinghamshire) and since 2016 only 2.90% of the LLW accepted at the site has arisen from Buckinghamshire. This limits the potential for the bulking of waste, however Augean reports that the majority of vehicles delivering waste to the site arrive with a full or almost full payload either in tonnage terms or in volume terms when carrying lighter materials. It is the responsibility of the producer to transport the waste efficiently.</p>
	<p>Buckinghamshire would welcome confirmation that impacts on human health in the county have been de-scoped because other than transport – which is already taking place and regulated by the Environment Agency – those pathways are too distant to have an effect and be below the identified reasonable threshold for significant effects?</p>	<p>The potential impacts on human health as a result of the proposed development are assessed in full and the results are presented in Sections 12 and 25 of the Environmental Statement (ES) (PINS document reference 5.2). The operations at the site are and will continue to be the subject of Environmental Permits which are regulated by the Environment Agency. The Environmental Permits include emission limits which are protective of human health and the environment at the boundary of the site and therefore also are protective of human health and the environment at any greater distances from the site boundary. There is therefore no need to assess specifically the potential impacts on the health of the residents of Buckinghamshire as the distance from the site to Buckinghamshire is more than 60km at its closest point.</p>
	<p>With reference to paragraph 9.5.7 the Council asks that the Augean provide summary details of the site(s) in Buckinghamshire considered at the first stage shortlisting that identified 43 potential locations.</p>	<p>The list of sites in Buckinghamshire identified as potential alternative locations in the first stage shortlist is commercially confidential. The potential alternative suitable facilities were identified using a structured geographical search against a set of search criteria and there were no discussions with landowners at this early stage of the site search process.</p>

S42 consultee	Summary of the key comments on the PEIR.	Responses to the key comments and issues
<p>Duddington and Fineshade Parish Council</p>	<p>The Parish Council is concerned that the preferred option is to extend ENRMF to the west rather than to the south, as was suggested would be the case when the original planning application was made years ago.</p>	<p>The consideration of alternative locations for the development is set out in Section 10 of the ES and includes consideration of expansion to the fields to the south of the existing site. As explained, extending the site to the south would result in the potential for a greater visual and landscape impact than development of the western area which is generally more contained and likely to result in a lower potential visual and landscape impact. Regardless of the impacts associated with development of the southern fields, the option has never been an alternative to the extension into the western fields, as the land is not, and will not be for sale. This position has been reconfirmed by the landowner. The only viable extension to the site is the development of the land to the west for which Augean has an option agreement which will only be implemented once a Development Consent Order is in place. In the event the application is refused the land will continue to be used for commercial farming. The development and subsequent restoration of the site presents a realistic opportunity and the only way to fulfil what is Augean’s understanding of the ecological aspirations of creating connectivity between the woodlands in a relatively short period of the life of the site.</p>
	<p>The Parish Council would again urge you to rethink the exact areas for your expansion, concentrating on the fields further south.</p>	
	<p>The two fields that you have in mind would bring your facility right to the edge of Fineshade Wood and the boundary of our parish. Noise from the existing site negatively affects the tranquillity of the woodland, and the works provide a visual eyesore on our eastern horizon. Clearly, extending to the west would bring the facility to within 1.25km of residential properties in Duddington Village and 2.5km of cottages in Fineshade Wood.</p>	<p>It is acknowledged that tranquillity has the potential to be influenced by levels of light, noise, traffic and visual intrusion. An assessment of the impacts of noise, traffic, lighting and visual intrusion of the proposed development on the tranquillity of the area and the amenity of users of the woodlands to the west and footpaths in the vicinity of the site has been assessed and is presented in the ES in sections 20, 19, 22 and 14. It is concluded that the proposed development will not have a significant impact on tranquillity during the operational phases and that in the long term will contribute positively to the tranquillity of the area as set out in Section 25 of the Environmental Statement. The outskirts of Duddington are approximately 1.1km to the west north west of the boundary of the northern section of the western extension area and Fineshade is located approximately 2.4km to the west south west of the southern part of the proposed western extension. The A43, Collyweston Quarry and agricultural fields are located between Duddington and the northern area of the proposed western extension. The noise and visual impact assessments (PINS document reference 5.4.20.1 and 5.4.14.1) demonstrate that there will be no significant impacts on residents in Duddington as a result of the proposed</p>
	<p>There are two public footpaths leading from Duddington Village that are very close to your proposed site. These are, currently, the only rights of way leading out of the village and are frequently used by residents for walks. Also Fineshade Wood is open-access land, allowing visitors and residents alike to wander freely through the network of rides and glades. Forestry England have estimated that 400,000 people per year visit Fineshade Wood for recreation and exercise and these numbers have increased dramatically during 2020 with the pressures imposed by the pandemic. Increasingly, people from Corby, Kettering and Peterborough have been using the entire</p>	

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	<p>Fineshade woodland for its tranquillity and to escape the pressures of lockdown and urban life. Already noise from, and the visual impact of, your present site makes the footpaths and the nearest part of the woodland a less attractive option for quiet walks. To emerge from peaceful woodland to see mountainous spoil heaps with lorries labouring up them is a soul-destroying experience. Your proposal will mean the present degradation of tranquillity and beauty being extended for an extra 20 years and also being brought much nearer to the wood. Because the worked area will be immediately adjacent to the public woods there will be a general loss of amenity. For example, one area of the wood adjacent to your proposal is a glade where wild garlic grows in profusion, where generations of residents have gone to forage or picnic. With new spoil heaps towering above that glade the opportunity for restoring mental well-being will be gone. In your extensive documents we can find no mention of, or appreciation for, the reduction of amenity caused by developing adjacent to publicly accessible woodland.</p>	<p>development. Fineshade Woods and The Assarts are located between the proposed development boundary and Fineshade and the noise and visual impact assessments demonstrate that there will be no significant impacts on residents in Fineshade as a result of the proposed development.</p> <p>No public rights of way cross the development site and the closest footpath (MX15) is approximately 100m to the west of the western boundary of the development at the closest point. For the majority of the route of MX15 the proposed development site is screened from view by the intervening woodland. Glimpses of the site are possible from a short length of the footpath at a break in the woodland at the location of the water pipeline route. However, due to the woodland blocks either side of the view, which extend right to the edge of the proposed western extension, views of the rest of the proposed western extension are not available so the vast majority of the proposed works would be out of view. Once footpath users are back within the woodland itself, there would be no or very obscured views of the proposed works due to the mass of intervening woody and (in summer) leafy vegetation.</p> <p>Any temporary impacts on amenity users of this part of Fineshade Wood, including on the tranquillity of the setting would therefore be limited to a short part (approximately 50m) of a long footpath walk (approximately 1.5km for MX15 in Fineshade Wood). Footpath MX15 leads to MX18 and other footpaths beyond. Footpath MX18 is not located in woodland and is close to the active mineral extractions at Collyweston Quarry therefore the current and proposed operations at ENRMF are not entirely out of keeping with the other activities in the vicinity. In addition, operations in the area closest to footpath MX15 will only take place while the nearby phases are being prepared, filled and capped; the area will not be operational for the whole lifetime of the proposed development.</p> <p>The overall restoration proposals will bring improved opportunities for the amenity use of the site. Accordingly, any views of the site from this limited length of the footpath route will be transient and unlikely to affect the overall level of tranquillity experienced along the route of the linked footpaths. Additional monitoring has been carried out to assess the acoustic environment at locations along the footpaths closest to the proposed development in order to assess the potential impact on users of this section of the footpath. Any additional impacts from noise will be limited in the context of the overall footpath route.</p>

S42 consultee	Summary of the key comments on the PEIR.	Responses to the key comments and issues
		<p>The only lighting which will be present on the landfill areas will be mobile lighting used only when necessary during the operational hours for mineral extraction and landfill working. Accordingly the lighting associated with the proposed western extension is likely to have a negligible effect on the tranquillity of people using the woodland and other adjacent areas. An assessment of the impacts of the proposed development on amenity is presented in Section 22 of the Environmental Statement.</p>
	<p>The Parish Council has particular concerns about the more northern of the two fields because this would reinforce the fragmentation of adjacent areas of woodland. This Parish Council is currently working on a Neighbourhood Plan and in that the issue of woodland connectivity is addressed.</p> <p>Within the Parish there are a number of arable fields that we would like to see covered with trees (either by planting or by natural regeneration) that would assist with this linkage, but the most important field is undoubtedly beyond our boundary-the northern part of your proposed extension. Were your proposed work to go ahead, woodland wildlife communities and protected species which are currently able to cross the arable areas (albeit reluctantly) would be totally blocked for decades, until your restoration work reconnects the woodlands. However, since you have an option to purchase the field it does put you in the position of being able to replace the low-quality arable field, right now, by the creation of high-quality woodland-based habitat. Therefore the Parish Council would again urge you to rethink the exact areas for your expansion, concentrating on the fields further south. At the same time you could strengthen your green credentials by substantial woodland creation, which would have a beneficial effect on the landscape and wildlife of this part of Rockingham Forest. This new woodland would also provide more of a buffer between your activities and the Duddington community.</p>	<p>All wildlife, plants, animals and insects have certain definite habitat requirements; these are mainly to find shelter, cover from predators and to obtain food. They rarely move far from the habitat that meets their requirements and that they are established in or feel safe within. To function as a wildlife corridor, an area must provide all these attributes consistently. Due to the cyclical nature of arable farming, there is little opportunity for such a corridor to become established and as no species cross it as part of continuous or habitual use, loss of the fields will not sever any wildlife corridor or disconnect any population.</p> <p>Very great care has been taken to identify every species currently using the woods, hedges and their margins. No woodland will be lost or damaged, and new habitat creation or enhancement will provide increased and improved habitat for all the species currently using the area resulting in biodiversity net gain for the area. Consultation with the ecologists currently involved in monitoring the rare and vulnerable species in the area has ensured that their current locations and requirements are known and understood so they will not be put at risk.</p> <p>The site operations and subsequent restoration have been planned to ensure that no species, flora or fauna, will be lost. The requirements of all species have been carefully considered in planning the sequence and method of working the site so that habitats can be enhanced or created at the earliest opportunity during and even before operations commence. Pre-operational improvements include the retention and improvement of the hedgerow to the north of the proposed site and the establishment of wide field margins so that the important existing adjacent habitats will be maintained, improved and managed throughout the operational life of the site.</p> <p>The proposed western extension to the site will be constructed and operated in a series of phases which will be progressively restored so that the site is returned to beneficial</p>

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		<p>ecological use as soon as possible. The current projection is that the first, northernmost, area (Phase 12) will be restored in around 5 to 7 years from the start of cell extraction work in the area. There have been active discussions with both Natural England and the Forestry Commission regarding planting as both organisations have an interest in the choice of trees and linking habitats. Natural regeneration will also play a part. There are other opportunities for habitat creation which are being actively explored to realise the ambitions to create connectivity between the two areas of woodland as soon as possible resulting in significant biodiversity gain as a result of the proposals. If the site was not utilised as an extension to the existing ENRMF it would remain in arable use with limited ecological interest.</p>
Kings Cliffe Parish Council	<p>The Parish Council strongly object to these plans. However, should you proceed with these we would strongly insist an alternative entrance is put into place to manage the additional vehicle movement, maintenance and cleanliness of the road given the recent near misses and road repairs recently carried out.</p>	<p>The current entrance to the site is approved under the existing Development Consent Order (DCO) and was assessed as part of that application as being suitable for the development. Nevertheless, Augean has sought and gained approval for widening of the site entrance and the design has been approved by the highways team at the former Northamptonshire County Council. This work will widen the site entrance and improve the visibility splays in both directions as well as improving the drainage in the site entrance area. These improvements are being carried out in July and August 2021 and therefore will already be in place if the DCO is granted. It is also proposed that the weighbridge and reception location for HGVs entering the site will be moved further within the site to allow a longer queuing area on the site and the easier circulation of vehicles within ENRMF if the DCO is granted. The former Northamptonshire County Council highways team (now part of North Northamptonshire Council) who are responsible for road signage have indicated that the current signage on the Stamford Road could be improved, particularly on the approach to the woods in either direction which has seen a number of accidents due to excess speed and the adverse camber on the highway. Any such signs must be installed by or under the control of the highways team themselves. Whilst these accidents have not been caused by the activities of Augean, Augean has indicated that they are happy to contribute towards the costs of the signage improvements.</p> <p>The site has full wheel cleaning facilities that are used by all vehicles prior to leaving the site, the site also has a road sweeper employed full time to sweep the highway between the site entrance and the A47 in order to keep it clean and free of mud and debris. The</p>

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		<p>condition of the highway is continuously monitored by the road sweeper driver and also by ENRMF site staff via routine inspections and monitoring of site CCTV cameras to confirm that the road is maintained in a satisfactory manner at all times.</p> <p>The current DCO for the site includes a requirement which restricts HGV vehicles associated with the site from travelling to the south of the site access on Stamford Road towards the village of Kings Cliffe, unless they are delivering wastes collected locally. This requirement will be mirrored in the draft DCO (PINS document reference 3.1) for the proposed development.</p> <p>In addition the Section 106 Agreement for the existing ENRMF includes an annual payment be made by Augean to the Northamptonshire County Council highways team for repairs to Stamford Road between the site entrance and the A47. Improvements have recently been implemented by the Council and the highway surface at the entrance to the site has been repaired. Similar requirements for contributions towards highway repairs will be included in a Section 106 Agreement for the proposed development.</p>
<p>Northamptonshire County Council (this response was subsequently adopted by North Northamptonshire Council and West Northamptonshire Council)</p>	<p>Northamptonshire County Council is the minerals and waste planning authority in which both the existing East Northants Resource Management Facility and the proposed new location to its west are sited. As the minerals and waste planning authority the council also has an up to date minerals and waste local plan, the Northamptonshire Minerals and Waste Local Plan (MWLP), adopted July 2017, and upon which significant weight needs to be given in determining the application.</p> <p>As the adopted local plan for minerals and waste matters covering the proposed application site, the minerals and waste planning authority would therefore request that the application for the Development Consent Order references how the proposal both does and does not conform to the policies and general approach to waste disposal and to mineral extraction in the MWLP and if elements of the proposal do not conform to the MWLP how this should be addressed.</p> <p>In particular the minerals and waste planning authority seeks the local plan policy justification for the following matters to be clearly set out:</p>	<p>This application is accompanied by a Planning Statement (PINS document reference 6.1) which addresses the national and local policies relevant to the proposed development including those set out in the MWLP. Policies with respect to mineral extraction and waste disposal are reviewed as well as those relating to environmental impacts. The proposed development is generally in accordance with the policies set out in the MWLP.</p> <p>Notwithstanding this, the proposed development is classed as a Nationally Significant Infrastructure Project due to its scale and the nature of the waste to be disposed. In these circumstances the National Policy Statement for Hazardous Waste has greater weight than the relevant local planning policy.</p> <p>Consideration of the alternatives to the development the subject of the application is set out in Section 10 of this ES. The assessment of alternatives includes both the selection and the assessment of the suitability of the site location, the identification of the constraints which affect and lead to the choices that have been made with respect to the design of the proposed operations, the containment engineering design, the restoration profile hence the void generated, the operational and management proposals and the design of the restoration scheme.</p>

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	<ul style="list-style-type: none"> - The winning and working of minerals in order to create the landfill void for disposal, particularly in respect of Policy 3 (Development criteria for mineral extraction) which paragraphs 4.60 and 4.61 on refractory minerals and clay specifically refers to. In relation to this references should also be made as to why other locations, including nearby in Peterborough in Augean’s portfolio are not considered more appropriate rather than extracting a site for the sole purpose of it then being filled.- How the amount of hazardous waste disposal meets the requirements of Policy 14 (Strategy for waste disposal) and Policy 15 (Development criteria for waste disposal) of the MWLP. - How the amount of radioactive waste disposal meets the requirements of Policy 17 (Development criteria for radioactive waste management), Policy 14 (Strategy for waste disposal) and Policy 15 (Development criteria for waste disposal) of the MWLP. - How the 50,000tpa increase in throughput of the waste treatment facility to 250,000tpa meets the considerations of Policy 10 (Northamptonshire’s waste management capacity) and Policy 12 (Development criteria for waste management facilities) of the MWLP. - How the combined waste importation rate limit to the waste treatment facility and landfill of 300,000tpa (an increase of 50,000tpa compared with the currently consented total input rate) meets the considerations of Policies 10 and 14 of the MWLP. - Why when this proposal is effectively a new location to the west of the existing site that restoration to a generally domed restoration profile is considered appropriate. - Why an amendment to the longstanding approved restoration profile of the existing ENRMF site is considered appropriate. - Whether continuing operations by a further 20 years beyond the completion of the existing operational site (and which itself is still five years 	

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	away) is appropriate and whether, as is the case with the existing permitted facility, there should be a fixed completion date.	
	<p>- The current operations in relation to radioactive waste provide for funding to be made to the local communities in relating to amounts landfilled. Policy 25 (Implementation) in the MWLP supports this by including reference to proposals providing benefits to compensate the local community affected by the development. There should be consideration given as to whether this community benefit should be enhanced.</p>	<p>It is intended that the Augean Community Fund will continue to operate throughout the life of the proposed development and an obligation will be included in the draft Section 106 Agreement (PINS document reference 6.4). Consideration has been given to whether it should be enhanced. As you know, the agreed contribution made by Augean to the Community Fund as a direct result of the acceptance of LLW at the site is £5 per tonne of LLW deposited at the site. This contribution was made in spite of the conclusion that the disposal of LLW at the site does not result in additional environmental impact compared with other waste but recognises that there is some perception of impact within the local community. From 2015 up to the end of 2019 35,284.73 tonnes of LLW had been deposited at the site (Table 9.6 of the PEIR) which equates to approximately £176,424 contributed to the Community Fund i.e. an average of approximately £35,300 per annum. In addition, Augean participates in the Landfill Communities Fund (LCF) scheme which encourages landfill site operators to fund local community environmental projects using credits as allowed in the Government Landfill Tax scheme. LCF contributions are paid by Augean to the community via Grantscape, who allocate the sums to approved uses. These have increased by 43% per tonne since 2013 (when the LLW Community Fund rate was first agreed) while the Consumer Price Index (CPI) has only increased by 12% over that time. However, the recent overall average contribution by Augean to Grantscape is equivalent to £5.69 per tonne. Accordingly, for each tonne of LLW deposited at the site the community receives a total of £10.69 per tonne of LLW which is a 19% overall increase in the rate per tonne since 2013. This rate of increase is higher than the 12% increase in CPI since 2013. In summary, the increase in the relative contribution to the community resulting from the deposition of LLW at the site has matched and even exceeded the increase in CPI over the same period. Accordingly we do not consider that any increase in the rate of compensation to the Community Fund is necessary.</p>
	Northamptonshire County Council as the Local Highway Authority note that the applicant intends to review traffic numbers associated with the currently	Augean and their traffic specialist advisers have held discussions with the Highway Authority in order to agree the scope of the traffic assessments. These discussions included

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	<p>consented activities at the site to determine whether there will be any significant changes to these flows as a result of the increase in size of the facility.</p> <p>The applicant states that the probable average number of HGV vehicle movements associated with the combined activities that were assessed in relation to the previous consent was 196 per day (98 movements in and 98 movements out). Whilst the applicant states this figure is unlikely to change significantly as a result of this application we will need appropriate surveys and assessment to confirm this is the case.</p> <p>To confirm due to the current COVID-19 pandemic obtaining traffic survey data for volumetric purposes is not permitted within Northamptonshire however we review matters frequently and seek to lift this measure once traffic levels are returned to near typical levels.</p> <p>As noted by the applicant a full Transport Statement will be required to accompany the DCO application and prior we welcome a Scoping Note to agree the contents of this</p> <p>The current site access arrangements appear sub-standard. We will require confirmation of access width and radii with visibility splays shown on a scaled drawing. Vehicle tracking of the largest vehicles to enter site will also be required</p> <p>Improvements may be required for the junction of Stamford Road with the A47 subject to trip distribution information being provided.</p> <p>A suitably worded condition covering collection vehicles using the site access to not travel to the South of the site access on Stamford Road towards the village of Kings Cliffe, unless they are delivering wastes collected locally will be required.</p>	<p>the alternative means by which representative, up to date road traffic data could be derived for use in the assessments given the restrictions associated with the COVID-19 pandemic. The current entrance to the site is approved under the existing DCO and was assessed as part of that application as being suitable for the development. Nevertheless, Augean has gained approval for widening of the site entrance and the proposed design has been approved by the highways team at the former Northamptonshire County Council. These improvements to the access are being implemented in July and August 2021 and therefore will already be in place if the new DCO is granted. A transport and traffic impact assessment is provided in Section 19 of this ES the scope of which was agreed with the relevant consultees including the local Highways Authority.</p> <p>The Section 106 Agreement (PINS document reference 6.2.4.3) for the site includes an annual payment for repairs to Stamford Road between the site entrance and the A47. It is proposed that similar arrangements will be included in a Section 106 Agreement for the proposed development (PINS document reference 6.4).</p> <p>The current DCO for the existing ENRMF includes a requirement which restricts HGV vehicles associated with the site from travelling to the south of the site access on Stamford Road towards the village of Kings Cliffe, unless they are delivering wastes collected locally. It is proposed that a similar requirement will be included in the draft DCO (PINS document reference 3.1) for the proposed development</p>
East Northamptonshire District Council	<p>The justification provided in the consultation documentation for the significantly increased land levels proposed by the 'domed' restored landform is noted, however further justification and explanation for the 'domed' restoration profile is required.</p>	<p>A domed restoration profile is necessary for landfill sites which accept non-inert waste in order to maximise the runoff of rainfall. The final profile of the waste and capping layer is designed to form a stable slope which will encourage shedding of rainfall to minimise infiltration and as a consequence to minimise the generation of leachate. Leachate is the</p>

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	<p>An analysis should be undertaken to determine what trees and vegetation would be growing on the site in around 200 years time, taking account of climate change, to ensure the capping layer would be sufficient to withstand root penetration from these species.</p>	<p>contaminated liquid formed when water infiltrates into the waste and which is collected in the base of the site from where it is collected and managed. Further detail on the design of the landfill site including justification for the restoration profile is provided in Section 5 of this ES.</p> <p>The restoration scheme for the site includes the planting of trees on the restored site. The final details including the types of trees which will be planted have been discussed and agreed with Natural England. Detailed discussions have taken place with Natural England as well as North Northamptonshire Council, Forestry England and the Wildlife Trust in order to agree the restoration planting scheme which included discussions on tree species. Actions are also in hand, including through liaison with the Friends of Fineshade Wood and others, for proposals to collect and propagate tree saplings from local seed banks. Research by the Forestry Commission has shown that the risks of root intrusion into a compacted low permeability cap are not significant and the planting of woodland on restored landfill sites is accepted by the Environment Agency who do not consider that the risks of root penetration are significant. Woodland planting on the restored landfill site is included in the approved restoration scheme for the current landfill area. The specification and construction of the low permeability capping layers are approved and regulated through the Environmental Permit by the Environment Agency.</p>
	<p>Further justification is required to confirm that the soil thickness of 1m – 1.5m beneath the ‘domed’ restoration profile would be sufficient for the restoration scheme and to protect the capping layer from root penetration (related to item 2 above).</p> <p>The commitment to provide three photomontages from Viewpoints 3, 5 and 9 to illustrate the appearance of the proposed restored landform in the landscape is welcomed; however additional photomontages are requested from other viewpoints to assist in the assessment of its visual and landscape impacts.</p>	<p>As set out in above research has shown that the risks of root intrusion into a compacted low permeability cap are not significant. The research has concluded that soil of 1.5m thickness is suitable to ensure trees can be established on landfills without posing a significant threat of damage to the underlying cap which would adversely affect the management of water ingress to the waste.</p> <p>Liaison has taken place with the Minerals and Waste Planning Service at North Northamptonshire Council regarding the proposed development including with respect to the landscape and visual impact assessment. As there are limited locations from which views of the proposed development would be available it is not considered necessary to prepare photomontages from all the viewpoint locations considered in the Landscape and Visual Impact Assessment. In agreement with the Minerals and Waste Planning Service at North Northamptonshire Council, it has been determined that the proposed locations will provide a</p>

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	The advice of the Lead Local Flood Authority should be sought regarding surface water run-off and drainage from the proposed development.	<p>representative selection of views to assist in the assessment of impacts. The photomontages are presented in the Landscape and Visual Impact Assessment at Appendix ES14.1 to this ES (PINS document reference 5.4.14.1).</p> <p>The proposed Surface Water Management Plan (PINS document reference 6.5) has been provided to the Lead Local Flood Authority and their feedback is awaited.</p>
Natural England	A detailed submission was made by Natural England which included comments on the potential for impacts on designated sites, the potential for impacts on protected species, the potential for impacts on air quality that may affect the adjacent protected woodlands, the importance of using the opportunity of the restoration of the site to enhance the local distinctiveness in the long term of the Rockingham Forest landscape character, to encourage Augean to take advantage of the opportunities to provide stronger ecological links between Collyweston Great Wood and Fineshade Wood as the application site is of major strategic importance in this respect, and forms one of the key potential habitat corridors that can help create a nature recovery network linkage across the north Rockingham Forest landscape, and to demonstrate measurable biodiversity net gain.	A Discretionary Advice Service (DAS) meeting was held with Natural England at the ENRMF offices on 10 February 2021. Plans for the proposed extension area (phased clay extraction / landfill / restoration) with potential utilities limitations in some areas and likely timeframes were outlined. Full descriptions (completed and ongoing) of the surveys undertaken for protected and other valued species, and the habitat surveys to identify S41 habitats, and to inform the BNG baseline were given. At this meeting, early thoughts on avoidance of impacts, including the issue of loss of connectivity were discussed, and suggestions were put forward by NE. Due to Covid restrictions, most later discussions were held by video or telephone or email, including with representatives of other bodies. Results and avoidance/mitigation plans were continually updated and discussed, with all suggestions received included in further versions. A later site meeting was held on the ENRMF site for NE to see completed restoration/management work carried out on the current site. More details are given in the Ecological Impact Assessment presented at Appendix 13.1 to the Environmental Statement.
Environment Agency	<p>Requirements under the Environmental Permitting Regulations (2016)</p> <p>Augean currently operate the East Northants Resource Management Facility under an Environmental Permit. The proposed development is an extension to the current site activities and would require the permit to be varied to accommodate the increased capacity etc. It is understood that the extended development will essentially operate in the same manner as the current site activities.</p> <p>We met with the applicants' consultant on 17 July 2020 to discuss the permit variation. It was concluded that the proposals are generally acceptable as the design and operation of the site will be similar to the current permitted site. However, the detailed design has yet to be agreed with particular</p>	<p>Discussions have been taking place with the Environment Agency since 2019 regarding the proposed development, the principles of the landfill design and the scope of the site investigation. A detailed hydrogeological risk assessment has been carried out as part of the application for the variation of the Environmental Permit for the landfill in the proposed western extension in order to demonstrate that appropriate groundwater protection is in place.</p> <p>An application for the variation to the Environmental Permit for the landfill in the proposed western extension was submitted to the Environment Agency in May 2021.</p> <p>An application for the variation to the Environmental Permit for the waste treatment and recovery facility was submitted to the Environment Agency in May 2021.</p>

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	<p>regard to the protection of the nearby swallow hole. This will be determined by the outcome of additional proposed investigations and assessments on this matter.</p> <p>We have requested that these assessments are based upon our position statements N6, N7, N9 and N11 in Section N of our document detailing our approach to groundwater protection which is located here: www.gov.uk/government/publications/groundwater-protection-position-statements</p>	
Public Health England	A detailed submission was made by Public Health England which included comments on potential impacts on air quality, health and wellbeing, mental health and physical activity/access to open space.	The comments provided by Public England reflect the advice now set out in their guidance on NSIP applications. Discussions were held with Public Health England in February 2021. In response to the comments and advice a separate chapter is provided at Section 25 of the ES which presents in a single location the assessments of factors which have the potential to affect health including the wider determinants of health.
The Forestry Commission (East and Midlands)	A detailed submission was made by Forestry England which focussed on the connection between the two woodlands either side of the western section of the proposed western extension and in particular the opportunity to restore a link between these woods as part of a wider aim to deliver a more biodiverse landscape across the Rockingham Forest Area.	Emails were exchanged with Forestry Commission Services following receipt of their original submission to give assurances that the issues of connectivity, and recognition of the importance for future resilience and long term aims for Rockingham Forest of connecting the adjacent woodlands. Further discussions were held with the staff of Forestry England, by video and telephone, to provide ongoing information of surveys and avoidance/mitigation/enhancement planning. Technical advice on choice of tree species and deer fencing was also given by FE staff. More information is provided in the Ecological Impact Assessment presented at Appendix 13.1 to the Environmental Statement.
Historic England (Midlands)	Recommended that engagement with the specialist archaeologist adviser at Northamptonshire County Council is continued in order that the assessment of potential impacts on heritage assets is appropriately detailed and robust.	Communication with the specialist adviser and others continued throughout the assessment work and is detailed in the assessment for archaeology and cultural assessment provided at Appendix ES16.1. The communications have resulted in an agreed archaeological mitigation strategy which is included in the DCO Environmental Commitments Document (PINS document reference 6.5).
Ministry of Defence	<p>Birdstrike</p> <p>This application occupies the statutory birdstrike safeguarding zone surrounding the aerodrome. Within this zone, the principal concern of the</p>	It was confirmed with the Ministry of Defence (MoD) that the site will not handle any putrescible wastes and as that should not change as part of the proposed extension, therefore the wastes being handled should not attract hazardous birds. However, it is considered by the MoD that stripping of topsoil and storing on site can result in an attractant

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	<p>MOD is that the creation of new habitats may attract and support populations of large and, or, flocking birds close to the aerodrome.</p> <p>The site currently accepts hazardous waste. The landfill does not handle domestic or catering waste. It is proposed that the extension will be for the same types of waste as currently permitted. The waste to be managed at the site will contain minimal quantities of putrescible material and the waste and the organic content of the waste which can be landfilled is limited by legislation to less than 6% by volume of total organic carbon.</p> <p>If only permitted wastes, and no putrescible or biodegradable waste are handled on the site then this should not result in an exploitable food resource for hazardous birds such as gulls and Red Kites.</p> <p>The stripping and handling of topsoils can expose invertebrates, resulting in feeding opportunities for hazardous birds such as corvids and gulls. As such, at any development near an aerodrome which involves earthworks a Bird Hazard Management Plan (BHMP) would be required to ensure that the handling of topsoil does not result in a transitory attractant for hazardous birds.</p> <p>The restoration of the existing site and proposed extension is to generally domed restoration landforms with restoration to nature conservation interest using the soils available at the site as well as suitable imported materials. If the restoration is to species rich grassland, then this should not result in an attraction for hazardous birds. Other habitat types may be attractive to hazardous species, and the restoration should be agreed with the MOD.</p> <p>To address the issue of increased birdstrike risk, DIO Safeguarding would request a condition to be included as part of any permission granted for this application as follows:</p> <ul style="list-style-type: none"> • No putrescible wastes are accepted or handled on site in line with the currently permitted wastes due to the potential for such waste to provide an exploitable food resource for hazardous birds such as gulls and Red Kites. 	<p>both from the stripped areas and stored soils and from puddling and ponding on the bare surface. A Bird Hazard Management Plan was requested that should include monitoring during and after the process until the bare earth is covered or removed. A Bird Hazard Management Plan is included in the DCO Environmental Commitments Document (PINS document reference 6.5).</p> <p>The amount of open water included in the Restoration Concept Scheme has been minimised as requested by the MoD and the ponds will be surrounded by tall marginal and emergent vegetation or scrub in order to further reduce the attraction posed to hazardous birds by open water.</p>

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	<ul style="list-style-type: none"> • A Bird Hazard Management Plan is submitted to compact, cover or remove any areas of loose topsoil as soon as practicable and to monitor and disperse any hazardous birds attracted to these areas. • The proposed restoration habitats are agreed with the MOD prior to commencement of restoration 	
Cecil Estate Family Trust	<p>A. Profile of the landform – concern regarding the proposed changes to the restoration profile of the existing landfill site and the eventual restoration profile of the western extension particularly that the gradient of the restored land to the existing site to be steepened even further with associated increased risk of flooding.</p> <p>B. Traffic Impact Assessment – concern that there will be significant increases in traffic numbers and that a traffic impact assessment should be carried out.</p> <p>C. Impact on the Adjacent SSSI & Ancient Woodland & National Nature Reserve - an assessment of road traffic noise and the noise from the increased activity on the existing and proposed site is needed to assess the impacts on neighbouring land, wildlife and occupiers.</p> <p>D. Assessment of Odour – the impacts from odour need to be properly assessed and sufficient mitigation measures put forward as part of the application.</p> <p>E. Ownership of Bund – comments on land ownership issues that are not material to the DCO application</p>	<p>A. The respondent's main concern relates to the gradient of the northern slope of the existing ENRMF. No changes are proposed as part of the proposed development to the gradient of the northern slopes as the eastern part of these areas are already completed and restored.</p> <p>B. A traffic impact assessment has been carried out and is provided at Section 19 and Appendix ES19.1 of the ES. The increase in traffic associated with the proposed development is limited.</p> <p>C. As the increase in traffic associated with the proposed development is limited (an average of four additional movements per hour), any associated impact on the SSSI from traffic is negligible. The impact of noise associated with the increase in traffic is considered in Section 20 of the ES.</p> <p>D. The potential for odour associated with the proposed development is considered in Section 19 of the ES. The control, management and monitoring of waste, including potentially odorous waste, is part of the procedures regulated by the Environment Agency through the Environmental Permit.</p>
National Grid	<p>National Grid Gas has a high pressure gas transmission pipeline and associated apparatus located within or in close proximity to the proposed order limits. The transmission pipeline forms an essential part of the gas transmission network in England, Wales and Scotland:</p> <ul style="list-style-type: none"> • Feeder Main 2 Helpston to Duddington. <p>Gas Infrastructure</p> <p>The following points should be taken into consideration:</p>	<p>Discussions have been held with National Grid and the other service providers who have apparatus in the vicinity of the proposed development in order to agree the appropriate safe standoffs for the excavation works from the location of the services. The correspondence with National Grid and other service providers is presented at Appendix ES5.2 and the agreed standoffs are incorporated into the overall boundary standoffs as set out at Appendix ES5.1 and in the Boundary Design Principles for the Western Extension which is in the DCO Environmental Commitments Document (PINS document reference 6.5).</p>

S42 consultee	Summary of the key comments on the PEIR.	Responses to the key comments and issues
	<ul style="list-style-type: none"> ▪ National Grid has a Deed of Grant of Easement for each pipeline, which prevents the erection of permanent / temporary buildings, or structures, change to existing ground levels, storage of materials etc. Pipeline Crossings: <ul style="list-style-type: none"> • Where existing roads cannot be used, construction traffic should ONLY cross the pipeline at previously agreed locations. • The pipeline shall be protected, at the crossing points, by temporary rafts constructed at ground level. The third party shall review ground conditions, vehicle types and crossing frequencies to determine the type and construction of the raft required. • The type of raft shall be agreed with National Grid prior to installation. • No protective measures including the installation of concrete slab protection shall be installed over or near to the National Grid pipeline without the prior permission of National Grid. • National Grid will need to agree the material, the dimensions and method of installation of the proposed protective measure. • The method of installation shall be confirmed through the submission of a formal written method statement from the contractor to National Grid. • Please be aware that written permission is required before any works commence within the National Grid easement strip. • A National Grid representative shall monitor any works within close proximity to the pipeline to comply with National Grid specification T/SP/SSW22. • A Deed of Consent is required for any crossing of the easement General Notes on Pipeline Safety: <ul style="list-style-type: none"> • National Grid will also need to ensure that our pipelines access is maintained during and after construction. 	

S42 consultee	Summary of the key comments on the PEIR.	Responses to the key comments and issues
	<p>Our pipelines are normally buried to a depth cover of 1.1 metres however; actual depth and position must be confirmed on site by trial hole investigation under the supervision of a National Grid representative. Ground cover above our pipelines should not be reduced or increased.</p> <ul style="list-style-type: none"> • If any excavations are planned within 3 metres of National Grid High Pressure Pipeline or, within 10 metres of an AGI (Above Ground Installation), or if any embankment or dredging works are proposed then the actual position and depth of the pipeline must be established on site in the presence of a National Grid representative. A safe working method agreed prior to any work taking place in order to minimise the risk of damage and ensure the final depth of cover does not affect the integrity of the pipeline. • Excavation works may take place unsupervised no closer than 3 metres from the pipeline once the actual depth and position has been confirmed on site under the supervision of a National Grid representative. Similarly, excavation with hand held power tools is not permitted within 1.5 metres from our apparatus and the work is undertaken with NG supervision and guidance. <p>Any request for additional depth of soil cover over the pipeline can be investigated further on request but it is avoided due to the additional loading and restriction for access to the pipe in the case of an emergency.</p> <p>We also wish to confirm that any proposed overhead power cable realignment at this site should be kept away from the pipeline, due to the impact on the pipeline's Cathodic Protection Scheme</p>	

Table ES2.3

Summary of the changes made to the design of the development and the approach to the Environmental Impact Assessment in response to comments received during pre-submission consultation

Consultation comments	Changes made
<p>Due to the Covid-19 pandemic it was not possible to hold face to face consultation events as would normally be undertaken as part of the pre-application process. A number of consultee responses requested that additional time was given for the submission of responses to the consultation material to allow anyone who wanted to respond the opportunity to do so.</p>	<p><i>Extension in the consultation period.</i></p> <p>The pre-application consultation period was initially scheduled to run from the end of October 2020 to 14 December 2020. In response to requests, this period was extended initially to 8 January 2021 and then to 15 February 2021. Comments received after this date were also taken into account.</p>
<p>A number of consultees raised concerns regarding the potential for a reduction in wildlife connectivity between Collyweston Great Wood and Fineshade Wood/The Assarts and concerns regarding the anticipated consequent detriment to wildlife and potential biodiversity loss.</p>	<p><i>Enhancements to maximise connectivity</i></p> <p>Additional surveys were carried out in the proposed western extension to confirm the use of the proposed western extension by species travelling between the two woodland communities. It was determined that due to the cyclical nature of arable farming, there is little opportunity for such a corridor</p>

Consultation comments	Changes made
	<p>to become established and as no species cross it as part of continuous or habitual use, loss of the fields will not sever any wildlife corridor or disconnect any population.</p> <p>In order to create maximum benefit in the restoration design, measures have been included in the design to maintain boundary habitats and to improve the connectivity between the habitats present to the east of the proposed western extension in Collyweston Wood and to the west of the proposed western extension in Fineshade Wood during operation and restoration encompassing the following:</p> <ul style="list-style-type: none"> • Where it is necessary to remove hedgerows it is proposed that this will not be done until the latest possible time • Some hedgerows around the site will be improved prior to the commencement of the proposed development. • New hedgerows crossing the proposed western extension will be planted prior to the commencement of

Consultation comments	Changes made
	<p>the development so that they will have had the opportunity to mature before the two existing hedgerows are removed.</p> <p>Detailed discussions have been held with a number of local and national groups and organisations in order to share information on ecological surveys and long term habitat development plans for the area. Restoration proposals have been designed based on these discussions to maximise biodiversity enhancement for the restored site including connecting existing habitats.</p> <p><i>Change in phasing order and restoration sequence</i></p> <p>The phasing of the proposed western extension including restoration phasing has been amended so that the northern part of the proposed western extension (Phases 12 to 14) is excavated, filled, capped and restored at the earliest possibility following commencement of operations.</p>

Consultation comments	Changes made
	<p><i>Exclusion of the northern area from future operational use</i></p> <p>The operational plans for the proposed western extension have been amended so that no stockpiling or other activity will be undertaken in the northern area of the proposed western extension following completion of landfilling (Phases 12 to 14) in order to allow the restored areas to mature as soon as possible.</p>
	<p><i>Maintenance of the central surface water channel</i></p> <p>Three restoration options were presented in the Preliminary Environmental Information Report for the central area of the proposed western extension across which surface water currently drains in a culvert. This area also is known to have potential doline features and will be subject to further investigation prior to agreeing with the Environment Agency the final design of the landfill construction in these areas.</p>

Consultation comments	Changes made
	<p>Following receipt of consultation comments the development design was adjusted so that a minimum 20m wide area will be retained at this location, the culvert will be removed and replaced with a watercourse (Swallow Brook) with ponds flowing from the west of the site to the swallow hole in the east to provide continued surface water drainage. This provides the opportunity to develop east-west connectivity and to maximise biodiversity in these areas including in the grassland adjacent to the watercourse and in the proposed double hedgerows planted at an early stage (as explained above) either side of the route of the watercourse.</p> <p>Ecology workshop</p> <p>In order to share the information which underpins the design of the site mitigation, enhancement and restoration scheme a workshop has been proposed at which the flora and fauna present at and around the proposed western extension could be discussed together with the effects of the proposed</p>

Consultation comments	Changes made
	development. Suitable dates are being sought for those interested in attending.
Some consultee responses identified that the car park for visitors to Fineshade Wood often became busy and requested that a car park was included in the restored site to allow members of the public to make use of the footpaths proposed on the restored site.	<p><i>Provision of a car park for visitors to the restored site</i></p> <p>A small car park has been included in the proposed restoration scheme</p>
Concerns were raised by the Ministry of Defence regarding the potential for the site to attract birds that may present a hazard of bird strike (hazardous birds) to aircraft at Wittering airfield.	<p><i>Minimising the potential for 'hazardous birds'</i></p> <p>The types of waste accepted at the site are not attractive to birds, however the Ministry of Defence were concerned that hazardous birds may be attracted during soil stripping and as a result of the restoration design, particularly if waterbodies are present.</p> <p>A Bird Hazard Management Plan has been developed and will be implemented during soil stripping activities.</p> <p>The restoration scheme design for the site includes limited areas of open water and where these are present they will be</p>

Consultation comments	Changes made
	planted with tall marginal plants to minimise their attractiveness to hazardous birds.
Consultees raised concerns regarding the potential impact from noise on nearby public rights of way as a result of the proposed development.	<p><i>Additional noise monitoring</i></p> <p>Additional monitoring of the acoustic environment was undertaken at points along Footpaths MX15 and MX13 as part of the noise impact assessment.</p>
Concerns were raised regarding the use of ditches and drainage features at the site boundary for the continued drainage of surface water runoff from the proposed western extension.	<p><i>Change in the application boundary</i></p> <p>Changes were made to the application boundary to specifically include the existing surface water drainage features utilised by surface water draining from the proposed western extension and beyond.</p>

Table ES5.1

Anticipated phasing sequence for the continued operation of East Northants Resource Management Facility

Key stages	Excavate/engineer	Fill	Cap	Restore	Aftercare
Current (July 2021)	Phases 8 and 9	Phase 7 (except western edge)	Phases 6C and 10	Largest extent of stockpile	Phases 1 and 2 (north)
Work starts in the north of the western extension (Phase 12) approximately Q4 2023/Q1 2024	Phase 12	Phases 8 and 9 (except western edge)	Phase 7 (southern flank)	Phase 2B (eastern flank), Phase 5A (eastern flank), Phase 10 (north)	Phases 1 and 2 (north)
Filling completed in the current landfill in all but the western area and the treatment plant area	Phase 13	Phase 12	Remainder of Phases 3, 6 and 10	Phases 3A (south) and 6 (south) and 7 (southern flank)	Phase 1(north) and 2 (east), Phase 5A (east), Phase 10 (north)

Key stages	Excavate/engineer	Fill	Cap	Restore	Aftercare
↓	Phase 14	Phase 13	Phases 8 and 9 (except western edge) Phase 12	Remainder of Phases 1 and 2, 3, 6 and 10, Phase 4A	Phase 1(north) Phase 2 (east), Phase 3A (south), Phase 6 (south), Phase 5A (east), Phase 7 (south), Phase 10 (north)
The northern most Phase in the western extension (Phase 12) is restored. Work starts at the southern end of the western extension	Phase 15	Phase 14	Phase 13	Phases 8 (east) and 9 (east) and remainder of Phase 7 (east). Phase 12	Phase 1 to 3, 4A, 5A, 6, 7 (south) and 10
↓	Phase 16	Phase 15	Phase 14	Phase 13	Phases 1 to 3, 4A, 5A, 6, 7(east) to 9 (east), 10 and 12

Key stages	Excavate/engineer	Fill	Cap	Restore	Aftercare
Restoration is completed in the northern area of the western extension	Phase 17	Phase 16	Phase 15	Phase 14	Phases 1 to 3, 4A, 5A, 6, 7(east) to 9(east), 10 and 12 to 13
↓	Phase 18	Phase 17	Phase 16	Phase 15	Phases 1 to 3, 4A, 5A, 6, 7(east) to 9(east), 10 and 12 to 14
↓	Phase 19 and join to the western edge of Phase 7	Phase 18	Phase 17	Phase 16	Phases 1 to 3, 4A, 5A, 6, 7(east) to 9(east), 10 and 12 to 15
Restoration is completed in the area to the south of the gas pipeline	Phase 20 and join to the western edge of Phases 8 and 9	Phase 19 and the western part of Phase 7	Phase 18	Phase 17	Phases 1 to 3, 4A, 5A, 6, 7(east) to 9(east), 10 and 12 to 16
Restoration is completed in the area to the south of the water pipelines	Phase 21 (central and western areas)	Phase 20 and the western part of Phases 8 and 9	Phase 19	Phase 18	Phases 1 to 3, 4A, 5A, 6, 7(east) to 9(east), 10 and 12 to 17

Key stages	Excavate/engineer	Fill	Cap	Restore	Aftercare
Work commences in the area of the treatment plant	Removal of the treatment plant. Eastern area of Phase 21 and Phase 11	Phase 21 (central and western areas)	Phase 20	Phase 19	Phases 1 to 3, 4A, 5A, 6, 7(east) to 9(east),10 and 12 to 18
↓		Eastern area of Phase 21, Phase 11 and western edges of Phases 7, 8 and 9	Phase 21 (central and western areas)	Phase 20	Phases 1 to 3, 4A, 5A, 6, 7(east) to 9(east),10 and 12 to 19
Waste acceptance ceases.			Eastern area of Phase 21, Phase 11 and western edges of Phases 7, 8 and 9	Phase 21 (west)	Phases 1 to 3, 4A, 5A, 6, 7(east) to 9(east),10 and 12 to 20

Key stages	Excavate/engineer	Fill	Cap	Restore	Aftercare
↓	Removal of temporary haul roads etc.			Eastern area of Phase 21, Phases 11, 4B and 5B and completion of Phases 7, 8 and 9	Phases 1 to 3, 4A, 5A, 6, 7(east) to 9(east), 10 and 12 to 20 and 21 (west)
2046	Removal of all infrastructure not needed for aftercare and monitoring. Construction of car park.				Landfilling complete and all phases in aftercare

Note: Shaded cells denote phases located in the proposed western extension

Table ES5.2

Mitigation measures identified in the Environmental Statement for the proposed western extension to ENRMF

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
<p>Waste treatment and landfill operations</p> <p>Flare for the combustion of landfill gas.</p>	<p>The embedded mitigation measures comprise the construction, operation, management and monitoring of the treatment facility and the landfill site in accordance with specifications and procedures controlled through the Environmental Permits. The mitigation measures include regular monitoring of emissions from the site in accordance with the Environmental Permit and submission of the results to the Environment Agency.</p> <p>The containment design detail including the depth to the base of the landfill site and the stability of the slopes will be agreed with the</p>	<p>The site design and operational controls are regulated through the Environmental Permits by the Environment Agency under the pollution control regime.</p> <p>Construction Quality Assurance Plans are approved and controlled under the Environmental Permit.</p>

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	<p>Environment Agency for each phase prior to construction.</p> <p>The landfill operations are carried out in a sequence of phases to limit the operational area at any one time.</p> <p>The landfill restored landform is designed to maximise surface water runoff as well as to integrate into the landscape.</p>	<p>Phasing sequence (PINS document reference 6.5). Details of phasing must accord with the phasing sequence table and must be submitted to the relevant planning authority for approval pursuant to Requirement 4 of the draft Order.</p> <p>The restored landform profile plan is a certified plan under Article 18(1)(c) of the draft Order. Compliance is secured under Requirement 3(d) of the draft Order.</p>
<p>Population including impacts on human health</p>	<p>The embedded mitigation measures comprise the construction, operation, management and monitoring of the</p>	<p>The site design and operational controls are regulated through the Environmental</p>

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	treatment facility and the landfill site in accordance with specifications and procedures controlled through the Environmental Permits. The mitigation measures include procedures for waste assessment, waste acceptance, waste receipt, treatment and storage and waste deposit as well as regular monitoring of emissions from the site in accordance with the Environmental Permit and submission of the results to the Environment Agency.	Permits by the Environment Agency under the pollution control regime.
Ecology and biodiversity	Identification and protection of a Root Protection Area.	Boundary design principles for the proposed western extension (PINS document reference 6.5). Compliance is secured by Requirement 3 of the draft Order. Tree Management Scheme (PINS document reference 6.5). The DEC is a

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
		<p>certified document under Article 18(1)(e) of the draft Order. Compliance is secured through Requirement 4 of the draft Order.</p> <p>Ecological Management, Monitoring and Aftercare Plan (PINS document reference 6.5). Compliance is secured by Requirement 4 of the draft Order.</p>
	<p>Identification and protection of woodland margin habitat.</p> <p>The site margins will be enhanced through management to create increased and improved habitat for invertebrates and herpetofauna and improve foraging for badgers. The enhancements will benefit amphibians, adders, bats and badgers.</p>	<p>Boundary design principles for the proposed western extension (PINS document reference 6.5). Compliance is secured by Requirement 3 of the draft Order.</p> <p>Ecological Management, Monitoring and Aftercare Plan (PINS document reference 6.5). Compliance is secured by Requirement 4 of the draft Order.</p>

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	Erection of protective fences to prevent amphibians (including GCN), badgers and deer from entering the operational area to prevent death or injury.	
	Protection and enhancement of identified hedgerows which will remain in place throughout the development.	Ecological Management, Monitoring and Aftercare Plan (PINS document reference 6.5). Compliance is secured by Requirement 4 of the draft Order.
	Searching, trapping and supervision as necessary prior to and during clearance and removal of the vegetation prior to the commencement of each phase of the development	Ecological Management, Monitoring and Aftercare Plan (PINS document reference 6.5). Compliance is secured by Requirement 4 of the draft Order.
	Management and control of invasive plant species	The current invasive species on site are managed in accordance with legal obligations and relevant guidance. Compliance is secured through Requirement 4 of the draft DCO.

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
		<p>Ecological Management, Monitoring and Aftercare Plan (PINS document reference 6.5). Compliance is secured by Requirement 4 of the draft Order.</p>
	<p>The creation of the six east to west hedgerows as part of the pre-commencement works and progressive restoration of the site will provide additional movement and foraging areas for adders.</p>	<p>Ecological Management, Monitoring and Aftercare Plan (PINS document reference 6.5). Compliance is secured by Requirement 4 of the draft Order.</p> <p>The Restoration Concept Scheme is a certified plan under Article 18(1)(d) of the draft Order. Compliance is secured by Requirement 4 of the draft Order.</p>
	<p>Dust control measures</p>	<p>Dust Management Scheme (PINS document reference 6.5). Compliance is secured by Requirement 6(2) of the draft Order</p>

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	Water control measures	<p>Emission limits for dust deposition are included in the Environmental Permit.</p> <p>During the operation of Proposed Development site water management is controlled under the Environmental Permit.</p> <p>Once the facility ceases to operate and the site is restored water will be managed in accordance with the Surface Water Management Plan (PINS document reference 6.5). Compliance is secured by Requirement 3(e) of the draft Order</p>
	The site is restored in accordance with the Restoration Concept Scheme	The Restoration Concept Scheme is a certified plan under Article 18(1)(d) of the draft Order. Compliance is secured by Requirement 4 of the draft Order.

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	Implementation of a phasing, landscaping and restoration plan with regular reviews on progress	Compliance is secured by Requirement 4 of the draft Order.
Landscape and visual effects	<p>Advance planting of hedgerow with trees along the eastern boundary of the southern section of the western extension area to provide visual screening</p> <p>The landfill operations and restoration are carried out in a sequence of phases to limit the operational area at any one time.</p> <p>Stockpiles shall be managed in accordance with the stockpile management plan.</p>	<p>Ecological Management, Monitoring and Aftercare Plan (PINS document reference 6.5). Compliance is secured by Requirement 4 of the draft Order.</p> <p>Phasing sequence (PINS document reference 6.5). Compliance is secured by Requirement 4 of the draft Order.</p> <p>Stockpile Management Scheme (PINS document reference 6.5). Compliance is secured by Requirement 6(1) of the draft Order.</p>

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	The site is restored in accordance with the Restoration Concept Scheme	The Restoration Concept Scheme is a certified plan under Article 18(1)(d) of the draft Order. Compliance is secured by Requirement 4 of the draft Order.
	Implementation of a phasing landscaping and restoration plan with regular reviews on progress	Compliance is secured by Requirement 4 of the draft Order.
Soil resources and agricultural land classification	<p>All soil handling, movement and storage will be undertaken in accordance with schemes based on the MAFF Good Practice Guide for Handling Soils.</p> <p>BMV soils in the north of the western extension will be husbanded for use in the development of calcareous grassland in the restored site.</p>	<p>Soil Handling and Management Scheme (PINS document reference 6.5). Compliance is secured by Requirement 6(2) of the draft Order.</p> <p>The Restoration Concept Scheme is a certified plan under Article 18(1)(d) of the draft Order. Compliance is secured by Requirement 4 of the draft Order.</p>

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	<p>A bird hazard management scheme to be implemented during soil stripping.</p> <p>Stockpiles shall be managed in accordance with the stockpile management plan.</p>	<p>Bird Hazard Management Scheme. Annex DEC I1 to the Soil Handling and Management Scheme (PINS document reference 6.5). Compliance is secured by Requirement 6(2) of the draft Order.</p> <p>Stockpile Management Scheme (PINS document reference 6.5). Compliance is secured by Requirement 6(1) of the draft Order.</p>
<p>Archaeology and cultural heritage</p>	<p>Soil stripping under the direction of an archaeologist followed by archaeological excavation of two defined areas</p> <p>Watching brief during any excavation or soil stripping in the service corridor for the existing electricity cable route and the service corridor for the water pipes prior to placement of the diverted electricity cable.</p>	<p>Archaeological Mitigation Strategy (PINS document reference 6.5). Compliance is secured by Requirement 9 of the draft Order.</p>

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
Water resources	The embedded mitigation measures comprise the construction, operation, management and monitoring of the treatment facility and the landfill site in accordance with specifications and procedures controlled through the Environmental Permits. The mitigation measures include regular monitoring of emissions from the site in accordance with the Environmental Permit and submission of the results to the Environment Agency.	The site design and operational controls are regulated through the Environmental Permits by the Environment Agency under the pollution control regime.
	The design and implementation of the surface water management plan.	Surface Water Management Plan (PINS document reference 6.5). Compliance is secured by Requirement 3(1)(e) of the draft Order.
Flood risk assessment	Implementation of the surface water management plan for the restored site.	Surface Water Management Plan (PINS document reference 6.5). Compliance is

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
		secured by Requirement 3(1)(e) of the draft Order.
Transport and traffic	Traffic routing agreement.	Traffic Management Plan (PINS document reference 6.5). Compliance is secured by Requirement 11 of the draft Order.
	Annual contribution for highway maintenance to the Highways Authority for the maintenance of the roads.	Section 106 Agreement
Noise and vibration	Standard noise and vibration mitigation measures	Noise and Vibration Management Plan (PINS document reference 6.5). Compliance is secured by Requirement 5 of the draft Order.
	Noise compliance monitoring	
Air quality	Emissions to the atmosphere are measured through monitoring programmes that are agreed with the Environment Agency and	The operational controls are contained within the Environmental Permits.

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	regulated through the Environmental Permits.	
Amenity	Measures will be continued to be implemented to minimise the impacts of dust and mud on the road.	Traffic Management Plan (PINS document reference 6.5). Compliance is secured by Requirement 11 of the draft Order.
	Dust Control Measures	<p>Wheel cleaning. Compliance is secured by Requirement 13 of the draft Order.</p> <p>Dust Management Scheme (PINS document reference 6.5). Compliance is secured by Requirement 6(2) of the draft Order.</p> <p>Emission limits for dust deposition are included in the Environmental Permit.</p>
Socio-economic impacts	High standards of engineering and operational practice will continue to be	The site design and operational controls are regulated through the Environmental

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	<p>applied at the site so that the activities do not result in significant environmental impact in the short or long term.</p> <p>The site will be restored to blend with the surroundings and enhance the ecology and biodiversity of the site resulting in biodiversity improvements and a long term benefit in respect of green infrastructure well beyond the operational life of the site.</p>	<p>Permits by the Environment Agency under the pollution control regime.</p> <p>Restoration Concept Scheme. Compliance is secured by Requirement 4 of the draft Order.</p>

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	<p>To continue to provide contributions to a community fund based on the quantity of LLW inputs to the landfill.</p> <p>To continue to make a contribution of funding to the Local Highway Authority for the maintenance of Stamford Road.</p>	<p>Section 106 Agreement, Schedule 1(1) and Schedule 2(1)</p>
<p>Commitments</p> <p>To continue to make available community funding from the Landfill Tax Credits as permitted by Government legislation.</p> <p>To continue to take an active part in communications through a Local Liaison Group for the site.</p>	<p>N/A. Enhancement.</p>	

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	<p>To continue to use and give preference to of a range of local services.</p> <p>To continue to take part in and support educational activities and promotion of understanding of waste management through the open door policy, regular open days, periodic community newsletters, the reception of visits from educational establishments and presentations to stakeholders.</p>	<p>Augean are committed to continuing to provide the enhancements identified to support the local community in the vicinity of the site.</p>
<p>Climate change and natural disasters</p>	<p>Implementation of the Surface Water Management Plan</p> <p>Creation of new blue and green infrastructure through habitat creation</p>	<p>Surface Water Management Plan (PINS document reference 6.5). Compliance is secured by Requirement 3(1)(e) of the draft Order.</p>

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
Health and wellbeing	<p>The site will be restored to blend with the surroundings and enhance the ecology and biodiversity of the site resulting in biodiversity improvements and a long term benefit in respect of green infrastructure well beyond the operational life of the site.</p> <p>Public access to the site will be available and encouraged by the provision of footpaths and a car park for visitors.</p>	Restoration Concept Scheme. Compliance is secured by Requirement 4 of the draft Order.

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	To continue to provide contributions to a community fund based on the quantity of LLW inputs to the landfill.	Section 106 Agreement

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	<p>Commitments</p> <p>Monitoring data will continue to be presented for review by the public on the Augean web site. The regular monitoring provides confirmation that the mitigation measures are effective.</p> <p>To continue to take an active part in communications through a Local Liaison Group for the site.</p> <p>To continue to take part in and support educational activities and promotion of understanding of waste management through the open door policy, regular open days, periodic community newsletters, the reception of visits from educational</p>	<p>N/A. Enhancement.</p> <p>Augean are committed to continuing to provide the enhancements identified to support the local community in the vicinity of the site.</p>

Environmental Statement Section	Mitigation measures	Method of securing the mitigation
	<p>establishments and presentations to stakeholders.</p> <p>To continue to make available community funding from the Landfill Tax Credits as permitted by Government legislation.</p> <p>To continue to use and give preference to of a range of local services.</p>	

Table ES10.1

Waste input (tonnes) to the waste treatment and recovery facility at ENRMF from 2015 to 2020 together with the source of the wastes by region

Area	2015	2016	2017	2018	2019	2020	Total	% of the Total
East Midlands	31,075.99	41,139.96	32,471.17	23,363.99	57,986.23	54,735.55	240,772.89	21.50%
East of England	10,229.49	16,237.80	16,474.34	35,453.01	39,339.27	34,919.49	152,653.40	13.63%
Greater London	40,624.42	31,693.63	18,822.82	39,813.28	45,209.45	17,898.44	194,062.04	17.33%
North East	5,876.30	10,962.87	296.24	148.42	1,169.50	151.76	18,605.09	1.66%
North West	5,160.71	1,966.61	2,273.22	1,750.72	4,733.48	3,302.12	19,186.86	1.71%
Scotland	130.84	67.40	249.26	0	170.92	5.54	623.96	0.06%
South East	25,534.98	27,898.31	26,742.76	28,307.52	24,409.92	33,477.65	166,371.14	14.86%
South West	9,184.75	9,462.59	12,137.21	11,435.54	15,987.34	15,161.52	73,368.95	6.55%
Wales	5,037.47	595.05	736.14	2,376.98	6,454.25	8,446.25	23,646.14	2.11%
West Midlands	25,213.24	27,135.01	25,026.61	27,861.64	30,169.57	37,854.65	173,260.72	15.47%
Yorkshire and Humberside	7,647.52	13,162.25	12,556.97	11,739.97	6,549.76	5,420.10	57,076.57	5.10%
Total	165,715.71	180,321.48	147,786.74	182,251.07	232,179.69	211,373.07	1,119,627.76	

Source: Annual waste returns submitted to the Environment Agency

The total percentage of waste accepted at the facility from the West Midlands, East of England, Greater London and the South Eastern regions over this is over 80%.

Table ES10.2

Hazardous waste input (tonnes) to the landfill site at ENRMF from 2015 to 2020 together with the source of the wastes by region

Area	2015	2016	2017	2018	2019	2020	Total	% of the Total
East Midlands (this is mostly residues from the ENRMF treatment facility)	134,052.46	111,217.76	128,204.76	111,286.61	192,575.82	187,068.06	864,405.47	88.16%
East of England	13,173.04	10,095.02	2,034.87	1,243.30	1,200.18	2,826.61	30,573.02	3.12%
Greater London	7,863.50	5,787.29	8,695.19	2,722.47	2,014.97	1,206.10	28,289.52	2.89%
North East	11.92	17.04	0	0	0	3.66	32.62	0.00%
North West	21.28	44.62	57.24	5.56	0	0	128.70	0.01%
South East	9,198.94	3,792.31	1,041.18	4,350.14	3,286.86	5,056.22	27,091.91	2.76%
South West	575.07	148.93	97.10	75.80	130.78	450.31	1,477.99	0.15%
Wales	23.88	24.64	0	328.98	10,130.18	10,987.75	21,495.43	2.19%
West Midlands	1,232.01	553.58	863.20	692.94	1,845.55	1,469.58	6,656.86	0.68%
Yorkshire and Humberside	31.46	92.49	39.02	59.30	59.12	39.22	320.61	0.03%
Total	166,183.56	131,773.68	141,032.56	121,131.36	211,243.46	209,107.51	980,472.13	
Quantity arising at the site treatment facility	127,777.22	109,554.18	127,734.95	110,211.88	187,442.88	181,359.30	844,080.41	
Percentage landfilled arising at the site treatment facility	77%	83%	91%	91%	89%	87%	86%	

Source: Annual waste returns submitted to the Environment Agency

The total percentage of waste accepted at the landfill from the West Midlands, East of England, Greater London and the South Eastern regions over this period is approximately 98%.

Table ES10.3

Hazardous waste produced (tonnes) in England and Wales from 2014 to 2019

2014	2015	2016	2017	2018	2019
5,299,474	5,692,442	5,720,776	5,759,886	5,934,059	6,697,641

Source: <https://data.gov.uk/search?filters%5Bpublisher%5D=Environment+Agency>. Data tables from 2014, 2015, 2016, 2017, 2018 and 2019. [Accessed June 2021]

Table ES10.4

Hazardous waste produced (tonnes) in the regions nearest to ENRMF from 2014 to 2019

Area	2014	2015	2016	2017	2018	2019
East Midlands	424,530	479,846	466,975	574,694	520,404	611,455
West Midlands	483,449	440,374	451,608	532,041	579,606	734,530
East of England	554,725	514,917	463,471	539,933	533,908	553,571
London	371,272	538,229	480,607	317,182	356,360	485,665
South East	1,294,375	1,141,517	1,300,403	1,202,014	1,302,816	1,169,298
Total	3,128,351	3,114,882	3,163,064	3,165,864	3,293,095	3,554,519

Source: <https://data.gov.uk/search?filters%5Bpublisher%5D=Environment+Agency>. Data tables from 2014, 2015, 2016, 2017, 2018 and 2019. [Accessed June 2021]

Table ES10.5

Hazardous waste disposed of (tonnes) to landfill in England from 2014 to 2019

2014	2015	2016	2017	2018	2019
830,928	935,427	794,201	741,413	748,083	876,706

Source: <https://data.gov.uk/search?filters%5Bpublisher%5D=Environment+Agency>. Data tables from 2014, 2015, 2016, 2017, 2018 and 2019. [Accessed June 2021]

Table ES10.6

LLW input (tonnes) to the landfill site at ENRMF from 2015 to 2020

2015	2016	2017	2018	2019	2020	Total
3,015.24	1,517.00	5,308.00	10,835.00	14,609.49	7,511.20	42,795.93

Table ES10.7

Current and future quantities of LLW from the major producers of LLW

	Volume (m ³)	Mass (t)
LLW as at 1 April 2019	27,340	38,000
Estimated future LLW arisings	1,450,000	1,800,000
Total	1,477,340	1,838,000

Source: The 2019 UK Radioactive Waste Inventory. Main Report. December 2019. Department for Business, Energy & Industrial Strategy (BEIS) and the Nuclear Decommissioning Authority (NDA). Table 6

Table ES11.1

Summary of the main potential exposure pathways for hazardous waste associated with the landfill and treatment plant that are assessed

Phase	Scenarios considered	Likelihood of occurrence of scenarios considered	Potential pathway	Receptor	Comments
<p>Site operations</p> <p>Acceptance and placement of the waste in the landfill or storage prior treatment</p>	Direct contact with waste during receipt and placement	Low potential to occur for site workers	Direct exposure	Site workers	<p>Exposure to workers will be minimised through the implementation of waste handling and management procedures. Operational procedures specify that all wastes are handled by machines with air-conditioned and filtered cabins and that operatives generally will not enter the operational area on foot.</p> <p>Deposited waste will be covered with a minimum thickness of cover material over all exposed surfaces following placement.</p> <p><i>The site is not open to the public during the operational period. Site security is in place to deter trespassers (boundary vegetation, fencing, locked gates) daily cover material is placed over deposited wastes.</i></p>
	Exposure due to loose waste tipping or waste placement in a stockpile prior to treatment	Low potential to occur for site workers <i>Unlikely to occur to members of the public.</i>	Inhalation	Site workers and members of the public	<p>Waste is expected to be damp. Dust suppression will be used as necessary to control dust generation. No tipping or stockpiling will be undertaken in windy conditions. Asbestos waste is delivered in double bags which are placed directly in the landfill and covered immediately with daily cover.</p> <p>Dusty wastes at the treatment plant are stored in silos or in enclosed containers such as drums or specifically designed bags.</p> <p><i>The site is not open to the public during the operational period. Site security is in place to deter trespassers (boundary vegetation, fencing, locked gates).</i></p> <p>Boundary dust and fibre monitoring will continue to be undertaken to confirm that airborne particulates and fibres at the boundary do not exceed limits set in the Environmental Permit.</p>
	<i>Dropped waste container resulting in spillage</i>	<i>Unlikely to occur</i>	<i>Inhalation</i>	<i>Site workers and members of the public beyond the site</i>	<i>Procedures are in place and will be implemented at the site in the event that any waste is spilled from a container or a container is dropped. A water bowser is available to spray and damp down loads in the event of a spillage.</i>

	<i>Contamination as a result of waste entering an open wound.</i>	<i>Unlikely to occur</i>	<i>Direct contact</i>	<i>Site workers</i>	<i>Workers will wear standard protective clothing and will not in normal circumstances be expected to handle wastes directly. Workers will not normally be working with open, undressed, wounds. The site is not open to the public.</i>
Site operations Operational phase including waste treatment and following waste placement and covering in the landfill including capping and the aftercare period when the landfill Environmental Permit remains in place	Direct exposure to waste during operation of the treatment facility	Low potential to occur for site workers	Direct exposure Inhalation	Site workers	Exposure to workers will be minimised through the implementation of waste handling and management procedures. Operational procedures specify that all wastes are handled by machines with air-conditioned and filtered cabins. Treatment procedures include the containment of potential emissions. Boundary monitoring will be carried out to ensure that the emissions do not exceed anticipated levels.
	Exposure to emissions of landfill gas, vapours and combustion products from the gas flare	Normally expected to occur	Inhalation of releases through the surface of the waste or from the flare stack	Site workers and members of the public beyond the site	If gas or vapours are generated they will be collected in the gas management system and directed to the landfill gas plant for combustion. The potential for lateral migration and emissions through the surface is minimised by the low permeability containment system. Gaseous emissions from the treatment plant are unlikely as a result of the treatment processes carried out. Where there is the potential for emissions, controls will be implemented as specified through the Environmental Permit. The control of emissions from the gas combustion system and direct gaseous emissions from the site are monitored routinely for comparison with agreed emission criteria.
	<i>Excavation of previously deposited waste</i>	<i>Unlikely to occur</i>	<i>Direct exposure Inhalation Ingestion</i>	<i>Site workers</i>	<i>Any excavations necessary would be carried out after a full risk assessment and with appropriate precautions in place.</i>
	Leachate collection and processing	Normally expected to occur	Direct exposure Ingestion Inhalation	Site workers at the processing plant and members of the public in contact with the treated discharges	Leachate is extracted and stored at the site prior to its use as part of the waste treatment process during which the containment process principles the subject of the Environmental Permit are applied. Excess leachate is exported from the site to a facility which itself is the subject of an Environmental Permit and therefore appropriate emission controls will be implemented through the permit for that facility. Leachate quality is monitored regularly.
	<i>Leachate spillage off site</i>	<i>Unlikely to occur</i>	<i>Direct exposure Ingestion Inhalation</i>	<i>Members of the public</i>	<i>If leachate was spilled to land during management on site or during transport appropriate clean up measures would be undertaken. If leachate is spilled on site it will be contained in the site surface water management system (see below)</i>

	<i>Fire at the site</i>	<i>Unlikely to occur</i>	<i>Direct exposure Inhalation</i>	<i>Site workers and members of the public beyond the site</i>	<i>The waste acceptance criteria for the hazardous waste landfill exclude material with an organic carbon content above 6% and flammable wastes are prohibited from all landfill sites. There is no limit on the organic carbon content for wastes accepted at the treatment plant but flammable wastes are not accepted. Emergency procedures are in place in the unlikely event of a fire and the landfill containment system or the surface water management system in place in the other areas of the site will contain firefighting water on site.</i>
	Migration to public water supply via groundwater	Low potential to occur	Direct exposure Ingestion	People using abstracted water	As no material is completely impermeable small amounts of leachate may permeate through the low permeability liner. The liner is designed and constructed so that any permeation is at an acceptable level determined by the hydrogeological risk assessment and specified in the Environmental Permit. A quantitative risk assessment is carried out to demonstrate to the Environment Agency that the risks are sufficiently low. The risk assessment is reviewed regularly. The treatment plant is located on a low permeability hardstanding with integrated surface water collection sump. Groundwater monitoring is carried out routinely and the results are compared with trigger levels set in the Environmental Permit.
	Migration from the site via surface water runoff	Low potential to occur	Direct exposure Ingestion	People using surface water	A surface water management plan is in place for the current site and will be extended for the proposed extension area. A consent is in place for the discharge of surface water from the south east corner of the site. Monitoring of discharged surface water from the consented location is carried out to demonstrate that the quality meets the discharge criteria set in the Environmental Permit. Surface water quality at and around the site is monitored regularly.
	<i>Exposure of wildlife</i>	<i>Unlikely to occur</i>	<i>Direct exposure Inhalation Ingestion</i>	<i>Various species</i>	<i>Immediately after placement all waste is covered with non-hazardous material. The operational landfill and treatment plant are not attractive environments for wildlife. The waste types deposited in the landfill and treated at the site do not comprise a food source for wildlife. Following completion of landfilling in any cell or phase an engineered capping layer and restoration soils are placed. The waste has a minimum 1m thickness of suitable cover material above a 1m capping layer and 0.3m cap protection layer. The compacted, engineered clay capping layer is not conducive to burrowing animals. Boundary monitoring is carried out to ensure that the emissions do not exceed anticipated levels.</i>

	<i>Recreational user of the site</i>	<i>Normally expected to occur</i>	<i>Direct exposure Inhalation</i>	<i>Members of the public</i>	Following completion of the treatment activities at the site all the plant and infrastructure will be removed and the area will be landfilled. Following completion of landfilling an engineered capping layer and restoration soils are placed before public access is allowed to the restored site. The waste has a minimum 1m thickness of suitable cover material above a 1m capping layer and 0.3m cap protection layer.
Site restoration and closure Following the completion of the site activities including beyond the period of the Environmental Permit when there are no management controls in place	<i>Exposure due to groundwater contamination following deterioration of the containment system</i>	<i>Unlikely to occur</i>	<i>Direct exposure Inhalation Ingestion</i>	<i>Members of the public</i>	<i>As leachate level monitoring will continue following completion of filling, capping and placement of the restoration materials, leachate levels will be controlled as necessary. The control of leachate levels at the site will continue until it is considered by the Environment Agency that the landfill is unlikely to present a significant risk to the environment if leachate management ceases. The Environmental Permit for landfill sites cannot be surrendered until the Environment Agency consider that the site no longer presents a potential significant risk to the environment and human health including groundwater. On this basis the potential for escape of leachate through a degraded liner or the overtopping of leachate at a stage when the leachate could have an unacceptable impact on the environment is very unlikely to occur. There are no groundwater abstractions close to the site.</i>
	<i>Leachate migration to groundwater due to overtopping</i>	<i>Unlikely to occur</i>	<i>Direct exposure Inhalation Ingestion</i>	<i>Members of the public</i>	<i>The Environmental Permit cannot be surrendered unless the Environment Agency is satisfied that the low permeability capping layer and overlying soils have been installed in accordance with the agreed design and that the emissions from the site are in accordance with specified criteria. Construction of housing is very unlikely on reclaimed land that has been subject to land raise.</i>
	<i>Exposure of people as a result of houses built directly on the site and the growing and consumption of vegetables</i>	<i>Unlikely to occur</i>	<i>Direct exposure Inhalation Ingestion</i>	<i>Members of the public</i>	<i>Records will be maintained of the location of hazardous waste at the site. Any excavation into the site would encounter the cap placed over the waste and visually obvious waste types and containers therefore it would be highly likely the presence of waste would be recognised and excavations would cease at an early stage.</i>
	<i>Inadvertent excavation and intrusion into the waste</i>	<i>Unlikely to occur</i>	<i>Direct exposure Inhalation Ingestion</i>	<i>Future site worker/ Members of the public</i>	

Table ES11.2

Summary of the main potential exposure pathways for radioactive emissions associated with the landfill of LLW that are assessed

Phase	Scenarios considered	Likelihood of occurrence of scenarios considered	Potential pathway	Receptor	Comments
Site operations Acceptance and placement of the waste	Direct exposure to waste during receipt and placement	Normally expected to occur	Direct exposure	Site workers and members of the public beyond the site	Exposure to workers will be minimised through the implementation of waste handling and management procedures. Operational procedures specify that all wastes are handled by machines with air-conditioned and filtered cabins and that operatives generally will not enter the operational area on foot. Most LLW will be delivered to the landfill in containers or packages. LLW is only accepted when the activity level 1m from any package face (or covered loose waste) is less than 10µSv/hr. The LLW waste will be covered with a minimum thickness of 300mm of suitable cover material over all exposed surfaces. The emissions at 1m above from the top of the cover material will be monitored to confirm they are less than 2µSv/hr. Additional cover material will be added immediately if necessary in order to ensure that the criterion is not exceeded. The site is not open to the public.
	Exposure due to loose waste tipping	Normally expected to occur	Inhalation	Site workers and members of the public beyond the site	Waste is expected to be damp. Dust suppression will be used as necessary. No tipping will be undertaken in windy conditions.
	<i>Dropped waste container resulting in spillage</i>	<i>Unlikely to occur</i>	<i>Inhalation</i>	<i>Site workers and members of the public beyond the site</i>	<i>Procedures are in place and will be implemented at the site in the event that any waste is spilled from a container or a container is dropped. A water bowser is available to spray and damp down loads in the event of a spillage. A risk assessment will be carried out to demonstrate that the risks from exposure as a result of a dropped load would not be unacceptable.</i>

	Contamination as a result of waste entering an open wound.	Unlikely to occur	Direct contact	Site workers	Workers will wear standard protective clothing and will not in normal circumstances be expected to handle wastes directly. Workers will not normally be working with open, undressed, wounds. A risk assessment will be carried out to demonstrate that the risks from exposure would not be unacceptable. The site is not open to the public.
<p>Site operations</p> <p>Operational phase following waste placement and covering including capping and the aftercare period when the Environmental Permit remains in place</p>	Direct exposure to emissions from landfilled waste through cover materials	Normally expected to occur	Direct exposure	Site workers and members of the public beyond the site	Immediately after placement all waste is covered with non-hazardous material. The LLW waste will be covered with a minimum thickness of 300mm of suitable cover material over all exposed surfaces. The emissions at 1m above the top of the cover material will be monitored to confirm they are less than 2µSv/hr. Additional cover material will be added immediately if necessary in order to ensure that the criterion is not exceeded. A risk assessment will be carried out to demonstrate that the risks from exposure would not be unacceptable. The site is not open to the public. Boundary monitoring is carried out to ensure that the emissions do not exceed anticipated levels.
	Gas emissions	Normally expected to occur	Inhalation of releases through the surface of the waste or from the flare stack	Site workers and members of the public beyond the site	If gas or vapours are generated they will be collected in the gas management system and directed to the landfill gas plant for combustion. Emissions from the gas combustion system and direct gaseous emissions from the site are monitored routinely for comparison with agreed emission criteria. The potential for lateral migration and emissions through the surface is minimised by the low permeability containment system. A risk assessment will be carried out to demonstrate that there will be no unacceptable risks from exposure to gaseous emissions.
	Cell excavation	Unlikely to occur	Direct exposure Inhalation Ingestion	Site workers	Any excavations necessary would be carried out after a full risk assessment and with appropriate precautions in place. LLW will not be deposited within 2m of the side liner or within 1m of the capping layer.
	Leachate processing off site	Normally expected to occur	Direct exposure Ingestion Inhalation	Site workers at the processing plant and members of the public in contact	Leachate is extracted and stored at the site prior to its use as part of the waste treatment process during which the containment process principles the subject of the Environmental Permit are applied.

				with the treated discharges	Excess leachate is exported from the site to a facility which itself is the subject of an Environmental Permit and therefore appropriate emission controls will be implemented through the permit for that facility. Leachate would not be dispatched to an off-site treatment plant without a full assessment of the risks so that appropriate controls can be applied.
	<i>Leachate spillage off site</i>	<i>Unlikely to occur</i>	<i>to</i>	<i>Direct exposure Ingestion Inhalation</i>	<i>Members of the public</i> <i>If leachate was spilled to land during transport appropriate clean up measures would be undertaken.</i>
	<i>Fire at the site</i>	<i>Unlikely to occur</i>	<i>to</i>	<i>Direct exposure Inhalation</i>	<i>Site workers and members of the public beyond the site</i> <i>The waste acceptance criteria for the hazardous waste landfill exclude material with an organic carbon content above 6% and flammable wastes are prohibited from all landfill sites. Emergency procedures are in place in the unlikely event of a fire and the landfill containment system or the surface water management system in place in the other areas of the site will contain firefighting water on site.</i>
	<i>Migration to public water supply via groundwater</i>	<i>Unlikely to occur</i>	<i>to</i>	<i>Ingestion</i>	<i>People using abstracted water</i> <i>As no material is completely impermeable small amounts of leachate may permeate through the low permeability liner. The liner is designed and constructed so that any permeation is at an acceptable level determined by the hydrogeological risk assessment and specified in the Environmental Permit. A quantitative risk assessment will be carried out to demonstrate to the Environment Agency that the risks are sufficiently low. There are no abstractions close to the site.</i>
	<i>Aircraft crash</i>	<i>Unlikely to occur</i>	<i>to</i>	<i>Inhalation</i>	<i>Site workers and members of the public</i> <i>A quantitative assessment of the potential exposure is carried out. Assumptions are made regarding the quantities of material which may be disposed. The presence of the scoping and cover layers is ignored in the assessment. Still weather conditions are assumed which minimises dilution.</i>
	<i>Exposure of wildlife</i>	<i>Normally expected to occur</i>	<i>to</i>	<i>Direct exposure Inhalation Ingestion</i>	<i>Various species</i> <i>Immediately after placement all waste is covered with non-hazardous material. The LLW waste will be covered with a minimum thickness of 300mm of suitable cover material over all exposed surfaces. The emissions from the top of the cover material will be monitored to confirm they are less than 2µSv/hr at 1m above the ground. Additional cover material will be added immediately if necessary in order to ensure that the criterion is not exceeded. The operational landfill and treatment plant are not attractive environments for wildlife. The waste types deposited in the landfill and treated at the site do not comprise a food source for wildlife.</i>

					<p>Following completion of landfilling in any cell or phase an engineered capping layer and restoration soils are placed. The capping system will comprise a 0.3m thick regulation layer, a 1m thick clay cap, a 0.3m thick drainage layer and at least 1m of restoration soils. The compacted, engineered clay capping layer is not conducive to burrowing animals.</p> <p>Boundary monitoring is carried out to ensure that the emissions do not exceed anticipated levels.</p> <p>A quantitative risk assessment will be carried out to demonstrate to the Environment Agency that the risks are sufficiently low.</p>
<p>Restored site</p> <p>Following the surrender of the Environmental Permit when there are no management controls in place</p>	Recreational user of the site	Normally expected to occur	Direct exposure Inhalation	Members of the public	The capping system will comprise a 0.3m thick regulation layer, a 1m thick clay cap, a 0.3m thick drainage layer and at least 1m of restoration soils. A quantitative risk assessment will be carried out to demonstrate to the Environment Agency that the risks are sufficiently low.
	<i>Exposure due to groundwater contamination following deterioration of the containment system</i>	<i>Unlikely to occur</i>	<i>Direct exposure Inhalation Ingestion</i>	<i>Members of the public</i>	<i>As leachate level monitoring will continue following completion of filling, capping and placement of the restoration materials, leachate levels will be controlled as necessary. The control of leachate levels at the site will continue until it is considered by the Environment Agency that the landfill is unlikely to present a significant risk to the environment if leachate management ceases. The Environmental Permit for landfill sites cannot be surrendered until the Environment Agency consider that the site no longer presents a potential significant risk to the environment and human health including groundwater. On this basis the potential for escape of leachate through a degraded liner or the overtopping of leachate at a stage when the leachate could have an unacceptable impact on the environment is very unlikely to occur. There are no groundwater abstractions close to the site.</i>
	<i>Leachate migration to groundwater due to overtopping</i>	<i>Unlikely to occur</i>	<i>Direct exposure Inhalation Ingestion</i>	<i>Members of the public</i>	<i>A quantitative risk assessment will be carried out to demonstrate to the Environment Agency that the risks are sufficiently low.</i>
	<i>Exposure of people as a result of houses built directly on the site and the growing and consumption of vegetables</i>	<i>Unlikely to occur</i>	<i>Direct exposure Inhalation Ingestion</i>	<i>Members of the public</i>	<i>The Environmental Permit cannot be surrendered unless the Environment Agency is satisfied that the low permeability capping layer and overlying soils have been installed in accordance with the agreed design and that the emissions from the site are in accordance with specified criteria. Construction of housing is very unlikely on reclaimed land that has been subject to land raise.</i> <i>A quantitative risk assessment will be carried out to demonstrate to the Environment Agency that the risks are sufficiently low.</i>

	<i>Inadvertent excavation and intrusion into the waste</i>	<i>Unlikely to occur</i>	<i>Direct exposure Inhalation Ingestion</i>	<i>Future site worker/ Members of the public</i>	<p><i>Records will be maintained of the location of LLW at the site. Any excavation into the site would encounter the cap placed over the waste and visually obvious waste types and containers therefore it would be highly likely the presence of waste would be recognised and excavations would cease at an early stage.</i></p> <p><i>A quantitative risk assessment will be carried out to demonstrate to the Environment Agency that the risks are sufficiently low</i></p>
	<i>Exposure of people running a smallholding on site</i>	<i>Unlikely to occur</i>	<i>Direct exposure Inhalation Ingestion</i>	<i>Members of the public</i>	<p><i>The Environmental Permit cannot be surrendered unless the Environment Agency is satisfied that the low permeability capping layer and overlying soils have been installed in accordance with the agreed design and that the emissions from the site are in accordance with specified criteria.</i></p> <p><i>Records will be maintained of the location of LLW at the site. Any excavation into the site would encounter the cap placed over the waste and visually obvious waste types and containers therefore it would be highly likely the presence of waste would be recognised and excavations would cease at an early stage.</i></p> <p><i>A quantitative risk assessment will be carried out to demonstrate to the Environment Agency that the risks are sufficiently low.</i></p>

Table ES11.3

**Radioactivity exposure limits compared with natural radiation and
more familiar exposure situations**

Item	Radioactivity Average annual or event dose	Source document
EXPOSURE LIMITS		
Legal dose limit for workers (UK)	20 mSv/yr	The Ionising Radiations Regulations 2017 (Statutory Instrument 2017 No. 1075)
Legal dose limit for the public (UK)	1 mSv/yr	The Ionising Radiations Regulations 2017 (Statutory Instrument 2017 No. 1075) and The Environmental Permitting (England and Wales) Regulations 2016 ⁹³
Design Dose criterion for exposure of workers for the landfill site	1mSv/yr	Design Dose criterion for workers at the landfill sites for routine operational activities.
Other constraint for the public from a single source	0.3 mSv/yr	Policy for the Long Term Management of Solid Low Level Radioactive Waste in the United Kingdom. March 2007, Defra and devolved administrations and The Environmental Permitting (England and Wales) Regulations 2016 (Statutory Instrument 2016/115).

⁹³ Schedule 23 Part 4 Section 1 Paragraph 1b references the legal limits in the EU Basic Safety Standards (Article 13, Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom). The BSS Directive refers in turn to Section (Table) 2.3 of ICRP Publication 116

Item	Radioactivity Average annual or event dose	Source document
Other constraint for the public from a single site	0.5 mSv/yr	Policy for the Long Term Management of Solid Low Level Radioactive Waste in the United Kingdom. March 2007, Defra and devolved administrations and The Environmental Permitting (England and Wales) Regulations 2016 (Statutory Instrument 2016/115)
Design Dose criterion for exposure of members of the public for the landfill site	0.3 mSv/yr	Design Dose criterion for exposure of members of the public as a result of routine operational activities during the management period.
	0.02mSv/yr	Design Dose criterion for exposure of all persons following the management period and for exposure from the groundwater pathway during the management period.
	3mSv/yr	Design Dose criterion for exposure of all persons as a result of intrusion following the management period. For intrusion events a dose of 3mSv/yr is used which is at the lower end of the guidance dose range of 3mSv/yr to 20mSv/yr allowed in the guidance for intrusion events.
<p>Note: Design Dose criteria are adopted for normal operational activities as well as for accidents. The adopted design dose criterion for each circumstance is either the relevant dose constraint specified in legislation or regulatory guidance or a dose level proposed by Augean which is lower (i.e. more protective) than the dose constraint specified in legislation or regulatory guidance and which is achievable based on the proposed activities and waste types to be accepted.</p>		
NATURAL RADIATION		

Item	Radioactivity Average annual or event dose	Source document
Average annual exposure of UK population to radiation	2.7 mSv/yr	Ionising Radiation Exposure of the UK Population: 2010 review Public Health England (2016). (PHE-CRCE-026)
The average annual exposure in Northamptonshire from natural sources	3.6 mSv/yr	Ionising radiation exposure of the UK population: 2005 review. Watson S.J., Jones A.L., Oatway W.B. and Hughes J.S. (2005) HPA-RPD-001. Didcot, Oxfordshire.
Average annual exposure of UK population from background sources	2.3 mSv/yr	Ionising Radiation Exposure of the UK Population: 2010 review Public Health England (2016). (PHE-CRCE-026)
Average annual exposure in Cornwall from natural sources	6.9 mSv/yr	Public Health England (2011) Ionising radiation: dose comparisons. https://www.gov.uk/government/publications/ionising-radiation-dose-comparisons/ionising-radiation-dose-comparisons
COMPARATIVE DOSES		
Food; for example 100g of Brazil nuts	0.01 mSv	Ionising Radiation Exposure of the UK Population: 2010 review Public Health England (2016). (PHE-CRCE-026)

Item	Radioactivity Average annual or event dose	Source document
Chest x-ray	0.014mSv	Public Health England (2011) Ionising radiation: dose comparisons. https://www.gov.uk/government/publications/ionising-radiation-dose-comparisons/ionising-radiation-dose-comparisons
Dental x-ray	0.005 mSv	Public Health England (2011) Ionising radiation: dose comparisons. https://www.gov.uk/government/publications/ionising-radiation-dose-comparisons/ionising-radiation-dose-comparisons
London to US return flight	0.08 mSv	Ionising Radiation Exposure of the UK Population: 2010 review Public Health England (2016). (PHE-CRCE-026)
CT scan of chest	6.6 mSv	Public Health England (2011) Ionising radiation: dose comparisons. https://www.gov.uk/government/publications/ionising-radiation-dose-comparisons/ionising-radiation-dose-comparisons
UK action level for Radon in homes	200Bq/m ³ (equivalent to 10mSv/y)	Health Protection Agency. 2010. Limitation of human exposure to radon in homes. RCE 15. Supporting Target Level of 100Bq/m ³

Table ES13.1

**Summary of residual ecological effects and proposed further mitigation,
protection and enhancement**

Ecological feature	Proposed mitigation, protection and enhancement	Residual effect
Collyweston Great Wood and Easton Hornstocks SSSI and NNR.	Provision of a wide RPA managed to provide habitat for many woodland plants and animals. Measures to prevent dust and to control water movements.	Significant positive.
Fineshade Woods LNR.		Significant positive.
Short-term loss of two short lengths of species-poor hedgerows, important for reptiles; eventual loss of both hedgerows	Protection and enhancement of off-site hedgerows in advance; retention of at least half of the central hedgerow and western hedgerow for as long as possible and replacement with three east-west species-rich hedgerow corridors, with additional connectivity through the restoration plan.	Phased loss of two existing hedgerows, advance provision of new and gapped-up hedgerows and long-term significant positive effect on restoration.
Site Margins	Enhancement through management to create increased and improved habitat for invertebrates and herpetofauna and improved foraging for other mammals.	Significant positive.

Ecological feature	Proposed mitigation, protection and enhancement	Residual effect
Great Crested Newts	Erection of protective fence before works start to prevent death or injury.	Significant positive.
Common amphibian assemblage	Enhanced management of the marginal grassland to provide improved and increased habitat for invertebrates and herpetofauna.	Significant positive.
Adders	<p>Creation during the course of the works, of three new east-west corridors to provide movement and foraging areas for adders. Retention of at least half of the current central hedgerow, managed as suitable adder habitat until at least two new corridors are functioning.</p> <p>Enhanced management of the marginal grassland to provide improved and increased habitat for herpetofauna.</p>	Significant positive.
Bat assemblage	<p>Retention of at least half of the current east-west hedgerow to provide commuting habitat for bats.</p> <p>Creation of three new east-west corridors to provide commuting and foraging habitat for bats.</p> <p>Enhanced management of the marginal grassland to provide improved and increased habitat for invertebrates.</p>	Significant positive.

Table ES20.1

2021 baseline noise survey summary data

Monitoring Location	Ambient Sound Levels L _{Aeq,15mins} (dB)		Background Sound Levels L _{A90,15mins} (dB)	
	Daytime (0700 – 1800)	Night-time (2300 – 0700)	Daytime (0700 – 1800)	Night-time (2300 – 0700)
Westhay Cottages and Farm	63	55	45	33
Westhay Lodge	52	42	36	28
Cuckoo Lodge	65	59	51	33
Duddington Village	60	55	49	36

Table ES20.2

Calculated sound power levels based on measurements of plant and activities
at the existing ENRMF site (July 2020)

Source	Measured Sound Pressure Level dB(A)	Calculated Sound Power Level dB(A)
Mobile crusher/screen	L _{Aeq} 81.2 at 10m	109.2
Excavator loading dumptruck	L _{Aeq} 72.1 at 20m	106.1
Dozer (Engineering)	L _{Aeq} 83.6 at 5m	105.6
Tanker Compressor	L _{Aeq} 82.1 at 5m	104.0
Dozer (Restoration)	L _{Aeq} 75.9 at 10m	103.9
360 Excavator loading HGV	L _{Aeq} 76.0 at 10m	103.8
Loading Ash Hopper with telehandler	L _{Aeq} 75.1 at 10m	103.0
Dumptruck (movements)	L _{Amax} 74.9 at 10m	102.9
Soil Plant (Waste Treatment Facility)	L _{Aeq} 73.3 at 10m	101.3
Loading Shovel Loading Dumptruck	L _{Aeq} 73.4 at 10m	101.1
Placement of materials	L _{Aeq} 72.2 at 10m	100.3
Road Lorry (movements)	L _{Amax} 71.0 at 10m	99.0
Telehandler (Unloading)	L _{Aeq} 70.2 at 10m	98.2
Dust Suppression Unit (Cannon)	L _{Aeq} 70.3 at 10m	98.2
Generator	L _{Aeq} 76.1 at 5m	98.1
Leachate Pump	L _{Aeq} 72.7 at 5m	94.9
HGV manoeuvring on weighbridge	L _{Aeq} 66.3 at 10m	94.3
Plant 4 (Waste Treatment Facility)	L _{Aeq} 71.7 at 5m	93.7
Wheelwash	L _{Aeq} 70.5 at 5m	92.6

Source	Measured Sound Pressure Level dB(A)	Calculated Sound Power Level dB(A)
Wheelwash Pump	L _{Aeq} 74.5 at 3m	91.8
Wheelwash Generator	L _{Aeq} 68.3 at 5m	90.5
Laboratory Ventilation Plant	L _{Aeq} 65.3 at 4m	85.5
HGV idling on weighbridge	L _{Aeq} 62.0 at 5m	84.0

Table ES20.3

Baseline Noise Measurements along Footpaths MX13 and MX15

Monitoring Location	Date and Time	Notes/Observations on the acoustic environment
FP1	15 February 2021 1400 to 1530	<i>Collyweston Quarry operations audible</i>
FP2		<i>Distant Road Traffic and Birdsong also contributing to the acoustic environment</i>
FP3		<i>ENRMF operations audible</i>
		<i>Distant road traffic and birdsong also contributing to the acoustic environment</i>
		<i>Acoustic environment mainly comprises distant road traffic and birdsong</i>
		<i>ENRMF operations faintly audible on occasions</i>

Table ES20.4

Initial Estimate of Impact during the daytime (BS 4142)

Assessment Location	Daytime Background Sound Level ($L_{A90,15min}$ dB)	Specific Sound Level ($L_{Aeq,1h}$ dB)	Acoustic Feature Correction (dB)	Rating Level ($L_{Ar,Tr}$ dB)	Excess of rating over background sound level (dB)	Difference to PPG limit of 55dB
Westhay Cottages	45	48	0	48	+3	-7
Westhay Farm	45	48	0	48	+3	-7
Westhay Lodge	36	38	0	38	+2	-17
Cuckoo Lodge	51	38	0	38	-13	-17
Duddington Village	49	30	0	30	-19	-25

Table 20.5

Initial Estimate of Impact during the night-time (BS 4142)

Assessment Location	Night-time Background Sound Level ($L_{A90,15min}$ dB)	Specific Sound Level ($L_{Aeq,15min}$ dB)	Acoustic Feature Correction (dB)	Rating Level ($L_{Ar,Tr}$ dB)	Excess of rating over background sound level (dB)	Difference to PPG limit of 42dB
Westhay Cottages	33	22	0	22	-11	-20
Westhay Farm	33	26	0	26	-7	-16
Westhay Lodge	28	24	0	24	-4	-18
Cuckoo Lodge	33	26	0	26	-7	-16
Duddington Village	36	20	0	20	-16	-22

Table ES21.1

Estimated concentrations of air quality parameters around ENRMF for 2019

	PM _{2.5}	PM ₁₀	NO ₂	NO _x
Average concentrations around ENRMF⁹⁴ (annual mean)	9.29 µg/m ³	15.45 µg/m ³	8.39 µg/m ³	10.92 µg/m ³
National Air Quality Objective concentration⁹⁵ for the protection of human health (annual mean)	25 µg/m ³	40 µg/m ³	40 µg/m ³	30 µg/m ³ (target value for the protection of vegetation and ecosystems)

⁹⁴ DEFRA (2020) UK Ambient Air Quality Interactive Map <https://uk-air.defra.gov.uk/data/gis-mapping>

⁹⁵ DEFRA (2020) National Air Quality Objectives https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update.pdf

Table ES22.1

Summary dry hours wind data for 2000 to 2019 from the Wittering weather station located approximately 3.3km north east of the proposed development

Mean wind speed (m/s)	True wind direction (% of the total dry hours)															All observations		
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW		NNW	
0																	0.975%	
0.5 to 2	0.552 %	0.381 %	0.344 %	0.324 %	0.467 %	0.527 %	0.735 %	0.701 %	0.924 %	0.533 %	0.527 %		0.470%	0.584%	0.382 %	0.382 %	0.335 %	8.168%
2 to 3	1.045 %	0.807 %	0.677 %	0.600 %	0.631 %	0.679 %	0.796 %	0.762 %	1.190 %	0.911 %	0.800 %		0.871%	1.283%	0.899 %	0.755 %	0.684 %	13.391%
3 to 4	1.405 %	1.035 %	0.862 %	0.759 %	0.584 %	0.488 %	0.560 %	0.602 %	1.407 %	1.202 %	1.023 %		1.365%	2.476%	1.170 %	1.056 %	0.902 %	16.895%
4 to 5	1.223 %	0.997 %	0.831 %	0.658 %	0.434 %	0.337 %	0.368 %	0.458 %	1.300 %	1.337 %	1.134 %		1.656%	2.497%	1.138 %	1.077 %	0.821 %	16.264%
5 to 7	1.291 %	1.276 %	1.213 %	0.767 %	0.412 %	0.359 %	0.265 %	0.602 %	2.153 %	2.470 %	2.489 %		3.398%	3.046%	1.745 %	1.179 %	0.919 %	23.584%
7 to 9	0.321 %	0.363 %	0.549 %	0.269 %	0.117 %	0.050 %	0.048 %	0.226 %	1.066 %	1.771 %	1.839 %		2.114%	1.673%	0.882 %	0.350 %	0.278 %	11.915%
Equal to or greater than 9	0.063 %	0.071 %	0.182 %	0.115 %	0.017 %	0.009 %	0.002 %	0.050 %	0.566 %	1.353 %	1.402 %		1.299%	1.274%	0.391 %	0.083 %	0.061 %	6.939%
Missing/Incomplete																		1.868%
All observations	5.901 %	4.930 %	4.657 %	3.491 %	2.662 %	2.448 %	2.774 %	3.401 %	8.607 %	9.577 %	9.215 %	11.172 %	12.833 %	6.607 %	4.883 %	4.000 %		100.000%
% year wind between 0.5- 5m/s	4.22%	3.22%	2.71%	2.34%	2.12%	2.03%	2.46%	2.52%	4.82%	3.98%	3.48%	4.36%	6.84%	3.59%	3.27%	2.74%		54.718%
% year wind greater than 5m/s	1.68%	1.71%	1.94%	1.15%	0.55%	0.42%	0.32%	0.88%	3.79%	5.59%	5.73%	6.81%	5.99%	3.02%	1.61%	1.26%		42.439%

Notes: The true wind direction is the direction from which the wind is blowing

The percentage of days with calm wind is 0.98%

There is missing data for 1.87% of the days

Average wind speed is 4.84 m/s

Table ES22.2

Summary of the risk of potential dust disamenity effects at specific receptors within 400m of the site without operational controls in place

The receptor locations are shown on Figure 22.1

Receptor details and location		Approximate location relative to nearest dust source	Residual source emissions	Pathway effectiveness	Dust impact risk	Receptor sensitivity	Magnitude of dust effect
R1	Properties at Westhay Cottages (Residential)	23m east of the existing ENRMF	Large	Moderately effective	Medium risk	High	Moderate adverse effect
		105m north north east of the site entrance	Medium	Moderately effective	Low risk		Slight adverse effect
R2	Westhay Farm (Residential)	75m east of the existing ENRMF	Large	Moderately effective	Medium risk	High	Moderate adverse effect
		57m east of the site entrance	Medium	Moderately effective	Low risk		Slight adverse effect
R3	Collyweston Great Wood and Easton Hornstocks NNR and SSSI	Adjacent to and north of the existing ENRMF and north east and east of the western extension area	Large	Ineffective Moderately effective	Low risk Medium risk	Low	Negligible effect
R4	Fineshade Woods Local Wildlife Site	Adjacent to and west of the western extension area	Large	Ineffective	Low risk	Low	Negligible effect
R5	Footpath MX13	230m west of the western extension area	Large	Ineffective	Low risk	Low	Negligible effect
R6	Footpath MX15	102m west of the western extension area	Large	Ineffective	Low risk	Low	Negligible effect
R7	Footpath MX18	312m west of the western extension area	Large	Ineffective	Low risk	Low	Negligible effect
R8	Footpath NE13	211m south west of the western extension area	Large	Ineffective	Low risk	Low	Negligible effect

Table ES22.3

Dust control measures which will continue to be implemented at ENRMF

Activity	Controls	Effectiveness of controls
Extraction, movement and stockpiling of clay and overburden	<ul style="list-style-type: none"> • Current controls will continue to be used for future extraction and handling of clay. A water bowser will be used to dampen down the clay and internal hauls roads if the generation of dust is likely or has been observed during extraction and/or handling operations. 	High
Landfill engineering works	<ul style="list-style-type: none"> • During landfill engineering works clay is in a damp condition to ensure that the optimum moisture content is maintained. 	High
Waste treatment	<ul style="list-style-type: none"> • Processes at the treatment plant will be wet processes or will incorporate damping systems as an inherent part of the treatment processes. 	High
Movement of HGVs, plant and machinery	<ul style="list-style-type: none"> • Mobile plant will be regularly serviced. • The site haul road is hard-surfaced to the wheelwash area on the southern boundary of and close to the south eastern corner of the site to reduce the mud and debris which may be carried by vehicles onto the local road network. • Other site haul roads are formed of compacted hardcore or similar material. • The movement of mobile plant and site traffic is restricted to defined haul routes. • Haul roads will be sprayed as necessary. • The hard-surfaced areas of the haul routes will be checked daily and cleaned as necessary. • The running surface of unsurfaced roads will be maintained to prevent the formation of ruts and potholes. • All vehicles leaving the site following delivery of waste or the collection of clay are inspected visually by site operatives before leaving the site and are obliged to use the wheel wash. • The hard surfaced site road and Stamford Road are swept regularly to clear mud or debris. • Vehicle exhausts will point above the horizontal. Vehicle speed limits of 15mph will be enforced to minimise the potential for dust generation during vehicle movements. • Careful loading to minimise spillage and drop heights. 	High
Soil stripping and placement during restoration	<ul style="list-style-type: none"> • Soils must be handled when dry and friable therefore only limited use can be made of water sprays to dampen the material. • Minimise drop heights for tipping. • Movement of materials within the site will cease during high winds if it could generate dust emissions beyond the site boundary. • Stockpiles which will be in place for a long period will be seeded where necessary to minimise wind blow as soon as conditions permit following formation. • Restored areas will be planted with vegetation as soon as possible after soil placement. 	High

Table 23.1

Total Augean expenditure at businesses within Northamptonshire and/or 15 miles of the site between January 2019 and December 2020

Type of service	Location	Expenditure by Augean 2019	Expenditure by Augean 2020
Silo construction and maintenance	Kings Cliffe	£176,000	£192,000
Electrical installations and testing	Peterborough /Kettering	£3,000	£12,000
Construction material supply	Peterborough	£13,000	£14,000
Mobile plant and equipment	Weldon	£117,000	£110,000
Vehicle Hire	Peterborough/Corby		£110,000
Tyres	Stamford	£7,000	£3,000
Tyres	Wansford	£17,000	£14,000
Plant and equipment maintenance	Peterborough	£17,000	£14,000
Car sales and repair	Peterborough	£16,000	£7,000
Car sales	Corby	£18,000	£2,000
Fuel and oil	Wansford	£68,000	£34,000
Cleaning products/small	Peterborough/Stamford/Corby	£11,000	£59,000

Type of service	Location	Expenditure by Augean 2019	Expenditure by Augean 2020
equipment supplier			
Plant and machinery hire	Wellingborough	£225,000	£110,000
Repair and sale of machinery	Peterborough	£6,000	
Hydraulic repair	Peterborough	£6,000	£9,000
Logistics	Kings Cliffe	£2,000	£31,000
Temporary Agency Staff	Peterborough		£64,000
Catering services	Kings Cliffe	£2,000	£2,000
Total		£704,000	£787,000

Table 23.2

Augean Community Fund grants awarded in 2020

Project	Funding
Seaton Parish Council, Improvement of Playing Field Facilities in Seaton	£9,681
Peterborough Football and Sports Development Foundation, Improving Nene Valley Community Centre	£5,800
Nene Park Trust, Ferry Meadows Accessible Electric Boat Provision	£20,000
Oundle Town Council, Replace the boardwalk at Snipe Meadow	£17,576
Leicestershire and Rutland Wildlife Trust, A Better Welcome to Nature	£27,555
Oundle Tennis Club, Court 3 Lighting	£11,792
T21, The Old School Cafe	£45,000
Glapthorne Parish Council, Glapthorne Community Recreation Project	£50,000
Folksworth, Washingley & Morborne Village Hall Management Committee, External wall insulation and rendering of Folksworth Hall	£16,834
South Luffenham Parish Council – Natural Environment Committee – Improvement to the Pond in Pond Close Nature Conservation Area	£7,450
St Peters PCC, Yaxley, Provision of servery, toilets and meeting room	£25,000
Easton on the Hill Parish Council, Playing fields improvement project	£39,000
Stamford Tennis Club, Clubhouse Roof Replacement	£6,720
PCC of All Saints and St James, Kings Cliffe, Tower and Clock Repairs	£30,000

Project	Funding
Ufford Youth Centre and Village Hall Trust, Ufford Village Hall 2020 Improvements	£4,317
South Luffenham Village Hall, New Roof	£36,468
Woodnewton Village Hall, Audio Visual Installation	£6,182
The Church of St John the Evangelist, North Aisle Roof Restoration	£40,000
Seaton Parish Council, Replace Springers in Parish Play Area, Rutland	£12,500
Nene Valley Railway, Conserve Nene Valley Railway's Historic Carriages	£7,500
Kings Cliffe & Area Community Sports Project Limited, KC Active Refurbishment	£21,828
Total	£441,203

Green infrastructure projects which are supported.

Table ES25.1

Wider determinants of health and wellbeing

Health and wellbeing themes (Reproduced from Appendix 1 of the PHE guidance ⁹⁶)			
For each of the determinants listed in the table, the outcome of the screening explained in Section 25 of this Environmental Statement is summarised in <i>red italic text</i> .			
Access	Traffic and transport	Socioeconomic	Land use
<i>Wider determinants of health and wellbeing</i>			
<p>Access to the following:</p> <ul style="list-style-type: none"> Local public and key services and facilities. <i>The proposed development does not affect the physical access routes to the available services and facilities.</i> <i>The impacts associated with the support of local services and facilities are assessed.</i> Good quality affordable housing. <i>The proposed development will not affect access to good-quality affordable housing.</i> Healthy affordable food <i>The proposals do not affect the availability of suitable food outlets or the availability of affordable healthy food. The site is located some distance from locations where people grow their own fruit and vegetables</i> The natural environment <i>The site does not affect physical access to the natural environment. The proposed development does not remove any natural environments.</i> 	<ul style="list-style-type: none"> Accessibility <i>As the site is not open to the public during the operational period, its accessibility to the public is not a relevant factor for consideration.</i> <i>The accessibility of the restored site by future users of the green space which will be developed is assessed.</i> Access to/by public transport <i>The accessibility of the site to those who work on the site by modes other than by car is considered in Section 19 of this ES.</i> Opportunities for access by cycling and walking <i>The accessibility of the restored site by future users of the green space which will be developed is assessed.</i> Links between communities. <i>There will be no potential for affecting community links including connections to jobs, services, facilities or leisure opportunities.</i> Community severance <i>There will be no potential for affecting community links including connections to jobs, services,</i> 	<ul style="list-style-type: none"> Employment opportunities, including training opportunities <i>The impact of the proposed development on employment and training opportunities is assessed.</i> Local business activity <i>The impact of the proposed development on local business activity is assessed.</i> Regeneration <i>The location of the site is not in a regeneration area and no built development will be removed as part of the proposed development.</i> <i>The role of the site in providing waste management services to support the regional and national need of regeneration businesses is discussed in Section 23 of this ES.</i> Tourism and leisure industries <i>The potential impacts of the proposed development on those who use local tourism and leisure facilities, open space and recreational opportunities are assessed.</i> Community/social cohesions and access to social networks 	<ul style="list-style-type: none"> Land use in urban and/or /rural settings <i>The change in land use affects only the agricultural use of the proposed western extension. The proposed western extension is well contained and currently not available for public access.</i> <i>The provision of the new recreational facility on the restored site is assessed.</i> Quality of Urban and natural environments <i>The provision of the new recreational facility on the restored site is assessed</i>

⁹⁶ Public Health England 'Advice on the content of Environmental Statements accompanying an application under the Nationally Significant Infrastructure Planning Regime' March 2021.

Health and wellbeing themes (Reproduced from Appendix 1 of the PHE guidance ⁹⁶)			
For each of the determinants listed in the table, the outcome of the screening explained in Section 25 of this Environmental Statement is summarised in <i>red italic text</i> .			
Access	Traffic and transport	Socioeconomic	Land use
Wider determinants of health and wellbeing			
<p><i>The impacts associated with the support of local facilities, including local green spaces and natural environments are assessed.</i></p> <ul style="list-style-type: none"> The natural environment within the urban environment <p><i>The site does not affect physical access to the natural environment within the urban environment The proposed development does not remove any natural environments within any urban environments.</i></p> <p><i>The impacts associated with the support of local facilities, including local green urban environments are assessed.</i></p> <ul style="list-style-type: none"> Leisure, recreation and physical activities within the urban and natural environments <p><i>The potential impacts associated with the provision of new green space and recreational facilities as part of the site restoration are assessed.</i></p> <p><i>The potential impacts of the proposed development on users of the existing natural environment including in particular the rights of way in Fineshade Woods and The Assarts are assessed.</i></p>	<p><i>facilities or leisure opportunities, or which might result in community severance.</i></p> <ul style="list-style-type: none"> Connections to jobs <p><i>There will be no potential for affecting community links including connections to jobs.</i></p> <ul style="list-style-type: none"> Connections to services, facilities and leisure opportunities <p><i>There will be no potential for affecting community links including connections to services, facilities or leisure opportunities.</i></p>	<p><i>The impacts associated with the support of local facilities and services, including local green spaces, is assessed.</i></p> <p><i>The potential for the proposed development to result in feelings of anxiety in people and communities living in the vicinity of the proposed development is assessed.</i></p> <ul style="list-style-type: none"> Community engagement <p><i>The potential impacts of the current and proposed community engagement on the acceptability of the proposed development are assessed.</i></p>	