

Northacre

RENEWABLE ENERGY

The Northacre Energy from Waste
Facility, Stephenson Road, Northacre
Trading Estate, Westbury
Amended Proposal

ENVIRONMENTAL STATEMENT VOLUME 1: MAIN REPORT

AUGUST 2020



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FOREWORD

This Environmental Statement has been prepared on behalf of Northacre Renewable Energy Limited in support of a detailed planning application for an amended energy from waste facility (the 'Northacre Facility' or the 'Proposed Development') on the Northacre Trading Estate, Westbury.

The ES has been prepared in accordance with the Town and County Planning (Environmental Impact Assessment) Regulations 2017 and comprises the following documents:

- The Environmental Statement (ES) Main Report (Volume 1), which contains the detailed project description; an evaluation of the current environment in the area of the Northacre Facility; the likely significant environmental impacts of the scheme; and details of the proposed mitigation measures which would alleviate, compensate for, or remove adverse impacts identified in the study. Volume 1 also includes a summary of the overall likely significant environmental impacts of the Northacre Facility;
- Illustrative Figures (Volume 2) which contains all relevant schematics, diagrams and illustrative figures;
- Technical Appendices (Volume 3), which include details of the methodology and information used in the assessment, detailed technical schedules and, where appropriate, raw data; and
- a Non-Technical Summary (Volume 4), containing a brief description of the Northacre Facility and a summary of the ES, expressed in non-technical language.

Hard copies of the ES, as a four Volume set, are available at a cost of £400 by writing to AXIS, Camellia House, Water Lane, Wilmslow, Cheshire, SK9 5BB. Alternatively, the Non-Technical Summary can be purchased on its own from the same point of contact for £15, with the entire ES available for purchase on a CD for £15. Finally, all of the planning application documentation, including the ES, can be downloaded free of charge from the planning portal on Wiltshire Council's website.

CHAPTER 1.0 INTRODUCTION AND BACKGROUND

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Figure 1.1	Site Location Plan
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1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

- 1.1.1 This Environmental Statement (ES) has been prepared on behalf of Northacre Renewable Energy Limited (hereafter referred to as 'NREL or the 'Applicant') in support of a detailed planning application for an amended energy from waste facility (the 'Northacre Facility' or the 'Proposed Development') on the Northacre Trading Estate, Westbury, (the 'Application Site' or 'Site'). The Site lies wholly within the administrative area of Wiltshire Council ('WC') and its location is provided in Figure 1.1.
- 1.1.2 As set out in detail within the Planning Statement, that also supports the application (and as referenced subsequently within the ES), the Northacre Facility already benefits from extant planning permission, albeit for a different technology selection to that for which permission is now being sought.
- 1.1.3 Planning permission for: *"an advanced thermal treatment facility"* (application ref: 14/12003/WCM) was granted on the Application Site by WC on the 23rd September 2015. This scheme represented the first iteration of the Northacre Facility and was an energy from waste (EfW) facility using a gasification technology (the 2015 Permission).
- 1.1.4 Subsequently, a second planning permission for the Northacre Facility was granted by WC on 17th June 2019 (application ref: 18/09473/WCM). This permission was for the: *"Revision of the layout and design of Advanced Thermal Treatment Facility permitted under consent 14/12003/WCM."*
- 1.1.5 In short, the amendments included significant changes to the layout and appearance of the scheme and involved the introduction of a different gasification technology. This permission remains extant (until 16th June 2022) and is hereafter referred to as the '2019 Permission'.
- 1.1.6 The ES has been prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations 2017). The EIA Regulations 2017 supersede those in force at the time of the application

resulting in the 2015 Permission. Accordingly, this ES incorporates the requirements of the updated Regulations. It also updates the environmental baseline to reflect contemporary conditions on and around the Application Site.

1.1.7 This ES has been prepared as a standalone document for the amended Northacre Facility, rather than an Addendum to the 2015 or 2018b ESs. It assesses the likely significant effects of the amended Northacre Facility, on the environment during the construction and operation and compares them to the effects reported in the 2018 ES for the scheme approved under the 2019 Permission.

1.1.8 This introductory chapter provides an outline description of the proposed amendments to the Northacre Facility, describes the Site and its context, provides details of the Applicant, outlines the structure of the ES and identifies the expert organisations that have undertaken the EIA.

1.2 The Proposed Development

The Main Scheme Amendments

1.2.1 The planning application site and overall disposition of the main building on the site remain similar to that approved in the 2019 Permission. The main amendments to the Northacre Facility, as now proposed, are as follows:

- i. The scheme remains an EfW / thermal treatment facility for the recovery of energy from residual waste, with the type of technology deployed within the plant changing from gasification (in the 2019 Permission) to a conventional moving grate combustion technology.
- ii. The building footprint has marginally reduced from 6,535m² in the 2019 Permission to 6,477m² now proposed.
- iii. The height of the Application Site (above ordnance datum) would remain at 62m AOD, the same as the development platform level in the 2019 Permission.
- iv. In order to accommodate the proposed combustion technology, the highest part of the main building (the Boiler Hall) would need to be raised to 40m high, compared to 36.8m high for the corresponding part of the building in the 2019 Permission, an increase of 3.2m. All other elements of the main building would be lower than the Boiler Hall.

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- v. The height of the stack would remain at 75m, the same as in the 2019 Permission. However, the width of the stack has reduced from 4m to 2.55m.
 - vi. The odour abatement stack which was 40m high in the 2019 Permission would now be 43m.
 - vii. The net power generation would now be 25.6 Megawatts (MW), compared with 24.5 MW net for the scheme in the 2019 Permission.
 - viii. The Northacre Facility would now treat circa 243,000 tonnes per annum (tpa) of residual waste, compared to a total facility throughput of 160,000 tpa in the scheme granted under the 2019 Permission. However, more of the input material (52,000 tpa) would be directly transferred by conveyor from the adjacent Northacre Resource Recovery Centre (RRC), that was proposed in the 2019 Permission (41,500).
 - ix. The current proposal would generate circa 53 net HGV movements per working day (taking account of imports / exports to / from the Northacre Facility itself and the reduction in exports from Northacre RRC). This compares on a like for like basis to circa 42 net HGV movements per working day for the proposal in the 2019 Permission.
 - x. The administration / office element of the facility would now be integrated into the main building, rather than being located on the site boundary as under the 2019 Permission.
 - xi. The mechanical pre-treatment element included in the 2019 Permission is no longer required, and an ash handling facility has been incorporated to manage the IBA created.
 - xii. The Air-Cooled Condenser (ACC) is now located away from the site frontage (which is the boundary closest to residential property) and is now shielded by a section of building.

The Northacre Facility as Now Proposed

- 1.2.2 The Northacre Facility, as now proposed comprises a conventional, single line, moving grate combustion plant for the recovery of energy from residual waste and enabling recovery of metals and the residues from the process by offsite recycling. The residual waste input would be non-hazardous waste primarily from commercial and industrial sources and may include municipal waste. Residual waste, defined more fully elsewhere, is that waste which remains after re-use and recycling / composting operations have taken place.

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- 1.2.3 The residual waste for this facility will include Solid Recovered Fuel (SRF) and the “fines and heavies” from the adjacent Mechanical Biological Treatment facility (MBT).
- 1.2.4 The Proposed Development would generate electricity by way of a steam turbine which would be driven through the controlled combustion of residual waste. As described above, the gross power generating capacity of the Northacre Facility would be 28.6 Megawatts (MW). After subtracting the power used to run the facility itself, it would have the ability to export approximately 25.6 MW of electricity to the local electricity grid, a significant proportion of which would be classed as renewable. This is sufficient to meet the average annual domestic electricity needs of approximately 48,000 homes. It would also be capable of exporting heat, in the form of steam or hot water, to local heat users. It would provide a potential source of heat in a location where further employment growth is planned and represents a significant capital investment in the local area.
- 1.2.5 The proposal is based around a single main building which would contain the following elements:
- Reception Hall;
 - Bunker;
 - Boiler Hall;
 - Turbine Hall;
 - Incinerator Bottom Ash (IBA) storage; and
 - Offices, Workshop, Stores and Staff Welfare Facilities.
- 1.2.6 The Air-Cooled Condensers (ACCs) would form a separate standalone structure situated adjacent to the main building. The Flue Gas Treatment (FGT) facility is located outside the main building as a separate structure also. The stack is associated with the FGT facility and extends to a height of circa 75m.
- 1.2.7 The Proposed Development is located adjacent to the MBT plant which will supply SRF to the Facility, therefore also incorporated within these revised proposals is a conveyor link between the two buildings. This supplements the vehicle access between the two sites which will be used to transfer other residual materials.

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- 1.2.8 The Proposed Development would also include the following ancillary / infrastructure:
- Vehicle weighbridges and weighbridge Gatehouse;
 - Transformer and Substation buildings
 - A separate DNO substation;
 - Fire water tank and associated pump house;
 - Tanks / silos (containing fuel oil, ammonia hydroxide, FGT residues);
 - Internal circulation roadways / ramps and manoeuvring areas;
 - Employee and visitor parking / bicycle parking including EV charging;
 - Fencing and gating;
 - Service connections;
 - Surface water drainage;
 - Lighting and CCTV; and
 - Areas of hard and soft landscaping.
- 1.2.9 In association with granting the 2019 Permission, a further permission was approved by WC (ref 18/09550/FUL) which was for a screening bund on land adjacent to the site that would be created using material which needs to be removed from the site as part of the development works. That screening bund will be constructed in association with this revised proposal for the Northacre Facility.
- 1.2.10 On the basis that the planning application is approved, the overall construction period for the Proposed Development would last circa 36 months, with operation starting 2022. The Proposed Development would have a design life of approximately 25 years although, in reality many elements would last beyond this period. Planning permission is being sought for a permanent development and therefore as elements of the facility require repair / refurbishment / replacement this would be carried out.
- 1.2.11 The Proposed Development would make an important contribution to the acknowledged shortfall in waste recovery capacity within the UK. This shortage is resulting in approximately 11 million tonnes per annum (2018)¹ of residual waste, capable of being subject to energy recovery, being sent to landfill. On top of this, England exported over 3.2 million tonnes of Refuse Derived Fuel to energy recovery facilities in mainland Europe in 2017. The Proposed Development would contribute significantly to the diversion of waste from landfill and the utilisation of indigenous

¹ Approximate figure calculated from Tolvik Consulting – UK Energy from Waste Statistics – 2018 (June 2019)

residual waste to generate energy (including renewable energy) within England, as opposed to in mainland Europe.

- 1.2.12 The Proposed Development would represent a capital investment of circa £200 million during construction, with peak construction phase jobs of approximately 450 on Site at any one time. When operational it would employ around 40 people in permanent roles. Like the scheme approved in the 2019 Permission, it would operate 24 hours per day, 365 days per year, but HGV delivery and removal hours would be restricted to 07:00 – 22:00 on weekdays and 07:00 – 17:00 on Saturdays, with no HGV movements on Sundays or Bank Holidays.
- 1.2.13 A detailed description of the Proposed Development, and its operation, is provided within Chapter 4.0 of this ES. Full details of the need for the Proposed Development and its benefits are contained within the Planning Statement.

1.3 The Site and Its Context

- 1.3.1 The Application Site comprises circa 2.88 hectares (ha) of vacant land located on the Northacre Trading Estate and is between the Arla Foods Westbury Dairies to the north-west and the Northacre RRC to the south east. Stephenson Road is immediately north east of the site whilst there are fields to the south west. On the opposite side of Stephenson Road, are various other industrial/business units and uses and a sewage works, and a few remaining vacant plots awaiting new industrial/business uses.
- 1.3.2 The nearest residential properties to the east are Brookfield and Crosslands, which front Brook Lane approximately 60m from the Site. To the south west beyond this open farmland, approximately 300m from the site, are two further residential properties, Brook Farm and Orchard House. There are a number of semi-detached houses on Storridge Road to the north-east
- 1.3.3 The Site is broadly rectangular in shape, and slopes gently to the west. The overall development site varies in level from 62.85m AOD at the south-west corner; approximately 65.00m AOD at the south-east corner; 60.40m AOD along the northwest perimeter and 62.30m AOD at the entrance to the site. The Site lies within

an established industrial area and is situated 600m south of the West Wiltshire Trading Estate.

- 1.3.4 The Site boundary is currently defined by galvanised steel palisade fencing and chain link fencing. The western boundary has a gappy and remnant hedgerow. Within the Site the land comprises a mosaic of rank grassland, tall herb/ruderal vegetation, scrub vegetation and open, hard-standing (including a car-park and tarmac access road). Also, within the site there are spoil mounds also supporting a mixture of rank grassland, tall herb/ruderal and scrub vegetation.
- 1.3.5 Stephenson Road runs along the north eastern boundary of the Site and provides access to surrounding industrial / commercial development. Stephenson Road also offers the principle point of access to the Site via an existing priority junction. Other development along or served off Stephenson Road include industrial and manufacturing units, Arla Dairies, a solvent recovery firm, Network Rail Recycling depot and the Northacre RRC. There is additional consent at the RRC for a Waste Management building and expansion of the vehicle depot consented at the MBT.
- 1.3.6 The southern western boundary of the Site is farmland, but also identified, as is the developed part of the Northacre Trading Estate, in Core Policies 32 and 35 of the Wiltshire Core Strategy as a Principal Employment Area and in the adopted Waste Site Allocations Plan as a Strategic Waste Site.
- 1.3.7 The Site is identified in the Wiltshire Waste Site Allocations Plan as suitable for 'Materials Recovery Facility / Waste Transfer Station, Local Recycling and Waste Treatment'.
- 1.3.8 The Site falls within Flood Zone 1 (the lowest category of flood risk), is not directly constrained by any statutory or non-statutory ecological designations, nor does it contain or form part of any designated heritage asset, such as a scheduled monument or a Listed Building. There are no public footpaths / rights of way within the Site.

1.4 The Applicant

1.4.1 Northacre Renewable Energy Limited (NREL) is a special purpose joint venture established to deliver the Northacre Facility in Westbury. NREL is owned by Bioenergy Infrastructure Group (“BIG”), a UK independent power producer specialising in energy-from-waste and biomass facilities, and The Hills Group, a Wiltshire-based with business activities including waste management; quarrying of aggregates and building new homes.

1.5 This Document

1.5.1 This ES (**Main Report, Volume 1**) has been prepared to support a detailed planning application for the Northacre Facility. The remaining chapters of the ES are as follows:

Chapter 2.0: Approach to the Environmental Impact Assessment;

Chapter 3.0: Alternatives Considered;

Chapter 4.0: Scheme Description and Construction Methods;

Chapter 5.0: Landscape and Visual;

Chapter 6.0: Ecology and Nature Conservation;

Chapter 7.0: Noise and Vibration;

Chapter 8.0: Air Quality and Human Health;

Chapter 9.0: Surface Water and Flood Risk;

Chapter 10.0: Transport;

Chapter 11.0: Socio-Economics;

Chapter 12.0: Cultural Heritage; and

Chapter 13.0: Summary of Effects.

1.5.2 The Illustrative Figures that support the ES are contained within **Volume 2**.

1.5.3 A series of **Technical Appendices (Volume 3)** are provided that include details of the methodology and information used in the assessment, detailed technical schedules and, where appropriate, raw data.

1.5.4 All the chapters of the ES are summarised in a **Non-Technical Summary (Volume 4)** to provide a review of the Proposed Development, and the possible environmental implications, in concise lay terms.

1.6 Assessment Team

- 1.6.1 In accordance with Regulation 18(5) of the EIA Regulations 2017, NRE has engaged competent experts to prepare the ES. As per Regulation 18(5)(b), each of the technical assessment chapters (Chapter 5.0 to 12.0) include a statement outlining the relevant expertise and / or qualifications of the experts that prepared the chapter.
- 1.6.2 The ES was compiled and coordinated by AXIS a multi-disciplinary planning environmental and transport consultancy with Land & Mineral Management (LMM), a planning consultancy. AXIS & LMM have prepared Chapters 1.0 to 4.0 and 13.0 of the ES. AXIS have also provided expert assessment of Landscape and Visual impact.
- 1.6.3 Additionally, a wider team of specialist consultants have provided expert assessment in respect of the following:
- Fichtner – Air Quality and Human Health;
 - A D Ecology and Argus Ecology – Ecology and Nature Conservation;
 - NVC – Noise and Vibration;
 - Wessex Archaeology – Archaeology / Cultural Heritage;
 - Floodline – Surface Water and Flood; and
 - IMA Transport Planning – Traffic and Transportation.
- 1.6.4 AXIS is one of the UK's leading consultancies with regard to the planning of energy recovery facilities (from waste and biomass fuels), having secured planning permission for over 35 such projects. The AXIS' project team for the Northacre project includes: Chartered Town Planners; Members of the Chartered Institute of Ecology and Environmental Management; and Chartered Landscape Architects.

CHAPTER 2.0 APPROACH TO THE ENVIRONMENTAL STATEMENT

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FIGURES (bound separately in Volume 2)

Figure 2.1	Location of Cumulative Schemes
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2.0 APPROACH TO THE ENVIRONMENTAL STATEMENT

2.1 Introduction

2.1.1 This Chapter: sets out the legislative requirement for the application to be supported by an ES; outlines the general approach to the assessment and the scoping process; describes the broad approach to the assessment that has been undertaken in relation to the topics that have been identified as having the potential to result in significant environmental effects; and finally, sets how the ES complies with the requirements of the EIA Regulations.

2.2 Need for EIA

2.2.1 The requirement for EIA was prescribed by European law under Council Directive 85/337/EEC. This Directive has been amended four times, with the latest amendment, the Environmental Impact Assessment (EIA) Directive (2014/52/EU) entering into force on 15th May 2014.

2.2.2 In England, the Directive has been enacted most recently into law by the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 [SI 2017 No. 571] – referred to hereafter as ‘the EIA Regulations 2017’. These regulations came into force on the 16th May 2017.

2.2.3 Schedule 1 of the EIA Regulations 2017 lists categories of developments for which EIA is mandatory, whilst Schedule 2 lists categories of development for which EIA may be required depending upon, inter alia, whether the development is likely to have significant environmental effects.

2.2.4 With regard to the need for an EIA, the Proposed Development is included within Schedule 1 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 under Part 10 as follows: “10. *Waste disposal installations for the incineration or chemical treatment (as defined in Annex IIA to Council Directive 75/442/EEC under heading D9) of non-hazardous waste with a capacity exceeding 100 tonnes per day.*”

2.2.5 As such, the Proposed Development is deemed to be a Schedule 1 development and therefore EIA is mandatory. This reflects the same position as was the case for the application resulting in the 2015 and 2019 Permissions.

2.3 Approach

2.3.1 As outlined previously, the EIA Regulations 2017 supersede those in force at the time of the application resulting in the 2015 Permission, but were in place when the application as made for the 2019 Permission. Accordingly, this ES incorporates the requirements of the updated Regulations. It also updates the environmental baseline to reflect contemporary conditions on and around the Application Site.

2.3.2 The impact of the Covid 19 pandemic has been noted where appropriate in the technical assessments and commentary provided as to how the restrictions caused have been addressed and overcome.

2.3.3 This ES has been prepared as a standalone document for the amended Northacre Facility, rather than an Addendum to the previous ES's. It assesses the likely significant effects of the amendments to the approved facility on the environment, during the construction and operation and using the baseline of the effects reported in the ES for the scheme approved under the 2019 Permission.

2.3.4 The overall approach to this ES has been guided by that previously adopted for earlier iterations of the Northacre Facility. Planning permission for the first iteration of the facility (application ref: 14/12003) was granted by WC on the 23rd September 2015. This planning application was supported by an ES and this scheme is referred to as the '2015 Permission'. The ES was prepared following the receipt of an EIA Scoping Opinion, from WC, dated 6th November 2014.

2.3.5 Subsequently, a planning application (resulting in the 2019 Permission) was made under Section 70 of the Town and County Planning Act 1990 and approved by WC on 17th June 2019 (application ref: 18/09473/WCM). This sought to update the 2015 permission in order to allow a number of amendments to the design of the facility.

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- 2.3.6 After consideration by the expert advisors of the location, the degree of material change in land use planning terms, cumulative developments, and the likelihood of significant impact arising from the revised proposal, further Scoping has not been sought. For robustness some issues previously screened outside of the ES by WC have been included within the ES, specifically ecology and nature conservation and water resources.
- 2.3.7 Correspondence with the Defence Infrastructure Organisation (DIO) on behalf of the Ministry of Defence has confirmed in relation to the 2015 and 2019 Permissions, that the impact on Keevil Aerodrome is no longer considered significant in respect of the height of the stack¹ as it is less than the Keevil Area Safeguarding Direction dated 8th May 2013 structure specified height of 91.4m.
- 2.3.8 Furthermore, evidence on the condition of the site has been provided with the previous applications and WC has been satisfied that no issues relating to potential for contamination of the land arising from the work already done on site investigation. Therefore, this subject has not been addressed again in this application.
- 2.3.9 In summary, the approach to this EIA involves:
- Preparing the ES in accordance with the detailed requirements of the EIA Regulations 2017;
 - Updating the baseline to reflect the contemporary site and contextual conditions, and noting where there had been restrictions due to the Covid 19 situation; and
 - Assessing the environmental effects of all aspects of the amended Northacre Facility and comparing those identified effects to the effects reported in the 2018 ES for the scheme approved under the 2019 Permission.
- 2.3.10 Such an approach provides a fully updated ES and compares the effects of the Proposed Development against the 2019 Permission, within the contemporary environmental baseline context.

¹ Email DIO to LMM dated 10-04-2019

2.4 Scope of the ES

2.4.1 The information to be included in an ES is set out in Schedule 4 of the EIA Regulations 2017. References to chapters in the ES where information relevant to the requirements of Schedule 4 can be found are listed within Table 2.1 below.

Table 2.1: Review of Schedule 4 Requirements

Para	Requirement	Where Addressed Within the ES
1	<p>A description of the development, including in particular:</p> <p>(a) a description of the location of the development;</p> <p>(b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;</p> <p>(c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;</p> <p>(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat and radiation) and quantities and types of waste produced during the construction and operation phases.</p>	<p>(a) Section 1.3.</p> <p>(b & c) Chapter 4.0.</p> <p>(d) Within Chapter 4.0 as it relates to the scheme description and within Chapters 5.0 to 12.0 as it relates to individual topic areas.</p>
2	<p>A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.</p>	Chapter 3.0
3	<p>A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.</p>	The baseline is fully described / established within Chapters 5.0 to 12.0 as it relates to individual topic areas.
4	<p>A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.</p>	The baseline factors that have potential to be affected by the Proposed Development are fully described / established within Chapters 5.0 to 12.0 as they relate to individual topic areas.
5	<p>A description of the likely significant effects of the development on the environment resulting from, inter alia:</p> <p>(a) the construction and existence of the development, including, where relevant, demolition works;</p> <p>(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;</p> <p>(c) the emission of pollutants, noise, vibration, light, heat and radiation,</p>	All within Chapters 5.0 to 12.0 as it relates to individual topic areas.

	<p>the creation of nuisances, and the disposal and recovery of waste;</p> <p>(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);</p> <p>(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;</p> <p>(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;</p> <p>(g) the technologies and the substances used.</p> <p>The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC and Directive 2009/147/EC</p>	
6	<p>A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.</p>	<p>The overall EIA methodology and approach to assessment is described in sections 2.3 and 2.5. The specific technical methodologies used to identify and assess effects are fully described (or referenced) within Chapters 5.0 to 12.0 as they relate to individual topic areas. Certain methodologies are specifically contained within the Technical Appendices to Chapters 5.0 to 12.0.</p>
7	<p>A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.</p>	<p>'Incorporated Mitigation' (as described in section 2.5) is included within the detailed scheme description within Chapter 4.0. The specific mitigation measures, as they apply to individual environmental topic areas, are fully described (or referenced) within Chapters 5.0 to 12.0 as they relate to each topic.</p>
8	<p>A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.</p>	<p>Section 2.6</p>
9	<p>A non-technical summary of the information provided under paragraphs 1 to 8.</p>	<p>A separate Non-Technical Summary is contained as ES Volume 4.</p>

10	A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.	References are provided as footnotes and / or reference document lists within, or at the end of each ES Chapter, as appropriate.
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Consultation

2.4.2 Regulation 15 of the EIA Regulations 2017 states that prospective applicants may request a Scoping Opinion from the relevant planning authority, in this instance WC. This is a written confirmation as to the information that, in the opinion of the planning authority, ought to be provided within the ES. However, requesting such an Opinion is not a mandatory requirement.

2.4.3 In light of the fact that a previous EIA for an earlier iteration of the Proposed Development was Scoped by WC, the Applicant has elected in this instance not to undertake formal EIA Scoping. The Applicant is fully satisfied that these activities have allowed the EIA to be fully and properly scoped, resulting in a correctly focussed, comprehensive and fully compliant ES.

2.4.4 The information and knowledge required to produce this ES was acquired from a number of varied sources to ensure that all effects, whether explicit from the outset, or coming to light during the project’s development, were assessed. These sources included:

- discussions with technical consultees;
- review of public files and records;
- review of historical mapping and aerial photography;
- site surveys undertaken by the Applicants specialists;
- surveys and assessments undertaken previously on the Site;
- specialist studies, such as computer modelling of potential noise impacts; and
- expert knowledge from the consultancy team.

2.5 EIA Methodology

2.5.1 The approach to EIA is not standardised, but there are established, and recognised approaches set out by professional institutions as to methods to be used for the assessment of environmental effects. Where appropriate, the environmental effects of the Proposed Development have been assessed using definitive standards,

legislation and guidance applicable to each of the technical areas covered within this ES.

2.5.2 In order to provide a clear and robust assessment each of the technical chapters presented within the ES follows the structure set out in the subsequent paragraphs.

Introduction

2.5.3 A brief summary of the approach to the topic is provided outlining any key issues relevant to the subject area being assessed.

Methodology

2.5.4 This section provides details of the assessment method followed and provides the following information:

- a description of any relevant legislation, policy or guidance which has been taken into account in the assessment;
- the findings from any consultations undertaken when compiling the assessment;
- the approach taken to gathering of any desk-based or field data. Where specific surveys have been undertaken, an outline of the assessment methodology is provided;
- the approach to the impact assessment is defined. This includes how the particular topic has defined impact magnitude, receptor sensitivity and how these relate to the overall level effect / significance; and
- any limitations or assumptions made in the assessment.

Baseline

2.5.5 The baseline conditions have been established through consultation, collation and analysis of existing data sets and reports, and gathering of site-specific field data. The baseline assessment identifies any particular sensitive receptors that will need to be evaluated in the assessment. The baseline conditions have been updated from the ES that supported the scheme approved under the 2019 Permission or where not feasible due to the Covid 19 situation, any limitations have been noted.

2.5.6 Where relevant and appropriate, the likely future state of the environment is set out by predicting future change in the baseline conditions in the absence of the Proposed Development, in line with current guidance². The future baseline is then taken into account when assessing the likely effects of the project over its operational lifetime.

Assessment of Effects

2.5.7 The assessment includes a description of the nature, extent and significance of the effects of the Proposed Development upon the baseline and compares them to the effects arising from the extant 2019 Permission. The assessment considers mitigation measures that have been specifically incorporated into the Proposed Development to reduce environmental effects of the project.

2.5.8 As described in Chapter 1.0, the Applicant is applying for permanent development and as such the assessment of effects will consider the construction and operational phases of the Proposed Development only. A detailed assessment of decommissioning has not been provided. Any effects associated with decommissioning works are considered likely to be similar in nature to construction phase effects.

2.5.9 The EIA Regulations 2017 do not provide definitive methods for the assessment of significance and a variety of methods are employed within ES. The method used to assess the effects is specific to each discipline. Where available and appropriate, the assessments follow impact assessment criteria and methodology set out by relevant professional institutions (e.g. Institute of Ecology and Environmental Management, Landscape Institute etc.). Where such guidance is not available, or prescriptive methods are not set out by the relevant professional body, then assessment criteria have been developed by the technical specialists to enable a clear and structured assessment to be undertaken.

² *The State of Environmental Impact Assessment Practice in the UK, IEMA. 2011. Section 6.1 Establishing an Effective Baseline.*

2.5.10 The level of the effect is, in general, derived by considering the magnitude of the impact and the sensitivity of the receptor to a change resulting from the Proposed Development.

2.5.11 Depending on the discipline there are several factors that need to be taken into account when establishing the type and magnitude of an effect, including:

- whether the effect is adverse or beneficial;
- whether it is temporary or permanent;
- extent or spatial scale of the effect;
- duration of the effect;
- whether the effect is reversible; and
- probability / likelihood of the effect.

2.5.12 Similarly, the sensitivity of a receptor is the function of several elements dependent on the discipline and effect being assessed, these could include:

- designation and legal status;
- quality;
- rarity; and
- ability to adapt to change.

2.5.13 Having established the magnitude of the effect and the sensitivity of the receptor, the level of the effect is then defined. For some disciplines, a matrix is used to classify the level of effect by correlating magnitude and sensitivity, as shown in Table 2.2.

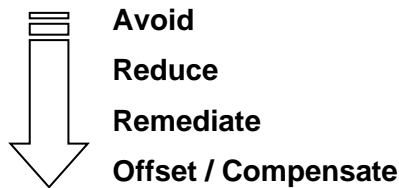
Table 2.2: Example Level of Effect Matrix

		Magnitude of Impact			
		High	Medium	Low	Negligible
Receptor Sensitivity	High	Major	Moderate	Minor to Moderate	Negligible or Minor
	Medium	Moderate	Minor to Moderate	Minor	Negligible
	Low	Minor to Moderate	Minor	Negligible or Minor	Negligible
	Negligible	Negligible or Minor	Negligible	Negligible	Negligible

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- 2.5.14 Where a matrix is not used, the magnitude of change and the sensitivity of the receptor is used to make a reasoned professional judgement to establish the level of the effect and whether it is considered to be significant or not significant.
- 2.5.15 There is no statutory definition of what level of effect is to be regarded as significant and there is often not a single, definitive, correct answer as to whether an effect is significant or not. A significant effect does not necessarily mean that such an effect is unacceptable to decision-makers nor necessarily results in a breach of any particular planning policy. This is a matter to be weighed in the planning judgement / balance alongside other material considerations. What is important is that the likely significant environmental effects of any proposal are transparently assessed and described in sufficient detail to enable the determining authority to make a balanced and well-informed judgement as part of the decision-making process.
- 2.5.16 Where the findings of an assessment are set out as different levels of effect (e.g. major, moderate, minor, etc.) the assessment clearly sets out where an effect is considered to be significant. This may vary between disciplines and the threshold is defined within each chapter. This approach is used to assist the decision maker, consultees and other interested parties in establishing the most important environmental effects of the Proposed Development.
- 2.5.17 In all instances, the assessment sets out the basis of the judgements made so that the readers of the ES can see the weight attached to the different factors and can understand the rationale of the assessment. In this sense the ES clearly explains how the significance of effects has been derived.

Mitigation

- 2.5.18 It is a requirement of the EIA Regulations to describe the measures envisaged to prevent, reduce and where possible offset any significant effects on the environment. Whilst not a requirement of the EIA Regulations, mitigation measures can be used to reduce or avoid any adverse effect, whether or not that effect is deemed to be 'significant'. Mitigation can be achieved in a number of ways as listed below; this approach is often referred to as the mitigation hierarchy with mitigation being selected as high up the hierarchy as possible.



2.5.19 Many of the mitigation measures associated with the project have been incorporated into the Proposed Development as a result of decisions undertaken during the design of the scheme. Accordingly, they feature within the detailed scheme description in Chapter 4.0 of this ES. On the basis that these mitigation measures are considered to be embedded into the project, they have been taken into account when coming to a judgement of the significance of the effects of the Proposed Development and are not necessarily specifically referenced within the individual ES assessment chapters.

2.5.20 Where additional mitigation, compensation or enhancement measures are proposed to prevent, reduce or offset adverse effects unavoidable through design, or to provide benefits to the scheme / local environment; these are described separately within the mitigation section of each chapter. Where such measures have been defined, an explanation is provided of how these measures will mitigate / reduce the identified effects of the Proposed Development.

Cumulative Effects

2.5.21 The EIA Regulations require that a description of the likely significant effects of the development on the environment should be included in the ES, including cumulative effects. On this basis, each technical chapter provides an assessment of likely significant cumulative environmental effects with other projects in the area.

2.5.22 The EIA Regulations do not define cumulative effects. However, a commonly accepted description is: *“Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project.”* (European Commission, 1999)

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- 2.5.23 There is no defined methodology in the UK as to how cumulative effects should be assessed. In determining the approach to be adopted to this element of the assessment, regard has been given to the following guidance:
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Commission 1999);
 - Cumulative Effects Assessment Practitioners Guide (Canadian Environmental Assessment Agency 1999);
 - Guidelines for Environmental Impact Assessment (Institute of Environmental Management and Assessment 2006);
 - The State of Environmental Impact Assessment Practice in the UK (Institute of Environmental Management and Assessment 2011); and
 - Assessing the Cumulative Impact of Onshore Wind Energy Developments (Scottish Natural Heritage, 2012).
- 2.5.24 The assessment of cumulative impacts associated with the Proposed Development encompasses the effects of the proposal in combination with:
- approved development under construction;
 - approved development, awaiting implementation; and
 - proposals awaiting determination within the planning system, with design information in the public domain.
- 2.5.25 Projects to be considered for inclusion in the cumulative assessment are major projects falling within the above categories. Major projects are considered to be developments of 10,000m² in size or greater that have been subject to EIA. However, in this ES a number of residential and commercial developments that fall outside the above criteria have been included for robustness.
- 2.5.26 The cumulative effects of operational projects already form part of the baseline and as such are assessed within each of the discipline Chapters.
- 2.5.27 Each technical assessment area will have a different spatial zone where potential cumulative significant effects could occur. However, a preliminary search area of 1.5km from boundary of the Site (within WC's administrative boundary) was used to identify projects to be included in the cumulative assessment.

2.5.28 Following this exercise, the cumulative assessment undertaken by each technical specialist has focused on the developments set out in Table 2.3 with the location of these developments provided in Figure 2.1.

Table 2.3: Projects for Consideration in the Cumulative Assessment

Ref.	Reference Number and Description	Comments
1	Immediately adjacent to the proposed development ref: 18/03366/WCM (Approved 9 August 2018). Address: Northacre Resource Recovery Centre Stephenson Road Westbury BA13 4WD. Proposal: Waste management facility, extended vehicle depot and welfare, workshop and office / welfare building.	Application accompanied by Planning, Noise and Transport Statements. Supersedes the approved Household Recycling Centre, which will result in a substantial reduction in vehicle movements.
2	Circa 1km to the north-west of the proposed development, ref: 19/10253/FUL (Approved 3 January 2020). Address: Brook Mill, Victory Road, Wilts Trading Estate, BA13 4JL. Proposal: Demolition of existing cereal bin building (including intake and 4 No. silos), redundant extruder plant building and warehouses, for the construction of a feed mill along with associated buildings, silo, bulk bins and HGV parking (use classes B2 & B8).	Application accompanied by a Design & Access Statement, Contamination Report, Ecological and Flood Assessments.
3	Circa 300m to the north-east of the proposed development, ref: 17/07548/FUL (Approved 31 July 2019). Address: Land off Station Road, Westbury. Proposal 87 dwellings, car parking and associated works.	Application accompanied by a Planning Statement with Noise, Transport, Flood, Ecology and Arboricultural Assessments.
4	Circa 510m to the south east of the proposed development ref: 15/12551/OUT (outline permission) and ref: 17/01314/VAR (reserved matters). Address: Land at Westbury Sailing Lake (off Station Road). Proposal: Erection of up to 300 dwellings, public open space, highway infrastructure including bridge over avoiding railway line, and associated works.	Construction is underway

Residual Effects and Conclusions

2.5.29 This section of each technical chapter provides a textual description of the likely residual effects of the Proposed Development following the implementation of any additional mitigation or enhancement measures.

2.5.30 The conclusions summarise the key elements of the assessment and include a statement on whether the Proposed Development is likely to result in any new or

significant environmental effects when compared to the scheme approved under the 2019 Permission.

2.6 Project Vulnerability to Major Accidents / Disasters

- 2.6.1 As identified in Table 2.1, Schedule 4 paragraph 8 of the EIA Regulations 2017 requires that the ES includes a description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and / or disasters which are relevant to the project concerned. Further, that where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events and the approach to managing emergencies.
- 2.6.2 The Proposed Development is located within a politically, geologically and meteorologically stable part of Europe. Accordingly, the facility is not at material risk from, for example, civil unrest, war, earthquakes or extreme weather conditions (hurricanes etc.).
- 2.6.3 The Proposed Development lies within Flood Zone 1 and is therefore suitably elevated above all surrounding watercourses and at an elevation above the extreme 1 in 1,000-year flood level that flooding does not present a significant risk to the development.
- 2.6.4 The Proposed Development is for a type of development and technology that has been successfully deployed around Europe for many decades and in over 500 instances without, to the Applicant's knowledge, any major accidents and / or disasters. The most notable incidents being accidental fire damage. Thus, the technology is proven and well understood.
- 2.6.5 In terms of human health (considered in Chapter 8.0 of this ES), the UK Government and specifically Public Health England (formerly the Health Protection Agency) - who has been undertaking an ongoing major Government funded study since 2012 into the potential health effects of emissions from waste combustion - has repeatedly reported that they have found no consistent or conclusive linkage between energy-from-waste plants and adverse human health. Accordingly, Government policy continues to support the development of energy-from-waste

facilities. A study entitled ‘Foetal growth, stillbirth, infant mortality and other birth outcomes near UK municipal waste incinerators; retrospective population based cohort and case-control study’ (November 2018), is believed to be the largest study to date and is based on evidence from waste incinerators from 2003 – 2010. The study identifies that there is no evidence for increased risk of any of the studied birth outcomes in relation to either waste incinerator emissions or living near a facility operating to the current EU emissions regulations.³ Accordingly, Government policy continues to support the development of energy-from-waste facilities. Most recently a study by Imperial College London also found no link between exposure to emissions from municipal waste incinerators and infant deaths or reduced foetal growth.⁴

2.6.6 It should also be noted that a series of regulatory consents would be required to build and operate the Proposed Development, perhaps the most significant of which is an Environmental Permit. The legislation that governs the Environmental Permitting regime is in place to protect human health and the environment. In order to obtain an Environmental Permit, sufficient information must be provided to the Environment Agency to satisfy them that the facility can be operated within the regulatory requirements established by UK and European legislation. It also requires a Fire Prevention Plan. Once the Environmental Permit has been issued, the facility would be required to operate within the limits and conditions set out in the Permit. Failure to do so may result in the facility being closed and could lead to prosecution of the operator.

2.6.7 Based upon the foregoing, it is concluded that the Proposed Development would not give rise to significant adverse effects on the environment deriving from the vulnerability of the development to risks of major accidents and / or disasters. Nevertheless, Chapters 8.0 and 9.0 provide detailed assessment of the risks associated with the project from a human health and flood risk perspective. Accordingly, the specific topic of the risks arising from major accidents and / or disasters is not considered further within this ES and is deemed to have been properly considered in terms of compliance with the EIA Regulations 2017.

³ <https://www.sciencedirect.com/science/article/pii/S0160412018316398>

⁴ <https://www.imperial.ac.uk/news/191653/major-study-finds-conclusive-links-health/>

CHAPTER 3.0 ALTERNATIVES

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APPENDICES (bound separately in Volume 3)

Appendix 3-1	Design Statement
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3.0 ALTERNATIVES

3.1 Introduction

3.1.1 Schedule 4 of the EIA Regulations 2017 identifies the information for inclusion in an ES, of which paragraph 2 requires: *“A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.”*

3.1.2 It should be noted that the Regulations place no specific obligation on a developer to study alternatives, but simply to describe them in the manner specified, where they have been considered.

3.1.3 In the case of the Proposed Development, and specifically the work undertaken leading up to the application, a number of alternatives have been considered by NREL. The subsequent sections provide a summary of each of the alternatives considered under the following headings:

- Alternative Technology Solutions.
- Alternative Direct Combustion Technologies.
- Alternative Design Solutions.

3.1.4 It should be noted that given fact that the Proposed Development is an amendment to earlier consents (i.e. that approved under the 2015 and 2019 permissions), the Applicant has not given any regard to alternative sites.

3.2 Alternative Technology Solutions

3.2.1 NRE has considered a number of potential alternative technology options in relation to waste recovery, the principal technology types being:

- Advanced Thermal Treatment (i.e. pyrolysis and gasification); and
- Direct Combustion.

Advanced Thermal Treatment (ATT)

- 3.2.2 The site benefits from an extant planning permission for an Advanced Thermal Treatment (ATT) based design solution (application ref: 18/09473/WCM), which was granted by WC on 17th June 2019 and is hereafter referred to as the ‘2019 Permission’. That permission was a revision of the design and layout of an earlier consent (application reference 14/12003/WCM) granted 23rd Sept 2015 and referred to as the 2015 Permission.
- 3.2.3 At the time of the 2015 Permission ATT technologies were eligible for UK Government subsidy support through both the Renewables Obligation (RO) and Contract for Difference (CfD) mechanisms, which were considered essential to meet the economic conditions required for a viable project at the site. The facility proposed under the 2015 Permission was successful in securing a contract in the CfD Allocation Round 2 (AR 2) in September 2017.
- 3.2.4 NREL is in discussions with the Low Carbon Contracts Company who are party to the CFD contract with NREL. The combustion technology which is the subject of the this application is not eligible for support from the CFD contract and therefore and is likely that it will be abandoned by NREL, but the formal process for doing that has not been agreed with the LCCC. NREL do not consider it likely that similar or improved levels of alternative subsidy support will be available.
- 3.2.5 Following analysis and feedback from the funding market, NREL considers that the reductions in available subsidy support for energy generation from waste and refuse derived fuels will require the economies of scale from increased throughput capacity to achieve the economic conditions for a viable project at the site.
- 3.2.6 In relation to ATT, the investment decision, influenced largely by BREXIT, shifted away from gasification technologies with less stable supply chains which could no longer offer competitive solutions or guarantee build times required for this £200m investment. The supply chains for a tried and tested conventional moving grate combustion technology are more established, and better able to offer competitive solutions whilst guaranteeing build times in a post-BREXIT UK. Therefore, it was not just technology type, but the deliverability that influenced the investment decision.

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- 3.2.7 This viability hurdle associated with scaled up ATT plants and the consequent limitation to the EPC contracting market, mean there are currently significant issues with securing funding for large scale gasification projects. Due to the combination of delivery and contracting / technical risks associated with the required technology scale up, reductions in available subsidy support and the associated issues with securing funding, NREL decided that ATT was unlikely to result in the delivery of a viable project and thus the use of an ATT technology has been discounted.
- 3.2.8 The investment decision, influenced largely by BREXIT, has shifted away from gasification technologies. The supply chains for a tried and tested conventional moving grate combustion technology are more established, and better able to offer competitive solutions whilst guaranteeing build times. Therefore, it was not just technology type, but the deliverability that influenced the investment decision in this application seeking to change the type of technology.

Direct Combustion

- 3.2.9 Direct waste combustion in a modern thermal treatment EfW facility is a proven technology capable of delivering a flexible and sustainable waste management solution. EfW is used throughout the UK and Europe for the management of municipal / household waste, similar commercial and industrial wastes, and residual waste from such waste streams. The technology is, by a very significant margin, the most widely deployed waste recovery solution in Europe (with over 500 operating plants). An EfW facility would be capable of managing the requisite residual waste volume and would effectively treat the composition of the waste predicted to be managed at the facility. Given, the technology is well proven it is also significantly less complex to fund. On this basis, the use of a modern EfW facility was considered to be the most appropriate waste recovery technology option currently available.

Alternative Direct Combustion Technologies

- 3.2.10 Direct waste combustion EfW facilities can be delivered through a variety of sub-technologies. NREL has considered these technologies and a synopsis of this assessment is set out below.

Fixed Hearth

- 3.2.11 This type of furnace is generally not considered to be suitable for the management of large volumes of residual waste and is best suited to low volumes of a more consistent waste. Therefore, they have not been used for the combustion of residual waste in the UK.

Pulsed Hearth

- 3.2.12 Pulsed hearth technology has been used for municipal waste in the past, as well as other solid wastes. However, there have been difficulties in achieving reliable and effective burnout of waste and it is considered that the burnout criteria required by the Industrial Emissions Directive (IED) would be difficult to achieve.

Rotary Kiln

- 3.2.13 Rotary Kilns have achieved good results with clinical waste, but they are not commonly used in the UK for municipal / household waste, similar commercial and industrial wastes, and residual waste from such waste streams. There is a rotary kiln in use for municipal waste at Grimsby, which has a design throughput of 56,000 tpa. In general, this technology is suitable only in the throughput range of 40,000 to 80,000 tpa and thus would not be appropriate for the Proposed Development. The energy conversion efficiency of a rotary kiln is lower than that of a moving grate (see below) due to the large areas of a refractory lined combustion chamber.

Fluidised Bed

- 3.2.14 Fluidised bed technology has been used for municipal / household waste and similar commercial and industrial wastes at a very few sites in Europe. In the UK, there are only two operating facilities which are located in Dundee and at Allington in Kent. The former has a long history of significant operational difficulties and is going to be rebuilt using grate technology.
- 3.2.15 Fluidised bed technology has several advantages over moving grate technology, including lower nitrogen oxide (NO_x) formation, slightly higher thermal efficiency and the lack of moving parts within the combustion chamber. However, there are also several disadvantages:

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- the waste stream needs to be homogenised and therefore would need to be pre-treated before feeding to the fluidised bed. This would lead to additional energy consumption and a larger building. The additional energy consumption tends to outweigh the combustion efficiency advantage;
 - high fluidisation velocities can lead to the carryover of fine particulate material. This can lead to a higher particulate loading in the flue gases, so leading to higher quantities of flue gas treatment residues, which need to be disposed of as waste – and in particular as hazardous waste. However, the bottom ash tends to be of finer quality;
 - when the fuel preparation is included, the operational and capital costs of a fluidised bed can be higher than the equivalent costs for a moving grate incinerator; and
 - reliability in UK fluidised bed plants has been lower than for other EfW options in a number of circumstances.

Moving Grate

- 3.2.16 This is the leading technology in the UK and Europe for the combustion of municipal and other similar wastes (including residual waste), being installed on circa 90% of UK incinerators and some 98% of European incinerators. It is a proven and developed design, with several suppliers available. The various designs are proven to achieve the burnout requirements for IED compliance. For these reasons NREL selected this particular EfW technology.

Single Line vs Twin Line

- 3.2.17 Having decided to progress with a moving grate EfW solution, NREL reviewed the option of developing a single line solution or a twin line solution. A single line solution involves constructing a single moving grate furnace, boiler and FGT facility that would handle the entire waste stream. A twin line solution would involve the construction of two moving grate furnaces, two boilers and two FGT facilities which would run in parallel, each dealing with half the overall residual waste volume. A twin line solution would still only require a single turbine.
- 3.2.18 There are multiple examples of both single and twin line plants throughout the UK and the rationale for selecting different options depends on the project specific

delivery requirements including: overall capacity requirement; the solutions offered by technology contractors; site size and constraints, requirements for building in operational redundancy and cost. Most notable is that the largest single line technology available is circa 350,000 tpa capacity (possibly a little larger dependent on the waste characteristics).

3.2.19 The current iteration of the Northacre Facility is for a plant with typical operating capacity of circa 160,000 tpa. In order to maintain a generating capacity, to address changing energy content in residual waste as a result of an increased focus on removing certain items from residual waste and due to the economies of scale offered by combustion grate technology, an increase in capacity has been designed into the proposals now being assessed.

3.2.20 The constraints of the site also were considered in reviewing technology alternatives. Maintaining the footprint of the development and the mass of the buildings within the parameters that were acceptable when the 2019 Permission was granted led to the single line facility choice.

3.2.21 In summary, a single line, moving grate solution was selected due to the following environmental reason:

- A moving grate solution represents the leading technology for the combustion of residual waste. This technology is the most reliable and can treat significant volumes of waste more efficiently than other solutions. Moving grate technology also provides environmental certainty in relation to emissions.

3.3 Alternative Design Solutions

3.3.1 The project architect, GSDA, worked through a variety of design solutions, prior to the currently Proposed Development being fixed. This design evolution encompassed:

- Overall facility layout;
- Shape and form of the main building;
- Maximising the most efficient use of land; and
- Proximity of receptors and overall appearance of the facility in the Site's context.

3.3.2 The alternative design solutions and rationale for selecting the current design are set out in the Design Statement contained at Appendix 3-1.

3.3.3 There are a number of key similarities between the amended design of the Northacre Facility and that of the 2019 Permission. These include:

- The planning application Site remains essentially the same but has been extended south in areas to cover the conveyor feed and ramp access from the MBT site;
- The overall disposition of the main building on the Site remains similar with the Tipping Apron at the western end and the FGT and stack at the eastern end;
- the one-way traffic flow has been maintained within the Site;
- The location for the vehicular entrance and exit into the Site from Stephenson Road remains broadly the same;
- Retaining the existing planted buffer zone along the western boundary;
- The Site's platform level is maintained;
- The stack height will be at 75m the same as the 2019 Permission;
- The '*form follows function*' design approach has been repeated; and
- The principle of using a blend of different but complementary colours to break up the scale of the main building and mitigate its visual impact has been repeated.

3.3.4 Many of the design changes from the 2019 Permission have been generated by process requirements, but others have transpired from the development of the overall design. The key differences between the amended design and that of the 2019 Permission include:

- The Air-Cooled Condensers (ACC) are now located further west and better acoustically shielded from nearby noise receptors to the east of the Site and comprise 6 no. rather than 4 no. cells;
- The western extent of the main building has been moved east away from the Site's western boundary to reduce its visual impact;
- The massing on the western end of the main building steps down to reduce its scale and visual impact when viewed from the west;
- The highest part of the main building (the Boiler Hall) would be 4.2m higher than the corresponding part of the building in the 2019 Permission;

-
- The IBA storage and loading operations will now be contained within a building rather than being external;
 - The administration and workshop components now form an integral part of the main building rather than being detached;
 - The FGT bag filters are now enclosed within a standalone building;
 - The car park has been relocated to segregate cars as far as possible from HGV vehicles; and
 - In addition to the vehicle access and exit points between the sites there is also a high level inclined conveyor which would connect the MBT direct to the Bunker in the main building of the Northacre Facility.

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5.0 LANDSCAPE AND VISUAL EFFECTS

5.1 Introduction

5.1.1 This Landscape and Visual Impact Assessment (LVIA) follows best practice guidance set out in *Guidelines for Landscape and Visual Impact Assessment*¹, hereafter referred to as the GLVIA.

5.1.2 Landscape and visual effects are separate, although closely related and interlinked issues.

5.1.3 Landscape effects are caused by physical changes to the landscape, which may result in changes to the distinctive character of that landscape and how it is perceived.

5.1.4 Visual effects are changes to what can be seen by people as a result of what is proposed. A visual assessment assesses the change in visual amenity undergone by people (either individually or in groups) that would arise from any change in the nature of views experienced.

5.1.5 In accordance with the guidance set out in the GLVIA, the LVIA adopts an approach proportionate to the likely significant effects of the Proposed Development. The conclusions of the LVIA have been determined via use of professional judgement, set within a structured assessment framework, and supported by reasoned justification.

5.1.6 The LVIA aims to establish the following:

- A clear understanding of the Site and its context, in respect of the physical and perceived landscape and in respect of views and visual amenity;
- An understanding of the Proposed Development in terms of how this would relate to the existing landscape and views;
- An identification of the likely significant effects of the Proposed Development upon the landscape and upon views, throughout the life-cycle of the Proposed Development;

¹ *Landscape Institute and Institute for Environmental Management and Assessment, 3rd edition 2013. Guidelines for Landscape and Visual Impact Assessment. Abingdon: Routledge.*

-
- Potential for mitigation to reduce / eliminate any potential adverse effect on the landscape or views arising as a result of the Proposed Development; and
 - A conclusion as to the residual likely significant landscape and visual effects of the Proposed Development.

5.1.7 The process follows a standard approach, namely:

- The establishment of the baseline conditions, against which the effects of the Proposed Development will be assessed;
- The determination of the nature of the receptor likely to be affected, i.e. its sensitivity;
- The prediction of the nature of the effect likely to occur, i.e. the magnitude of change; and
- An assessment of whether a likely significant landscape and visual effect would be experienced by any receptor, by considering the predicted magnitude of change together with the sensitivity of the receptor, taking into account any proposed mitigation measures.

5.1.8 Further details regarding the specific methodologies of assessment and determination of significance are included in Appendix 5-1. The LVIA has been informed by both desk and field-based studies.

5.1.9 It should be noted that the landscape (including the context in which views are experienced) is dynamic, i.e. it is affected by social, economic, technological and climatic changes, all of which can influence patterns of land use, land cover and land management. As such, the baseline context for the LVIA is not static.

5.1.10 An assessment of effects upon the setting of cultural heritage assets is included in Chapter 12.0 (Cultural Heritage). The LVIA and Cultural Heritage Assessments, whilst sometimes considering effects upon the same receptors, deal with different environmental effects, using different methodologies.

Proposed Development

5.1.11 The Proposed Development is described in detail in Chapter 4.0. In summary, the Proposed Development would comprise:

- Buildings with a maximum roof height of 40m (the boiler house);

-
- Emissions stack (75m high and 2.5m wide);
 - Associated ancillary developments (including internal access roads, storage tanks, transformers, substation, parking, drainage and lighting etc); and
 - Landscape treatments.

5.1.12 The Site benefits from planning permission granted in 2015 for a smaller facility (ref. (ref: 14/12003/WCM) and 2019 for a scale similar facility (ref. 18/09473/WCM). The more recently consented scheme (hereafter referred to as the 2019 Permission) would include a main building of different dimensions to the Proposed Development. The 2019 Permission and the Proposed Development are compared on Figures 4.1-4.5. The proposed stack would be the same height as the consented stack (75m), but would have a lesser diameter (2.5m proposed, compared with 4.5m consented). The maximum building height would be 3.2m higher than the 2019 permission.

5.1.13 The information submitted as part of the planning application for the 2019 Permission included an LVIA (2019 LVIA). Work undertaken in relation to the 2019 LVIA has informed the current assessment.

5.1.14 The landscape proposals that would form part of the Proposed Development are illustrated indicatively on Figure 5.8. The proposals are similar to those associated with the 2019 Permission and would include new screen planting along the Stephenson Road frontage (north-east boundary of the Site) and along a mound at the south-western boundary, along with areas of native shrub planting, groundcover, and species rich grassland. It is envisaged that a detailed landscape scheme would be agreed with Wiltshire Council by planning condition, should consent be granted. In addition, a separate planning consent was secured in 2019 for a screen mound and woodland planting to the southwest of the Site (ref: 18/09550/FUL). This would provide additional screening for properties off Brook Lane and further opportunities for biodiversity gains.

Competence

5.1.15 The LVIA was undertaken by two Chartered Members of the Landscape Institute (CMLI) with over twenty-five and thirteen years' post qualification experience in the landscape and visual assessment of major infrastructure projects respectively. The LVIA is informed by the previous assessment for the 2019 Permission which was

undertaken by a third CMLI landscape architect in conjunction with the senior landscape architect that has prepared this assessment.

5.2 Methodology and Scope of Assessment

Legislation and Guidance

5.2.1 Details of the planning and policy background for the proposal, including an appraisal of effects on relevant landscape-related policies, as set out in the adopted Statutory Development Plan, are included in the Planning Supporting Statement. Key legislation and policies relevant to the LVIA are summarised below.

European Landscape Convention

5.2.2 The UK Government is a signatory of the European Landscape Convention (ELC), which became binding in March 2007. The Convention is aimed at the protection, management and planning of all landscapes and raising awareness of the value of a living landscape. It relates chiefly to public bodies and to the policies, plans and programmes produced by these.

5.2.3 The LVIA is a development specific process which accords with Article 6C of the ELC. The LVIA is informed by extant Landscape Character Assessment studies (described in Section 5.4 below), which more directly relate to the provisions of Article 6C.

Planning Policy

5.2.4 For details of relevant landscape planning policies, refer to the Planning Supporting Statement.

Assessment Methodology

5.2.5 As noted in Section 5.1, this LVIA has followed a methodology which has been developed using the published good practice guidelines set out in the GLVIA. The detailed methodology followed in undertaking the LVIA is set out in Appendix 5-1 and is based on the methodology used for the 2019 Permission.

5.2.6 The LVIA also follows the Landscape Institute's recently published guidance regarding the production of visualisations². The methodology followed in the production of visualisation material (photomontages, photographs and Zones of theoretical Visibility (ZTV) is set out in Appendix 5-2.

The Study Area

5.2.7 The Study Area for the LVIA is the same as that used for the 2019 LVIA, i.e. a radius of 5km around the Proposed Development. This extent is considered sufficient to capture the key topographical and screening features for a project of this type and scale, in this landscape setting. It should be noted that it is still possible that some elements of the proposed development (particularly the stack) may be discernible beyond this distance in certain weather conditions or during the winter months (e.g. when the screening effect of intervening vegetation is less pronounced). However, this visibility would be short-term and/or very fragmented as illustrated by the ZTVs (refer to Figures 5.4a-d & 5.5a-d). As such beyond the 5km study area significant landscape and visual effects are considered unlikely.

Assessment of Significance / Assessment Criteria

5.2.8 Not all landscape and visual effects arising as a result of a particular proposal will be significant. Furthermore, where likely significant environmental effects are predicted, this does not automatically mean that such effects are unacceptable. The acceptability of landscape and visual effects is a matter to be weighed in the planning balance alongside other factors. What is important is that the likely environmental effects of any proposal are transparently assessed and described in order that the relevant determining authority can bring a balanced and well-informed judgement to bear as part of the decision-making process.

5.2.9 The judgement in relation to this LVIA is that a greater than a 'moderate' level of effect is more likely to be significant. This is because such an effect would generally result from larger magnitudes of change on higher sensitivity receptors. This does not preclude a 'moderate' effect or lower being significant, or a greater than 'moderate' effect not being significant. The professional judgement made will depend

² Landscape Institute, 2019. Visual Representation of Development Proposals. Technical Guidance Note 06/19

on the specific circumstances being considered. Refer to Appendix 5-1 for further details.

Scope of Assessment

- 5.2.10 The current LVIA has been undertaken based upon the same scope included in the previous 2019 LVIA.

Limitations

- 5.2.11 Assessment work reflects the level of vegetation cover present at the time of the field visit to the Study Area to take viewpoint photography (April 2020), and is also informed by previous field visits undertaken in 2018 for the 2019 Permission and potential public inquiry for an earlier refused scheme (ref: 18/03816/WCM). Where relevant to its conclusions, the LVIA makes assumptions as to the likely visibility of the Proposed Development at other times of year.

5.3 Baseline

Data Collection

- 5.3.1 Baseline data for the LVIA has been gathered by both desk and field based surveys. These have included review of extant landscape character assessment studies (see below), the 2019 LVIA and field visits to gain an understanding of the landscape and visual context of the Site.

The Site and its Surroundings

Context

- 5.3.2 The general context of the Site is illustrated on Figure 5.1 which has been updated from the 2019 LVIA in respect of the Westbury Bypass refusal and the Settlement Framework Boundary.
- 5.3.3 The Site is located in the Northacre Trading Estate, adjacent to the Brook Lane Trading Estate and the larger West Wilts Trading Estate. Together these form a

significant urban extension to the north-west of Westbury town centre, comprising various utilitarian buildings and other structures. Access to the various plots is via Stephenson Road and Brook Lane. To the south of these industrial areas is the Westbury Rail Freight Facility.

- 5.3.4 The Site sits on the western slope of a slight ridge that runs north eastwards towards The Ham and falls away to the west, towards the West Wilts Trading Estate and the valley of the Biss Brook. The Site itself is a currently vacant plot which has been subject to varying degrees of disturbance. It largely consists of vegetated spoil mounds and a small area of hardstanding, along with an area divided off by a steel palisade fence. Vehicular access is from the north, off Stephenson Road. A hedgerow runs along the south-western boundary. The elevation of the Site falls slightly from east to west.
- 5.3.5 To the north of the Site is the prominent Westbury Dairy facility, currently operated by ARLA Foods. This is a large scale facility forming a prominent landmark within views from the surrounding area due to its scale, form and colour. It has an estimated maximum roof height of c.33.5m and approximate stack heights of c. 38.5m.
- 5.3.6 A vacant plot is located to the north-east of the Site (on the other side of Stephenson Road). The land to the south-west, whilst allocated for employment in the local plan is currently in agricultural use.
- 5.3.7 To the south-east of the Site is a Mechanical Biological Treatment (MBT) facility operated by Hills Waste Solutions, which is a large structure with a strong horizontal form. Adjacent land also has an extant planning consent for an associated Waste Transfer Station (WTS) and administrative offices. The combined facility is referred to as the Northacre Resource Recovery Centre (NRRC), and also includes a HGV depot.
- 5.3.8 The closest residential properties to the Site are Crosslands and Brookfields on Brook Lane (approximately 60m to the east of the site boundary). In addition, two properties at Brook Farm and Orchard House are located approximately 175m to the south-west. A residential area known as The Ham is located approximately 275m to the north-east at the closest. The nearest properties within The Ham are located on Storridge Road.

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- 5.3.9 In the vicinity of the Site, the influence of existing industrial development is strong. Structures at Westbury Dairy (c. 38.5m), Welton Bibby & Baron (north of the Site c.32m) and Faccenda (at the north-western edge of the West Wilts Trading Estate c.31m) are well-established large scale built features within the wider industrial areas. Other functional development, including scrapyards and vehicle repair/storage yards are also present. A floodlit freight rail depot is located to the south of Brook Lane Trading Estate. Other lighting is also present at many of the industrial facilities.
- 5.3.10 There is very little significant vegetation within the surrounding industrial / trading estates although there is a line of semi-mature trees along the Stephenson Road boundary of the Westbury Dairy facility. There are some significant belts of vegetation beyond the railway south of the Site. The stream immediately to the west of the Site, Biss Brook is lined with willows
- 5.3.11 The town of Westbury is situated on the northern edge of Salisbury Plain. Much of the town comprises of post 1920's residential development that has expanded outwards from its market town core. The main urban core is relatively compact except on the south western side where ribbon development coalesces with Westbury Leigh and the elongated settlement of Dilton Marsh. The industrial areas described above form a significant protrusion into open countryside to the north-west of the settlement, and are separated from the town by the London to West Country railway line, associated sidings, and two large lakes. Some of the adjacent intervening land has been allocated for residential development in the core strategy.
- 5.3.12 In the wider context, there is a distinctive landform south and south-west of Westbury, with the edge of the chalk escarpment of Salisbury Plain rising sharply from the clay lowland. Residential development has taken place on some of this higher ground, such as at Westbury Leigh, with the result that many properties have open views across the town and the industrial areas around the Site.
- 5.3.13 To the south-west of Westbury, the prevailing greensand geology provides a softer landform, with a varied ridge profile south of Dilton Marsh extending south-west towards Chapmanslade. The village of Upton Scudamore is located on a spur of higher ground on the north-western fringes of the chalk upland and properties on its northern edge have views towards the Site.

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- 5.3.14 North of Westbury there is a gently undulating landform with minor ridges and hollows ranging between 50m and 80m AOD. A more prominent ridge lies to the west at Rudge.
- 5.3.15 The whole area is drained by small brooks and streams that flow generally north-west towards the River Avon north of Trowbridge.
- 5.3.16 There is a significant contrast in vegetation cover between the relatively open chalk downland and the adjoining clay vale below which is typified by a pattern of hedgerows that contain a good number of mature trees and occasional larger blocks of mature woodland which interrupt views and create a sense of enclosure in some areas.

Landscape Designations

- 5.3.17 There are no statutory landscape designations located within the Study Area. The nearest such designation is the Cranborne Chase and West Wiltshire Downs Area of Outstanding Natural Beauty (AONB) approximately 6.5km to the south of the Site at its closest point.

Landscape Character Assessment and Other Studies

National

- 5.3.18 159 National Character Areas (NCA) have been identified across England by the former Countryside Commission (now Natural England). Their broad geographic reach means that the key characteristics identified as typical of a particular character area may not necessarily apply to a specific location within that character area. The Site is located within NCA117 Avon Vales³ (refer to Figure 5.2 for boundary).

³ Natural England. 2013. *National Character Area profile: 117 Avon Vales*. Available at <https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles#ncas-in-south-west-england> [accessed 01 Jul 2020]

5.3.19 Relevant key characteristics of NCA117 include:

- An undulating clay vale with a mix of arable and pasture;
- Small- and medium-sized fields with mostly hedgerow boundaries with few hedgerow trees, varying in shape from irregular piecemeal enclosure to rectilinear planned enclosure;
- Numerous low ridges with local views over towns and villages;
- Wide views across whole area from higher areas of surrounding chalk downs.

County

5.3.20 The *Wiltshire Landscape Character Assessment*⁴ identifies a series of different landscape types and landscape character areas within Wiltshire. The Site is located within landscape type 11: Rolling Clay Lowland, and within landscape character area 11C: Trowbridge Rolling Clay Lowland (refer to Figure 5.2 for location).

5.3.21 Key characteristics of landscape type 11 include:

- Gently rolling lowland based on Clay;
- Mixed arable and pastoral land use with pasture concentrated around the water courses;
- Variable field pattern with network of full hedgerows and mature hedgerow trees;
- Presence of streams marked by lines of willows and crossed by modest bridges;
- Woodland blocks including some ancient woodland and wet woodland of high ecological value plus scattered mature trees;
- Small number of meadows of neutral and unimproved grassland;
- Scattered settlement of towns, small villages and farmsteads, many using vernacular materials of brick, half-timber, stone, tiles and thatch;
- Roads largely minor and rural with a few trunk roads and sections of motorway;
- Views vary from semi-enclosed by intact hedgerows, riparian vegetation and woodland blocks to more open with views to the rising scarps of the chalk uplands;
- A largely peaceful, rural landscape.

5.3.22 The descriptive text for landscape character area 11C notes that towards the west (i.e. the area where the Site is located), that there are large scale industrial buildings,

⁴ *Land Use Consultants, 2005. Wiltshire Landscape Character Assessment. Wiltshire County Council.*

and that this part of the character area is considerably less rural and tranquil than the eastern part.

5.3.23 Inherent landscape sensitivities for landscape type 11 include the views to the adjacent downland scarps. Broad management objectives include to screen views to intrusive urban edges.

District

5.3.24 The *West Wiltshire District Landscape Assessment*⁵ provides a finer grain characterisation of the landscape. This document identifies that the Site is located within landscape type E: Rolling Clay Lowland, and within landscape character area E8: Heywood Rolling Clay Lowland (refer to Figure 5.2 for location). Key characteristics of landscape character area E8 include:

- Gently rolling topography of the area slopes gradually downwards, moving southwards towards Westbury;
- Human influence strongly visible in the form of West Wiltshire Trading Estate and junction of two main railway corridors;
- Rural character disturbed by noise and visual intrusion associated with the railway corridors, roads and West Wiltshire Trading Estate;
- Combination of small, medium and large, farmed fields surround the trading estate, the boundaries of which are delineated by hedgerows in varying condition;
- A series of interconnecting minor roads cross the area;
- Generally, a low level of tranquillity throughout the area due to the main roads, the railway corridor and Trading Estate.

5.3.25 The accompanying descriptive text identifies the potential for further visual intrusion from development at the West Wilts Trading Estate and that landscape enhancements should be sought from such development.

5.3.26 Since the document was published in 2007, there has been further infilling/development at the West Wilts Trading Estate, and further similar development has taken place at Hawke Ridge Business Park. The western extent of landscape

⁵ *Chris Blandford Associates, 2007. West Wiltshire District Landscape Character Assessment. West Wiltshire District Council.*

character area E8 is now largely developed and forms an extensive urban/ industrial extension to Westbury. This is illustrated on Figure 5.1 & 5.2

5.3.27 The open countryside immediately to the west of the site is located in landscape character area E3, North Bradley Rolling Clay Lowland, the key characteristics of which include:

- Gently rolling farmland based on clay, with extensive views, including views of the chalk downland in the east and south;
- Distinct pattern of small to medium sized fields enclosed by mainly intact hedgerows with mature trees;
- Predominantly pasture with a few scattered ancient woodland blocks;
- Settlements consist of several villages and farmsteads linked by a dense network of mainly secondary roads and footpaths;
- Pylons as a dominant vertical element.

5.3.28 Views towards the West Wilts Trading Estate are identified in the descriptive text for landscape character E3 as a slight detractor from rural character, and further development at the edges of Trowbridge and Westbury is highlighted as being potentially visually intrusive.

Visual Baseline

ZTV

5.3.29 Zone of Theoretical Visibility (ZTV) mapping has been used to identify the extent of the possible visibility of the Proposed Development. The ZTVs reflect the theoretical visibility of both the 2019 Permission and the Proposed Development, based upon the following heights:

- Consented and proposed stacks (both 75m above the development platform);
- Consented boiler house roof (36.8m above the development platform);
- Proposed boiler house roof (40m above the development platform).

5.3.30 Firstly, ZTVs have been produced based upon Ordnance Survey Terrain 50 Digital Terrain Model (DTM) data, which does not take account of the presence of screening features in the landscape, such as buildings and vegetation. These ZTVs are presented on Figures 5.4a-b for the Proposed Development and Figures 5.5a-b for

the 2019 Permission and 2020 application comparison. These bare earth ZTVs illustrate a worst-case scenario of visibility, which overestimates the actual real-world visibility of the Proposed Development.

5.3.31 Additional ZTVs have been produced, using a commercial 2m Photogrammetric Digital Surface Model (DSM) available from Bluesky International. This is derived from aerial photography and does take account of surface features that would screen views of the Proposed Development. This gives a far more realistic picture of the actual extent of the visibility of the Proposed Development in the field. The DSM ZTV treats vegetation as a solid feature, when in reality filtered views can sometimes be available through leaves and branches, particularly in winter months. These ZTVs are presented on Figures 5.4c-d for the Proposed Development and Figures 5.5c-d for the 2019 Permission and 2020 application comparison.

5.3.32 The field work undertaken as part of the LVIA confirmed that the DSM ZTVs provide a more representative interpretation of the theoretical visibility than the DTM ZTV.

5.3.33 Appendix 5-2 provides details of the methodology followed in producing the ZTVs.

Viewpoints

5.3.34 The LVIA includes a detailed assessment of visual effects from fifteen viewpoints. The location of the viewpoints is shown on Figure 5.3. The viewpoints are broadly the same as those included in the 2019 LVIA, so that a comparison between the effects of the Proposed Development and the 2019 Permission can be made. The location of one viewpoint (Viewpoint E) has been amended slightly to reflect a clearer view towards the Site and all photography has been updated.

5.3.35 Viewpoints can fall into three categories, as set out in the GLVIA:

- Representative viewpoints (which represent the experience of different types of receptors in the vicinity);
- Specific viewpoints (a particular view, for example a well-known beauty spot);
- Illustrative viewpoints (which illustrate a particular effect / issue, which may include limited / lack of visibility).

5.3.36 It should be noted that the viewpoint itself is not the receptor; rather it is the people that would be experiencing the view from the viewpoint. Receptors in the vicinity of the Site that are likely to experience views of the development include:

- Residents in nearby properties;
- Users of public rights of way and other routes / land with public access;
- Road users; and
- Employees in nearby premises.

5.3.37 The viewpoints included in the LVIA are set out in Table 5.1.

Table 5.1: Viewpoint Locations

Viewpoint	British National Grid Co-ordinates	Viewpoint Details
1: Footpath, west of Site	385374, 151932	<i>Representative of views available to walkers</i>
2: Footpath, Round Wood	384283, 152292	<i>Representative of views available to walkers</i>
3: Footpath, west of Rudge	382578, 151966	<i>Representative of views available to walkers</i>
4: Bridleway, near White Horse	389840, 151502	<i>Representative of views from the public rights of way on the scarp east of Westbury, in a location with promoted public access and strong heritage interest (well-known prehistoric landmark)</i>
A: Brokerswood Lane	384654, 153503	<i>Representative of views available to road users</i>
B: Footpath adj, to W Wilts Trading Est	385045, 152806	<i>Representative of views available to walkers</i>
C: Stephenson Road	385537, 152315	<i>Specific view from the northern access to the Northacre Trading Estate</i>
D: Warminster Road Car Park	387204, 151045	<i>Representative of elevated views from central Westbury</i>
E: Footpath east of Westbury	387822, 150660	<i>Representative of views available to walkers</i>
F: Leigh Close	386498, 150011	<i>Representative of views available to local residents</i>
G: Biss Close, Upton Scudamore	386699, 147973	<i>Representative of views available to local residents</i>
H: Footpath, Tower Hill	385442, 149633	<i>Representative of views available to walkers</i>
I: Bridleway, Penleigh Road	385854, 150933	<i>Representative of views available to walkers/ riders</i>
J: St Mary's Lane, Dilton Marsh	384771, 384771	<i>Representative of views available to residents/ walkers/ road users</i>
K: Scotland Lane	381963, 151560	<i>Representative of views available to walkers/ road users</i>

5.3.38 Photography for each viewpoint has been prepared in accordance with current best practice guidance⁶, and a detailed methodology describing how they have been produced is included in Appendix 5-2. In accordance with the approach followed in the 2019 LVIA, photomontages have been produced from Viewpoints 1-4 only (refer to Figures 5.6a-d), with annotated photography provided for Viewpoints A-K (refer to Figures 5.7a-k).

Cumulative Baseline

5.3.39 As noted in Table 2.3 in Chapter 2.0, four cumulative schemes have been identified for inclusion in the ES. Of these four schemes, the consented waste management facility at the Northacre Resource Recovery Centre (NRRC) is the closest to the Proposed Development and would be located immediately adjacent to the Site. The scheme would comprise a new waste management facility building with a maximum roof height of 10.6m, and a new office and welfare block. The cumulative effects with this approved development have been considered in the assessment of effects section.

5.3.40 The approved demolition work and new feed mill and silos at Brook Mill would be located over 1km to the north west of the Proposed Development. The works comprise demolition of existing buildings and silos and construction of extensions to the blending bin and feed mill, as well as new silos and ancillary development. This work would increase the overall height of the development by 2-3m and increase the massing of built form on the northern edge of the trading estate. The cumulative effects with this approved development have been considered in the assessment of effects section.

5.3.41 The two remaining schemes identified in Chapter 2.0 relate to housing developments remote from the Site and separated by other intervening development. As such there is little scope for significant cumulative landscape and visual effects to occur, and no further consideration is given to these sites.

⁶ *Landscape Institute, 2019. Visual Representation of Development Proposals. Technical Guidance Note 06/19*

Future Baseline

- 5.3.42 Should the Proposed Development not be consented, the most likely scenario is that the 2019 Permission or a variation would be constructed. It is highly unlikely that the Site would remain vacant given the extant 2019 permission and the Site's allocation for strategic waste facility development. As such, it is highly likely that some form of large scale industrial /waste facility will be constructed on the Site at some point in the future.
- 5.3.43 In addition, it should also be recognised that the land immediately to the west of the Site is allocated for employment use (see figure 5.1). These areas are likely to be developed at some point in the future and this would potentially screen much of the Proposed Development from the footpath (Viewpoint 1) and more rural landscape to the west.

5.4 Assessment of Effects

Incorporated Mitigation

- 5.4.1 A description of the Proposed Development is set out in Chapter 4.0. A series of measures have been incorporated into both the design of the Proposed Development and the drawing up of the construction and operational procedures, which are intended to provide embedded mitigation against potentially adverse landscape and visual effects and other environmental effects. These measures include:
- Careful selection of colours for the different elevations and the stack cladding to break up the visual mass of the built volumes and better integrate them visually with the surrounding landscape/ skyline;
 - Landscape proposals incorporating the following principle objectives:
 - To filter and partially screen views of development from roads and public footpaths in the open countryside to the south-west and north-west of the site;
 - Use of predominately native species that occur locally on all boundaries except in a few strategic locations where evergreen species or faster growing trees of conical habit will provide more effective screening;

-
- Tree and shrub planting on south-western boundary in order to contain light spillage from the development and thus not deter bat foraging along the existing boundary hedgerow;
 - Adoption of more ornamental treatment on outer edge of Stephenson Road frontage (and at site entrance) in order to complement existing landscape treatment on eastern boundary of Westbury Dairies;
 - The establishment of wildflower areas to provide a nectar source for bees and other invertebrates
 - Introduction of new screening features on the south-western boundary, in accordance with objectives set out in the district landscape character assessment;
 - The development of an external lighting system in accordance with best practice measures, which would minimise the generation of obtrusive light/ light spillage, and
 - The implementation of a project-specific Construction Environmental Management Plan (CEMP), which would govern construction activities, and would include measures to protect retained vegetation and control construction lighting.

5.4.2 The landscape and visual effects of the Proposed Development (as assessed below) thus relate to a project that has benefited from mitigation by design.

Construction Phase

Overview

5.4.3 Construction would be managed in accordance with a CEMP, setting out how environmental issues would be managed in compliance with any particular limitations imposed by the planning permission, as well as in compliance with relevant legislation, regulations and best practice guidance. This is explained in more detail in Chapter 4.0.

5.4.4 Items to be addressed by the CEMP that pertain to landscape and visual effects are likely to include:

- Measures for the ensuring the successful retention of existing vegetation (for example, use of protective fencing);

-
- Formation of mounding and attenuation ponds in respect of soil handling, and
 - Measures taken to limit the effects of temporary construction lighting.

5.4.5 Construction would, by necessity, require the use of specialist vehicles and other plant (notably cranes), some of which would be readily apparent by virtue of their colour, size or movement.

5.4.6 The timing and phasing of the different elements of construction are not known in detail. However, as stated in Chapter 4.0, the assessment assumes the Proposed Development would take approximately thirty-six months. Different activities would take place at different times during this period and, as such, construction effects would vary over time and would not occur on a consistent basis throughout the construction stage, but rather are likely to vary in intensity with specific effects of shorter duration occurring.

5.4.7 For example, based on knowledge of other similar developments, it is anticipated that cranes would be present at the Site for approximately half of the total construction period (approximately eighteen months).

5.4.8 Construction activities are anticipated to be limited to between 07.00 and 19.00hrs Monday to Saturday, with no construction work on Sundays or Bank Holidays.

5.4.9 Lighting would be required to ensure the health, safety and welfare of those on Site during poor light conditions, and in particular at the beginning and end of the working day in winter. This may require both fixed lighting columns and mobile task lighting. In some instances, lighting may be required for work on elevated structures, including crane mounted lighting. Some use of low level lighting of compounds for security purposes may be required through the night. Potential for adverse effects upon amenity arising from such lighting would, as stated above, be addressed by the CEMP.

Construction Effects

5.4.10 The main initial construction activities associated with groundworks and foundations would not be particularly evident from the wider surrounding landscape. The main construction elements that would have landscape and visual effects beyond the

immediate environs of the Site would be the cranes used to construct the development. These would only be on site for c. 18 months and as such the temporary landscape and visual impacts of these elements would not be significant and would be consistent with other construction activities elsewhere on the industrial estate, where large building and silo are installed.

- 5.4.11 Night-time construction effects resulting from lighting would be limited and would not be significant. Lighting is already present at the existing developments on the industrial estate and any construction lighting would be seen in this context. Lighting would generally not be present outside of normal working hours, other than low-level security lighting, and the CEMP would include measures to minimise any effects on amenity.

Operational Phase: Landscape Effects

Landscape Fabric

- 5.4.12 As there is no vegetation cover of note within the Site, and that the hedgerow along the south-western boundary would be largely retained and incorporated into the proposed landscape design for the Proposed Development, it is clear that any potential adverse effects upon landscape fabric would be very small in scale, and would not be significant. Detailed assessment is not therefore necessary.

Landscape Character

- 5.4.13 The landscape character of the Trading Estates where the Site is located has a low susceptibility to change given the well-established industrial use and existing large scale buildings in the vicinity. Its value is deemed to be low because of the lack of landscape quality and absence of any recreational value, heritage interest or positive perceptual associations. Therefore, the Trading Estate it is considered to be of **Low Landscape Sensitivity** and is tolerant to significant change of an industrial nature.
- 5.4.14 As stated above, the Site is located within landscape character area E8: Heywood Rolling Clay Lowland. The agricultural land to the west of the Site between the Proposed Development and Biss Brook is allocated for employment use. The western extend of landscape character area E8 is now almost entirely developed /

allocated for development. As such, large areas need to be taken out of the landscape character area to be incorporated into the urban areas. This includes the proposed site. The influence of industry at the edge of Westbury upon the wider landscape is well-established, and the Proposed Development located between two existing industrial facilities on an allocated site would accord with and reinforce this land use. The Proposed Development would be larger than existing structures and there would therefore be an incremental increase in the scale of development locally

5.4.15 Although the Proposed Development would be a large scale permanent addition, the magnitude of change to the character of the Trading Estates and LCA 8 would be **Small** because:

- the Proposed Development would be located on a vacant allocated plot within an existing large scale trading estate and is compatible with adjoining land uses;
- large-scale visually prominent industrial buildings immediately to the north-west, south-east of the Site and elsewhere on the trading estates already strongly influence local character, and the further presence of the Proposed Development would only result in limited change (largely due to the presence of the stack and the scale of the proposed building);
- the proposed landscape treatment would partially screen views of the lower levels of the Proposed Development other areas of the trading estate and nearby footpaths. In addition, landscape treatments along Stephenson Road would be provided that would improve the street scene over time, as illustrated on Figure 5.8.

5.4.16 Consequently, the significance of landscape effects, for the Trading Estates (i.e. areas within the E8 LCA) would be **Slight Adverse**, at most. These impacts on the Trading Estate and LCA E8 would be comparable to those of the 2019 Permission

5.4.17 The open countryside to the west of the Site (LCA E3) is rural in character, but with evidence of alteration and degradation where it meets the urban/industrial fringe. As such it is considered to have a medium susceptibility to change of the type proposed at its boundary with the urban area. Value is also considered to be medium, there are no landscape designations present that would indicate an increased value, and the area provides limited recreational value in the vicinity of the Site. As illustrated by Figure 5.2 the area is part of an extensive lowland farming landscape that is commonly occurring in the wider area. Overall, the landscape has a **Medium**

Landscape Sensitivity and is considered tolerant to some change at its interface with the urban edge of Westbury.

5.4.18 In relation to the countryside that immediately adjoins the Site (landscape character area E3: North Bradley Rolling Clay Lowland), the Proposed Development would be added to the existing assemblage of industrial structures at the edge of Westbury, increasing the overall amount of built development present in views eastwards from the rural area. The magnitude of change in the character of the open countryside to the of the site is deemed to be **Medium** due to a partial alteration of the areas visual context in close proximity to the site and from more elevated locations in the wider landscape (see Viewpoints 2 & A). There would be no fundamental changes to the underlying key characteristics associated with topography, vegetation, enclosure or pattern and it can be seen from the DSM ZTV on Figures 5.4c & d that changes to the visual context of the character area would only occur relatively close to the Site. Visibility from the majority of LCA E3 would be limited and fragmented due to the following factors:

- Screening afforded by the combination topography, woodlands, hedgerows and hedgerow trees;
- The approach taken to the design of the Proposed Development in terms of the arrangement of the different elements of the main building and the colour scheme chosen for the building facades, which would help integrate the facility visually reducing its overall prominence in the landscape;
- The slender nature of the exhaust stack which would be much narrower than that approved under the 2019 Permission;
- A sensitively designed lighting scheme which would minimise the generation of light beyond the Site boundary, and the incorporation of best practice noise reducing measures into the construction and operation of the Proposed Development that would reduce any effects on the tranquillity of the area;
- The landscape proposals associated with the development incorporate a screen mound in the south-western corner of the Site, augmented by predominately native species trees and shrubs along most of the south-western boundary. This would help prevent views of the ‘active’ elements of the Proposed Development such as vehicle movements within the tipping apron and accessing the tipping hall;
- The existing context of established large scale industrial development on the urban edge of Westbury;

-
- The retention of the hedgerow on the south-west boundary means that there will be no associated physical impacts (and hence no alteration of the existing field pattern) on the LCA.
 - Land west of the Site, which is currently in agricultural use, is allocated for employment use in local planning policy documents, indicating the likelihood of future development activity with an associated loss of rural character and development in closer proximity to LCA E3.

5.4.19 The landscape effects on LCA E3 would be **Moderate Adverse** due the intensification of existing industrial uses on its eastern the boundary. These effects would be localised and would not be widespread across the LCA. As such they are not considered significant. This trend of industrial intensification on the edge of the character area is likely to continue due to the allocation of land to the west of the Site for strategic employment uses and ongoing development elsewhere on the Trading Estate.

5.4.20 When contrasted with the consented 2019 Permission, the Proposed Development would be broadly similar in form and scale. However, due to the arrangement of the different elements of the main building, reduced stack diameter and the choice of colours for the building facades, it would appear slightly smaller (despite a greater maximum roof height) and better integrated visually with the wider landscape. This is illustrated by Figure 5.6a for Viewpoint 1. As such there would be small scale beneficial change as a result of the Proposed Development, when contrasted with the consented scheme.

Operational Phase: Visual Effects

5.4.21 The ZTVs presented on Figures 5.5a-d demonstrate that theoretical visibility of the Proposed Development would be very similar to that of the 2019 Permission, with only very localised areas where additional visibility is predicted due to the increased building height or relocation of the stack. Comparison of the bare-earth ZTVs and the DSM ZTVs demonstrate that the presence of buildings and vegetation in the surrounding landscape would have a very marked influence upon the actual extent of visibility.

5.4.22 A detailed assessment of effects upon representative viewpoints is set out in below in Tables 5.2 and 5.3 respectively for the Photomontage Viewpoints and Photograph Viewpoints.

Table 5.2: Photomontage Viewpoints

Viewpoint 1: Footpath, west of Site (Figure 5.6a(i)-(iv))
<p>Existing View</p> <p>The viewpoint location is on a public footpath (DMAR10) approximately 200m to the south-west of the site. The image shows a landscape indicative of its character type, streamside pollarded willows being one of the most characteristic features. Some of the Westbury Dairies structures including two stacks are visible from this location, but views of the Dairy are more prominent when not screened by foreground vegetation elsewhere along this route.</p>
<p>Sensitivity:</p> <p>Due to its lower lying urban fringe context close to allocated and developed employment land, users will be less susceptible to visual change of an industrial nature. The susceptibility of the users of this footpath is considered to be Medium for these reasons.</p> <p>The Value of this particular route is deemed to be Medium (despite filtered views of visual detractors on the industrial estate). This footpath is in an area with lower levels of recreational activity, but contains many elements (such as the pollarded willows) that are typical of the landscape type and these are arranged in a relatively balanced composition.</p> <p>Consequently, these users of this footpath are considered to have a Medium Sensitivity.</p>
<p>Magnitude and Significance:</p> <p>While the Proposed Development is broadly compatible in terms of mass and scale with the adjacent dairy buildings and structures, it does result in a very clear change to the character and composition of this particular view mainly due to the fact that the associated buildings would occupy a large proportion of the overall view, substantially altering the existing views available. Consequently, there would be a deterioration in the quality of the view at this particular angle and location. This location was originally selected in order to represent the maximum degree of visual exposure to the Proposed Development along this section of public footpath (i.e. a worst case scenario) as views towards the Proposed Development either side of the viewpoint location would be filtered and partially screened by the existing streamside vegetation. This very close proximity view is perpendicular to the direction of travel for walkers using this footpath although the nature of their activity often involves absorbing wider contextual views. Taking all the above factors into consideration the degree of magnitude of change is deemed to be Large and this would result in Substantial to Moderate Adverse visual effects that are considered significant.</p>
<p>Comparison with the 2019 Permission:</p> <p>When compared to the 2019 Permission scheme, the Proposed Development would, whilst incorporating a main building with a taller maximum roof height, appear slightly smaller in scale, due to the arrangement of different elements of the building complex. The composition and colour of the new building elements would result in the form appearing less intrusive than the consented development. There would therefore be a small scale beneficial change when contrasted with the consented scheme.</p>

Viewpoint 2: Footpath, Round Wood (Figure 5.6b(i)-(iv))

Existing View

This viewpoint is located approximately 1.4 kilometre to the west of the nearest proposed building, along a public footpath (NBRA32) that skirts the eastern edge of Round Wood. The viewpoint is broadly representative of views from locations to the south of the footpath and the nearby lanes, such as Fairwood Road located to the south-east. However, the DSM ZTV in Figures 5.4c & d illustrates that from lower lying viewpoints to the south and west, views towards the Site would be increasingly fragmented by intervening vegetation. The chalk upland scarp slope is a prominent horizontal component of the view that is punctuated by mature trees in the foreground and stacks associated with the Dairy. A large scale industrial shed (Welton Bibby & Baron building) is clearly visible above the intervening topography and vegetation, as is Westbury Dairy. The Dairy obscures the view of a portion of the scarp slope on which the Westbury White Horse is situated. The majority of the MBT building situated to the south-east of the Site, is visible although its horizontal form and more modest height and colour results in it being considerably less conspicuous than the other two prominent structures referenced above

Sensitivity:

Although it is uncertain how well used this particular footpath is (the susceptibility of its users (which might include residents at the nearby holiday lodges at Brokerswood) is considered to be Medium to High, as they are likely to be engaged on a recreational walk around the local area in which appreciation of the landscape, the White Horse Scheduled Ancient Monument (when not obscured by the Dairy) and the downland scarp slope is a key consideration. This is moderated by the presence of existing industrial features in the existing views.

The value of this particular view is deemed to be Medium to High due to the perceived limited usage offset by the scenic quality associated with views of the scarp slope.

Overall people at this viewpoint are considered to have a **Medium to High Sensitivity**

Magnitude and Significance:

The proposed buildings would just break the chalk downland skyline. However, vegetation on the skyline beyond would still be visible and this minimises the skyline effect of the building. The stack (and the much smaller stack associated with odour control) would clearly break the skyline. As can be seen from the photomontage image, the proposed colour scheme assists in reducing the overall visual mass of the Proposed Development and this would help to integrate the facility visually with its surroundings, breaking up the overall development into similar scale blocks to the adjacent dairy. The proposed buildings are generally compatible in size and scale with the adjacent structures and occupy a relatively small proportion of the total views available from this location. However, due to the obscuring of a section of the scarp slope there would be a perceptible deterioration in the quality of the view associated with the intensification of development and stacks breaking the skyline. The DSM ZTVs indicate that due to the screening effects of intervening trees and hedgerows there would only be intermittent glimpses of the buildings from the section of public footpath to the south of this viewpoint location. Taking all the above factors into consideration the magnitude of change is considered to be **Medium** and this would result in a **Moderate Adverse** visual effect that are not considered significant due to separation distances of c.1.4km, the wide angles of view available that would be unaffected, existing large scale industrial buildings present in the view and limited impacts on views of the scarp slope and associated skyline.

Comparison with the 2019 Permission:

When contrasted with the consented 2019 Permission the overall massing of the Proposed Development would be comparable although the buildings of 2019 Permission would occupy a slightly greater angle of view. Whilst the main building of the Proposed Development would be taller than the 2019 Permission and just break the skyline, this is offset by the reduced impact of the stack and more compact massing of the buildings and closer relationship with the Dairy. As such, the significance of visual effect would be comparable.

Viewpoint 3: Footpath, west of Rudge (Figure 5.6c(i)-(iv))

Existing View

This viewpoint is located on a public footpath approximately 3km from the nearest proposed building, a short distance south-east of Scotland Lane on the ridge above Lower Rudge. The foreground of this view is dominated by post and rail fencing (and to a lesser extent by a telegraph pole and associated overhead wires). The hedgerow trees and shrubs are notable features in the middle ground of the view and break up views of the scarp slope and industrial areas in the distance. The Brook Lane and Northacre Trading Estate buildings occupy a small proportion of the view, although Westbury Dairy is a prominent focal point due to its height and colour. During the summer and autumn these structures are partially screened by vegetation although during the winter months they would be more visible. An electricity pylon in the middle distance breaks the skyline formed by the downland scarp slope. The White Horse can clearly be seen on the visible portion of the chalk upland scarp slope and serves to focus the viewer's attention in that direction

Sensitivity:

The users of this public right of way have a medium to high susceptibility. Whilst views are primarily rural and include the scarp slope and White Horse expectations are moderated by the existing presence of industrial buildings such as the dairy and MBT. As such users of the footpath have a reduced susceptibility to development of an industrial nature in the distance.

The value of this particular view is deemed to be medium to high. The route is likely to be of local value to residents of Rudge rather than having wider recreational value for the quality of the views or as part of a long distance route.

Overall receptors at this viewpoint are considered to have a **Medium to High Sensitivity**.

Magnitude and Significance:

It can be seen from the photomontage that the mass of the Proposed Development would be broken up through the use of contrasting, but complimentary colours. The proposed building blocks would be broadly compatible in terms of size and scale with the adjacent Dairy buildings. The top of the proposed stack would extend slightly above the skyline defined by the downland ridge, but to a lesser degree than the existing pylon. The proposed colour scheme would also assist in integrating these structures into their landscape context. There would be a noticeable deterioration in the quality of a small part the existing view associated with introduction of the stack, and the increased massing of industrial development. The majority of this view (located approximately 3km to the west of the Site) would be unaffected by the addition of the Proposed Development. The primary attention is likely to be focused on the White Horse and the undeveloped skyline, rather than the Trading Estate. Taking all the above factors into consideration the magnitude of change is categorised as **Small to Medium** and the visual effects would be **Slight to Moderate Adverse** due to the localised impact that the stack would have on the skyline.

Comparison with the 2019 Permission:

When contrasted with the consented 2019 Permission the overall massing of the Proposed Development would appear reduced due to the a slightly narrower angle of view occupied by the Proposed Development and the reduced impact of the much narrower stack. As such, the significance of visual effect associated with the Proposed Development would be slightly reduced compared to the 2019 Permission.

Viewpoint 4: Bridleway, near White Horse (Figure 5.6d(i)-(iv))

Existing View

This viewpoint is located more than 4km from the nearest proposed building, on the chalk downland scarp slope adjacent to the Westbury White Horse and Bratton Iron Age Camp. The location affords panoramic views of the rolling clay lowland landscape below. This is due to the complete absence of vegetation on this particular section of the scarp slope. The settlement of Westbury and the existing

industrial /trading estates are clearly visible, as are a number of solar farms to the east of the town. The former Lafarge cement works site is still a prominent brownfield site in the middle distance, a notable element detracting from the overall quality of the view. The most prominent structures in the vicinity of the town are the dairy and other large buildings on the Trading Estate to the north. The location is well signposted and is marked on OS mapping as a panoramic viewpoint. There is a car park close to the viewpoint and the location is a popular visitor destination.

Sensitivity:

Visitors to this viewpoint would have a high susceptibility as appreciation of the panoramic view is a key part of their experience.

The value of this viewpoint is also classified as high due to its popularity and the heritage association with The White Horse (which can be viewed from above at nearby locations). Consequently, visitors to this viewpoint are considered to have a **High Sensitivity**.

Magnitude and Significance:

Although the proposed buildings and associated stack would be clearly visible, they would only occupy an extremely small proportion of the overall panoramic views available. The small part of the view affected is already influenced by existing industrial development at the Dairy, MBT and adjacent industrial sites. In the context of the expansive panoramic view available, the Proposed Development would represent a minor addition. There would be a minor deterioration in the quality of the part of the view that looks towards Westbury, largely because of the contrast in colour between the stack and the woodland beyond and the intensification of industrial development in proximity to the dairy. Taking all the above factors into consideration the overall magnitude of change to the views available would be very **Small** and the resulting level of visual effect would be **Moderate to Slight Adverse**

Comparison with the 2019 Permission:

When contrasted with the consented 2019 Permission the overall massing of the Proposed Development would be appear slightly reduced due to the a slightly narrower angle of view occupied by the main built forms and the reduced impact of the much narrower stack. At distances in excess of 4km the increased maximum building height would be barely perceptible. As such, the significance of visual effect associated with the Proposed Development would be slightly reduced compared to the 2019 Permission due to the narrower stack.

Table 5.3: Photograph Viewpoints

Viewpoint A: Brokerswood Lane (Figure 5.7a)
<p>Existing View</p> <p>This viewpoint is located approximately 1.8km from the nearest proposed structure and looks south-east from the junction of Brokerswood Lane and the access road to Brook Farm. Vehicular traffic would have glimpsed views towards the Site from other places to the south of this location. Whilst the intervening vegetation is a significant component of this view, the existing trading estate buildings at Faccenda (Brook Mill) and Westbury Dairy are prominent and partially obscure the view of the chalk downland beyond. The overhead electricity cables are a prominent component and detract from the view of the chalk downland beyond. Demolition and new construction is proposed at Faccenda (Brook Mill) complex and this will include an in increase the main building height.</p>
<p>Sensitivity:</p> <p>The susceptibility of this viewpoint is considered to be Low to Medium, whilst attention will be focussed on driving the road provides opportunities to take in views of the scarp slope and surrounding countryside.</p> <p>Value is deemed to be Low to Medium as views of the downland scarp slope are degraded by</p>

intervening development that interrupts the ridge.
Receptors at this viewpoint are considered to have a **Low to Medium Sensitivity**.

Magnitude and Significance:

From this location it is likely that much of the Proposed Development would be screened from view by the adjacent Dairy. The proposed stack would be visible and would break the skyline along with other existing features. There would only be a minor change in the composition of the existing view, albeit one which is permanent. Views toward the Proposed Development would be oblique to the direction of travel and this combined with the prominence of the Dairy and the Faccenda structures mean that the magnitude of the change for receptors at this viewpoint would be **Small** at most. Consequently, the resulting degree of visual effect would be **Slight Adverse** due to the intensification of existing industrial uses and the proposed stack breaking the skyline

Comparison with the 2019 Permission:

It is unlikely that there would be any appreciable difference in the influence of the buildings that form part of the Proposed Development and the consented 2019 Permission upon the view, due to the presence of the intervening buildings at the Dairy. The reduced diameter of the proposed stack would reduce visual effects compared to the 2019 Permission.

Viewpoint B: Footpath adj. to W Wilts Trading Estate (Figure 5.7b)

Existing View

This viewpoint is located approximately 980m to the northwest of the nearest proposed structure and is representative of views looking south-east along the public footpath (DMAR10) which skirts the western edge of the West Wilts Trading Estate and follows the course of Biss Brook. The flat relatively open nature of this valley means that there are long views in several directions. Although the chalk scarp of Salisbury Plain is clearly visible in the background. The views available are generally of low quality due to the prominence of the dairy buildings and a variety of disparate elements in the foreground associated with commercial activities.

Sensitivity:

The susceptibility users of the public footpath is considered to be Medium as the visual context and amenity value of the footpath is diminished by the adjacent industrial development and further industrial development would not be out of context.

Views from this footpath are likely to be only locally valued due to the location on the edge of an extensive industrial area and evidence of limited use. As such the value of this footpath route is considered to be Low.

Overall receptors at this viewpoint are considered to be of **Low to Medium Sensitivity**.

Magnitude and Significance:

A small portion of the Proposed Development might be visible either side of and above the Dairy, from this location. This would result in a slightly increased portion of the downland scarp slope being obscured from view. The proposed stack would be more clearly visible against the sky. The views of the Proposed Development would be entirely compatible with existing structures and would not introduce any particularly discordant elements into to what is a very fragmented poor quality view. Consequently, the magnitude of visual change is deemed to be **Small to Medium** with the visual effect categorised as **Moderate to Slight Adverse** primarily due to visibility of the proposed stack.

Comparison with the 2019 Permission:

It is unlikely that there would be any appreciable difference in the influence of the Proposed Development and the consented 2019 Permission upon the view, due to the presence of the intervening buildings at the Dairy. Although, the reduced diameter of the proposed stack would be an improvement on the 2019 Permission.

Viewpoint C: Stephenson Road (Figure 5.7c)

Existing View

This viewpoint is located approximately 280m from the nearest proposed structure and looks south-east down the length of Stephenson Road. The line of semi-mature trees in front of Westbury Dairy makes a positive contribution to the overall quality of the street scene, and screens the Dairy and much of the proposed Site from view. Lighting columns are a prominent component and reinforce the urban character of the scene. The frontage of the Site is visible and part of the wooded scarp slope of the chalk upland is visible in the background. Overall, this view is of low to medium quality.

Sensitivity:

The susceptibility of this view is considered to be Low as all the people exposed to it will be travelling to and from their place of work or those involved in making deliveries to individual premises, both categories of activity where enjoyment of the landscape is not usually a key consideration. The Value of this view is deemed to be Low overall (despite glimpses of the open countryside beyond) because of the generally utilitarian character of the landscape setting. Consequently, receptors at this location are considered to be of **Low Sensitivity**.

Magnitude and Significance:

The upper portion of the stack and potentially parts of the roof of the proposed building would be visible from this viewpoint, although during the summer months the existing trees along the Westbury Dairies boundary would provide a significant degree of screening. The Proposed Development would only occupy a relatively modest proportion of the overall view, and would be visually compatible with nearby existing development. In addition, the proposed tree planting proposed on the northern boundary of the Site would continue the line of existing trees along the roadside and would enhance the overall quality of the street scene. Taking all the above factors into consideration the magnitude of change is only deemed to be **Small** and the consequent visual effect would be **Slight Adverse to Negligible**. For road users in the immediate vicinity of the Site there would be some beneficial visual effects associated with the removal of a vacant plot from the road frontage and provision of a semi-ornamental boundary landscape treatment along Stephenson Road.

Comparison with the 2019 Permission:

There would be little appreciable difference in the influence of the Proposed Development and the consented 2019 Permission upon the view due to the presence of the intervening existing screening vegetation along the Dairy boundary. There would be some slight beneficial visual effects associated with the reduced diameter of the exhaust stack, which would be the most visible element of the development, for both schemes from this location and other areas within the trading estate

Viewpoint D: Warminster Road Car Park (Figure 5.7d)

Existing View

This viewpoint is located approximately 1.7km from the nearest proposed building and is within a car park above the centre of Westbury. The foreground view is dominated by the visual clutter associated with urban areas: signage, lighting columns and fences. Due to the higher elevation of this part of the town, the Westbury Dairy, the MBT and other nearby industrial buildings are visible towards the rear of the view and framed by tree cover close to the viewpoint. The main dairy building and associated stacks break the skyline, as do other foreground feature.

Sensitivity:

The susceptibility of this view is considered to be Low as most of the people exposed to it will be engaged in activities such as shopping with little or no focus on the surrounding landscape. The Value of this view is deemed to be Low because of the generally poor quality and disjointed nature of the view. The location is considered to be of **Low Sensitivity**.

Magnitude and Significance:

The Proposed Development would be introduced in front of Westbury Dairy and would therefore largely obscure this existing facility. The proposed stack would also be clearly visible. The Proposed Development would occupy a small proportion of the view and would be seen as an incremental increase in built development compared to the existing dairy (that it would replace in the view). This would be partly mitigated by the proposed colour scheme, which would break up the mass of the Proposed Development into similar scale blocks to the dairy using contrasting, but complimentary colour. The proposed colour scheme would also be more sympathetic than the existing bright white of the dairy. Taking all the above factors into consideration the overall magnitude of change is deemed to be **Small** resulting in a **Slight Adverse** visual effect associated primarily with the introduction of the stack. The DSM ZTVs at Figures 5.4c & d illustrate that there would be limited views of the Proposed Development from the urban areas of Westbury, due to the screening afforded by built form within the development.

Comparison with the 2019 Permission:

There would be little appreciable difference in the influence of proposed buildings and the consented 2019 Permission upon the view. However, there would be some slight beneficial visual effects associated with the reduced diameter of the exhaust stack, which would be the most visible element of the development, for both schemes from this location.

Viewpoint E: Footpath east of Westbury (Figure 5.7e)**Existing View**

This viewpoint is located approximately 2.5km from the nearest proposed building, on a public footpath (WEST32) looking north-west down from the top of a rounded hill (approximately 140 metres above sea level but not named on ordnance survey maps). The viewpoint is slightly further west than the equivalent 2019 Permission LVIA viewpoint, to avoid unrepresentative foreground screening. There are sweeping views of the town and wider countryside from this location, including the extensive industrial development to the north of the town. Westbury Dairy and MBT are clearly visible in the middle ground below the horizon, but form minor components of the panoramic views available.

Sensitivity:

Users of this footpath are considered to be of medium to high susceptibility as enjoyment of the long range views be one of the prime motivators behind their excursion, albeit the visual amenity is already influenced by extensive urban /industrial development in the middle distance of the views.

Value is deemed to be Medium to High due to the location on a route that provides access from Westbury to the White Horse and long distance paths on the ridge.

Consequently, receptors at this location are considered to have **Medium to High Sensitivity**.

Magnitude and Significance:

The Proposed Development would be visible as an addition to the existing assemblage of industrial development on the north western edge of Westbury. The new building would partially screen Westbury Dairy from view. The Proposed Development would occupy a very small proportion of the overall views available from this elevated location above the town and would be seen as an incremental increase in built development compared to the existing dairy, MBT and other large scale development in the wider industrial estate. This would be partly mitigated by the proposed colour scheme that would break up the mass of the Proposed Development into similar scale blocks to the dairy using contrasting, but complimentary colours. The proposed colour scheme would also be more sympathetic to the wider landscape setting than the existing dairy. The nature of the existing view, namely an expansive panorama including the localised presence of industry would not appreciably change. The magnitude of visual change for this viewpoint is considered to be very **Small** and result in a **Slight Adverse** visual effect, that is not considered significant.

Comparison with the 2019 Permission:

There would be little appreciable difference in the influence of proposed buildings and the consented 2019 Permission upon the view. However, there would be some slight beneficial visual effects associated with the reduced diameter of the exhaust stack

Viewpoint F: Leigh Close (Figure 5.7f)**Existing View**

This viewpoint is located approximately 2km from the nearest proposed building at the top of Leigh Close, an elevated residential road to the south of Westbury Leigh, a suburb of Westbury. The viewpoint represents views experienced by drivers of vehicles on roads which run perpendicular to the steep slope, pedestrians and occupiers of residential properties. Views from properties are generally oblique or screened by intervening properties or vegetation. Roads in this area which run parallel to the slope generally have views curtailed by foreground properties. Views from the more elevated sections of road, which run perpendicular to the slope are long distance with most of the urban area of Westbury town screened by the intervening vegetation during the summer months. From this particular vantage point Westbury Dairy is conspicuous, and the tops of other industrial development, such as Brook Mill, are also visible above the tree cover. The horizon is defined by a distant wooded ridge with the settlement of Trowbridge below.

Sensitivity:

Receptors at this viewpoint primarily comprise local residential properties and road users and are considered to be of medium susceptibility to visual change of an industrial nature due to existing industrial elements within the view and generally oblique nature of views from within properties. Direct views from the north facing windows of the residential properties themselves, are likely to be obscured by other buildings and / or vegetation. The value of views from within this urban area deemed to be low to medium due to their fragmented nature and suburban character with the presence of visual screening in the foreground of many views. As a result, receptors at this and similar viewpoints in the residential areas above Westbury town are considered to have a **Medium Sensitivity**.

Magnitude and Significance:

The Proposed Development would be clearly visible, approximately 2km to the north-west. The new building would largely obscure the existing Westbury Dairy structures from view. The prominence of the proposed stack and greater mass of the proposed buildings when compared to the Dairy would result in a minor deterioration in the quality of the view. This would be partly mitigated by the proposed colour scheme that would break up the mass of the Proposed Development into similar scale blocks to the dairy using contrasting, but complimentary colours. The proposed colour scheme would also be more sympathetic to the wider landscape setting than the bright white of the dairy. Views from residential properties would generally be oblique with views from main windows generally screened by adjacent properties. The majority of receptor experience would be restricted to people leaving and entering properties (direct and oblique angle of view) and vehicles / pedestrians travelling northwards along the road (direct view). In both instances the duration of exposure is likely to be brief. Taking all these factors into consideration a **Small** magnitude of change would occur. This would result in **Slight Adverse** visual effects primarily associated with the proposed stack breaking the skyline. It should be noted that the visibility from within the settled areas of Westbury Leigh would be very fragmented as illustrated by the DSM ZTVs on Figures 5.4c&d. As such the image on Figure 5.7f represents one of the few areas where clear views would be available.

Comparison with the 2019 Permission:

There would be little appreciable difference in the influence of proposed buildings and the consented 2019 Permission upon the view. However, there would be some slight beneficial visual effects associated with the reduced diameter of the exhaust stack and its juxtaposition with the distant skyline.

Viewpoint G: Biss Close, Upton Scudamore (Figure 5.7g)**Existing View**

This viewpoint is located over 4km from the nearest proposed building. Views in the direction of the Site are available from a small number of properties on the northern side of the village of Upton Scudamore, which is located on higher ground approximately 3 km south of Westbury town centre. Drivers using the lane on the western edge of the village also have brief glimpses of views towards the Site and adjacent dairy building. There is an extensive foreground component to the view over agricultural land interrupted by vegetation occupying a valley in the middle distance. Westbury Dairy and other development on the industrial estates are a minor feature, although the dairy is clearly visible due to its colour.

Sensitivity:

Occupiers of the residential properties in close proximity to this viewpoint, with direct views from rear gardens and windows, are deemed to be of medium to high susceptibility as appreciation of the surrounding countryside views is likely to contribute to the visual amenity enjoyed by the residents, albeit existing industrial development is visible in the distance. The value of this view is considered to be Medium as the views available lack any foreground interest or unique scenic qualities. Consequently, people at this location are considered to be of **Medium to High Sensitivity** overall.

Magnitude and Significance:

The Proposed Development would occupy a very narrow angle of the views available. It would largely obscure Westbury Dairy and due to the proposed colour scheme would be better integrated visually than the existing dairy buildings. The increased mass of built development would be partly mitigated by the proposed colour scheme which would break up the Proposed Development into similar scale blocks to the dairy using contrasting, but complimentary colours. Overall there would be a minor deterioration in the overall quality of the view primarily associated with the introduction of the stack and incremental increase in the scale of development visible. Taking all these factors into consideration the proposed development would result in a **Small** magnitude of visual change. Visual effects from this location (and other parts of Upton Scudamore village with a direct view towards the site) would be **Moderate to Slight Adverse**, primarily due to the visibility of the proposed stack.

Comparison with the 2019 Permission:

There would be little appreciable difference in the influence of proposed buildings and the consented 2019 Permission upon the view. At this distance, the increased maximum building height would be barely perceptible. However, there would be some slight beneficial visual effects associated with the reduced diameter of the exhaust stack and its juxtaposition with the distant skyline.

Viewpoint H: Footpath, Tower Hill (Figure 5.7h)**Existing View**

This viewpoint is located approximately 2.3km from the closest propose building on a public footpath (DMAR23) above Dilton Marsh, looking through a gap in a hedge on Tower Hill. Views towards the Site are very well screened by vegetation in the summer months and only the tops of the Dairy building and stacks are visible. There would be filtered views available in winter (as illustrated by the viewpoint photograph in the LVIA for the 2019 Permission) towards the existing industrial development at the western edge of Westbury, including the Dairy and MBT.

Sensitivity:

Due to the close proximity to the village of Dilton Marsh users of this particular footpath will be a mixture of dog walkers and recreational walkers returning from rambles in the adjoining countryside. Views of existing industrial development reduce susceptibility to change, particularly in winter months. The susceptibility of these receptors has been categorised as medium to high.

The value of this view is deemed to be low to medium due glimpsed nature and edge of urban setting reducing the quality of views available when not screened by vegetation.

Consequently, the users of this footpath are considered to have a **Medium Sensitivity**.

Magnitude and Significance:

The Proposed Development would be very well screened by vegetation cover in summer, and its presence would have little influence upon the view.

In winter, it would form an addition to the existing assemblage of industrial development towards the rear of the view, and its presence would not result in any significant change in the intrinsic character of the views available. The main impact would be associated with the introduction of the stack, as the buildings would occupy a similar area of the view to the dairy.

Whilst this is a direct view from a public right of way it will only be experienced as a brief glimpse during winter for those walking northwards, as the footpath heads down a steep slope at this particular location. Taking all these factors into consideration a **Small** magnitude of change is predicated. This would result in a **Slight Adverse** visual effect primarily associated with the introduction of the stack.

Comparison with the 2019 Permission:

There would be little appreciable difference in the influence of proposed buildings and the consented 2019 Permission upon the view and the increased maximum building height would be barely perceptible. However, there would be some slight beneficial visual effects associated with the reduced diameter of the exhaust stack.

Viewpoint I: Bridleway, Penleigh Road (Figure 5.7i)

The viewpoint is located approximately 1km south of the Site on Penleigh Road, an un-adopted track designated as a bridleway (WEST20). To the north Westbury Dairy and lighting columns in the rail freight depot are clearly visible through a gap in the vegetation associated with the railway embankment. The land beyond the railway has been allocated for housing and outline consent granted. However, due to screening vegetation it is not anticipated that this development will alter the view markedly in the future. Heavily filtered views of the lower part of Westbury Dairy would be available during the winter months. The bridleway runs immediately west from a residential area located on the western edge of Westbury urban area and is surfaced to provide ease of access.

Sensitivity:

Because of its location on the edge of Westbury, it has been assumed that this bridleway is predominately used by dog walkers and local residents for whom the activity is perhaps more important than appreciation of the limited views available. Consequently, the susceptibility of these receptors has been categorised as medium.

The value of this view, which lacks any single point of focus apart from the dairy, is deemed to be low to medium because views from this section of the bridleway are of limited scenic quality.

Both these factors result in this receptor at this viewpoint being deemed to be of **Medium Sensitivity**.

Magnitude and Significance:

The close proximity of the Site means that the Proposed Development would be clearly visible above the trees. The influence of development upon the skyline in the background of the view would increase. However, the Proposed Development would partially screen Westbury Dairy from view. The nature of the view would remain similar to baseline, albeit with a slightly greater extent of industry visible. Whilst the overall mass of the development would be greater than that of the dairy the proposed colour scheme would break up the Proposed Development into similar scale blocks using contrasting, but complimentary colours. The proposed colour scheme would also be more sympathetic to the vegetation cover along the railway than the bright white of the dairy. There is likely to be no more than a minor deterioration in the overall quality of the view which is perpendicular to the direction of travel for those

walkers / horse riders heading east or west along the bridleway. Receptors are likely to be potentially exposed to this changed view for a distance of several hundred metres, but it will not be their main focus. Taking all the above factors into consideration, the overall magnitude of change is deemed to be **Small** and would result in **Slight Adverse** visual effect associated with the increased height and density of built development and introduction of the stack.

Comparison with the 2019 Permission:

There would be little appreciable difference in the influence of proposed buildings and the consented 2019 Permission upon the view. However, there would be some slight beneficial visual effects associated with the reduced diameter of the exhaust stack against the sky.

Viewpoint J: St Mary's Lane, Dilton Marsh (Figure 5.7j)

Existing View

This viewpoint is located approximately 2km from the nearest building at the end of the section of St Mary's Lane that is accessible to vehicles, on the northern edge of the village of Dilton Marsh looking north-east towards the Site. Westbury Dairy and MBT buildings are visible above the trees in the background. This viewpoint reflects the view from the cottages and other dwellings located on both sides of St Mary's Lane as well as glimpses experienced by users of the bridleway which starts at the end of the surfaced section of this lane.

Sensitivity:

The susceptibility of the receptors, which includes both occupiers of the nearby cottages as well as recreational walkers is deemed to be medium to high due to the largely rural character of views being moderated by elements of industrial development in the distance. The value of this location is considered to be medium to high due to the potential for primary frontage views or rear garden views to be valued by residents.

Consequently, the people at this viewpoint are considered to have a **Medium -High Sensitivity**.

Magnitude and Significance:

The Proposed Development would be visible in the background of the view, filling the gap between the Dairy and MBT. The lower elements of the Proposed Development would be screened by vegetation and topography. Whilst appearing taller than the Dairy the Proposed Development would occupy a similar angle of the view and the mass of the building would be reduced by the proposed colour scheme. The proposed colour of the new buildings would also assist in integrating the development into the landscape setting. The Proposed Development would be compatible in character and scale with the existing industrial features in the view and consequently it is considered that there will only be a minor deterioration in the overall quality of this view, mainly due to the stack. Only a very small proportion of the views available would be affected and these are already characterised by industrial development. The view for both drivers of vehicles and recreational walkers would be perpendicular to the direction of travel and this reduces the significance of any visual effects on these receptors. Taking all the above factors into consideration the magnitude of visual change would be **Small** and visual effects **Moderate Adverse** due to the intensification of industrial uses and stack visibility.

Comparison with the 2019 Permission:

There would be little appreciable difference in the influence of proposed buildings and the consented 2019 Permission upon the view due to the tallest building being located further away. However, there would be some slight beneficial visual effects associated with the reduced diameter of the exhaust stack against the sky.

Viewpoint K: Scotland Lane (Figure 5.7k)

Existing View

This viewpoint is located approximately 3.7km from the nearest building at the end of Scotland Lane which runs along a low ridge located to the west of the hamlets of Rudge and Lower Rudge. The viewpoint is close to the junction of two public footpaths and Scotland Lane is well integrated into the local footpath network which appears to be the focus of a significant amount of recreational use. Long distance views east are available, with existing industry partially screened by intervening vegetation. Westbury Dairy and the existing MBT are both visible, but are minor features. The White Horse on the scarp above Westbury is visible and the top of the scarp forms the skyline. Electricity poles and overhead wires are conspicuous components in the foreground of the view and break the skyline in places.

Sensitivity:

The users of this public right of way have been deemed to be of medium - high susceptibility as the rural context and scenic quality is slightly diminished by the existing industrial development in the distance and power lines in the foreground.

The value of this particular viewpoint is deemed to be medium to high due to the perceived level of usage of the footpath network and attractive views of the scarp slope and White Horse.

Overall receptors at this viewpoint are considered to have a **Medium to High Sensitivity** to visual change of an industrial nature.

Magnitude and Significance

The Proposed Development would be visible between the Westbury Dairy and MBT. The proposed buildings would be located below the skyline, but the stack would break the horizon. The mass of the Proposed Development would be broken up through the use of contrasting, but complimentary colours. The proposed building blocks would be broadly compatible in terms of size and scale with the adjacent Dairy buildings. The proposed colour scheme would also assist in integrating these structures into their landscape context. There would be a noticeable deterioration in the quality of a small part the existing view associated with the introduction of the stack and the increased massing of industrial development. However, the majority of this view would be unaffected by the addition of the Proposed Development. The primary attention is likely to be focused on the *White Horse* and the undeveloped skyline to the south, rather than infrastructure on the Trading Estate. Taking all the above factors into consideration the magnitude of change is categorised as **Small** and the visual effects would be **Slight to Moderate Adverse** due to the stack breaking the skyline.

Comparison with the 2019 Permission:

When contrasted with the consented 2019 Permission the overall massing of the Proposed Development would appear reduced due to the a slightly narrower angle of view occupied by the Proposed Development and the reduced impact of the much narrower stack. As such, the significance of visual effect associated with the Proposed Development would be slightly reduced compared to the 2019 Permission. .

5.4.23 Of the fifteen viewpoints included in the LVIA, there is only one location (Viewpoint 1: Footpath west of Site) that would experience a significant visual effect. At the other fourteen viewpoints, effects would not be significant due to the Proposed Development occupying a modest proportion of the views available and being seen in the context of other industrial development on the trading estates. This is consistent with the findings of the LVIA for the 2019 Permission.

5.4.24 In comparison to the consented 2019 Permission the overall massing and height of the Proposed Development would be appear reduced in some views (such as Viewpoint 1) and comparable in others. The increase in maximum height would barely be perceptible from many views due to the revised position of the boiler house and the reduced height/location of other elements. The most significant improvement would be the reduction in the diameter of the proposed stack from 4.5m to 2.5m. This reduces the prominence of the stack in a number of views and reduces the visual impact of the development compared to the consented scheme.

Plume Visibility

5.4.25 The combustion process at the Proposed Development would produce an emissions plume, composed primarily of water vapour, which would be emitted via the exhaust flues contained in the stack. The degree to which this plume is visible would be determined by the flowrate of the exhaust gases in combination with their temperature and humidity relative to that of the surrounding air environment.

5.4.26 When visible, emission plumes vary greatly in their visual characteristics in response to weather conditions. Plumes often have characteristics in common with the surrounding air environment (i.e. on a cloudy or overcast day they will tend to blend in with the background, as they comprise primarily of water vapour).

5.4.27 Plume visibility has been modelled as part of the Air Quality Assessment (Chapter 8.0). The modelling was based on weather data recorded over the five-year period 2015-2019.

5.4.28 The modelling indicates that a visible plume would be apparent for between 26.2% and 32.5% of daylight hours (the extent of variation is based upon the variability of weather conditions during the 5-year period included in the model). In other words, there would be no visible plume for more than 67.5% of the time. The average visible plume length is predicted to be short, with plume length being less than 50m for between approximately 82.6% and 84.8% of daylight hours (including those periods when no plumes are visible). The visible plume would be of a length that exceeds 100m for between approximately 17.7% and 26.2% of daylight hours.

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- 5.4.29 Where the emissions plume is visible, this would have potential to draw attention to the presence of the Proposed Development from the surrounding area, thereby increasing the influence of the new structures upon the views available.
- 5.4.30 Atmospheric conditions that lead to plume formation (low temperature and low humidity) occur more frequently in winter, and consequently both plume length and visibility reduce in the summer months.
- 5.4.31 Cloud cover is a significant factor in determining the extent to which visible plumes are discernible. In clear or blue sky conditions a plume will contrast strongly with its background. However, in skies with more than one or two oktas⁷ of cloud, this contrast becomes progressively less marked. The periods when cloud cover is likely to be at its greatest are across the autumn, winter and early spring seasons, which coincide with when the plumes are most likely to occur, and when hours of daylight are less.
- 5.4.32 The modelling indicates that a visible plume would not be present for the majority of daylight hours (not visible more than 67.5% of the time), and when visible, the plume would tend to be fairly short. As such, in general it is considered that the emissions plume would not be prominent. There would be occasional transient adverse visual effects locally (for example where the plume forms in clear skies during a temperature inversion) but it is concluded overall that the presence of the emissions plume would not lead to significant adverse visual effects.

Operational Phase: Night-time Effects

- 5.4.33 Lighting is a well-established presence in the Study Area due to the presence of existing developments in the adjacent industrial estates and surrounding residential areas. In particular, the adjacent Westbury Dairy facility is operational on a 24-hour basis.
- 5.4.34 As described in Chapter 4.0 once commissioned, the Proposed Development would be operational on a continuous 24 hours, 7 days per week basis, (there would be some exceptions, such as waste deliveries and most staff movements which would

⁷ An okta is a unit of measurement describing levels of cloud cover. 0 oktas equates to a clear sky, whilst 8 oktas equates to complete cloud cover.

take place during the normal working day). Due to the continual nature of the operation there would be a need for additional artificial lighting at the Site to ensure a safe working environment for operatives during the hours of darkness. It is likely that low level security lighting would also be required.

- 5.4.35 The measures that would be incorporated into the lighting design are described in outline in Chapter 4.0. Lighting would be designed and specified to accord with current industry standards and best practice guidance. The aim would be to minimise the generation of obtrusive light beyond the Site. Internal lighting within the proposed new buildings would be designed with the same concerns in mind and would be designed to reduce the spillage of light outside the buildings themselves.
- 5.4.36 As daylight hours are shorter during the winter months, the proposed lighting would be in use for a greater proportion of the day, and at times when larger numbers of people are likely to be outside to experience views towards the Site (i.e. going to and from work). As such, the night-time effects of the Proposed Development are more likely to be experienced during the winter.
- 5.4.37 The generation of light would increase locally as a result of the Proposed Development. However, this increase would be minimised by the implementation of a sensitively designed lighting scheme, and would occur in the context of an already relatively well lit industrial area. Change in lighting levels outside of the Site would be incremental. As such, the presence of the Proposed Development would not materially alter the night-time environment, and night-time effects would not be significant.
- 5.4.38 There are few details regarding the lighting of the consented 2019 Permission. However, due to health and safety requirements it is assumed that lighting of the 2019 Permission would be designed and implemented on a similar basis that described above (i.e. lighting designed and specified in accordance with industry standards and best practice guidelines), then the night-time effects of the two scheme would be unlikely to differ materially.

5.5 Cumulative Effects

- 5.5.1 In a scenario where the consented waste management facility at the NRRC is present and operational, the introduction of the Proposed Development would not give rise to any significant cumulative landscape and visual effects that would be materially different to those described in Section 5.4 above. The consented waste management facility would be a relatively small scale development compared to the Proposed Development and established NRRC. It would be unlikely to have any influence of note beyond its immediate vicinity. From the surrounding area, the appearance of the Proposed Development and its influence upon landscape character and visual amenity would not alter as a result of the consented development.
- 5.5.2 The approved demolition and construction work at Brook Mill to the Northern edge of the Trading Estate would introduce a slightly taller building (c.2-3m) and other ancillary development. However, this would not fundamentally alter the scale relationship between the Mill and the Proposed Development or fundamentally alter any of the assessments for the viewpoints considered above. As such there would be no cumulative effects over and above those considered in Section 5.4.

5.6 Mitigation

- 5.6.1 No further mitigation measures are proposed, over and above those embedded into the design of the Proposed Development, which are described in Section 5.4.

5.7 Residual Effects and Conclusions

- 5.7.1 The Proposed Development would be introduced into a vacant plot at the Northacre Trading Estate, which itself forms part of a wider belt of industrial estates at the edge of Westbury. The influence of industrial development upon the surrounding area is well established, and indeed the Site benefits from planning consent for a similar scale facility.
- 5.7.2 The Proposed Development benefits from a design that breaks up the mass of the building with contrasting, but complimentary colours. The arrangement of the

different parts of the main building, and the colour scheme chosen for the building help assimilate the building into the with the wider landscape.

- 5.7.3 The Proposed Development would not result in significant landscape effects. Locally, character is already heavily influenced by industry and the influence would increase only incrementally should the Proposed Development be introduced. Agricultural land west of the Site is allocated for industrial development in local planning policy documents, and should this land be developed, then the Proposed Development would be surrounded by built development, further reducing its potential for significant landscape effects.
- 5.7.4 Of the fifteen viewpoints included in the LVIA, there is only one location (Viewpoint 1: Footpath west of Site) that would experience a significant visual effect. At the other fourteen viewpoints, effects would not be significant due to the Proposed Development occupying a modest proportion of the views available and being seen in the context of other industrial development on the trading estates. This is consistent with the findings of the LVIA for the 2019 Permission.
- 5.7.5 In comparison to the consented 2019 Permission the overall massing and height of the Proposed Development would be appear reduced in some views (such as Viewpoint 1) and comparable in others. The increase in maximum height would barely be perceptible from most viewpoints due to the revised position of the boiler house and the reduced height/location of other elements. The most significant improvement would be the reduction in the diameter of the proposed stack from 4.5m to 2.5m. This reduces the prominence of the stack in a number of views and reduces the visual impact of the development compared to the consented scheme.

CHAPTER 6.0 ECOLOGY AND NATURE CONSERVATION

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FIGURES (Volume 2 bound separately)

Figure 6.1	Phase 1 Habitat Plan
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6.0 ECOLOGY AND NATURE CONSERVATION

6.1 Introduction

6.1.1 The Chapter considers the potential impacts on the Proposed Development on ecology and nature conservation.

6.1.2 An Ecological Impact Assessment (EclA) is required as part of an overall Environmental Impact Assessment (EIA) for the development. The EclA contains appropriate survey information and an assessment of impacts on protected sites, protected species and biodiversity in general. Any predicted adverse impacts are addressed with proposals for mitigation / compensation as well as identifying opportunities for enhancement. The ecological assessment has been undertaken in accordance with the appropriate ecological guidelines and taking into consideration appropriate legislation and policies.

6.1.3 AD Ecology was commissioned to undertake the ecological survey and assessment of the site and Proposed Development, and to provide a report to fulfil the requirements of nature conservation legislation, planning guidance, and to provide sufficient information to inform an Appropriate Assessment.

Proposed Development

6.1.4 The study area encompasses a single plot of land that supports a mosaic of regenerating vegetation (tall herbs and ruderal species) and open, bare ground. The land is bounded by metal palisade and chain-link fencing, and is bordered by roads, industrial units and hard-standing to the north, east and south, and improved grazed pasture lying to the west.

Competence

6.1.5 The ecological survey programme and impact assessment was undertaken by Jonathan Adey and Dr Stephen Dangerfield who are professional ecological consultants. They are all full members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and Chartered Environmentalists. Stephen is also a Fellow of the Chartered Institution of Water and Environmental Management (CIWEM). They both hold Natural England European Protected Species (EPS)

survey licences covering bats and great crested newt, and have held mitigation licences for these species as well as badger and Roman snail.

- 6.1.6 Jonathan and Stephen have a combined circa 60 years' professional experience covering the full spectrum of ecological work from field survey to impact assessment, design and implementation of mitigation measures, practical site management/supervision, and monitoring. They have extensive experience with surveying and assessments covering protected / notable terrestrial and freshwater habitats and species, and have worked on a wide range of engineering and conservation projects, including industrial, infrastructure and residential development, and renewable energy projects.

6.2 Methodology and Scope of Assessment

Legislation and Policy

Wildlife and Countryside Act 1981

- 6.2.1 The Wildlife and Countryside Act (WCA) 1981 (as amended) forms the main body of nature conservation legislation in England.

Wild Birds

- 6.2.2 All wild birds are protected under Part 1 of the WCA, which makes it an offence (with certain limited exceptions) to intentionally kill, injure or take any wild bird, or intentionally to damage, take or destroy their nest (whilst being built or in use), or to take or destroy its eggs. It is also an offence to possess any live or dead wild bird or egg, or anything derived from a wild bird or egg.
- 6.2.3 Certain birds (generally rare or vulnerable breeding species) are protected under Schedule 1 of the WCA, which makes it unlawful intentionally or recklessly to disturb such a bird whilst it is building a nest or occupying a nest with eggs or young or disturb their dependent young. Under some circumstances, licences issued by Natural England may be required to survey for Schedule 1 species.

Wild Animals

6.2.4 Part 1 of the WCA protects certain species of wild animal listed in Schedule 5, making it an offence (with certain exceptions) to:

- Intentionally kill, injure or take any wild animal of such a listed species;
- Intentionally or recklessly damage or destroy or obstruct access to any structure or place which any animal of a listed species uses for shelter or protection;
- Intentionally or recklessly disturb an animal of a listed species whilst it is occupying such a structure or place which it uses for that purpose;
- Trade in an animal of a listed species whether alive or dead, or any part of it or anything derived from it; and
- Possess or have in one's control alive or dead animal of a listed species, or any part of it or anything derived from it.

Wild Plants

6.2.5 Part 1 of the WCA protects certain species of wild plant listed in Schedule 8, which makes it an offence (in the absence of a licence) to:

- Intentionally pick, uproot or destroy a wild plant listed in Schedule 8;
- Not being an authorised person, intentionally uproot any wild plant not included in Schedule 8; or
- Sell, offer or expose for sale, or have possession of or to transport for the purpose of sale, any live or dead wild plant, or any part of or anything derived from a wild plant listed in Schedule 8.

Conservation of Habitats and Species Regulations 2017

6.2.6 The Conservation of Habitats and Species Regulations transposes into UK legislation the EC Habitats Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (Council Directive 92/43/EEC). Schedule 2 lists certain animal species (also referred to as 'European Protected Species'), which are given protection under the Regulations such that it is unlawful to:

- Deliberately capture, injure or kill any wild animal of a European protected species;
- Deliberately disturb wild animals of any such species;
- Deliberately take or destroy the eggs of such an animal; and

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- Damage or destroy a breeding or resting place of such an animal.

6.2.7 Disturbance is interpreted as any action that is likely to impair ability to survive, breed or reproduce, to rear to nurture their young or to hibernate/migrate, or to significantly affect the local distribution or abundance of the species.

6.2.8 Schedule 2 and Schedule 5 (European Protected Species of wild plants) also makes it an offence for a person to be in possession of, or control; transport; sell or exchange; or offer for sale or exchange:

- Any live or dead animal or part of an animal or plant, which has been taken from the wild or
- Anything derived from such an animal or any part of such an animal or plant.

6.2.9 There are exemptions, where the law is set-aside (or derogated) upon issue of a licence from Natural England which may allow certain activities to take place provided that they are satisfied that the proposal or development meets the following 'tests':

- It preserves public health or safety or there are other imperative reasons of overriding public interest;
- There is no satisfactory alternative; and
- It will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range.

Protection of Badgers Act 1992

6.2.10 Badgers are legally protected under the Protection of Badgers Act 1992. Of particular relevance for this scheme, it is an offence to:

- Wilfully kill, injure or take a badger, or attempt to kill, injure or take a badger [Section 1];
- Intentionally or recklessly damage a sett or any part of it, or destroy a sett [Section 3]; and
- Intentionally or recklessly obstruct access to or any entrance of a sett, cause a dog to enter a sett, or disturb a badger whilst it is occupying a sett [Section 3].

6.2.11 The Protection of Badgers Act (1992) defines a sett as ‘any structure or place that displays signs indicating current use by a badger¹. Natural England has qualified this by stating this definition only applies to the tunnels and chambers of the sett, and the areas immediately outside the entrances, or to other structures used by badgers for shelter and refuge.

6.2.12 Natural England provides guidance on ‘current use’ as follows:

- A badger sett is protected by the legislation if it ‘displays signs indicating current use by a badger.’ A sett is therefore protected as long as such signs remain present. In practice, this could potentially be for a period of several weeks after the last actual occupation of the sett by a badger or badgers;
- It follows that demonstration of the fact that a sett is not occupied by badgers does NOT necessarily exempt it from the protection afforded by the Act if it still displays signs otherwise indicative of current use; and
- A sett is likely to fall outside the definition of a sett in the Act if the evidence available indicates that it is NOT in use by badgers; e.g. absence of badger field signs, debris in sett entrances etc. In practice, such a sett may have been unused for several weeks.

6.2.13 Under Section 10(1) of the Protection of Badgers Act 1992 licences may be issued by Natural England to interfere with a badger sett for the purposes of development as defined by Section 55(1) of the Town and Country Planning Act 1990.

Hedgerow Regulations 1997

6.2.14 The Hedgerow Regulations 1997 protect ‘Important’ hedgerows by controlling their removal through a system of formal notification and permission from the local authority. Hedgerows are classified as being ‘Important’ based on a number of factors including length, age, ecological and historical attributes.

Natural Environment and Rural Communities Act (NERC) Act 2006

6.2.15 The NERC Act 2006 places a duty on public authorities to conserve and have regard for biodiversity when discharging their functions and making decisions. The

¹ Natural England (2009b). *Guidance on ‘current use’ in the definition of a badger sett (Version 11/09)*

conservation of biodiversity includes the enhancement, restoration and protection of species populations and habitats.

- 6.2.16 Section 41 of the Act requires the government to publish and maintain lists of species and habitats of 'Principal Importance' for the conservation of biodiversity. These 56 priority habitats and 943 species are drawn from the previous United Kingdom Biodiversity Action Plan (UKBAP).

National Planning Policy

- 6.2.17 The National Planning Policy Framework (NPPF), revised February 2019, requires that the planning system should conserve and enhance the natural environment (Section 15) by, *inter alia*, 'protecting and enhancing sites of biodiversity value' and 'minimising impacts and providing net gains for biodiversity' (para 170).

- 6.2.18 Scheme plans should 'promote the conservation, restoration and enhancement of priority habitat, ecological networks and the protection and recovery of priority species' and 'identify and pursue opportunities for securing measurable net gains for biodiversity' (para 174).

- 6.2.19 Local planning authorities should aim to protect and enhance biodiversity by applying the following principles: 'if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused', 'development resulting in the loss or deterioration of irreplaceable habitats should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists' and 'development whose primary objective is to conserve or enhance biodiversity should be supported, while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity' (para 175).

Wiltshire Planning Policy

- 6.2.20 The Wiltshire Core Strategy (2015) sets out the relevant biodiversity policy, as Core Policy 50: Biodiversity and geodiversity.

Protection

- 6.2.21 Development proposals must demonstrate how they protect features of nature conservation and geological value as part of the design rationale. There is an expectation that such features shall be retained, buffered, and managed favourably in order to maintain their ecological value, connectivity and functionality in the long-term. Where it has been demonstrated that such features cannot be retained, removal or damage shall only be acceptable in circumstances where the anticipated ecological impacts have been mitigated as far as possible and appropriate compensatory measures can be secured to ensure no net loss of the local biodiversity resource, and secure the integrity of local ecological networks and provision of ecosystem services.
- 6.2.22 All development proposals shall incorporate appropriate measures to avoid and reduce disturbance of sensitive wildlife species and habitats throughout the lifetime of the development.
- 6.2.23 Any development potentially affecting a Natura 2000 site must provide avoidance measures in accordance with the strategic plans or guidance set out in paragraph 6.70 above where possible, otherwise bespoke measures must be provided to demonstrate that the proposals would have no adverse effect upon the Natura 2000 network. Any development that would have an adverse effect on the integrity of a European nature conservation site will not be in accordance with the Core Strategy.

Biodiversity Enhancement

- 6.2.24 All development should seek opportunities to enhance biodiversity. Major development in particular must include measures to deliver biodiversity gains through opportunities to restore, enhance and create valuable habitats, ecological networks and ecosystem services. Such enhancement measures will contribute to the objectives and targets of the Biodiversity Action Plan (BAP) or River Basin / Catchment Management Plan, particularly through landscape scale projects, and be relevant to the local landscape character.

Local Sites

- 6.2.25 Sustainable development will avoid direct and indirect impacts upon local sites through sensitive site location and layout, and by maintaining sufficient buffers and ecological connectivity with the wider environment. Damage or disturbance to local sites will generally be unacceptable, other than in exceptional circumstances where it has been demonstrated that such impacts:
- Cannot reasonably be avoided;
 - Are reduced as far as possible;
 - Are outweighed by other planning considerations in the public interest; and
 - Where appropriate compensation measures can be secured through planning obligations or agreements.

- 6.2.26 Development proposals affecting local sites must make a reasonable contribution to their favourable management in the long-term.

Wiltshire & Swindon Waste Development Control Policy (WDC) 8: Biodiversity & Geological Interest

- 6.2.27 Proposals for waste management development in Wiltshire and Swindon must be accompanied (where appropriate) by an objective assessment of the potential effects of the development on areas of biodiversity and / or geological interest, taking into account cumulative impacts with other development and the potential impacts of climate change.

- 6.2.28 The assessment must have particular regard to the need to maintain and / or enhance, sites and species of international and national importance in accordance with the relevant statutory requirements.

- 6.2.29 The assessment must also consider carefully the need to maintain and / or enhance the following features of local and regional importance:
- Local Biodiversity Action Plan habitats and species;
 - County Wildlife Sites (including Semi Natural Ancient Woodlands);
 - Regionally Important Geological and Geomorphological Sites;
 - Local Nature Reserves; and
 - The Great Western Community Forest.

6.2.30 Proposals for waste management development will only be permitted where adverse impacts will be:

- Avoided;
- Where an adverse impact cannot be avoided, the impact will be adequately mitigated; and
- Where adverse impacts cannot be avoided or adequately mitigated, compensation measures will, as a last resort, be designed and implemented to ensure the maintenance or enhancement of biodiversity / geodiversity.

6.3 Assessment Methodology

Assessment Process

6.3.1 The ecological assessment of the proposed development is undertaken in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine², which are in full accordance with the mandatory requirements of the UK EIA Regulations. The ecological assessment will seek to obtain the best possible biodiversity outcomes by integrating the following key principles:

- Avoidance: seek options that avoid harm to ecological features (for example, by locating on an alternative site).
- Mitigation: Adverse effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed (for example, through a condition or planning obligation).
- Compensation: Where there are significant residual adverse ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.
- Enhancements: Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

² CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester

Defining Important Ecological Receptors and Value

- 6.3.2 The CIEEM EclA guidelines state that one of the key challenges in EclA is to decide which ecological features (habitats, species, ecosystems and their functions / processes) are important and should be subject to detailed assessment. Such ecological features will be those that are considered to be important and potentially affected by the project. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable.
- 6.3.3 However, effort should be made to safeguard biodiversity in its entirety, as emphasised by the Convention on Biological Diversity and developed in the EU Biodiversity Strategy 2020. The EU Strategy and national policy documents emphasise the need to achieve no net loss of biodiversity and enhancement of biodiversity.
- 6.3.4 The importance of an ecological feature will be considered within a defined geographical context. The following frame of reference will be used:
- International and European;
 - National;
 - Regional;
 - Metropolitan, County, vice-county or other local authority-wide area;
 - River Basin District;
 - Estuarine system / Coastal cell; and
 - Local.
- 6.3.5 Various approaches can be adopted for defining local importance, including assessment within a district, borough or parish context or within another locally defined area.

Characterising Ecological Effects

- 6.3.6 When describing ecological impacts and effects, reference should be made to the following characteristics as required:
- Positive or negative;
 - Extent;

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- Magnitude;
 - Duration;
 - Frequency and timing; and
 - Reversibility.

6.3.7 The assessment only needs to describe those characteristics relevant to understanding the ecological effect of the impacts and determining its significance.

Assessment of Significance / Assessment Criteria

6.3.8 The CIEEM guidelines define an 'ecologically significant effect' as an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Significant effects should be qualified with reference to an appropriate geographic scale. However, the scale of significance of an effect may not be the same as the geographic context in which the feature is considered important.

6.3.9 Significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution). A significant effect is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project.

6.4 Baseline

Data Collection

Desk-based review

6.4.1 The Wiltshire and Swindon Biological Records Centre (WSBRC) provided in April 2020 records of designated sites and notable / protected species from the last 25 years in the local landscape (1 km radius data search from study area).

6.4.2 This baseline data review was supported by a review of OS maps and aerial imagery to establish whether any natural features of interest, particularly ponds, were located within or adjacent to the study area.

6.4.3 The study area has been subject to previous ecological surveys^{3,4,5} including Phase 1 habitat, badger and reptile surveys, and this information and key findings have been reviewed and referenced in this report for completeness.

Field Survey

6.4.4 An initial Phase 1 ecological survey was undertaken on the 15th September 2014, with the development site and immediate surrounding land were re-surveyed on the 11th / 17th April 2018, 5th April 2019 and 19th May 2020. Surveys were based upon the Phase 1 habitat survey methodology⁶ with standard habitat-type nomenclature used.

6.4.5 A habitat survey to determine type, quality and extent of habitats present. Botanical lists of each habitat type were recorded as far as possible. Rare/scarce and invasive plants were highlighted if found.

6.4.6 A survey to determine the presence of, or the potential for the study area to support, protected and rare / scarce animals, which included looking for the following:

- Potential bat roosting structures or trees in accordance with best practice survey guidelines⁷;
- Potential/actual badger (*Meles meles*) setts, as well as latrines, tracks and other signs (foraging holes, hairs, etc);
- Potential reptile habitat and terrestrial habitat for amphibians, particularly great crested newt (*Triturus cristatus*); and
- Potential for breeding birds to use the site.

6.4.7 The aim of an extended Phase 1 ecological survey is to identify the habitat types present and their relevance to nature conservation, based on species assemblage and structural diversity. It is also to identify the actual or likelihood of protected species inhabiting or frequenting the study area based on field signs or habitat quality/structure etc. The identification of protected, sensitive, threatened or scarce habitat or species within the development site or potentially affected by the proposed

³ Michael Woods Associates (2006). *Extended Phase 1 Survey - Northacre Resource Recovery Centre, Westbury, Wiltshire*

⁴ Michael Woods Associates (2007). *Northacre Resource Recovery Centre, Westbury, Wiltshire – Additional Ecological Surveys*

⁵ Clarkson & Woods (2018). *Reptile Survey – Northacre Road Resource Recovery Centre, Westbury*

⁶ JNCC (2003). *Handbook for Phase 1 habitat survey – a technique for environmental audit*

⁷ Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London*

development could trigger the need for, and subsequent recommendation, for further Phase 2 surveys at an appropriate time of year.

Baseline Environment

Designations

- 6.4.8 There is no European, national or local nature conservation designation covering the study area.
- 6.4.9 There is no European or nationally designated nature conservation site located within 1km of the study area. The nearest European site is the Salisbury Plain Special Area of Conservation (SAC) and Special protection Area (SPA), which is located >3.5 km south east of the study area.
- 6.4.10 The SAC is designated for *Juniperus communis* formations on heaths or calcareous grasslands, semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuca-Brometalia*) (* important orchid sites) and marsh fritillary butterfly (*Euphydryas* [*Eurodryas*, *Hypodryas*] *aurinia*). The SPA is designated for breeding stone curlew (*Burhinus oedicanus*), quail (*Coturnix coturnix*) and hobby (*Falco subbuteo*), and over-wintering hen harrier (*Circus cyaneus*).
- 6.4.11 The nearest nationally designated site is Westbury Iron Stone Site of Special Scientific Interest (SSSI), which is located >1 km south of the study area. This is a geological site of national importance.
- 6.4.12 The study area does not support habitats used by European qualifying bird species, and due to the distance and lack of connective pathways between the study area and these European / nationally designated sites, there are no likely significant effects and they are therefore scoped out of this assessment.
- 6.4.13 There are two locally designated sites located within 1 km of the study area, as follows:
- Westbury Lakes Local Wildlife Site (LWS) located 430m east of the study area, comprising two large open waterbodies; and
 - Fairwood Road Railway Line LWS located 830m south of the study area, comprising scrubby, rabbit-grazed limestone grassland.

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- 6.4.14 Due to the distance and lack of connective pathways between the study area and these locally designated sites, there are no likely significant effects and they are therefore scoped out of this assessment.

Habitats and Botany

- 6.4.15 Six County notable terrestrial plants have been recorded in the local landscape including rat's-tail fescue (*Vulpia myuros*), spreading meadow-grass (*Poa humilis*), yellow-juiced poppy (*Papaver dubium* subsp. *lecoqii*), spotted medick (*Medicago arabica*), cornfield knotgrass (*Polygonum rurivagum*) and tutsan (*Hypericum androsaemum*).
- 6.4.16 The land within the study area comprises a mosaic of rank grassland, tall herb / ruderal vegetation, scrub vegetation and open, hard-standing (including a car-park and tarmac access road). Within the site there are five spoil mounds also supporting a mixture of rank grassland, tall herb/ruderal and scrub vegetation. The majority of the ground within the site is heavy, compacted clayey soil that is water-logged in the winter and after heavy rain, and baked hard in the summer.
- 6.4.17 Flat areas of land support a mix of common and widespread grasses and herbaceous plants typical of disturbed land. Common grasses are dominated by false oat grass (*Arrhenatherum elatius*) and cock's-foot (*Dactylus glomerata*) with bent grass (*Agrostis* sp), meadow fescue (*Festuca pratensis*), tufted hair grass (*Deschampsia cespitosa*) and couch grass (*Elytrigia repens*) also occurring in places. Common reedmace (*Typha latifolia*), branched bur-reed (*Sparganium erectum*), hard rush (*Juncus inflexus*), jointed rush (*Juncus articulatus*) and hairy sedge (*Carex hirta*) are also found in low-lying, damper areas.
- 6.4.18 Flowering plants include nettle (*Urtica dioica*), hemlock (*Conium maculatum*), broad-leaved dock (*Rumex obtusifolius*), cleavers (*Galium aperine*), broad-leaved willowherb (*Epilobium montanum*), rosebay willowherb (*Chamerion angustifolium*), hairy willowherb (*Epilobium hirsutum*), ragwort (*Senecio jacobaea*), hoary ragwort (*Senecio erucifolius*), spear thistle (*Cirsium vulgare*), creeping thistle (*Cirsium arvense*), colt's-foot (*Tussilago farfara*), dandelion (*Taraxacum officinale* agg), prickly sow thistle (*Sonchus asper*), perennial sow thistle (*Sonchus arvensis*), bristly ox-tongue (*Picris echioides*), hogweed (*Heracleum sphondylium*), wall lettuce (*Mycelis muralis*), red clover (*Trifolium pretense*), white clover (*Trifolium repens*),

teasel (*Dipsacus fullonum*), creeping buttercup (*Ranunculus repens*), ribbed melilot (*Melilotus officinalis*), red campion (*Silene dioica*), smooth tare (*Vicia tetrasperma*), black medick (*Medicago lupulina*), broad-leaved plantain (*Plantago major*), mouse ear (*Cerastium holosteoides*), fleabane (*Pulicaria dysentrica*), field bindweed (*Convolvulus arvensis*), square-stalked St John's-wort (*Hypericum tetrapterum*), ground ivy (*Glechoma hederacea*), red dead-nettle (*Lamium purpureum*), white dead-nettle (*Lamium album*), silverweed (*Potentilla anserine*) and selfheal (*Prunella vulgaris*). Small, self-set grey willow (*Salix cinerea*), buddleia (*Buddleja davidii*) and patches of bramble (*Rubus fruticosus* agg) also occur within the site. A small stand of purple loosestrife (*Lythrum salicaria*) also occurs in a low-lying area. A few rubble piles are present in the eastern part of the site.

- 6.4.19 The mounds are generally dominated by a mix of bramble (*Rubus fruticosus* agg), rank grassland or nettle/hemlock (*Urtica dioica/Conium maculatum*), with other species occurring including Russian comfrey (*Symphytum x uplandicum*), bittersweet (*Solanum dulcamara*) and hedge bindweed (*Calystegia sepium*).
- 6.4.20 Immediately outside the southern boundary fence is a strip of formal native and non-native planting comprising ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), rowan (*Sorbus aucuparia*), maple (*Acer* sp), hazel (*Corylus avellana*), shrub honeysuckle (*Lonicera nitida*), holly (*Ilex aquifolium*), blackthorn (*Prunus spinosa*), hornbeam (*Carpinus betulus*), burnet rose (*Rosa pimpinellifolia*), cherry laurel (*Prunus laurocerasus*) and ornamental barberry (*Berberis* sp). Much of this was removed in late 2018, and now comprises regenerating bramble (*Rubus fruticosus* agg) with colonising forbs such as teasel (*Dipsacus fullonum*), broad-leaved dock (*Rumex obtusifolius*), thistles (*Cirsium* sp), willowherb (*Epilobium* sp), mugwort (*Artemisia vulgaris*), bristly ox-tongue (*Picris echioides*) and common grasses such as cock's-foot (*Dactylus glomerata*) and false oat grass (*Arrhenatherum elatius*).
- 6.4.21 Immediately outside the western boundary fence is a remnant and gappy hedgerow that supports hawthorn, elder (*Sambucus nigra*), English elm (*Ulmus procera*), field maple (*Acer campestre*) and bramble.
- 6.4.22 The habitats on-site are common/widespread and of no specific conservation concern (i.e. not rare, scarce or threatened). No habitats or plants occurring on site or immediately outside the boundaries are legally protected or listed in the UK /

Wiltshire Biodiversity Action Plan. The habitats on-site are not a constraint for the Proposed Development.

- 6.4.23 The survey findings are sufficient to establish habitat value, as described above, and to determine appropriate mitigation and enhancement opportunities. Therefore, further Phase 2 botanical surveys are not necessary.

Bats

- 6.4.24 Eight species of bat have been recorded in the local landscape including greater horseshoe (*Rhinolophus ferrumequinum*), lesser horseshoe (*Rhinolophus hipposideros*), myotis species (*Myotis* sp), serotine (*Eptesicus serotinus*), noctule (*Nyctalus noctula*), brown long-eared (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelle (*Pipistrellus pygmaeus*). Of these five species have been recorded foraging/commuting through the trading estate including lesser horseshoe, noctule, brown long-eared, common pipistrelle and soprano pipistrelle.

- 6.4.25 There are no mature trees or other structures suitable for supporting roosting bats within the development site or immediately bordering the study area, and as such bat roosting is not a constraint. Given the current condition of the land within the development site, which supports poor quality vegetation of restricted botanical species diversity, and which will therefore have a correspondingly low invertebrate faunal diversity, the proposed development site is considered to provide very low value foraging habitat for bats. Given the presence of low quality and isolated habitats located within an industrial setting, specific bat transect surveys are not considered appropriate or necessary, which is in accordance with BCT survey guidelines⁸.

Badgers

- 6.4.26 There are three records for badger in the local landscape, including at the Northacre Recovery Resource Centre. In 2006 / 2007 a two hole subsidiary (outlier) badger sett was recorded in the north-western corner of the study area. In addition, other badger

⁸ Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. The Bat Conservation Trust, London

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- diggings and several well-worn mammal paths were also recorded within the site. However, this sett was re-checked in 2012 (Jonathan Adey, pers. comm.) and no evidence of a badger sett was found.
- 6.4.27 During the 2014 survey no evidence of a badger sett was found within or immediately adjacent to the study area. There was also an absence of other clear evidence of badger within the study area with no badger diggings, latrines/dung pits or paths found.
- 6.4.28 During the April 2018 survey a one hole subsidiary (outlier) badger sett was found on the south-western boundary (boundary with Brook Farm) with the set entrance located immediate outside the site boundary palisade fence. From this sett entrance a well-worn badger path ran directly across the site to the north-eastern boundary and then into habitat beyond the perimeter road (still present in May 2020). Other well-worn paths run from the western boundary northwards and then eastwards along the boundary of the adjacent industrial site. In the middle of the study area, on the line of the badger path, a well-used and large (12 dung pits) badger latrine was found, although by May 2020 this latrine has disappeared.
- 6.4.29 The one hole outlier sett on the south-western boundary of the development site was linked by a frequently used 'run' along the north-eastern boundary of Brook Farm which leads to the artificial badger sett located to the immediate south of the Hills Waste Treatment Facility, which is currently occupied by badgers and has four used entrance holes (main sett). In addition, to the immediate west of this main sett is a second one hole subsidiary (outlier) sett located within a hedge on Brook Farm land.
- 6.4.30 The one hole outlier sett on the south-western boundary of the development site was shut down and destroyed, under Natural England licence (Licence No. 2018-36699-SPM-WLM), in November 2018.
- 6.4.31 There is no evidence that badgers inhabit the interior of the development site. All mounds were visually inspected in September 2014, April 2018, November 2018, April 2019 and May 2020 and although most mounds are covered with tall herb/scrub vegetation, much of this vegetation had died back in late 2018 and therefore the area could be inspected with a high degree of certainty. No badger setts were found, with no holes, excavated spoil, excavated bedding or clear runs into mounds identified.

However, given the presence of scrub vegetation a precautionary approach to site clearance is advocated (see mitigation).

- 6.4.32 Mammal runs across the site are also probably contributed to by fox and rabbit, both of which are on-site.

Birds

- 6.4.33 Two nationally protected or notable bird species have been recorded associated with the Northacre trading estate including red kite (*Milvus milvus*) and herring gull (*Larus argentatus*), which were either flying over or foraging.
- 6.4.34 Birds heard or observed during the walkover surveys included common garden and lowland farmland species including wood pigeon (*Columba palumbus*), magpie (*Pica pica*), blackbird (*Turdus merula*), robin (*Erithacus rubecula*), dunnoek (*Prunella modularis*), wren (*Troglodytes troglodytes*), goldfinch (*Carduelis carduelis*), great tit (*Parus major*) and blue tit (*Cyanistes caeruleus*), which were associated with boundary vegetation and interior scrub patches. There is potential for a few common birds to nest within interior scrub patches.
- 6.4.35 The site is unsuitable for ground nesting species being small, enclosed and prone to disturbance by adjacent land use and predation from fox.

Reptiles

- 6.4.36 There are records of common lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*) and grass snake (*Natrix helvetica*) in the local landscape, particularly associated with the railway line/sidings and land much further to the south of the concrete works.
- 6.4.37 A reptile presence-absence survey of the proposed development site was carried out in 2007⁹, and this found no reptiles on-site.

⁹ Michael Woods Associates (2007). Northacre Resource Recovery Centre, Westbury, Wiltshire – Additional Ecological Surveys

6.4.38 A second reptile presence-absence survey of land immediately southeast of the application site was carried out in 2018¹⁰, and this survey again recorded no reptiles on-site.

6.4.39 The application site provides very limited habitat for reptiles, with vegetation in 2018 either having an open structure or being heavily shaded ruderal / scrub vegetation. There are pockets of rank grassland and some refugia piles, however, the ground conditions also make the site sub-optimal for reptiles with site suffering extensive water-logging or becoming baked hard. Given the physical nature and isolated location of this site, which is disconnected from other potential reptile habitat, it is concluded that reptiles are not on-site and are not a constraint for the Proposed Development.

Amphibians

6.4.40 There are records of great crested newt (*Triturus cristatus*) in the local landscape, associated with the open waterbodies located adjacent to and east of the railway line – i.e. disconnected from the application site.

6.4.41 The application site does not contain any ponds and there are no other suitably connected ponds within 500 m of the proposed development site shown on the OS 1:25,000 map. The study area, although well vegetated, provides sub-optimal habitat for newts in their terrestrial phase as it is compacted and prone to drying out during the summer and holding surface water in the winter becoming saturated. As such, great crested newt is not considered to be present on-site and is not a constraint for the Proposed Development.

Future Baseline

6.4.42 The current mosaic of rank grassland, tall herb / ruderal vegetation, scrub vegetation and hard-standing if left unmanaged is likely to lead to an increased extent of scrub, particularly bramble and grey willow, while other quick colonising woody species such as ash, elder and silver birch may also establish and mature. The encroachment of other nuisance woody species, such as buddleia, may also occur.

¹⁰ Clarkson & Woods (2018). *Reptile Survey – Northacre Road Resource Recovery Centre, Westbury*

Smaller areas of tussocky grassland and tall herb vegetation, such as thistles, docks, nettles etc., are also likely to establish between scrub patches.

- 6.4.43 Establishment and maturing scrub vegetation is likely to lead to increased suitable habitat for nesting birds, while the presence of vegetated mounds will always have the potential to be colonised by badger. A more mature scrub habitat is also likely to be better used by foraging bats, but given the industrial setting of the site this is never likely to include rarer / higher conservation bat species. Other notable wildlife, for example great crested newt and reptiles, are extremely unlikely to colonise the site given its isolated nature.

6.5 Assessment of Effects

- 6.5.1 This section sets out the incorporated mitigation, construction / operational phase and cumulative effects. The ecological interpretation of the Air Quality Assessment and information to inform the Habitats Regulation Assessment are referenced in Chapter 8.0 of this ES and Appendices 8-5 and 8-6 respectively.

Incorporated Mitigation

- 6.5.2 Adverse ecological impacts are low given the current very poor quality of habitat present and general absence of legally protected, rare, scarce or notable wildlife within the development footprint.
- 6.5.3 In accordance with national and local biodiversity planning policy and CIEEM best practice ecological impact assessment guidelines, adverse ecological impacts have been removed or significantly reduced by:
- Siting the proposed development within habitats of low ecological value with a general lack of protected/notable wildlife;
 - Siting the proposed development in an existing urbanised, industrial location, which is generally of low value for ecology and wildlife;
 - Avoiding sites designated for nature conservation within the local landscape; and
 - Avoiding and protecting better quality habitats adjacent to or on the boundary of the site including hedgerow.

6.5.4 This protects and significantly minimises adverse impacts on locally important habitat and species found within the local landscape.

6.5.5 A mosaic of semi-natural habitats will be incorporated into the scheme landscaping design to provide benefits for local wildlife.

Construction Phase

6.5.6 The main effect on ecology is associated with site clearance (i.e. removal of soils and vegetation) and construction of foundations (i.e. open trenches, pipework etc.), which may have potential direct effects (e.g. destruction of nesting birds) and indirect effects (e.g. entrapment and injury of badger).

Badger

6.5.7 There is no confirmed badger sett within the application site, but badgers migrate and forage within the development site (important in a Local (site) context). The main sett is located circa 170 m south-east of the application site and will remain unaffected by the Proposed Development.

6.5.8 The construction phase of the Proposed Development has the potential to cause injury / death to migrating / foraging badgers if implemented without appropriate safeguards. If this were to happen this is a negative impact in a Local (site) context. Potential adverse impacts on migrating / foraging badgers will be removed by implementing good site working practices and / or an appropriate scheme design.

Nesting birds

6.5.9 Nesting birds could be present within some of the interior scrub vegetation, particularly bramble patches (important in a Local (Site) context). This vegetation will need to be removed to facilitate the development. If woody, scrub vegetation is removed without appropriate safeguards then there is the potential to damage, destroy or disturb nesting birds. This is a potential negative impact in a Local (site) context, but will be removed through implementing appropriate mitigation.

Operational Phase

- 6.5.10 There are no predicted impacts on ecology associated with the operational phase of the Proposed Development.

Cumulative Effects

- 6.5.11 Given the low level of predicted adverse impacts during the construction phase of the development and absence of predicted adverse impacts during the operational phase of the development, combined with the absence of a significant residual adverse impact on ecology, the following statements regarding the cumulative impact of the proposal can be made:

- The Proposed Development maintains and protects biodiversity, in particular those habitats and species found in the local landscape that are identified as being of national or local priorities; and
- The Proposed Development will not contribute to or compound any existing or future adverse ecological impact that may be manifest within the local landscape.

6.6 Mitigation

Construction Mitigation

Protection of Badger

- 6.6.1 Badgers migrate and forage through and around the development site. To protect and avoid injury / mortality of badgers the following mitigation will be implemented:
- Construction activity will be restricted to normal working hours, which will minimise impacts on the largely, nocturnal badgers.
 - Excavations will be managed appropriately to avoid creating pit-fall traps for badgers and other mammals, for example, all excavations will be appropriately profiled, installed with an escape ramp (plank of wood), covered or back-filled at the end of each working day.
 - Any open pipework with an outside diameter of greater than 120 mm must be covered at the end of each workday to prevent animals entering/becoming trapped.

-
- Should a new sett be discovered or excavated by badgers prior to site clearance, work within a 25 m radius of the entrance must cease and advice should be sought from a suitably qualified ecologist to determine and implement an appropriate plan of action which may include licensed sett closure at a suitable time of year.

6.6.2 If it is not practicable to manage individual excavations or open pipework etc., then the following mitigation will be employed:

- Preventing badger access to the entire development site through installation of badger-proof fencing along the south-western boundary (and potentially part of the north-western and south-eastern boundaries); or
- Appropriately fencing large excavations or discrete areas of the development site with badger-proof fencing to stop ingress of badgers.

Protection of nesting birds

6.6.3 The Proposed Development will remove scrub vegetation potentially available for nesting birds to use. This could result in the damage or destruction of breeding birds, their nests (while in use or being built) or the destruction of bird eggs unless appropriate mitigation action is taken. To ensure compliance with the Wildlife and Countryside Act, 1981 (as amended) the following action is required:

- Undertake any woody, scrub vegetation removal outside the bird breeding season, which is generally considered to be from 1st March to 31st August (to cover all bird species, particularly multiple brood species). This option will avoid the need for a pre-works inspection to determine the presence of nesting/breeding birds.

6.6.4 If this option is not feasible and some or all work has to go ahead within the bird breeding season, as defined above, then the following action will be taken:

- A nesting bird inspection immediately prior to the commencement of the vegetation clearance (maximum of 2 weeks prior to work starting) will be undertaken by a qualified person. If nesting birds or birds constructing a nest are subsequently identified to be present, work in that area must cease until the nest is clear.

-
- 6.6.5 Regardless of the time of year if nesting birds are found in the application site then work in the immediate vicinity should stop and an ecologist consulted to define appropriate mitigation.

Operational Mitigation and Enhancement

- 6.6.6 There is no mitigation associated with the operational phase of the development.
New Habitats
- 6.6.7 The landscaping design incorporates a range of semi-natural habitats including woodland, trees and scrub, pond and associated marginal / bankside wildflower planting, and species-rich wildflower grassland turfs
- 6.6.8 The habitats and planting specifications are shown on the accompanying landscape plan (Figure 5.8) and 'Screen Mound Plan (Ref. NOR-LP02 Rev A), dated September 2018'.
- 6.6.9 These habitats form a linked and contiguous wildlife corridor along the southern, western and northern boundaries of the site, which connect to and strengthen existing linear habitats in the local landscape. These new habitats will allow a variety of local wildlife to inhabit and to exploit for foraging and migration through the local landscape. Target species include bats, badger, birds, common amphibians and both terrestrial and aquatic invertebrates.

6.7 Residual Effects and Conclusions

- 6.7.1 There will be no significant adverse ecological impacts associated with the change in use of this land and construction of the Northacre Facility, with badgers and nesting birds being protected with appropriate mitigation during the construction phase.
- 6.7.2 The Proposed Development would not have adverse impacts on the ability of local wildlife to survive, breed or reproduce, to rear or nurture their young or to hibernate or migrate. The scheme would not adversely affect the local distribution or abundance of nationally or locally notable wildlife species.

-
- 6.7.3 The proposed on and off-site landscape / habitat works would form a linked and contiguous wildlife corridor along the southern, western and northern boundaries of the site, which connect to and strengthen existing linear habitats in the local landscape. These new habitats would allow a variety of local wildlife to inhabit and to exploit for foraging and migration through the local landscape. Target species include bats, badger, birds, common amphibians and both terrestrial and aquatic invertebrates.
- 6.7.4 Given the absence of any residual adverse impacts combined with the integration of a range of linked new semi-natural habitats that diversify habitat niches for a range of local wildlife, the residual ecological effect of the Proposed Development is concluded to be positive at the local scale, as the scheme contributes a net gain for local biodiversity. Thus, the Proposed Development is in accordance with national and local biodiversity policies.

CHAPTER 7.0 NOISE AND VIBRATION

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FIGURES (Volume 2 bound separately)

Figure 7.1	Site Location, Baseline Monitoring Positions
Figure 7.2	Receptor Locations

APPENDICES (Volume 3 bound separately)

Appendix 7-1	Basic Acoustic and Vibration Terminology
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7.0 NOISE AND VIBRATION

7.1 Introduction

7.1.1 This Chapter assesses the likely significant environmental effects from the Northacre Facility (also referred to as the Proposed Development) with regard to noise. It describes the methods used to assess the effects, the baseline conditions that currently exist and potential future baseline in the vicinity of the Site and the potentially affected noise sensitive receptors. The Chapter also sets out direct and indirect likely significant effects arising from the construction and operation of the Northacre Facility and provides details of any additional mitigation measures required beyond those which have been incorporated into the design.

7.1.2 The assessment includes a:

- description of the existing sound environment;
- outline of the likely evolution of the future baseline sound levels;
- identification of construction and operation activities that may cause noise effects;
- predictions of noise levels during the operation phase upon the nearest Noise Sensitive Receptors (NSRs);
- details of potential cumulative effects where noise from other potential developments may also affect the same NSRs; and
- likely residual significant effects taking account additional mitigation.

7.1.3 Potential noise effects are considered in the context of the predicted background sound levels at nearest sensitive receptors, which at this location are likely to be influenced by road traffic, and other existing industrial activities.

7.1.4 Appendix 7-1 provides details of technical terms used within the chapter. There is also a chart showing typical everyday noise levels to assist in understanding the subjective level of noise in terms of decibels (dB).

Competence

- 7.1.5 The author of this Chapter has over 35 years' experience in the field of industrial and environmental acoustics with a Masters' Degree in Acoustics and is a Member of the Institute of Acoustics, Member of the Association of Noise Consultants, Member of the Academy of Experts and an Incorporated Engineer.

7.2 Legislation, Policy and Guidance

National Planning Policy

The National Planning Policy Framework (February 2019)

- 7.2.1 Chapter 15 of the National Planning Policy Framework (NPPF) relates to 'Conserving and enhancing the natural environment'.
- 7.2.2 Paragraph 170 e) refers directly to noise and states that: *"e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;"*
- 7.2.3 Paragraph 180 also states: *"180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life⁶⁰;*
 - b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.”

7.2.4 The Noise Policy Statement for England (NPSE) was published in March 2010. It specifies the following long-term vision and aims:

“Noise Policy Vision: Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

This long-term vision is supported by the following aims:

Noise Policy Aims

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life.”*

7.2.5 The NPSE introduced three concepts to the assessment of noise, as follows:

NOEL – No Observed Effect Level: This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

LOAEL – Lowest Observable Adverse Effect Level: This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level: This is the level above which significant adverse effects on health and quality of life occur.

- 7.2.6 The above categories are undefined in terms of noise levels and for the SOAEL the NPSE indicates that the noise level will vary depending upon the noise source, the receptor and the time of day/day of the week, etc. The need for more research is therefore required to establish what may represent a SOAEL. It is acknowledged in the NPSE that not stating specific SOAEL levels provides policy flexibility until there is further evidence and guidance.
- 7.2.7 The NPSE indicates how the LOAEL and SOAEL relate to the three aims listed above. The first aim of NPSE requires that: *“significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development.”*
- 7.2.8 The second aim of the NPSE (mitigating and minimising adverse impacts on health and quality of life) refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate adverse effects on health and quality of life whilst also taking into account the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur, as there may be situations where there is a limit to the effect of mitigation to try and minimise impacts, due to other essential operational requirements.
- 7.2.9 The third aim envisages pro-active management of noise to improve health and quality of life, again taking into account the guiding principles of sustainable development.

Planning Practice Guidance

- 7.2.10 In March 2014, the Government published the National Planning Practice Guidance (NPPG) on noise, which provides further information in respect of new developments which may be sensitive to the prevailing noise environment.
- 7.2.11 The NPPG refers to the NPPF and NPSE documents and under the heading ‘How to determine the noise impact?’ it states: *“Local planning authorities’ plan-making and decision taking should take account of the acoustic environment and in doing so consider:*
- *whether or not a significant adverse effect is occurring or likely to occur;*

- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.”*

7.2.12 The NPPG includes a table summarising the noise exposure hierarchy, based on the likely average response. Table 7.1 below provides the perception, example of outcome, effect and action required relative to noise.

Table 7.1: Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect (NOEL)	No Specific Measures Required
Noticeable and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect (NOAEL)	No Specific Measures Required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Observed Adverse Effect	Prevent

Guidance and Standards

BS4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

7.2.13 BS4142: 2014+A1:2019 is based on the measurement of background sound using L_{A90} noise measurements, compared to source noise levels measured in L_{Aeq} units. Once any corrections have been applied for source noise tonality, distinct impulses etc., the difference between these two measurements (i.e. known as the 'rating' level) determines the impact magnitude.

- Typically, the greater the difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact (although this can be dependent on the context).
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is, relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact (although this can be dependent on the context).

7.2.14 In order to establish the rating level, corrections for the noise character need to be taken into consideration. The Standard states that when considering the perceptibility: *"Consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention."*

7.2.15 The subjective method adopted includes the character corrections set out in Table 7.2.

Table 7.2: BS4142: 2014+A1:2019 Character Corrections

Level of Perceptibility	Correction for Tonal Character dB	Correction for Impulsivity dB	Correction for Intermittency dB	Correction for Other Character' dB
Not perceptible	0	0	0	0
Just perceptible	+2	+3	0	0
Clearly perceptible	+4	+6	+3*	+3*
Highly perceptible	+6	+9	+3*	+3*

*Standard defines this should be readily distinctive against the residual acoustic environment, it is interpreted therefore to be either clearly or highly perceptible as a character.

If characteristics likely to affect perception and response are present in the specific sound, within the same reference period, then the applicable corrections ought normally to be added arithmetically. However, if any single feature is dominant to the exclusion of the others then it might be appropriate to apply a reduced or even zero correction for the minor characteristics

BS8233: 2014 'Guidance on sound insulation and noise reduction for buildings'

7.2.16 The British Standard BS8233 provides additional guidance on noise levels within buildings. These are based on the World Health Organisation (WHO) recommendations and the criteria given in BS8233 for unoccupied spaces within residential properties.

7.2.17 The guidance provided in section 7.7 of BS8233 provides recommended internal ambient noise levels for resting, dining and sleeping within residential dwellings. Table 7.3 provides detail of the levels given in the standard.

Table 7.3: BS8233: 2014 Indoor Ambient Noise Levels for Dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB LAeq,16hours	-
Dining	Dining room/area	40 dB LAeq,16hours	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16hours	30 dB LAeq,8hours
Study and work requiring concentration	Staff/Meeting Room, Training Room Executive Office	35-45dB LAeq8hours 35-45dB LAeq8hours	

7.2.18 This standard would be appropriate to apply to existing or proposed residential development. The Site noise contribution should be within the proposed internal noise levels, which would include the following noise limits:

- Living room areas: $\leq 35\text{dB LAeq,16hours}$ (0700-2300 hours) [equivalent to an external level of approximately 65dB LAeq,16hours based on typical standard

double-glazed units in the closed position and approximately 50dB $L_{Aeq,16hours}$ in the open position].

- Bedrooms: $\leq 30dB L_{Aeq,8\text{ hours}}$ (2300-0700 hours) [equivalent to an external level of approximately 60dB $L_{Aeq,8hours}$ based on typical standard double-glazed units in the closed position and approximately 45dB $L_{Aeq,8hours}$ in the open position].
- Offices: 35dB-45dB $L_{Aeq, 8hours}$ [equivalent to an external level of approximately 65dB-75dB $L_{Aeq, 8hours}$ based on typical standard double-glazed units in the closed position].

7.2.19 The above internal bedroom limits would comply with sleep disturbance criteria defined by WHO. The WHO night noise guidelines for Europe refers to sleep disturbance limit of 42dB-45dB L_{Amax} for regular peak events within bedrooms (which is approximately 57dB-60dB L_{Amax} external to the bedroom window in the open position).

World Health Organisation Guidelines for Community Noise: April 1999

7.2.20 This document provides further updated information on noise and its effects on the community. Within the document for noise 'In Dwellings' it states that 'To enable casual conversation indoors during daytime, the sound level of interfering noise should not exceed 35dB L_{Aeq} . To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB L_{Aeq} on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50dB L_{Aeq} . Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development.'

World Health Organisation (2009) – Night noise guidelines for Europe

7.2.21 The WHO regional office for Europe set up a working group of experts to provide scientific advice to the Member States for the development of future legislation and policy action in the area of assessment and control of night noise exposure.

Considering the scientific evidence on the thresholds of night noise exposure indicated by $L_{\text{night, outside}}$ as defined in the Environmental Noise Directive (2002/49/EC), an $L_{\text{night, outside}}$ of 40dB should be the target of the night noise guidance (NNG) to protect the public, including the most vulnerable groups such as children, the chronically ill and the elderly. $L_{\text{night, outside}}$ value of 55dB is recommended as an interim target for the countries where the NNG cannot be achieved in the short term for various reasons, and where policy-makers choose to adopt a stepwise approach.

World Health Organisation 'Environmental Noise Guidelines for the European Region': 2018

- 7.2.22 The objective of the 'Environmental Noise Guidelines for the European Region' is stated in the Executive Summary of the report: *"The main purpose of these guidelines is to provide recommendations for protecting human health from exposure to environmental noise originating from various sources: transportation (road traffic, railway and aircraft) noise, wind turbine noise and leisure noise. Leisure noise in this context refers to all noise sources that people are exposed to due to leisure activities, such as attending nightclubs, pubs, fitness classes, live sporting events, concerts or live music venues and listening to loud music through personal listening devices. The guidelines focus on the WHO European Region and provide policy guidance to Member States that is compatible with the noise indicators used on the European Union's END."*

*Integrated Pollution Prevention and Control (IPPC) - Technical Guidance Note
IPPC H3 Part 2 – Noise Assessment & Control*

- 7.2.23 Integrated Pollution Prevention and Control (IPPC) is a regulatory system that employs an integrated approach to control the environmental impacts of certain industrial activities. It involves determining the appropriate controls for industry to protect the environment through a single permitting process. To gain a Permit, operators have to show that they have systematically developed proposals to apply the 'Best Available Techniques' (BAT) and meet certain other requirements, taking account of relevant local factors.

- 7.2.24 In terms of noise specifically, the use of BAT has to be considered and balanced within the wider context of other releases to different media (air, land and water) and taking issues such as usage of energy and raw materials into account. Noise cannot therefore be considered in isolation from other impacts on the environment.
- 7.2.25 The definition of pollution includes “*emissions which may be harmful to human health or the quality of the environment, cause offence to human senses or impair or interfere with amenities and other legitimate uses of the environment*”. BAT is therefore likely to be similar, in practice, to the requirements of the Statutory Nuisance legislation which requires the use of “best practicable means” to prevent or minimise noise nuisance. In the case of noise, “offence to human senses” may be judged by the likelihood of complaints. However, the lack of complaint should not necessarily imply the absence of a noise problem. In some cases it may be possible, and desirable, to reduce noise emissions still further at reasonable costs and this may therefore be BAT for noise emissions.
- 7.2.26 Consequently, the aim of BAT should be to ensure that there is no reasonable cause for annoyance to persons beyond the installation boundary.
- 7.2.27 In summary, the aim of BAT should be to achieve the following:
- Underpinning of good practice, a basic level of which the operator should employ for the control of noise including adequate maintenance of any parts of plant or equipment whose deterioration may give rise to increases in noise. For example, this would include bearings, air handling plant, the building fabric as well as specific noise attenuation measures associated with plant, equipment or machinery.
 - Noise levels should not be loud enough to give reasonable cause for annoyance for persons in the vicinity, which is a more appropriate environmental standard than that of Statutory Nuisance and is normally the aim of most planning or other conditions applied by Local Authorities.
 - Prevention of ‘*creeping background*’ (i.e. creeping ambient L_{Aeq}), which is the gradual increase in sound levels as industry expands and areas develop.

- 7.2.28 The indicative requirements apply to both new and existing activities but it is more difficult to justify departures from them in the case of new activities. Indeed, because the requirements for noise are likely to be strongly influenced by the local environmental conditions, new installations are expected to meet BAT from the outset and to demonstrate that noise reduction or prevention has been built into the process design. For most existing plant, especially where there are no existing noise limits, the focus is on good practice (BAT) and the need to ensure that there is no reasonable cause for annoyance. In assessing any noise impact, it is more normal to monitor existing levels and apply corrections and calculations, rather than rely on predictions.
- 7.2.29 The guidance makes reference to BS4142:1997, BS8233:1999 and WHO guidance for absolute levels for protection of community annoyance. The two British Standards have been updated since the guidance was published and the latest versions have been considered in this assessment.

Road Traffic Noise

- 7.2.30 No guidance exists for assessing increased traffic noise on existing roads as a result of traffic generated by new developments. However, any change in noise levels along affected roads would be relevant to subsequent planning applications.
- 7.2.31 The standard index used in the UK for describing road traffic noise is LA10, which is the 'A' weighted sound level in dB exceeded for 10% of the assessment period (ref. LA 111 Terms and Definitions). Daytime noise is assessed using the 18-hour LA10, following the methodology given in the Department of Transport's Calculation of Road Traffic Noise (CRTN).
- 7.2.32 For the Northacre Facility it is proposed that the majority of HGV movements would be restricted to daytime periods. Therefore, an assessment has been undertaken on the impact of road traffic in relation to the increase in noise level based on a 18-hour average using an LA10 index in accordance with DMRB LA 111 methodology.

- 7.2.33 For road traffic noise, the CRTN calculation method can be used to predict noise levels from the movement of traffic along adjacent roads. Post-development predicted noise levels at sensitive receptors can be compared with predicted noise without the Northacre Facility, to establish any likely significant increase in overall traffic noise.
- 7.2.34 Traffic data for the CRTN assessment presented in this chapter is based on the figures contained within the Transport Assessment (TA), Chapter 10.0, Appendix 10-1. The TA sets out existing and predicted traffic data for the assessment year based on established growth factors and known committed developments. In this regard the impact of road traffic noise is inherently a cumulative assessment.
- 7.2.35 According to CRTN where the traffic flow volumes are very low (i.e. where traffic flows below 50 vehicles per hour or 1000 vehicles per 18 hours) then the CRTN methodology is unreliable (ref. paragraph 30 of CRTN). For the assessment of on-site traffic, ISO9613-2 calculation methodology using a 'line source' to represent moving vehicles with appropriate speed and empirical sound power levels obtained from other similar sites in the UK has been used.

BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites

- 7.2.36 This scope of the standard that is relevant to construction noise is clarified as follows: *“This part of BS5228 gives recommendations for basic methods of noise control relating to construction and open sites where work activities/operations generate significant noise levels, including industry-specific guidance. The legislative background to noise control is described and recommendations are given regarding procedures for the establishment of effective liaison between developers, site operators and local authorities. This part of BS5228 provides guidance concerning methods of predicting and measuring noise and assessing its impact on those exposed to it.”* [Reference: BS5228-1-A1: 2014 page 1, section 1].
- 7.2.37 Part 1 deals with noise in terms of background legislation and gives recommendations for basic methods of noise control relating to construction

and open sites where significant noise levels may be generated. The guidance is aimed at giving advice on achieving 'best practice' in controlling noise and vibration from construction and open sites. There is an example of noise limits given in Annex E, which sets out cut-off limits between 65dB(A) and 75dB(A) or 5dB(A) above the ambient noise, whichever is the greater. Part 2 of BS 5228 deals specifically with vibration control and provide the legislative background to the control of vibration and recommendations for controlling vibration at source and management controls (e.g. liaison with communities, supervision, preparation and choice of plant etc.).

Ground Vibration

- 7.2.38 Most of the available data relating to the effects of ground vibration on buildings have been obtained during tests using explosives. From these studies, two regimes of building damage have evolved, those of structural damage involving major failures of whole or parts of buildings and architectural damage involving cracking plaster or other brittle materials.
- 7.2.39 Recent International and British Standards define and categorise building damage under three main headings:
- a) Cosmetic - the formation of hairline cracks on drywall surfaces or the growth of existing cracks in plaster or drywall surfaces. In addition, the formation of hairline cracks in mortar joints of brick / concrete block construction.
 - b) Minor - the formation of large cracks or loosening and falling of plaster or drywall surfaces, or cracks through bricks/concrete blocks.
 - c) Major - damage to structural elements of the building, cracks in support columns, loosening of joints, splaying of masonry cracks, etc.
- 7.2.40 An investigation into the effects of induced vibration undertaken by the British Standards Institution (BSI) has culminated in BS7385:1993; Part 2 which gives guide values to prevent cosmetic damage to property of 15 to 20mms⁻¹ between 4Hz and 15Hz, whilst above 40 Hz the guide value is 50mms⁻¹. The Standard gives guidance on the levels of vibration (i.e. peak particle velocity in mms⁻¹) above which building structures could be damaged. Strains imposed on a

building by ground motion will tend to be greater if lower frequencies (in Hz) predominate.

7.2.41 The BSI suggests reducing these figures by a factor of 50% for continuous vibration, for example from rail traffic, thus the values become 7.5-10mms⁻¹ at 4-15Hz, and 25.0mms⁻¹ at 40Hz and above.

7.2.42 With regard to the threshold of cosmetic damage, for continuous vibration such as road or rail traffic, levels below 5.0mms⁻¹ are unlikely to be significant. For a given level of vibration the risk of damage decreases as the frequency of that vibration increases.

7.2.43 BS5228-2:2009 Annex B Table B.1 gives guidance on the effects of vibration levels, which is summarised in Table 7.4.

Table 7.4: Guidance on Effects of Vibration Levels

Vibration Level mm.s ⁻¹	Effect
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments.
1.0	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10	Vibration is likely to be tolerable for any more than a very brief exposure to this level.

7.2.44 In terms of response limits of buildings BS5228-2:2009 (Annex B, Table B.2) refers to BS7385-1 and BS7385-2 and sets out guide values for transient vibration for cosmetic damage, which gives a low frequency limit of 15mm/sec (4Hz) increasing to 20mm/sec at 15Hz for residential or light commercial buildings. For reinforced or framed structures the limit is 50mm/sec at 4Hz and above.

Vibration Nuisance

- 7.2.45 The human body is very sensitive to vibration and therefore can result in subjective concern being expressed at energy levels well below the threshold of damage.
- 7.2.46 Guidance on the human response to vibration in buildings is found in British Standard BS 6472-1:2008. Weighting curves relating to human response to vibration of buildings are presented within this chapter. Estimates are given on the probability of adverse comment, which might be expected, from human beings experiencing vibration in buildings. This is based on a vibration dose value (VDV), assessed from frequency weighted vibration measurements and based on a 16-hour day and 8-hour night period as set out in BS6472-1:2008.
- 7.2.47 For the purposes of assessing the potential to cause nuisance the guidance in BS6472-1:2008 has been used.

7.3 Assessment Methodology

Methodology

Noise Predictions

- 7.3.1 In terms of noise predictions this assessment has used the calculation method based upon ISO9613-2, which is an internationally recognised methodology, which takes into account source distance, screening effects, operating time and direction in relation to the nearest sensitive receptor. The noise model includes suitable calculation method settings and assumes that all relevant plant is operational to ensure the highest likely noise levels are assessed. Appendix 7-5 and 7-6 provide further detail of the noise model settings and assumptions made in respect of plant noise levels.
- 7.3.2 The plant noise levels assumed within this assessment have been based on actual noise levels measured at other similar sites in the UK and from advice provide from Technology Providers who are involved in the detailed design of such developments.

Level and Significance of Effect

7.3.3 The level of an effect is a function of the sensitivity or importance of the receiver, or receptor, and the scale or magnitude of the effect. In the case of this assessment the level of the effect has been determined by reference to existing guidance and standards outlined below.

7.3.4 The receptors identified for the assessment include:

- Residents of existing houses adjacent to the Site who could experience site construction noise during daytime periods;
- Residents of existing houses adjacent to the Site who could experience site operational noise during daytime and night-time periods; and
- Residents of existing houses who could experience additional road noise during the construction and operation of the Northacre Facility.

Magnitude of Effect

Construction Noise

7.3.5 For residents of houses that could be exposed to construction noise, BS5228:2009+A1:2014 is considered to be the appropriate standard. This standard does not prescribe limits but requires 'best practicable means' ("BPM") to be employed to control noise generation. The criterion therefore is that BPM should be employed, and conditions implemented for example to restrict construction noise to non-sensitive hours.

7.3.6 The construction impact semantic scale, set out in Table 7.6 below, is based on the ABC method of assessment described in Annex E.3.2 of BS5228, which sets out threshold values depending upon the ambient noise at receptors, which have been determined from the baseline sound survey.

7.3.7 According to the guidance found within the DMRB LA 111, the lowest observable adverse effect level (LOAEL) and significant observable adverse effect level (SOAEL) for noise sensitive receptors during construction are shown in Table 7.6.

Table 7.6: Construction Time Period - LOAEL and SOAEL

Time period	LOAEL	SOAEL	Threshold level LAeq _{1hr} dB
Day (0700-1900 hours Weekday and 0700-1200 Saturdays)	Baseline noise levels LAeq,T	Threshold level determined as per BS5228-1:2009+A1:2014 Section E3.2 and Table E.1 BS 5228-1:2009+A1:2014	65-75
Night (2300-0700 hours)	Baseline noise levels LAeq,T	Threshold level determined as per BS5228-1:2009+A1:2014 Section E3.2 and Table E.1 BS 5228-1:2009+A1:2014	45-55
Evening and weekends (time periods not covered above)	Baseline noise levels LAeq,T	Threshold level determined as per BS5228-1:2009+A1:2014 Section E3.2 and Table E.1 BS 5228-1:2009+A1:2014	55-65

7.3.8 The magnitude of impact for construction noise is outlined in Table 7.7 (as defined in DMRB LA 111).

Table 7.7: Magnitude of Impact for Construction Noise

Magnitude of impact	Construction noise level
Negligible	Below LOAEL
Minor (Slight)	Above or equal to LOAEL and below SOAEL
Moderate	Above or equal to SOAEL and below SOAEL +5dB
Major (Substantial/Severe)	Above or equal to SOAEL +5dB

Construction Road Traffic Noise

7.3.9 According to the LA 111 guidelines, the magnitude of impact at noise sensitive receptors from construction traffic is set out in Table 7.8.

Table 7.8: Magnitude of Impact for Construction Road Traffic Noise

Magnitude of impact	Increase in basic noise level of closest public road used for construction traffic (dB)
Negligible	Less than 1.0
Minor (Slight)	Greater than or equal to 1.0 and less than 3.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Major (Substantial/Severe)	Greater than or equal to 5.0

Note: Construction noise and construction traffic noise shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

- 1) 10 or more days or nights in any 15 consecutive days or nights;
- 2) a total number of days exceeding 40 in any 6 consecutive months.

Construction Phase – Vibration

- 7.3.10 For construction phase vibration the LOAEL and SOAEL is set out in DMRB LA 111 and provided in Table 7.9.

Table 7.9: Construction Vibration LOAELs and SOAELs

Time period	LOAEL	SOAEL
All time periods	0.3mm/sec PPV	1.0mm PPV

- 7.3.11 The magnitude of impact for construction vibration is therefore determined in accordance with Table 7.10, as defined in DMRB LA 111.

Table 7.10: Magnitude of Impact for Construction Vibration

Magnitude	Vibration level
Negligible	Below LOAEL
Minor (Slight)	Above or equal to LOAEL and below SOAEL
Moderate	Above or equal to SOAEL and below 10mm/s PPV
Major (Substantial/Severe)	Above or equal to 10mm/s PPV

Note: Construction vibration shall constitute a likely significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

- 1) 10 or more days or nights in any 15 consecutive days or nights; or
- 2) a total number of days exceeding 40 in any 6 consecutive months.

Operational Noise

- 7.3.12 Table 7.11 shows the proposed impact magnitude methodology considering the guidance contained within BS4142: 2014+A1:2019 for fixed and mobile plant noise (e.g. fans, turbines and on-site HGV movements etc.).

Table 7.11: Impact Magnitude Scale - Future Noise against Existing (BS4142: 2014+A1:2019)

Rating level above background noise dB(A) as BS4142: 2014+A1:2019	Description of Effect	Impact Magnitude	PPG Effect Level
-10 to 0	No discernible effect on the receptor	Negligible	NOEL to NOAEL
+0.1 to +4.4	Non-intrusive - Noise impact can be heard but does not cause any change in behaviour or attitude. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Slight	LOAEL
+4.5 to +9.4	Intrusive - Noise impact can be heard and causes small changes in behaviour and/or attitude. Affects the character of the area such that there is a perceived change in the quality of life. Potential for non-awakening sleep disturbance.	Moderate	LOAEL to SOAEL
9.5 or greater	Disruptive – Causes a material change in behaviour and/or attitude e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty getting to sleep. Quality of life diminished due to change in character of the area.	Substantial	SOAEL
Undefined**	Physically Harmful – Significant changes in behaviour and/or inability to mitigate effect of noise leading to psychological stress or physiological effects e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm.	Severe	UOAEL

Note: The 'rating' level is the difference between the noise contribution from site and the existing background sound level allowing for any adjustments required for noise characteristics (i.e. tonal, impulsive or intermittent noise character). The Standard advises that rounding of numbers to one decimal place should relate to levels of 0.5dB or above, which is reflected in the table limits. The impact magnitude scales in Tables 7.11 to 7.12 are used in the assessment of operational noise impacts.

7.3.13 The Institute of Environmental Management and Assessment (IEMA) has provided 'Guidelines for Environmental Noise Impact Assessment'. The guidelines set out an example of how changes in noise level may be assessed in terms of residual LAeq. This assists in determining the impact of Site operational noise relative to the context of the noise climate, which is detailed in Table 7.12.

Table 7.12: Impact Magnitude Scale – General Site Noise

Change in sound levels LAeq dB	Description of Effect	Impact Magnitude	PPG Effect Level
< +2.9	No discernible effect on the receptor	Negligible	NOEL
+3.0 to +4.9 (high receptor sensitivity)	Non-intrusive - Noise impact can be heard but does not cause any change in behaviour or attitude. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Slight	NOAEL
+5.0 to +9.9 (high receptor sensitivity)	Intrusive - Noise impact can be heard and causes small changes in behaviour and/or attitude. Affects the character of the area such that there is a perceived change in the quality of life. Potential for non-awakening sleep disturbance.	Moderate	LOAEL
10 or greater (high receptor sensitivity)	Disruptive – Causes a material change in behaviour and/or attitude e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty getting to sleep. Quality of life diminished due to change in character of the area.	Substantial	SOAEL
Undefined*	Physically Harmful – Significant changes in behaviour and/or inability to mitigate effect of noise leading to psychological stress or physiological effects e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm.	Severe	UOAE

Road Traffic Noise

7.3.14 To assess the likely impact on NSRs from noise due to increased traffic on the local road network associated with the Northacre Facility, noise calculations have been undertaken using CRTN methodology and traffic flow information for the Northacre Facility.

7.3.15 The DMRB LA 111 provides guidance on the magnitude of change in terms of road traffic noise. The procedure for assessing noise impacts advises the use of a LA₁₀ measurement index based on a daytime 18-hour time period (i.e. 0600 to 2400 hours) and night-time period (i.e. 0000-0600 hours). Further assessment of the impact would be required where changes of 1dB(A) or more are expected in the short-term and changes of 3dB(A) in the long term.

7.3.16 DMRB LA 111 defines the short term and long-term scenarios are considered to represent the situation when a new road opens (short term) and 15 years

after a road opens (long term). The magnitude of change criteria are set out in Table 7.13 for the short term and 7.14 for the long term.

Table 7.13: Magnitude of Change – Road Traffic Noise- Short Term

Short term magnitude	Short term noise change (dB L _{A10,18hr} or L _{night})
Negligible	Less than 1.0
Minor (Slight)	1.0 to 2.9
Moderate	3.0 to 4.9
Major (Substantial/Severe)	Greater than or equal to 5.0

Table 7.14: Magnitude of Change – Road Traffic Noise- Long Term

Long term magnitude	Long term noise change (dB L _{A10,18hr} or L _{night})
Negligible	Less than 3.0
Minor (Slight)	3.0 to 4.9
Moderate	5.0 to 9.9
Major (Substantial/Severe)	Greater than or equal to 10.0

Receptor Sensitivity

7.3.17 In order to determine the level of the effect, not only must the magnitude of impact be determined but also the sensitivity of the receptors. Receptor sensitivity for this assessment is outlined in Table 7.15.

Table 7.15: Receptor Sensitivity

Receptor Sensitivity	Type of Receptor
High	Dwellings/residential properties including houses, flats, old people's homes, hospitals, schools, churches, caravans and open spaces/conservation areas.
Moderate	Commercial premises including retails and offices etc.
Low	Industrial premises including warehouses and distribution etc.

Level of Effect

7.3.18 Based upon the assessment of impact magnitude and the sensitivity of individual receptors, the matrix shown in Table 7.16 has been developed in order to provide an indication of the possible level of effect for each predicted noise impact. Given that there are many factors which may affect the level of

the effect of an impact, not least, the character of the noise and timescales over which the noise operates, the overall level of effect must be assessed on an individual basis using professional judgement and experience. Therefore, whilst the matrix provides a useful indication of the likely significance it cannot be applied in all situations.

Table 7.16: Level of Effect Matrix

Impact Magnitude	Receptor Sensitivity		
	High	Moderate	Low
Severe	Major	Major/Moderate	Moderate/Minor
Substantial	Major/Moderate	Moderate	Minor
Moderate	Moderate	Moderate/Minor	Minor/Neutral
Slight	Minor	Minor/Neutral	Neutral
No significant impact (negligible)	Neutral	Neutral	Neutral

7.3.19 Where a level of effect is defined as Major or Major/Moderate then the effect is likely to be considered significant.

Scope

7.3.20 The noise assessment identifies potential noise impacts associated with the Northacre Facility on neighbouring NSR during both construction and operation. The scope of the assessment and agreement reached in terms of baseline methodology, NSRs, appropriate guidance and standards and noise limits with consultee is detailed in Table 7.5. The assessment will also consider any impacts from vibration during the construction and operation phased works and identify any cumulative effects along with other proposed developments area.

Limitations

7.3.21 The baseline levels have been based on historical data due to the restrictions on movement and effective operation of local businesses and therefore any update has not been possible. The historical data however is based on agreed positions and methodology with the Local Authority EHO and the latest survey work was undertaken in 2018 and should therefore provide a good indication of representative baseline levels.

7.4 Baseline

Data Sources

7.4.1 The following sources of data have been used in order to support and undertake analysis of baseline levels and noise predictions:

- a) Baseline sound data from a survey undertaken in October 2014 by Enzygo for the planning submission for the proposed Gasification Facility (planning consent ref. 14/12003/WCM).
- b) Baseline sound data from a survey undertaken in March 2018 by iON Acoustics for the Advanced Thermal Treatment Facility (planning consent ref. 18/09473/WCM).
- c) Empirical noise level data for external plant and reverberant sound pressure levels for plant operating within specific buildings from library data obtained by NVC Ltd at a number of EfW sites in the UK and from empirical data provided by Technology Providers who have designed, built and measured noise levels from this type of plant and facility.

Baseline Survey

7.4.2 Due to the restriction of movement and operation of business during the Covid 19 period, the above baseline sound survey study work is considered to be appropriate to reference as this was carried out in the vicinity of the Site to determine existing representative background and residual sound levels for a similar facility and the latest survey was undertaken less than 2 years ago. The aim of the sound surveys was to:

- identify the existing baseline sound levels for use as a reference for background and residual sound levels in the assessment of impacts relating to the construction and operation of the Northacre Facility;
- enable the assessment baseline to be established to understand the effects of existing developments on the future baseline; and
- characterise the nearest noise sensitive receptors (NSRs) or noise sensitive sites.

7.4.3 The most recent baseline sound survey was undertaken between 21st February and 7th March 2018 at one fixed long-term monitoring position in proximity to the NSR and five spot roaming noise monitoring locations to give an indication of typical baseline sound levels at more distant NSRs. The older survey results from October 2014 (by Enzygo) are also presented for further information. The background sound survey was carried out in accordance with the advice given in BS4142.

7.4.4 Following a review of previous noise studies, the following locations for noise monitoring were identified in the Ion Acoustics noise assessment report (approximate and similar locations had been originally agreed in 2014 for the ES submission with the EHO at Wiltshire Council).

Table 7.17: Noise Monitoring Locations (iON Acoustics Survey)

Location Reference	Description	Approximate Ordnance Survey Co-ordinates (E, N)
M01	Unattended logging station in the vicinity of Stephenson Road, close to the junction with Brook Lane.	385831, 152051
M01a	Attended monitoring location on Brook Lane, in the vicinity of the residential property at Brookfield.	385921, 152035
M02	Attended monitoring location off Oldfield Road to the south east of the proposed site, close to the railway lines and the residential properties.	386323, 151551
M03	Attended monitoring location off Storridge Road to the north east of the site.	385887, 152370
M04	Attended monitoring location to the south west of the site, approximately 160m from the existing MBT facility. This is in the vicinity of Orchard House receptor.	385566, 151779
M05	Attended monitoring location in the vicinity of Brook Cottage, approximately 600m to the west of the existing MBT Facility.	385045, 151896

7.4.5 The above monitoring positions represent the nearest receptors in different directions from the Site as noise levels reduce relative to increasing distance (under normal environmental and assessment conditions) then impacts at other more distant NSRs will experience a similar or lower impact. Refer to Figure 7.1.

- 7.4.6 Although ambient noise levels can vary depending on weather conditions, the purpose of the baseline survey was to monitor sound levels under suitable weather conditions. This then provides a typical and representative indication of ambient conditions. The effect of wind on noise levels can be significant, as an example, BS8233: 2014 (Ref. Paragraph 6.8) states: *“Whether noise levels are measured or predicted, wind gradients, temperature gradients and turbulence affect the level of received sound and audibility over short periods. The magnitude of these effects, i.e. variations in noise level and audibility, increases with increasing distance between source and receptor. The effects are asymmetrical and, for distances of 500m to 1000 m, typically range from increasing the level by typically 2 dB downwind to reducing it by typically 10 dB upwind. It is not usually practicable to use these factors in design, but the prevailing wind direction should be considered when planning building orientation. Noise from wind and precipitation, including the wind-generated noise from trees, can also affect noise measurements.”*
- 7.4.7 For the purpose of this assessment, it is assumed that monitoring and assessment of operational noise from the Northacre Facility is undertaken under appropriate weather conditions and therefore any significant positive or negative vector from wind direction is not representative. The effect of wind speed and direction can also increase background noise levels thereby masking any potential increase in site-specific noise levels. For this reason, it is assumed that typical weather conditions apply and no increase or decrease for the wind vector is required. Any monitoring periods where rainfall occurred were removed from the data set by iON Acoustics for determination of baseline levels.
- 7.4.8 In consideration that monitoring positions and locations represent a good indication of existing baseline levels. This can then be referenced for the assessment of impacts for the Northacre Facility future operation.
- 7.4.9 The baseline methodology and the results presented to Wiltshire Council for the two previous planning application were accepted as being a reasonable assessment of representative sound levels at receptors.

Environmental Baseline

Existing Baseline Scenario

- 7.4.10 The Site is located on the Northacre Trading Estate, Westbury, Wiltshire and is accessed from Stephenson Road. The site is surrounded by commercial/ industrial uses with the nearest residential dwellings to the east, on Brook Lane, approximately 60m from the site boundary.
- 7.4.11 The local sound environment is therefore generally formed by a mixture of noise from transport links and local industry.
- 7.4.12 The baseline sound monitoring positions are representative of the area and NSRs surrounding the Site (shown on Figure 7.1). The noise monitoring positions are representative of residential properties adjacent to the development and provide broadband data of the existing sound climate at these receptors.
- 7.4.13 The results of measurements taken at the fixed monitoring positions are presented in Tables 7.18 to 7.19 and detailed measurements are provided in Appendix 7-3.

Table 7.18: Established Background Sound Levels at Monitoring Positions (Daytime) by iON Acoustics & Enzygo

Receptor (Refer to Figure 7.1)	Monitoring Location	LAeq dB	Enzygo LAeq dB	Representative LA90 dB	
		iON	Enzygo	iON 2018	Enzygo 2014
R1: Orchard House	M04	52	47-50	45	42-48
R2: Crosslands/Brookfield	M01	52-54	52-53	42*	40-48
R3. Storridge Road	M03	67	70	44	50
R4. Oldfield House	M02	66	71	55	49
R5. Brook Lane	M03	67	68	44	60
R6. Brook Cottage	M05	43	51	33	37

*The modal value used for this long-term monitoring position as it is lower than the mean value.

Table 7.19: Established Background Sound Levels at Monitoring Positions (Night-time) by iON Acoustics & Enzygo

Receptor (Refer to Figure 7.1)	Monitoring Location	L _{Aeq} dB	Enzygo L _{AeqdB}	Representative L _{A90} dB	
		iON	Enzygo	iON 2018	Enzygo 2014
R1: Orchard House	M04	44	44-47	43	42-45
R2: Crosslands/Brookfield	M01	47	42-46	42	39-43
R3. Storridge Road	M03	54	53	44*	37
R4. Oldfield House	M02	57	61	35	31
R5. Brook Lane	M03	54	53	44*	40
R6. Brook Cottage	M05	43**	29	33**	27

*The daytime value is used as the night-time value was shown to be marginally higher.

**The levels for night-time assumed to be similar to daytime.

7.4.14 The results of background sound measurements taken at the fixed monitoring positions indicate that representative background sound levels during the daytime period (0700-2300 hours) vary between 33dB and 55dB L_{A90} and during the night-time period (i.e. between 2300-0700 hours) between 27dB and 45dB L_{A90}.

7.5 Assessment of Effects

Incorporated Mitigation

7.5.1 Predicted noise levels from the Northacre Facility have been calculated using the noise levels provided within Appendix 7-5. These noise levels are based on library data from similar plant used on other UK sites and include the following assumed inherent mitigation measures:

- (i) Buildings constructed from single skin cladding (R_w=24dB).
- (ii) Air cooled condenser fans operating at an overall sound power level of 100dB(A) (6 fans at 92dBW each fan).
- (iii) Fan stack & roof vents designed to a sound power level of 90dBW (79dB L_{Aeq15mins} @ 1m free field) at flue exit point of stack.
- (iv) Turbine air cooler fans – overall sound power level of all fans operating designed to a level of 90dB(A)
- (v) Smaller external plant (e.g. air conditioning, pumps etc) not to exceed 70dB(A) @ 1m.
- (vi) ID Fan acoustically enclosed.

- (vii) Ventilation louvres attenuated using single bank acoustic louvres.
- (viii) Doors closed except for access to vehicles for offloading and collection unless for maintenance or emergency.
- (ix) Doors into Tipping Hall minimum Rw 12dB, doors into Turbine Hall acoustic type (Rw 29dB) and all other doors Rw 18dB.
- (x) Earth mound screen along southwestern boundary (as permitted).
- (xi) Sound power levels of plant as detailed in Appendix 7-5.
- (xii) Design to ensure no noise character is perceptible at NSRs in accordance with BS4142: 2014+A1:2019.
- (xiii) Mobile plant vehicles fitted with non-tonal reversing alarms (i.e. broadband type noise alarms). Where practicable HGVs that are in control of the site operator should be instructed to have a similar type of reversing alarm.

Construction Phase Effects

Assessment of Effects against Existing Baseline

Plant Noise

- 7.5.2 Construction works would involve the movement of soils, piling and the construction of new buildings and infrastructure. Excavators, haulage lorries, piling rigs, cranes, dumpers, concrete plant, diggers and paving machines would all, at some time during the construction programme, be operating on the Site. In addition, ancillary equipment such as small generators, pumps and compressors may also be operating on occasion.
- 7.5.3 The above noise sources and their associated activities would vary from day to day and may be in use at different stages of the construction period for relatively short durations. The noisiest activities are expected to be generated during soil movement and piling work during the initial stages of construction when excavators, piling rigs, dozers or similar may be in use.
- 7.5.4 The actual noise level produced by construction work would vary at the nearest property boundary at any time depending upon a number of factors including the plant location, duration of operation, hours of operation, intervening

topography and type of plant being used (see Appendix 7-4 for construction plant inventory that has been taken into account in the assessment).

7.5.5 Construction works would take place during normal daytime operating hours. The daytime construction activities and associated noise levels are provided in Table 7.20, which is based on the ABC method of assessment within BS5228: 2009+A1:2014 (Annex E.3.2.).

Table 7.20: Daytime Construction Noise Predictions at NSRs

Position	Approximate Distance to receptor (m)	Activity	Predicted Noise Level LAeq dB _{hr}	Typical Residual Noise LAeq dB	BS5228 Threshold Value LAeq dB (daytime)	Increase above threshold LAeq dB
R1: Orchard House	200-370	Site Preparation	47-54	52	65	0
	230-370	Piling	48-56	52	65	0
	200-370	General activities	46-52	52	65	0
	210-380	Infrastructure	46-57	52	65	0
	230-370	Building Constr'n	49-54	52	65	0
R2: Crosslands/ Brookfield	60-260	Site Preparation	51-66	54	65	+1
	100-220	Piling	53-65	54	65	0
	70-260	General activities	49-64	54	65	0
	70-260	Infrastructure	49-66	54	65	+1
	70-220	Building Constr'n	54-63	54	65	0
R3. Storridge Road	290-490	Site Preparation	45-49	67	70	0
	320-450	Piling	46-52	67	70	0
	290-470	General activities	44-48	67	70	0
	290-460	Infrastructure	44-53	67	70	0
	290-460	Building Constr'n	48-52	67	70	0
R4. Oldfield House	720-850	Site Preparation	40-41	66	70	0
	740-840	Piling	40-45	66	70	0
	730-840	General activities	38-40	66	70	0
	730-840	Infrastructure	39-45	66	70	0
	740-840	Building Constr'n	42-44	66	70	0
R5. Brook Lane	270-470	Site Preparation	45-49	67	70	0
	300-440	Piling	46-53	67	70	0
	270-440	General activities	44-49	67	70	0
	280-440	Infrastructure	45-54	67	70	0
	280-440	Building Constr'n	48-52	67	70	0
R6. Brook Cottage	580-780	Site Preparation	39-42	43	65	0
	620-760	Piling	41-47	43	65	0
	580-800	General activities	39-42	43	65	0
	590-790	Infrastructure	40-47	43	65	0
	590-790	Building Constr'n	43-45	43	65	0

7.5.6 On the basis of the above predictions the increase in noise, as a result of construction, at all receptors (except for short periods during peak noise at R2), results in an impact magnitude classification of **slight** resulting in a **minor** level of effect at all receptors. At R2 during site preparation and infrastructure works, the guidance threshold value may be just exceeded resulting in a **moderate** impact and **moderate** effect. However, the application of 'best practice' in accordance with BS5228-1:2009+A1:2014 would assist in reducing impact from peak construction noise and it is expected that any moderate impacts would reduce to **slight and minor** effect.

Construction Road Traffic Noise

7.5.7 Chapter 4.0 outlines the potential construction phase activities and the level of staff and HGV traffic that could arise during peak stages of the construction period. These estimates indicate that construction traffic movements could reach a peak with 372 light vehicles based on site and 102 HGV movements per day. The construction delivery hours would be generally limited to 07.00 to 19.00hrs Monday to Friday and 07.00 to 14.00hrs Saturday, although construction workers may well not work the full 12-hour weekday hours. Accordingly, and for robustness, it has been assumed that all construction vehicles go to / from the site during a 10 hour period.

7.5.8 Table 7.21 provides details of predicted highest likely impacts due to the increased traffic flow along the local road network. The dwelling positions in the vicinity of Brook Lane are likely to be the most sensitive receptors to any traffic flow increase from construction traffic movement.

Table 7.21: Predicted Change in Road Traffic Noise on local road network due to construction works

Road	Baseline Year	2023 'Do nothing' LA10 _{10hours} (dB)	'Do something' LA10 _{10hours} (dB)	Change (with development) LA10 _{10 hours} (dB)
Link Road	2023	66.4	66.5	+0.1
B3097 at Hawkeridge	2023	70.0	70.1	+0.1
B3097 The Ham	2023	66.9	66.9	0
A363 at Yarnbrook	2023	68.0	68.1	+0.1
A350 (North) at Yarnbrook	2023	69.9	70.0	+0.1
A350 (South) at Yarnbrook	2023	68.4	68.4	0
A350 in AQMA	2023	68.2	68.2	0
Brook Lane	2023	63.8	63.9	+0.1
B3097 Station Road at the Ham	2023	66.1	66.1	0

Note: The predicted noise levels are based on a notional 10m distance from the kerbside

7.5.9 Based on the 'worst case' scenario in terms of traffic route during the early stages of construction, the above results show no significant increase along roads where residential receptors exist. According to DMRB LA 111 impact methodology (noise in the short term), the change in road traffic noise would be **negligible** and the level of effect **neutral**, based on high sensitivity receptor. This would not be significant.

Vibration Effects

7.5.10 The highest levels of vibration generated by construction plant is likely to include the following:

- Piling rigs;
- Dozers;
- Vibratory rollers and compactors;
- Material offloading onto hard surfaces; and
- Concrete vibratory plant.

7.5.11 BS5228:2009+A1:2014 Part 2 deals with vibration from construction and open sites and provides information on the effects of the levels of vibration, human and structural response, response limits of structures and practical measures to reduce vibration.

7.5.12 Table 7.22 outlines the highest likely vibration levels that could be experienced during construction at the NSRs (i.e. during Piling activities).

Table 7.22: Daytime Construction Vibration at NSRs

Location	Approximate Nearest Distance to Receptor (m)	Receptor Sensitivity	Range of highest likely vibration (mm/sec)	Perceptible levels of vibration for residential receptors (mm/sec)	Cosmetic damage limits (mm/sec)
R1: Orchard House	230-370	High	0.1 to 0.2	>0.3	>5.0
R2: Crosslands	100-220	High	0.2 to 0.7	>0.3	>5.0
R3. Storridge Road	320-450	High	0.1 to 0.2	>0.3	>5.0
R4. Oldfield House	740-840	High	0 to 0.1	>0.3	>5.0
R5. Brook Lane	300-440	High	0.1 to 0.2	>0.3	>5.0
R6. Brook Cottage	620-760	High	0	>0.3	>5.0

7.5.13 The above results show no significant vibration levels during construction and the highest likely vibration levels at all receptors except R2 are below the level of perception at NSRs. For R2 the application of 'best practice' using lower vibratory plant would reduce the vibration level such that it was imperceptible.

7.5.14 BS5228:2009 Part 2+A1:2014 deals with vibration from construction and open sites and provides information on the effects of the levels of vibration, human and structural response, response limits of structures and practical measures to reduce vibration.

7.5.15 The distance from the nearest residential receptors to any likely use of piling rigs (i.e. building foundation construction) and vibratory compaction (i.e. during road construction) is likely to be a minimum distance of 70m (road construction) to 100m (piling).

7.5.16 In terms of HGV movement on access roads passing receptors, a number of noise and vibration studies of the movement of HGVs along local roads adjacent to residential properties in the UK, have been undertaken by the author of this assessment. This has included a study where monitoring has taken place within 1m of the kerbside. The results show at positions close to the pavement edge this only just triggers the seismograph and at levels below or just around perceptibility. The vibration levels from vehicle movements are well below

cosmetic damage levels and highly unlikely to generate vibration that would constitute a nuisance according to BS6472: 2008.

- 7.5.17 Based upon the above, even at the closest approach to existing residential properties and assuming the highest likely plant vibration, the levels of ground-borne vibration from construction works would be below perceptible levels (i.e. 0.3mm/s) at all receptors. The results of empirical measurements of vibration from vibratory plant at distances greater than 30m according to BS6472:2008 would indicate that the vibration levels are unlikely to give rise to an 'adverse comment' from a nuisance aspect.
- 7.5.18 It should be noted that the type of equipment, ground conditions and structural form could all affect the resultant level of vibration. At this stage, it has been assumed that the highest likely vibration level scenario occurs (i.e. a conservative estimate of potential effects).
- 7.5.19 The levels of vibration, as a result of construction, without mitigation are likely to result in an impact magnitude classification of **negligible to slight** and a level of effect of **neutral to minor** during general and highest generated vibration. The introduction of 'best practicable means' in respect of piling works should reduce the impact to **negligible** and **neutral** effect.

Operational Phase Effects

Assessment of Effects against Existing Baseline

Plant Noise

- 7.5.20 In terms of the potential noise characteristics of the Northacre Facility the following provides the details of the appropriate noise criteria applied in the assessment in accordance with BS4142: 2014+A1:2019:

Tonality

- 7.5.21 In terms of tonality the results of a number of Energy from Waste facility noise surveys at other similar sites operating in the UK show no tonal characteristics

associated with the operational noise. The route of the HGVs utilises a one-way system. Mobile plant vehicles would be fitted with broadband noise type reversing alarms. Fixed plant emitting any significant tonal character at source would be controlled by design or mitigation measures. It is therefore assumed that no tonal noise character penalty is required, however we have included for a +2dB tonal penalty for receptors R1, R4 & R6 for third party vehicles that may have 'beeper' reversing alarms when entering the Tipping Hall during daytime hours. Other receptors to the northeast direction would be self-screened by the development buildings and no tonal character would be required.

Impulsivity

- 7.5.22 In terms of impulsivity (e.g. noise from pressure relief valves and impacts) empirical on-site noise monitoring of similar sites indicates no audible impulse noise where pressure relief valves and offloading of waste are enclosed within buildings. If any pressure relief valves are mounted external to the building they would be fitted with appropriate silencers. There are safety valves for emergency venting of steam, which are externally mounted on the roof of the Boiler House but these are not normally in operation. For the proposed design we therefore assume that an impulse noise character penalty is not required.

Intermittency

- 7.5.23 In terms of intermittency the only typical intermittent activity is likely to be noise from daytime HGV movements on-site. These are unlikely to be distinctive at NSRs during daytime periods (due to the influence of local road traffic movements along the local road network).
- 7.5.24 In conclusion, with the proposed noise mitigation strategies and controls of specific plant selection and design there is no character penalty required.

Daytime Operations

- 7.5.25 Table 7.23 provides information on the predicted noise levels during daytime operations from the Northacre Facility (i.e. in accordance with section 7.2 Note 1 of BS4142: 2014+A1:2019 07.00 to 23.00 hours) at the Northacre Facility.

Table 7.23: Predicted Daytime Noise Contribution from the Northacre Facility (i.e. existing and Proposed Development) with incorporated mitigation

Receptor Position (Refer to Figure 7.1)	Time Period (0700-2300 hours)	Predicted Rating ¹ Noise Level from Site LAeq _{1hr} dB	Assessment ² Baseline Sound Level LA90 _{1hr} dB [LAeq]	Rating ¹ compared to Baseline Sound LAeq _{1hr} dB	Noise Change ³ LAeq dB
R1: Orchard House	Daytime	40	45 [52]	-5	+0.2
R2: Crosslands/ Brookfield	Daytime	46	42 [52-54]	+4	+1.0
R3. StorrIDGE Road	Daytime	42	44 [67]	-2	0
R4. Oldfield House	Daytime	34	55 [66]	-21	0
R5. Brook Lane	Daytime	37	44 [67]	-7	0
R6. Brook Cottage	Daytime	33	33 [43]	0	+0.3

Note 1: Noise characteristics at receptor locations do not include a penalty except at R1, R4 & R6, which include +2dB for potential third-party vehicle reversing alarms at Tipping Hall end of building during daytime. Fixed plant noise would be controlled by design.

Note 2: Based on LA90 baseline results from 2017, 2019 or 2020 at NSRs.

Note 3: Column 6 is calculated by the logarithmic addition of columns 3 and column 4 **Leq** level in [] and subtraction of the background **Leq** noise level (i.e. column 4 in []).

7.5.26 The fifth column in Table 7.24 shows the difference between the predicted rating noise level and the baseline sound level at the receptor positions. The rating level in column 5 is therefore in accordance with the methodology found within BS 4142: 2014+A1:2019 which is the most relevant applicable noise assessment guidance.

7.5.27 According to BS4142: 2014+A1:2019, the rating level relative to the assessment baseline noise would indicate **negligible to slight** impact magnitude at all receptors (refer to Table 7.11). The operational noise impacts from the Northacre Facility are therefore considered to represent a **neutral to minor** level of effect at all receptors and therefore would not be significant. However, due to the potential cumulative effect of adjacent permitted development (i.e. Waste Transfer Facility) and to comply with BAT, further mitigation measures are required.

7.5.28 In relation to the IEMA guidelines (which considers the increase in existing residual noise and therefore the context of the impact, reference Table 7.12), it can be seen that the magnitude of the impact during daytime periods (final column of table) shows that there is a change of up to +1.0dB in noise level, which indicates a **negligible magnitude impact**. The predicted level of effect

that would be experienced by residential receptors would therefore be a **neutral** level of effect and not significant.

Night-time Operations

7.5.29 Table 7.24 provides information on the predicted noise levels during night-time from the Northacre Facility (i.e. 23.00 to 07.00 hours according to BS4142: 2014+A1:2019 section 7.2 Note 1).

Table 7.24: Predicted Night-time Noise Contribution from the Northacre Facility (i.e. existing and Proposed Development) with incorporated mitigation

Receptor Position (Refer to Figure 7.1)	Time Period (2300-0700 hours)	Predicted Rating ¹ Noise Level from Site LAeq _{15mins} dB	Assessment ² Baseline Sound Level LA90 dB [LAeq]	Rating ¹ Compared to Background Sound LAeq _{15mins} dB	Noise Change ³ LAeq dB
R1: Orchard House	Night-time	37	43 [44]	-6	+0.8
R2: Crosslands/ Brookfield	Night-time	46	42 [47]	+4	+2.5
R3. Storridge Road	Night-time	42	44 [54]	-2	+0.3
R4. Oldfield House	Night-time	32	35 [57]	-3	0
R5. Brook Lane	Night-time	38	44 [54]	-6	+0.1
R6. Brook Cottage	Night-time	33	27 ⁴ [29]	+6	+5.5

Note 1: Noise characteristics at receptor locations do not include a penalty. This would be controlled by design.

Note 2: Based on LA90 baseline results from 2018 at NSRs.

Note 3: Column 6 is calculated by the logarithmic addition of columns 3 and column 4 Leq level in [] and subtraction of the background Leq noise level (i.e. column 4 in []).

Note 4: We have referred to the 2014 survey for the baseline levels as this was not measured during the 2018 survey and is therefore deemed to be robust.

7.5.30 According to BS4142: 2014+A1:2019, the rating level relative to the assessment baseline noise indicates in general a **negligible to moderate** impact magnitude (refer to Table 7.11). The operational noise impacts from the facility is therefore considered to represent a **negligible to moderate** level of effect and not significant. In order to reduce impacts such that the impacts according to BS4142 are below an adverse impact, further noise mitigation measures are required, which are detailed in 7.8.

7.5.31 In relation to the IEMA guidelines and making reference to Table 7.12, it can be seen that the magnitude of the impact during night-time periods (final column of table) shows that the change in noise level ranges between 0dB and +5.5dB

LAeq which indicates **negligible to moderate impact**. The predicted level of effect would therefore be **neutral to moderate** and not significant for all NSRs.

Operational Road Traffic Noise

7.5.32 The Transport Assessment considers the assessment opening year (2025) for the traffic demand from the Northacre Facility for these periods compared to a ‘Do-nothing’ scenario. Table 7.25 provides details of the noise impact due to the increased traffic flow along the local road network based on an 18-hour average for the opening year using the traffic data provided within the Transport Assessment.

Table 7.25: Predicted Change in Road Traffic Noise on Local Road Network

Road	Opening Year	‘Do nothing’ LA10 _{18hours} (dB)	‘Do something’ LA10 _{18hours} (dB)	Change (with development) LA10 _{18 hours} (dB)
Link Road	2025	64.5	64.7	+0.2
B3097 at Hawkeridge	2025	70.7	70.8	+0.1
B3097 The Ham	2025	65.7	65.7	0
A363 at Yarnbrook	2025	67.9	68.0	+0.1
A350 (North) at Yarnbrook	2025	70.0	70.1	+0.1
A350 (South) at Yarnbrook	2025	68.1	68.1	0
A350 in AQMA	2025	67.9	67.9	0
Brook Lane	2025	58.1	58.2	+0.1
B3097 Station Road at the Ham	2025	64.7	64.7	0

Note: The predicted noise levels are based on a notional 10m distance from the kerbside

7.5.33 Based on a maximum HGV demand the impact shows **negligible** impact magnitude and **neutral** level of effect in respect of traffic movements relative to the nearest local road network at nearest residential properties. In terms of the DMRB LA 111 guidance, in relation to short-term effects (refer to Table 7.13) an increase of <3dB(A) is minor and <1dB(A) is negligible.

Vibration Effects

7.5.34 Experience of monitoring night-time vibration levels at other EfWs shows that in close proximity to plant (i.e. 1m to 5m) operational vibration levels would be between 0.05mm.sec to 0.1mm/sec. This would produce imperceptible levels

at distances of around 10m from the Northacre Facility (i.e. below 0.3mm.sec). Results show measurements of HGV movement around access roads do not generate levels above 0.3mm/sec unless they are passing over a speed 'hump' or 'pot-hole', which is likely to produce more vibration than the fixed plant. Bearing in mind the separation distance from the Northacre Facility to NSRs (the closest being circa 100m), no measurable or perceptible vibration will be produced.

Cumulative Effects

- 7.5.35 Chapter 2.0 identifies 3 projects (Table 2.4) which have been granted planning permission and have not yet been constructed or being constructed in the local area which are considered to have the potential to give rise to cumulative effects with the Northacre Facility. The planning decisions (where relevant) and the planning applications have been reviewed to try and identify potential noise levels associated with the proposed operations at each of the developments. The following paragraphs describe the information available and a summary of the likely noise contribution from these developments to the NSR relevant to the Northacre Facility.
- 7.5.36 The permitted **residential development** on land off Station Road, Westbury (Ref: 17/07548/FUL) is located circa 1.1km northwest of the Site boundary. There are no specific noise sources from this type of development other than construction works and operational vehicle movements. In view of the type of development and separation distance there is no likelihood of cumulative impacts. There are receptors much closer to the site than these and therefore no likely impacts are expected.
- 7.5.37 The permitted development at Brook Mill, Victory Road, Wiltshire Trading Estate is circa 1km northwest of the Proposed Development (Ref. 19/10253/FUL). The development involves the demolition of existing cereal bin building (including intake and 4 silos) redundant extruder plant building and warehouses and the construction and operation of a replacement feed mill along with associated buildings. There are no supporting noise assessment reports attached to the application. The planning consent requires a CEMP for the control of construction noise and condition 8 requires a noise impact assessment in

accordance with BS4142:2014 requiring plant rating levels to be less than background at the façade of nearest sensitive receptor. In view of the separation distance location and noise limits, there is no cumulative effects likely from this development.

7.5.38 The permitted development off Stephenson Road, Westbury on land adjacent to the Northacre Facility in the form of a Waste Management Facility including welfare, office and workshop building (Ref: 18/03366/WCM) is accompanied by a noise impact assessment. The development would only operate during daytime hours and the associated planning consent condition relating to noise (Conditions 13 and 16) requires a Construction Environmental Management Plan submission to control construction noise effects and a noise assessment to show that the noise predictions provided in the associated iON Acoustics Ltd report have been achieved. The iON Acoustics report provides the following predicted noise contribution from the WTS facility, which is taken into account in the cumulative effect of the Northacre Facility in section 7.7.11 of this Chapter.

Table 7.26: Predicted Daytime Noise Contribution for the WTS facility taken from the Ion Acoustics report (A1247 R02) dated 9th April 2018

Receptor Position (Refer to Figure 7.1)	Time Period (0700-2300 hours)	Predicted Rating ¹ Noise Level from Site L _{Ar} dB	Noise Limit (ref Table 8) dB L _{Ar}
R1: Orchard House	Daytime	38	45
R2: Crosslands/Brookfield	Daytime	42	42
R3. Storridge Road	Daytime	32	44
R4. Oldfield House	Daytime	33	55
R5. Brook Lane	Daytime	33	44
R6. Brook Cottage	Daytime	29	33

7.6 Additional Mitigation

Construction Mitigation

7.6.1 In accordance with BS5228-1:2009+A1:2014, best practical means would be employed to control the noise generation (e.g. using equipment that is regularly

maintained, where practicable use equipment fitted with silencers or acoustic hoods).

7.6.2 In consideration of the likely highest levels of construction noise, the following approach would be considered as part of any CEMP:

- Restriction of construction hours to non-sensitive times of day would normally form part of the planning consent conditions.
- Sensible routing of the construction plant to avoid the nearest residential properties (where practicable).
- Careful choice of piling rigs to minimise noise.
- Avoid un-necessary plant operation and revving of plant or vehicles.
- Locate plant away from nearest sensitive receptors or in locations which provide good screening in the direction of sensitive receptors.
- Use of broadband noise reverse alarms (where practicable) on mobile plant.
- Construction of the consented acoustic screen at the north eastern boundary at the start of the construction phase to provide screening benefit to the NSR.
- Communication and liaison with NSRs in proximity to the Site to inform them of any likely peak periods of noise or vibration.

Operational Mitigation

7.6.3 The incorporated mitigation measures described previously adequately address the needs to avoid, reduce and compensate for many of the potential effects of the Northacre Facility and avoid any significant effects. However, in order to comply with the relevant standards and to avoid any significant cumulative effects from permitted development adjacent to the plant, further noise mitigation would be required. These could include the following additional measures which are all standard commonly applied forms of mitigation applied at other similar facilities operating in the UK.

- (i) Air cooled condenser fans operating at an overall sound power level of 97dB(A) (6 fans at 89dBW each fan).
- (ii) Fan stack & roof vents reduced by a further 2dB(A) i.e. designed to a sound power level of 88dB(A) at flue exit point of stack and vent.

- (iii) Turbine air cooler fans – overall sound power level of all fans operating designed to a level of 88dB(A).
- (iv) Conveyor enclosed to a design level of 65dB(A) @ 1m along its length from Northacre Facility to MBT.
- (v) Acoustic screen along NE boundary with access road into site to 3.5m high close boarded fence or similar (minimum mass of 15kg/m²).
- (vi) All buildings clad to the following acoustic performance:

All building roof areas clad with double skin insulated panels having a minimum $R_w = 40\text{dB}$. Typical acoustic performance (SRI):

Hz	31.5	63	125	250	500	1k	2k	4k	8k
dB	8	12	16	30	40	44	51	60	45

All walls of plant buildings clad with double skin insulated panels having a minimum $R_w = 42\text{dB}$. Typical acoustic performance (SRI):

Hz	31.5	63	125	250	500	1k	2k	4k	8k
dB	5	12	19	32	42	50	52	60	60

- (vii) Ventilation louvres fitted with double bank acoustic louvres or attenuators to be finalised when final location and size known (typical $R_w 25\text{dB}$).
- (viii) Doors into the Boiler Room, Bunker and FGT building to be fitted with acoustic doors to $R_w 29\text{dB}$ or greater.

7.6.4 There are a number of different ways in which the criteria can be achieved, for example, the use of noise control at source and/or the selection of different plant equipment, which may be quieter, can be investigated. The chosen method(s) of mitigation should be appropriate to meet the noise criteria and the application of BAT. The aforementioned measures are just one combination that would be effective in achieving the requisite noise levels during the daytime and night-time periods.

7.7 Residual Effects and Conclusions

7.7.1 During the construction period there would be a variety of noise sources in use at different stages and their associated activities would vary from day to day. The highest noise levels relative to nearest receptors are likely to occur during

demolition, piling and infrastructure activities. The peak noise activities do not normally occur over long periods of time and best practical means would be employed to control the noise being generated. It is concluded that the increase in construction noise with the implementation of mitigation measures, using best practice, is likely to result in an impact magnitude classification of **negligible to slight** at receptors and a **neutral to minor** level of effect.

7.7.2 The assessment of impact on existing residential areas from any increase in road traffic noise during the daytime construction or operational stage of the Proposed Development shows no significant change in noise levels and therefore there is likely to be a **negligible** magnitude impact at receptors, resulting in a **neutral** level of effect. The effect would not be significant.

7.7.3 In terms of vibration during the construction period, following the application of 'best practicable means' there would be a **negligible** magnitude impact, resulting in a **neutral** level of effect at the nearest residential receptor and well within guidance limits for nuisance and cosmetic damage. The effect would not be significant.

7.7.4 The following analysis considers the residual effect of the additional mitigation measures on the predicted operational noise levels. Table 7.27 below provides information on the predicted noise levels during daytime operations from the Northacre Facility (07.00 to 23.00).

Table 7.27: Predicted Noise Contribution from the Northacre Facility during Daytime (with additional noise mitigation measures)

Receptor Position (Refer to Figure 14.1)	Time Period (0700-2300 hours)	Predicted Rating ¹ Noise Level from Site LAeq _{1hr} dB	Assessment ² Baseline Sound Level LA90 _{1hr} dB [LAeq]	Rating ¹ compared to Baseline Sound LAeq _{1hr} dB	Noise Change ³ LAeq dB
R1: Orchard House	Daytime	39	45 [52]	-6	+0.1
R2: Crosslands/Brookfield	Daytime	42	42 [52-54]	0	+0.4
R3. Storrige Road	Daytime	39	44 [67]	-5	0
R4. Oldfield House	Daytime	32	55 [66]	-23	0
R5. Brook Lane	Daytime	34	44 [67]	-10	0
R6. Brook Cottage	Daytime	33	33 [43]	0	+0.3

Note 1: Noise characteristics at receptor locations do not include a penalty except at R1, R4 & R6, which include +2dB for potential third-party vehicle reversing alarms at Tipping Hall end of building during daytime. Fixed plant noise would be controlled by design.

Note 2: Based on LA90 baseline results from 2018 at NSRs.

Note 3: Column 6 is calculated by the logarithmic addition of columns 3 and column 4 **Leq** level in [] and subtraction of the background **Leq** noise level (i.e. column 4 in []).

7.7.5 The predicted noise levels reflect site attributable noise with the additional noise control measures. The fifth column in Table 7.27 shows the difference between the predicted rating noise level and assessment baseline sound level at the receptor positions. No character penalty is required at R2, R3 & R5 based on mitigation measures and residual noise influence, which provides masking of noise at NSRs. A noise character is only included at receptors R1, R4 & R6 for the worst-case scenario of third-party HGVs reversing into the Tipping Hall, if fitted with a 'beeper' tonal reversing alarm, which may be just perceptible at these NSRs. At other NSRs the development buildings will provide significant screening in the north-easterly direction. The rating level in column 5 is therefore in accordance with the methodology found within BS 4142: 2014+A1:2019, which is the most relevant applicable noise assessment guidance.

7.7.6 According to BS4142: 2014+A1:2019, the rating level relative to the assessment baseline noise would indicate **negligible** magnitude impact at all receptors (refer to Table 7.11). The operational noise impacts from the facility are therefore considered to represent a **neutral** level of effect, and not significant.

7.7.7 In relation to the IEMA guidelines (which considers the increase in existing residual noise and therefore the context of the impact, reference Table 7.12), it

can be seen that the magnitude of the impact during daytime periods (final column of table) shows that there is a change in noise level of up to +0.4dB, which indicates a **negligible** magnitude impact. The predicted level of effect that would be experienced by residential receptors would therefore be **neutral** and not significant.

Night-time Operations

7.7.8 Table 7.28 below provides information on the predicted noise levels during night-time from the Northacre Facility (23.00 to 07.00) activities taking into account the additional mitigation measures.

Table 7.28: Predicted Noise Contribution from the Northacre Facility during Night-time (with additional noise mitigation measures)

Receptor Position (Refer to Figure 7.1)	Time Period (2300-0700 hours)	Predicted Rating ¹ Noise Level from Site LAeq _{15mins} dB	Assessment ² Baseline Sound Level LA90 dB [LAeq]	Rating ¹ Compared to Background Sound LAeq _{15mins} dB	Noise Change ³ LAeq dB
R1: Orchard House	Night-time	35	43 [44]	-8	+0.5
R2: Crosslands/ Brookfield	Night-time	40	42 [47]	-2	+0.8
R3. Storridge Road	Night-time	39	44 [54]	-5	+0.1
R4. Oldfield House	Night-time	25	35 [57]	-10	0
R5. Brook Lane	Night-time	36	44 [54]	-8	+0.1
R6. Brook Cottage	Night-time	30	27 ⁴ [29]	+3	+3.5

Note 1: Noise characteristics at receptor locations do not include a penalty, this would be controlled by design.

Note 2: Based on LA90 baseline results from 2018 at NSRs.

Note 3: Column 6 is calculated by the logarithmic addition of columns 3 and column 4 **Leq** level in [] and subtraction of the background **Leq** noise level (i.e. column 4 in []).

Note 4: We have referred to the 2014 survey for the baseline levels as this was not measured during the 2018 survey and is therefore deemed to be robust. The background level is so low that the absolute level is likely to be more relevant than the level difference in column 5.

7.7.9 According to BS4142: 2014+A1:2019, the rating level relative to the assessment baseline noise indicates a **negligible to slight** impact magnitude (refer to Table 7.11). The night-time operational noise impacts from the facility are therefore considered to represent a **neutral to minor** level of effect and not significant. It should be noted that the assessment of impact at receptor R6 is based on the 2014 background level, which is likely to represent the worst-case baseline.

- 7.7.10 In relation to the IEMA guidelines and making reference to Table 7.12, it can be seen that the magnitude of the impact during night-time periods (final column of table) shows that the maximum change in noise level is +3.5dB LAeq which indicates **slight** magnitude of impact. The predicted level of effect would therefore be **minor** and not significant.
- 7.7.11 In terms of establishing the cumulative effect of the Northacre Facility and the WTS facility operating together during the daytime, the following table provides the analysis.

Table 7.29: Predicted Cumulative Noise Levels from the Northacre Facility & Permitted WTS Facility during Daytime

Receptor Position (Refer to Figure 6.1)	Predicted Northacre Facility Rating ¹ Noise Level from Site L _{Aeq1hr} dB	Predicted WTS* Rating ¹ Noise Level from Site L _{Aeq1hr} dB	Cumulative noise level L _{Aeq1hr} dB	Baseline Sound Level LA90 _{1hr} dB [LAeq]	Excess over baseline dB(A)	Noise Change LAeq dB
R1: Orchard House	37	38	41	45 [52]	-4	+0.3
R2: Crosslands/ Brookfield	42	42	45	42 [52-54]	+3	+0.5 to +0.8
R3. Storridge Road	39	32	40	44 [67]	-4	0
R4. Oldfield House	30	33	35	55 [66]	-20	0
R5. Brook Lane	34	33	37	44 [67]	-7	0
R6. Brook Cottage	32	29	34	33 [43]	+1	+0.5

*iON Acoustics predicted noise contribution from report A1247 R02 dated 9th April 2018

7.7.12 The above table shows a **negligible to slight** impact in terms of BS4142:2014+A1:2019 (ref. Table 7.11) and **negligible** impact relating to residual sound levels (i.e. ref. Table 7.12). The cumulative effect is therefore **neutral to minor** and not significant. The above table also shows slightly lower impact when comparing the iON cumulative impact assessment of the previous ATT facility where it showed a maximum increase over baseline of +4dB at R2.

7.7.13 In summary, no significant noise effects have been identified by the noise assessment in relation to construction or operation of the EfW noise or plant vibration. Table 7.30 below summarises the predicted effects of the construction, and operation of the Proposed Development.

Table 7.30: Residual Impact at Nearest Receptor after Mitigation Measures

Source	Nature of Effect	Time Period	Potential Effect	Proposed Mitigation	Residual Effect	Residual Impact Magnitude
Construction noise	Direct & Temporary	Daytime	Neutral to Moderate	CEMP	Neutral to Minor	Negligible to Slight
Road traffic noise (construction)	Direct & Temporary	Daytime	Neutral	None required	Neutral	Negligible
Road traffic noise (operation)	Direct & Permanent	Daytime	Neutral	Inherent traffic routes	Neutral	Negligible
Industrial noise (Site operation)	Direct & Permanent	Daytime Night	Neutral to Minor Neutral to Moderate	Design & mitigation	Neutral Neutral to Minor	Negligible Negligible to Slight
Cumulative effects	Direct & Permanent	Daytime	Neutral to Minor	Design & Mitigation	Neutral to Minor	Negligible to Slight
Construction Vibration	Direct & Temporary	Daytime	Neutral	CEMP	Neutral	Negligible
Operational Vibration	Direct & Permanent	Daytime Night	Neutral Neutral	None required	Neutral Neutral	Negligible Negligible
Road traffic vibration	Direct & Permanent	Daytime	Neutral	None required	Neutral	Negligible

Summary

7.7.14 Noise and vibration levels have been considered and assessed during the construction and operational phases of the Proposed Development. Relevant and appropriate noise and vibration guidance and standards have been used to determine the impact. The assessment has been undertaken to inform and guide the design of the Proposed Development, such that any likely noise and vibration impact on existing and potential sensitive receptors is minimised.

7.7.15 To establish any likely impact from noise a robust assessment of baseline sound levels has been considered by undertaking fixed position noise monitoring at the nearest noise sensitive receptor areas around the Site and additional spot roaming monitoring at other more distant receptors. This was carried out over an extended monitoring periods to establish representative background sound levels.

7.7.16 In accordance with appropriate standards, best practical means would be employed to control the noise generation during the construction period. Measures may include restriction on operating hours, sensible routing of equipment to site and careful choice of piling rigs to minimise noise. Such

measures would be defined within the Construction Environmental Management Plan.

7.7.17 In relation to the operational phase a number of potential mitigation measures have been proposed to ensure that the resultant operational noise levels are within appropriate guidance and standards. The measures would be based on the employment of Best Available Techniques (BAT) to mitigate any potential peak noise sources.

7.7.18 The assessment shows that there would be no significant impacts during the construction or operation of the Proposed Development following the implementation of appropriate mitigation.

CHAPTER 8.0 AIR QUALITY, ODOUR AND HUMAN HEALTH

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8.0 AIR QUALITY, ODOUR AND HUMAN HEALTH

8.1 Introduction

8.1.1 This chapter considers the potential impacts of the Proposed Development on local air quality and odour. The main focus of the chapter is the emissions from the stack associated with the Proposed Development. However, impacts from fugitive emissions of dust during the construction phase, the emissions from traffic associated with the import and export of materials and potential fugitive emissions of dust and odour during operational phase have also been assessed.

8.1.2 This chapter is supported by the following technical appendices:

- Appendix 8-1 Baseline Analysis, which provides a detailed analysis of the existing air quality in the area;
- Appendix 8-2 Construction Dust Assessment Methodology, which provides all the technical details of the assessment methodology for construction phase dust impacts;
- Appendix 8-3 Emissions Modelling, which provides all the technical details of the dispersion modelling of process emissions undertaken;
- Appendix 8-4 Human Health Risk Assessment;
- Appendix 8-5 Ecological Interpretation of Air Quality Assessment; and
- Appendix 8-6 Information to Inform a Habitats Regulations Assessment

Competence

8.1.3 This EIA and supporting technical appendices have been prepared by Hannah Lederer and reviewed by Rosalind Flavell at Fichtner Consulting Engineers. Hannah is a recent geography (BSc Hons) graduate from Durham University. Rosalind (CEnv CSci MIAQM MIEEnvSc PIEMA) is a chartered member of the IAQM and IES and a practitioner member of the IEMA. Rosalind has over ten years of experience undertaking air quality assessments for planning and permitting purposes for a wide range of developments including Energy from Waste facilities across the UK.

8.2 Methodology

Legislation and Guidance

- 8.2.1 European air quality legislation is consolidated under the Ambient Air Quality Directive (Directive 2008/50/EC), which came into force on 11 June 2008. This Directive consolidates previous legislation which was designed to deal with specific pollutants in a consistent manner and provides Ambient Air Directive (AAD) Limit Values for sulphur dioxide, nitrogen dioxide, benzene, carbon monoxide, lead and particulate matter with a diameter of less than 10µm (PM₁₀) and a new AAD Target Value and Limit Value for fine particulates (those with a diameter of less than 2.5µm (PM_{2.5}). The fourth daughter Directive - 2004/107/EC - was not included within the consolidation. It sets health-based Target Values for polycyclic aromatic hydrocarbons (PAHs), cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable. Directives 2008/50/EC and 2004/107/EC are transposed into UK Law into the Air Quality Standards Regulations (2010) and subsequent amendments.
- 8.2.2 The UK Government and the devolved administrations are required under the Environment Act (1995) to produce a national air quality strategy. This was last reviewed and published in 2007. The Air Quality Strategy (AQS) sets out the UK's air quality objectives and recognises that action at national, regional and local level may be needed, depending on the scale and nature of the air quality problem. This includes additional targets and limits for 15-minute sulphur dioxide and 1,3-butadiene and more stringent requirements for benzene and PAHs, known as AQS Objectives. Environmental Assessment Levels (EALs) for other pollutants are presented on the gov.uk website as part of the Environment Agency's (EA) Environmental Management Guidance (Air emissions risk assessment for your environmental permit), which was last updated on 1 March 2016 and is referred to here as the Air Emissions Guidance. AAD Target and Limit Values, AQS Objectives, and EALs are set at levels well below those at which significant adverse health effects have been observed in the general population and in particularly sensitive groups. For the remainder of this chapter these are collectively referred to as AQALs.
- 8.2.3 The UK Government published the Clean Air Strategy (CAS) in January 2019. This sets out the methods by which air pollution from all sectors will be reduced. The CAS has not introduced any new air quality limits.

8.2.4 Local Air Quality Management Technical Guidance (2016) referred to as LAQM.TG(16), outlines that the AQALs apply in the following locations:

- Annual mean - all locations where members of the public might be regularly exposed - i.e. building facades of residential properties, schools, hospitals, care homes etc.
- 24-hour mean and 8-hour mean - all locations where the annual mean objective would apply together with hotels and gardens of residential properties.
- 1-hour mean - all locations where the annual mean, 24-hour and 8-hour mean apply together with kerbside sites and any areas where members of the public might be reasonably expected to spend one hour or more.
- 15-minute mean - all locations where members of the public might reasonably be exposed for a period of 15 minutes or more.

8.2.5 The AQALs relevant to this project are summarised in Appendix 8-3 and summarised in the following tables.

Table 8.1: Air Quality Assessment Levels

Pollutant	AQAL ($\mu\text{g}/\text{m}^3$)	Averaging Period	Frequency of Exceedance	Source
Nitrogen dioxide	200	1 hour	18 times per year (99.79th percentile)	AAD Limit Value
	40	Annual	-	AAD Limit Value
Sulphur dioxide	266	15 minutes	35 times per year (99.9th percentile)	AQS Objective
	350	1 hour	24 times per year (99.73rd percentile)	AAD Limit Value
	125	24 hours	3 times per year (99.18th percentile)	AAD Limit Value
Particulate matter (PM_{10})	50	24 hours	35 times per year (90.41st percentile)	AAD Limit Value
	40	Annual	-	AAD Limit Value
Particulate matter ($\text{PM}_{2.5}$)	25	Annual	-	AAD Limit Value
Carbon monoxide	10,000	8 hours, running	-	AAD Limit Value

Pollutant	AQAL (µg/m ³)	Averaging Period	Frequency of Exceedance	Source
	30,000	1 hour		Air Emissions Guidance
Hydrogen chloride	750	1 hour	-	Air Emissions Guidance
Hydrogen fluoride	160	1 hour	-	Air Emissions Guidance
	16	Annual	-	Air Emissions Guidance
Ammonia	2,500	1 hour	-	Air Emissions Guidance
	180	Annual	-	Air Emissions Guidance
Benzene	195	1-hour	-	Air Emissions Guidance
	5	Annual	-	AQS Objective
1,3-butadiene	2.25	Annual, running	-	AQS Objective
PCBs	6	1-hour	-	Air Emissions Guidance
	0.2	Annual	-	Air Emissions Guidance
PAHs – benzo(a)pyrene	0.00025	Annual	-	AQS Objective

Table 8.2: Air Quality Assessment Levels for Metals

Pollutant	AAD Target – Long Term (µg/m ³)	Long Term Air Emissions Guidance (µg/m ³)	Short Term Air Emissions Guidance (µg/m ³)
Cadmium	0.005	0.005	-
Thallium	-	-	-
Mercury	-	0.25	7.5
Antimony	-	5	150
Arsenic	0.006	0.003	-
Cadmium	0.005	0.005	-
Chromium (II & III)	-	5	150
Chromium (VI)	-	0.0002	-
Cobalt	-	-	-
Copper	-	10	200
Lead	-	0.25	-
Manganese	-	0.15	1500
Nickel	0.020	0.020	-
Vanadium	-	5	1

8.2.6 Critical Levels for the protection of sensitive ecosystems and habitats are also outlined within the Air Quality Standards Regulations for oxides of nitrogen and sulphur dioxide. Limits for ammonia and hydrogen fluoride are contained in the Air Emissions Guidance. The Critical Levels relevant to this project are presented in the following table.

Table 8.3: Critical Levels for the Protection of Ecosystems

Pollutant	Critical Level ($\mu\text{g}/\text{m}^3$)	Averaging period	Source
Nitrogen oxides (as nitrogen dioxide)	75	Daily mean	Air Emissions Guidance
	30	Annual mean	AAD
Sulphur dioxide	10	Annual mean for sensitive lichen communities and bryophytes and ecosystems where lichens and bryophytes are an important part of the ecosystems integrity	Air Emissions Guidance
	20	Annual mean for all higher plants	AAD
Hydrogen fluoride	<5	Daily mean	Air Emissions Guidance
	<0.5	Weekly mean	Air Emissions Guidance
Ammonia	1	Annual mean for sensitive lichen communities and bryophytes and ecosystems where lichens and bryophytes are an important part of the ecosystems integrity	Air Emissions Guidance
	3	Annual mean for all higher plants	Air Emissions Guidance

8.2.7 In addition to the Critical Levels, the Air Pollution Information System (APIS) provides habitat specific Critical Loads for nitrogen and acid deposition. Full details of the habitat specific Critical Loads can be found in Appendix 8-3.

Industrial Pollution Regulation

8.2.8 Atmospheric emissions from industrial processes are controlled in the UK through the Environmental Permitting (England and Wales) Regulations (2010), and subsequent amendments. The Proposed Development will be regulated by the Environment Agency and so will need an Environmental Permit to operate. The Environmental

Permit will include conditions to prevent fugitive emissions of dust and odour beyond the boundary of the installation. The Environmental Permit will also include limits on emissions to air.

- 8.2.9 The Industrial Emissions Directive (IED) (Directive 2010/75/EU), was adopted on 07 January 2013, and is the key European Directive which covers almost all regulation of industrial processes in the European Union (EU). Within the IED, the requirements of the relevant sector BREF (Best Available Techniques Reference documents) become binding as BAT (Best Available Techniques) guidance. The Waste Incineration BREF was published by the European Integrated Pollution Prevention and Control (IPPC) Bureau in December 2019. The BREF has introduced BAT-AELs (BAT Associated Emission Levels) which are more stringent than those currently set out in the IED for some pollutants. The Proposed Development would be designed to meet the requirements of the BREF for a new plant. Therefore, it has been assumed that the emissions from the Proposed Development would comply with the BAT-AELs set out in the BREF for new plants, or the emission limits in Annex VI Part 3 of the IED for waste incineration plants where BAT-AELs are not applicable.

Local Air Quality Management

- 8.2.10 Under Section 82 of the Environment Act (1995) (Part IV), local authorities are required to periodically review and assess air quality within their area of jurisdiction, under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves assessing present and likely future ambient pollutant concentrations against AQALs. If it is predicted that levels at the façade of buildings where members of the public are regularly present (normally residential properties) are likely to be exceeded, then the local authority is required to declare an Air Quality Management Area (AQMA). For each AQMA, the local authority is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant levels in pursuit of the relevant AQALs. A review of the local area shows that the closest AQMA is the Westbury AQMA which at its closest point is located approximately 1.7 m from the Site. This assessment fully quantifies the impact on the local AQMAs. Appendix 8-1 includes a detailed overview of the local AQMA and the AQAP.

Control of Dust and Emissions during Construction and Demolition

8.2.11 The main requirements with respect to dust control from industrial or trade premises such as the Proposed Development construction site, are those provided in Section 80 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as: "*any dust, steam, smell or other effluvia arising on industrial trade or business premises and being prejudicial to health or a nuisance.*"

8.2.12 Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the local authority is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Act requiring abatement and any necessary works to achieve it.

Assessment Methodology

Dust from Construction Activities

8.2.13 There is the potential for dust to be released into the atmosphere as a result of construction activities. These fugitive dust emissions have been assessed on a qualitative basis in accordance with the methodology outlined within the 2014 IAQM guidance document - 'Guidance on the assessment of dust from demolition and construction'. A detailed description of the methodology for the assessment of construction phase dust impacts is presented in Appendix 8-2.

Vehicle Emissions

8.2.14 The IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality' (2017) states that an air quality assessment is required where a development would cause a "*significant change*" in light duty vehicles (LDVs) or heavy goods vehicles (HGV). The indicative criteria to process to an assessment are:

- A change in LDV flows of:
 - more than 100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA; or
 - more than 500 AADT elsewhere.
- A change in HGV flows of:
 - more than 25 AADT within or adjacent to an AQMA; or
 - more than 100 AADT elsewhere.

8.2.15 The IAQM guidance does not clearly state the level of assessment which is required. However, if the change in LDV and HGV flows does not exceed the above criteria, the Proposed Development is not expected to cause a significant change and the significance of effect is deemed to be negligible and further detailed analysis of the impact is not needed.

Operational Phase Process Emissions

8.2.16 This assessment has been undertaken using the Advanced Dispersion Modelling System (ADMS) 5.2 dispersion model, and the five most recent years for which weather data is available. Full details of the dispersion modelling methodology and inputs can be found in Appendix 8-3. The model has been used to predict the ground level concentration of pollutants on a long and short-term basis across a grid of points. It has also been used to predict the concentration at nominated points to represent sensitive receptors.

8.2.17 For some pollutants which accumulate in the environment such as dioxins and dioxin-like PCBs, inhalation is only one of the potential exposure routes and the assessment levels is expressed as a sum of the exposure from inhalation and ingestion. Therefore, other exposure routes have been considered. A detailed Human Health Risk Assessment has been carried out using the Industrial Risk Assessment Program - Human Health (IRAP-h View - Version 5.0). The programme, created by Lakes Environmental, is based on the United States Environment Protection Agency (USEPA) Human Health Risk Assessment Protocol. This Protocol is a development of the approach defined by Her Majesty's Inspectorate for Pollution (HMIP) in 1996, taking account of further research since that date. Full details of the modelling methodology and inputs can be found in Appendix 8-4.

Plume Visibility

8.2.18 There is the potential for the plume to be visible under certain circumstances. ADMS 5.2 includes a plume visibility module, which models the dispersion and cooling of water vapour and predicts whether the plume will be visible, based on the liquid water content of the plume. This module has been used to quantify the number of visible plumes likely to occur during the operation of the Proposed Development. These results have been drawn upon in the ES Chapter 5 (Landscape and Visual).

Fugitive Dust and Odour

- 8.2.19 There is the potential for fugitive emissions of dust and odour to be released from the Proposed Development during the operational phase, especially during the delivery, unloading and storing of materials. The impact of fugitive odour emissions has been assessed on a qualitative basis in accordance with the methodology outlined within the IAQM guidance document 'Guidance on the Assessment of Odour for Planning' (the IAQM (2018) guidance). This guidance sets out a methodology for assessing the effects of odour on amenity.
- 8.2.20 There is no specific guidance for assessing the impact of dust from operational sites. Therefore, we have applied the principals of the construction phase dust assessment methodology to determine the impact of fugitive dust emissions which could arise during operation of the Proposed Development.

Assessment of Significance / Assessment Criteria

Dust from Construction Activities

- 8.2.21 The effect of construction phase activities has been assessed in accordance with IAQM guidance. The guidance is structured to determine the risk of dust effects arising from four types of construction phase activities. These are:
- Demolition;
 - Earthworks;
 - Construction; and
 - Trackout (defined as the transport of dust and dirt from the construction / demolition site onto the public road network).
- 8.2.22 A site is allocated to a risk category for dust emissions for each of the activities above based on two factors; dust emission magnitude, and the sensitivity of the area. These factors are combined to give the risk of dust impacts.
- 8.2.23 The highest risk category identified is used to define appropriate, site-specific, mitigation measures. The final stage is to determine whether significant effects are likely. For almost all construction phase activities, the aim should be to prevent

significant effects on receptors through the use of effective mitigation. Experience has shown that this is normally possible.

- 8.2.24 A detailed description of the assessment criteria for the assessment of construction phase dust impacts is presented in Appendix 8-2.

Process Emissions

- 8.2.25 For the Proposed Development to operate it will need to satisfy industrial permitting requirements set out and monitored by the Environment Agency. However, Environment Agency guidance has not been developed for conducting an assessment to accompany a planning application. Consequently, the IAQM guidance document “Land-Use Planning & Development Control: Planning for Air Quality” (2017) has been developed for professionals operating within the planning system. It provides planning officers and developers with a means of reaching sound decisions, having regard to the air quality implications of development proposals. The IAQM (2017) guidance states that it may be adapted using professional judgement. Therefore, where appropriate, Environment Agency guidance has been incorporated which is considered appropriate given that the Proposed Development will need to satisfy the industrial permitting requirements set out by the Environment Agency.
- 8.2.26 The IAQM (2017) guidance includes the following matrix which should be used to describe the impact based on the change in concentration relative to the AQAL and the overall predicted concentration from the scheme - i.e. the future baseline plus the process contribution.

Table 8.4: Magnitude of Change Descriptors

Long term average concentration at receptor in assessment year	% change in concentration relative to the Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

8.2.27 It is intended that the change in concentration relative to the AQAL (the process contribution) is rounded to the nearest whole number. Therefore, any impact which is between 0.5% and 1.5% would be classified as a 1% change in concentration. An impact of less than 0.5% is described as negligible, irrespective of the total concentration.

8.2.28 The above matrix is only designed to be used with annual mean concentrations. The approach for assessing the impact of short-term emissions has been carried out in line with the IAQM (2017) guidance. This does not take into account the background concentrations as it is noted that background concentrations are less important in determining the severity of impact for short term concentrations.

8.2.29 Consequently, for short term concentrations (i.e. those averaged over a period of an hour or less), the following descriptors of change are used to describe the impact:

- < 10% - negligible;
- 10 - 20% - slight;
- 20 - 50% - moderate; and
- > 50% - substantial.

8.2.30 Following quantification of the magnitude of change the assessor should determine the significance of effect using professional judgement and should take into account such factors as:

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts; and
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

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- 8.2.31 The IAQM (2017) states that, in relation to the significance of short-term impacts, *“In most cases, the assessment of impact severity for a proposed development will be governed by the long-term exposure experienced by receptors and it will not be a necessity to define the significance of effects by reference to short-term impacts. The severity of the impact will be substantial when there is a risk that the relevant AQAL for short-term concentrations is approached through the presence of the new source, taking into account the contribution of other prominent local sources.”*
- 8.2.32 Therefore, if a short-term impact cannot be screened out as negligible or insignificant, consideration will be given to the risk of exceeding the short-term AQAL when determining the significance of effect.
- 8.2.33 The IAQM (2017) guidance does not provide any descriptors for averaging periods of between 1 hour and a year. Therefore, for these periods the Air Emissions Guidance criteria have been used, which state that:
- “process contributions can be considered insignificant if:*
- *the long term process contribution is <1% of the long term environmental standard; and*
 - *the short term process contribution is <10% of the short term environmental standard.”*
- 8.2.34 Where an impact cannot be screened out as "insignificant" based on the outputs of the initial screening and modelling, the significance of the effect has been determined based on professional scientific judgement of the likelihood of emissions causing an exceedance of an AQAL. This is a standard approach which allows the risk and likelihood of exceedance to be investigated and assessed in detail, following the first stage assessment.
- 8.2.35 In addition, the Environment Agency guidance document 'Guidance on assessing group 3 metals stack emissions from incinerators - V.4 June 2016' for assessing the impact of emissions of metals relative to their respective AQALs, states that where the process contribution (PC) for any metal exceeds 1% of the long term or 10% of the short term environmental standard (in this case the AQAL), this is considered to have potential for significant pollution. Where the PC exceeds these criteria, the Predicted Environmental Contribution (PEC) should be compared to the environmental standard. The PEC can be screened out where the PEC is less than the environmental standard. Where the impact is within these parameters, it can be

concluded that there is no risk of exceeding the AQAL and, as such, the magnitude of change and significance of effect is considered negligible.

8.2.36 For those substances which have the potential to accumulate in the environment, Tolerable Daily Intakes (TDI) (the amount of contaminant which can be ingested daily over a lifetime without appreciable health risk) and Index Doses (ID) (a level of exposure which is associated with a negligible risk to human health), are defined. Where the impact of process emissions is within these levels, emissions are expected to make a negligible impact on human health.

8.2.37 In June 2019 the IAQM released the guidance document 'A guide to the assessment of air quality impacts on designated nature conservation sites' (the IAQM (2019) guidance). This guidance draws on the Environment Agency's Air Emissions Guidance, which states that to screen out impacts as 'insignificant' at European and UK statutory designated sites:

- the long-term process contribution must be less than 1% of the long-term environmental standard (i.e. the Critical Level or Load); and
- the short-term process contribution must be less than 10% of the short-term environmental standard.

8.2.38 If the above criteria are met, no further assessment is required. If the long-term process contribution exceeds 1% of the long-term environmental standard, the PEC must be calculated and compared to the standard. If the resulting PEC is less than 70% of the long-term environmental standard, the Air Emissions Guidance states that the emissions are 'insignificant' and further assessment is not required. In accordance with the guidance, calculation of the PEC for short-term standards is not required.

8.2.39 The Air Emissions Guidance states further that to screen out impacts as 'insignificant' at local nature sites:

- the long-term process contribution must be less than 100% of the long-term environmental standard; and
- the short-term process contribution must be less than 100% of the short-term environmental standard.

8.2.40 In accordance with the Air Emissions Guidance, calculation of the PEC for local nature sites is not required. However, with regard to locally designated sites, the

IAQM (2019) guidance states: “For local wildlife sites and ancient woodlands, the Environment Agency uses less stringent criteria in its permitting decisions. Environment Agency policy for its permitting process is that if either the short-term or long-term PC is less than 100% of the critical level or load, they do not require further assessment to support a permit application. In ecological impact assessments of projects and plans, it is, however, normal practice to treat such sites in the same manner as SSSIs and European Sites, although the determination of the significance of an effect may be different. It is difficult to understand how the Environment Agency’s approach can provide adequate protection.”

- 8.2.41 As such, it is considered appropriate to apply the screening criteria for SSSIs and European Sites to locally designated sites to screen out the requirement for further consideration of the significance of effect for planning. Where an impact cannot be screened out as ‘insignificant’ further analysis has been undertaken by the project ecologist and this analysis is provided in Appendix 8-5.

Operational Phase - Fugitive Dust and Odour

- 8.2.42 The IAQM (2018) guidance has been developed to assist in the assessment of the effects of odour on amenity. The IAQM note that before an adverse effect can occur there must be odour exposure. For odour exposure to occur all three links in the source-pathway-receptor chain must be present. The magnitude of effect experienced is determined by the scale of the exposure (considering the Frequency, Intensity, Duration and Odour unpleasantness, FIDO) and the sensitivity of the receptor (L, denoting the location), which is often taken to be a surrogate for the sensitivity and incorporates the social and physical factors that can be expected for a given community.
- 8.2.43 As with the dust assessment the likely magnitude of effect is a combination of the risk of exposure and the sensitivity of the receptors. The risk of exposure is determined based on the source odour potential and the pathway effectiveness.
- 8.2.44 When determining the risk of exposure, the first stage is to categorise the source odour potential using the following risk ranking:

Table 8.5: Source Odour Potential Criteria

Source Potential	Description
Large	<ul style="list-style-type: none"> • Larger Permitted processes of odorous nature or large Sewage Treatment Works (STWs). • Highly odorous compounds with very low detection thresholds with unpleasant to very unpleasant odours. • Open air operation with no containment.
Medium	<ul style="list-style-type: none"> • Smaller Permitted processes or small STWs. • Moderately odorous compounds with neutral to unpleasant odours. • Some mitigation measures in place, but significant residual odour remains.
Small	<ul style="list-style-type: none"> • Smaller Permitted processes or small STWs. • Processes classed as “Less offensive. • Effective, tangible mitigation measures in place (e.g. Best Available Techniques (BAT), Best Practicable Means (BPM) leading to little or no residual odour.

8.2.45 The next stage is to determine the pathway effectiveness as a transport mechanism for odour. This includes consideration of the distance, whether the receptors are down wind of the odour source, the effectiveness of the release, the topography and terrain between the source and receptor. Using the following risk ranking the pathway effectiveness can be categorised as ineffective, moderately effective or highly effective.

Table 8.6: Pathway Effectiveness Criteria

Pathway Effectiveness	Description
Highly effective	<ul style="list-style-type: none"> • Receptor is adjacent to the source/site. • Direction – high frequency (%) of winds from source to receptor (or, qualitatively, receptors downwind of source with respect to prevailing wind).
Moderately effective	<ul style="list-style-type: none"> • Receptor is local to the source.
Ineffective	<ul style="list-style-type: none"> • Receptor is remote from the source. • Direction – low frequency (%) of winds from source to receptor (or, qualitatively, receptors upwind of source with respect to prevailing wind).

8.2.46 The risk of odour at receptor locations is then determined using the following matrix considering the pathway effectiveness and source odour potential.

Table 8.7: Risk of Odour Exposure Criteria

Pathway Effectiveness	Source Odour Potential		
	Small	Medium	Large
Highly effective	Low Risk	Medium Risk	High Risk
Moderately effective	Negligible Risk	Low Risk	Medium Risk
Ineffective	Negligible Risk	Negligible Risk	Negligible Risk

8.2.47 The sensitivity of receptors to odours is determined using the following principles.

Table 8.8: Sensitivity of Receptor

Sensitivity of receptor	Description
High	Surrounding land where: <ul style="list-style-type: none"> • users can reasonably expect enjoyment of a high level amenity; and • people would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Examples may include residential dwellings, hospitals, schools/education and tourist/cultural.
Medium	Surrounding land where: <ul style="list-style-type: none"> • users would expect to enjoy a reasonable level of amenity, but wouldn't reasonably expect to enjoy the same level as amenity as in their home; or • people wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Examples may include places of work, commercial/retail premises and playing/recreation fields.
Low	Surrounding land where: <ul style="list-style-type: none"> • the enjoyment of amenity would not reasonably be expected; or • there is transient exposure, where the people would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Examples may include industrial use, farms, footpaths and roads.

8.2.48 The next step is to estimate the effect of that odour impact on the exposed receptor, taking into account its sensitivity, as shown by the following matrix.

Table 8.9: Odour Impact Criteria

Risk of Odour Exposure	Receptor Sensitivity		
	Low	Medium	High
High risk	Slight Adverse	Moderate Adverse	Substantial Adverse
Medium risk	Negligible	Slight Adverse	Moderate Adverse
Low risk	Negligible	Negligible	Slight Adverse
Negligible	Negligible	Negligible	Negligible

8.2.49 Where the overall effect is greater than “slight adverse” the effect is likely to be considered significant.

8.2.50 Although not specifically developed for assessing fugitive dust from operational sites the approach for construction dust has been applied when determining the impact of fugitive dust release from the Site in lieu of any other specific guidance.

Limitations

8.2.51 Limitations of the assessment have been taken into account wherever possible. For instance:

- The assessment has been undertaken using standard methods outlined in guidance produced by the Environment Agency and the IAQM. Standard assessment criteria, developed by nationally recognised institutions, minimise any uncertainty on the applicability of the approach used.
- Baseline data has been collected from local and national monitoring networks. Where site specific monitoring is not available, worst-case assumptions have been made and if impacts cannot be screened out as negligible irrespective of the baseline concentration, then the choice of baseline concentrations has been considered in greater detail.
- The impact of process emissions from the Proposed Development has been determined, based on operation at the ELVs. In practice the Proposed Development will operate below the ELVs and will be offline for periods of maintenance. Therefore, impacts would be even lower.
- The assessment has used five years of meteorological data to ensure inter-annual variability is taken into account and considered the predicted concentrations at the point of maximum impact and receptor locations.

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- A range of sensitivities of model inputs have been analysed in line with best practice. Where assumptions have been made, these are conservative yet realistic.

8.3 Baseline

Dust and Odour

- 8.3.1 The Site is within a trading estate. Adjacent to the Site is the existing mechanical and biological treatment (MBT) Facility. There is also a hazardous waste management site approximately 350 m to the south. The baseline odour in the local area is potentially impacted by these facilities. However, each facility is required to control odour beyond its installation boundary as a requirement of their respective Environmental Permits. Therefore, these should not be a source of considerable odour in the area. No other potentially significant sources of odour, such as wastewater treatment plants or other waste sites, have been identified in the local area. The closest wastewater treatment works is 1.2 km from the Site. Therefore, the baseline odour levels are not expected to be significant.

Atmospheric Pollution

- 8.3.2 A detailed review of baseline atmospheric pollution levels has been undertaken as provided in Appendix 8-1. This has included a review of local and national monitoring networks, and nationally modelling background data.
- 8.3.3 This analysis has shown that the monitoring of pollutants is limited. In lieu of any local monitoring of other pollutants reference has been made to the DEFRA mapped background dataset and national monitoring networks. This has shown that background concentrations (away from the local road network) are below the AQAL. For other pollutants, not included in the DEFRA mapped background dataset, to determine the baseline concentrations for this assessment reference has been made to national monitoring data and estimates of the local conditions made based on the maximum monitored concentrations for sites in a similar setting to the application Site.

Sensitive Receptors

Dust Sensitive Receptors

8.3.4 As a worst-case assumption, it has been assumed that dust generating activities will occur at the boundary of the Site. Figure 8.1 illustrates the screening distances for dust sensitive receptors from the boundary of the Site.

8.3.5 The IAQM methodology is based on:

- The dust emission magnitude for each activity undertaken at the site - which is based on the scale of each activity; and
- The sensitivity of the area - which is based on the number of properties within certain distances of the boundary of the works.

8.3.6 The following table outlines how many sensitive human receptor locations have been identified in the relevant distance bands from the Site. For clarity, the IAQM methodology states that one residential unit is one high sensitivity receptor.

Table 8.10: Dust Sensitive Receptors

Distance (m)	Estimated number of residential units			
	From Site Boundary		From Site Access Routes	
	High Risk	Medium Risk	High Risk	Medium Risk
< 20	0	0	13	8
< 50	0	2	25	12
< 100	2	~10	-	-
< 200	3	~30	-	-
< 350	~40	~55	-	-

8.3.7 There are a number of both high and medium risk receptors within the human receptor screening distances (i.e. within 350 m of the site boundary, or 50 m by any route used by construction vehicles on the public highway, up to 500 m from the site entrance) indicating the need for further assessment for human receptors.

8.3.8 No hospitals, schools, or hotels have been identified within the relevant screening distances. However, Westbury Lodge care home is located within 350 m of the Site, and is considered within the High Risk human receptors count in Table 8.10. There

are also a number of commercial and industrial premises surrounding the Site within 350 m, including the adjacent dairy. These have been considered in the medium risk human receptors count as shown in Table 8.10.

8.3.9 No designated ecological receptors have been identified within 50 m of the Site boundary or the route used by construction vehicles on the public highway, up to 500 m from the Site entrance. Therefore, there are no ecological receptors which require consideration in this assessment.

Odour Sensitive Receptors

8.3.10 The following table outlines the odour sensitive receptors identified for the purpose of this assessment, including their relative sensitivities to odour effects. These are displayed on Figure 8.2.

Table 8.11: Odour Sensitive Receptors

ID	Receptor Name	Sensitivity	Location		Distance from Site boundary (m)	Distance from Tipping Hall (m)
			X (m)	Y (m)		
OR1	Oakfield Business Centre	Medium	385676	152219	94	186
OR2	23 Storridge Road	High	385917	152362	286	410
OR3	Savencia Fromage & Dairy UK	Low	385858	152173	101	231
OR4	Brook Lane 1 (Residential)	High	385900	152063	61	209
OR5	Brook Lane 2 (Trading)	Medium	385926	152006	85	218
OR6	Brook Lane 3 (Trading)	Medium	385880	151936	101	174
OR7	Brook Lane 4(Trading)	Medium	385868	151825	190	218
OR8	Brook Lane 5 (Residential)	High	385561	151568	368	411
OR9	Brook Drove 1 (Farm)	Low	385551	151768	190	234
OR10	Brook Drove 2 (Residential)	High	385496	151812	199	240
OR11	Biss Brook Footpath 1	Low	385396	151931	197	268
OR12	Biss Brook Footpath 2	Low	385362	152061	233	291
OR13	Westbury Dairies	Medium/High	385631	152069	21	53

8.3.11 The above is not an exhaustive list of sensitive receptors in the local area but those chosen to represent the closest likely areas of exposure in each wind direction. The identification of receptors has been limited to an area of 500 m from the Site boundary. The adjacent Westbury Dairies facility is an industrial process and as such would typically be considered to a medium sensitive receptor. However, as this process is potentially sensitive to odour (as noted in the previous applications for the Site) the sensitivity of this receptor has been increased to medium / high.

Process Emissions - Human Sensitive Receptors

8.3.12 The general approach to the assessment is to evaluate the highest predicted process contribution to ground level concentrations. In addition, the predicted process contribution has been evaluated at a number of sensitive receptor locations. These locations are displayed in Figure 8.3 and listed in the following table.

Table 8.12: Process Emissions Sensitive Receptors

ID	Receptor Name	Location		Distance from Stack (m)
		X (m)	Y (m)	
R1	Westbury Dairies	385654	152070	134
R2	Storridge Road 1	385947	152331	318
R3	Storridge Road 2	386022	152265	314
R4	Westbury Lodge	386078	152180	316
R5	Brook Lane 1	385912	152056	125
R6	Cossington Square	386351	152058	564
R7	Primmers Place 1	386416	151994	632
R8	Primmers Place 2	386496	151911	724
R9	Station Road	386523	151833	769
R10	Bridge Court	386474	151680	783
R11	Oldfield Road	386374	151590	749
R12	Phoenix Rise	386259	151457	763
R13	Hackney Way	386112	151140	972
R14	Sandlewood Road	386035	150412	1663
R15	Brook Lane 2	385564	151571	534
R16	Brook Drove 1	385494	151811	382
R17	Penleigh Road	385503	150879	1,211

ID	Receptor Name	Location		Distance from Stack (m)
		X (m)	Y (m)	
R18	Brook Drove 2	385021	151871	788
R19	Brokerswood Road	384441	153475	1,956
R20	Brook, Heywood	385051	153408	1,539
R21	High Wood	383896	152422	1,926
R22	Bebe Tots Nursery	387461	151765	1,699
R23	Bitham Brook Primary School and Kingfisher Nurseries	387679	151716	1,922
R24	Daisy Chain Pre- School	387043	151316	1,458
R25	Matravers School	386950	150932	1,617
R26	Bright Stars Pre-School	386721	150943	1,453
R27	Bright Stars Nursery	386646	151204	1,210
R28	Westbury Infant School	386647	151274	1,162
R29	Westbury C of E Junior School	386522	151267	1,078
R30	Westbury Leigh Primary School	385983	150314	1,753
R31	Ditton Marsh C of E Primary School and Step-up Pre-School	384878	149720	2,507
R32	On Track Education Centre	385679	153095	1,045

Process Emissions - Ecological Sensitive Receptors

8.3.13 The Air Emissions Guidance states that the following sites of ecological importance should be considered:

- Special Protection Areas (SPAs), Special Areas of Conservation (SACs), or Ramsar sites within 10 km of the site (or 15 km for a coal- or oil- fired power station);
- Sites of Special Scientific Interest (SSSIs) within 2 km of the site; and
- National Nature Reserves (NNR), Local Nature Reserves (LNRs), Local Wildlife Sites (LWSs) and ancient woodlands within 2 km of the site.

8.3.14 Picket and Clanger Wood SSSI lies out of the 2 km screening boundary. However, it is located downwind of the prevailing wind direction and was included in the previous assessments for the Site. Therefore, this site has been included in the assessment. Westbury Ironstone Quarry SSSI has been identified within 2 km screening zone but is significant for geological reasons rather than ecological ones, therefore this is not

considered to be sensitive to air quality impacts and has not been considered further in this assessment.

8.3.15 The locations of these sensitive ecological receptors are listed in the following table and displayed in Figure 8.4. A review of the citation and APIS website for each site has been undertaken to determine if lichens are an important part of the ecosystem's integrity, for the purposes of determining the relevant Critical Level for the habitat.

Table 8.13: Process Emissions – Ecologically Sensitive Receptors

Site	Distance from the Stack at the Closest Point (km)	Lichens identified as present?
European designated sites within 10 km		
Salisbury Plain	3.5	Yes
UK designated sites		
Picket and Clanger Wood	2.3	Yes
Local sites within 2 km		
High Wood/Hazel Wood	1.8	Yes ¹
Round Wood	1.5	Yes ¹
Note: ¹ No information available on lichen presence. Assumed 'Yes' as a conservative measure.		

8.3.16 Reference should be made to Appendix 8-3 for full details of the discrete receptor points used to assess the impact on these ecological sites, the habitats present at each site and the habitat-specific Critical Loads.

8.4 Assessment of Effects

Incorporated Mitigation

8.4.1 The Proposed Development will require an Environmental Permit in order to operate. The Permit will include a list of conditions including limits on emissions to air known as ELVs. For the purpose of this ES Chapter, it has been assumed that the Proposed Development complies with the requirements of the Environmental Permit.

8.4.2 At the Proposed Development all operations will be conducted within enclosed buildings, and vehicles would deposit waste into an enclosed tipping hall. The tipping hall would be held under negative pressure, with the air being used in the combustion

process. This prevents the release of odours and dust from the building when the doors are opened for short periods for deliveries. Residual waste would be stored within a waste bunker, albeit this would be within the enclosed waste tipping hall and waste would not be stored for prolonged periods helping to minimise the conditions which can lead to the generation of malodours. There would be no waste stored outside the buildings. Any odours from the waste stored within the bunker would be drawn into the combustion process by the induced draft fan, where the odorous compounds would be destroyed as a result of the high temperatures within the furnace. Therefore, there would be no release of odour from the stack emissions.

8.4.3 In the event of a planned shut-down / closure, the incoming waste would be managed such that residual waste in the waste bunker would be processed prior to shut-down and the amount of residual waste remaining in the waste bunker would be minimal. However, the proposals also include for a secondary odour abatement system which will involve a carbon filter to abate the odour prior to release to atmosphere via a dedicated stack. This would be in operation whenever the combustion air for the ERF is not needed. This would minimise the risk of odours during these events.

8.4.4 It should be noted that as part of the Environmental Permit needed for the Proposed Development, all emissions, including fugitive dust and odour, would be controlled to ensure there is no impact beyond the installation boundary.

Construction Phase

8.4.5 Potential air quality impacts during the construction phase have been identified as:

- Generation of dust from construction activities on Site; and
- Generation of exhaust emissions from construction phase traffic.

Generation of Dust from Construction Activities on Site

8.4.6 The risk of dust emissions from a construction site causing loss of amenity and / or health or ecological effects is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc.);
- The duration of these activities;
- The size of the site;
- The meteorological conditions (wind speed, direction and rainfall);

-
- The proximity of receptors to the activity;
 - The adequacy of the mitigation measures applied to reduce or eliminate dust; and
 - The sensitivity of the receptors to dust.

8.4.7 The quantity of dust emitted is related to the area of land being worked and the level of construction activities, in terms of the nature, magnitude and duration of those activities. The wind direction, wind speed and rainfall at the time when a construction activity is taking place will also influence whether there is likely to be a dust impact. Atmospheric conditions which promote adverse impacts can occur in any direction from the site. However, adverse impacts are more likely to occur downwind of the prevailing wind direction and / or close to the worked areas. Impacts are also more likely to occur during drier periods as rainfall acts as a natural dust suppressant.

8.4.8 Dust impacts from demolition activities have been screened out from the assessment as there are no demolition activities needed to construct the Proposed Development. The dust emission magnitude for earthworks, construction and trackout activities has been classified using the criteria outlined in Table 1 of Appendix 8-2:

- Earthworks - The total area of the Site is >10,000 m², and there will be a considerable amount (9,900 m³) of earth excavation and earth movement required to dig the bunker hall. The site will be levelled to 62 m AOD and the surplus material used in a screening bund adjacent to the site. On this basis, the dust emission magnitude is classified as 'large'.
- Construction - The total building volume is likely to be >100,000m³ and involve potentially dusty activities. As a conservative assumption, the dust emission magnitude is deemed to be 'large'.
- Trackout - The peak HGV movement during construction is 50 movements per day. For a development of this scale and nature the dust emission magnitude from trackout is deemed to be 'large'.

8.4.9 The sensitivity of the area to dust effects is defined in the following table, taking into account the number of receptors and proximity to the source of potential dust emissions using the criteria outlined in Table 2 to Table 7 of Appendix 8-2.

Table 8.14: Sensitivity of the Surrounding Area

Activity	Sensitivity	Justification
Earthworks and Construction		
Dust soiling	Low	The closest sensitive receptors are classified as medium risk receptors and over 20 m of the Site boundary. The closest high risk receptors are over 100 m from the Site boundary
Human health impacts	Low	The closest sensitive receptors are classified as medium risk receptors and are over 20 m of the Site boundary. The closest high risk receptors are over 100 m from the Site boundary. The annual mean PM ₁₀ concentration are <24 µg/m ³ .
Ecological effects	n/a	No ecological sites have been identified within the screening distances
Trackout		
Dust soiling	High	There are 13 high risk receptors within 20 m of the routes used by construction vehicles up to 500 m from the Site entrance, which have risk of being subject to trackout.
Human health impacts	Low	There are 13 high risk receptors within 20 m of the routes used by construction vehicles up to 500 m from the Site entrance, but the annual mean PM ₁₀ concentration is <24 µg/m ³ .
Ecological effects	n/a	No ecological sites have been identified within the screening distances

8.4.10 The risk of dust impacts from construction activities is summarised in the following table. This is based on the dust emission magnitude and the sensitivity of the area.

Table 8.15: Summary of Dust Risk to Define Site Specific Mitigation

Activity	Risk	Justification
Demolition	N/a	No demolition activities to take place.
Earthworks	Low Risk	The dust emission magnitude is large but the sensitivity of the area is low.
Construction	Low Risk	The dust emission magnitude is large but the sensitivity of the area is low.
Trackout	High Risk	The dust emission magnitude is large and the sensitivity of the area to dust soiling is high.

8.4.11 In summary, the Site has been assessed to be of low risk for dust soiling and human health effects associated with earthworks and construction activities. However, the risk of the Site has been assessed as high risk for dust soiling and human health effects associated with trackout activities. There is no risk of ecological impacts.

8.4.12 In accordance with the IAQM assessment methodology, the risk category of the site is used to define suitable mitigation measures to minimise the risk which would be implemented via the Construction Environmental Management Plan (CEMP). Potential mitigation measures are detailed in the mitigation section of this chapter. These are based on a low risk site for earthworks and construction and high risk site for trackout. With the implementation of these mitigation measures the residual risk is not expected to be significant.

8.4.13 It should be recognised that any impacts would be temporary in nature, short-term in duration and would only occur during the construction period.

Generation of Exhaust Pollutants from Construction Phase Traffic

8.4.14 As set out in chapter 10 the number of construction phase vehicles is 250 AADT of which 50 are HGVs. This does not exceed the screening criteria – i.e. the change in LDV flows is less than 500 AADT, and the change in HGV flows is less than 100 AADT. Therefore, the Proposed Development is not expected to cause a significant change and the significance of effect is deemed to be negligible. Further consideration has been made to the change in vehicle numbers in the AQMA. This has shown that the predicted change in vehicles is 66 AADT of which 14 are HGVs. This does not exceed the screening threshold of 25 HGVs in an AQMA. Therefore, the Proposed Development is not expected to cause a significant change in vehicle numbers in the AQMA and the significance of effect is deemed to be negligible.

Operational Phase

8.4.15 Potential air quality impacts during the operational phase have been identified as:

- Generation of exhaust pollutants from operational phase traffic;
- Generation of process emissions from the Proposed Development; and
- Generation of dust and odour from operational phase activities on Site.

Generation of Exhaust Pollutants from Operational Phase Traffic

8.4.16 As set out in chapter 10 the number of operational phase vehicles is 110 AADT of which 54 are HGVs. This does not exceed the screening criteria – i.e. the change in LDV flows is less than 500 AADT, and the change in HGV flows is less than 100

AADT. Therefore, the Proposed Development is not expected to cause a significant change and the significance of effect is deemed to be negligible. Further consideration has been made to the change in vehicle numbers in the AQMA. This has shown that the predicted change in vehicles is 32 AADT of which 16 are HGVs. This does not exceed the screening threshold of 25 HGVs in an AQMA. Therefore, the Proposed Development is not expected to cause a significant change in vehicle numbers in the AQMA and the significance of effect is deemed to be negligible.

Operational Phase Process Emissions

- 8.4.17 Full details of the modelling methodology, input parameters, assumptions, sensitivity analysis, and results can be found in Appendix 8-3.
- 8.4.18 It should be noted that the first stage of the assessment is considered highly conservative as it assumes that:
- The Proposed Development operates at the ELVs for the entire year;
 - The worst-case conversion of NO_x to NO₂ has been applied;
 - The entire dust emissions are assumed to consist of either PM₁₀ or PM_{2.5};
 - The entire Volatile Organic Compound (VOC) emissions are assumed to consist of either benzene or 1,3-butadiene; and
 - Cadmium is released at the combined ELV for cadmium and thallium.
- 8.4.19 The following tables provides a summary of the maximum impact of process emissions when the Proposed Development is operating at the daily and short-term ELVs

Table 8.16: Summary of Dispersion Modelling Results – Point of Maximum Impact – Daily ELVs

Pollutant	Quantity	Units	AQAL	Background	PC	PC as % of AQAL	PEC	PEC as % of AQAL
Nitrogen dioxide	Annual mean	µg/m ³	40	13.19	0.76	1.89%	13.95	34.87%
	99.79th%ile of hourly means	µg/m ³	200	26.38	5.04	2.52%	31.42	15.71%
Sulphur dioxide	99.18th%ile of daily means	µg/m ³	125	4.42	1.89	1.51%	6.31	5.05%
	99.73rd%ile of hourly means	µg/m ³	350	4.42	3.57	1.02%	7.99	2.28%
	99.9th%ile of 15 min. means	µg/m ³	266	4.42	4.06	1.53%	8.48	3.19%
PM ₁₀	Annual mean	µg/m ³	40	14.91	0.05	0.11%	14.96	37.39%
	90.41th%ile of daily means	µg/m ³	50	29.82	0.15	0.30%	29.97	59.94%
PM _{2.5}	Annual mean	µg/m ³	25	9.77	0.05	0.18%	9.82	39.26%
Carbon monoxide	8 hour running mean	µg/m ³	10,000	532	8.20	0.08%	540.20	5.40%
	Hourly mean	µg/m ³	30,000	532	10.63	0.04%	542.63	1.81%
Hydrogen chloride	Hourly mean	µg/m ³	750	1.42	1.27	0.17%	2.69	0.36%
Hydrogen fluoride	Annual mean	µg/m ³	16	2.35	0.01	0.06%	2.36	14.74%
	Hourly mean	µg/m ³	160	4.7	0.21	0.13%	4.91	3.07%
Ammonia	Annual mean	µg/m ³	180	2.93	0.09	0.05%	3.02	1.68%
	Hourly mean	µg/m ³	2,500	5.86	2.13	0.09%	7.99	0.32%
VOCs (as benzene)	Annual mean	µg/m ³	5	0.39	0.09	1.80%	0.48	9.60%

Pollutant	Quantity	Units	AQAL	Background	PC	PC as % of AQAL	PEC	PEC as % of AQAL
VOCs (as benzene)	Hourly mean	µg/m ³	195	0.78	2.13	1.09%	2.91	1.49%
VOCs (as 1,3-butadiene)	Annual mean	µg/m ³	2.25	0.16	0.09	4.01%	0.25	11.12%
Mercury	Annual mean	ng/m ³	250	20.01	0.18	0.07%	20.19	8.08%
	Hourly mean	ng/m ³	7500	40.02	4.25	0.06%	44.27	0.59%
Cadmium	Annual mean	ng/m ³	5	0.57	0.18	3.61%	0.75	15.01%
	Hourly mean	ng/m ³	-	1.14	4.25	-	5.39	-
PAHs	Annual mean	pg/m ³	250	980	0.95	0.38%	980.95	392.38%
Dioxins	Annual mean	fg/m ³	-	32.99	0.54	-	33.53	-
PCBs	Annual mean	ng/m ³	200	0.13	0.05	0.02%	0.17	0.09%
	Hourly mean	ng/m ³	6000	0.26	1.06	0.02%	1.32	0.02%

Table 8.17: Summary of Dispersion Modelling Results – Point of Maximum Impact – Short-term ELVs

Pollutant	Quantity	Units	AQAL	Background	PC	PC as % of AQAL	PEC	PEC as % of AQAL
Nitrogen dioxide	99.79th%ile of hourly means	µg/m ³	200	26.38	16.80	8.40%	43.18	21.59%
Sulphur dioxide	99.73rd%ile of hourly means	µg/m ³	350	4.42	23.81	6.80%	28.23	8.07%
	99.9th%ile of 15 min. means	µg/m ³	266	4.42	27.07	10.18%	31.49	11.84%
Carbon monoxide	8 hour running mean	µg/m ³	10,000	532	16.40	0.16%	548.40	5.48%
	Hourly mean	µg/m ³	30,000	532	21.27	0.07%	553.27	1.84%
Hydrogen chloride	Hourly mean	µg/m ³	750	1.42	12.74	1.70%	14.16	1.89%
Hydrogen fluoride	Hourly mean	µg/m ³	160	4.7	0.85	0.53%	5.55	3.47%
VOCs (as benzene)	Hourly mean	µg/m ³	195	0.78	4.25	2.18%	5.03	2.58%
Mercury	Hourly mean	ng/m ³	7,500	40.02	7.44	0.10%	47.46	0.63%

8.4.20 As shown, at the point of maximum impact the contribution from the Proposed Development is less than 10% of the short term AQAL and less than 0.5% of the annual mean AQAL and can be screened out as negligible irrespective of the total concentration in accordance with the stated assessment methodology, with the exception for the following:

- Annual mean nitrogen dioxide impacts;
- 15-minute sulphur dioxide impacts;
- Annual mean VOC impacts; and
- Annual mean cadmium impacts.

8.4.21 For the above, further analysis of the likely future baseline concentrations has been undertaken to define the magnitude of change for annual mean impacts for, and the extent of relevant exposure has been undertaken to determine the magnitude of change for short-term impacts

Annual mean nitrogen dioxide impacts

8.4.22 For annual mean nitrogen dioxide, the process contribution at the point of maximum impact is 1.89% of the AQAL. Therefore, consideration needs to be given to baseline concentrations in order to determine the PEC. Figure 8.5 shows the spatial distribution of annual mean nitrogen dioxide impacts as a percentage of the annual mean AQAL. As shown, the point of maximum impact occurs in a small field to the north east of the proposed development off Station Road (i.e. an area where the annual mean AQAL does not apply). Baseline concentrations in the area where the point of maximum impact occurs are likely to be similar to the mapped background concentration (i.e. 13.19 µg/m³). Applying this baseline concentration, the PEC at the point of maximum impact would be 34.87% of the AQAL. Therefore, using IAQM guidance the magnitude of change is described as negligible as the process contribution is less than 5.5% of the AQAL and the PEC is less than 75% of the AQAL.

8.4.23 The impact at local residential receptors has also been investigated, the detailed results table is provided in Appendix 8-3. Using the IAQM guidance, the impact at all but nine of the identified specific sensitive receptor locations is less than 0.5% of the AQAL and so can be described as negligible irrespective of baseline concentrations.

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- 8.4.24 The area where impacts are greater than 0.5% of the AQAL are two distinct areas to the south-west and north-east of the Proposed Development. As shown in Figure 8.5.
- 8.4.25 The area to the south-west where the process contribution is greater than 0.5% of the AQAL includes the receptors identified as R15, R16 and R18. There are a few additional residential properties in this area which are not included as specific receptors. This area is distanced from any main road and therefore baseline concentrations are likely to be similar to the mapped background concentration which is $13.19 \mu\text{g}/\text{m}^3$ (or 33 % of the AQAL). The PEC is well below 75% of the AQAL. Therefore, using the IAQM guidance the magnitude of change is described as negligible.
- 8.4.26 The area to the north-east where the process contribution is greater than 0.5% of the AQAL includes the receptors identified as R2 to R4 and R6 to R9. These are all located along Storridge Road and the B3097. There are also a number of additional residential properties in this area which are not included as specific receptors. This area is adjacent to the road and therefore baseline concentrations are likely to be greater than the mapped background concentration.
- 8.4.27 A review of the local monitoring (Appendix 8-1) shows that analyser P18/108 is most likely to be representative of conditions adjacent to Storridge Road and the B3097. Monitoring at this site is only available from 2018. However, this showed that monitored concentrations were $17 \mu\text{g}/\text{m}^3$ (or .42.5% of the AQAL). The other site of note is P18/57 which is located adjacent to the A350 which is a much busier road. Concentrations at this site ranged between $29 \mu\text{g}/\text{m}^3$ and $36 \mu\text{g}/\text{m}^3$ (or 72.5% and 90% of the AQAL) between 2015 and 2018. This is only really applicable for conditions along the A350 due to the significantly higher traffic rates along this road.
- 8.4.28 Even applying the worst-case assumption that baseline concentrations for receptors along Storridge Road and the B3097 are similar to that monitored along the A350 the PEC is less than 95% of the AQAL. As the process contribution is between 0.5% and 1.5% of the AQAL in this area the magnitude of change is described as negligible.
- 8.4.29 It is noted that operational phase vehicles will travel along the local road network and are a source of emissions of oxides of nitrogen. As set out previously, the change in

vehicle numbers is well below the screening threshold and deemed to be negligible. It is unlikely that the magnitude of change would be described as anything other than negligible even if the additional contribution from road traffic is included, as the contribution from process emissions is small and the baseline concentrations relatively low. Therefore, the in combination nitrogen dioxide impact of process and road traffic emissions is deemed to be negligible.

- 8.4.30 As shown in Figure 8.5 the impact of process emissions is well below 0.5% of the AQAL in the AQMA. The maximum impact is between 0.2 and 0.4% of the AQAL. Therefore, the magnitude of change in the AQMA is described as negligible. Again, the change in vehicle numbers of well below the screening threshold and deemed to be negligible. It is unlikely that the magnitude of change would be described as anything other than negligible even if the additional contribution from road traffic is included, as the contribution from process emissions is small and the baseline concentrations relatively low. Therefore, the in combination nitrogen dioxide impact of process and road traffic emissions in the AQMA is deemed to be negligible.

15-minute sulphur dioxide impacts

- 8.4.31 As shown in Table 8.17, the 99.9th percentile of 15-minute sulphur dioxide PC from the Proposed Development is predicted to be 10.18% of the AQAL at the point of maximum impact if it assumed that the plant operates at the half-hourly ELV as set out in the IED (i.e. 200 mg/Nm³). This is four times the daily ELV set in the IED (50 mg/Nm³). The Waste Incineration BREF introduces a more stringent limit of 30 mg/Nm³. If the same ratio is applied the maximum process contribution is predicted to be 6.11% of the AQAL. It is unlikely that the plant would operate at the half-hourly ELV during the worst-case weather conditions for dispersion. Therefore, there is little risk that the impact would exceed 10% of the AQAL and the magnitude of change is deemed to be negligible.

Annual mean VOCs impacts

- 8.4.32 For annual mean VOCs if it is assumed that the entire VOC emissions consist of only benzene, the process contribution at the point of maximum impact is 1.80% of the AQAL. The detailed receptor results (Table 19 in Appendix 8-3) shows that the maximum impact at a receptor is 1.17% of the AQAL. When the baseline concentration of 0.39 µg/m³ is included, the PEC at the point of maximum impact and at all receptor locations is well below 75% of the AQAL. Therefore, the magnitude of

change is described as negligible, as the maximum impact is less than 5.5% of the AQAL and the PEC is less than 75% of the AQAL. Figure 8.6 shows the spatial distribution of emissions. This is extremely conservative as it assumes that the VOC emissions consist of only benzene.

8.4.33 If it is assumed that the entire VOC emissions consist of only 1,3-butadiene, the process contribution at the point of maximum impact is 4.01% of the AQAL. The detailed receptor results (Table 20 in Appendix 8-3) shows that the maximum impact at a receptor is 2.60% of the AQAL. When the baseline concentration of 0.16 $\mu\text{g}/\text{m}^3$ is included, the PEC at the point of maximum impact and at all receptor locations is well below 75% of the AQAL. Therefore, the magnitude of change is described as negligible, as the maximum impact is less than 5.5% of the AQAL and the PEC is less than 75% of the AQAL. Figure 8.7 shows the spatial distribution of emissions. This is extremely conservative as it assumes that the VOC emissions consist of only 1,3-butadiene.

Annual mean cadmium

8.4.34 For annual mean cadmium, the process contribution at the point of maximum impact is 3.61% of the AQAL. The detailed receptor results (Table 21 in Appendix 8-3) shows that the maximum impact at a receptor is 2.34% of the AQAL. When the baseline concentration of 0.57 ng/m^3 is included, the PEC at the point of maximum impact and at all receptor locations is well below 75% of the AQAL. Therefore, the magnitude of change is described as negligible, as the maximum impact is less than 5.5% of the AQAL and the PEC is less than 75% of the AQAL. This is extremely conservative as it assumes that the entire cadmium and thallium emissions consist of only cadmium. As detailed in Appendix 8-3 monitoring from facilities processing a similar fuel has indicated that average recorded concentration of cadmium and thallium is 8% of the limit. Figure 8.8 shows the spatial distribution of emissions for the following scenarios:

- Screening - assumes emissions of cadmium at 100% of the ELV for cadmium and thallium
- Worst-case - assumes emissions of cadmium at 50% of the ELV for cadmium and thallium
- Typical - assumes emissions of cadmium at 8% of the ELV for cadmium and thallium

Annual mean heavy metals

8.4.35 The Environment Agency's metals screening guidance has been followed as detailed in Appendix 8-3. This has shown that if it is assumed that the Proposed Development will perform no worse than a currently permitted facility, the predicted process contribution is below 1% of the annual mean AQAL and 10% of the 1-hour AQAL for all metals, with the exception of annual mean arsenic and nickel impacts. However, the PECs for arsenic and nickel are well below 100% of the AQAL and so the impacts can be screened out and the significance of effect of process emissions of metals on human health is considered negligible.

Dioxins and dioxin-like PCBs

8.4.36 A human health risk assessment has been undertaken (see Appendix 8-4). This considers the impact of dioxins and dioxin-like PCBs which have the potential to accumulate in the food chain. This has shown that the impact of the Proposed Development on human health due to the accumulation of dioxins and dioxin-like PCBs in the environment is predicted to be negligible.

Summary of Process Emissions Impacts on Human Health

8.4.37 The assessment of process emissions has drawn the following conclusions:

- The process contribution for most pollutants can be described as negligible irrespective of baseline concentration at the point of maximum impact. However, further analysis has been needed for annual mean impacts of nitrogen dioxide, VOCs and cadmium, and short-term sulphur dioxide impacts.
- When the baseline concentrations are taken into account the magnitude of change of annual mean concentrations is negligible at all areas of relevant exposure. This includes consideration of the in-combination impact of process and road traffic emissions.
- Further analysis of the short-term sulphur dioxide impacts concludes that there is little risk that impacts would be greater than 10% of the AQAL and therefore the magnitude of change is negligible.
- The magnitude of change of nitrogen dioxide emissions in the AQMA can be described as negligible. This includes consideration of the in combination impact of process and road traffic emissions.

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- The impact of most metals on human health can be screened out as insignificant irrespective of baseline concentration. However, further analysis has been needed for the impacts of arsenic, and nickel. When baseline concentrations are taken into account, the PEC is well below the AQAL and the impacts can be screened out. Therefore, the effect of process emissions of metals on human health is considered negligible.

8.4.38 Using professional judgement, based on the conservatism in the process emissions modelling assumptions, the overall process emissions associated with the operation of the Proposed Development is predicted to have a 'negligible' and 'not significant' effect on human health.

Impact of Process Emissions on Ecology

8.4.39 Full detailed results tables are provided in Appendix 8-3 showing the impact of process emissions at the identified ecological sites. As shown, the impact is less than 1% of the long-term and less than 10% of the short-term critical level and loads and can be screened out as insignificant for all sites with the exception of Pickett and Clanger Wood SSSI. At this site the impacts of the following are greater than the screening criteria:

- Annual mean oxides of nitrogen emissions
- Annual mean ammonia emissions;
- Nitrogen deposition on woodland habitats; and
- Acid deposition on woodland habitats

8.4.40 Further analysis has been undertaken to determine the significance of the impact on Pickett and Clanger Wood SSSI. This analysis is provided in Appendix 8-5 (Ecological Interpretation of Air Quality Assessment).

Plume grounding

8.4.41 The plume visibility modelling can be used to predict the number of visible plumes grounding. This has shown that a visible plume is not predicted to ground under any meteorological condition. This is due to the relatively high temperature of the release ensuring the plume remains buoyant and disperses effectively in the atmosphere.

Operational Phase Dust and Odour Emissions

- 8.4.42 The IAQM (2018) guidance sets out a methodology for estimation of the effect of odour on a receptor, taking into account the risk of odour exposure (which is a function of the source odour potential and pathway effectiveness) and receptor sensitivity.
- 8.4.43 The aspects of the Proposed Development likely to give rise to dust and odour are the delivery and unloading of waste. The closest receptor to the Site boundary is Westbury Dairies. It is also the closest receptor to the Tipping Hall where any potential odour would originate. Westbury Dairies is located approximately 53 m from the Tipping Hall. As a place of work, this is considered to be a medium sensitivity receptor. However, as a conservative approach as it has been identified that the potential for odour to taint the milk during the drying process has been raised this has been assessed as a high sensitive receptor.
- 8.4.44 The odour source potential is considered to be 'small' as the planned odour containment and mitigation measures embedded in the design of the Proposed Development as set out previously are intended to prevent an unacceptable level of odour beyond the Site boundary. In the event of an unplanned shut-down, the combustion process would not be using air extracted from the odourous areas of the building as combustion air. However, the air would be transferred to the odour abatement system and vent to atmosphere via the dedicated stack. Therefore, the odour source potential would remain small.
- 8.4.45 The risk of odour from the proposed processes at distances greater than 500 m from the source is minimal as odour would dissipate with distance from the source. If odours were to be released from the Proposed Development these would originate from the Tipping Hall. Under calm conditions odour would remain close to this area whereas during turbulent conditions odour would be moved away from the area and dissipate.
- 8.4.46 The wind roses from Lyneham for 2015 to 2019 (Figure 3 of Appendix 8-3) have been reviewed. There is a distinct peak in frequency of winds from the south west, with a secondary peak in winds from the north-east, winds from other directions occurring with a relatively uniform low frequency. When considering wind direction,

receptors located downwind of the peak in wind direction frequency (to the north-east) have the most effective odour pathway. Receptors not located downwind of the peak wind direction have an ineffective pathway.

8.4.47 Excluding Westbury Dairies (OR13), all identified receptors are over 170 m from the Tipping Hall, as shown on Figure 8.2.

8.4.48 The effectiveness of the pathway from the source to each receptor has been considered using the criteria in Table 8.6.

- OR1 to OR4 are located over 180 m from the source of odour (the Tipping Hall). This is down-wind of the peak in wind directions, but the receptor is at a far enough distance that odour would have dissipated by this point. There will also be some screening provided by the rest of the building. Therefore, the pathway effectiveness to OR1 to OR4 is considered to be 'ineffective'.
- OR5 to OR8 are over 170 m from the source of odour (the Tipping Hall) and winds do not frequently blow in this direction. There will also be some screening provided by the rest of the building for OR5 and OR6. Therefore, the pathway effectiveness to OR5 to OR8 is considered to be 'ineffective'.
- OR9 to OR11 are located over 230 m from the source of odour (the Tipping Hall). This is down-wind of the secondary peak in wind directions, but the receptors are at a far enough distance that odour would have dissipated by this point. Therefore, the pathway effectiveness to OR9 to OR11 is considered to be 'ineffective'.
- OR12 is located over 290 m from the source of odour (the Tipping Hall) and winds do not frequently blow in this direction. Therefore, the pathway effectiveness to OR12 is considered to be 'ineffective'.
- OR13 is located adjacent to the Site and only 20 m from the potential source of odour (the Tipping Hall). Although mitigation measures should control odour, and winds do not frequently blow in the direction of the receptor, because of its close proximity, the pathway effectiveness to OR13 is 'highly effective'.

8.4.49 Using the criteria in Table 8.8 and Table 8.9, the likely magnitude of odour effects at the receptors considered has been determined as detailed in the following table based on a 'large' odour source potential as a conservative assumption.

Table 8.18: Likely Magnitude of Odour Effects at Receptors

Receptor		Pathway effectiveness	Risk of odour exposure	Likely magnitude of effect
OR1	Oakfield Business Centre	Ineffective	Negligible Risk	Negligible
OR2	23 Storrige Road	Ineffective	Negligible Risk	Negligible
OR3	Savencia Fromage & Dairy UK	Ineffective	Negligible Risk	Negligible
OR4	Brook Lane 1 (Residential)	Ineffective	Negligible Risk	Negligible
OR5	Brook Lane 2 (Trading)	Ineffective	Negligible Risk	Negligible
OR6	Brook Lane 3 (Trading)	Ineffective	Negligible Risk	Negligible
OR7	Brook Lane 4(Trading)	Ineffective	Negligible Risk	Negligible
OR8	Brook Lane 5 (Residential)	Ineffective	Negligible Risk	Negligible
OR9	Brook Drove 1 (Farm)	Ineffective	Negligible Risk	Negligible
OR10	Brook Drove 2 (Residential)	Ineffective	Negligible Risk	Negligible
OR11	Biss Brook Footpath 1	Ineffective	Negligible Risk	Negligible
OR12	Biss Brook Footpath 2	Ineffective	Negligible Risk	Negligible
OR13	Westbury Dairies	Highly effective	Low Risk	Slight Adverse

8.4.50 The likely odour effect under the worst case scenario is ‘negligible’ at receptors with the exception of the Westbury Dairies (OR13), where the effect would be slight adverse.

8.4.51 The IAQM 2018 odour guidance states that ‘where the overall effect is greater than ‘slight adverse’, the effect is likely to be considered significant. Therefore, as the effect at any receptor location is not greater than ‘slight adverse’, the odour effect of the operation of the Proposed Development is not significant.

8.4.52 In order to assess the impact of fugitive dust from the operational phase of the Proposed Development the principals of the approach used to determine construction phase dust impacts have been applied.

8.4.53 A review of the proposals has shown that, during the operational phase, the most significant sources of fugitive dust would arise from the delivery and unloading of waste to the Proposed Development. Noting that the Environmental Permit would ensure any fugitive dust would be controlled to ensure there is no impact beyond the installation Site boundary, the likelihood of significant dust arisings during the operational phase is minimal.

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- 8.4.54 Based on the inherent mitigation the dust emission magnitude of fugitive dust is deemed to be 'small'. All high sensitive receptors are over 200 m from the Tipping Hall and all medium receptors are over 50 m from the Tipping Hall. Baseline PM₁₀ concentrations are less than 24 µg/m³. Therefore, the sensitivity of the area is deemed to be 'low'. The risk of dust impacts during the operational phase is deemed to be 'negligible' as the magnitude of dust emissions is 'small' and the sensitivity of the area is 'low'.
- 8.4.55 The operational phase fugitive emissions of dust and odour associated with the operation of the Proposed Development are predicted to have a negligible and not significant effect.

Bio-aerosols

- 8.4.56 The previous applications for the site considered the risk of bioaerosol generation and the potential to affect the existing air filtration system at Westbury Dairies. The ES for the 2019 Permission included an assessment of the potential release of bio-aerosols. The 2008 planning application for the Northarce RRC including the MBT had required this due to concerns raised by Westbury Dairies and it was therefore echoed in the ES Scoping received from Wiltshire Council in Nov 2014.
- 8.4.57 This application is seeking permission for advanced thermal treatment plant using moving grate technology. The Facility will accept residual household waste and C&I wastes which generally has a low organic content. Waste will be delivered and unloaded within the tipping hall which would be kept under negative pressure. The air from the tipping hall would be used as combustion air in the Facility. Any bioaerosols in the extracted air would be removed during the incineration process prior to release via the main stack. Therefore, the potential for bioaerosols to be in the waste is low and there is little risk of any releases during normal operations. The risk of bioaerosol release when the Facility is offline during planning maintenance is low as the level of waste in the bunker would be managed to ensure waste would not be left in the bunker for long periods. In addition, the secondary odour abatement system would act to mitigate and disperse any low residual levels. In the event of an unplanned shut-down where the Facility cannot be re-started the secondary odour abatement system would be in operation and any waste would be removed for processing at an alternative facility. These measures would be detailed in the

Environmental Permit application. Therefore, the potential for bioaerosol releases from the Facility is negligible and not significant.

Cumulative Effects

8.4.58 No cumulative schemes have been identified as requiring assessment. Therefore, there is no potential for cumulative effects.

8.5 Mitigation

Construction Phase Mitigation Measures

8.5.1 The construction dust assessment has identified that the risk of the Site causing dust impacts from earthworks and construction is low. However, there is a high risk of impacts from trackout during the period of peak construction.

8.5.2 Appropriate mitigation measures to minimise any impacts as a result of trackout, as highly recommended in the IAQM guidance for a high risk site, are listed here:

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

8.5.3 Further highly recommended mitigation measures for all sites from the IAQM guidance are listed here:

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- Display the name and contact details of person(s) account-able for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information.
- Develop and implement a Dust Management Plan (DMP).
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book.
- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to visually monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.

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- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
 - Cover, seed or fence stockpiles to prevent wind whipping.
 - Ensure all vehicles switch off engines when stationary - no idling vehicles.
 - Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
 - Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
 - Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
 - Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
 - Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
 - Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
 - Use enclosed chutes and conveyors and covered skips.
 - Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
 - Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
 - Avoid bonfires and burning of waste materials.

Operational Phase Mitigation Measures

- 8.5.4 In relation to operational impacts, no additional mitigation is required beyond that imbedded into the design and required by legislation, that will be regulated by the Environment Agency under an Environmental Permit.

8.6 Residual Effects and Conclusions

- 8.6.1 Mitigation measures have been recommended to control construction phase dust impacts in line with the IAQM guidance. With the implementation of these measures any residual effects are deemed to be not significant. No further mitigation measures, beyond those included for in the design of the Facility and legislation, have been recommended.
- 8.6.2 In conclusion, the Proposed Development is not predicted to give rise to significant environmental effects on air quality, human health and odour in the local area either during the construction or operational phases
- 8.6.3 Generally, the impact of process emissions is less than the previously consented scheme due to the reduction in the ELVs associated with the implementation of the Waste Incineration BREF. The 2018 ES concluded that the impact of the Proposed Development would be not significant – i.e. the same as this assessment for the revised scheme.

CHAPTER 9.0 SURFACE WATER AND FLOOD RISK

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APPENDICES (bound separately in Volume 3)

Appendix 9-1.....	Flood Risk Assessment
Appendix 9-2.....	Drainage Strategy Report

9.0 SURFACE WATER AND FLOOD RISK

9.1 Introduction

- 9.1.1 Flood Risk Mitigation: National Planning Policy Framework (NPPF) and Environment Agency guidelines state that a formal Flood Risk Assessment (FRA) is required to support a planning application for any new development at a site that is; (i) Located in Flood Zone 2 or Flood Zone 3, (ii) Located in a Critical Drainage Area, (iii) Changing Vulnerability classification from less to more vulnerable, or (iv) Over 1 hectare in plan area.
- 9.1.2 The FRA report (Appendix 9-1) was produced to satisfy item (iv) as the Proposed Development Site is approximately 2.88 ha in plan area (herein referred to as the 'Site'). The other three criteria do not apply. The assessment is required to ensure the Northacre Facility is not a potential cause for flooding at the Site or elsewhere.
- 9.1.3 Drainage Strategy: the Northacre Industrial Estate is currently served by a dedicated foul and stormwater sewer network which has been adopted by Wessex Water (WW). The collector sewers have been designed and built specifically to serve all future development sites and associated highways proposed within the Industrial Estate. The adopted stormwater system has been designed for the 1 in 100 year storm event with further allowance for climate change.
- 9.1.4 A comprehensive drainage strategy is required for all developments that addresses safe discharge of stormwater and foul water from a proposed development in a sustainable manner to comply with national and local guidelines. Stormwater management is the key requirement for the Northacre Facility as foul water flow rates generated are very low and can be discharged directly to the WW's foul sewer in Stephenson Road. The proposed stormwater management is compliant with Wiltshire Council's (WC) Local Flood Risk Management Strategy, recommendations in the Sustainable Drainage (SuDS) Manual and adheres to the discharge conditions stipulated by WW for their adopted stormwater sewer network.
- 9.1.5 The Drainage Strategy Report (Appendix 9-2) was produced to satisfy the requirements of the Lead Local Flood Authority (LLFA, WC), WW and national Building Regulation and design guidelines.

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- 9.1.6 Connection to the WW public sewers will be in full accordance with their Section 106 sewer connection procedures, standards and guidelines.

Proposed Development

- 9.1.7 As described in detail within Chapter 4.0 of this ES, the Proposed Development would be a conventional combustion plant for the recovery of energy from non-hazardous residual waste.
- 9.1.8 The existing Site is formed predominantly of permeable (grass and soil) surfaces with a short length of tarmac access road. The site layout plan (Figure 4.6) shows the Proposed Development would comprise 79.8% impermeable surfaces (i.e. roofs, roads and hardstanding areas for plant and equipment) and 20.2% permeable green spaces and a pond. Therefore, hard surfaces and green spaces equate to 2.07 ha and 0.53 ha respectively.¹

Competence

- 9.1.9 Faruk Pekbeken, BEng CEng MICE is a Chartered Civil Engineer with over 31 years' experience in infrastructure sector including project management, strategic analysis, detail design and site supervision of major projects throughout the UK and overseas with emphasis on sustainable drainage and flood mitigation. His wider engineering experience covers environmental enhancement of urban and rural sites, provision of utilities infrastructure, water and wastewater treatment facilities, highway drainage, port and coastal works and. He is currently managing multiple projects for a large variety of private and public-sector clients across the industry, designing and delivering efficient engineering solutions for schemes involving bespoke residential properties, schools, business parks, energy centres, breweries, hospitals and parks. He is actively involved with local authorities, water companies, private sector clients and charities in providing planning and engineering and environmental guidance compliant with current NPPF, Code for Sewerage, Building Regulations, SuDS Manuals, EA / Defra / CIRIA reports and latest BS EN standards and procedures. Faruk is an Expert Witness in the sustainable drainage and flood risk sector resolving disputes and advising solicitors and re-insurers on cases relating to local and

¹ Not that the figures do not add up to the total application site size 2.88ha on the basis this size takes account of the high-level overhead conveyor linking the MBT facility and the Proposed Development and visibility splays on Stephenson Road.

industrial-scale failures in the UK and globally. He is currently working on several Expert Witness duties involving detailed assessment of drainage-related failures supported by recommendation for corrective-action in a timely manner for properties and sites in urban and rural areas.

9.2 Methodology and Scope of Assessment

Legislation and Guidance

9.2.1 For Flood Risk Mitigation the following legislation, guidance and standards have been applied in the Flood Risk Assessment report:

- NPPF, Ministry of Housing, Communities and Local Government, published 27 March 2012, updated 19 June 2019
- NPPF Planning Practice Guidance, Ministry of Housing, Communities and Local Government, published 29 November 2016, updated 01 October 2019
- Department for Communities and Local Government, Planning Policy Statement 25: Development and Flood Risk, 2010
- WC Level 1 Strategic Flood Risk Assessment, Updated by JBA Consulting, May 2019
- Flood and Water Management Act, Defra, 2010
- WC, Local Flood Risk Management Strategy, April 2015
- National Flood and Coastal Erosion Risk Management (FCERM) Strategy, Environment Agency 24 May 2019
- Wiltshire and Swindon Waste Site Allocations Local Plan (WSALP), Wiltshire Council, February 2013
- Factual Site Investigation No 3175/11 at Brooke Lane 3, Westbury, Terramech Investigations Ltd, 2011
- Approved Document Part H of the Building Regulations, Drainage and Waste Disposal: 2015 Edition
- Sewers for Adoption 8th Edition: A Design and Construction Guide for Developers, published by Water UK and WRc: July 2018 and Code for Adoption – Sewerage by Water UK, effective from 01 April 2020.
- British Standard 'Drain and sewer systems outside buildings. Sewer system management', BS EN 752: 2017
- Drainage Strategy, Proposed Resources Recovery Centre, Northacre, Wiltshire, Cole Easdon, 2007.

9.2.2 For SuDS the following legislation, guidance and standards have been applied in the Drainage Strategy report:

- Factual Site Investigation No 3175/11 at Brooke Lane 3, Westbury, Terramech Investigations Ltd, 2011
- Drainage Strategy, Proposed Resources Recovery Centre, Northacre, Wiltshire, Cole Easdon, 2007
- SuDS Manual CIRIA C753, CIRIA: November 2015
- Approved Document Part H of the Building Regulations, Drainage and Waste Disposal: 2015 Edition
- Sewers for Adoption 8th Edition: A Design and Construction Guide for Developers, published by Water UK and WRc: 2018 and Code for Adoption – Sewerage by Water UK, effective from 01 April 2020.
- British Standard 'Drain and sewer systems outside buildings. Sewer system management', BS EN 752: 2017
- CIRIA Guidance on Key Performance Indicators C657 for water use in commercial facilities (W010) and for water use in offices (W011): February 2006.

Assessment Methodology

9.2.3 The overall objective of the flood risk mitigation study was to produce a FRA report that meets the requirements of NPPF. The Site lies in Flood Zone 1 (lowest national risk category) but all potential forms of flood risk has been investigated including tidal, fluvial, groundwater, sewer and reservoir.

9.2.4 Liaison with the Environment Agency (EA) resulted in their confirmation that flood risk at the Site is not only low but there is no record of previous flooding incidents at this location. Therefore, an appropriate drainage strategy is more prevalent for the Site using SuDS principles.

9.2.5 To achieve this aim, the following key actions were carried out; (i) Undertake consultation with the EA and water authority, (ii) Review topographical and flood risk data to identify the existing flood risk posed to the Site from all sources, (iii) Review and assess the surface water run-off generated at the Site and identify suitable measures to manage drainage from the proposed development and, (iv) Identify suitable mitigation measures to protect the development Site against flooding.

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- 9.2.6 In order to meet the above objectives, the following scope of work and tasks were undertaken.
- 9.2.7 Task 1: Data Collection - The latest relevant information on the nature of the flood risk at the Site was collected from key stakeholders. A comprehensive topo survey was produced and issued in 2014. NRE Ltd provided plans and elevations showing the layout and design for the Proposed Development. The EA has provided flood data for the Site and adjacent areas.
- 9.2.8 Task 2: Identification of Current and Post-Development Flood Risk - The existing and post-development flood risk posed to the Site was assessed from the data that was collected in Task 1. The assessment identifies the flood risk from all potential sources of flooding and includes consideration of the impact of climate change on flood risk. Particular emphasis is given to SuDS techniques where appropriate on an industrial Site.
- 9.2.9 Task 3: Assessment of Site Drainage - Using national standards, guidelines and current good practice methods, the existing and post-development surface water flows discharged from the Site were calculated. The results of these calculations were used to develop a site-specific drainage strategy. This strategy complies with the requirements of NPPF and the requirements of the both the LLFA (WC) and the EA.
- 9.2.10 The overall objective of the drainage strategy study was to produce a Drainage Strategy report to satisfy the sustainable requirements of the LLFA (WC), WW and national Building Regulation and design guidelines.
- 9.2.11 Due to the clayey ground conditions, infiltration techniques are not possible at the Site. Subsequently, the next best option in the sustainable drainage hierarchy has been proposed involving attenuation of stormwater on-site in a pond and discharging to a sewer at a controlled, and reduce, rate.
- 9.2.12 The proposed Surface Water (SW) drainage strategy is based on the design of the SW drainage network throughout the proposed Site follows the principles listed in the Approved Document Part H of the Building Regulations and Sewers for Adoption 8th Edition. The Building Regulations established a hierarchy for SW disposal which encourages a SuDS approach.

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- 9.2.13 Northacre Industrial Estate is served by an existing SW drainage network that incorporates large collector sewers under Stephenson Road supplemented by a large detention pond that has been designed to attenuate stormwater run-off for the 1:100 year + Climate Change storm event based on 65% impermeable areas within the Estate. Outflow from the pond at the Site is limited to the 1:1 year greenfield discharge rate (200 l/s). This equates to 7.27 l/s/ha for the entire Northacre Trading Estate (27.5 ha). The reservoir has been designed with 5,000m³ storage and discharges SW to the Biss Brook.
- 9.2.14 As the impermeable area of the proposed Site (from the layout plan, see Figure 4.6) is 78.9% (i.e. higher than 65%) additional on-site stormwater attenuation has been produced to provide betterment and to restrict outflow to the required discharged rate.
- 9.2.15 The design life of the Proposed Development is 40 years therefore the SW sewers for the Site are designed and modelled for the 1 in 40 year flood event with 20% allowance for climate change. The design also allows for a 1 in 2 year no surcharge and 1 in 30 year no flooding standard for a commercial facility in accordance with BS EN 752: 2017.
- 9.2.16 The proposed SW sewer network for the Site has been designed with nationally applied WinDes Microdrainage modelling software and calculations and outputs are provided in the Drainage Strategy Report (Appendix 9-2).
- 9.2.17 On-site stormwater attenuation is provided by a new stormwater detention pond near the northern perimeter of the Site which is 300m² in plan area and has an invert level of 59.54m AOD. The invert is approximately 2.5m below the proposed finished Site level of 62.0m AOD. The pond provides a total of 300m³ of attenuated storage volume.
- 9.2.18 To satisfy SuDS requirements and pollution prevention guidelines, the proposed SW network will include a petrol interceptor and trapped gullies to ensure that a minimum of two forms of treatment is provided by the new drainage system to prevent pollution of receiving waters.

9.2.19 Controlled peak SW discharge of 287 l/s² would be made from the new facility to the existing 525mm diameter WW SW sewer in Stephenson Road under gravity. The public sewer ultimately discharges into the existing detention reservoir located downstream. The receiving WW sewer has approximately 1 in 23 gradient with a pipe full capacity of approximately 1,000 l/s designed for 1 in 100 year + CC rainfall event; therefore, the public sewer is expected to have sufficient capacity to convey the controlled peak SW discharge rate of 287 l/s.

9.2.20 Control of SW discharge from the Site will be via an orifice plate located in a control chamber.

Assessment of Significance / Assessment Criteria

9.2.21 The assessment of the magnitude of flood risk at the Site is compliant with the EA's classifications and their latest flood modelling data for the nearest watercourse, Biss Brook. The risk of flooding from tidal, fluvial, groundwater, sewer or reservoir sources are 'low' or 'very low' as defined by EA's assessment methodology. The Site is not at risk from these sources or from potential surface water sources resulting from overland flow during heavy rain.

9.2.22 The proposed peak foul water (FW) discharge rate from the Site to the existing 225mm diameter Wessex Water sewer in Stephenson Road is not expected to exceed 3 l/s. This is well within the overall capacity of the receiving public sewer and in expected flow rates generated at the Estate.

9.2.23 The proposed on-site SW drainage system is a supplement to the existing, and extensive, drainage network serving the entire Northacre Industrial Estate, which provides stormwater attenuation during the 1 in 100 year event with 20% allowance for climate change. The stormwater attenuation facility at the Proposed Development Site provides betterment and reduces flows off the Site via a new attenuation pond and control chamber. The Proposed Development Site is therefore furnished with two levels of stormwater provision, on- and off-site.

² It is generally accepted that a suitable rainfall design intensity for sizing surface water drains is 0.014 litres/second/m² (50mm/hour) in accordance with Building Regulations Approved Document Part H.

Scope of Assessment

9.2.24 The scope of the assessment is detailed in Section 9.2

Consultation

9.2.25 The EA has been consulted as they are the statutory consultee where main rivers are concerned. The latest flood modelling data has been obtained from the EA for the detailed analysis of all potential forms of flood risk at the Site. The LLFA's statutory guidelines have also been assessed in preparation of the site-specific FRA report.

9.2.26 WW has been consulted with respect to the extensive foul and sewer networks serving the Northacre Industrial Estate. This network provides extensive protection to the Site, but an on-site stormwater attenuation scheme has been designed to provide two levels of protection by reducing peak stormwater discharges from the Site to the adopted public sewer.

Limitations

9.2.27 All necessary baseline technical and modelling data required to produce the FRA and Drainage Strategy reports were obtained by the statutory consultees with no specific limitations.

9.3 Baseline

Data Collection

9.3.1 The latest relevant information on the nature of the flood risk at the Site was collected from key stakeholders. A comprehensive topo survey was produced and issued in 2014. NRE Ltd provided plans and elevations showing the layout and design for the Proposed Development. The EA has provided flood data for the Site and adjacent areas. The existing sewer asset data was obtained from WWs developer services department. Underlying soils data was obtained from BGS sources which confirmed the clayey ground conditions at the Site.

Baseline Environment

- 9.3.2 All baseline survey data collected from the stakeholders, and methodologies used to produce the FRA and Drainage Strategy Report are detailed in paragraphs 9.2.7 to 9.2.13. A comprehensive list of all references used to produce the FRA and Drainage Strategy reports are identified in paragraphs 9.2.1 and 9.2.2 respectively.

Future Baseline

- 9.3.3 The existing Site is in Flood Zone 1 and located on high ground above the floodplain of the nearest main river, Biss Brook. Any increase in the existing floodplain is unlikely to affect the proposed Site even in the severe 1,000 year flood event.
- 9.3.4 The Proposed Development has a design life of 40 years. However, the existing Northacre Industrial Estate is furnished with a comprehensive stormwater attenuation facility designed to accommodate the 1 in 100 year storm with 20% allowance for climate change.
- 9.3.5 The Proposed Development is supplemental with an on-site stormwater attenuation system modelled for the 1 in 40 year flood event with 20% allowance for climate change.
- 9.3.6 Proposed foul water discharges from the Site are small and unlikely to affect the capacity of the existing foul sewers serving the Site.
- 9.3.7 The Site is therefore sufficiently futureproofed and minor variation to Site layout would not significantly affect facility or the Industrial Estate.

9.4 Assessment of Effects

Incorporated Mitigation

- 9.4.1 The Proposed Development is designed with a stormwater drainage system that allows for the 40 year design life plus a further 20% increase in the future resulting from climate change. This allowance is in addition to the 1000 year + 20% climate change allowance provided by the wider adopted network serving the entire Estate.

9.4.2 On-site stormwater attenuation is proposed using a pond with 300m³ volume (rather than an underground tank) to provide additional environmental benefits at the Site. Consideration has also been given to reduce surface water run-off at the Site by allowing parking area to be constructed with permeable paving to reduce run-off from the Site.

Construction Phase

9.4.3 Stormwater and foul water drainage systems are normally installed as part of the initial infrastructure installation works. Any connection to the public sewer network will be carried out after approval is secured from the LLFA and WW under a Section 106 Agreement. All drainage installation would therefore be completed prior to construction of the main facility.

9.4.4 The installed drainage system on Site will be operated and maintained for its lifetime by the Applicant and all foul and stormwater drainage networks are to be assessed in accordance with national guidelines for pollution prevention. All ponds, road gullies, petrol interceptors, control chambers, sanitary systems etc require regular inspection and maintenance to be undertaken using a maintenance plan to be produced by the assigned site management company.

Operational Phase

9.4.5 See paragraph 9.4.4.

9.5 Cumulative Effects

9.5.1 The potential cumulative effects arising from the Proposed Development has been considered. As the site is in Flood Zone 1 and offers a drainage strategy that attenuates excess rainwater on site and discharges at a controlled rate agreed with the water authority, there are no negative residual effects beyond the Site.

9.6 Mitigation

Construction Mitigation

9.6.1 No further mitigation measures are deemed necessary.

Operational Mitigation

9.6.2 As for construction mitigation.

9.7 Residual Effects and Conclusions

9.7.1 The application site is in Flood Zone 1 which is the lowest flood risk designation in the UK. All forms of flood risk at the Site has been assessed and resulting risk considered to be low to very low.

9.7.2 The Proposed Development would increase the impermeable area to 79.8% of the Site resulting in an increase in surface water run-from the Site to the existing WW stormwater collector sewer in Stephenson Road. The collector sewers have been designed to accommodate unrestricted run-off from the Site based on a 65% allowance for impermeable surfaces. Therefore, a comprehensive on-site stormwater attenuation system has been designed to accommodate the difference and reduce flows off the Site via a control chamber thus providing overall betterment.

9.7.3 The clayey ground conditions at the Site reduces the natural infiltration rate of rainwater into the underlying ground resulting in potential overland flow toward Biss Brook. The Proposed Development would prevent this by controlling all run-off and attenuating flows in a new stormwater attenuation pond reducing the threat of overland flow to areas outside the Site boundary which is an improvement on the existing conditions.

9.7.4 Provision of an on-site attenuation pond, with 300m³ volume, allows for habitat creation and environmental enhancement at the Site.

9.7.5 The design of the overall surface water drainage system is based upon SuDS principles, and the proposed stormwater management systems at the Site allow for increase in rainwater run-off due to climate change therefore any increase will be accommodated in the proposed network without detrimental effect to the Site or elsewhere.

9.7.6 The proposed foul water drainage system is a traditional adoptable network that is designed in accordance with current Building Regulations Part H and relevant drainage design standards. The resulting peak flows are very small and can be

accommodated by the WW foul sewer network designed to serve the sites at the Industrial Estate.

- 9.7.7 The betterment provided by the proposed stormwater drainage system and the low foul water rates discharged from the Site are expected to be approved by WW in due course.

CHAPTER 10.0 TRANSPORT

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10.0 TRANSPORT

10.1 Introduction

- 10.1.1 This Chapter of the Environmental Statement (ES) assesses the traffic and transport implications of the proposed Northacre Facility.
- 10.1.2 The content of the ES Chapter is drawn from a Transport Assessment (TA) which forms a standalone document submitted in support of the application, the scope of which has been expanded from supporting information prepared by IMA Transport Planning for previous planning applications for Energy from Waste development on this site, including planning application ref: 18/09473/WCM, approved in 2019 (hereafter referred to as the '2019 permission').
- 10.1.3 The consultation responses from the Local Highway Authority (LHA) on previous Energy from Waste applications on this site (ref: 14/12003/WCM, 18/03816/WCM and 18/09473/WCN, described in section 1.2 of the TA), consistently concluded that the proposals would not have any measurable impact on the local highway network.
- 10.1.4 The analysis presented in the TA demonstrates that would remain the case for the current proposal, which would therefore have no significant adverse transport impacts. This chapter presents those findings in the format of an ES.

Proposed Development

- 10.1.5 The Northacre Facility is fully described elsewhere in Chapter 4.0 of this ES, but a description in a transport context is provided here.
- 10.1.6 The Proposed Development would generate Energy from Waste (EfW), comprising residual non-hazardous waste from municipal, commercial and industrial sources, and output from the neighbouring Mechanical and Biological Treatment (MBT) facility, also referred to as the Northacre Resource Recovery Centre (RRC).
- 10.1.7 The MBT operates from land adjoining the application site, processing municipal waste to produce solid recovered fuel (SRF) which is exported to mainland European EfW facilities by road.

- 10.1.8 Providing an EfW facility on the adjacent site would allow SRF (other residues such as heavies and fines) transfer by conveyor, removing the need for long distance road transport, with significant environmental and economic benefits. The HGV movements that would be removed from local roads are quantified in section 4.2 of the TA.
- 10.1.9 The proposal would also allow residual waste to be managed economically close to their source, reducing the need for waste transport, mainly by road, to other parts of the UK and to landfill, with further environmental and economic benefits.
- 10.1.10 The Northacre Facility would operate 7 days a week, year-round, with HGV movements operating between 07:00 and 22:00 Monday to Friday and 07:00 to 17:00 on Saturdays. It is expected to employ 40 staff.
- 10.1.11 The scheme plan shows 37 car parking spaces, including 3 for disabled users and 7 equipped with Electric Vehicle Charging Points (EVCP), plus 5 motorcycle bays and a secure and covered shelter for 12 bicycles. The proposed provision is adequate to serve the 40 staff and occasional visitors.

Competence

- 10.1.12 This chapter has been prepared by Paul Greatwood, a director of IMA Transport Planning, a consultancy based in Bath and established in 2001. Paul has over 30 years' experience in traffic and transportation planning in public and private sectors, and manages schemes across the UK that include mineral extraction, waste management, retail, residential, office, commercial and mixed-use regeneration projects. Paul has extensive experience advising on private sector development from initial feasibility studies, through Transport Statements and Assessments, Travel Plans and Environmental Statements for planning applications, section 106 and 278 agreements, to expert witness evidence at planning appeals.

10.2 Methodology and Scope of Assessment

Legislation and Guidance

- 10.2.1 This section considers national and local planning policy as it relates to the site and the proposals in terms of transport.

- 10.2.2 National Policy is drawn from the National Planning Policy Framework, while local policy is summarised from the Wiltshire & Swindon Waste Core Strategy Development Control Policies DPDs, the Wiltshire Core Strategy and the third Local Transport Plan for Wiltshire.
- 10.2.3 Guidance on the environmental assessment of road traffic is from the Institute of Environmental Management and Assessment (IEMA) Guidance Note 1 (1993).

National Planning Policy Framework (June 2019)

- 10.2.4 The National Planning Policy Framework (NPPF), revised in June 2019, sets out the Government's planning policies for England and how these should be applied. It states that achieving sustainable development involves meeting economic, social and environmental objectives.
- 10.2.5 NPPF emphasises that the objectives are not criteria against which every decision can or should be judged, but should be delivered through development plans and the application of policies in the Framework, taking local circumstances into account to reflect the character, needs and opportunities of each area.
- 10.2.6 A presumption in favour of sustainable development lies at the core of the framework, which in terms of decision making, means approving development that accords with an up to date development plan without delay. Where relevant development plan policies are absent or out of date, permissions should be granted unless NPPF policies provide a clear reason for refusal, or adverse impact would significantly and demonstrably outweigh the benefits.
- 10.2.7 The NPPF states that transport issues should be considered from the earliest stages of development to: address impacts on transport networks; realise opportunities from existing or proposed transport infrastructure; pursue opportunities to promote non-car transport; assess the environmental impacts of traffic and transport infrastructure, including net gains from mitigation; and to ensure that movement patterns and other transport considerations are integral to the scheme design.
- 10.2.8 Significant development should be located where it will be or could be made sustainable, by limiting the need to travel and ensuring a genuine choice of modes, but recognising the different opportunities available in urban and rural areas.

10.2.9 NPPF explains that if setting local parking standards for residential and non-residential development, they should consider: the accessibility of the development; the development type, mix and use of development; public transport availability / opportunities; local car ownership; and provision for charging plug-in and other ultra-low emission vehicles.

10.2.10 In assessing development sites, NPPF requires:

- appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;
- safe and suitable access to the site can be achieved for all users; and
- any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.

10.2.11 Paragraph 109 sets out a key consideration for determining planning applications:

- Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.

10.2.12 A range of more detailed criteria are then set out, followed by a requirement that all development that generates significant movement demand should be required to provide a Travel Plan and a Transport Statement or Transport Assessment to examine the likely impacts.

Wiltshire & Swindon Waste Core Strategy DPD (July 2009)

10.2.13 Paragraph 4 discusses environmental considerations of the Waste Strategy, noting that to balance the need for new facilities while protecting and enhancing the local environment, the councils are committed to reducing the impacts associated with the management and movement of waste.

10.2.14 Sustainable transport of waste and minimising cross-boundary transport are considered essential to that objective, as is a framework of waste management facilities across the area that will use the most sustainable, realistic and appropriate transport modes and routes to minimise 'waste mileage'.

10.2.15 Strategic Objective 3 – The Environment states: “...options for sustainable transportation should be encouraged in order to reduce the impacts of transporting waste through Wiltshire and Swindon...”

10.2.16 Paragraph 5.12 emphasises the importance of locating waste management facilities as close as possible to the specific growth areas that will be the main source of additional waste arisings.

Wiltshire & Swindon Waste Development Control Policies DPD (September 2009)

10.2.17 Section 5 of this document deals with the transportation of waste, headline by Strategic Objective 3 from the Waste Strategy quoted above.

10.2.18 The DPD recognises that waste management facilities often generate HGV traffic with adverse environmental impacts, so transporting waste between sites is an important consideration in the impacts of waste management development.

10.2.19 Locating waste management facilities close to the Wiltshire HGV Route Network will minimise the adverse impacts of waste management transportation, so sites with direct access or good links with the HGV route network or the Primary Route Network (PRN) will be supported.

10.2.20 Daily HGV movements will be an important consideration and planning applications will need a comprehensive TA where significant transport impacts might arise, identifying measures to mitigate impact and improve accessibility and safety. A simplified Transport Statement can be produced where transport implications are limited. Scope should be established through pre-application discussion.

10.2.21 Developers will be encouraged to consider routeing restrictions to minimise the potential transport impacts of new waste management development or legal agreements for appropriate improvements to road networks that are not adequate for the level of HGV use.

10.2.22 Policy WDC11: Sustainable Transport of Waste sets out requirements to make waste management acceptable, which include:

- Minimising transport distances;
- Minimising carbon emissions;

- Ensuring direct access to appropriate roads;
- Mitigating adverse impacts on safety, capacity and use of the highway; and
- Providing TA where necessary, considering highway network, cross-boundary and cumulative impacts and identifying necessary mitigation.

Wiltshire Core Strategy (Adopted January 2015)

10.2.23 Several Core Policies relate to transport and the Proposed Development.

10.2.24 Core Policy 60 deals with sustainable transport and sets out commitments to reduce the need to travel and encourage the sustainable, safe and efficient movement of goods in the county, by measures that include planning development in accessible locations, promoting sustainable alternatives to private cars,, maintaining and improving the transport network, promoting demand management, influencing freight routes and assessing and mitigating development impact.

10.2.25 Core Policy 61 deals specifically with transport and development, specifying that development is located to reduce travel and encourage sustainable alternatives, with Transport Assessments that demonstrate consideration of the needs of all transport users, with safe highway access adequate servicing and, where appropriate, contributions to sustainable transport improvements and Travel Plans to encourage sustainable travel and freight movement.

10.2.26 Core Policy 62 considers transport impact from development, requiring mitigation to offset adverse impact during construction and operation and discouraging direct access onto national primary routes outside built-up areas.

10.2.27 Core Policy 65 deals with freight movement, seeking a sustainable distribution system making efficient use of existing networks. Development generating large volumes of freight and bulk materials should be make use of rail or water where practical but where that is not realistic, HGVs should use the advisory freight network to minimise impacts, with freight management to avoid use of inappropriate routes.

Wiltshire Local Transport Plan (2011-2026)

- 10.2.28 The Wiltshire Local Transport Plan Freight Strategy (March 2011) sets out objectives that include reducing HGV movements on inappropriate routes, minimising HGV impact on communities and the environment and enhancing road safety.
- 10.2.29 To assist with those objectives, a network of advisory freight routes is identified, which identifies the A350 and A36 as Strategic Lorry Routes and the A361 as a Local Lorry Route.

Institute of Environmental Management and Assessment (IEMA) Guidance Note 1 (1993)

- 10.2.30 This guidance note, titled Guidelines for the Environmental Assessment of Road Traffic, has been used for the basis of the analysis in this chapter. The scope of the guidelines explains they are for the assessment of the off-site environmental impact of road traffic associated with major new development, whether or not the sites are subject to formal ESs.
- 10.2.31 The guidance is intended to provide a basis for systematic, consistent and comprehensive coverage for the appraisal of traffic impacts for a wide range of development projects, complementing the professional judgement and experience of the assessor.

Assessment Methodology

- 10.2.32 This chapter of the ES is based on guidance from the Institute of Environmental Management and Assessment (IEMA) set out in their Guidelines for the Environmental Assessment of Road Traffic (1993).
- 10.2.33 The impact of the construction phase and the operational phase are considered against relative criteria selected from that guidance.
- 10.2.34 Separate baseline positions are established for the construction and operational phases. The baselines include construction and operational traffic associated with the EfW facility already permitted on the site by the 2019 permission, as this ES considers the changes relative to that consented scheme.

- 10.2.35 Traffic associated with construction is predicted to peak in the second year of a 3-year programme, so 2023 has been assumed as the construction baseline year. The baseline includes predictions of construction traffic derived from figures provided for the 2019 permission.
- 10.2.36 The facility is expected to be complete by 2025, which has therefore been used at the operational baseline year, which also includes traffic from the permitted scheme.
- 10.2.37 The ES considers walking and cycling, public transport and vehicular traffic (light vehicles and HGVs), with a desk study of existing public transport services to determine the routes and frequencies of public transport within walking distance.
- 10.2.38 This ES chapter draws traffic data from a TA prepared during government travel restrictions imposed to counter spread of the Covid 19 virus, so it is based on representative traffic data already in the public domain, which is entirely adequate to allow the planning application to be determined.
- 10.2.39 The surveyed traffic data considered in the TA is drawn from a planning application on a site that shares the same highway network (ref: 19/06389/OUT on behalf of Gladman for 190 dwellings on land at The Ham), and considers the following junctions, covering weekday peak hours and Annual Average Daily Traffic:
- B3097 / West Wilts Trading Estate (WWTE) / Hawke Ridge Business Park Roundabout;
 - A363/B3097 Phillips Way Roundabout;
 - A350/A363 Roundabout (Yarnbrook);
 - A350/B3097 Mini Roundabout;
 - A350/B3098 Mini Roundabout; and
 - B3097 / Storridge Road / Brook Lane Roundabout.
- 10.2.40 The traffic survey data is presented in section 3.3 of the TA and the accompanying traffic flow diagrams (Figures 1A to C). Traffic growth is applied, derived from the Department for Transport TEMPRO software, and traffic associated with specific planning applications that have been approved but not built out is added, based on supporting information from planning applications.

- 10.2.41 The TA considers weekday AM & PM peak hours and daily traffic flows, or Annual Average Daily Traffic (AADT). To simplify presentation, this ES chapter considers the AADT data and predictions.
- 10.2.42 Traffic associated with the permitted EfW scheme is applied to provide future baseline positions for the years 2023 and 2025. Traffic changes relative to those baselines are then considered.
- 10.2.43 The IEMA Guidelines for the Environmental Assessment of Road Traffic include two broad ‘rules of thumb’ for setting the scope of a study, as follows:
- Rule 1: Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%).
 - Rule 2: Include any other specifically sensitive areas where traffic flows have increased by 10% or more.
- 10.2.44 The first stage of the assessment is to apply the ‘rules of thumb’ on percentage changes to the traffic predictions set out in the TA to identify the links to be considered, using AADT flows to provide a profile of changing conditions over the entire day and week.
- 10.2.45 The ‘rules of thumb’ provide a starting point for identifying significance, but to avoid missing significance simply because background traffic flows might be high, or overstating significance where background flows are very low, absolute values of the change in traffic are also considered for each receptor.
- 10.2.46 Where effects on a link are identified as significant, the magnitude of the individual effects will be assessed against the IEMA Guidance as set out below. Some of the categories are identified as not applicable to this scheme or as being dealt with in other chapters of this ES by specialists in those fields.

Noise

- 10.2.47 Chapter 7.0 of this ES has been produced by a specialist noise consultant, so no noise assessment of road traffic noise has been attempted in this chapter.

Vibration

- 10.2.48 The IEMA guidance notes that research studies have been unable to show that traffic induced ground borne vibration results in structural building damage beyond surface damage in sensitive properties, but airborne vibration can lead to effects that might impact on quality of life.
- 10.2.49 Expert advice is recommended where such effects are likely to be significant. Basic appraisal of the requirement for expert advice will be provided where significant changes in HGV traffic are predicted.

Visual Effects

- 10.2.50 The guidance notes that visual effects from traffic might include blocking of views and intrusion into scenic areas or places of historic interest, noting that appraisal of visual impact is complex. Visual impact is examined by a specialist consultant in Chapter 5.0 of this ES, but the guidance notes that for most Environmental Statements, changes from traffic will have little additional impact.

Severance

- 10.2.51 The guidance notes the difficulty in assessing severance but notes that marginal changes in traffic flows alone are unlikely to create or remove severance. Factors to be considered include road width, the quantity, composition and speed of traffic, the availability of crossing facilities and the number of movements likely to be affected.
- 10.2.52 The guidance notes that a 30% change in traffic might give rise to a 'slight' change in severance, while a 'moderate change might arise from a 60% change in traffic, while a 90% change is likely to lead to a 'substantial' change in severance. The likelihood of severance will be appraised against those thresholds where relevant.

Driver Delay

- 10.2.53 The guidance recommends that where traffic delays might arise, specialist junction modelling software should be used to quantify those delays to establish their significance.

10.2.54 The TA has demonstrated that the predicted changes in traffic at peak hour level are so low that there is no requirement for junction modelling, hence no material driver delay issues are expected to arise from this scheme, but where potential significance is identified, individual links will be examined nevertheless.

Non-Motorised User Delay

10.2.55 The guidance refers to pedestrian delay only, but the consideration will be extended to cyclists and equestrians where required.

10.2.56 The guidance notes an absence of clear thresholds for quantifying delay significance, recommending that assessors use their judgement.

Non-Motorised User Amenity

10.2.57 Amenity is described as the relative pleasantness of a journey, influenced by traffic volume, composition and speed, route width and separation from traffic. The guidance suggests that a doubling or halving in traffic flow might be a tentative threshold for judging changes in amenity.

Fear & Intimidation

10.2.58 Again, this is influenced by traffic volume, composition and speed, as well as route widths and separation. The guidance notes there is no consensus on thresholds for changes, but suggests the following in the first instance:

Table 10.1: Fear & Intimidation Assessment Criteria

Degree of Hazard	Average Traffic Flow over 18-Hour Day (Vehicles/Hour)	Total 18-Hour HGV Flow	Average Speed over 18-Hour Day
Extreme	1800+	3000+	20mph+
Great	1200-1800	2000-3000	15-20mph
Moderate	600-1200	1000-2000	10-15mph

Accidents & Safety

- 10.2.59 The guidance recommends use of highway authority Personal Injury Collision records to carry out simple statistical assessment, supplemented by professional judgement where changes in traffic composition might arise.

Hazardous Loads

- 10.2.60 The guidance refers to 'specialist' or unconventional loads as potentially hazardous as well as the transport of potentially hazardous material that might be released in the event of a collision. In either case, where a development is expected to lead to a significant increase of such vehicle movements, risk analysis is recommended.

Air Pollution, Dust & Dirt

- 10.2.61 Air quality and human health aspects are considered by a specialist consultant in Chapter 8.0 of this ES.

Ecological Effects

- 10.2.62 These aspects are considered by a specialist consultant in Chapter 6.0 of this ES.

Heritage & Conservation Areas

- 10.2.63 These aspects are considered by a specialist consultant in Chapter 12.0 of this ES.

Assessment of Significance / Assessment Criteria

- 10.2.64 The approach in this ES is to define the level of the effect and then to determine whether that is significant or not significant.

- 10.2.65 The level of the transport effects is determined by reference to the changes in traffic arising from the development in the construction and operational stages, relative to the levels previously accepted from development on this site in association with the 2019 Permission.

- 10.2.66 The significance of any effects on transport consider the interaction between the sensitivity of the receptor and magnitude of the predicted change, using national guidance, accepted practice and professional judgement.
- 10.2.67 The significance of effects is based on the magnitude of changes arising from the development relative to the permitted scheme, taking account of the sensitivity of the areas affected by those changes. The magnitude of changes is assessed on a scale descending from Major through Moderate, and Minor to Negligible and No Change, defined as follows.
- Major: A very significant change arises
 - Moderate: A noticeable change arises
 - Minor: A small, barely noticeable change arises
 - Negligible: Change is above zero but unlikely to be perceptible
 - No Change: No change at all is predicted
- 10.2.68 Sensitivity is assessed on an ascending scale from Negligible through Low and Medium to High as follows.
- Negligible: Areas of low sensitivity to traffic flow
 - Low: Residential areas with adequate pedestrian facilities, public open space, nature conservation areas
 - Medium: Congested areas, areas with significant attractors of pedestrian traffic, conservation areas
 - High: Roads passing schools, colleges or identified Personal Injury Collision concentrations
- 10.2.69 The impact of an effect needs to be quantified against the sensitivity of the receptor being considered. For example, a rise in traffic of 'X' vehicles per day on a purpose-built industrial estate distributor road might be considered 'not significant', while the same rise in traffic narrow village streets, past a school or other locations with high pedestrian activity might be considered 'significant'.
- 10.2.70 To take account of the sensitivity of receptors to Major, Moderate, Minor or Negligible impacts, the following matrix, based on professional judgement, is applied in this ES to identify where changes are likely to be 'Not Significant' or 'Significant', which will determine whether mitigation needs to be considered.

Table 10.2: Significance Matrix

Receptor Sensitivity	Magnitude of Impact				
	Major	Moderate	Minor	Negligible	No Change
Negligible	Significant	Not Significant	Not Significant	Not Significant	Not Significant
Low	Significant	Significant	Not Significant	Not Significant	Not Significant
Medium	Significant	Significant	Significant	Not Significant	Not Significant
High	Significant	Significant	Significant	Significant	Not Significant

10.2.71 This section of the ES considers the effects of the Proposed Development in terms of the above magnitudes of impact, receptor sensitivity and significance, based on changes in daily traffic.

10.2.72 The receptors considered are listed below with sensitivity applied based on the description of each highway link.

10.2.73 Link Road, Quartermaster Road and Stephenson Road are considered together as the approach to the site from the B3097, but the only representative traffic data available for this approach during the Covid 19 travel restrictions is on the first section, so the three are referred to collectively as ‘The Link Road Approach’.

Table 10.3: Receptors & Sensitivity

Link	Description	Sensitivity
The Link Road Approach	Unclassified purpose-built industrial distributor road	Low
B3097 at Hawkeridge	B-class road with some frontage development at Hawkeridge & Dursley Road/Bitham Brook	Low
B3097 at The Ham (The Ham)	B-class road through residential area, with traffic calming	Medium
A363 at Yarnbrook	A-class road, frontage development at Yarnbrook and peak-period congestion	Medium
A350 North at Yarnbrook	A-class Primary Route, limited frontage development, peak period congestion	Medium
A350 South at Yarnbrook	A-class Primary Route, frontage development at Yarnbrook	Medium
A350 in Westbury	A-class Primary Route through residential/retail area, peak period congestion	Medium
Brook Lane	Unclassified industrial access road, short single-track section with priority system	Low
B3097 Station Road at The Ham	B-class road, residential area, 7.5T weight limit, some peak-period congestion, schools to south, care home	Medium

10.2.74 The sensitivities assigned to individual links take account of relative sensitivities to provide a reasonable hierarchy. No links on the highway network considered have been classed as ‘Negligible’ or ‘High’ sensitivity. The industrial distributor roads and links with very little frontage development are classed as ‘Low’ sensitivity, the others are all classed as ‘Medium’, as none directly pass highly sensitive receptors.

Scope of Assessment

10.2.75 The Transport chapter of the ES uses traffic data from the TA to set out baseline positions for construction and operational phases, before assessing the implications of additional traffic arising during construction and operation of the facility. The process is then repeated with traffic predicted for relevant committed development to ensure that potential cumulative impacts are considered

Consultation

10.2.76 No formal EIA Scoping Report has been submitted to Wiltshire Council, but the scope of the supporting information on transport set out in the Transport Assessment is expanded from previous work for Energy from Waste facilities on this site that was fully accepted by the Local Highway Authority (LHA), most notably the approved planning applications ref: 14/12003/WCM and 18/09473/WCM, so is more comprehensive than previously agreed with the LHA.

10.2.77 The LHA consultation response on the first EfW scheme approved for this site, 14/12003/WCM, concluded that “... *the proposed facility will not have a measurable effect on the local highway network.*” The LHA maintained that response through subsequent planning applications ref: 18/03816/WCM and 18/09473/WCM, and the scope of supporting information on which those responses were based has been expanded for this application.

Limitations

10.2.78 This ES chapter and the TA were prepared during government travel restrictions imposed to counter spread of the Covid 19 virus, so it was necessary to use representative traffic data already in the public domain as a baseline to consider the transport implications of this scheme, which is entirely adequate to allow the planning application to be determined.

10.3 Baseline

Data Collection

- 10.3.1 Traffic surveys to establish baseline highway conditions were commissioned in March 2020, but had to be cancelled when the government introduced Covid 19 travel restrictions, as the surveys would not have yielded representative results.
- 10.3.2 Baseline traffic data has therefore been sourced from existing data in the public domain. Planning application ref: 19/06389/OUT for 190 dwellings on land at The Ham, north east of Northacre, was supported by a TA and Air Quality Assessment that considered the highway network used by this development.
- 10.3.3 That planning application was refused in January 2020, but there were no highway reasons and the highway authority consultation response raised no issues with the baseline traffic flows presented, so it is reasonable to quote that data.
- 10.3.4 Figures 3C in the TA shows AADT figures for 2019, with the percentage of HGVs. That survey data is summarised in the Table below for all the main highway links examined in the TA.

Table 10.4: Traffic Surveyed in 2019

Link	2019 AADT All Traffic	2019 AADT HGVs	%age HGVs
The Link Road Approach	6,233	548	9%
B3097 at Hawkeridge	12,823	619	5%
B3097 at The Ham	7,210	714	10%
A363 at Yarnbrook	11,056	381	3%
A350 North at Yarnbrook	18,747	859	5%
A350 South at Yarnbrook	12,533	476	4%
A350 in Westbury	15,487	801	5%
Brook Lane	2,473	29	1%
B3097 Station Road at The Ham	10,260	133	1%

Baseline Environment

Pedestrian Access

- 10.3.5 A large area of Westbury is within walking distance of the site, connected by a network of footways alongside the street-lit roads.
- 10.3.6 The walk-in catchment takes in extensive residential development at The Ham, the Oldfield Road and Oldfield Park estates, the Rosefield Way and Meadow Lane estates and extends to the town centre.

Cycle Access

- 10.3.7 There are no formal cycle paths within Westbury, but the whole of the town is within reasonable cycling distance of the site.

Public Transport Access

- 10.3.8 The weak bridge at the railway station has required bus routes to be diverted, so the nearest stops with a frequent service are near the junction of The Ham with Hawkeridge Road, 1km from the site or about 13 minutes on foot.
- 10.3.9 Route D1 runs from those stops to Bath via Trowbridge and to Salisbury via Warminster, once an hour Monday to Saturday at times suitable for commuting.
- 10.3.10 Bus stops at the railway station are approximately 10 minutes on foot, where route 87 links to Trowbridge and Devizes four times a day.
- 10.3.11 The railway station is some 760m from the site on foot, about 10 minutes. There are direct trains to Trowbridge, Frome, Warminster and many stations further afield.

Vehicular Access

- 10.3.12 Vehicular access to the site will be from Stephenson Road via separate entry and exit points, with visibility easily exceeding the 43m requirement for the 30mph speed limit, as illustrated in Plan 3 in the TA.

- 10.3.13 Stephenson Road joins Brook Lane to the south of the site, which terminates in a no-through-road. The main access route is therefore from the north via the roundabout where Stephenson Road meets Storridge Road and Quartermaster Road, which are main distributor routes for the West Wilts Trading Estate.
- 10.3.14 Access is also possible via the north eastern end of Brook Lane, which serves the Brook Lane Industrial Estate from the B3097 Station Road. There is a short section of single-track road on the Brook Lane link to the B3097, controlled by formal priority working.
- 10.3.15 The site and the immediate highway network serving it are shown in Plan 1 in the TA, while Plan 2 shows the wider highway network.
- 10.3.16 Storridge Road runs south east to the B3097 at The Ham, which runs to the A350 at Westbury. A weak railway bridge with a 7.5 tonne weight limit adjacent to Westbury Station prevents access by HGVs, with a low bridge (14 foot maximum) to the south restricting high vehicles.
- 10.3.17 Signs on the approach to the Storridge Road roundabout from Stephenson Road direct all traffic to the M4, A350 and A361 via Quartermaster Road, an industrial distributor road running through the West Wilts Trading Estate to Link Road, connecting to the B3097 Hawkeridge Road at a 4-arm roundabout, built to serve a strategic employment site at the Hawke Ridge Business Park (TA Plan 1).
- 10.3.18 The B3097 runs north past Hawkeridge to the A363 and A350 (see TA Plan 2). Dursley Lane links the B3097 to the A350 just north of Hawkeridge, but HGV use is prevented by another weak railway bridge with a 7.5 tonne weight restriction.
- 10.3.19 Hawkeridge Road continues north to a roundabout with Phillips Way, which links to the A363 at the White Horse Business Park roundabout. All traffic between the B3097 and A350 is signed via Phillips Way, although Hawkeridge Road continues north on a more direct route to the A363/A350 at the Yarnbrook roundabout under a low bridge (15 foot restriction) with shuttle traffic signals.
- 10.3.20 The A363 runs south east from the White Horse Business Park roundabout to the A350 at the Yarnbrook Roundabout, which runs north to the M4 via Chippenham and south to the A36 at Warminster.

- 10.3.21 The A363 also runs north from the White Horse Business Park roundabout to Trowbridge, while Westbury Road runs into North Bradley, west of which Southwick Road, Bradley Road and Wynsome Street link to the A361 Frome Road at Southwick, which runs south west to the A36.
- 10.3.22 The various weight and height restrictions associated with railway bridges in the area mean that all HGV access is via the B3097/A363/A350 to the north of Hawkeridge, no HGVs can route directly south via the shortest route into Westbury, the B3097 Station Road.
- 10.3.23 Core Policy 66 in the Wiltshire Core Strategy (adopted January 2015) sets out a commitment to improve sections of the A350 due to its strategic importance, including a scheme to reduce congestion in the Yarnbrook and West Ashton areas.
- 10.3.24 Swindon and Wiltshire's Local Economic Partnership (LEP) has secured funding for the improvement works through the Government's Growth Deal, with a new carriageway link and new roundabouts that are expected to reduce congestion, improve journey time reliability and facilitate housing the Ashton Park urban extension to Trowbridge.

Future Baseline

- 10.3.25 Separate baseline positions are established for the construction and operational phases. Traffic associated with construction is predicted to peak in the second year of a 3-year construction programme, so 2023 has been assumed as the construction baseline year. The facility is expected to be complete by 2025, which has therefore been used at the operational baseline year.
- 10.3.26 Traffic growth factors for the years 2023 and 2025 have been derived from the Department for Transport software TEMPRO7.2b, with factors specific to the area of Wiltshire around the site. The TEMPRO inputs and outputs are summarised in the following table.

Table 10.5: Traffic Growth Factors

General Inputs	Study Area:	Wiltshire MSOAs 037, 039 & 040	Trip Purpose:	All Purposes
	Base Year:	2019	Transport Mode:	Car Driver only
	Result Type:	Trip Ends by Time Period	Trip End Type:	Origin/Destination
RTF Inputs	RTF Dataset:	AF15	RTF Road Type:	Principal
Outputs	2023 Average Weekday Factor:	1.0320	2025 Average Weekday Factor:	1.0479

10.3.27 The following table applies the TEMPRO growth to 2023 for the construction phase.

Table 10.6: Surveyed Traffic with Growth to 2023

Link	AADT All Traffic	AADT HGVs	%age HGVs
The Link Road Approach	6,433	565	9%
B3097 at Hawkeridge	13,234	639	5%
B3097 at The Ham	7,441	737	10%
A363 at Yarnbrook	11,410	394	3%
A350 North at Yarnbrook	19,348	886	5%
A350 South at Yarnbrook	12,934	492	4%
A350 in Westbury	15,983	826	5%
Brook Lane	2,552	30	1%
B3097 Station Road at The Ham	10,589	138	1%

10.3.28 The following table applies traffic growth to 2025 for the operational year.

Table 10.7: Surveyed Traffic with Growth to 2025

Link	AADT All Traffic	AADT HGVs	%age HGVs
The Link Road Approach	6,532	574	9%
B3097 at Hawkeridge	13,438	649	5%
B3097 at The Ham	7,556	748	10%
A363 at Yarnbrook	11,586	400	3%
A350 North at Yarnbrook	19,646	900	5%
A350 South at Yarnbrook	13,134	499	4%
A350 in Westbury	16,229	839	5%
Brook Lane	2,592	30	1%
B3097 Station Road at The Ham	10,752	140	1%

10.3.29 The construction baseline needs to consider construction traffic that would have been associated with the EfW development already approved on the site by the 2019 Permission, which is summarised below from section 5 and Figure 18 in the TA, split between light and heavy vehicles per day.

Table 10.8: Construction Traffic Associated with the 2019 Permission

Link	Daily LDVs	Daily HGV Movements
The Link Road Approach	30	40
B3097 at Hawkeridge	40	40
B3097 at The Ham	10	-
A363 at Yarnbrook	0	40
A350 North at Yarnbrook	10	28
A350 South at Yarnbrook	0	12
A350 in Westbury	26	12
Brook Lane	70	-
B3097 Station Road at The Ham	60	-

10.3.30 The 2023 construction baseline, including traffic associated with the 2019 Permission, is as follows.

Table 10.9: 2023 Construction Baseline Traffic including the 2019 Permission

Link	AADT All Traffic	AADT HGV Movements	%age HGVs
The Link Road Approach	6,503	605	9%
B3097 at Hawkeridge	13,314	679	5%
B3097 at The Ham	7,451	737	10%
A363 at Yarnbrook	11,450	434	4%
A350 North at Yarnbrook	19,386	914	5%
A350 South at Yarnbrook	12,946	504	4%
A350 in Westbury	16,021	838	5%
Brook Lane	2,622	30	1%
B3097 Station Road at The Ham	10,649	138	1%

10.3.31 The operational baseline also needs to consider EfW development already approved under the 2019 Permission, which is predicted to attract traffic as follows (Figure 11C in the TA):

Table 10.10: Net Additional Traffic from the 2019 Permission

Link	Daily LDVs	Daily HGV Movements
The Link Road Approach	21	42
B3097 at Hawkeridge	28	42
B3097 at The Ham	7	-
A363 at Yarnbrook	0	42
A350 North at Yarnbrook	8	30
A350 South at Yarnbrook	0	12
A350 in Westbury	16	12
Brook Lane	45	-
B3097 Station Road at The Ham	38	-

10.3.32 The table below shows the baseline traffic for 2025, the operational phase assessment year.

Table 10.11: 2025 Operational Phase Baseline with the 2019 Permission

Link	AADT All Traffic	AADT HGVs	%age HGVs
The Link Road Approach	6,595	616	9%
B3097 at Hawkeridge	13,508	691	5%
B3097 at The Ham	7,563	748	10%
A363 at Yarnbrook	11,628	442	4%
A350 North at Yarnbrook	19,684	930	5%
A350 South at Yarnbrook	13,146	511	4%
A350 in Westbury	16,257	851	5%
Brook Lane	2,637	30	1%
B3097 Station Road at The Ham	10,790	140	1%

10.4 Assessment of Effects

Incorporated Mitigation

- 10.4.1 The 2019 Permission includes planning conditions relating to operational phase HGV delivery hours, a Travel Plan (TP) and a Construction Environmental Management Plan (CEMP). It is proposed that similar conditions will also be attached to any new consent for the Proposed Development.
- 10.4.2 Condition 7 of the 2019 Permission limits delivery / removal of waste by HGVs during the operational phase to 07:00-22:00 Monday to Friday and 07:00-17:00 on Saturdays, with none permitted on Sundays or Bank Holidays. The same hours are expected to apply to the Proposed Development.
- 10.4.3 Condition 13 of the 2019 Permission requires approval of a TP before the development is brought into use, with details of implementation and monitoring. Provision for car sharing and EVCPs were specifically required. The reason for the condition referred to the interests of air quality and reducing vehicular traffic to the development.
- 10.4.4 The Proposed Development will also operate a TP to reduce environmental effects of the project, although no targets for traffic reduction have been agreed, so no adjustments have been made to traffic predictions. Typically, a TP might reduce traffic by 10 to 20%, although in the case of a waste processing facility, reductions will principally apply to staff travel.
- 10.4.5 The developer would commit to providing a CEMP as mitigation of transport impact during the construction phase. A site-specific CEMP was approved under condition 12 of the 2019 Permission, which includes the following requirements:
- Procedures for maintaining good public relations including complaint management, public consultation and liaison;
 - Control measures for dust and other air-borne pollutants; and
 - Agreed construction traffic routes.

Construction Phase

10.4.6 Construction traffic estimates are set out in section 5 of the TA. The change relative to estimates of the construction traffic for the 2019 Permission, derived from delivery and construction workforce estimates, is as follows:

Table 10.12: Change in Construction Traffic Relative to the 2019 Permission

Link	Daily LDVs	Daily HGV Movements
The Link Road Approach	+30	+10
B3097 at Hawkeridge	+40	+10
B3097 at The Ham	+10	0
A363 at Yarnbrook	0	+ 10
A350 North at Yarnbrook	+12	+ 8
A350 South at Yarnbrook	0	+2
A350 in Westbury	+26	+2
Brook Lane	+70	0
B3097 Station Road at The Ham	+60	0

10.4.7 The percentages changes in traffic arising from construction are summarised below.

Table 10.13: Changes due to Construction Traffic (Peak in 2023)

Link	AADT <u>All</u> Traffic	AADT <u>HGVs</u> Only
The Link Road Approach	0.62%	1.65%
B3097 at Hawkeridge	0.38%	1.47%
B3097 at The Ham	0.13%	0.00%
A363 at Yarnbrook	0.09%	2.31%
A350 North at Yarnbrook	0.10%	0.88%
A350 South at Yarnbrook	0.02%	0.40%
A350 in Westbury	0.17%	0.24%
Brook Lane	2.67%	0.00%
B3097 Station Road at The Ham	0.56%	0.00%

10.4.8 The changes in traffic on each link are all far below the 30% thresholds for assessment set by the IEMA Rule 1, and also far below the 10% threshold suggested

by Rule 2 for specifically sensitive areas, so purely in terms of percentage changes in traffic, all are considered to be of no significance, requiring no further analysis.

- 10.4.9 The change in traffic on each link has also been considered individually in context however, with the absolute levels of change in traffic on each link considered against the significance matrix in Table 10.2.
- 10.4.10 HGV movements will take place across the construction hours, proposed to be 07:00 to 19:00 on weekdays and 07:00 to 14:00 on Saturdays, spanning 12 hours on weekdays and 7 hours on Saturdays, so HGV movements are likely to be dispersed across those periods.
- 10.4.11 In contrast, traffic movements associated with construction workers will be concentrated around the start and end of the working day. All workers are expected to arrive on site from just prior to 07:00 and will therefore travel in advance of the highway network morning peak hour (08:00-09:00). Shift durations will typically vary from 9 to 12 hours so departures would be dispersed over the periods 16:00-17:00, 17:00-18:00 and 18:00-19:00.
- 10.4.12 The changes in traffic on each link are considered in the above context.

The Link Road Approach

- 10.4.13 These purpose-built industrial distributor roads, comprising Link Road, Quartermaster Road and Stephenson Road, all classified as **low** sensitivity, are predicted to experience 30 additional light vehicles daily and 10 HGVs.
- 10.4.14 The 10 additional HGV movements will be spread over the working day will have no perceptible impact.
- 10.4.15 The 30 additional light vehicle movements from construction staff amount to 15 arrivals that will occur before the weekday morning peak hour and 15 departures that will be split over 3 hours from 16:00 to 19:00, some 5 movements an hour on average, which will have no impact.
- 10.4.16 The changes are effectively just above zero and therefore classified as **negligible** (see paragraph 0) and the effects are considered **not significant**.

B3097 at Hawkeridge

- 10.4.17 This B-class road with low levels of frontage development, classified as **low** sensitivity, is predicted to experience 40 additional light vehicles daily and 10 HGV movements (5 arrivals, 5 departures).
- 10.4.18 The 10 additional HGV movements will be spread over the working day will have no perceptible impact.
- 10.4.19 The 40 additional light vehicle movements from construction staff amount to 20 arrivals that will occur before the weekday morning peak hour, one movement every 3 minutes on average, and 20 departures that will be split over 3 hours from 16:00 to 19:00, with no impact likely to arise.
- 10.4.20 The changes are extremely low and therefore classified as **negligible** (see paragraph 0) and the effects are considered **not significant**.

B3097 at The Ham

- 10.4.21 This section of the B-class road runs through a residential area with traffic calming present and advisory signs directing HGVs via a more suitable route through the WWTE, so is classified as **medium** sensitivity. It is predicted to experience 10 additional light vehicles daily during construction.
- 10.4.22 The 10 additional light vehicle movements from construction staff amount to 5 arrivals that will occur before the weekday morning peak hour and 5 departures that will be split over 3 hours from 16:00 to 19:00, with no impact.
- 10.4.23 The changes are just above zero and therefore classified as **negligible** (see paragraph 0) and the effects are considered **not significant**.

A363 at Yarnbrook

- 10.4.24 This A-class road has some frontage development and peak period congestion, so is classified as **medium** sensitivity. It is predicted to experience 10 additional heavy vehicles daily during construction, spread over the working day with no perceptible impact.

10.4.25 The changes are just above zero and therefore classified as **negligible** (see paragraph 0) and the effects are considered **not significant**.

A363 North at Yarnbrook

10.4.26 This A-class road has some frontage development and peak period congestion, so is classified as **medium** sensitivity. It is predicted to experience to experience 12 additional light vehicles daily and 8 HGVs daily.

10.4.27 The 8 HGV movements spread over the working day will have no perceptible impact.

10.4.28 The 12 additional light vehicle movements from construction staff amount to 6 arrivals that will occur before the weekday morning peak hour and 6 departures that will be split over 3 hours from 16:00 to 19:00, with no impact.

10.4.29 The changes are just above zero and therefore classified as **negligible** (see paragraph 0) and the effects are considered **not significant**.

A363 South at Yarnbrook

10.4.30 This A-class road has some frontage development and peak period congestion, so is classified as **medium** sensitivity. It is predicted to experience 2 additional heavy vehicles daily during construction, with no perceptible impact.

10.4.31 The changes are just above zero and therefore classified as **negligible** (see paragraph 0) and the effects are considered **not significant**.

A350 in Westbury

10.4.32 This section of the A-class road runs through residential areas and past retail frontage in the town centre with adequate footway provision, so is classified as **medium** sensitivity. It is predicted to experience 26 additional light vehicles and 2 additional HGVs daily during construction.

10.4.33 The 2 HGV movements per day will have no perceptible impact.

10.4.34 The 26 additional light vehicle movements from construction staff amount to 13 arrivals that will occur before the weekday morning peak hour, less than one movement every 4 minutes on average, and 13 departures that will be split over 3 hours from 16:00 to 19:00, with no impact.

10.4.35 The changes are extremely low and therefore classified as **negligible** (see paragraph 0) and the effects are considered **not significant**.

Brook Lane

10.4.36 This unclassified industrial distributor road has a short section of single-track working covered by a formal priority system and is classified as **low** sensitivity. It is predicted that 70 additional light vehicles might use the road per day during construction.

10.4.37 The 70 additional light vehicle movements from construction staff amount to 35 arrivals that will occur before the weekday morning peak hour and 35 departures that will be split over 3 hours from 16:00 to 19:00, averaging about 11 to 12 movements over an hour.

10.4.38 The PM changes are extremely low and therefore classified as **negligible** (see paragraph 0). The AM changes, which are more likely to be focussed in a single hour, only amount to just over one vehicle movement every 2 minutes, which would not be perceived in practice, so is also classified as **negligible**. The overall effects on Brook Lane are therefore considered **not significant**.

B3097 Station Road at The Ham

10.4.39 This B-class road has little or no frontage activity near The Ham, but runs through residential development further into Westbury, generally well served by footways, so is classified as **medium** sensitivity. It is predicted that 60 additional light vehicles might use the road per day during construction.

10.4.40 The 60 additional light vehicle movements from construction staff amount to 30 arrivals that will occur before the weekday morning peak hour and 30 departures that will be split over 3 hours from 16:00 to 19:00, averaging about 10 movements over an hour.

10.4.41 The PM changes are extremely low and therefore classified as **negligible** (see paragraph 0). While the AM changes are more likely to be focussed in a single hour, they only amount to one vehicle movement every 2 minutes, which is unlikely to be perceived in practice, so is classified as **negligible**. The overall effects on Station Road are therefore considered **not significant**.

10.4.42 The following table summarises the sensitivities, changes in light and heavy vehicle traffic, impacts and significance for each link on the highway network during the construction period.

Table 10.14: Receptor Analysis in Construction Phase 2023

Link	Sensitivity	Change from the 2019 Permission		Impact Magnitude	Significance
		Light Vehicles	Heavy Vehicles		
The Link Road Approach	Low	+30	+10	Negligible	Not Significant
B3097 at Hawkeridge	Low	+40	+10	Negligible	Not Significant
B3097 at The Ham	Medium	+10	0	Negligible	Not Significant
A363 at Yarnbrook	Medium	+0	+10	Negligible	Not Significant
A350 North at Yarnbrook	Medium	+12	+8	Negligible	Not Significant
A350 South at Yarnbrook	Medium	0	+2	Negligible	Not Significant
A350 in Westbury	Medium	+26	+2	Negligible	Not Significant
Brook Lane	Low	+70	0	Negligible	Not Significant
B3097 Station Road at The Ham	Medium	+60	0	Negligible	Not Significant

10.4.43 No links are predicted to experience significant effects following reasoned comparison of the impacts and receptor sensitivities during the construction phase, so no mitigation is considered necessary beyond the planning conditions listed under Incorporated Mitigation in paragraphs 10.4.1 to 0. The previous commitments to restricting HGV movement hours and providing a Construction Environmental Management Plan are considered entirely adequate to mitigate the insignificant impacts identified in this section.

Operational Phase

10.4.44 Traffic predictions for the operational phase are taken directly from the Transport Assessment, using the predicted change in EfW traffic relative to the EfW facility approved under the 2019 Permission, shown in Figure 14C, summarised below.

Table 10.15: Predicted Change in EfW Traffic (Relative to the 2019 Permission)

Link	Daily LDVs	Daily HGVs
The Link Road Approach	0	+12
B3097 at Hawkeridge	0	+12
B3097 at The Ham	0	0
A363 at Yarnbrook	0	+12
A350 North at Yarnbrook	0	+8
A350 South at Yarnbrook	0	+4
A350 in Westbury	0	+4
Brook Lane	0	0
B3097 Station Road at The Ham	0	0

10.4.45 The changes are compared against the 2025 baseline below.

Table 10.16: Changes due to EfW Development in 2025

Link	AADT <u>All</u> Traffic	AADT HGVs Only
The Link Road Approach	0.18%	1.95%
B3097 at Hawkeridge	0.09%	1.74%
B3097 at The Ham	0.00%	0.00%
A363 at Yarnbrook	0.10%	2.72%
A350 North at Yarnbrook	0.04%	0.86%
A350 South at Yarnbrook	0.03%	0.78%
A350 in Westbury	0.02%	0.47%
Brook Lane	0.00%	0.00%
B3097 Station Road at The Ham	0.00%	0.00%

10.4.46 The changes in traffic on each link are all far below the 30% thresholds for assessment set by the IEMA Rule 1, and also well below the 10% threshold

suggested by Rule 2 for specifically sensitive areas, so in terms of percentage changes in traffic, all are considered to be of no significance.

10.4.47 The change in traffic on each link has also been considered individually in context however, with the absolute levels of change in traffic on each link considered against the significance matrix in Table 10.2.

10.4.48 The changes in traffic predicted for the operational stage all relate to HGV movements that will take place across the permitted hours (see 0 above), which span 15 hours on weekdays and 10 hours on Saturdays, so HGV movements will be dispersed across those hours.

10.4.49 The additional HGV movements range from 4 movements a day on the A350 through Westbury to 12 movements a day on the B3097. Spread over a 15-hour working day (10 hours on Saturday), there will be no perceptible changes on roads that already carry a significant level of HGV traffic. Therefore, where changes occur, they are classified as **negligible**.

10.4.50 The following table summarises the sensitivities, changes in light and heavy vehicle traffic, impacts and significance for each link on the highway network during the operational period.

Table 10.17: Receptor Analysis in Operational Phase 2025

Link	Sensitivity	Change from 18/09473/WCM		Impact Magnitude	Significance
		Light Vehicles	Heavy Vehicles		
The Link Road Approach	Low	0	+12	Negligible	Not Significant
B3097 at Hawkeridge	Low	0	+12	Negligible	Not Significant
B3097 at The Ham	Medium	0	0	Negligible	Not Significant
A363 at Yarnbrook	Medium	0	+12	Negligible	Not Significant
A350 North at Yarnbrook	Medium	2	+8	Negligible	Not Significant
A350 South at Yarnbrook	Medium	0	+4	Negligible	Not Significant
A350 in Westbury	Medium	0	+4	Negligible	Not Significant

Link	Sensitivity	Change from 18/09473/WCM		Impact Magnitude	Significance
		Light Vehicles	Heavy Vehicles		
Brook Lane	Low	0	0	Negligible	Not Significant
B3097 Station Road at The Ham	Medium	0	0	Negligible	Not Significant

10.4.51 No links that are predicted to experience significant effects following reasoned comparison of the impacts and receptor sensitivities during the operational phase, so no mitigation is considered necessary beyond the planning conditions listed under Incorporated Mitigation in paragraphs 10.4.1 to 0. The previous commitments to restricting operational HGV movement hours and providing a Travel Plan are considered entirely adequate to mitigate the insignificant impacts identified.

10.5 Cumulative Effects

10.5.1 The following developments are approved and were not built out at the time of the surveys, but would attract traffic to the highway network, so were considered in the Transport Assessment.

- Residential development north of Bitham Park (300 units, 14/09262/OUT)
- Residential development at Westbury Sailing Lake (300 units, 15/12551/OUT)
- Extension to WWTE Feed Mill (50% increase in throughput, 19/10253/FUL)
- Hawke Ridge Business Park (42,520m² B-class, 14/10780/VAR)

10.5.2 The TA sets out daily traffic predictions for each element. The residential development combined add some 630 daily light vehicle movements to the B3097 and 1,022 to the A350 through Westbury (see TA Figure 7C), Hawke Ridge Business park adds some 1,961 daily movements to the B3097, 499 of them HGVs, and 416 movements through Westbury on the A350, including 116 HGVs (TA Figure 8C), while the Feed Mill extension is predicted to add 29 HGVs daily (TA Figure 9C). Daily traffic associated with each scheme, drawn from the TA, is summarised below.

Table 10.18: Committed Development Traffic

Link	AADT All Traffic	AADT HGVs
The Link Road Approach	28	28
B3097 at Hawkeridge	2,619	527
B3097 at The Ham	1,448	-
A363 at Yarnbrook	684	353
A350 North at Yarnbrook	1,250	228
A350 South at Yarnbrook	976	125
A350 in Westbury	1,385	125
Brook Lane	-	-
B3097 Station Road at The Ham	890	-

10.5.3 The committed development alters the 2023 construction baseline position to that shown below.

Table 10.19: 2023 Construction Phase Baseline with Committed Development

Link	AADT All Traffic	AADT HGVs	%age HGVs
The Link Road Approach	6,531	633	10%
B3097 at Hawkeridge	15,933	1,206	8%
B3097 at The Ham	8,899	737	8%
A363 at Yarnbrook	12,135	786	6%
A350 North at Yarnbrook	20,636	1,142	6%
A350 South at Yarnbrook	13,923	628	5%
A350 in Westbury	17,406	963	6%
Brook Lane	2,622	30	1%
B3097 Station Road at The Ham	11,539	138	1%

10.5.4 The changes arising from construction traffic with the cumulative effects of committed development are as follows.

Table 10.20: Construction Phase Changes with Committed Development (2023)

Link	AADT <u>All</u> Traffic	AADT HGVs Only
The Link Road Approach	0%	2%
B3097 at Hawkeridge	0%	1%
B3097 at The Ham	0%	0%
A363 at Yarnbrook	0.1%	1%
A350 North at Yarnbrook	0.1%	1%
A350 South at Yarnbrook	0.0%	0%
A350 in Westbury	0.2%	0%
Brook Lane	3%	0%
B3097 Station Road at The Ham	1%	0%

10.5.5 The effects of the increased baseline traffic arising from committed development are to further reduce the percentage changes in traffic arising during the construction phase, but they have no material effect on the consideration of actual traffic changes on individual links set out in section 0.

10.5.6 The committed development alters the 2025 operational phase baseline position to that shown below.

Table 10.21: 2025 Operational Phase Baseline with EfW & Committed Development

Link	AADT All Traffic	AADT HGVs	%age HGVs
The Link Road Approach	6,623	644	10%
B3097 at Hawkeridge	16,127	1,218	8%
B3097 at The Ham	9,010	748	8%
A363 at Yarnbrook	12,312	794	6%
A350 North at Yarnbrook	20,934	1,158	6%
A350 South at Yarnbrook	14,122	636	5%
A350 in Westbury	17,642	976	6%
Brook Lane	2,637	30	1%
B3097 Station Road at The Ham	11,680	140	1%

10.5.7 The percentage changes in traffic arising from the operational development in 2025 with committed development are summarised below.

Table 10.22: Cumulative Changes due to Development in 2025

Link	AADT <u>All</u> Traffic	AADT HGVs Only
The Link Road Approach	0.2%	1.9%
B3097 at Hawkeridge	0.1%	1.0%
B3097 at The Ham	0%	0%
A363 at Yarnbrook	0.1%	1.5%
A350 North at Yarnbrook	0%	0.7%
A350 South at Yarnbrook	0%	0.6%
A350 in Westbury	0%	0.4%
Brook Lane	0%	0%
B3097 Station Road at The Ham	0%	0%

10.5.8 As with the construction phase, the effects of the increased baseline traffic arising from committed development reduces the percentage changes in traffic arising from the facility being operational.

10.5.9 There is no change to the conclusions arising from the analysis of the individual links on the highway network under either the construction phase or the operational phase as a result of considered the cumulative impact.

10.6 Mitigation

Construction Mitigation

10.6.1 No links are predicted to experience SIGNIFICANT effects following reasoned comparison of the impacts and receptor sensitivities during the construction phase, so no mitigation is considered necessary beyond the planning conditions listed under Incorporated Mitigation in paragraphs 10.4.1 to 10.4.5.

10.6.2 The previous commitments to restricting HGV movement hours during construction and providing a Construction Environmental Management Plan are considered entirely adequate to mitigate the insignificant impacts identified in section 0 of this Chapter.

Operational Mitigation

- 10.6.3 No links are predicted to experience SIGNIFICANT effects following reasoned comparison of the impacts and receptor sensitivities during the operational phase, so no mitigation is considered necessary beyond the planning conditions listed under Incorporated Mitigation in paragraphs 10.4.1 to 10.4.5.
- 10.6.4 The previous commitments to restricting operational HGV movement hours and providing a Travel Plan with a commitment to encouraging car sharing and providing Electric Vehicle Charging Points, are considered entirely adequate to mitigate the insignificant impacts identified in section 10.4 of this Chapter, as was the case for the permitted application.

10.7 Residual Effects and Conclusions

- 10.7.1 The Proposed Development would have much the same patterns of travel as presented for the approved scheme, although different assumptions were made about construction traffic and the number of operational weeks per year for the consented scheme, which have led to worst-case comparisons in this ES Chapter.
- 10.7.2 Even on that worst-case basis, there are no residual transport effects anticipated to arise from this development relative to the 2019 Permission, and the mitigation measures agreed as suitable for that scheme remain entirely applicable and adequate for the Proposed Development.

CHAPTER 11.0 SOCIO ECONOMIC EFFECTS

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FIGURES (bound separately in Volume 2)

Figure 11.1	Socio Economic Assessment: Study Area
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11.0 SOCIO ECONOMIC EFFECTS

11.1 Introduction

11.1.1 This Chapter of the Environmental Statement (ES) considers the likely effects of the Proposed Development with regards to socio-economic matters. Socio-economic effects most commonly relate to the impact upon the human population living in the area surrounding a development site.

11.1.2 The assessment includes the following:

- Identification of the socio-economic baseline in respect of key issues identified, focussing on the characteristics of the local labour force. These characteristics can then be used as a measure for assessing future change; and
- Identification of the socio-economic effects, both direct and indirect, that would arise from the construction and operation of the Proposed Development.

11.1.3 A description of the Proposed Development is set out Chapter 4.0 of this ES and has not been repeated here.

Competence

11.1.4 The Socio-Economic Assessment was prepared by AXIS, a registered practice of the Royal Town Planning Institute (RTPI), with twenty years' experience of working in the planning and environmental sectors, with a particular focus on the environmental assessment of major infrastructure development. AXIS has previously undertaken similar assessments for various large-scale developments, including energy recovery facilities.

11.2 Methodology and Scope of Assessment

Planning Policy Context

11.2.1 For a detailed appraisal of planning policy, refer to the Planning Supporting Statement that forms part of the planning application. Those policy documents of most relevance to this Chapter are listed below:

- National Planning Policy Framework (the NPPF)¹;
- Wiltshire Core Strategy²;
- Waste Core Strategy³;
- Waste Development Control Policies⁴; and
- Waste Site Allocations Local Plan⁵.

National

11.2.2 The NPPF contains a range of policies related to land-use planning in England. It confirms that the purpose of the planning system is to achieve sustainable development. The NPPF identifies the three objectives of the planning system as follows:

- The NPPF contains a range of policies related to land-use planning in England. It confirms that the purpose of the planning system is to achieve sustainable development. The NPPF identifies the three objectives of the planning system as follows;
- A social objective: to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
- An environmental objective: to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising

¹ Ministry of Housing, Communities and Local Government, 2019. *National Planning Policy Framework*

² Wiltshire Council, adopted 2015. *Wiltshire Core Strategy*.

³ Wiltshire Council and Swindon Borough Council, adopted 2009. *Wiltshire and Swindon Waste Core Strategy 2006-2026*

⁴ Wiltshire Council and Swindon Borough Council, adopted 2009. *Waste Development Control Policies Development Plan Document*

⁵ Wiltshire Council and Swindon Borough Council, adopted 2013. *Waste Site Allocations Local Plan*

waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

Wiltshire Core Strategy

- 11.2.3 The Wiltshire Core Strategy includes a series of key principles, one of which is:
- Working towards lowering Wiltshire’s carbon footprint through the appropriate location of development, and through renewable energy and sustainable construction
- 11.2.4 Key outcomes identified in the Wiltshire Core Strategy include:
- Land will have been identified in sustainable locations to provide for about 27,500 new jobs up to 2026 and significant progress to tackle the issue of out-commuting from Wiltshire will have been achieved;
 - Potential for the expansion of green jobs will have been realised, particularly in relation to developing and installing renewable energy and energy efficiency technologies;
 - The supply of energy and heat from renewable sources will have contributed towards meeting national targets and helped to address fuel poverty;
 - High energy efficiency will have been incorporated into new buildings and development. New developments will have incorporated appropriate adaptation and mitigation for climate change;
 - New development will be supported by sustainable waste management; and
 - Provision of essential infrastructure, including transport, water, energy, flood alleviation, sustainable urban drainage (SUDs), telecommunications, affordable housing, education, health care, emergency services and waste and recycling, will have been coordinated and provided in a timely manner within all new development.
- 11.2.5 Specific issues identified for the Westbury Area in the Wiltshire Core Strategy include maintaining and enhancing the strategic employment role of the town. The area including the Site is identified in Core Policy 32 as a Principal Employment Area.
- 11.2.6 Core Policy 42 specifically supports renewable energy schemes, subject to addressing a series of environmental and site-specific constraints.

Waste Planning Policies

- 11.2.7 Policy WDC 12 of the *Waste Development Control Policies* document highlights the need for waste management proposals to maximise opportunities for renewable energy production (both heat and electricity).
- 11.2.8 The Waste Sites Allocation Local Plan specifically allocates the Northacre Trading Estate, which includes the Site, for strategic waste management development.

Other Policies

- 11.2.9 The Site is located within the Swindon and Wiltshire Local Economic Partnership (LEP) area. The LEP have produced a Strategic Economic Plan (SEP)⁶.
- 11.2.10 Amongst the key outcomes identified in the SEP to be achieved by 2026 are:
- Deliver the significant growth planned for the A350 Growth Zone, exploiting the digital cluster and advanced manufacturing capacity, and investing in the regeneration of the urban areas;
 - Align the acceleration of economic growth i.e. jobs and investment with the housing growth, infrastructure and utilities needed to satisfy existing and future need; and
 - Get ahead of the skills deficit 'curve' so that we have a workforce that provides a competitive advantage by being fit for the future by improving access to higher education through our innovative Higher Futures Programme.
- 11.2.11 A strategic objective identified in the SEP is: (1). Skills and talent - we need an appropriately skilled and competitive workforce to achieve our growth ambitions.
- 11.2.12 Priority actions to help achieve this objective include:
- Develop a skilled and competitive workforce meeting the needs of employers;
 - Develop higher level skills provision through smarter engagement between the higher and further education sectors and business;
 - Achieve a higher proportion of individuals employed in higher skilled and higher value-added roles (Level 4 and above) in priority sectors; and

⁶ Swindon and Wiltshire Local Enterprise Partnership, 2016. *Swindon and Wiltshire Strategic Economic Plan*.

-
- Embed apprenticeships as an established route to employment and maximise the opportunities to grow higher and degree apprenticeships.

11.2.13 A further strategic objective set out in the SEP is: (4). Place shaping – we need to deliver the infrastructure required to deliver our planned growth and regenerate our city and town centres, and improve our visitor and cultural offer.

11.2.14 Priority actions associated with this objective include:

- Deliver infrastructure improvements to support economic growth, support higher value skilled employment and attract inward investment; and
- Develop increased energy infrastructure resilience for businesses and residents.

11.2.15 The final strategic objective of the SEP is: (5). Business development - we need to strengthen the competitiveness of small and medium sized businesses and attract a greater share of foreign and domestic investment into the area.

11.2.16 A priority action associated with this objective is to: Develop Swindon and Wiltshire as a nationally significant player in the UK's energy sector, with particular strengths in the low carbon energy generation sector and the application of hydrogen technologies.

11.2.17 The SPE also identifies the low carbon economy as a key driver of change, that will create new opportunities in many sectors, including energy generation.

11.2.18 An associated document, the Local Energy Strategy⁷, is intended to assist a deeper engagement in the energy sector by the LEP. The four key objectives of the Local Energy Strategy are as follows:

- Taking steps to grow the low carbon economy and upgrading energy infrastructure in order to enable growth;
- Delivering the existing local priorities identified in SWLEP's Strategic Economic Plan to 2026 as well as those of Swindon Borough Council and Wiltshire Council;
- Aligning with the direction and intent of national policy, reflecting the Clean Growth Strategy and the clean growth elements of the Industrial Strategy;

⁷ Ricardo Energy and Environment, 2018. SWLEP Local Energy Strategy Swindon and Wiltshire's Energy Future: Setting the Agenda. Swindon and Wiltshire LEP

-
- Making a contribution towards our national climate change commitments, ensuring Swindon & Wiltshire help meet the carbon budget.

11.2.19 The Local Energy Strategy sets out the LEP's strategic energy priorities, which include:

- Low Carbon Growth. The aim of SWLEP is to stimulate local growth and increase productivity. Looking ahead, the low carbon economy will be increasingly integral to that. SWLEP will support clean growth in the business community and it will help Swindon and Wiltshire deliver a sustainable physical growth pattern, consistent with the long-term decarbonisation pathway. This will include embedding low carbon growth in SWLEP's decision making and supporting low carbon construction and development.

Legislation and Guidance

11.2.20 There is no overarching guidance for the assessment of socio-economic effects. However, information published by government bodies has been used to derive estimates of the economic benefit that would accrue from the Proposed Development. The net positive economic effect of the Proposed Development has been estimated using information set out in the *Additionality Guide*⁸.

Assessment Methodology

Introduction

11.2.21 The assessment is based upon an approach typical in Environmental Impact Assessment, which considers the sensitivity of receptors to change and the magnitude of the change that each receptor would experience. Based upon this, a conclusion can be drawn as to whether the resultant effect is significant or not.

11.2.22 The assessment considers the potential for the Proposed Development to affect local socio-economic conditions both during the construction phase and once it becomes operational. These two elements are largely separate and, as such, are addressed under separate headings below. However, the methodology for determining effects is the same for both elements of the assessment.

⁸ Homes and Communities Agency, 4th edition 2014. *Additionality Guide*

11.2.23 The assessment has been carried out by undertaking a desk-based study, including a review of key statistical information.

11.2.24 The Proposed Development has the potential to affect local socio-economic conditions via three types of effect, as follows:

- Direct economic effects: jobs and wealth that are wholly or largely related to either the construction or operation of the Proposed Development;
- Indirect economic effects: jobs and wealth generated in the economy via the supply chain of goods and services that support the direct activities; and
- Induced economic effects: jobs and wealth created by direct and indirect employees' spending.

The Study Area

11.2.25 The Study Area for the Assessment has been determined through the use of 2011 Census data to identify travel-to-work patterns. Data is available for Middle-layer Super Output Areas (MSOAs) that form part of the Census.

11.2.26 The closest MSOA to the Site is Wiltshire 040. It is considered that travel-to-work patterns for this MSOA (discussed further in Section 11.4) are likely to give a reasonable indication as to where those employed at the Proposed Development would originate.

11.2.27 The online mapping resource, Data Shine Commute^{9 10}, can be used to display travel-to-work patterns for each MSOA, and identifies all other MSOA from where six or more people commuted to Wiltshire 040 for work in 2011.

11.2.28 Review of this online mapping indicates that the large majority of people employed locally to the Site live in Wiltshire (with the majority of the remainder living in and around Frome in Mendip District). As such, Wiltshire has been adopted as the Study Area for the Assessment. The Study Area is outlined in blue on Figure 11.1.

⁹ Data Shine Commute < <https://commute.datashine.org.uk> > [accessed 17 Apr 2020]

¹⁰ DataShine Blog (undated), About DataShine < <https://blog.datashine.org.uk/about/> > [accessed 17 Apr 2020]

Assessment of Significance / Assessment Criteria

Sensitivity

11.2.29 The sensitivity of the receptors is determined based upon the importance attached to each receptor in policy, and the use of professional judgement relating to the scale of socio-economic challenges faced by each receptor (following analysis of the baseline). The criteria followed in determining receptor sensitivity are set out in Table 11.1. The criteria are indicative, and the assessment includes a reasoned justification explaining the criterion allocated to each specific receptor.

Table 11.1: Sensitivity Criteria

Sensitivity	Description
High	<ul style="list-style-type: none">○ Evidence of direct and significant socio-economic challenges relating to the receptor; and/ or○ Identification in policy as a key thematic or spatial priority
Medium	<ul style="list-style-type: none">○ Some evidence of socio-economic challenges linked to the receptor, which may be direct or indirect; and/ or○ The receptor is identified in policy, but not as a key policy priority.
Low	<ul style="list-style-type: none">○ Little evidence of socio-economic challenges relating to the receptor; and/ or○ No identification in policy.
Negligible	<ul style="list-style-type: none">○ No socio-economic issues relating to the receptor; and/ or○ No particular economic weaknesses or challenges

Assessment of Construction Employment

11.2.30 Details of likely typical construction employment levels have been provided by the Applicant.

Additionality

11.2.31 The concept of additionality refers to the extent to which something would happen as a result of a particular intervention. In regard to this assessment, this means how the economy of the Study Area is likely to change because of the Proposed Development. The Additionality Guide¹¹ includes a formula for estimating the change in employment that would occur from development, which takes into account the influence of 'leakage' (jobs taken up by people living outside the Study Area), 'displacement' (where a development would take employment/ market share from

¹¹ Homes and Communities Agency, 4th edition 2014. *Additionality Guide*

other businesses or organisations), and ‘economic multipliers’ (knock-on effects in the Study Area economy).

Gross Value Added

11.2.32 Gross Value Added (GVA) is a measure of the contribution to the economy of a specific business or industry. It can be used as a headline indicator to monitor economic performance at regional and national level. It can also be estimated at a project-specific level to give some indication of the likely financial contribution of employment associated with a particular development.

11.2.33 GVA per person at the Study Area level is set out in Section 11.4

11.2.34 The increase in GVA per person relating to the Proposed Development has been estimated based upon details of employment and income provided by the Applicant, and is reported in Section 11.5.

Magnitude of Change

11.2.35 The magnitude of change undergone by each receptor is determined by considering the likely deviation from baseline conditions. Magnitude criteria are set out indicatively in the table below. Again, the assessment includes a reasoned justification explaining the criterion allocated to each specific receptor.

Table 10.2: Magnitude Criteria

Magnitude	Description
Large	A large change to existing conditions, in terms of either absolute or percentage change
Medium	A moderate change to existing conditions, in terms of either absolute or percentage change
Small	A limited change to existing conditions, in terms of either absolute or percentage change
Negligible	No tangible change from baseline conditions.

Significance of Effect

11.2.36 As described above, once the sensitivity of the receptor and the magnitude of change have been identified, these are considered together to determine whether the

resultant effect is significant or not. The level of effect that would occur is determined guided by the matrix below.

Table 10.3: Criteria for Assessment of the Level of Socio-Economic Effects

Magnitude		Sensitivity			
		High	Medium	Low	Negligible
	Large	<i>Substantial</i>	<i>Major</i>	<i>Moderate</i>	<i>Negligible</i>
	Medium	<i>Major</i>	<i>Moderate</i>	<i>Minor</i>	<i>Negligible</i>
	Small	<i>Moderate</i>	<i>Minor</i>	<i>Slight</i>	<i>Negligible</i>
	Negligible	<i>Negligible</i>	<i>Negligible</i>	<i>Negligible</i>	<i>Negligible</i>

11.2.37 For the purposes of this assessment, a major or substantial effect is considered to be significant. Where an effect is moderate, this may also be deemed significant following further consideration. A reasoned justification is provided as part of the assessment in relation to all judgements as to whether an effect is significant or not.

11.2.38 Wider and more intangible socio-economic effects may also derive from the Proposed Development, occurring upon receptors that cannot easily be identified, or where the change occurring is difficult to quantify with any degree of certainty. In these cases, the likely effect is described textually and a statement made as to whether that effect would be significant or not, based upon the professional judgement of the assessor.

Scope of Assessment

11.2.39 In socio-economic assessment, both receptors and the effects of development upon them may be abstract and diffuse when contrasted with the receptors set out in the other Chapters of this ES. The specific receptors that this assessment is concerned with are:

- Construction sector employment; and
- Rates of employment and gross value added, once the Proposed Development becomes operational

11.2.40 Understanding the effects of the Proposed Development on these receptors enables a conclusion to be made as to the effects on the socio-economics of the Study Area.

Limitations

- 11.2.41 The assessment and its conclusions are both dependent upon the accuracy of third-party data. Economic data used to project the changes resulting from the Proposed Development is inevitably historic, and actual outcomes may vary from those stated due to wider economic fluctuations, or to changes in technology.
- 11.2.42 The data gathered reflects different points in time, with 2011 Census data typically being less current than NOMIS labour market statistics. Like-for-like comparisons between data from different sources, or which covers different geographical areas is not always possible. See Section 11.3 for details of data sources.

11.3 Baseline

Data Collection

- 11.3.1 The Assessment utilises data gathered from various sources, including:
- 2011 Census Data¹²;
 - Office for National Statistics^{13 14};
 - NOMIS data¹⁵; and
 - The Applicant's, and the Project Team's, experience of other, similar types of development

Baseline Environment

Population

- 11.3.2 Mid-year population estimates for 2018 available from the Office of National Statistics indicate that the Study Area had a resident population of 498,064. The proportion of the population that was of working age was slightly above the regional average, but below the average for England and Wales. The number of under-18s was above the

¹² UK Data Service Census Support. [online] <https://borders.ukdataservice.ac.uk/easy_download.html> [accessed 17 March 2017]

¹³ Office for National Statistics. Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland [online] <<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalescotlandandnorthernireland>> [accessed 21 Apr 2020]

¹⁴ Office for National Statistics. Gross Value Added (GVA) [online] < <https://www.ons.gov.uk/economy/grossvalueaddedgva> > [accessed 21 Apr 2020]

¹⁵ NOMIS Official Labour Market Statistics. Area profiles [online] <<https://www.nomisweb.co.uk/>> [accessed 21 Apr 2020]

regional average, but the same as the national average. The number of people aged 65 or over was similar to the regional average, but above the national average.

Table 11.4: Age Structure (2018)

Population	Study Area	South West	England and Wales
<i>Total</i>	498,064 (100%)	5,599,735 (100%)	59,115,809 (100%)
<i>0-18</i>	111,389 (22.4%)	1,164,423 (20.8%)	13,250,119 (22.4%)
<i>19-64</i>	280,838 (56.4%)	3,205,112 (57.2%)	35,034,444 (59.3%)
<i>65+</i>	105,837 (21.2%)	1,230,200 (22%)	10,831,246 (18.3%)

Employment

11.3.3 NOMIS travel to work data¹⁶ (based upon the 2011 Census data) gives a picture of employment levels for MSOA Wiltshire 040. In 2011 a total of 2,991 people had a place of work within the MSOA (including those commuting from outside) and 5,622 people that lived within the MSOA commuted to places of work outside. Table 11.5 provides a breakdown of travel-to-work patterns in the Study Area (which are also illustrated on Figure 11.1).

Table 11.5: Employment within MSOA Wiltshire 040 (2011)

Location of employees	Number of jobs (with % of total in parentheses)
<i>Total</i>	
People with a place of work in MSOA Wiltshire 040	2,991 (100%)
<i>People living in East Hampshire District</i>	
People with a place of work in MSOA Wiltshire 040, that also live within MSOA Wiltshire 040	1,099 (36.7%)
People with a place of work in MSOA Wiltshire 040, that live in the remainder of the Study Area	1,404 (46.9%)
<i>People living further afield</i>	
People with a place of work in MSOA Wiltshire 040, commuting from further afield	488 (16.3%)

11.3.4 NOMIS labour market profile data indicates that during 2019, unemployment within the Study Area was lower than the figure for both the South West region and for Great Britain. Weekly earnings in 2019 were just above the regional average, but below the national average. Qualification levels were slightly below the regional average. At the national level, the percentage of higher level qualifications was below average, but more generally qualification levels were above average.

¹⁶ NOMIS Official Labour Market Statistics. Location of usual residence and place of work [online] <<https://www.nomisweb.co.uk/census/2011/wf01bew>> [accessed 21 Apr 2020]

11.3.5 With regards to employment breakdown by industry, the largest number of jobs in the Study Area in 2018 were in the Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles sector. Employment within electricity, gas, steam and air conditioning supply was similar to the regional and national averages. Employment within water supply, sewerage, waste management and remediation activities was below average. Construction employment was similar to the regional average, but above the national average. The proportion of higher skilled jobs (managerial, professional and technical) was above average.

11.3.6 The NOMIS data referred to above are set out in Tables 11.6-11.11 (percentage numbers are rounded, and do not necessarily add up to 100%).

Table 11.6: NOMIS total employee jobs (2018)

Area	Total number of employee jobs
Study Area	203,000

NOTE: Figures exclude the self-employed, those employed in farm-based agriculture, government-supported trainees, and HM forces.

Table 11.7: NOMIS employment and pay data

Area	Unemployment	Average Weekly Earnings
Study Area	2.7%	£565.80
South West	3.1%	£560.60
Great Britain	3.9%	£587.00

NOTE 1: Unemployment figures are based on NOMIS data covering the period Jan 2019 – Dec 2019.

NOTE 2: Average weekly earnings figures are for place of residence. Figures are based on NOMIS data for 2019.

Table 10.8: NOMIS qualification level data (2019)

Area	Qualification Level					
	NVQ4	NVQ3	NVQ2	NVQ1	Other	None
Study Area	38.6%	59.3%	79.2%	88.6%	5.7%	5.7%
South West	39.2%	60.5%	78.2%	89.3%	5.4%	5.3%
Great Britain	40.3%	58.5%	75.6%	85.6%	6.7%	7.7%

NOTE 1: Percentage figures for NVQ levels are for that level and above, i.e. the NVQ1 figure includes the totals for NVQ2, 3 and 4.

Table 10.9: NOMIS employment level by industry (2018)

Industry	Study Area	South West	Great Britain
Mining and Quarrying	0%	0.1%	0.2%
Manufacturing	9.4%	8.6%	8.1%
Electricity, Gas, Steam and Air Conditioning Supply	0.4%	0.5%	0.5%
Water Supply; Sewerage, Waste Management and Remediation Activities	0.5%	0.9%	0.7%
Construction	5.4%	5.4%	4.7%
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	17.2%	15.9%	15.2%
Transportation and Storage	3.0%	4.0%	4.8%
Accommodation and Food Service Activities	8.9%	9.8%	7.6%
Information and Communication	3.4%	3.4%	4.2%
Financial and Insurance Activities	1.0%	2.8%	3.5%
Real Estate Activities	2.2%	1.8%	1.7%
Professional, Scientific and Technical Activities	9.9%	7.2%	8.7%
Administrative and Support Services	5.9%	6.7%	9.1%
Public Administration and Defence; Compulsory Social Security	4.9%	4.4%	4.3%
Education	9.4%	8.8%	8.9%
Human Health and Social Work Activities	13.3%	14.9%	13.2%
Arts, Entertainment and Recreation	2.5%	2.7%	2.5%
Other Service Activities	2.0%	1.9%	2.0%

NOTE: Figures exclude the self-employed, those employed in farm-based agriculture, government-supported trainees, and HM forces.

Table 10.10: ONS Gross Value Added

Area	Gross Value Added	Gross Value Added per head
Study Area	£11,281 million	£22,724

NOTE: GVA figures quoted are provisional for 2017. The ONS figures are not broken down by local authority area, but reflect larger statistical units.

Table 10.11: NOMIS Employment Data (2019)

Data (2019)	Study Area	South West	Great Britain
Managers and Senior Officials	14.9%	11.8%	11.4%
Professional	18.8%	20.6%	21.4%
Associate Professional & Technical	15.2%	13.7%	14.6%
Administrative & Secretarial	8.6%	9.7%	9.6%
Skilled Trades	12.5%	11.4%	10.1%
Caring, Leisure and Other Service Occupations	10%	9.7%	9.1%
Sales and Customer Services	6.6%	6.8%	7.2%
Process Plant and Machine Operatives	5.2%	5.6%	6.2%
Elementary Occupations	8.1%	10.5%	10.3%

NOTE: Figures shown are a percentage of those in employment and are independent of unemployment rates.

Future Baseline

11.3.7 Should the Proposed Development not be implemented, it is assumed that the Site would continue in its present state, i.e. a vacant plot. It must be recognised that planning consent for a similar facility exists, and that the Site is allocated for strategic waste facility development. As such, the Site is likely to be developed irrespective of whether the Proposed Development gains planning consent.

11.4 Assessment of Effects

Construction Phase

Sensitivity of Receptor

11.4.1 The NOMIS data displayed in Section 11.3 shows that employment in the construction sector was similar to the regional average and above the national average in the Study Area in 2018, and that unemployment was below average in 2019. Employment in the skilled trades was above average in 2019.

11.4.2 Construction employment on a particular project is inherently temporary, lasting for only as long as that particular project (or specific aspect of that project) is under construction. Construction employment is therefore dependent upon ongoing development opportunities being available. The policy support for renewable energy, sustainable waste management, essential infrastructure and the develop of the low

carbon economy more generally all imply some degree of ongoing development, and hence increased levels of construction activity. Given this, there is clear potential for the maintenance and future growth of construction employment in the Study Area. There is also policy support for increasing skill levels, which construction employment would contribute to. As such, sensitivity is medium.

Direct Effects

- 11.4.3 The Applicant has confirmed that construction of the Proposed Development is likely to last for just over three years. The number of people on-site is likely to fluctuate depending upon the programming of particular work elements, and would be likely to comprise a mix of full-time and part-time contractors. The Applicant has confirmed that up to 465 people are likely to be on Site at any one time. Over the entire project there would be an average of 250 staff employed on the site per day. The staffing profile over the construction is shown on Figure 4.17.
- 11.4.4 It is likely that elements of construction would be tendered in a series of sub-contractor packages, including for example ground works, steel works etc. Local contractors may be able to fulfil the requirements of some of these packages, and given the breakdown of the local labour market, there is scope for the employment of local people during the construction process (for example those employed in skilled trades), and the provision of employment opportunities for those that are currently out of work. However, some of the contractors and some of the workforce for more specialised elements of construction are more likely to be drawn from outside the Study Area.
- 11.4.5 There would be an increase in construction employment within the Study Area during the construction phase, either via the creation of new jobs, or via the maintenance of existing employment. In absolute terms, with, on average, approximately 250 workers on-site and a peak employment level approximately 465 people, this would represent a small to medium magnitude of change when considered against baseline construction employment levels. These figures are relatively small in percentage terms when considered against the whole of the Study Area, but nevertheless are large in absolute terms.
- 11.4.6 The effects of this on the Study Area overall would be moderate beneficial. The effects, which would be temporary, could be significant for individual businesses and

workers, particularly for those based locally. Additionally, the generation of construction activity and employment associated with the Proposed Development has potential to lead to further opportunities for both businesses and individual workers, should further development in the Study Area be implemented subsequently.

- 11.4.7 The ES submitted for the consented scheme is vague regarding construction employment levels, stating that the workforce would vary from 50 to 'over 150' depending upon the activities being undertaken. As such, the Proposed Development is likely to result increased levels of construction employment, and hence there would be a beneficial effect when compared with the consented scheme.

Indirect and Induced Effects

- 11.4.8 Indirect effects associated with the construction process would derive from supply chain employment. Construction materials and services would be bought-in by contractors. Some of these materials and services would be specialised, whilst others would be more generic. The various supply chains can only be determined by the relevant appointed contractors and therefore effects cannot be quantified at the time of writing. It should be recognised however, that supply chain businesses would benefit from construction, and demand for their goods or services is likely to support continued or additional employment.
- 11.4.9 Induced effects would derive chiefly from the expenditure by those employed in construction. Some of this expenditure is likely to occur locally to the Site, or elsewhere in the Study Area. Expenditure by construction workers on food and drink is likely to have benefits for local shops. Additionally, any non-local workers whose home base is remote from the Site are likely to require accommodation during the week, and there would therefore be potential benefits to local hotels and guest houses.
- 11.4.10 The *Additionality Guide* suggests a composite multiplier of 2.7 (covering income and supply) is appropriate for construction employment. As such, it is estimated that approximately 425¹⁷ further jobs could be supported via the indirect or induced effects of the Proposed Development.

¹⁷ 250 direct construction jobs multiplied by 2.7 gives 675, with the difference (i.e. 425) being the additional indirect or induced employment supported.

11.4.11 The magnitude of change deriving from indirect and induced construction employment cannot be stated with any certainty. The level of effect would range from being minor (across the entire Study Area) to major (and therefore significant) for some local businesses and some supply chain businesses, given the size and scale of the Proposed Development. As set out above, effects would be temporary, however construction activity at the Site has the potential to lead to further opportunities for both businesses and individual workers. It should be noted that many supply chain businesses may be located outside the Study Area and that expenditure by construction workers may also take place outside the Study Area (including for example, online purchases, holiday expenditure, etc.). There is nevertheless clear potential for some businesses within the Study Area to derive economic benefits from the Proposed Development during the construction stage.

Operational Phase

Sensitivity of Receptor

11.4.12 Within the Study Area, unemployment was below average in 2019, as set out in Section 11.3. Employment within the waste management sector was below average in 2018. In 2019, employment skewed slightly towards higher skilled occupations. The development of the low carbon economy, and the need to raise skills levels, are highlighted in local planning and economic policies. On this basis, the sensitivity of employment in the Study Area is considered to be medium.

Employment

11.4.13 As set out in Chapter 4.0, the Proposed Development would result in the creation of approximately 40 FTE jobs. The occupational mix would be broadly as follows:

- Managers: 5;
- Engineers, Supervisors and Technicians: 10;
- Plant and process Operatives: 22; and
- Administrative and Secretarial Occupations: 3.

11.4.14 Based on the Project team's experience of another similar facility in the south of England, the average salary of those employed at the Proposed Development is

likely to be approximately £31,111.11. This would give an overall gross income of approximately £1.244 million per annum.

- 11.4.15 When compared with a UK-wide average weekly earning (across all sectors) of £545.00 and an average annual salary of £28,340.00¹⁸, this shows that the average earnings of those employed at the Proposed Development facility would be more than the average salary within the Study Area, regionally and nationally.

Leakage

- 11.4.16 Approximately 83.7% of those working within MSOA Wiltshire 040 (i.e. where the Proposed Development would be located) live within the Study Area, based upon commuting patterns identified in the 2011 census (as referenced in Section 11.3), and approximately 16.3% of existing (in 2011) jobs are taken up by those living further afield. Based on this, the likely leakage of employment outside the Study Area is estimated at 16.3%.

Displacement

- 11.4.17 It is possible that the Proposed Development would take trade from other businesses located within the Study Area. Some waste would potentially be diverted from other waste management facilities and hence could displace activity at these sites. However, any diversion from UK landfills would, given overall UK landfill inputs, result in minimal displacement. Any displacement of exported solid recovered fuel (SRF) from European facilities would not impact upon the UK economy. Further, it may well be replaced by residual waste presently going to landfill within Europe. As a consequence, displacement resulting from the Proposed Development is likely to be very low and has been estimated at no more than 5%.

Indirect and Induced Effects

- 11.4.18 There will inevitably be a range of bought-in goods and services required, once the Proposed Development becomes operational. These will result in continued or additional indirect employment by the suppliers of these goods and services. Further

¹⁸ Office for National Statistics. *EARN01 Average Weekly Earnings* [online] <<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/averageweeklyearning/searn01>> [accessed 21 Apr 2020]

induced effects would derive from spending by those employed directly and indirectly at the Proposed Development, which would inevitably support employment (continued or additional) in relation to a further range of goods and services. The scale of this additional indirect and induced employment can be estimated via use of a multiplier. The *Additionality Guide* suggests a composite multiplier (covering income and supply) of 2.8 is appropriate for electricity production. As such, approximately 72¹⁹ 20 new or existing FTE jobs would be supported via the indirect or induced effects of the Proposed Development.

Additionality

11.4.19 Based on the above, the additionality deriving from the Proposed Development (i.e. how it would be likely to affect the economy of the Study Area once operational) can be estimated. Gross Value Added (GVA) has been estimated based on the income levels estimated above, and in relation to direct employment, is approximately £31,111.11 per job (excluding income tax and other deductions). This is a significantly higher figure than the current GVA per head for the Study Area, (which is set out in Table 11.10).

11.4.20 Table 11.12 sets out the additionality calculation for the Proposed Development.

Table 11.12: Additionality

	FTE Employment	Gross Value Added
A. Direct Employment	40	£1,244,444.40
B. Leakage (outside Study Area)	16.3%	n/a
C. Gross Direct Effect (A - B)	33.48 (33-34 jobs)	£1,041,599.96
D. Displacement ²¹	5%	n/a
E. Net Direct Effect (C - D)	31.80 (31-32 jobs)	£989,519.96
F. Multiplier	2.8	n/a
G. Total Net Effect (E x F)	89.04 (89 jobs)	£2,770,655.88

11.4.21 The Site is presently an undeveloped plot within the wider Northacre Trading Estate, and does not support any current employment. The consented EfW at the same Site would employ approximately 40 people. The Environmental Statement for the consented scheme does not give any breakdown of job types, but these are likely to

¹⁹ 40 direct FTE jobs multiplied by 2.8 gives 112, with the difference (i.e. 72) being the additional indirect or induced employment supported

²⁰ The figure of 72 additional FTE jobs is absolute and excludes the effects of leakage or displacement.

²¹ Displacement is estimated at 5%, as discussed above.

similar as for the Proposed Development, given that the two facilities would be broadly similar (albeit utilising different technologies as set out in Chapter 3.0).

11.4.22 The Proposed Development would result in the direct creation of approximately 40 FTE jobs. When leakage and displacement, and indirect and induced effects are taken into account, the Proposed Development is likely to support approximately 89 jobs within the Study Area. The net GVA to the economy of the Study Area by the Proposed Development would be in the region of £2.77 million annually.

11.4.23 These figures are relatively small in percentage terms when considered against the whole of the Study Area, but nevertheless are relatively large in absolute terms. The creation of skilled employment opportunities, and the contribution of the Proposed Development towards the development of the low carbon economy would support local planning economic policies. There would be a medium magnitude of change from the baseline for both employment and Gross Valued Added reported in Section 11.3. This would result in a moderate beneficial effect to the economy of the Study Area, which would not be significant across the whole of the Study Area. Effects are however likely to be significant for some businesses that supply bought-in goods and services, and for individuals (including those employed at the Proposed Development).

11.4.24 For both the Proposed Development and the consented scheme estimates of employment levels are approximate. The actual socio-economic effects of the two schemes would be very similar.

Wider Socio-Economic Effects

Renewable Energy Generation.

11.4.25 The Northacre Facility would generate energy from the controlled combustion of residual waste. It would have the ability to export approximately 25.6 MW of electricity to the local electricity grid. Based upon its planned 7884 operating hours per year (circa 90% availability), the Northacre Facility would export circa 201,830²² MW hours of electricity per annum. This is sufficient to meet the entire annual domestic electricity needs of over 48,000²³. The Northacre Facility would also be

²² 25.6 MW x 7612 operating hours per year = 201,830MW/hrs

²³ Based on UK average domestic consumption of 4.2MWh per household. Source Ofgem

capable of exporting heat, in the form of steam or hot water, to local heat users. Approximately 50% of the energy generated would be from the biogenic fraction of the residual waste treated at the Site and as such would be classified as renewable energy. This would clearly have a beneficial social effect in terms of the transition to a low carbon economy, and the development of renewable energy sources.

Non-Domestic Business Rate Retention

11.4.26 The Proposed Development would be liable for non-domestic (business) rates which would be paid to Wiltshire Council. Government policy allows for business rate retention for local authorities who support the development of renewable energy projects. Where SRF comprises biomass, or is otherwise biodegradable, this is recognised as a source of renewable energy. As noted above, approximately 50% of the residual waste treated at the Proposed Development would be biomass, and as such, this proportion of the energy generated at the Proposed Development is likely to be subject to business rate relief (which would need to be determined via a detailed assessment). As such approximately 50% of the business rates attributable to the Proposed Development could be retained by Wiltshire Council, providing a financial benefit to the Council and its residents.

District Heating and Heat Off-Take

11.4.27 In addition to the production of electricity, the Proposed Development would also produce heat in the form of steam and hot water. The Proposed Development would be CHP-ready (Combined Heat and Power). As such, there is considerable potential for future beneficial effects to derive via the supply of heat to local businesses, public buildings and residential development, which would again represent a contribution to the transition to a low-carbon economy.

Increasing Local Electricity Grid Capacity / Resilience

11.4.28 There are acknowledged constraints on power supply to the industrial / employment areas sitting to the north west of Westbury, in particular to Hawke Ridge Business Park, a 35 acre strategic employment site serving mid-Wiltshire. The site is located immediately adjacent to, and served by, the Hawkeridge primary substation. This

substation has very limited available power and this has been a direct constraint on the development of the Business Park. The Northacre Facility could assist in improving local levels of power supply, create a more resilient local grid network and aid in unlocking the constraint, thus leading to greater local levels of economic development.

11.5 Cumulative Effects

11.5.1 The three projects identified to be appraised as part of the cumulative assessment are described in Chapter 2.0 of this ES. Each of these schemes would generate their own constructed related employment, with associated indirect and induced effects. One of the projects is for residential development and therefore would not result in any operational employment. The other two projects are for employment uses, and would therefore generate operational employment with associated indirect and induced effects and associated GVA.

11.5.2 The Proposed Development and each of the three cumulative projects would be wholly separate and unrelated developments. Employment at each scheme would not relate to any of the others.

11.5.3 Nevertheless, should the Proposed Development and one or more of the other projects be implemented, the cumulative levels of direct construction employment would be greater than for either in isolation. Direct levels of employment during operation would also increase cumulatively if either of the two employment-related projects were built. Additionally, there would be greater levels of indirect and induced expenditure occurring cumulatively.

11.5.4 Therefore, it seems reasonable to state that cumulative socio-economic effects would be beneficial

11.6 Mitigation

11.6.1 The effect on both construction employment and permanent (non-construction) employment within the Study Area would be beneficial and no specific mitigation measures are deemed necessary.

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- 11.6.2 Nevertheless, there are enhancement measures that could be used to increase the positive aspects and potential supply chain benefits to local businesses, such as:
- Use of labour agreements to maximise the proportion of local construction workers;
 - A recruitment/training programme with a focus on the closest Jobcentres; and
 - Local procurement of products and services where possible.
- 11.6.3 Specifically, the Applicant would engage with Wiltshire Council and with other relevant organisations, to develop and agree a plan to ensure, as far as possible, that local people have the opportunity to acquire the skills needed to operate the facility and so be ready for employment during commissioning and operation.
- 11.6.4 This particular measure would enhance the benefits of the Proposed Development, by increasing the skill base of the local labour force.

11.7 Residual Effects and Conclusions

- 11.7.1 The Proposed Development would have a beneficial effect on construction employment within the Study Area. As such, the scheme would have a clear positive influence upon the continued viability of a range of contractor companies and their employees, as well of other businesses forming part of the supply chain. There may therefore be significant effects for specific businesses, and indeed for individuals employed in construction. This would be of general benefit to the wider economy, in terms of retention and possible upgrading of skilled workers, and in terms of the viability of construction sector businesses.
- 11.7.2 Construction is a sector that is dependent upon the availability of continued opportunities to undertake built development, and the Proposed Development would provide such an opportunity. Construction effects would be temporary, but construction activity (and the experience and skills gained/ developed) has the potential to lead to further opportunities for both businesses and individual workers in future.
- 11.7.3 Once operational, the Proposed Development would directly create approximately 40 jobs. A further 72 jobs are likely to be created or supported by indirect or induced expenditure (e.g. services bought-in to the Site, or spending outside the Site by

employees). Once the effects of displacement and leakage are considered, it is estimated that within the Study Area approximately 89 jobs would be supported directly or indirectly. This would add an estimated £2.77 million to the economy of the Study Area each year. When considered in the context of the wider Study Area economy, it is concluded that there would be a moderate beneficial effect. Effects for individual businesses and for individual employees are likely to be greater.

11.7.4 It should be recognised that the Site of the Proposed Development already benefits from planning consent for a similar facility. Given the similarities between the two schemes, employment levels during the operation of the Proposed Development are likely to be very similar to those associated with the consented scheme. The Proposed Development would result in greater levels of construction employment than the consented scheme.

11.7.5 The job creation and increase in gross value added that would result from the Proposed Development, together training providing by the Applicant, would contribute to the achievement of both planning and economic policies. Additionally, the Proposed Development would accord closely with planning and economic policies that are supportive of increasing skill levels in the workforce and that encourage the development of the low carbon economy.

CHAPTER 12.0 CULTURAL HERITAGE

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FIGURES (Volume 2 bound separately)

Figure 12.1	Heritage Assets with 5km of Site
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APPENDICES (Volume 3 bound separately)

Appendix 12-1.....	Heritage Impact Assessment
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12.0 CULTURAL HERITAGE

12.1 Introduction

- 12.1.1 This Chapter provides an assessment of the potential effects of the proposed Northacre Facility upon the cultural heritage and archaeological (historic environment) resource. The assessment covers the full development but will compare assessed outcomes to those predicted in respect of the development permitted in 2019 (referred to hereafter as the 2019 Permission). The assessment includes consideration of potential effects on individual heritage assets and their settings.
- 12.1.2 For the purposes of this assessment, the historic environment resource is taken to encompass archaeological sites, features, deposits and associated artefacts and ecofacts; the built heritage resource (buildings, historic structures etc); and the historic landscape.
- 12.1.3 The Chapter will describe the assessment methodology, current planning policy context, the baseline conditions of the Northacre Facility (which is essentially unchanged from the baseline when the 2019 Permission was granted), the likely significant heritage impacts during the construction and operational phases of the Proposed Development, and the mitigation measures required to prevent, reduce or offset any significant adverse effects.
- 12.1.4 A Heritage Impact Assessment is provided in Appendix 12-1.
- 12.1.5 The Chapter has been prepared in support of a planning application to revise the development permitted in the 2019 Permission.
- 12.1.6 A full description of the Northacre Facility can be found in Chapter 4.0 of this ES. In summary, there are a number of minor changes from the 2019 Permission relating primarily to changes in the processes used to generate energy from waste, and in the handling of materials in the site. The majority of the changes are internal to the main structures (and irrelevant for purposes of this cultural heritage assessment), and physically the facility occupies the same site as the permitted development, albeit with minor decrease in physical footprint of the principal structures. The main building will see a minor increase in maximum height from 36.8m (as permitted) to

40m, with the odour control stack increasing from 40m (permitted) to 43m. The height of the main stack will remain at the permitted 75m, but 2.55m contrasting with 4.5m in the 2019 Permission.

Competence

12.1.7 This Chapter has been prepared by Alex Godden, Principal Consultant, Wessex Archaeology. Alex has over ten years' experience in curatorial and commercial archaeology and is an Associate of the Chartered Institute for Archaeologists. He has produced archaeology and heritage Environmental Assessment chapters for a number of large-scale housing developments and quarry sites. The chapter has been reviewed and completed by Mark Turner, Principal Heritage Manager at Wessex Archaeology and a Member of the Chartered Institute for Archaeologists (MCIfA). Mark has some 30 years post-graduate experience in archaeology and cultural heritage, with 20 years as a consultant, with considerable experience of EIA and major development, including energy schemes. Mark has particular expertise in the assessment of potential effects on the settings and significance of heritage assets.

12.2 Methodology and Scope of Assessment

Legislation and Guidance

National Policy and Legislation

12.2.1 The National Planning Policy Framework (NPPF) 2019 sets out the Government's national planning policies, including those on the conservation of the historic environment. The NPPF covers all aspects of the historic environment and heritage assets, including Designated Assets (World Heritage Sites, Scheduled Monuments, Listed Buildings, Protected Wreck Sites, Conservation Areas, Registered Parks and Gardens and Registered Battlefields) and non-designated assets. The NPPF draws attention to the benefits that conserving the historic environment can bring to the wider objectives of the NPPF in relation to sustainability, economic benefits and place-making (Paragraph 185).

12.2.2 The NPPF states that the significance of heritage assets (including their settings) should be identified, described, and that the impact of proposals should on the

significance of assets should be assessed. Planning applications should include sufficient information to enable the impact of proposals on significance to be assessed, and thus where desk-based research is insufficient to assess the impact, field evaluation may also be required. The NPPF identifies that the requirements for assessment and mitigation of impacts on heritage assets should be proportionate to their significance and the potential impact (Paragraph 189).

- 12.2.3 The NPPF sets out the approach that local authorities should adopt in assessing development proposals within the context of applications for development of both designated and non-designated assets. Great weight should be given to the conservation of designated heritage assets, and harm or loss to significance through alteration or destruction should require clear and convincing justification. Substantial harm to or loss of a Grade II Listed Building or Registered Park & Garden should be exceptional. Substantial harm to or loss of designated heritage assets of the highest significance, notably Scheduled Monuments, Protected Wreck Sites, Registered Battlefields, Grade I and Grade II* Listed Buildings, Grade I and Grade II* Registered Park & Gardens, and World Heritage Sites, should be wholly exceptional (Paragraph 194). Additional guidance is given on the consideration of elements within World Heritage Sites and Conservation Areas (Paragraphs 200 and 201).
- 12.2.4 Where there is substantial harm to or total loss of significance of a designated heritage asset, a number of criteria must be met alongside achieving substantial public benefits (Paragraph 195). Where there is less than substantial harm, the harm should be weighed against the public benefits of the development (Paragraph 196). Balanced judgements should be made when weighing applications that affect non-designated heritage assets (Paragraph 197). The NPPF also makes provision to allow enabling development (Paragraph 202) and allowing development which enhances World Heritage Sites and Conservation Areas (Paragraph 200).
- 12.2.5 Where loss of significance as a result of development is considered justified, the NPPF includes provision to allow for the recording and advancing understanding of the asset before it is lost in a manner proportionate to the importance and impact. The results of these investigations and the archive should be made publicly accessible. The ability to record evidence should not however be a factor in deciding whether loss should be permitted.

12.2.6 Legislation relating to Scheduled Monuments is contained within the *Ancient Monuments and Archaeological Areas Act 1979*, whereas legislation regarding buildings of special architectural or historic interest is contained within the *Planning (Listed Buildings and Conservation Areas) Act 1990*. Section 72 of the 1990 Act provides protection for the character and appearance of Conservation Areas.

Wiltshire Core Strategy

12.2.7 The Wiltshire Core Strategy Development Plan Document was formally adopted in January 2015 to guide development up to 2026. This replaces previously saved policies within the former district council's local plans.

12.2.8 Core Policy 58 sets out policies for the conservation of the historic environment and states that development will need to be sensitive as regards impacts on heritage assets, and that it should protect, conserve and where possible enhance the historic environment. In addition, it states that distinctive elements of Wiltshire's historic environment which contribute to a sense of local character and identity, will be conserved and if possible, enhanced. Heritage assets at risk will be monitored and development proposals that improve their condition will be encouraged.

Assessment Methodology

12.2.9 The impact assessment methodology adopted for archaeology and cultural heritage defines those assets likely to be impacted by the Proposed Development. The assessment is not limited to physical impacts, but also assesses possible impacts to the significance of heritage assets arising from change within their settings, whether visually, or in the form of noise, vibration, dust etc.

12.2.10 More specifically, the impact assessment presents:

- The perceived heritage significance (importance) importance of any assets identified as being affected;
- The anticipated magnitude of effect (change) upon those assets; and
- The significance of any identified impacts upon the heritage significance of those assets.

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- 12.2.11 The methodology that will be employed in the assessment of the significance of the effect of the Proposed Development is based upon that outlined in The Highways Agency Design Manual for Roads and Bridges (DMRB Vol.11, Section 3 Part 2, LA106). This is recognised as the most up-to-date and rigorous methodology available for cultural heritage assessment within the Environmental Impact Assessment process, and the only one adopted by a government agency.
- 12.2.12 In addition, the methodology is in conjunction with recent guidance documents such as the Historic Environment Good Practice in Planning Advice Note 2 ‘Managing Significance in Decision Taking in the Historic Environment’ (Historic England, 2015a) and the Historic Environment Good Practice in Planning Advice Note 3 “The Setting of Heritage Assets” (Historic England, 2nd Ed. 2017).
- 12.2.13 A Study Area of 5km was established in the 2015 desk-based assessment (Thames Valley Archaeological Services, 2015)¹, undertaken as part of the original application, and the subsequent Heritage Impact Assessment (Wessex Archaeology 2018)² undertaken to support a revised application. These assessments have been used to inform the baseline evidence for this chapter, along with an updated dataset received from the Wiltshire Historic Environment Record. Additional assets identified during in responses to the 2019 application are included in this assessment. This approach has been adopted, and is considered proportionate, as the proposed amendments to the 2019 Permission are relatively minor in terms of changes to scale and massing of structures. For example, the stack height will remain the same, while the overall height of the buildings will increase from 36.8m to 40m. The 2018 assessment is included as a Technical Appendix to this Chapter.
- 12.2.14 Aside from the previous desk-based assessments, an archaeological evaluation was undertaken within the site itself in 2000 by AC Archaeology. The site was found to be largely truncated, with nothing of archaeological significance surviving. Previous applications have established that there would be no requirement for archaeological work within the site (TVAS, 2015).

¹ Thames Valley Archaeological Services (2015) ‘Proposed Advanced Thermal Treatment Facility, Stephenson Road, Northacre Trading Estate, Westbury, Wiltshire; Heritage Assessment

² Wessex Archaeology (2018) ‘Northacre Renewable Energy, Westbury Design Amendment, Heritage Impact Assessment, Revised Application’

Assessment of Significance / Assessment Criteria

Significance Criteria

- 12.2.15 Heritage significance is described in the Glossary to the NPPF as “the value of a heritage asset to this and future generations because of its heritage interest”. Significance can derive from its setting, as well as its physical presence. That heritage interest is defined as archaeological, architectural, artistic or historic, and this vocabulary is used to inform the assessments presented in this Chapter.
- 12.2.16 While the importance of some heritage assets is recognised through their designation, other assets may not be formally designated but may be of equivalent value. In NPPF it states that ‘non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to Scheduled Monuments, should be considered subject to the policies for designated heritage assets.
- 12.2.17 Whilst this assessment primarily uses NPPF compliant terminology, consideration is given to the *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment* (English Heritage 2008) which outlines how aesthetic, communal, evidential and historical aspects of a heritage asset may all contribute to its overall value or importance; this language is used where appropriate to better articulate those “interests” defined in the NPPF. The criteria and principles of selection for Scheduled Monuments (DCMS 2013) and the Secretary of State’s criteria and general principles for the inclusion of buildings on the Statutory List (DCMS 2010) also illustrates how factors such as period, rarity, interest, survival, group value and documentation may also contribute to the assessment of the importance of a heritage asset.
- 12.2.18 For the purpose of assessing the significance of effects in EIA terms, heritage significance has also been assigned to one of five classes, with reference to the heritage interests described above and relying on professional judgement as informed by policy and guidance. The hierarchy given in Table 12.1 reflects the NPPF distinction between designated and non-designated heritage assets. The NPPF further distinguishes between designated assets of the highest heritage significance (i.e. Scheduled Monuments, Protected Wreck Sites, Battlefields, Grade I and II* Listed Buildings, Grade I and II* Registered Parks and Gardens, and World Heritage Sites) and other designated heritage assets. This further distinction is

relevant to planning policy but has less influence on the establishment of the significance of an effect in EIA terms, with Listed Buildings of whatever grade subject to the same legal protection in any case.

12.2.19 Effectively, designation of an asset is a recognition of the heritage interests and value inherent within that asset, which are deemed worthy of statutory protection. These assets are therefore typically regarded as more important than non-designated heritage assets, except where provided for in the NPPF e.g. where non-scheduled assets are of demonstrably equivalent importance to a scheduled monument. The sensitivity of an asset to change is not the same as its designation status, but the latter is used in informing the weight given in decision-making. Sensitivity of an asset referred to where appropriate in the individual assessments presented in this Chapter.

12.2.20 The significance of identified heritage assets is defined in Table 12.1. The phrase ‘heritage significance’ is used where appropriate to avoid confusion between significance of a heritage asset in policy terms and the significance of effect.

Table 12.1: Importance / Value of Receptor

Importance/Value	Categories
Very High	World Heritage Sites (including nominated sites) Assets of recognised international importance Assets that contribute to international research objectives
High	Scheduled Monuments Grade I and Grade II* Listed Buildings Grade II Listed Buildings that can be shown to have exceptional qualities in their fabric or historical associations Grade I and Grade II* Registered Parks and Gardens Conservation Areas containing high value assets Registered Battlefields Non-designated assets of national importance Assets that contribute to national research agendas
Medium	Grade II Listed Buildings Grade II Registered Parks and Gardens Conservation Areas Assets that contribute to regional research objectives
Low	Locally listed buildings Assets compromised by poor preservation and/or poor contextual associations Assets with importance to local interest groups Assets that contribute to local research objectives
Negligible	Assets with little or no archaeological, architectural or historical interest
Unknown	The importance of the asset cannot be ascertained from available evidence

12.2.21 In consideration of sensitivity and importance, designation status (and its implicit recognition of the value of heritage interest within an asset deserving of such protection) is a starting point. However, some assets may be more or less sensitive to the anticipated changes from the Proposed Development, whatever their grading. The assignment of an asset to a particular level of sensitivity or importance is based in part on designation and in part on professional judgement on the degree to which an asset is sensitive to the type of change expected. The text assessments presented in 12.4 below take this into account.

12.2.22 Direct effects are qualified by the extent and nature of remains associated with an asset which would be disturbed or lost, and the effect of this loss on the heritage interests (heritage significance) of the asset. In respect of buried archaeological remains with no visible above ground remains, this would normally result in the loss of archaeological interest, but elements of architectural and historic interest can also be affected.

12.2.23 In this context, the effects of change in the setting of a heritage asset may depend on individual aspects of that setting, and assessments must be, by their nature, specific to the individual assets being considered. Recent guidance (Historic England, 2017) advises that the following aspects of setting should be considered in addition to any identified key attributes:

- The physical surroundings of the asset, including its relationship with other assets;
- The way the asset is appreciated; and
- The asset's associations and patterns of use.

12.2.24 It should also be noted that not all change necessarily detracts from the heritage significance of the asset. In the assessment of effects on the setting of heritage assets, the nature of the effect, i.e. positive, negative or neutral, of development is a subjective matter. It is noted here that simple intervisibility between a development and a heritage asset is not in and of itself harmful; there must be a specific effect on the heritage significance of that asset. It is further noted (following the advice at Paragraph 9 of Historic England's guidance on assessing settings (2017) that "setting" is not itself a designation; what is important about setting is the contribution it makes to the heritage significance of an asset. Change is usually taken to constitute a negative effect where it will introduce new and different elements to the

setting of designated features, either to an imagined contemporary setting (i.e., contemporary with the construction of the asset or its primary phase of use) or to their existing setting, in a way that reduces the contribution made by that setting to the heritage significance of a heritage asset. However, this change will only be assessed as generating a significant (adverse) effect where it reduces the contribution made by the setting of an asset to such a degree (magnitude) that the overall significance of the asset is diminished or otherwise harmed. The degree to which this overall significance is affected is what is being assessed and is reflected in the final assessed significance score.

- 12.2.25 Effects on receptors are assigned to one of four classes of magnitude, defined in Table 12.2

Assessment of the Magnitude of Impact

- 12.2.26 The magnitude of impact will be determined as the predicted change to the existing baseline environment during construction and operation of the development. Due to great variety of heritage assets, there is no standard scale of comparison against which the severity of impacts on heritage assets may be judged. Assessment of impacts has therefore considered the proportion of the features affected, their tolerance or sensitivity to an impact and whether key characteristics would be impacted on. The duration and frequency of impacts has also been considered. Direct impacts upon most heritage assets are permanent, as the loss or damage to archaeological and cultural heritage material cannot be repaired, replaced or re-created.

- 12.2.27 Impacts can also arise as a result of changes to the settings of designated heritage assets and non-designated heritage assets, which reduce the contribution of that setting so as to affect the heritage significance of those assets. Annex 2 of the NPPF defines the setting of a heritage asset as *'the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.'*

- 12.2.28 Table 12.2 below presents the potential impacts to cultural heritage remains, expressed using a five-point scale from 'Negligible' to 'Very High'. Impacts may be

beneficial as well as adverse. The assignment of a magnitude of impact in this way is based on professional judgement.

Table 12.2: Criteria for Establishing the Magnitude of Impact

Magnitude of Impact	Description of change
Very High	<p>Total loss of or major alteration to a site, building or other feature (e.g. destruction of archaeological feature, demolition of building).</p> <p>Fundamental change in setting and/or disassociation of asset from its setting, such as by blocking or severance of key views so as to cause a wholesale reduction in the contribution of that setting to the significance of that asset, and hence a significant loss of the asset's overall significance.</p>
High	<p>Major physical damage to or significant alteration to a site, building or other feature.</p> <p>Extensive change (e.g., loss of dominance, intrusion on key view or sightline) to the setting of a Scheduled Monument, Listed Building or other feature registered as nationally important, which may lead to a major reduction in the contribution of that setting to the significance of the heritage asset itself, and hence a loss of overall significance for that asset.</p>
Medium	<p>Damage or alteration to a site, building or other feature.</p> <p>Encroachment on an area considered to have a high archaeological potential.</p> <p>Change in setting (e.g., intrusion on designed sight-lines and vistas) to monuments / buildings and other features, which may lead to a moderate reduction in the contribution of that setting to the significance of the heritage asset, and hence a reduction in the asset's overall significance.</p>
Low	<p>Minor damage or alteration to a site, building or other feature.</p> <p>Encroachment on an area where it is considered that low archaeological potential exists.</p> <p>Minor change in setting (e.g., above historic skylines or in designed vistas) of Monuments, Listed Buildings, sites and other features, which may lead to a small reduction in the contribution the setting makes to the significance of the heritage asset, with an appreciable loss in the assets' overall significance.</p>
Negligible/No change	<p>No physical effect.</p> <p>Slight or no change in setting, with no or very limited change in the contribution that setting makes to the significance of the asset, and no loss of overall significance.</p>

Assessment of the Significance of Effect

12.2.29 Once the value of a cultural heritage asset and its sensitivity to the possible impacts of the proposed development and the magnitude of this impact have been determined it is possible to determine the significance of the effect. The matrix table below (Table 12.3) provides a framework around which significance of effect is assessed. Such assessment follows criteria set out in national guidelines as well as

being informed by professional judgement. Overall effects identified may be beneficial or adverse.

12.2.30 Effects are considered to be significant in EIA terms according to the matrix in Table 12.3 below. For this assessment, an effect of Moderate or Major significance would be considered to be “Significant” in EIA terms, depending on the heritage significance of the asset (above) and the exercise of professional judgement.

12.2.31 In making the final judgement on the significance of an effect, consideration is given not only to the importance of an asset in terms of its designation, but also to the sensitivity of an asset to the type of change or impact anticipated, as well as the magnitude of that change. For example, a highly graded Listed Building may have a high level of importance by virtue of its designation but may be less susceptible to a change in setting (and hence potential reduction in significance) arising from the Proposed Development. This may be due to the asset’s form, or location or its heritage interests are not such that its significance relies on a visual contribution from setting, so that its heritage interests and hence overall significance is not harmed; conversely if an asset’s significance is entirely derived from a visual contribution from its setting, then a higher level of significance may be accorded to the effect on the assets significance from the anticipated impact, whatever the level of grading of the asset. The final score of the significance of any effect is informed by professional judgement and based on consideration of all of these factors and set out in the relevant assessment text as appropriate.

Table 12.3: Criteria for Establishing the Significance of Effect

Value/ Importance	Magnitude of impact				
	Very High	High	Medium	Low	Negligible/No Change
Very High	Major	Major	Moderate	Minor	Not Significant
High	Major	Major	Moderate	Minor	Not Significant
Medium	Moderate	Moderate	Moderate	Minor	Not Significant
Low	Minor	Minor	Minor	Not Significant	Not Significant
Negligible	Minor	Not Significant	Not Significant	Not Significant	Not Significant
Unknown	Unknown	Unknown	Unknown	Unknown	Not Significant

12.2.32 An impact of Major or Moderate would be considered in Significant in EIA terms, whereas Minor would not be considered significant.

12.2.33 In some circumstances, potential adverse effects may be avoided, reduced or offset through the implementation of an appropriate scheme of mitigation.

Scope of Assessment

12.2.34 The assessment is concerned with potential effects on the significance of heritage assets within the study area resulting from the current proposal considered against the 2019 Permission.

12.2.35 The footprint of the main structure will reduce slightly, and the development will remain largely within the permitted site boundary (noting that a conveyor extends from the main structure to the MBT building). Previous assessment (including archaeological investigation undertaken in 2000) reported in the Assessment undertaken by TVAS in 2015 demonstrated that the area within the Development boundary has been truncated by past activity and consequently no archaeological interest was considered likely to remain. Therefore, no direct impacts on cultural heritage (archaeological remains) within the Development boundary are anticipated from the construction of the Proposed Development. As there is no potential for a likely significant direct effect (or any effect) on archaeology within the development boundary this issue is not considered further.

12.2.36 This assessment therefore concentrates on indirect (i.e., primarily visual) effects of the Proposed Development where these might affect the significance of heritage assets through a change in their settings.

Consultation

12.2.37 No formal EIA Scoping Report has been submitted to Wiltshire Council, and no direct consultation was made during the preparation of this chapter. However, a consultation response from the Wiltshire Council archaeological advisor to the previous planning application (18/09473/WCM) stated that the development site had no archaeological interest, due to a lack of activity identified in an evaluation carried out within the site.

12.2.38 However, the Wiltshire Council Conservation Officer identified that the proposals (in the 2018 assessment) would result in some harm to the Grade II Listed Brook Farm, although no objections were raised to the application (which was consented as the 2019 Permission). It was also suggested that the Grade II* Listed Heywood Manor, as well as a number of undesignated heritage assets, which had been omitted from the 2015 and 2018 assessments, should be considered. These have been included for assessment in this Chapter. Historic England made no comment on the application, suggesting that the views of relevant specialist conservation and archaeological advisers to the Planning Authority should be sought.

Limitations

12.2.39 Data utilised in the assessments that form the baseline of this Chapter consist mainly of secondary information derived from a variety of sources, only some of which have been directly examined. The assumption is made that the data is reasonably accurate.

12.2.40 The records held by the Wiltshire Historic Environment Record are not a record of all surviving heritage assets, but the record of the discovery of wide range of archaeological and historical components of the historic environment. The information held within it is not complete and does not preclude the subsequent discovery of further elements of the historic environment that are, at present, unknown.

12.3 Baseline

Data Collection

12.3.1 As the Proposed Development does not represent a significant change from the 2019 Permission, the previous desk-top assessments undertaken by Thames Valley Archaeological Services in 2015 and Wessex Archaeology in 2018 have been utilised to form the baseline for this assessment and the study area used in those previous assessments is considered to remain appropriate. Nevertheless and number of assets have been added (as noted above in 12.2.38 and in 12.3.2 and following below) to ensure a complete assessment of all assets noted as of concern by the consultees in response to the application in 2018 (consented as the 2019 permission) In addition, an updated dataset from the Wiltshire Historic Environment

Record was obtained, in order to identify any significant changes or additions to the historic environment within the Study Area since the last assessment undertaken in 2018.

12.3.2 While some additional records have been added to the WHER, these consist either of archaeological sites or finds, or undesignated buildings in the centre of Westbury. As such, it is not anticipated that these will be affected by the Proposed Development in any way and as such are not discussed further.

12.3.3 An additional designated asset, the Grade II Listed Dilton Marsh War Memorial (NHLE 1451712), was added to the List in January 2018. However, this asset is situated within the urban centre of Dilton Marsh and is some 2.5km from the Site; furthermore, there will be no intervisibility with the Northacre Facility. In addition, the Site is not considered to be situated within the Setting of the asset, which consists of its immediate surroundings and its roadside position on the main route through the settlement. As such, no impacts are anticipated, and this asset will not be considered further by this assessment.

12.3.4 Following comments made by the Wiltshire Council Conservation Officer, the Grade II* Listed Heywood House and a number of undesignated assets have also been considered in this assessment.

Baseline Environment

12.3.5 The following section provides a brief summary of the historic environment resource within the Site and the Study Area, compiled from the data sources mentioned above, that has the potential to be affected by the Northacre Facility. As discussed in the 2015 desk-based assessment, and subsequent 2018 Heritage Impact Assessment, the archaeological resource within the Site and Study Area was scoped out following consultation with the Wiltshire Council archaeological advisor.

12.3.6 Designated assets considered within the 2018 Heritage Impact Assessment are described again here; these were selected using a Zone of Theoretical Visibility based on the maximum height of the proposed main stack. The assessment only considered sensitive designated assets at beyond 2km from the Site where specific long-range visibility and/or prominence in the landscape would be considered important. Figure 12.1 illustrates the following heritage assets on a map.

12.3.7 The Northacre Facility as proposed includes some changes to the proposal consented in the 2019 Permission as noted above. However, no changes to the 2018 Zone of Theoretical Visibility are required for purposes of this assessment as the main stack height (constituting the highest element of the Scheme) will remain the same, albeit there is a minor overall height increase of 3.2m for the main building. Accordingly, the original scope is considered to be still valid, and as such the same heritage assets selected using this methodology are assessed here (with the additions noted above).

12.3.8 Following the 2018 Assessment, this Assessment has identified the following assets within 2km of the Proposed Development as requiring consideration:

- Storridge Farmhouse (Grade II Listed Building, NHLE 1364400);
- Brook Farmhouse (Grade II Listed Building, NHLE 1180471);
- Complex of Listed Buildings at Brook Hall:
- Early Wing of the Hall (Grade I Listed Building, NHLE 1285019);
- The Hall (Grade II Listed Building, NHLE 1021502); and
- The Barn (Grade II Listed Building, NHLE 1181461).
- Medieval Settlement and associated field systems (Scheduled Monument, NHLE 1019386); and
- Moated Site 400m east of Penleigh House (Scheduled Monument, NHLE 1013083).

12.3.9 In addition, a number of further designated assets that fall within a 2-5km distance from the Site are considered, where these occupy an elevated location or where potential intervisibility with the Northacre Facility has been identified. These are:

- Park Court in Upton Scudamore (Grade II* Listed Building, NHLE 1021515);
- Bratton Camp Iron Age Hillfort, the Westbury White Horse, barrows and trackways on Bratton Down (Scheduled Monument, NHLE 1013399);
- The Devil's Bed and Bolster long barrow (Scheduled Monument, NHLE 1017897);
- Two Cross-ridge dykes at Wellhead Farm (Scheduled Monument, NHLE 1020372); and
- Bowl barrow north of White Horse Farm (Scheduled Monument NHLE 1017937).

12.3.10 In addition to the above, the following assets have also been considered in this Chapter, as they were specifically mentioned in consultation responses following the submission of the application in 2018 which was consented in the 2019 Permission:

- Heywood House (Grade II * Listed Building, NHLE 1284971);
- Brook Cottage, formally Butler's Cottage (Undesignated);
- Brook Cottages, formally Brook Mill Farm (Undesignated, WHER MWI70253);
- The Railway Inn (Undesignated, WHER MWI59029);
- Former brewery (Undesignated); and
- Westbury Station (Undesignated).

Future Baseline

12.3.11 The 2017 Regulations require: *“A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.”*

12.3.12 Archaeological sites are effectively a finite and non-renewable resource. It has been established that there is no archaeological interest within the Site itself, and this will not change, with or without the proposed development. The proposed Northacre Facility will not change or affect this situation.

12.3.13 Cultural heritage assets within the study area constitute a finite and effectively non-renewable resource. The baseline assets identified for this assessment are not under direct threat as a result of any natural process (and no demolitions or other artificial changes to the physical baseline are known) and no extensions to area designations are currently known (or anticipated). The proposed Northacre Facility will not change this situation.

12.4 Assessment of Effects

Incorporated Mitigation

- 12.4.1 Key mitigation measures that have been incorporated into the design of the Northacre Facility are discussed in Chapter 4 (Scheme Description).
- 12.4.2 Mitigation incorporated into the design of the proposed Northacre Facility including the screening bund along part of the western boundary of the Site, will offset limited negative impacts (e.g. visual, noise etc) upon designated assets to the south west during the Construction phase.
- 12.4.3 No mitigation in respect of heritage concerns is proposed or considered necessary in respect of the Proposed Development (as was the case with the 2019 Permission).

Construction Phase

- 12.4.4 No heritage assets have been identified within the Site, and previous investigations have not identified any archaeological activity, and established that the site has suffered truncation in the past. Although the physical footprint of the main building is reduced and related structures may change, they are contained within the same site boundary are previously assessed. Consequently, no significant direct impact upon archaeological remains is anticipated as a result of the construction of the Northacre Facility (and this is the same as predicted for the 2019 Permission).
- 12.4.5 No significant indirect effects upon nearby heritage assets resulting from construction of the Northacre Facility have been identified (as was the case with the 2019 Permission). Changes in the noise environment and intrusion in the form of flashing lights, erection of cranes etc, during construction are temporary and short term and unlikely to cause any significant effect on the heritage significance of any heritage asset. Full assessment of indirect effects is therefore considered in relation to the final operational form of the development (below).

Operational Phase

- 12.4.6 Indirect impacts here are considered to derive from changes in the setting of an asset (visual intrusion and loss of tranquillity etc.) that cause a reduction in the contribution setting makes to the significance (or the ability to appreciate and understand that significance) of an asset of such a magnitude that the asset itself loses significance ('harm' in NPPF terms). Whilst intervisibility with the development is not in and of itself necessarily harmful to the setting of an asset (and consequently to the significance of that asset), visibility is not the sole determinant of "setting". Nevertheless, it is considered to be important here in determining whether the development has any potential to affect assets that lie at distance from it.
- 12.4.7 The 2018 Heritage Impact Assessment concluded that there would be no impact on identified heritage assets outside of a 2km radius. As such, those assets have been scoped out and are no longer considered in this Chapter as no additional effect from the proposed revisions would be predicted to occur.
- 12.4.8 As the revisions proposed are minor in nature as far as the potential for effects on the significance of heritage assets to occur through changes in their settings, only the heritage assets within 2km identified in the 2018 Heritage Impact Assessment have been assessed.

Assets within 2km

Storridge Farmhouse (Grade II Listed Building, NHLE 1364400).

- 12.4.9 The significance of this asset largely derives from its setting within a largely open and agricultural landscape, which to the west and south is largely uncompromised. However, this has been thoroughly compromised to the north and east by modern elements including barns, industrial units and a carpark.
- 12.4.10 Views towards the Site are to the south east and have already been compromised by modern development. The building structure would not be visible over the intervening housing development, with the stack considered to be seen (if visible at distance) as part of the existing industrial complex already present in views from the asset. The proposed revisions will not change this situation, as the stack height

remains the same, and the minor increase in main building and odour control stack height are unlikely to be noticeable. Even if glimpsed, this would be in the context of existing industrial development. The setting of the asset is not considered to be changed, with no potential to affect the heritage significance of the asset. No significant effect is assessed to occur, and no harm is found

- 12.4.11 This asset is considered to be of **Medium** value. As the contribution made by the setting to the heritage significance of the asset and the ability to appreciate and understand the heritage interests which comprise that significance are not diminished, an impact of **Negligible** Magnitude is judged to occur. Accordingly, the Significance of Effect is anticipated to be **Not Significant** in terms of the EIA Regulations (and does not cause any harm for purposes of the NPPF). This is the same conclusion reached in respect of the 2019 Permission.

Brook Farm (Grade II Listed Building, NHLE 1180471)

- 12.4.12 The significance of this asset partly derives from its setting within an agricultural landscape, in particular to the west, north west and south-west of the farm. The asset has **Medium** importance. Land to the north east and south east has been allocated as 'Principal Employment Area' by Wiltshire Council, although no development has taken place in this area to date. In addition, there is a close physical and functional relationship with the adjacent Scheduled settlement and field system (see below). Views from the farm have been compromised by modern development, particularly to the north east, where they are dominated by large industrial units, and to the south east.

- 12.4.13 It is considered that the presence of the Northacre Facility will cause a change in the current setting. Although the Development would be seen as part of the larger industrial estate in views to the north-east, intensifies this development and brings it closer to the asset. This serves to erode the part played by the agricultural surroundings which comprises the setting of this asset, and which in part allows its significance to be appreciated. The degree of change in the setting is low (one of degree, as opposed to a change in character, and this has an effect of **low** magnitude on the contribution made to the heritage significance of this asset. The overall effect is considered to an effect of "**minor**" significance (which is not significant for EIA purposes. This does constitute "harm", but this is considered to

fall into the “less than substantial” category and in degree at the lowest end of the scale. This is the same conclusion reached in respect of the 2019 Permission.

Brook Hall Complex of Listed Buildings at Brook Hall, including: Early Wing of the Hall (Grade I Listed Building, NHLE 1285019, The Hall (Grade II Listed Building, NHLE 1021502); and The Barn (Grade II Listed Building, NHLE 1181461

- 12.4.14 The setting of this farm complex within an agricultural landscape makes a positive contribution to its significance, which in part derives from its architectural and historic interests. Much of the setting relates to the interrelationship of the various structures and spaces within the complex, as well as their relationship with the surrounding agricultural land. The development will be visible in views to the south (above and between intervening development and vegetation), but these are already compromised by the existing industrial complex, with a recent solar farm development situated almost immediately to the north east of the complex.
- 12.4.15 Although the Northacre Facility will constitute a perceptible change in the setting of this complex, this element of its setting does not make a strong contribution to the significance of the group as a whole. The degree of change represented by the addition of the facility (in particular, the stack) is considered to be relatively minor and does not affect the character of the existing setting in that direction (i.e., towards the existing industrial complex). Views towards the Northacre Facility are not considered to contribute greatly to the significance of the asset, and it does not rely on any visual contribution from the development site to support its heritage significance or to enable its heritage interests to be appreciated.
- 12.4.16 The Brook Hall complex, including a Grade I and two Grade II Listed buildings, is considered to be of **High** value. The limited potential visibility of the facility within the context of the existing industrial complex, and where visible through intervening screening, will not materially change the setting of this group (even if perceptible). As the setting is not changed by the revisions, there is no potential for a reduction in the contribution made by that setting to the heritage significance of the complex (nor the ability to appreciate or understand that significance). As such, a **Negligible** Magnitude of Impact is anticipated, with the resulting Significance of Effect considered to be **Not Significant** in terms of the EIA Regulations, and no “harm” is identified as a result of the proposed revisions. This is the same conclusion reached with regard to the 2019 Permission.

Medieval Settlement and associated field systems (Scheduled Monument, NHLE 1019386);

- 12.4.17 This scheduled monument consist of the below ground remains of a medieval settlement with field system, located c. 350m from the proposed facility's boundary. It is considered to have **High** value. The physical surroundings of this asset are integral to its significance (which derives largely from its archaeological significance, related to the evidence it may hold for previous farming activities and farming life in the Medieval period) and this includes the layout of the fields and relationship to the manor site to the south. However, in broader terms the agricultural landscape within which the monument is situated does not retain substantial above ground related elements, and views to the north and east have been compromised by industrial development, and by modern housing and a railway siding to the south. Views to the west and northwest are thought to make a positive contribution to significance, as these allow the former agricultural setting (and function) if the remains to be better appreciated.
- 12.4.18 The Northacre Facility will be clearly noticeable, albeit as an addition to the neighbouring industrial estate which already includes substantial modern structures such as the Westbury Dairy. However, views in this direction would be experienced within the context of the existing industrial complex (with no further change or reduction in the contribution made by that setting judged to occur). It is noted that the design incorporates soft and hard landscape proposals which would seek to retain existing boundaries but thicken planting to the west of the facility to soften its impact in views from the west and south-west.
- 12.4.19 The presence of the facility to the east will not affect the archaeological interest in the Monument, as no archaeological survival or interest is identified within the development footprint, with no potential for remains related to the Monument to be affected. The development of the facility will not diminish the contribution of the current setting of the monument (an asset of High value) to its heritage significance and taking into account the existing industrial development within which the facility will be located, the ability to appreciate or understand that heritage significance will not be reduced.

12.4.20 As such, a **Negligible** Magnitude of Impact is anticipated, with the resultant Significance of Effect considered to be **Not Significant** in terms of the EIA Regulations. No “harm” is judged to occur. This is the same conclusion reached in respect of the 2019 Permission.

Moated Site 400m east of Penleigh House (Scheduled Monument, NHLE 1013083)

12.4.21 The monument is of **High** value and comprises the remains of moated site, located approximately 1.5km to the south of the Development boundary. Its significance lies in the archaeological evidence it may hold for past (medieval) land utilisation and organisation (archaeological interest). It lies to the south of the railway line and the development is not considered to lie within its setting. The current setting of this asset makes only a limited contribution to its heritage significance, with wider views largely making a negative contribution due to modern development. In addition, moated sites were designed to be isolated from their surrounding landscape, and as such, views from the monument will make a limited contribution to its significance.

12.4.22 Even where visible in glimpsed views over intervening vegetation and railway infrastructure, the facility will not change the setting of this monument, nor the contribution made by that setting to the heritage significance of that asset, nor the ability to appreciate that significance. Consequently, the Magnitude of Impact is considered to be **Negligible**. The Significance of Effect is predicted to be **Not Significant** in terms of the EIA Regulation, no “harm” in terms of the NPPF is identified. This is the same conclusion reached with regard to the 2019 Permission.

Assets between 2-5km

12.4.23 This section considers sensitive designated assets (Grade I and Grade II* Listed Buildings and Registered Parks and Gardens) and Scheduled Monuments where long range visibility may be important to their significance.

Bratton Camp Iron Age hillfort, the Westbury White Horse, barrows and trackways on Bratton Down (Scheduled Monument, NHLE 1017897).

12.4.24 This asset is of **High** value and has significance from its archaeological and historic interests. This asset clearly has an extensive setting with commanding views.

However, these views include significant modern development, including the town of Westbury, as well as smaller settlements. This assessment considers that the Northacre Facility, whilst potentially perceptible (see Figures 5.6a – d which support Chapter 5.0 of this ES), in long views from the monument (which is of high sensitivity) and at approximately 4.5km and more, will be seen essentially as a part of the industrial fringe of Westbury. The magnitude of the change in the setting of the monument is considered to be negligible and the Development will not materially change the setting of the asset, nor the contribution that its setting makes to the asset's significance. There will be no loss of significance for the asset and no change in the way that significance is appreciated. The impact is **negligible**, and the effect is assessed as **Not significant**, and no harm is considered to occur. This conclusion is the same as that reached in respect of the 2019 Permission.

Devils Bed and Bolster Long Barrow (Scheduled Monument, NHLE 1017897).

- 12.4.25 This asset's heritage significance lies principally in relation to archaeological interest. The setting of this asset (of **high** sensitivity) is considered to be visually limited by its location on a slight reverse slope and within plantation and lies over 4.5km west of the Northacre Facility, with which there may be no or negligible real world intervisibility. No harm to the significance of the asset is predicted in respect of the consented scheme. This assessment finds that there is no material change in the setting of this asset (an effect of **negligible** magnitude), nor is there a reduction in the contribution the setting makes to the significance of the asset, or in the way that significance is able to be appreciated. A **Not significant** effect is identified and no harm to the heritage significance of these assets is found to occur. This is the same conclusion reached in respect of the 2019 Permission.

Two Cross-ridge dykes at Wellhead Farm (Scheduled Monument, NHLE 1020372).

- 12.4.26 This monument is of **high** sensitivity and covers two sections of dyke (ditches and banks, presumed to be prehistoric) on the edge of the higher ground approximately 3km south of the development. Its heritage significance derives primarily from its archaeological interest. The monument is screened to its north by woodland, and by the intervening mass of Westbury, and is unlikely to be intervisible with the Northacre Facility (which is not considered to lie within its setting). The Development will not materially change the setting of the monument (even if visible as a distant object above or between intervening screening), nor the contribution that the setting

makes to the significance of the asset (which is considered to reside mainly in its archaeological interest), nor diminish the ability to appreciate that significance. The magnitude of the predicted change is **negligible**, and the predicted effect is assessed as “**not significant**”. No loss of significance results from the proposed amendments and no harm is identified. This is the same conclusion reached in respect of the 2019 Permission.

Park Court in Upton Scudamore (Grade II Listed Building, NHLE 1021515)*

- 12.4.27 This building (a 15th century Hall, extended in the 17th century and subsequently altered and rebuilt, finally being extensively renovated in the late 20th century) lies within its own grounds at the centre of Upton Scudamore, and is considered to be of **high** sensitivity. Its heritage significance lies in its architectural as well as historic and archaeological interest. The Northacre Facility will lie over 4.6km to the north of the house, but (notwithstanding lying with the ZTV), intervening screening in its immediate vicinity (as well as between the village and Westbury) means that the Development is not likely to have any real-world intervisibility with the house. The Development therefore is not considered to lie within the house’s setting, and consequently there is no potential for a loss of significance of this asset nor a reduction in the ability to appreciate that significance (an effect of **negligible** magnitude). An effect considered **Not significant** is identified, and no harm is found to occur. This is the same conclusion reached in respect of the 2019 Permission.

Bowl Barrow (Scheduled Monument, NHLE 1017937).

- 12.4.28 This monument (of **high** sensitivity) consists of the slight remains of the mound of a bowl barrow, situated in open ground adjacent to a minor road leading north from White Horse Farm (south of Bratton Camp), over 4.5km from the development. The barrow has very limited presence in the landscape and its significance lies primarily in its archaeological interest. Despite its limited above ground presence, is considered to have extensive setting, related largely its grouping with the Salisbury Plain archaeological landscape to the south and east. Its links with this landscape is not changed, not is the ability to appreciate its relationship to the White Horse and Bratton camp monument to its north as result of the construction of the Northacre Facility. The development may just be visible in views to the west from the barrow site, but only as a distant element and in the context of the industrial estate on the other side of Westbury. The addition of the facility to this industrial fringe in long

distance views across Westbury in no way diminishes the contribution of the setting to the significance of the asset, nor the way in which the asset is experience and its significance appreciated. The impact is of **negligible** magnitude, the effect of which is **Not significant**, and no loss of significance or harm is considered to result as a result of the proposed Development. This is the same conclusion reached in respect of the 2019 Permission.

Assets identified for assessment based on responses to the 2018 Application (consented as the 2019 Permission).

12.4.29 The following assets were mentioned in the Conservation Officer's comments on the 2018 application. These assets had not been assessed in the 2018b assessment, due to distance or on the basis that they were considered unlikely to receive a significant effect upon their heritage significance as a result of the proposals at that time. Although the 2018 application was consented (the 2019 Permission) and any effect presumably judged acceptable, they are assessed here against the current Northacre Facility proposal for completeness.

*Heywood House (Grade II * Listed Building, NHLE 1284971).*

12.4.30 This asset is considered to be of High heritage significance and lies within its grounds and former parkland (also designated) approximately 2.5km to the north-east of the Northacre Facility. It is a mid-Nineteenth Century Country House built on the site of an earlier house. It lies on higher ground to the north-east of Westbury, with a south facing aspect and open views in the direction of Salisbury. Its main approaches are from the south, and from the north west. Ancillary and related buildings survive to its east and south east, with traces of former parkland on all sides. Its significance largely derives from its architectural as well as historic interest. Its setting is considered to be defined by its relation to the ancillary structures, as well as to the surviving elements of the parkland, in particular the approach routes and the open view to the south (in which the Development will not be visible).

12.4.31 The development lies at distance to the south-west and intervisibility with the House is unlikely due to the presence of significant vegetation between the house's western side and bordering the Westbury Road to its west. Long views towards the west do not appear to be part of the House's intentional location, nor reflected in the

design of the parkland. If the Development is visible at all from the periphery of the House, it will be limited to glimpsed views of the stacks, amongst other industrial developments in views to the west across the West Wiltshire Trading estate and other modern structures in the landscape such as the solar panels east of the railway line and south of Shallow Wagon lane. The Development will not feature in any intentional view of the House, or along any principal access routes towards its, nor will it intrude in any long views in which the form of the house is visible.

- 12.4.32 The setting as described above is not changed, nor is its contribution to the significance of the house diminished (an effect of **negligible** magnitude upon an asset of **High** value), nor is the ability to appreciate that significance or understand the house as a former Victorian country house within an estate in any way reduced. As the architectural and historic interest in the House are not impacted, the potential effect of the Northacre Facility is therefore assessed as “**not significant**”, and no harm is found to occur.

Brook Cottages (former Brook Mill farm, Undesignated, WHER MWI70253)

- 12.4.33 These assets are situated some 360m to the south west of the Site and are of 19th century origin: it is possible that there will be some intervisibility with the facility, but this will be in the context of the existing industrial estate to the north east.
- 12.4.34 The significance of the asset will largely derive from its architectural value as the surviving aspect of the now largely removed Brook Mill Farm. Its setting would have originally been related to the larger farm complex and surrounding agricultural land. This original setting within the wider agricultural landscape has been compromised by modern development, including industrial units to the immediate south and east. Its immediate setting is now focussed on its garden, with the wider landscape making a lesser contribution. The presence of the development as an addition to the already industrial aspect to the north-east is considered to represent a change in setting (in degree rather than kind), but this does not alter the character of that setting. The contribution made by the setting to the significance of the asset (which derive primarily from its historic association with the former farm as well as some intrinsic architectural interest) is not reduced (an impact of **negligible** magnitude). The asset is accorded a **low** level of importance, and consequently no significant effect upon its heritage significance is assessed to occur (this is **Not Significant**, and no harm is found).

Brook Cottage (former Butler's Cottage)

- 12.4.35 This asset is also of 19th century origin, however it is not recorded on the Wiltshire Historic Environment Record (it is accorded **low** importance/sensitivity for purposes of this assessment). While this is situated within the wider agricultural landscape, with views towards the Northacre Facility likely, the significance of the asset will again derive from its architectural interest, with its primary setting being its immediate garden surroundings. The facility will be an addition to the industrial estate which forms a part of the wider setting. This is a change in degree, not kind and the contribution made by setting to the heritage significance of the asset is not substantially altered, nor will the ability to appreciate the architectural and historic interest in the buildings be diminished; it will continue to be understood as a survival of a former agricultural settlement, with a setting in which industrial elements are already prominent (in the direction of the Industrial estate). Taking this into account, an effect of **negligible** magnitude is assessed to occur to an asset of low value This is considered to be **Not Significant** and no harm to the heritage significance of the asset is judged to occur.

The Railway Inn (Undesignated, WHER MWI59029) and Former Brewery (Undesignated).

- 12.4.36 These assets lie within Westbury adjacent to each other and to the B3097 and within a setting that is partly urban and street side in nature. Their setting includes their relationship to each other (both physically and in respect of their former complimentary functions and to the wider community (especially travellers and railway workers) they served (and continue to serve in regard to the Inn). Their significance derives from their architectural and historic interest. They are undesignated and considered of **Low** importance/sensitivity for purposes of this assessment. Whether or not the buildings are intervisible with the Northacre Facility (and such visibility, if any, is likely to be glimpsed views of the stacks above intervening buildings and vegetation beyond the Westbury Lake and station and embanked railway line), this urban and street side setting is not essentially changed. The contribution made by this setting is not diminished. The heritage significance of the assets is not considered to be in anyway reduced (an effect of **negligible** magnitude), and the potential effect is assessed as “**not significant**”, and no harm is found to occur in respect of both buildings.

Westbury Station (Undesignated).

12.4.37 This station was opened in 1848 and takes the form of two “islands platforms between the lines on this elevated section of railway. It is accessed from the south-east at street level from Station Approach) with a subway access below the lines to the platforms. The main structures are single storey, in brick with a wooden and iron canopy along the part of the platforms (adjacent to the buildings). Its setting is related to the town it serves at large and the railway infrastructure in particular. The architectural detail in the structures is best appreciated in close proximity (effectively on the platforms). Industrial and modern buildings lie on both sides, but with the concentration of mass in the West Wiltshire Trading Estate to the north-west. The development will be seen as and form an addition to this part of this urban/industrial setting. The ability to appreciate the architectural detail and arrangement and function of the station is not in any way changed by the presence of the Northacre Facility, visible or otherwise. The contribution made by the setting is effectively unchanged, as the station will be still understood in relation to serving the town both for passengers and in respect to its industrial heritage. No effect of any magnitude (i.e., a **negligible** impact) is assessed to occur upon an asset of **Low** importance and sensitivity, and no loss of heritage significance will result (the effect is **Not Significant**) and no harm is found).

12.5 Cumulative Effects

12.5.1 Several potential cumulative developments have been identified as part of the EIA process. These consist of an addition to the Northacre Resource Recovery Centre (a waste management facility and a welfare, workshop and office building situated immediately adjacent to the Northacre Facility), the proposed re-development of a feed mill along with associated buildings, silo, bulk bins and HGV parking at Brook Mill (situated circa 1km to the north west of the Proposed Development), and the proposed development of 87 dwellings, car parking and associated works at Land of Station Road, some 300m to the north east of the Proposed Development.

12.5.2 None of these developments are considered to have the potential to generate cumulative impacts in combination with the Northacre Facility on archaeological assets (direct impacts), as they sit physically separated, on different sites.

12.5.3 Similarly, the Northacre Facility is not considered to have the potential to generate any likely significant cumulative impact upon the heritage significance of any of the assets considered in this Chapter. This is due to the lack of meaningful intervisibility in most cases, as well as the fact that the developments under consideration are all part of the same industrial / urban zone in the same part of northern Westbury, and some have overlapping areas of influence and the same character. Effectively they all are components which have the same character within the same area, when considered in relation to the settings of any individual assets under consideration here. No significant effects have been identified with respect to the heritage significance of any heritage asset and no harm is judged to occur as a result of the Northacre Facility in combination with or as an addition to developments identified above.

12.6 Mitigation

Construction Mitigation

12.6.1 There will be no direct impact upon heritage assets (archaeological remains), as none have been identified within the Site, and as such no mitigation is proposed for this aspect of the Construction phase.

12.6.2 While indirect impacts can be caused as a result of noise, air and light pollution from construction activities, these are considered temporary and short term and no mitigation is considered necessary.

12.6.3 As such, no additional mitigation, enhancement or compensation is deemed necessary during the Construction phase as a result of the proposed revisions.

Operational Mitigation

12.6.4 No significant impacts have been identified upon the heritage significance of any cultural heritage assets as a result of the Northacre Facility, and no specific mitigation beyond that embodied in the design is considered necessary.

12.7 Residual Effects and Conclusions

Construction Phase

- 12.7.1 No direct impacts upon cultural heritage assets are anticipated during the Construction Phase and, accordingly, no mitigation is proposed in respect of the proposed revisions. No significant indirect effects are predicted to occur, and no mitigation considered necessary. As such, residual effects are considered to remain **Not Significant**.

Operational Phase

- 12.7.2 No direct impacts have been identified upon cultural heritage assets during the Operational Phase, as a result of the operation of the proposed facility.
- 12.7.3 No significant indirect effects are predicted on the heritage significance of any heritage assets as a result of the operation of the facility. No mitigation is therefore required (beyond that embedded in the design), and the residual effect remains “**Not Significant**” (with no harm found).
- 12.7.4 Accordingly, it is concluded that the facility will not result in any significant effects upon Cultural Heritage in EIA terms, and no “harm” to cultural heritage significance is considered to occur.

Future Baseline

- 12.7.5 The future baseline of the development area is not considered to be subject to natural change with respect to archaeological or other cultural heritage assets. This situation will remain the same with or without the proposed facility.

CHAPTER 13.0 SUMMARY OF EFFECTS

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13.0 SUMMARY OF EFFECTS

13.1 Introduction

- 13.1.1 This ES has been prepared on behalf of Northacre Renewable Energy Limited (hereafter referred to NREL or the 'Applicant' in support of a detailed planning application for an amended energy from waste facility (the 'Northacre facility' or the 'Proposed Development') on the Northacre Trading Estate, Westbury, (the 'Application Site' or 'Site').
- 13.1.2 The Northacre Facility, as now proposed comprises a conventional, single line, moving grate combustion plant for the recovery of energy from residual waste and enabling recovery of metals and the residues from the process by offsite recycling. The residual waste input would be non-hazardous waste primarily from commercial and industrial sources and may include municipal waste.
- 13.1.3 The Proposed Development would generate electricity by way of a steam turbine which would be driven through the controlled combustion of residual waste. As described above, the gross power generating capacity of the Northacre Facility would be 28.6 Megawatts (MW). After subtracting the power used to run the facility itself, it would have the ability to export approximately 25.6 MW of electricity to the local electricity grid, a significant proportion of which would be classed as renewable. This is sufficient to meet the average annual domestic electricity needs of approximately 48,000 homes. It would also be capable of exporting heat, in the form of steam or hot water, to local heat users.
- 13.1.4 In light of the fact that a previous EIA for an earlier iteration of the facility was Scoped by WC, the Applicant has elected in this instance not to undertake formal EIA Scoping. The likely significant environmental effects of the Proposed Development are described fully within the Main Report (Volume 1), Illustrative Figures (Volume 2) and Technical Appendices (Volume 3) provide supporting data for the assessments.
- 13.1.5 The likely significant effects of the Proposed Development, as assessed and reported in ES Chapters 5.0 to 12.0, are summarised below.

13.2 Cumulative Impacts

13.2.1 Chapter 2.0 of the ES outlines the approach to the cumulative assessment and the other schemes to be considered. Each of the technical assessments consider the cumulative effects of the Northacre Facility along with the other identified schemes. All technical assessments found there to be no significant cumulative effects together with the Northacre Facility.

13.3 Landscape and Visual Effects

13.3.1 Chapter 5.0 of the ES, together with the supporting figures and appendices, sets out an assessment of the likely significant landscape and visual effects of the Northacre Facility.

13.3.2 The Proposed Development would be introduced into a vacant plot at the Northacre Trading Estate, which itself forms part of a wider belt of industrial estates at the edge of Westbury. The influence of industrial development upon the surrounding area is well established, and indeed the Site benefits from planning consent for a similar scale facility.

13.3.3 The Proposed Development benefits from a design that breaks up the mass of the building with contrasting, but complimentary colours. The arrangement of the different parts of the main building, and the colour scheme chosen for the building help assimilate the building into the wider landscape.

13.3.4 The Proposed Development would not result in significant landscape effects. Locally, character is already heavily influenced by industry and the influence would increase only incrementally should the Proposed Development be introduced. Agricultural land west of the Site is allocated for industrial development in local planning policy documents, and should this land be developed, then the Proposed Development would be surrounded by built development, further reducing its potential for significant landscape effects.

13.3.5 In comparison to the consented 2019 Permission the overall massing and height of the Proposed Development would appear reduced in some views (such as Viewpoint 1) and comparable in others. The increase in maximum height would barely be

perceptible from most viewpoints due to the revised position of the boiler house and the reduced height/location of other elements.

13.3.6 The most significant improvement would be the reduction in the diameter of the proposed stack from 4m to 2.55m. This reduces the prominence of the stack in a number of views and reduces the visual impact of the development compared to the consented scheme.

13.3.1 Fifteen viewpoints were included in the LVIA. There is only one location (Viewpoint 1: Footpath west of Site) that would experience a significant visual effect. At the other fourteen viewpoints, effects would not be significant due to the Proposed Development occupying a modest proportion of the views available and being seen in the context of other industrial development on the trading estates. This is consistent with the findings of the LVIA for the 2019 Permission.

13.4 Ecological and Nature Conservation

13.4.1 Chapter 6.0 of the ES sets out an assessment of the likely significant effects of the Northacre Facility upon ecology and nature conservation.

13.4.2 The impact assessment has been supported by ecological survey data of sufficient scope to assess all likely significant effects on habitats and species. Dispersion and deposition modelling undertaken as part of the Air Quality assessment allowed consideration of effects on sensitive ecological receptors in a wider context.

13.4.3 The Northacre Facility would not have a direct effect on habitats of ecological value and would not be significant in ecological terms.

13.4.4 No significant effects are predicted on statutory or locally designated sites, including air quality impacts of emissions from the Northacre Facility, or effects of noise and human disturbance. Mitigation measures including those inherent to the design of the facility would avoid other significant indirect effects occurring during the construction and operational phases.

13.4.5 Given the absence of any residual adverse impacts combined with the integration of a range of linked new semi-natural habitats that diversify habitat niches for a range of local wildlife, the residual ecological effect of the Proposed Development is

concluded to be positive at the local scale, as the scheme contributes a net gain for local biodiversity.

13.5 Noise and Vibration

13.5.1 Chapter 7.0 of the ES, together with the supporting figures and appendices, sets out an assessment of the likely significant effects of the Northacre Facility upon noise and vibration.

13.5.2 Due to the restriction of movement and operation of business during the Covid 19 period, the baseline sound survey study work from March 2018 is considered to be appropriate to reference as this was carried out in the vicinity of the Site to determine existing representative background and residual sound levels for a similar facility and the latest survey was undertaken 2 years ago.

13.5.3 In accordance with appropriate standards, best practical means would be employed to control noise generation during the construction period. Measures may include restriction on operating hours, sensible routing of equipment to site and careful choice of piling rigs to minimise noise. Such measures would be defined within the Construction Environmental Management Plan (CEMP).

13.5.4 In relation to the operational phase a number of potential mitigation measures have been proposed to ensure that the resultant operational noise levels are within appropriate guidance and standards. The measures would be based on the employment of Best Available Techniques (BAT) to mitigate any potential peak noise sources.

13.5.5 The assessment shows that there would be no significant impacts during the construction or operation of the Proposed Development following the implementation of appropriate mitigation.

13.6 Air Quality and Human Health

13.6.1 Chapter 8.0 of the ES, together with the supporting Figures and Appendices, sets out an assessment of the likely significant effects of the Proposed Development upon air quality (including dust and human health) and odour.

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- 13.6.2 The assessment found the overall process emissions associated with the operation of the Proposed Development is predicted to have a 'negligible' and 'not significant' effect on human health. The impact on ecological receptors including Picket and Clanger Wood SSSI was considered. The predicted process contribution can be regarded as insignificant in ecological and EIA terms.
- 13.6.3 The Northacre Facility also has the potential to cause impacts associated with the release of dust, odour and bioaerosols. A qualitative analysis has been undertaken, which takes into account the control measures in place and the distance to the nearest receptors. This concluded that the operational phase fugitive emissions of dust, odour or bioaerosols associated with the operation of the Proposed Development are predicted to have a negligible and not significant effect.
- 13.6.4 The increase in operational vehicles associated with the Northacre Facility is minimal, when compared to the scheme consented under the 2019 Permission, such that they are not expected to have a measurable impact on local air quality, including in the AQMA, and the effect is considered to be 'negligible'.
- 13.6.5 Generally, the impact of process emissions is less than the scheme consented under the 2019 Permission due to the reduction in the ELVs associated with the implementation of the Waste Incineration Best Available Techniques Reference documents or "BREF". The 2018 ES concluded that the impact of the consented development would be not significant – i.e. the same as this assessment for the revised scheme.

13.7 Surface Waters and Flood Risk

- 13.7.1 Chapter 9.0 of the ES, together with the supporting figures and appendices, considers the impact of the Northacre Facility in terms of flood risk (various sources of flooding), foul and surface water drainage during the construction and operational phases.
- 13.7.2 Assuming simple good working practises are adopted, throughout the construction phase, the impacts attributable to the Northacre Facility, in terms of flood risk, water quality, foul and surface water drainage and water supply are all considered to be negligible.

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- 13.7.3 The Northacre Facility would adopt the same design principles to those presented in support of the 2019 Permission. These would include measures to discharge surface water runoff and foul effluent into the sewer in Stephenson Road. A comprehensive on-site stormwater attenuation system has been designed to reduce flows off the Site via a control chamber thus providing overall betterment to the unrestricted runoff originally intended for the site when the Northacre Trading Estate was designed.
- 13.7.4 The Northacre Facility is in Flood Zone 1 which is the lowest flood risk designation in the UK. All forms of flood risk at the Site have been assessed and resulting risk considered to be low to very low.
- 13.7.5 In light of the above, it has been concluded that the potential impact attributable to the facility, throughout the operational phase, would be negligible and the same as that found in assessment provided with application that led to the 2019 Permission.

13.8 Traffic and Transportation

- 13.8.1 Chapter 10.0 has been prepared to consider the highways and transport related environmental impact of the construction and operation of the Northacre Facility with a baseline of the 2019 Permission.
- 13.8.2 Changes in traffic flows that will result from the Proposed Development during the construction and operational phases have been assessed. The assessment has found that the changes in overall traffic flows are well within the 30% threshold set out Rule 1 of the IEMA guidelines. These findings apply across all assessed scenarios.
- 13.8.3 The change in construction traffic relative to estimates derived for the 2019 Permission are generally well below 1%, far below the IEMA threshold of 30% for material changes in environmental terms. The additional traffic on all links during construction has been assessed individually and found to be not significant across the highway network.
- 13.8.4 The additional HGV movements range from 4 movements a day on the A350 through Westbury to 12 movements a day on the B3097. Spread over a 15-hour working day (10 hours on Saturday), there will be no perceptible changes on roads that already

carry a significant level of HGV traffic. Therefore, where changes occur, they are classified as negligible.

13.8.5 It is concluded that there are no traffic related environmental residual effects anticipated to arise from this development relative to the 2019 Permission.

13.9 Socio-Economics

13.9.1 Chapter 11.0 of the ES, together with the supporting figures and appendices, considers the likely effects of the Northacre Facility with regards to socio-economic matters.

13.9.2 The Northacre Facility would have a beneficial effect on construction employment within the Study Area. In addition, the scheme would have a clear positive influence upon the continued viability of a range of contractor companies and their employees, as well of other businesses forming part of the supply chain. There would be significant effects for specific businesses, and individuals employed during construction. This would be of general benefit to the wider economy, in terms of retention and possible upgrading of skilled workers, and viability of construction sector businesses. Construction effects would be temporary, but construction activity (and the experience and skills gained / developed) has the potential to lead to further opportunities for both businesses and individual workers should further development in the area be progressed.

13.9.3 Once operational, the Northacre Facility would directly create approximately 40 jobs. A further 70 jobs are likely to be created or supported by indirect or induced expenditure (e.g. services bought-in to the Site, or spending outside the Site by employees). Once the effects of displacement and leakage are considered, it is estimated that within the Study Area approximately 86-87 jobs would be supported directly or indirectly, which would add an estimated £2.7 million to the economy each year.

13.9.4 There would be a medium magnitude of change from the baseline for both employment and Gross Valued Added. This would result in a moderate beneficial effect to the economy of Wiltshire. Effects are however likely to be significant for some businesses that supply bought-in goods and services, and for individuals.

13.10 Cultural Heritage

- 13.10.1 Chapter 12.0 of the ES, together with the supporting figures and appendices, provides an assessment of the potential effects of the Northacre Facility upon the setting of heritage assets within a study area of 2 km (radius) from the site.
- 13.10.2 No direct effects have been assessed to occur for potential archaeological remains. Only one indirect effect of “minor” significance is identified in relation to the Grade II Listed Brook Farmhouse from development within its setting cause a reduction in its heritage significance. This is not considered significant for purposes of the EIA regulations. This considered to constitute “less than substantial harm” and at the lowest end of the scale.