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Brookhurst Wood Open Windrow Compost Facility

Environmental Permit Variation EPR/AB3700LS/V006 Impact Assessment Report

Biffa Waste Services Ltd

Project Reference: EPR/AB3700LS/V006
Project number: 60684371
60684371-ACM-XX-00-RP-OWC-IAR-R02

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Quality information

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1. Report Context

1.1 Introduction

AECOM has been commissioned by Biffa Waste Services Limited ("the Operator" or Biffa) to prepare an application to develop a new Open Windrow Composting Facility (OWC) at Brookhurst Wood, Warnham, West Sussex. Given the locality of the new development on site, the new OWC will be added as an additional operation to the environmental permit (EPR/AB3700LS) for the Aggregate Treatment and Recycling Facility.

The new OWC facility is being developed to treat up to 60,000 tonnes per annum of green waste and 30,000 tonnes per annum of wood waste.

This report has been prepared to support the permit application and details the potential impact of the proposed OWC on surrounding receptors. The report should be read in conjunction with other supporting application information.

1.2 Proposed Facility

There are no changes proposed to the existing Aggregate Treatment and Recycling Facility (ATRF) processes although a new crushing operation will be included and some additional waste codes will be added to the permitted waste list including mixtures of waste from the mechanical treatment of wastes that contain a high proportion of recoverable aggregate.

The proposed OWC facility will comprise new plant to facilitate the receipt, shredding and subsequent composting of green waste and shredding of wood waste. Waste types accepted at the facility will be defined according to their List of Waste (LoW) Code and will generally consist of:

- wood waste;
- green waste;
- leaves;
- grass clippings; and
- horticulture type waste.

The facility will not receive or accept any waste covered by the Animal By-Product (Enforcement) (England) Regulations 2013 (ABPR).

The new plant will be designed to effectively shred the constituent parts of the incoming green waste, which is then transferred to open air windrows for composting and maturation. Green waste will be treated through the composting process while wood waste will only be shredded.

The intention is to produce a PAS 100 compliant compost from the inputs and as such it will be deemed to have reached end of waste criteria and has achieved product status. The product can be utilised for a wide range of beneficial after-uses including; community projects within West Sussex and for agriculture.

2. Impact Evaluation

2.1 Introduction

This section outlines the approach taken to evaluate the risks to the environment and to human health associated with the operation of the Brookhurst Wood OWC Facility. The impact evaluation process has made reference to the appropriate guidance within:

- Environment Agency Guidance “Risk Assessments for your Environmental Permit”; and
- Environment Agency “A Practical Guide to Environmental Risk Assessment for Waste Management Facilities.”

2.2 Impact Evaluation Methodology

The evaluation methodology used involves three stages:

1. Source characterisation, to identify the potential hazards and risks associated with the operation of the facility. This is covered in detail in Section 0 below, but broadly covers:
    a. Point source emissions to air, land and water;
    b. Fugitive emissions to air, land and water;
    c. Odour emissions; and
    d. Noise and vibration.
2. Receptor evaluation, to review the receptors which could be impacted by the hazards and risks from the operation of the facility. This is discussed in more detail in Section 0 below, but broadly covers:
    a. Residential, commercial and industrial human receptors;
    b. Habitat receptors associated with designated and other sensitive sites; and
    c. Location related receptors associated with site geology, hydrogeology and hydrology.
3. Risk assessment which evaluates the hazards and risks in terms of the probability of occurrence and the severity of the impact on the identified receptors. The risk assessment also summarises the management plan approach that will be used to mitigate the identified risks.

3. Source Characterisation

3.1 Emissions to Air, Water and Land

Assessments take into account environmental as well as health and safety hazards and the main areas of consideration are:

- Point source emissions to air, land and water;
- Fugitive emissions to air, land and water;
- Odour emissions; and
- Noise and vibration.

3.1.1 Point Source Releases to Air

There are no point source releases to air associated with the new OWC facility and no further consideration is required within this assessment.

3.1.2 Point Source Releases to Water

3.1.2.1 Surface Water

Clean surface run-water from the facility is collected in a separate drainage system, see Drawing BA0313400 OWC Drainage Plan and discharged via the surface water management system to one of the lined lagoons.

3.1.2.2 Ground Water

There are no point source releases to ground water associated with the proposed OWC. No changes are proposed as part of this variation.

3.1.2.3 Sewer

There is no foul drainage within the OWC installation boundary. The OWC will share the welfare facilities with the ATRF at the adjacent landfill office.

Based on the above, there is no further consideration of point source releases to water within this report.

3.1.3 Fugitive Releases to Air

The following fugitive releases to air at the facility have been identified as potential release sources from the current operations:

- Loading and unloading of vehicles;
- Waste discharging;
- Waste through the OWC;
- Windblown dust and particulates from external roads and surfaces;
- Windblown dust from storage of incoming wastes and process outputs;
- Shredding oversize materials;
- Transfer of waste in the OWC processes; and
- Windblown litter from externally stored wastes.

A separate Dust Emission Management Plan including a dust risk assessment has been completed and is presented as Section 6 of the Application.

3.1.4 Litter

The nature of the waste accepted to the OWC, presents a low potential for litter to be generated.

3.1.5 Mud and Debris

The potential for mud and debris at the facility have been evaluated and the following potential sources noted:

- Waste delivery and despatch vehicles;
- Waste discharge and offloading operations;
- Waste and treatment residue storage; and
- Plant spillage and leaks.

The additional waste streams do not present an increased risk of mud and debris at the facility and although there is a proposed increase in throughput, the nature of the material being treated means that there is no anticipated increased risk of mud and debris associated with this.

3.1.6 Fugitive Releases to Water

The potential for fugitive releases to water (surface water, ground water and sewer) and land at the facility have been evaluated and the following potential sources noted:

- Leak of contaminated water from storage tanks, valves and pipes;
- Overflow of storage containers;
- Surface run-off from pavements, roads and hardstanding; and
- Firewaters.

The additional waste streams are similar in nature to the currently accepted waste streams and should present no increased risk of fugitive releases to water. Increased throughput while resulting in additional tonnage and operating time is not expected to significantly affect the risk of fugitive release to water. No changes to site control measures are proposed.

3.2 Odour

The following odour releases at the facility have been identified as potential release sources from the existing operations:

- Loading and unloading of waste incoming from vehicles; and
- The processing and storage of organic outputs.

The additional waste streams should not increase odour risk associated with site activities and the same control measure will be employed.

A separate Odour Management Plan including an odour risk assessment has been completed and is presented as Section 5 of the Application. Odour Risk has not been considered further in this document.

3.3 Noise and Vibration

The following potential noise and vibration at the OWC have been identified as potential release sources for the current operations:

- Motors and drives associated with the processing system;
- Vehicle movements associated with the delivery and despatch of waste and outputs;
- Mobile Crushing Unit; and
- Vehicle movements associated with use of on-site mobile plant.

A noise assessment has been competed to support the planning application and this is attached for information in Appendix D. A separate noise management plan presented in Section 7 of the application pack.

The additional waste streams will not impact on noise and vibration at the site. The use of processing and separation plant and use of a mobile crusher may have an impact on noise and vibration levels associated with additional site traffic and increased run time. However, given the location of the facility and the control measures in place, the impact is felt to be marginal.

3.4 Accidents and Abnormal Incidents

The following abnormal operations and emergency situations have been identified for the current operations:

- failure of containment (for example, bund failure, or drainage sumps overfilling)
- failure to contain firefighting water
- making the wrong connections in drains or other systems
- vandalism and arson
- extreme weather conditions, such as flooding or very high winds
- accessibility of control equipment in emergency situations
- failure of main services
- operator error
- flooding
- security breach
- major vehicle accident
- inappropriate waste storage

3.5 Fire Risk

In addition to the above abnormal operations and emergency situations, specific considerations have been given to fire risk in accordance with the EA Guidance *"Fire Prevention Plans: Environmental Permits*" (January 2021) – this assessment is considered in the separate Fire Prevention Plan (application part 8) which accompanies the application and is not considered further in this document.

4. Receptor Evaluation

4.1 Introduction

The application site is adjacent to the southern / south-west Brookhurst Wood landfill installation boundary, on existing hardstanding adjacent to the ATRF. This area extends to approximately 2.84 ha – see Drawings in Section 13 of the application.

The centre of the site is located at grid reference National Grid Reference (NGR) (NGR) E517165, N134577 at Brookhurst Wood, Langhurstwood, Horsham, West Sussex.

Potential receptors which could be impacted by the operations of the proposed facility include:

- Residential, commercial and industrial human receptors;
- Habitat receptors associated with designated and other sensitive sites; and
- Location related receptors associated with site geology, hydrogeology and hydrology.

The list of potentially sensitive receptors was discussed with the EA during the enhanced pre-application discussions, and it was confirmed that the identification of the receptors to a 1km radius of the site was appropriate for the nature of the activity proposed. (reference Appendix B, 60684371-ACM-XX-00-RP-OWC-NTS-R03 Non-Technical Summary, Application, Part 2).

4.2 Human Receptors

A range of potentially sensitive human receptors have been considered as detailed below and these are shown on a receptor plan which is attached in Appendix A.

Table 1 Human Receptors

Receptor	Description	Type	Distance	Direction	Sensitivity	Distance Category
R1	Greylands Commercial Centre	Commercial & Residential	700m	E	High	Intermediate
R2	Greylands Lodge	Commercial	450m	E	Medium	Intermediate
R3	Greylands Farm	Farmland	750m	SSE	Low	Intermediate
		Residential			High	
R4	Andrews Farm	Farmland	750m	SSW	Low	Intermediate
		Residential			High	
R5	Lower Chickens Farm	Farmland	800 m	WSW	Low	Intermediate
		Residential			High	
R6	Cox Farm Lodge	Residential	600m	W	High	Intermediate
R7	Cox Farm	Farmland	300m	W	Low	Close
R8	Sussex Camper Vans	Commercial	343m	NE	Medium	Close
R9	Orchard Lodge	Residential	550m	NW	High	Intermediate
R10	Durford Hill Farm	Farmland	700m	NNW	Low	Intermediate
		Residential			High	
R11	Fisher Clinical Services	Industrial	622m	N	Medium	Intermediate
R12	Broadlands Business Centre	Commercial	650m	NNE	Medium	Intermediate
R13	Weinerburger Brickworks and adjacent Business Park	Industrial	200m	SSE	Medium	Close

Receptor	Description	Type	Distance	Direction	Sensitivity	Distance Category
R14	Warnham Railway Station	Commercial	750m	S	Medium	Intermediate
R15	South Lodge	Residential	280m	NE	High	Close
R16	Boldings Brook Academy	School	714m	NW	High	Intermediate
R17	Langhurst Moat Cottage	Residential	452m	SSE	High	Intermediate
R18	Holmwood	Residential	760m	NNE	High	Intermediate
R19	Gunborn Crossing Cottages	Residential	559m	N	High	Intermediate
R20	Nowhere House	Residential	638m	NNW	High	Intermediate
R21	Richmond House	Residential	705m	NNW	High	Intermediate
R22	Wood Farm	Farmland	860m	NNW	Low	Distant
		Residential			High	
R23	Upper Chickens – Houses and Pet Supply Company	Residential Commercial	838m	NNW	High	Distant
R24	Highland House, The Mount & other residences	Residential	558m	NW	High	Intermediate
R25	Dog & Duck Pub	Commercial	678m	NNW	Medium	Intermediate
R26	Geerings	Residential	890m	W	High	Distant
R27	Police House and other adjacent residences	Residential	978m	SW	High	Distant
R28	Westons Farm & Westons Place Residential Properties	Farmland	900m	SSW	Low	Distant
		Residential			High	
R29	Lower Gate House	Residential	678m	S	High	Intermediate
R30	Pondtail Farm	Farmland	887m	SSE	Low	Distant
		Residential			High	
R31	Brittania Crest	Industrial	245m	SE	Medium	Close
R32	Biffa MMRC	Industrial	100m	E	Medium	Close
R33	Panel 2 Panel & Greens	Commercial	645m	S	Medium	Intermediate
R34	Sewage Works adjacent to Farm	Industrial	593m	SSW	Low	Intermediate
R35	Wealdon	Residential	509m	SSE	High	Intermediate
R36	Denhams Auctioneers	Commercial	534m	NW	Medium	Intermediate
R37	Sussex Health Centre	Nursing Home	580m	NW	High	Intermediate
R38	Male Journey	Commercial	660m	NW	Medium	Intermediate
R39	White Cottage Cake Company	Commercial	640m	NW	Medium	Intermediate
R40	Houses on Station Road	Residential	620m	S	High	Intermediate
R41	Little London Hill	Residential	657m	W	High	Intermediate
R42	Vale Stud Riding School	Commercial	763m	NNW	Medium	Intermediate

In line with EA guidance receptor sensitivity is considered as:

- High sensitivity receptors would generally be residential properties, commercial properties such as pubs and hotels, schools, care homes and hospitals;
- Moderate sensitivity receptors would be commercial and industrial workplaces; and
- Low sensitivity would be footpaths, roads.

4.3 Habitat Receptors

4.3.1 Designated Sites

Information regarding designated sites was obtained from the Landmark Information Group, the Multi-Agency Geographic Information for the Countryside (MAGIC) website and the Environment Agency Enhanced Conservation Screening Report, relating to:

- European Nature Conservation Sites;
- Special Protection Areas (SPAs);
- Special Areas of Conservation (SACs);
- RAMSAR sites; and
- Sites of Special Scientific Interest (SSSIs).

The searches which are provided as Appendix B and Appendix C of the Site Condition Report (reference: 60684371-ACM-XX-00-RP-OWC-SCR-R01, Application Part 12) identified:

The site is within close proximity to the Warnham SSSI, which is designated due to the specific geological qualities of this land;

The Warnham local nature reserve (LNR) lies approximately 1,165m to the south of the site boundary;

There are a number of Local Wildlife Sites (LWS) within 2km of the site, including; Benland Wood, Brookhurst Wood, Brookhurst Gill and Morris' Wood, Tickfold Gill and Warnham Mill Pond; and

There are areas of ancient woodland within 2km of the site, in all directions including:

- Allingham Wood
- Benhams Gill
- Blackmead Copse
- Dutshell Copse
- Furzefield Copse
- Hawksbourne Wood
- Holming Wood
- Hurst Wood
- Langhurst Copse
- North Heath Copse
- Old Barn Gill
- Tickfold Gill
- Upper Rapeland Wood

The application site does not lie in, or overlap with, any other statutory, non-statutory or international designated sites.

4.3.2 Other Sensitive Locations

In addition to the statutory designated sites, a further three sites with non-statutory designations were identified as being present within 2km of the site boundary. These are Sites of Nature Conservation Importance (SNCI) designated for their ecological value in a local context and are included in the Horsham District Local Plan:

- Brookhurst Wood, Brookhurst Gill and Morris' Wood, Horsham (SNCI H07);
- Warnham SNCI (SNCI H51);
- Tickfold Gill, Kingsfold (SNCI H11); and
- Warnham SNCI is also designated as a Local Nature Reserve (LNR).

4.3.3 Protected Species

The EA Enhanced Conservation Screening Report also identified the potential for protected species in the locality of the plant. A Preliminary Ecological Appraisal (PEA) was completed by AECOM on the proposed area for development of the OWC which reviewed potential ecological constraints and recommended further action. This is summarised in the table below and a copy of the PEA Report is presented in Appendix B:

Table 2 Summary of Ecological Constraints and Recommended Further Action

Receptor	Scale of Constraint	Further Action and Potential Mitigation
Bats	Low	One building on site was found to have low suitability for roosting bats. A single bat emergence survey should be undertaken between May and August inclusive. All other buildings and trees within the Site were confirmed as having negligible suitability for bats, therefore no further survey is required. The habitats within the Site are suboptimal for foraging and commuting bats and therefore bat activity surveys have not been recommended.
Nesting birds	Low	Vegetation clearance and building demolition should be undertaken during winter (October – February) if possible. A nesting bird check may be required prior to building demolition or vegetation removal at other times of year.
Great crested newts	Low	A 2022 survey of all ponds within 500m of the Site found no evidence of great crested newt. No further survey is required as at the time of writing this data is considered to be in date, but will be valid for a period of two years after collection.
Common reptiles and amphibians	Low	The Site comprises some limited suitable habitat for common reptiles and amphibians. Given the limited land take compared to the amount of suitable habitat it is considered unlikely the Proposed Development would involve significant impacts on common reptiles and amphibians providing care is taken to reduce the risk of killing and injury through the use of a precautionary working method
Badger	Low	Badgers are not considered to be present on the Site and there is no suitable habitat adjacent to the Site. No further survey is required.
Hedgehog	Low	Records of the NERC Act Section 41 listed species of principal importance, European hedgehog (Erinaceus europaeus), were returned by the desk study. This species should be included within the precautionary method of working during site clearance.
Invasive non-native species	Low	No species listed under Schedule 9 of the Wildlife & Countryside Act 1981 or The Sussex invasive non-native species report were recorded on Site. Contractors should remain vigilant and contact an ecologist if an invasive non-native species is found or suspected

4.4 Location Based Receptors

4.4.1 Geological Considerations

In respect of designing appropriate controls and mitigation measures for the proposed OWC, geological features on the site need to be considered. The main issues are:

- The area is situated on an exposed outcrop of Weald Clay;
- The clays are composed predominantly of illite, kaolinite and mica, with some mixed layer mica-vermiculite phases; and
- The clay strata in the quarries consists of grey silty clays, shales and mudstones, with beds of sand, ironstone and shelly limestone from the Lower Cretaceous period.

4.4.2 Hydrogeological Considerations

The Weald Clay formation is classified as a non-aquifer and is largely impermeable, although it does contain sandstone and limestone horizons, which may be locally important as Minor Aquifers.

- The Environment Agency groundwater vulnerability map indicates that the site is not located within a Groundwater Water Source Protection Zone;
- There is not a major aquifer present at the site; and
- There are no licensed groundwater abstraction sites within a 1km radius of the overall site.

The base of the Brookhurst Wood and former Warnham Landfill quarries does, however, lie below the regional groundwater table, and there is potential for issues if the leachate derived from the Brookhurst Wood or closed Warnham Landfill Site is not correctly managed.

4.4.3 Hydrological Considerations

The Great Brookhurst Gill (a watercourse) is located approximately 750 metres to the north of the site. The landfill site is between the development site and the Great Brookhurst Gill and has been landscaped such that its topography slopes towards the pond. It is therefore very unlikely that the Great Brookhurst Gill will be affected by the amendment of the development on the site.

Boldings Brook is located to the west of the site and is approximately 30m away at its closest point to the site. The London-Dorking Railway line runs between the site and the Brook. The Environment Agency classifies the Brook as a ‘main river’ and the water quality has been classed Poor ecological status.

4.4.4 Historical Land Use Considerations

Checks on the historical land use for the site confirm that the area has been used for industrial purposes, mainly the Warnham brickworks, which have been in operation for the past 100 years or so. More recently, a landfill site located to the north of the proposed development area has been developed and is currently in the process of being restored.

The main considerations for the proposed site development being:

- There is a low risk to human health for future occupants or workers to be employed at a new facility built on the site;
- There is a low risk to controlled water receptors on the site, due to the presence of the impermeable Weald Clay underlying the site; and
- No specific groundwater remediation works were considered necessary.

4.4.5 Air Quality

The site falls within the Horsham District Council Area. The site does not lie within, or in close proximity to, a declared Air Quality Management Area (AQMA).

5. Risk Assessment of Fugitive Releases

5.1 Methodology

The risk assessment (see Appendix C) has been completed by considering each of the hazards identified in section 3 above in terms of:

- Frequency of occurrence;
- Nature and quantity of substance released;
- Pathways and receptors involved;
- Environmental consequence(s) of the event;
- Overall risk and its significance to the environment; and
- Control and mitigation measures needed to prevent or reduce the risk.

5.2 Scoring Mechanism

The risk assessment methodology has been developed using a scoring mechanism, whereby scores are assigned to:

- The probability of the hazard occurring without the use of protective measures;
- The consequences of the hazard to the environment or human health; and
- The effectiveness of the control/mitigation used to prevent the hazard occurring.
- The scoring system used for the assessment is shown in Table 3 below.

Table 3 Risk Assessment Scoring System

Frequency of Occurrence		
Frequency	***Comment***	***Score***
Never	Incident occurs once every 100 to 10,000 years	1
Very Unlikely	Incident occurs once every 10 to 100 years	2
Unlikely	Incident occurs once every 1 to 10 years	3
Somewhat Unlikely	Incident occurs at least once per year	4
Fairly Probable	Incident occurs at least once per month	5
Probable	Incident occurs at least once per week	6
Consequence of Hazard to Environment or to Human Health		
Consequence	***Comment***	***Score***
Minor	• Onsite nuisance only no outside complaint • No breach of permit	1
Noticeable	• Nuisance noticeable off-site • Potential for 1 – 2 complaints • Reportable breach of permit • Minor plant damage • Health and safety ‘near miss’	2
Significant	• Severe sustained nuisance • Significant plant damage • Injury requiring on-site medical treatment • Major breach of environmental permit • Numerous public complaints	3
Severe	• Hospital treatment required for injured persons • Site evacuation required (partial or full) • Partial plant shutdown required • Replacement of part of plant • Hazardous substance release to water course with ½-mile effect • Off-site emergency services involved	4

	• Regulator (EA/HSE) involved	
Major	• Hospitalisation of injured persons • Public warning and off-site emergency plan implemented • Serious toxic effect on local protected habitat • Widespread but temporary damage to land • Significant fish kill over a 5-mile range • Full plant shut-down required • Regulatory prosecution likely	5
Catastrophic	• Major airborne release requiring evacuation of local population • Plant shutdown for longer than 1 week • Partial or full rebuild of plant • Significant contamination of land and/or water sources requiring significant remediation.	6
Effectiveness of Mitigation		
Mitigation Factor	***Comment***	***Score***
Non-existent	• No mitigation in place	1
Ineffective	• Some minor controls in place but mitigation not achieved	2
Partly effective	• Basic controls in place and hazard partly mitigated but significant residual risk remains	3
Effective	• Basic controls in place and hazard mitigated to an acceptable level although moderate level of residual risk may exist	4
Very effective	• Processes fully controlled (basic/advanced) and hazard mitigated to recognised standard. Some minor residual risk may remain	5
Entirely effective	• Processes fully controlled to level in excess of recognised standards. Hazard mitigation entirely effective and no residual risk remains	6

5.3 Potential Hazards

A list of potential hazards has been developed from the issues identified in section 3 and these are shown in Table 4 along with the anticipated pathways and receptors.

Table 4 Potential Fugitive Emission Hazards

Potential Hazard	Pathway	Receptor
Releases To Air		
Dust, particulates, microorganisms (bioaerosols) and litter during loading and unloading of vehicles	• Air	• Public • Staff
Windblown dust from external roads, pathways and other surfaces	• Air	• Public • Staff
Windblown dust from storage of incoming waste, and process outputs	• Air	• Public • Staff
Windblown emissions from the windrows	• Air	• Public • Staff
Windblown dust from processing waste in OWC processes.	• Air	• Public • Staff
Windblown emissions from processing oversize materials through crusher at the ATRF.	• Air	• Public • Staff
Releases To Land or Water		
Spillage of waste and materials during the OWC process	• Water • Land	• Surface water • Groundwater
Leaks from tanks, containers, valves or pipework	• Water • Land	• Surface water • Groundwater
Contaminated surface run-off	• Water • Land	• Surface water • Groundwater • Sewer system
Contamination of groundwater	• Water • Land	• Surface water • Groundwater
Nuisance		
Mud/litter carried onto highway	• Water	• Public

Potential Hazard	Pathway	Receptor
	• Land	
Pest and scavengers	• land	• Staff • Public
Seed dispersal of noxious plants or weeds	• Air • Land	• Public • Staff • Sensitive Habitats • Agricultural land
Odour		
Odour from loading, storage, treatment and unloading of waste	• Air	• Staff • Public
Odour release from storage and handling of organic material	• Air	• Staff • Public
Noise		
Noise and vibration from On-site equipment e.g shredder and crusher	• Air	• Staff • Public
Noise from vehicles delivering/collecting waste	• Air	• Staff • Public
Noise from on-site mobile plant movements	• Air	• Staff • Public
Bioaerocols		
From waste reception, processing and compost windrows	• Air	• Public • Staff

5.4 Risk Reduction and Management

The controls and mitigations employed at the site will be unaffected by the addition of the additional waste streams and increased annual throughput. These are summarised in Table 5 below. These are supported by site operating procedures and management plan as appropriate.

5.4.1 Controls and Mitigations

The controls and mitigations employed at the site are summarised in Table 5 below. These are supported by site operating procedures and management plan as appropriate.

Table 5 Fugitive Emission Controls and Mitigations

Potential Hazard	Controls and Mitigations
Releases to Air	
Dust, particulates and litter during loading and unloading of vehicles	• Materials for processing will be offloaded into designated areas. • Site is equipped with equipment which can be used to suppress dust and particulates. • Incoming waste which has been allowed to drain, or dry process outputs, are not loaded in high winds. • Materials being placed in the external skips (e.g. metals) are unlikely to produce aerial releases. Materials are placed in enclosed skips and no handling is required as full skips will be removed to relevant offsite treatment, recovery or disposal facility. • All loads (incoming/despatch) are fully contained or sheeted, to minimise the potential for material becoming airborne. • Site operators and drivers are fully trained. • Material clean-up via sweeping or vacuum is utilised in the event of a spillage. • Dusty waste to be rejected at the weighbridge. • Dusty waste identified upon discharge will be immediately sprayed with water.
Windblown dust from external roads, pathways and other surfaces	• A hard surfaced access road will be provided from the installation entrance. • Subsidiary installation roads will be constructed from hardcore or other suitable material to provide sufficient run off for vehicles using the installation. Internal road surfaces will be maintained through regular grading of haul roads to remove loose materials from the surface; and will be designed to avoid sharp corners and steep gradients that would encourage sharp breaking • Speed restrictions of 10mph will be imposed for all vehicles driving on the site, in order to minimise emissions of dust from internal road surfaces

Potential Hazard	Controls and Mitigations
	• All vehicles using the installation will be required to ensure that all loads (waste or aggregates) are adequately sheeted or otherwise contained prior to exiting the site onto the public highway. • Road and yard surfacing are subject to routine inspection and maintenance – any accumulation of materials is removed promptly. • Water suppression to abate dust emissions is available for use during dry periods.
Windblown dust from storage of incoming waste and process outputs	• OWC reception area is constructed from concrete bays. • Good housekeeping standards will ensure that the site areas are kept clean to prevent build-up of spillage waste. • Storage of process outputs is within a designated storage bays/areas and waste can be covered as necessary to minimise the release of dust during periods of high wind. • External stockpiles will be located to minimise wind-whipping as far as practicable; • Drop heights will be minimised during placement of materials into the stockpiles; • Profiling of stockpiles within the storage bay walls and keeping height 0.5m below the top of the storage bay height will be used to prevent emissions by wind-whipping; • Use of appropriate dust suppression systems to maintain the condition of the stockpiles during dry, windy conditions.
Windblown emissions from the windrows	• Formation of windrows is within a designated treatment area and monitoring of windrows for moisture and conditioning as required.
Windblown emissions from processing materials through OWC Processes	• The proposed screening and separation process is situated within a building at the north side of waste reception/storage area. • The shredder will be equipped with dust suppression. • Good housekeeping standards will ensure that the site areas are kept clean to prevent build-up of spillage waste.
Windblown emissions from processing oversize materials through crusher at the ATRF.	• Oversize materials will be stored within materials storage bays and/or stockpiles positioned to minisimise wind-whipping as far as possible. • Crushing will take place on a campaign basis by mobile enclosed mechanical crusher. • Drop heights will be minimised when material is being loaded into and discharged from the screen. • Misting will be used in and around the screening area, and in particular on the feed hopper and conveyors
Releases to Land and Water	
Spillage of waste and materials during the OWC process	• .High standards of housekeeping are maintained across the site. • Spill kits are available to deal with any leaks.
Leaks from storage tanks, valves or pipework	• Flanged connections have been kept to a minimum. • All tanks, pipes and valves are designed to appropriate industry standards. • All tanks, pipes and valves have a preventative maintenance programme to ensure ongoing integrity and effectiveness. • Operator checks daily for signs of leak and repairs are taken promptly. • Spill kits are available to deal with any leaks.
Contamination of groundwater	• Site surfacing for all areas accessed by vehicles are concrete designed to an appropriate standard and contains anti-crack mesh to improve surface durability.
Contaminated surface run-off	• Engineered site drainage system which allows the collection of potentially contaminated surface water, which is either recycled through the composting process or is discharged to the lagoons. • Drainage system is subject to routine inspection along with a preventative maintenance regime. • Emergency spills kits used in conjunction with a site emergency plan is available to help mitigate the effects of any contamination. • Discharges of clean surface water will be subject to daily visual inspection.
Nuisance	
Mud/litter carried onto highway	• All incoming and outgoing loads are contained or sheeted. • All internal roads, storage and processing areas are hard surfaced with concrete or tarmac and swept regularly. • Arrangements for washing wheels will be available and when deemed necessary by the Site Manager, vehicles exiting the installation will wash wheels in order to prevent materials being deposited on the highway

Potential Hazard	Controls and Mitigations
Pest and scavengers	• Use of registered pest control contractors and rodenticide will be considered if required.
Seed dispersal of noxious plants or weeds	• Robust waste acceptance procedures • Quarantine and rejection of such material
Odour	
Odour from loading, storage, treatment and unloading of incoming wastes	• Staff training includes raising employee awareness with respect to normal plant operational odour levels and actions to be taken to rectify any faults. • Dust suppression available when required. Mist sprays can be supplemented with de-odourising agents if required. • Screening and crushing operations will be enclosed. • Rejection of highly odorous materials at acceptance stage screening. • Implement odour management plan.
Odour release from storage of organics	• Staff training includes raising employee awareness with respect to normal plant operational odour levels and actions to be taken to rectify any faults. • Implement odour management plan.
Noise and Vibration	
Noise and vibration from LEVs, motors and pumps	• Staff training includes raising employee awareness with respect to normal plant operational noise levels and actions to be taken to rectify any faults. • During periods of downtime, all plant is switched off. • Site plant is maintained in line with manufacturer's recommendations this includes checking for deterioration of plant condition (e.g. bearings becoming worn). Repairs will be undertaken as appropriate to rectify any identified defects.
Noise from vehicles delivering/collecting waste	• Reversing is minimised where possible • Engines are switched off when not in use.
Noise from on-site mobile plant movements	• Mobile plant is maintained in accordance with manufacturer's recommendations to ensure potential vehicle noise is minimised. • Plant operator training includes using the plant effectively to minimise noise emissions, switching off when not in use, ensuring daily vehicle checks are completed to identify defects as early as possible and ensuring vehicle inspection hatches are kept closed when vehicle in use.
Bioaerosols	
From waste reception, processing and compost windrows	• Implement the controls and mitigations as specified in the Bioaerosol Risk Assessment (60684371-ACM-XX-00-RP-EN -BIORA-R03, Application Part 10)

5.4.2 Monitoring

Site monitoring arrangements include:

- Daily site inspections to assess odour, noise, fugitive emissions, housekeeping and security; corrective action will be undertaken as necessary;
- Odour checks are undertaken on all waste loads during acceptance checks, if necessary a waste load will be rejected in the event that a strong odour is detected;
- No specific environmental noise monitoring has been undertaken at the facility to date, however noise levels will be monitored in relation to workplace safety levels as appropriate;
- Periodic sampling and testing of clean surface water, prior to its discharge ; and
- The complaint procedure for the site will record any complaints associated with the site - should complaints be received consideration will be given to boundary monitoring as appropriate.

5.5 Conclusion

The proposed controls and mitigation measures are in place to reduce the impact of the OWC plant on the surrounding area and local receptors.

6. Noise

6.1 Risk Assessment Method

6.1.1 Assessment Methodology

A detailed noise assessment was undertaken by AECOM as part of the planning application). SoundPLAN (version 8.2) implementing the calculation procedures of ISO 9613[1] has been employed to predict the propagation of noise away from the site in all directions and to quantify resultant noise levels at the identified noise sensitive receptor locations.

The assessment of the significance of the noise impacts at residential properties has been based on the guidance in BS 4142: 2014 'Methods for rating and assessing industrial and commercial sound'.

A copy of the noise assessment is provided in Appendix D.

6.1.2 Establishment of Baseline

Baseline noise monitoring was carried out to establish the existing noise climate in the area. The monitoring procedures followed guidance from BS 7445-1:2003[2] and BS 4142:2014.

Baseline noise measurements were undertaken between Thursday 2nd February and Thursday 9th February 2023 at locations representative of the surrounding residential receptors closest to the application site boundary. These are summarised in Table 6 below.

Table 6 Environmental Noise Receptors

Receptor ID	Description	Distance from Planning Application Site Boundary (m)	Direction
R1 –	Bramblehurst	400	Southeast
R2 –	Graylands Lodge	250	East
R3	Kingcoate House	650	Northwest
R4	Cox Farm	350	West
R5 –	Andrew's Farm	650	Southwest
R6	18 Station Road	600	South
R7	South Lodge	300	Northeast

The background results are shown in Table 7 below.

Table 7 Summary of Baseline Noise Measurement Results

Measurement Location	Range of Background Sound Levels observed, $L_{A90,T}$, dB			Range of Ambient Sound Levels observed, $L_{Aeq,15min}$		
	ST	LT1	LT2	ST	LT1	LT2
Daytime (15:30-16:45)	46-52	51-53	44-47	51-53	60-63	52-53

6.2 Facility Noise Levels

6.2.1 Construction Noise

Based on the measured noise levels it is anticipated that at a distance of 250 m to the nearest receptor, the threshold of 65 dB would be unlikely to be exceeded. No significant construction noise effects would be anticipated.

[1] *ISO 9613, Acoustics – Attenuation of Sound During Propagation Outdoors*

[2] *British Standards Institute (2003) BS 7445 – Description and measurement of environmental noise – Part 1: Guide to quantities and procedures, BSi, London.*

6.2.2 Operational – Traffic

The addition of 76 HGV movements would result in a maximum of 468 HGV movements in total, compared to 392 existing HGV movements. This would be anticipated to result in off-site road traffic noise increasing by no more than 0.8 dB as a worst-case. Accounting for light vehicle traffic and HGVs passing or accessing other facilities, this value would be further reduced in practice, but this analysis is sufficient to demonstrate that a negligible change would occur.

Due to the identified presence of existing HGV movements associated with the existing site operations and the relatively low numbers of proposed additional HGV movements, increases in traffic noise off site would result in a negligible impact.

6.2.3 Operational Noise

Predicted rating levels (including HGV noise) have been compared against representative background levels at each receptor to assess impacts, with the nearest categorisation of impact as per BS 4142 guidance. The assessment (see Section 6 of the appended Noise Assessment Report) indicates that at all locations, a low impact is anticipated.

6.3 Risk Management and Control

6.3.1 Construction Noise and Vibration

It is expected that during construction Best Practicable Means to minimise the noise impact upon the local community will be used which may include the following:

- All construction plant and equipment should comply with EU noise emission limits.
- avoid unnecessary revving of engines, and switching off plant when not in use;
- ensure all plant and machinery is regularly maintained;
- ensure internal haul routes are well maintained and have as low a gradient as possible;
- minimise drop height of materials; and
- start-up plant and vehicles sequentially rather than together.

6.3.2 Operational Noise and Vibration

In addition, good site practices will be maintained throughout the life of the facility to ensure that noise from the facility is kept to a minimum. These good site practices will include:

- Management of on-site traffic to minimize delivery vehicles queuing with engines running;
- Minimization or elimination of use of reversing alarms;
- Management of materials handling to minimize noise emissions; and
- Implementing the Nosie and Vibration Management Plan (reference 60684371-ACM-XX-00-RP-OWC-NMP-R03, Application Part 7).

6.4 Conclusion

AECOM has undertaken an environmental noise impact assessment of the proposed OWC at the Biffa Brookhurst Wood site. A qualitative assessment of construction noise and vibration effects has been carried out. Construction noise effects are anticipated to be short-term and would be mitigated through the use of Best Practicable Means (BPM) outlined in Section 72 of the Control of Pollution Act 1974 (as amended) to minimise noise and vibration effects.

An assessment of the operational noise effects has been carried out. Potential increases in traffic noise on surrounding roads has been determined to be negligible. Operational noise from on-site operations has been assessed using the methods in BS 4142:2014+A1:2019. The assessment indicates that at Locations 2 and 4 an adverse impact may occur when the crusher is operating. However contextual factors including the existing noise character of the area is industrial, the crusher is operating for only 15-25% of the time and that it might be just perceptible above existing ambient noise levels during its

operation indicates that the impact at these locations may not be as high. At all other locations a low impact is anticipated.

Cumulative operational effects with other potential future developments have been considered. Although there is the potential for simultaneous effects to occur, the cumulative effect is likely to result in a negligible to minor adverse impact.

In conclusion, while there is the potential some minor adverse impacts to occur, no significant effects are predicted.

7. Abnormal Operations and Accidents

7.1 Introduction

This section of the impact assessment considers the specific issues around abnormal operations, potential accidents and potential fire hazards as required by the relevant EA Guidance and BREF notes as detailed in:

- Biological Waste Treatment: Appropriate Measures (BTAM) for Permitted Facilities (Nov 2020), sections 2.3, 2.4, and 2.5;
- Non-Hazardous and Inert Waste: Appropriate Measures (NHIAM) for Permitted Facilities (July 2021), sections 2.3 and 2.4; and
- "Best Available Techniques (BAT) Conclusions for Waste Treatment under Directive 2010/75/EU of the European Parliament and of the Council" (Decision 2018/1147).
- The risk assessment details the proposed controls and mitigations and is supported by an appropriate Emergency Management Plan as detailed in Section 5 of the Management Plan (60684371-ACM-XX-00-RP-OWC-MMP-R03, Application, Part 3).

Note assessment and controls of fire risk are detailed in the separate Fire Prevention Plan (Application, Part 7)

7.2 Methodology

The risk assessment (see Appendix E) has been completed by considering each of the hazards identified in section 3 relating to above in terms of:

- Frequency of occurrence;
- Nature and quantity of substance released;
- Pathways and receptors involved;
- Environmental consequence(s) of the event;
- Overall risk and its significance to the environment; and
- Control and mitigation measures needed to prevent or reduce the risk.

7.3 Scoring Mechanism

The risk assessment methodology has been developed using a scoring mechanism, whereby scores are assigned to:

- The probability of the hazard occurring without the use of protective measures;
- The consequences of the hazard to the environment or human health; and
- The effectiveness of the control/mitigation used to prevent the hazard occurring.

The scoring system used for the assessment is shown in Table 3 above.

7.4 Potential Hazards

A list of potential hazards has been developed from the issues identified in section 3 and these are shown in Table 8 along with the anticipated pathways and receptors.

Table 8 Potential Abnormal Operations and Accident

Potential Hazard	Pathway	Receptor
Abnormal and Emergency Situations		
Flooding	• Water	• Surface or groundwater
Main Services Failure	• Air • Water • Land	• Surface or groundwater • Staff • Public
Site security breach:	• Water	• Surface or groundwater

Potential Hazard	Pathway	Receptor
• entry by intruders • vandalism • damage to equipment • theft • fly-tipping • arson	• Land	
Major vehicle accident – leading to a significant loss of waste	• Air • Water • Land	• Staff • Public
Waste types and Inadequate waste acceptance procedures	• Air • Water	• Staff • Public •
Inappropriate waste storage	• Water • Land	• Staff • Public
Transfer of substances	• Air • Water • Land	• Staff • Public
Operator Error	• Air • Water • Land	• Staff • Public
Failure of containment on water storage Tank	• Water • Land	• Surface or groundwater
Overflow of Water tank	• Water • Land	• Surface or ground water
Failure of containment on fuel tank	• Water • land	• Surface or groundwater
Overflow of fuel tank	• Water • land	• Surface or groundwater
Failure of plant and equipment	• Air • Water • Land	• Staff • Public • Surface or groundwater
Wrong connections in drains or other systems	• Water • Land	• Surface or ground water
Very high winds	• Air	• Staff • Public
Accessibility of control equipment in emergency situations	• Air • Water • Land	• Staff • Public • Surface or groundwater
Unwanted Runaway Reactions	• Air • Water • Land	• Staff • Public • Surface or groundwater
Incompatible substances coming into contact with each other	• Air • Water • Land	• Staff • Public • Surface or groundwater
Hazardous atmospheres in confined spaces	• Air • Water • Land	• Staff • Public • Surface or groundwater

7.5 Risk Reduction and Management

The controls and mitigations employed at the site will be unaffected by the addition of the additional waste streams and increased annual throughput. These are summarised in Table 9 below. These are supported by site operating procedures and management plan as appropriate.

7.5.1 Controls and Mitigations

The controls and mitigations employed at the site are summarised in Table 9 below. These are supported by site operating procedures and management plan as appropriate.

Table 9 Hazardous Events

Potential Hazard	Controls and Mitigations
Abnormal Emergency Situations	
Flooding	• Site is not located in a floodplain and no history of flooding. • Site drainage has been designed taking 1:30 year and 1:100 year flood events.
Main services failure	• Failure of from the local grid will result in an emergency generator being utilised.
Operator Error	• Provision of appropriate operator training. • Technically competent person available at site. • Internal operational control procedures. • Strict compliance with site integrated management system.
Site security breach: • entry by intruders • damage to equipment • vandalism • theft • fly-tipping • arson	• Site secured by a perimeter fence and lockable gates. • Site covered by CCTV. • A vehicle number recording system is utilised.
Major vehicle accident – leading to a significant loss of waste	• Site speed restrictions in place and compliance with highway speed restrictions. • Approved carriers (i.e. trained hauliers employed by WCA). • Material clean-up arrangements in place. • Road vehicles are robust and designed to withstand high speed collisions that may occur on public highways. • Suitable barriers to prevent moving vehicles damaging equipment
Inadequate waste acceptance procedures	• Site operates a vehicle licence plate recording system. • All loads are checked against the details provided on the waste transfer documentation. • Clear and legible labelling of waste • All loads are visually inspected at the point of discharge/off-loading. • Non-permitted waste identified will be quarantined and transfer arranged to a suitably licensed facility.
Inappropriate waste storage (including incoming waste and recycling plant outputs)	• Wastes accepted at the facility are off-loaded to the relevant storage area. • Wastes accepted for transfer are off-loaded to the appropriate covered storage skips or secure storage containers. • Storage of waste containers allows easy inspection. • Storage of recycling plant outputs are within designated storage bays and materials can be covered as necessary to minimise the release of dust during periods of high wind. • Water suppression is available when required. • Waste will be stored in locations that minimise the handling of waste. • Waste handling will only be carried out by competent staff using appropriate equipment. • Waste storage areas will be away from watercourses and sensitive perimeters and within a secure area of the facility to prevent unauthorised access and vandalism.
Transfer of substances	• Water suppression is available when required.
Failure of containment on Water Storage Tank	• Storage tank designed in line with industry standards. • Containment is inspected daily for accumulation of material or damage to integrity – repairs will be completed as a priority. • Containment integrity testing is incorporated into the maintenance regime. • Tank will be emptied in the event that a leak is detected and repairs will be completed. • Any release of liquid due to failure of containment on the tank will be captured within the enclosed drainage system and can be sampled for testing prior to removal from site for treatment/disposal.
Overflow of Water StorageTank	• The tank is equipped with a level alarm and level will be checked at least daily and following any significant period of heavy rain. • Any material overflow will be directed to and collected in the enclosed drainage system – the material can be sampled for testing prior to removal from site for treatment/disposal.
Failure of containment on Fuel Tank	• Storage tank designed in line with industry standards. • Containment is inspected daily for accumulation of material or damage to integrity – repairs will be completed as a priority.

Potential Hazard	Controls and Mitigations
	• Containment integrity testing is incorporated into the maintenance regime. • Tank will be emptied in the event that a leak is detected and repairs will be completed. • Any release of liquid due to failure of containment on the tank will be captured within the enclosed drainage system and can be sampled for testing prior to removal from site for treatment/disposal.
Overflow of Fuel Tank	• The tank is equipped with a level alarm and level will be checked at least daily and following fuel delivery. • Any material overflow will be directed to and collected in the enclosed drainage system – the material can be sampled for testing prior to removal from site for treatment/disposal..
Failure of plant and equipment	• Plant/equipment is designed in accordance with relevant design and fabrication standards. • Preventative maintenance includes regulator inspection and maintenance regimes. • Plant is subject to a first use check on a daily basis to facilitate defect detection and reporting.
Wrong connections in drains or other systems	• Drainage design undertaken by suitably qualified engineers • Drainage design has been completed using appropriate modelling software • Construction of drainage will be undertaken in accordance with the specified designs
Incompatible substances coming into contact with each other	• Unlikely that incompatible wastes will be accepted due to the nature of the waste streams being treated and robust waste pre-acceptance and acceptance procedures. However, if such material was identified during waste acceptance then it will be segregated based on substances present and their hazardous properties • Robust handling procedures which will ensure segregation of incompatible waste types into bays. At a minimum a kerbed perimeter and separate drainage collection will be used.
Unwanted reactions and runaway reactions	• Treatment processes do not involve chemical treatment and therefore likelihood of an unwanted/runaway reactions is negligible.
Very high winds	• Dust suppression and other controls as stipulated in the Dust Emissions Management Plan will be implemented. • In conditions where winds exceed 25 mph, waste acceptance to the site will cease.
Accessibility of control equipment in emergency situations	• Emergency spill kits, fire extinguishers and access to water supplies in the event of an emergency are available from various locations both on the OWC and in the wider Brookhurstwood site.
Hazardous atmospheres in confined spaces	• Given the nature of the wastes and the treatment of the waste in well ventilated external area, there is low likelihood of hazardous atmospheres occurring. • All work in confined spaces will be subject to permit-to-work requirements including the monitoring for hazardous atmospheres.

7.5.2 Monitoring & Recording

Site monitoring and emergency arrangements include:

Daily site inspections to assess operational maintenance of waste materials, including waste segregation and housekeeping to prevent the build-up of loose combustible material (including waste and dust), particularly around treatment plant, equipment and other potential sources of ignition; corrective action will be undertaken as necessary.

Visual checks are undertaken on all waste loads during acceptance checks, if necessary a waste load will be investigated prior to tipping if smoke or odour detected.

Keeping an up-to-date record of all accidents, incidents, near misses, changes to procedures, abnormal events, and the findings of maintenance inspections.

Investigating accidents, incidents, near misses and abnormal events and recording actions taken to prevent a reoccurrence.

Maintaining an inventory of substances, which are present (or likely to be) and which could have environmental consequences if they escape.

Implementing procedures for checking raw materials and wastes to make sure they are compatible with other substances they may accidentally come into contact with.

7.5.3 Emergency Plan

The site maintains an Emergency Plan as part of the IMS, details of this are provided in section 5 of the Management Plan (reference 60596541-ACM-XX-00-RP-EN-MMP-R03, Application Part 3).

7.6 Conclusion

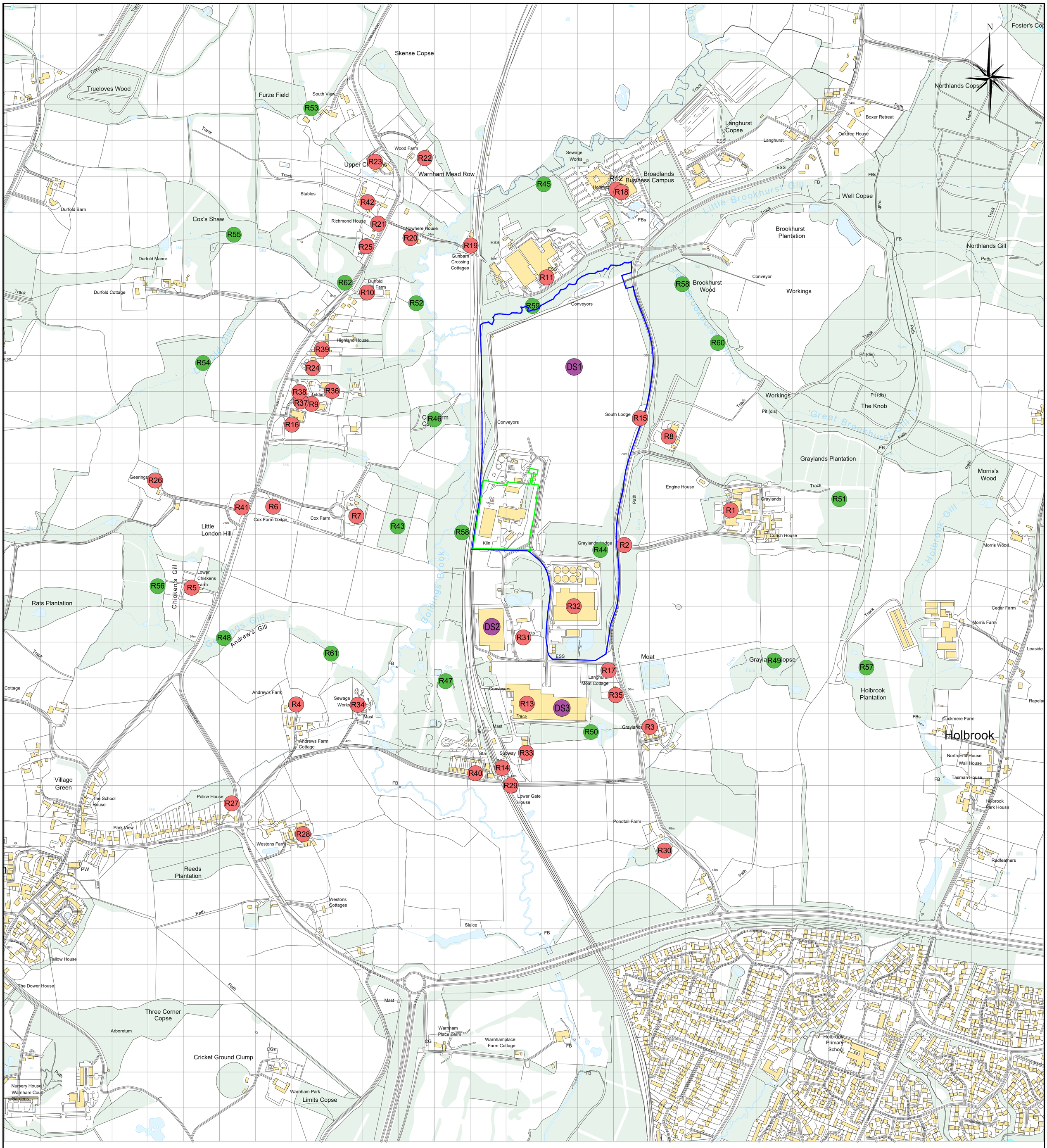
The proposed controls and mitigation measures are in place to reduce the likelihood and impact of an accident or fire at the OWC plant on the surrounding area and local receptors.

The risk assessment with identified controls and mitigation coupled with the Emergency Plan as detailed in Section 5 of the Management Plan (60684371-ACM-XX-00-RP-OWC-MMP-R03, Application, Part 3) should meet the requirements of the relevant EA/BREF guidance and advice received from the EA during enhanced pre-application.

In addition the measures should meet the 3 Fire Prevention Objectives identified in the Environment Agency Guidance on ‘Biological Treatment: appropriate measures for permitted facilities’ and ‘Non-hazardous and Inert Waste: appropriate measures for permitted facilities:

- minimise the likelihood of a fire happening
- aim for a fire to be extinguished within 4 hours
- minimise the spread of fire within the site and to neighbouring sites.

Appendix A Receptor Plan



KEY

- INSTALLATION BOUNDARY
- LAND IN BIFFA CONTROL
- TEMPORARY ACCESS FOR CONSTRUCTION

SENSITIVE HUMAN RECEPTORS

R1 Greylands Industrial Park
R2 Greylands Lodge
R3 Greylands Farm
R4 Andrews Farm
R5 Lower Chickens Farm
R6 Cox Farm Lodge
R7 Cox Farm
R8 Sussex Camper Vans
R9 Orchard Lodge
R10 Durford Hill Farm
R11 Fisher Clinical Services
R12 Broadlands Business Centre
R13 Weinerburger Brickworks and adjacent Business Park
R14 Warnham Railway Station
R15 South Lodge
R16 Boldings Brook Academy
R17 Langhurst Moat Cottage
R18 Holmwood
R19 Gunborn Crossing Cottages
R20 Nowhere House
R21 Richmond House
R22 Wood Farm
R23 Upper Chickens - Houses and Pet Supply Company
R24 Highland House, The Mount & other residences
R25 Dog & Duck Pub
R26 Geerings
R27 Police House and other adjacent residences
R28 Westons Farm & Westons Place Residential Properties
R29 Lower Gate House
R30 Pondtail Farm
R31 Brittaniacrest Recycling
R32 Biffa ATRF
R33 Panel 2 Panel & Greens
R34 Sewage Works adjacent to Farm
R35 Wealdon
R36 Denhams Auctioneers
R37 Sussex Health Centre
R38 Male Journey
R39 White Cottage Cake Company
R40 Houses on Station Road
R41 Little London Hill
R42 Vale Stud Riding School

SENSITIVE ENVIRONMENTAL RECEPTORS

R43 Unnamed Woodland
R44 Unnamed Woodland
R45 Unnamed Woodland
R46 Cox Farm Copse
R47 Unnamed Woodland
R48 Unnamed Woodland
R49 Graylands Copse
R50 Unnamed Woodland
R51 Graylands Plantation
R52 Unnamed Woodland
R53 Unnamed Woodland
R54 Unnamed Woodland
R55 Cox's Shaw
R56 Rat's Plantation
R57 Holbrook Plantation
R58 Brookhurstwood
R58 Boldings Brook
R59 Little Brookhurst Gill
R60 Great Brookhurst Gill
R61 Geerings Gill
R62 Durfield Gill

POTENTIAL SOURCES OF DUST

DS1 Adjacent Landfill
DS2 Britannia Crest Waste Transfer Station
DS3 Wienerberger Brickworks

REV.	DATE	DRAWN	DESCRIPTION

Biffa Waste Services Ltd
Redhill Landfill Site
Cormongers Lane,
Nutfield, Redhill
RH1 4ER
Tel. 01737 765042
Mob: 07921 386021

E-mail phil.mumford@biffa.co.uk

PROJECT	COMPOSTING SITE DEVELOPMENT	DRAWN	AAO
LOCATION	BROOKHURST WOOD LANDFILL SITE	DATE	10/23
DRAWING TITLE	RECEPTOR PLAN	SCALE(S)	1:500 @ A1
DRAWING No.	BA236000	COMPUTER REF.	

Appendix B Preliminary Ecological Assessment Plan

FINAL

Brookhurst Wood Open Windrow Composting (OWC) Facility

Preliminary Ecological Appraisal

Biffa Waste Services Ltd

Project number: 60684371

June 2023

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
SK Graduate Ecologist	RW Principal Ecologist, MCIEEM	TC Associate Director (Ecology) MCIEEM	EC Associate Director (Ecology) CEnv, MCIEEM

Revision History

Revision	Revision date	Details	Authorized	Name	Position
00	07/06/2023	Draft for client comment	07/06/2023	EC	Associate Director (Ecology)
01	03/08/2023	Final	03/08/2023	EC	Associate Director (Ecology)

Prepared for:

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Figures

Tables

1. Executive Summary

AECOM Ltd (hereafter 'AECOM') was instructed by Biffa Waste Services Ltd (hereafter 'Biffa') to carry out a Preliminary Ecological Appraisal (PEA) of an area of land adjacent to the Aggregate Treatment and Recycling Facility located at Brookhurst Wood, Horsham, West Sussex (hereafter referred to as 'the Site'). This is for the addition of a new Open Windrow Composting (OWC) Facility to the existing site (hereafter 'the Proposed Development').

The new OWC Facility is being developed to treat 90,000 tonnes of composting waste per annum (tpa), comprising 60,000 tpa of green waste and 30,000 tpa of wood.

This PEA was commissioned to identify whether there are known or potential ecological receptors (nature conservation designations and protected and notable habitats and species) and/or potentially invasive non-native species that may constrain or influence the design and implementation of the Proposed Development.

The desk study returned records of two statutorily designated sites for nature conservation within 2km of the Proposed Development, the closest of which is Warnham SSSI 0.5 km north-east of the Site. There are three non-statutorily designated sites for nature conservation within 2km of the Site.

A Phase 1 habitat survey was completed by two AECOM ecologists on 30th January 2023 in accordance with the standard survey method (Joint Nature Conservation Committee, 2010). The survey was 'extended' to include target notes on protected, notable and invasive species. This included an external inspection of buildings within the Site for their suitability to support roosting bats. This was also completed on 30th January 2023 and was conducted in line with best practice bat survey guidelines (Collins, 2016).

The Site predominantly comprises hardstanding and bare ground, with large piles of recycling and waste materials present. There is also an area of scrub.

None of the trees present on site were identified as having more than a negligible suitability to support roosting bats. One of the buildings present within the Site, Burts Barn (located at Target Note 2 on Figure 1 and shown on Figure 2), was assessed as having low suitability for roosting bats. The other buildings present within the Site were considered to have negligible suitability for roosting bats. To fully inform the proposals, **Burts Barn should be subject to a single bat emergence survey** in line with current best practice guidance from the Bat Conservation Trust (Collins, 2016).

Trees and scrub within the Site offer suitable habitat to support common nesting bird species. Therefore, it is recommended that any vegetation clearance takes place during the winter months (September – February inclusive) in order to avoid impacts on nesting birds. If site clearance is required between March and August inclusive, absence of nesting birds must be confirmed by a suitably qualified ecologist immediately prior to works commencing.

There are four ponds within 250m of the Site. These ponds were surveyed by AECOM in 2022 (AECOM, 2022), with great crested newt (*Triturus cristatus*) found likely to be absent. In accordance with current guidance (CIEEM , 2019) the existing great crested newt survey data has a 'shelf-life' of, and should only be relied on for a period of, two years from the date of survey.

The Site supports some limited areas suitable for common reptile species. It is recommended that clearance works within suitable reptile habitat is carried out under a precautionary working method. Given the limited land take compared to the amount of suitable habitat, it is considered unlikely the Proposed Development would involve significant impacts on reptiles, provided care is taken to reduce the risk of killing and injury.

No signs of badgers (*Meles meles*) were recorded within the Site and no suitable habitat is adjacent to the Site. No further survey is recommended.

No species listed on the Sussex Invasive Non-native Species (INNS) list or on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were noted during the Site visit. However, contractors should remain vigilant for listed species and if any are found or suspected during works an ecologist should be contacted for advice.

2. Introduction

AECOM Ltd (hereafter 'AECOM') was instructed by Biffa Waste Services Ltd (hereafter 'Biffa') to carry out a Preliminary Ecological Appraisal (PEA) of an area of land adjacent to the Aggregate Treatment and Recycling Facility located at Brookhurst Wood, Horsham, West Sussex (hereafter referred to as 'the Site'). This is for the addition of a new Open Windrow Composting (OWC) Facility to the existing site (hereafter 'the Proposed Development').

The OWC Facility is proposed to treat 90,000 tonnes of composting waste per annum (tpa), comprising 60,000 tpa of green waste and 30,000 tpa of wood.

This PEA was commissioned to identify whether there are known or potential ecological receptors (nature conservation designations and protected and notable habitats and species) and/or potentially invasive non-native species that may constrain or influence the design and implementation of the Proposed Development. The approach applied when undertaking this PEA accords with the Guidelines for Preliminary Ecological Appraisal published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017). The PEA addresses relevant wildlife legislation and planning policy as summarized in Section 3 of this report and is consistent with the requirements of British Standard 42020:2013 Biodiversity. Code of Practice for Planning and Development.

A desk study and an extended Phase 1 habitat survey were completed by two suitably qualified AECOM ecologists in January 2023 to identify and confirm any potential constraints regarding protected and/or notable species and habitats associated with the Site.

The purpose of the PEA was to:

- Identify and categorise all habitats present within the Site and any areas immediately outside of the Site where there may be the potential for direct or indirect effects (the "zone of influence");
- Carry out an appraisal of the potential of the habitats recorded to support protected or notable species of fauna and flora;
- Provide advice on any potential ecological constraints and opportunities in the zone of influence, including the identification (where relevant) of any requirements for follow-up habitat and species surveys and/or requirements for ecological mitigation; and
- Provide a map showing the location of the identified ecological features of relevance.

The purpose of this report is to inform the design of the Proposed Development and support a planning application. The report identifies the scope of further work (where necessary) to support a planning application. High level recommendations are made on potential options for the avoidance, mitigation or compensation of the potential impacts of the Proposed Development (where known) on the identified ecological receptors, and of potential enhancements to the biodiversity and ecosystem services.

In accordance with current guidance, ecological survey data are generally considered valid for a period of 12-36 months from the date of survey, depending on the species, habitat surveys are generally considered out of date after two years and bat roost suitability assessments after one year (CIEEM, 2019).

3. Wildlife Legislation and Planning Policy

3.1 Wildlife legislation

The following wildlife legislation is potentially relevant to the Proposed Development

- The Wildlife and Countryside Act (WCA) 1981 (as amended (Her Majesty's Stationary Office (HMSO), 1981);
- The Environment Act 2021 (HMSO, 2021);
- The Countryside and Rights of Way (CRoW) Act 2000 (HMSO, 2000);
- The Natural Environment and Rural Communities (NERC) Act 2006 (HMSO, 2006);
- The Conservation of Habitats and Species Regulations 2017 (as amended) (HMSO, 2017);
- The Protection of Badgers Act 1992 (HMSO, 1992);
- The Wild Mammals (Protection) Act 1996 (HMSO, 1996);
- The Hedgerow Regulations 1997 (HMSO 1997); and
- Invasive Alien Species (Enforcement and Permitting) Order 2019 (as amended) (HMSO, 2019).

The above legislation has been considered when planning and undertaking this PEA using the methods described in Section 4, when identifying potential constraints to the Proposed Development, and when making recommendations for further survey, design options and mitigation, as discussed in Section 6. Compliance with legislation may require the attainment of relevant protected species licences prior to the implementation of the Proposed Development.

Further information on the requirements of the above legislation is provided as Appendix A.

3.2 National planning policy

The National Planning Policy Framework (NPPF) was originally published on 27th March 2012 and detailed the Government's planning policies for England and how these are expected to be applied. The NPPF was then revised on the 24th July 2018 and on the 19th February 2019, and 20th July 2021 (Ministry of Housing, Communities and Local Government (MCHLG) (2021)).

The NPPF stated the commitment of the UK Government to minimising impacts on biodiversity and providing net gains in biodiversity. It specifies the obligations that Local Authorities and the UK Government have regarding statutory designated sites and protected species under UK and international legislation and how this is to be delivered in the planning system.

Protected or notable habitats and species can be a material consideration in planning decisions and may therefore make some sites unsuitable for particular types of development. If development is permitted, mitigation measures may be required to avoid or minimise impacts on certain habitats and species, or where impact is unavoidable, compensation may be required.

The NPPF is clear that pursuing sustainable development includes moving from no net loss of biodiversity to achieving net gains for nature, and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution.

3.3 Local Planning Policy

Relevant local planning policies for Horsham District Council and West Sussex County Council are detailed in the following documents:

- Horsham District Planning Framework (Horsham District Council, 2015);
- West Sussex Waste Local Plan (West Sussex County Council, 2014);

In addition, the Sussex Biodiversity Partnership (2007) has created habitat and species action plans for the County. The Sussex Biodiversity Partnership focusses on landscape-scale delivery, noting the importance of habitats for supporting protected and/or notable species. While none of the habitats within the Biodiversity Action Plan (BAP)

are of relevance to the Site, priority species of relevance to the Site include bats (including soprano pipistrelle, (*Pipistrellus pygmaeus)*, and brown long-eared bat, (*Plecotus auritus*) and great crested newt (*Triturus cristatus*)

Table 1 provides a summary of relevant planning policies. For the precise wording of each specific policy please refer back to the source document. This planning policy has been considered when assessing the potential ecological constraints and opportunities identified by the desk study and field surveys; and, when assessing requirements for further survey, design options and ecological mitigation, as described in Section 6.

Table 1. Summary of Local Planning Policy

Document	Planning Policy	Purpose
Horsham District Planning Framework	Policy 25: The Natural Environment and Landscape Character	To protect the natural environment, including protected landscapes and habitats from inappropriate development. To ensure this, the council will support proposals which *'Maintain and enhance the Green Infrastructure Network*', '*Maintain and enhance the existing network of…biodiversity, including safeguarding existing designated sites and species… ensures no net loss of wider biodiversity and provides net gains in biodiversity where possible*', and '*conserve and where possible enhance the setting of the South Downs National Park*'.
	Policy 26: Countryside Protection	To protect the rural character and undeveloped nature of the countryside from inappropriate development. This includes ensuring developments take in to account the ecological qualities, the patter of woodlands, fields, hedgerows, trees, and waterbodies and the landform of the area.
	Policy 30: Protected Landscapes	To conserve and enhance the natural beauty and public enjoyment of the High Weald Area of Outstanding Natural Beauty (AONB) and the South Downs National Park. Proposals within or adjacent to protected areas will need to demonstrate '*why the proposal is in the public interest and what alternatives to the scheme have been considered*'
	Policy 31: Green Infrastructure and Biodiversity	To maintain and enhance the existing network of green infrastructure by resisting proposals which result in the loss of green infrastructure, unless new opportunities can be created to mitigate or compensate any loss. The policy states *'Development proposals will be required to contribute to the enhancement of existing biodiversity, and should create and manage new habitats where appropriate…the Council will support development which makes a positive contribution to biodiversity through the creation of green spaces, and linkages between habitats to create local and regional ecological networks*'. This policy includes consideration of statutory and non-statutory protected sites and ancient woodland, and that any development that may impact the Arun Valley SPA or The Mens SAC will be subject to a HRA.
	Policy 33: Development Principles	To conserve and enhance the natural and built environment. This policy states that developments are required to '*Presume in favour of the retention of existing important landscape and natural features, for example trees, hedges, banks and watercourses…and justify and mitigate against any losses that may occur through the development*.'
	Policy 37: Sustainable Construction	To improve the sustainability of development. This policy states that proposals should '*incorporate measures which enhance the biodiversity value of development*'.
West Sussex Waste Local Plan	Policy W13: Protected Landscapes	This policy states that '*Proposals for waste development within protected landscapes will not be permitted*', unless the Site is allocated within an adopted plan, the proposal is of a small-scale and will meet local needs without undermining the designation, or the proposal is for a major development and accords with Part C of the policy. Part C stated that proposals will not be permitted unless there is an overriding need, they cannot be met in another way outside of the designated area and any adverse impacts can be mitigated. The policy also states that waste development proposals will be permitted if they are outside of protected areas and will not undermine the objectives of the designation.
	Policy W14: Biodiversity and Geodiversity	This policy states that waste development proposals will be permitted if sites with biodiversity importance (international, national, regional and local sites) are protected, unless there are no alternative solutions, and if the development will not result in the loss of or adversely affect an important site, area or feature, or if the harm is minimised,

Document	Planning Policy	Purpose
		mitigated or compensated for. The policy also states that proposals will be permitted if '*where appropriate, the creation, enhancement and management of habitats, ecological networks, and ecosystem services is secured consistent with wider environmental objectives, including Biodiversity Opportunity Areas and the South Downs Way Ahead Nature Improvement Area*'

4. Methodology

4.1 Desk study

A desk study was carried out in January 2023 to identify nature conservation designations and protected and notable habitats and species potentially relevant to the Proposed Development.

A stratified approach was taken when defining the desk study area, based on the likely zone of influence of the Proposed Development on different ecological receptors and, an understanding of the maximum distances typically considered by statutory consultees. Accordingly, the desk study identified any international nature conservation designations within 10km of the Site, and other statutory sites, non-statutory sites and protected and notable habitats and species within 2km of the Site.

The desk study was carried out using the data sources detailed in Table 2. Protected and notable habitats and species include those listed under Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended); Schedules 2 and 5 of the Habitats Regulations; species and habitats of Principal Importance for Nature Conservation in England listed under Section 41 (S41) of the NERC Act 2006; and other species that are Nationally Rare, Nationally Scarce or listed in national or local Red Data Lists and Biodiversity Action Plans.

Table 2. Desk Study Data Sources

Source	Accessed	Data Obtained
Multi-Agency Geographic Information for the Countryside (MAGIC) website	30/01/2023	• International statutory designations within 10 km • Other statutory designations within 2 km • Ancient woodlands and notable habitats within 1 km • Information on habitats and habitat connections (based on aerial photography) relevant to interpretation of planning policy and assessment of potential protected and notable species constraints
The Sussex Biodiversity Records Centre (SBRC)	20/01/2023	• Non-statutory designations within 2 km • Protected and notable species records including invasive non-native species within 2 km (records for the last 10 years only)

4.2 Field survey

The field survey comprised an extended Phase 1 habitat survey and an appraisal of the potential suitability of the habitats present within the Site to support roosting bats. Incidental evidence of any other protected species and invasive non-native species were also recorded.

4.2.1 Habitat Survey

During January 2023, an extended Phase 1 habitat survey was undertaken in accordance with the standard survey method (Joint Nature Conservation Committee, 2010), by two suitably qualified AECOM ecologists. While January is outside the main growing season for plants,, the surveys undertaken recorded all habitat types within the Site to an appropriate level of botanical detail to inform this PEA, and given the habitats present, the timing of the survey is not considered to be a significant limitation to the findings of this report.

Phase 1 habitat survey involves categorising different habitat types and habitat features within a survey area. The information gained from the survey can be used to determine the likely ecological value of a site, and to direct any more specific survey work which may need to be carried out prior to the submission of a planning application. The standard Phase 1 habitat survey method was "extended" to record target notes on protected, notable and invasive species. The surveyors recorded and mapped all habitat types present within the survey area, along with any

associated relevant ecological receptors observed. The survey area encompassed all safely accessible parts of the Site and adjacent habitats within a 10m buffer where access permission had been granted in advance of survey, or this land was visible from within the Site boundary or from public rights of way, or other publicly accessible areas.

Where relevant ecological receptors were present, target notes (Appendix C) were recorded and the position of these shown in Figure 1. Typical and notable plant species were recorded for different habitat types and reflect the conditions at the time of survey. This was not intended to be a detailed inventory of the plant species present in the Site.

Botanical nomenclature used for the purposes of this report follows Stace (2019).

4.2.2 Appraisal of potential suitability of habitats to support protected and notable species and invasive non-native species

During the Phase 1 survey an appraisal was made of the potential suitability of the habitats present to support protected and/or notable species of plants or animals (as defined in Section 3.1). Field signs, habitat features with potential to support such species and any sightings or auditory evidence were recorded when encountered. An initial assessment of trees and buildings to assess the suitability to support roosting bats was also undertaken (see Section 4.3.2).

A note was made of any visible instances of invasive non-native plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and species listed on the Invasive Alien Species (Enforcement and Permitting) Act 2019 (as amended), although it should be noted that the field survey took place in January, outside the main growing season for plants.

Section 6 of this report identifies further requirements for species survey based on the results of the habitat survey. These surveys should be completed prior to submission of a planning application, as the results are a material consideration in the determination of a planning application.

4.2.3 Assessment of Features for Suitability to Support Roosting Bats

A detailed inspection of trees and structures to be lost, or potentially lost or subject to disturbance (i.e. are within the Site Boundary or within a 10m buffer of the Site Boundary), was completed on 30th January 2023. The aim was to classify trees and structures within the Site for their suitability to support roosting bats. The assessment was completed by two AECOM ecologists, one of whom holds a Natural England WML-CL18 (Level 2) bat survey class licence. The survey was conducted in line with the Bat Conservation Trust (BCT) best practice bat survey guidelines (Collins, 2016) and BS 8596 *Surveying for bats in trees and woodlands* (British Standards, 2015).

Close focusing binoculars and a high-powered torch (Cluson Clulite) were used to conduct an external assessment of trees and structures from the ground. All potential access/egress points and features with suitability to support roosting bats (e.g. cracks, crevices) were identified and recorded along with any evidence which may have indicated the location of roosts, such as:

- Stains around entrance holes (resulting from the deposition of oil secretions in bat fur);
- Scratch marks around entrance holes (resulting from bat claw holds);
- Bat droppings;
- Feeding remains; and
- Odours or noise characteristic of bats.

On the basis of the survey, the overall suitability of each tree/structure to support roosting bats was classified using a scale of negligible, low, moderate, high or confirmed roost (see Appendix B for definitions of bat roost suitability categories). This assessment was based on both the intrinsic suitability of features to support roosting bats and other evidence giving an indication of the likelihood of use by bats (e.g. presence of droppings, lack of cobwebs, or exposure to elements).

4.3 Desk study and field survey limitations

The aim of the desk study was to help characterise the baseline context of the Site and provide valuable background information that would not be captured by a single site survey alone. Information obtained during the course of the desk study was dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for a particular habitats or species does not necessarily mean that

the habitats or species do not occur in the study area. Likewise, the presence of records for particular habitats and species does not automatically mean that these still occur within the area of interest or are relevant in the context of the Proposed Development.

Populations of annual plant species may fluctuate markedly between years dependent on the growing conditions present in any given season. Most such species are not visible or cannot be reliably mapped outside the growing season (May to September), and some species are only apparent during certain months. Populations of annual plant species may fluctuate markedly between years dependent on the growing conditions present in any given season.

The field survey took place in January, outside the main growing season for plants. Despite being outside of the optimal survey season, the surveys undertaken recorded all habitat types within the Site to an appropriate level of botanical detail to inform this PEA, and given the habitats present, the timing of the survey is not considered to be a significant limitation to the findings of this report.

Where habitat boundaries coincide with physical boundaries recorded on OS maps the resolution is as determined by the scale of mapping. Elsewhere, habitat mapping is as estimated in the field and/or recorded by hand-held GPS. Where areas of habitat are given they are approximate and should be verified by measurement on site where required for design or construction. While indicative locations of trees are recorded this does not replace requirement for detailed specialist arboricultural survey to British Standard 5837:2012 Trees in Relation to Design, Demolition and Construction.

Ecosystems are dynamic and constantly changing, and therefore species may move or new species may be recorded in subsequent years. For this reason, and in accordance with current guidance, the existing survey data has a ‘shelf-life’ of, and should only be relied on for a period of, two years from the date of survey, with the exception of the bat roost suitability survey, which has a ‘shelf-life’ of one year (CIEEM, 2019).

4.4 Quality assurance

AECOM Ecologists are members, at the appropriate level, of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct when undertaking ecological work.

5. Results

5.1 Nature conservation designations

5.1.1 Statutory designations

Table 3 details the statutory nature conservation designations identified by the desk study based on the method given in Section 4.1 of this report. The designations are listed in ascending order, with those closest to the Site listed first. No internationally designated sites were located within 10 km of the Site.

Table 3. Nationally statutory designated sites within 2km of the Site

Designation	Reason for designation	Size (Ha)	Relationship to the Site
Warnham SSSI	Geological and aquatic features	28.35	0.5km north-west of the Site
Warnham LNR	Diverse habitats with 10 species of amphibians and reptiles, 162 birds, 23 dragonflies and damselflies, 28 mammals including 7 bats, 366 plant species including grasses, sedges, rushes and ferns, as well as 523 species of moths.	38.35	1km south of the Site

Source: Multi-Agency Geographic Information for the Countryside (MAGIC) website

5.1.2 Non-statutory designations

Table 4 details the non-statutory nature conservation designations identified by the updated desk study based on the method given in Section 4.1 of this report. The designations are listed in ascending order, with those closest to the Site first. Three Local Wildlife Sites (LWS) are present within 2km of the Site.

Table 4. Non-statutory designated sites within 2km of the Site

Designation	Description	Size (Ha)	Relationship to the Site
Brockhurst Wood & Gill & Morris's Wood (LWS)	Semi- natural hornbeam (*Carpinus betulus*) coppiced woodland, Rich ground flora including ancient woodland indicators	28.9	0.5 km north-east of the Site
Warnham Mill Pond (LWS)	Open water, freshwater marsh and broadleaved plantation	38.2	1km south of the Site
Tickfold Gill (LWS)	Semi - natural woodland, stream and neutral grassland. Predominantly old hornbeam coppice	23.5	2km north-west of the Site

Source: The Sussex Biodiversity Records Centre (SBRC)

5.1.3 Ancient Woodland

22 areas of ancient woodland were identified within 1km of the Site, none of which are within or adjacent to the Site. The Site is surrounded in all directions by many small areas of ancient woodland with connectivity between them by hedgerows and trees in field margins. None of the below are directly connected to the Site.

- Unnamed ancient woodland 0.1km west of the Site. No connectivity to the Site due to railway line.
- Unnamed ancient woodland 0.3km west of the Site.
- Unnamed ancient woodland 0.3km east of the Site.
- Unnamed ancient woodland 0.3km east of the Site.
- Unnamed ancient woodland 0.4km north-west of the Site.
- Unnamed ancient woodland 0.4km south of the Site.
- Unnamed ancient woodland 0.5km north-west of the Site.
- Unnamed ancient woodland 0.5km north of the Site.

- Unnamed ancient woodland 0.5km north-east of the Site.
- Unnamed ancient woodland 0.5km north-east of the Site.
- Unnamed ancient woodland 0.5km south of the Site.
- Unnamed ancient woodland 0.6km south-west of the Site.
- Unnamed ancient woodland 0.7km north of the Site.
- Unnamed ancient woodland 0.7km east of the Site.
- Unnamed ancient replanted woodland 0.7km east of the Site.
- Unnamed ancient woodland 0.7km east of the Site.
- Unnamed ancient woodland 0.8km north of the Site.
- Unnamed ancient woodland 0.8km east of the Site.
- Unnamed ancient woodland 0.8km south-east of the Site.
- Unnamed ancient woodland 0.9km west of the Site.
- Unnamed ancient woodland 0.9km north-west of the Site.
- Unnamed ancient woodland 0.9km east of the Site.

5.2 Habitats

The extent and distribution of the habitats recorded are shown in Figure 1 in Appendix C.

The majority of the Site comprises hardstanding and bare ground, with some buildings. Scrub is present in the east of the Site, adjacent to an access road.

Table 5. Table showing the habitats present within the Site

Habitat	Description	Area (ha)
Hardstanding	A large, paved area with piles of recycling material and an access road	2.78
Bare ground	One area of bare ground with piles of recycling on it. One area of bare ground with rubble	1.97
Dense scrub	An area of scrub with willow (*Salix* sp.) and buddleia (*Buddleja davidii*) along an access road	1.44
Scattered scrub	An area of scattered willow and buddleia scrub adjacent to a building	<0.01
Buildings	Two corrugated steel barns and the remains of old derelict buildings	0.4

5.2.1 Hardstanding

Hard standing was recorded in the form of a large, paved area where piles of recycling material are present (Plates 1 and 2). Additional hard standing within the Site consists of an access road.

Plate 1. Hardstanding present within the Site

Plate 2. Hardstanding present within the Site

5.2.2 Dense scrub

Dense scrub was recorded in the east of the Site. The dense scrub in the east of the Site (Plate 3) consists primarily of buddleia and willow.

Plate 3. Dense scrub present within the east of the Site

5.2.3 Bare Ground

The Site has a substantial amount of bare ground. There are two main areas of bare ground:

- In the west of the Site, where the bare ground was predominantly covered by large piles of material for recycling. Where the ground was visible this appeared to be bare ground, however there is a possibility that this may have been a thin layer covering what would otherwise be hardstanding (Plate 4)
- In the east of the Site, the bare ground comprised an area of disused land with a substantial quantity of rubble integrated into the soil (Plate 5)

Plate 4. Bare ground in the west of the Site, partially flooded at the time of survey

Plate 5. Bare ground in the east of the Site

5.2.4 Buildings

There are several buildings within the Site. In the north of the Site is Burts Barn (Plate 6). In the south-east of the Site is another building (Building 1), comprised of corrugated metal (Plate 7).

Plate 6. Burts Barn in the north of the Site. This building is considered to have low suitability to support roosting bats.

Plate 7. Building 1 in the south-east of the Site

Other buildings present within the Site were derelict and mostly deconstructed, with large amounts of buddleia growing around them (Plate 8).

Plate 8. Example of a derelict building within the Site

5.2.5 Notable habitats

Based on the results of the Phase 1 habitat survey and with reference to guidance for the recognition of the Natural Environment and Rural Communities (NERC) Act Section 41 (Maddock, 2008) and Local Biodiversity Action Plan (LBAP) quality habitats, none of the habitats recorded within the Site are classified as notable.

5.3 Protected and notable species

This section provides a summary of potentially relevant species identified through a combination of desk study and field survey. Where species are identified in Appendix D or below in as potentially relevant to the Site, they are likely to represent legal constraints or may be material to determination of a planning application. Further surveys will or may be required to determine presence or probable absence. Requirements for further survey are identified in Section 6 of this report. The results of the desk study are in Appendix D.

5.3.1 Bats

The desk study returned at least four species of bat within 2km of the Site. Species recorded included common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle, brown long-eared bat, and *Myotis* species.

The dense scrub along the edge of the Site may provide a suboptimal linear feature for commuting and foraging by bats.

5.3.1.1 Assessment of suitability of structures and trees to support roosting bats

None of the trees present within the Site were identified as having more than a negligible suitability to support roosting bats. One of the buildings present within the north of the Site, Burts Barn, was assessed as having low suitability for roosting bats. The other buildings present within the Site had negligible suitability.

Burts Barn comprises a single storey, brick building with a pitched, corrugated asbestos roof, and corrugated asbestos wall sheets on the gable ends (as seen in Plate 6). Small gaps are present between asbestos wall sheets and the metal building frame on the eastern gable end (Plate 9). Gaps are also present between the roof overlap and the building frame on the eastern and western gable ends (Plates 9 and 10).

No roof void is present internally with the interior open to the rafters (Plate 11). No signs of bats were recorded.

Plate 9. Eastern gable end of Burts Barn, with features suitable for use by roosting bats shown by red boxes

Plate 10. Gap beneath roof overlap on western gable end

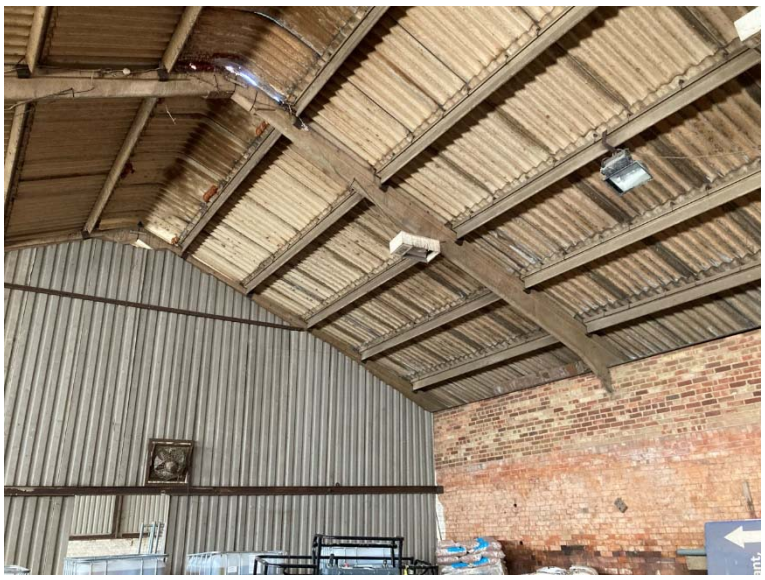

Plate 11. Interior of Burts Barn

5.3.2 Great Crested Newt

5.3.2.1 Desk Study

The desk study returned records for great crested newt within 2km of the Site in the last 10 years. The nearest record is 0.36km east of the Site in 2017. The most recent record is 1.64km east of the Site in 2021.

There are four ponds within 250m of the Site. Two within 130m to the south of the Site and two 170m to the east. These ponds were surveyed in 2022, with great crested newt found likely to be absent (AECOM, 2022).

5.3.3 Reptiles and Amphibians

5.3.3.1 Desk Study

The desk study returned records of five species of amphibian (not including great crested newt) within 2km during the last 10 years. Within the same range, records for two species of reptiles were returned, grass snake (*Natrix helvetica*) and slow worm (*Anguis fragilis*).

5.3.3.2 Field Survey

The majority of the Site consists of hardstanding and bare ground and as such, it is considered likely to be of negligible value for reptiles. The scrub present within the Site has low potential to be used by reptiles due to its low quality and poor connectivity to other suitable habitat

There are four ponds within 250m of the Site which may be suitable for amphibians. Two within 130m to the south of the Site and two 170m to the east. These ponds were surveyed in 2022 (AECOM, 2022). During these surveys, the two ponds in the east were found to support smooth newt (*Lissotriton vulgaris*). Great crested newts were considered likely to be absent following the surveys.

5.3.4 Nesting Birds

5.3.4.1 Desk study

150 species of bird were recorded within 2km of the Site within the past 10 years. Of these birds, 25 are protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). However, not all of these species are likely to be found within the Site, due to the habitats present.

5.3.4.2 Field Survey

The individual broadleaved tree and scrub habitat and buildings within the Site offer suitable habitat to support common nesting bird species.

5.3.5 Terrestrial Invertebrates

5.3.5.1 Desk study

The desk study returned records of 85 species of protected or rare invertebrates within a 2km radius of the Site within the past 10 years.

5.3.5.2 Field Survey

The scrub present on site is suitable for terrestrial invertebrates. However, it is considered unlikely that notable assemblages of invertebrates are present.

5.3.6 Other protected species

No signs of badger (*Meles meles*) were recorded within the Site and no suitable habitat is present on the Site. There was no suitable habitat within the Site for hazel dormice (*Muscardinus avellanarius*) due to lack of foodplants and absence of connectivity of scrub habitats to suitable offsite habitat. There was no suitable habitat within the Site for otter (*Lutra lutra*) or water voles (*Arvicola amphibius*). Records of the NERC Act Section 41 listed species of principal importance, European hedgehog *(Erinaceus europaeus*), were returned by the desk study. This species should be included within the precautionary method of working during site clearance.

5.3.7 Invasive Species

5.3.7.1 Field Survey

The desk study returned records of 16 invasive non-native species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) including Himalayan balsam (*Impatiens glandulifera*), and rhododendron (*Rhododendron ponticum*). The desk survey returned records of an additional 4 species that are not listed under Schedule 9 but are included in the Sussex Invasive Non-native Species report. All records are 2km from the Site. No invasive plants or animals were recorded during the extended Phase 1 habitat survey.

6. Ecological Constraints and Recommendations

6.1 Approach to the identification of ecological constraints

Relevant ecological receptors that may represent constraints to the Proposed Development, or that provide opportunities to deliver ecological enhancement in accordance with planning policy, are identified in Section 5 of this report.

The NPPF and local planning policy (summarised in Section 3 of this report) specify requirements for the protection of features of importance for biodiversity. Planning policy is a material consideration when determining planning applications.

Compliance with planning policy requires that a development considers and engages the following mitigation hierarchy where there is potential for impacts on relevant ecological receptors:

1. Avoid features where possible.
2. Minimise impact by design, method of working or other measures (mitigation) e.g. by enhancing existing features.
3. Compensate for significant residual impacts, e.g. by providing suitable habitats elsewhere (whether in the control of the client or otherwise legally enforceable through planning condition or Section 106 agreement).

This hierarchy requires the highest level to be applied where possible. Only where this cannot reasonably be adopted should lower levels be considered. The rationale for the proposed mitigation and/or compensation should be provided with planning applications, including sufficient detail to show that these measures are feasible and would be provided.

In pursuance of the objective within the NPPF of providing net gains in biodiversity where possible, consideration should be given to the scope for enhancement as part of the Proposed Development. This should represent biodiversity gain over and above that achieved through mitigation and compensation. Enhancement could be achieved on and/or off the Site.

The likelihood of the relevant ecological receptors constraining the Proposed Development has been assessed with reference to the scale described in Table 5. The higher the importance of the ecological receptor for the conservation of biodiversity at national and local scales, the more likely it is to be a material consideration during determination of the planning application (if required) for the Proposed Development.

Opportunities for ecological enhancement are identified in Section 6.5 of this report. There may be scope for ecological enhancement where existing habitat features could be improved or enhanced within the Proposed Development as designed. Ecological enhancement may not be possible where there is little scope to accommodate enhancement within the Proposed Development, e.g. due to a lack of utilisable space, or where land is required for essential mitigation. Consideration could be given to enhancing biodiversity in the vicinity of the Site.

Table 6. Scale of constraint in development

Likelihood	Definition
High	An actual or potential constraint that is subject to relevant legal protection and is likely to be a material consideration in determining the planning application (e.g. statutory nature conservation designations and European/nationally protected species). Further survey likely to be required (as detailed for bats in this report) to support a planning application.
Medium	An actual or potential constraint that is covered by national or local planning policy and, depending on the level of the potential impact as a result of the Proposed Development, may be a material consideration in determining the planning application. Further survey may be required (as detailed in this report) to support a planning application.

Likelihood	Definition
Low	Unlikely to be a constraint to development or require further survey prior to submission of a planning application. Mitigation is likely to be covered under Construction Environmental Management Plan (CEMP) or precautionary working method statement (e.g. generic requirements for the management of nesting bird risks).

The constraints outlined here will need to be reassessed if there is a significant change to the type or scale of works proposed, or if there are any significant changes in the use or management of the land that would affect the habitats and species. If a planning application is made two years or more after a PEA it is advisable to review and update the survey data. Bat roost suitability assessment data is considered to be valid for a period of one year. Great crested newt presence/ absence data it considered to be valid for a period of up to two years.

6.2 Constraints and requirements for further survey: Designations

The desk study did not identify any internationally designated sites for nature conservation located within 10km of the Site

The desk study identified two nationally statutory designated sites for nature conservation within 2km of the Site. The closest of which is Warnham (SSSI) which is situated approximately 500m north-east of the Site. However, this is a geological SSSI and therefore not relevant to ecological considerations as a designation. Warnham LNR is located approximately 1km south of the Site. Given the distance of the statutory site from the Proposed Development, it is considered that there is no link between the Proposed Development and statutorily designated sites.

The desk study identified six non statutory designated sites within 2km of the Site of the Proposed Development, the closest of which is Brockhurst Wood & Gill & Morris's Wood Local Wildlife Site (LWS), which is situated approximately 500m northeast of the Site. Given the distance of the LWSs from the Proposed Development no adverse impacts are anticipated as a result of the Proposed Development either from construction or operation. Any leachate will be collected reused to irrigate windrows or send off site for treatment or as use as an organic fertiliser.

There are 22 ancient woodlands within 1km of the Site, with the closest 0.1km from the Site. Given the scale of the proposed works and distance from the closest ancient woodland, assuming that standard best practice construction methods are implemented as part of a Construction Environmental Management Plan (CEMP) it is unlikely to be affected either directly or indirectly by the works associated with the construction or operation Proposed Development. The standard best practice measures that should be included in a CEMP will comprise measures to control noise, dust and pollution as a consequence of site clearance and development works, which may include (but are not limited to) the following measures where appropriate to the nature of the works:

- All vehicles and mechanical plant will be fitted with exhaust silencers;
- Acoustic covers used over generators and other plant;
- Plant and machinery will be turned off when not in use;
- Enclosure and sheeting of material stockpiles;
- Sheltered location for material storage;
- The use of wheel washes to reduce the trafficking of soil onto adjacent highways with prompt clearance as a remedial action;
- The use of a bowser on-site during extended periods of dry weather to damp down dust;
- Sheeting of vehicles carrying spoil;
- Dust suppression measures for any on-site crushers; and
- Bunding of fuel stores and material stockpiles to prevent pollution.

6.3 Constraints and requirements for further survey: Habitats

No habitats of principle importance were recorded within the Site. It is recommended that a Construction Environment Management Plan (CEMP) be prepared and then implemented during construction to prevent adverse impacts to any semi-natural habitats that are being retained.

The CEMP will include best practice measures to control noise, dust and pollution as a consequence of site clearance and development works, as outlined in Section 6.2 above.

6.4 Constraints and requirements for further survey: Species

6.4.1 Bats

All UK native bat species and their roosts are protected under the Conservation of Habitats and Species Regulations 2017 (as amended) and under the Wildlife and Countryside Act 1981 (as amended). A bat roost is defined as any structure showing evidence of use by bats, whereby a roost is afforded protection even when bats are absent. Under this legislation it is an offence to deliberately, intentionally or recklessly kill, injure or disturb a bat in any structure which the bat uses for shelter or protection or obstruct or modify a roost.

One building (Burts Barn) was found within the Site that has a low suitability for bats. If works to this building are required, or within 10m of the building, a single bat emergence survey should be undertaken to determine the presence or likely absence of roosting bats. The survey should be undertaken in line with current best practice guidelines from the Bat Conservation Trust (Collins, 2016). Surveys can be undertaken between May and August inclusive. If roosting bats are recorded within Butrs Barn, an additional two bat emergence surveys will be required between May and August inclusive to characterise the roost (i.e. determine the species present and the type of roost) to increase the survey effort to the level required for confirmed roosts and support a European Protected Species Mitigation Licence (EPSML) application to Natural England, if required.

All other buildings and trees within or adjacent to the Site are of negligible suitability to support roosting bats; therefore, they do not require further survey with regards to bats.

6.4.2 Nesting birds

Under the Wildlife and Countryside Act (1981 as amended) it is an offence to kill, injure or take a wild bird, or to intentionally take, destroy or damage the nest or eggs of a wild bird. Special protection is also afforded to species listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). These birds are rare, endangered, declining or vulnerable species. In addition to the protection afforded to all bird species, it is an offence to cause reckless or intentional disturbance to the specially protected Schedule 1 listed species when they are building nests. Specially protected birds are listed in Annex 1 of the EU Directive on the Conservation of Wild Birds (2009).

Trees, scrub and buildings within and immediately adjacent to the Site offer suitable habitat to support common nesting bird species. Therefore, it is recommended that where vegetation clearance within these habitats is required, this takes place during the winter months (October – February inclusive) in order to avoid impacts on nesting birds. If site clearance is required between March and September inclusive (for example, to be in line with recommendations for other protected species), absence of nesting birds must be confirmed by a suitably qualified ecologist immediately prior to works commencing.

6.4.3 Great crested newt

Great crested newts are afforded full protection under the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2017 (as amended). Under this legislation it is an offence to deliberately capture, injure, disturb or kill a great crested newt, or to deliberately take or destroy its eggs. It is also an offence to deliberately or recklessly damage, destroy or obstruct access to any structure which a great crested newt uses for shelter or protection. This protection includes both the breeding pond itself and terrestrial habitat utilised for foraging and hibernation which may be distant from the breeding pond.

The great crested newt is listed as a species of principal importance within Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

Great crested newt habitat is widely considered to extend up to 500m (the accepted maximum roaming distance[1]) from a breeding pond where areas of connective suitable habitat exist. Habitats within 50m of a breeding pond are considered to constitute 'core' habitat, within 50m to 250m 'intermediate' habitat and over 250m 'distant' habitat. In this instance 250m is considered to be a suitable distance for consideration of waterbodies that could support great crested newts due to the suboptimal nature of habitats and connectivity for amphibians within or immediately adjacent to the Site

There are four ponds within 250m of the Site. Two ponds are within 130m to the south of the Site, and two are 170m to the east. These ponds were surveyed in 2022 (AECOM, 2022) and great crested newt were found to be likely to be absent. Therefore, no further surveys are recommended at this time. In accordance with current guidance (CIEEM , 2019) the existing great crested newt survey data has a 'shelf-life' of, and should only be relied on for a period of, two years from the date of survey.

6.4.4 Reptiles and other amphibians

The four common and widespread reptile species grass snake, slow worm, common lizard (*Zootoca vivipara*) and adder (*Vipera berus*) and five amphibians, common frog (*Rana temporaria*), common toad (*Bufo bufo*), palmate newt (*Lissotriton helveticus*), smooth newt (*Lissotriton vulgaris*) and pool frog (*Pelophylax lessonae*) are all protected under the Wildlife and Countryside Act 1981 (as amended). All four common reptile species and common toad, pool frog, and great crested newt are listed as Species of Principal importance within Section 41 of the NERC Act (2006).

Habitats utilised by reptiles tend to include open, sunny and undisturbed land. Therefore, only small areas of habitat that are potentially suitable to support reptiles were present within the Site, comprising scrub.

Although grass snake and slow worm been recorded within the wider area, the suitable areas on Site for these species are small and lack connectivity. As such it would be very unlikely to find a significant population of reptiles on the Site and further survey would not be proportional to the value of the Site for the species or extent of the works.

Smooth newt were recorded within two ponds, both approximately 170m east of the Site (AECOM, 2022). While smooth newt hold no legal protection other than that provided by subsection 9.5 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to sell them, general animal welfare guidelines do apply and measures recommended for reptiles below will also reduce risks to smooth newt, in the unlikely event that they are present in terrestrial habitat.

While no further surveys for common reptiles or amphibians are recommended, legislation must still be considered with regards to killing or injuring common reptiles. Therefore, works are recommended to be carried out under a precautionary working method using a two-stage phased clearance method during the period when reptiles and amphibians are likely to be active (March to October, weather dependent), and absence of common reptiles and amphibians must be confirmed by a suitably qualified ecologist immediately prior to works commencing.

6.4.5 Badgers

No records of badgers were returned within the desk study in the last 10 years. Additionally, no signs of badger were recorded within the Site and no suitable habitat is present on the Site due to the topography.

6.4.6 Common Invertebrates

Loss of vegetation would lead to loss of habitat for use by common invertebrates. Where possible within the design, log piles could be incorporated into soft landscape designs to benefit invertebrates.

[1] Great crested newt habitat is widely considered to extend up to 500m (the accepted maximum roaming distance) from a breeding pond where areas of connective suitable habitat exist. Natural England's method statement template states that 'In keeping with a proportionate and risk-based approach, surveys need reasonable boundaries. The Great crested newt mitigation guidelines explains that survey of ponds up to around 500m from the development might need to be surveyed. The decision on whether to survey depends primarily on how likely it is that the development would affect newts using these ponds. For developments resulting in permanent or temporary habitat loss at distances over 250m from the nearest pond, carefully consider whether a survey is appropriate. Surveys of land at this distance from ponds are normally appropriate when all of the following conditions are met: (a) maps, aerial photos, walk-over surveys or other data indicate that the pond(s) has potential to support a large great crested newt population, (b) the footprint contains particularly favourable habitat, especially if it constitutes the majority available locally, (c) the development would have a substantial negative effect on that habitat, and (d) there is an absence of dispersal barriers.'

6.4.7 Other Protected or Otherwise Notable Species

There are no further recommendations for other protected or otherwise notable species.

6.4.8 Invasive non-native species

Contractors should maintain vigilance for invasive non-native species, and an ecologist should be consulted should any be discovered.

Table 7. Summary Appraisal of Ecological Constraints and Recommended Further Action

Receptor	Scale of Constraint	Further Requirements, Including Potential Mitigation Requirements	Driver	When is Action Likely to be Required?		
				To Inform Design	Before Planning Application	Pre-construction Onwards
Bats	Low	One building on site was found to have low suitability for roosting bats. A single bat emergence survey should be undertaken between May and August inclusive. All other buildings and trees within the Site were confirmed as having negligible suitability for bats, therefore no further survey is required. The habitats within the Site are suboptimal for foraging and commuting bats and therefore bat activity surveys have not been recommended.	Legislation	x	✓	✓
Nesting birds	Low	Vegetation clearance and building demolition should be undertaken during winter (October – February) if possible. A nesting bird check may be required prior to building demolition or vegetation removal at other times of year.	Legislation	x	x	✓
Great crested newts	Low	A 2022 survey of all ponds within 500m of the Site found no evidence of great crested newt. No further survey is required as at the time of writing this data is considered to be in date, but will be valid for a period of two years after collection.	Legislation	x	x (if after spring 2024)	✓
Common reptiles and amphibians	Low	The Site comprises some limited suitable habitat for common reptiles and amphibians. Given the limited land take compared to the amount of suitable habitat it is considered unlikely the Proposed Development would involve significant impacts on common reptiles and amphibians providing care is taken to reduce the risk of killing and injury through the use of a precautionary working method	Legislation	x	x	✓
Badger	Low	Badgers are not considered to be present on the Site and there is not suitable habitat adjacent to the Site. No further survey is required.	Legislation	x	x	x
Hedgehog	Low	Records of the NERC Act Section 41 listed species of principal importance, European hedgehog (Erinaceus europaeus), were returned by the desk study. This species should be included within the precautionary method of working during site clearance.	Legislation	x	x	□
Invasive non-native species	Low	No species listed under Schedule 9 of the Wildlife & Countryside Act 1981 or The Sussex invasive non-native species report were recorded on Site. Contractors should remain vigilant and contact an ecologist if an invasive non-native species is found or suspected	Legislation	x	x	✓

7. Conclusions

The Site predominantly comprises hardstanding and bare ground with stockpiles present. There is also an area of scrub in the east of the Site. The Site is adjacent to the Aggregate Treatment and Recycling Facility located at Brookhurst Wood, Horsham.

The desk study returned records of two statutorily designated sites for nature conservation within 2km of the Proposed Development, the closest of which is Warnham SSSI 0.5 km north-east of the Site. There are six non-statutorily designated sites for nature conservation within 2km of the Site. Given the scale of the Proposed Development and the distance of the designated sites from the Site, adverse impacts to these designations or any other statutory or non-statutory sites are not anticipated during the construction and operational phases of the Proposed Development. There are 22 ancient woodlands within 1km of the Site, with the closest 0.1km from the Site. Given the scale of the Proposed Development, assuming that standard best practice construction methods are implemented as part of a Construction Environmental Management Plan (CEMP) ancient woodlands are unlikely to be affected either directly or indirectly by the Proposed Development during the construction and operational phases.

One building was found to have low suitability for roosting bats. A single bat emergence survey of this building is required to determine the presence or likely absence of roosting bats. All other buildings and trees within and adjacent to the Site were assessed as negligible suitability for roosting bats and no further survey is required. The habitats within the Site are suboptimal for foraging and commuting bats, limited to a line of scrub, and therefore bat activity surveys have not been recommended.

Trees and scrub within the Site have the potential to support common nesting bird species. Therefore, it is recommended that all vegetation clearance takes place during the winter months (October – February inclusive) where possible to reduce the potential for impacts on nesting birds. If site clearance is required between March and September inclusive (e.g. due to precautionary working methods required for other species, such as reptiles), absence of nesting birds must be confirmed by a suitably qualified ecologist immediately prior to works commencing.

There are four ponds within 250m of the Site. A great crested newt survey in 2022 concluded that great crested newt were absent from all four of these ponds (AECOM, 2022). Therefore, no further consideration of great crested newt is required. In accordance with current guidance (CIEEM , 2019) the existing great crested newt survey data has a ‘shelf-life’ of, and should only be relied on for a period of, two years from the date of survey., after which it should be updated

The Site supports some limited areas suitable for reptiles. It is recommended that clearance works within suitable reptile habitat is carried out under a precautionary working method. Given the limited area it is unlikely the Proposed Development would involve significant impacts on reptiles, provided care is taken to reduce the risk of killing and injury.

No signs of badgers (*Meles meles*) were recorded within the Site and no suitable habitat is adjacent to the Site. No further survey is required.

No species listed on the Sussex Invasive Nonnative Species (INNS) list or on schedule 9 of the Wildlife and Countryside Act. If any listed species is found during works, it is not a requirement to remove the species from the Site. However, care should be taken to reduce the risk of spread of these species if found.

The recommendations outlined within this report will need to be reassessed if there is a significant change to the type or scale of the Proposed Development, or if there are any significant changes in the use or management of the land that would affect the habitats and species. Such changes may require additional surveys for protected species to be conducted. If a planning application is made two years or more after the surveys detailed within this report have been conducted, it is advisable to review and update the survey data. The existing great crested newt survey data held is valid until Spring 2024.

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Appendix A – Legislation and Planning Policy

The Wildlife and Countryside Act, 1981 (as amended)

The Wildlife and Countryside Act 1981 (as amended) is the major domestic legal instrument for wildlife protection in the UK, and is the primary means by which the following are implemented:

- The Convention on the Conservation of European Wildlife and Natural Habitats ('the Bern Convention'); and
- The Council Directive 79/409/EEC on the Conservation of Wild birds (the 'Bird Directive')

The main relevant provisions of the Act are: allowance for the protection of the most important habitats and species by designating SSSI's, a level of protection to all nesting wild birds and specific bird species under Schedule 1.

The Environment Act, 2021

The Environment Act 2021, published by the UK Government as the Environment Bill in October 2019 (Environment Bill, 2019), includes proposals to make biodiversity net gain (BNG) a mandatory requirement within the planning system in England. The Bill is was given Royal Assent on 10th November 2021 and the biodiversity elements of the Act include:

- Strengthened biodiversity duty;
- Biodiversity net gain to ensure developments deliver at least 10% increase in biodiversity;
- Local Nature Recovery Strategies to support a Nature Recovery Network;
- Duty upon Local Authorities to consult on street tree felling;
- Strengthen woodland protection enforcement measures;
- Conservation Covenants;
- Protected Site Strategies and Species Conservation Strategies to support the design and delivery of strategic approaches to deliver better outcomes for nature;
- Prohibit larger UK businesses from using commodities associated with wide-scale deforestation; and
- Requires regulated businesses to establish a system of due diligence for each regulated commodity used in their supply chain, requires regulated businesses to report on their due diligence, introduces a due diligence enforcement system.

The Countryside and Rights of Way (CroW) Act, 2000

Part III of this Act deals specifically with wildlife protection and nature conservation in England and Wales. The CroW Act strengthened the safeguards afforded to SSSIs.

Conservation of Habitats & Species Regulations, 2017 (as amended)

The original Regulations transposed the EU Directive on Natural Habitats, and Wild Fauna and Flora 9/43/EEC) into domestic legislation. The regulations were consolidated in 2017 and amended in 2018 to include:

- Amendments in 2007 and 2009 that addressed a number of gaps and inconsistencies in the original legislation and provided a greater legal certainty and clarity in a number of areas;
- Amendments in April 2010 that brought up to date to consolidate changes made since 1994. The Regulations afford a high level of protection to a variety of species that are considered important at a European scale. The Regulations identify European Protected Species and various habitats of importance within the European Union, with important Sites for these habitats/species or both being designated as special Areas of Conservation (SAC). Any Proposed Development that may have a significant effect on a SAC or Special Protection Area (SPA) should be assessed in relation to the Site's 'conservation objectives', i.e. the reasons for which the Site is designated.
- Amendments in 2012 to place new duties on public bodies to take measures to preserve, maintain and re-establish habitat for wild birds. They were also amended to ensure certain provision of the Habitats Directive and the Birds Directive were transposed clearly and Section 15 was amended to make clear that Local Nature Reserves can be designated for re-establishing bird habitat.

The new Regulations simplified the species protection regime to better reflect the Habitats Directive, providing a clear legal basis for surveillance and monitoring of European Protected Species (EPS). The Regulations also amended the WCA, updating Schedules 5 and 8 to consider provisions made by the Habitat Regulations 1994 in relation to the protection of EPS. They also offered further clarification to Part 4 of Section 9 considering "reckless" offences on wild animals, which was previously amended by the CROW Act 2000.

Natural Environment and Rural Communities (NERC) Act, 2006

Section 41 of the NERC Act requires the listing of habitats and species that are considered to be of Principal Importance for the conservation of biodiversity in England, including habitats and species in England that have been identified as priorities within the UK Biodiversity Action Plan (UKBAP).

The NERC Act requires that the section 41 list be used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the NERC Act 2006 'to have regard' to the conservation of biodiversity in England, when carrying out their normal functions.

The Protection of Badgers Act, 1992

Badgers and their setts are protected under the Protection of Badgers Act 1992. In England and Wales this makes it an offence to:

- Wilfully kill, injure or take a badger (or attempt to do so);
- Cruelly ill-treat a badger;
- Dig for a badger, intentionally or recklessly damage or destroy a badger sett, or obstruct access to it; cause a dog to enter a badger sett; and
- Disturb a badger while it is occupying a sett.

The Wild Mammals (Protection) Act 1996

The Wild Mammals (Protection) Act states it is an offence to intentionally cause all wild mammals unnecessary suffering by certain methods, including crushing and asphyxiation (suffocation). This includes common mammals such as red fox (*Vulpes vulpes*).

The Invasive Alien Species Act. (Enforcement and Permitting) Order 2019

The Invasive Alien Species Regulations (Ref 6-7) sets out to address the problems concerned with invasive alien species (IASs) in order to protect native biodiversity and ecosystem services and minimize and mitigate the human health and/or economic impacts that IASs can have. It sets out rules to prevent and manage the introduction and spread of IASs through prevention, early detection and rapid eradication, and management.

National Planning Policy Framework

The latest version of the NPPF came into being in July 2021, relevant sections are as follows:

Section 15 of the NPPF relates specifically to 'Conserving and Enhancing the Natural Environment'. Paragraph 170 states that '*Planning policies and decision should contribute to and enhance the natural and local environment by:*

a. *protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
b. *recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
c. *maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
d. *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
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; and

f. *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.'*

Paragraph 171 states that '*Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.* '

Paragraph 174 states that '*To protect and enhance biodiversity and geodiversity, plans should:*

a. *Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and*

b. *promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity. '*

Paragraph 175 states that '*When determining planning application, local planning authorities should apply the following principles:*

a. *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;*

b. *development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*

c. *development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and*

d. *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.'*

Paragraph 176 states that '*The following should be given the same protection as habitats sites:*

a. *potential Special Protection Areas and possible Special Areas of Conservation;*

b. *listed or proposed Ramsar sites; and*

c. *sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites. '*

Paragraph 177 states that '*The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site. '*

Appendix B – Grading of suitability of features to support roosting bats

Suitability to Support Roosting Bats	Description
Confirmed Roost	A feature within which bats are seen to be present (either live bats, or bat carcasses) or heard 'chattering' inside will be classified as a confirmed roost. In addition any feature/structure found to contain droppings during inspections will in the first instance be considered as a confirmed roost. N.B. In some cases it may be appropriate to revise this assessment following further survey (e.g. for buildings containing low numbers or old droppings and showing no evidence of use during emergence surveys).
High	A feature which, due to its size, depth, shape, orientation or other physical properties (such as ability to maintain a constant temperature, accessibility for bats) is considered to be ideal for use by bats. Potential feeding remains, urine staining or scratch marks (in the absence of droppings) within or around the feature are likely to indicate presence of a bat occupation and therefore suggest high risk that a roost is present. In the absence of such signs, assigning a feature high risk will also be informed by the surveyor's knowledge of bat ecology and preferred roost types (relative to the feature being assessed). The quality of the surrounding habitat for bats will also be considered. For example. A building within an area of woodland is more likely to be occupied by bats than one adjacent to large areas of hard standing (as the bats would use the woodland for feeding, and potentially roosting). Potential examples of high risk features are: • A south facing opening on a trunk that appears to form a significant wound within the tree, with uncluttered drop zone and good connectivity to other areas of suitable habitat; or • Gap below a ridge tile that provides potential point of access to a pitched roof, with marked cleaner tile below indicating potential use by bats.
Moderate	A feature which would be considered ideal for use by bats were it not for one or more key factors which limit its potential. For example, an ideal feature in sub-optimal surrounding habitat (e.g. within an area of predominately hard standing) may be considered to have moderate risk.
Low	A tree / structure containing features where use by bats cannot be ruled out but is considered unlikely based on size, depth, construction aspect, habitat location etc. For example often metal warehouse structures with suitable access/egress points will be classed as having low risk of supporting roosting bats.
Negligible	A tree / structure with no features suitable to support roosting bat species.

Appendix C - Habitat Map and Target Notes

Table 8. Target notes

Note Number	Target Note
1	Building with corrugated metal walls, Negligible suitability for bats
2	Burts Barn, low suitability for bats. External features, lighter roofing namely asbestos sheeting. No internal space, potential for summer roosts only
3	Large machinery present on site
4	Area used for container storage

Appendix D – Desk Study Results

Table 9. Table showing the results of the desk study

Species	Legally Protected Species?	Species of Principal Importance?	Other Notable Species?	Present on Site?	Possibly Present on Site?	Present / Potentially Present in Wider Zone of Influence?	Most recent record (distance, bearing and date)	Closest record (distance, bearing and date)
Amphibians								
Common toad *Bufo*	✓	✓	✓	X	X	✓	1.98 km, east, 2021	1.61km, south, 2021
Great crested newt *Triturus cristatus*	✓	✓	✓	X	X	✓	1.64 km, east, 2021	0.36km, east, 2017
Smooth newt *Lissotriton vulgaris*	✓	✓	X	X	✓	✓	0.36km, east, 2017	0.1km, north, 2017
Palmate newt *Lissotriton helveticus*	✓	✓	X	X	X	✓	0.36km, north-east, 2017	0.1km, south, 2017
Common frog *Rana temporaria*	✓	✓	X	X	X	✓	0.32km, south, 2017	0.1km, north, 2013
Pool frog *Pelophylax lessonae*	✓	✓	✓	X	X	✓	0.5km, south-east, 2017	0.5km, south-east, 2017
Plants								
Box *Buxus sempervirens*	X	X	✓	X	X	✓	Within 2km of the Site in 2018	Within 2km of the Site in 2018
Wild strawberry *Fragaria vesca*	X	X	✓	X	X	✓	Within 2km of the Site in 2018	Within 2km of the Site in 2018
Bluebell *Hyacinthoides non-scripta*	X	X	✓	X	X	✓	1.02km, southwest, 2018	1.02km, southwest, 2018
Welsh poppy *Meconopsis cambrica*	X	X	✓	X	X	✓	Within 2km of the Site in 2018	Within 2km of the Site in 2018
Corn mint *Mentha arvensis*	X	X	✓	X	X	✓	Within 2km of the Site in 2014	Within 2km of the Site in 2014
Tormentil *Potentilla erecta*	X	X	✓	X	X	✓	Within 2km of the Site in 2017	Within 2km of the Site in 2017

Species	Legally Protected Species?	Species of Principal Importance?	Other Notable Species?	Present on Site?	Possibly Present on Site?	Present / Potentially Present in Wider Zone of Influence?	Most recent record (distance, bearing and date)	Closest record (distance, bearing and date)
Sanicle *Sanicula europaea*	X	X	✓	X	X	✓	Within 2km of the Site in 2018	Within 2km of the Site in 2018
Lesser spearwort *Ranunculus flammula*	X	X	✓	X	X	✓	1.1km, south, 2021	1.1km, south, 2021
Sea wormwood *Seriphidium maritimum*	X	X	✓	X	X	✓	1.9km south 2014	1.9km south 2014
Heath speedwell *Veronica officinalis*	X	X	✓	X	X	✓	Within 2km of the Site in 2017	Within 2km of the Site in 2017
Invertebrates								
Stag beetle *Lucanus cervus*	✓	✓	✓	?	✓	✓	1.8km, south-west, 2015	1.8km, south, 2015
Purple emperor *Apatura iris*	✓	✓	✓	?	✓	✓	1.8km, west, 2021	1.8km, west, 2021
Chalk hill blue *Polyommatus coridon*	✓	✓	✓	?	✓	✓	1.9km, west, 2015	1.9km, west, 2015
White-letter hairstreak *Satyrium w-album*	✓	✓	✓	?	✓	✓	1.9km, west, 2015	1.9km, west, 2015
This list includes all recorded species that are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Within 2km of the Site in the last 10 years there are also records for: Three notable or protected species of ants and bees, 27 notable or protected species of beetle, 10 notable or protected species of butterflies, one notable or protected species of dragonfly, two notable or protected species of grasshopper and cricket, one notable or protected species of millipede, 25 notable or protected species of moth, nine notable or protected species of spider, three notable or protected species of true bugs, and three notable or protected species of true fly								
Mammals								
West European hedgehog *Erinaceus europaeus*	X	X	✓	?	✓	✓	1.69km, south, 2020	0.4km, south, 2017
Harvest mouse *Micromys minutus*	X	X	✓	?	✓	✓	1.5km south, 2019	1.5km, south, 2019
European rabbit *Oryctolagus cuniculus*	X	X	✓	?	✓	✓	1.9km, west, 2018	0.6km, south-east, 2014
Myotis species *Myotis* sp.	✓	✓	✓	?	✓	✓	1.9km west 2019	1.9km west 2019

Species	Legally Protected Species?	Species of Principal Importance?	Other Notable Species?	Present on Site?	Possibly Present on Site?	Present / Potentially Present in Wider Zone of Influence?	Most recent record (distance, bearing and date)	Closest record (distance, bearing and date)
Pipistrelle species *Pipistrellus* sp.	✓	✓	X	?	✓	✓	1.9km west 2019	0.6km, east, 2014
Common pipistrelle *Pipistrellus*	✓	✓	X	?	✓	✓	1.9km west 2019	0.1km west 2013
Soprano pipistrelle *Pipistrellus pygmaeus*	✓	✓	X	?	✓	✓	1.9km west 2019	1.9km west 2019
Long-eared bat *Plecotus* sp.	✓	✓	X	?	✓	✓	1.9km west 2019	0.1km north 2013
Brown long-eared bat *Plecotus auritus*	✓	✓	X	?	✓	✓	1.7m, west, 2020	1.3km, west, 2017
Reptiles								
Slow-worm *Anguis fragilis*	✓	✓	✓	?	✓	✓	1.7km, west,2020	1.4km, north-east, 2009
Grass snake *Natrix helvetica*	✓	✓	✓	?	✓	✓	1.9km, south-west, 2013	1.9km, north-east, 2006
Birds								
Common nesting bird species	✓	✓	✓	?	✓	✓	Dense scrub within the Site has the potential to support common nesting bird species	
Hen harrier *Circus cyaneus*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2019	Within 2km of the Site in 2019
Red kite *Milvus milvus*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2021	0.7km, north, 2020
Osprey *Pandion haliaetus*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2015	Within 2km of the Site in 2015
Honey-buzzard *Pernis apivorus*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2013	Within 2km of the Site in 2013
Scaup *Aythya marila*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2016	Within 2km of the Site in 2016
Garganey *Spatula querquedula*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2015	Within 2km of the Site in 2015

Species	Legally Protected Species?	Species of Principal Importance?	Other Notable Species?	Present on Site?	Possibly Present on Site?	Present / Potentially Present in Wider Zone of Influence?	Most recent record (distance, bearing and date)	Closest record (distance, bearing and date)
Little ringed plover *Charadrius dubius*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2021	Within 2km of the Site in 2021
Black tern *Chlidonias niger*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2015	Within 2km of the Site in 2015
Little gull *Hydrocoloeus minutus*	✓	✓	✓	?	✓	✓	Within 2km of the Site in 2014	Within 2km of the Site in 2014
Mediterranean gull *Ichthyaetus melanocephalus*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2021	Within 2km of the Site in 2021
Roseate tern *Sterna dougallii*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2013	Within 2km of the Site in 2013
Greenshank *Tringa nebularia*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2014	Within 2km of the Site in 2014
Green sandpiper *Tringa ochropus*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2013	Within 2km of the Site in 2013
Kingfisher *Alcedo atthis*	✓	✓	✓	X	X	✓	Within 2km of the Site in 2021	Within 2km of the Site in 2021
Peregrine *Falco peregrinus*	✓	✓	✓	?	✓	✓	Within 2km of the Site in 2021	Within 2km of the Site in 2021
Hobby *Falco Subbuteo*	✓	✓	✓	?	✓	✓	Within 2km of the Site in 2021	Within 2km of the Site in 2021
Skylark *Alauda arvensis*	✓	✓	✓	?	✓	✓	0.7km, north, 2021	0.7km, north, 2021
Cetti's warbler *Cettia cetti*	✓	✓	✓	x	x	✓	Within 2km of the Site in 2020	Within 2km of the Site in 2020
Brambling *Fringilla montifringilla*	✓	✓	✓	?	✓	✓	Within 2km of the Site in 2017	Within 2km of the Site in 2017
Crossbill *Loxia curvirostra*	✓	✓	✓	?	✓	✓	Within 2km of the Site in 2014	Within 2km of the Site in 2014
Black redstart *Phoenicurus ochruros*	✓	✓	✓	?	✓	✓	Within 2km of the Site in 2020	Within 2km of the Site in 2020

Species	Legally Protected Species?	Species of Principal Importance?	Other Notable Species?	Present on Site?	Possibly Present on Site?	Present / Potentially Present in Wider Zone of Influence?	Most recent record (distance, bearing and date)	Closest record (distance, bearing and date)
Firecrest *Regulus ignicapilla*	✓	✓	✓	?	✓	✓	Within 2km of the Site in 2017	Within 2km of the Site in 2017
Redwing *Turdus iliacus*	✓	✓	✓	?	✓	✓	Within 2km of the Site in 2021	Within 2km of the Site in 2021
Fieldfare *Turdus pilaris*	✓	✓	✓	?	✓	✓	Within 2km of the Site in 2021	Within 2km of the Site in 2021
Short-eared owl *Asio flammeus*	✓	✓	✓	?	✓	✓	Within 2km of the Site in 2021	Within 2km of the Site in 2021
Barn owl *Tyto alba*	✓	✓	✓	?	✓	✓	Within 2km of the Site in 2021	1.3km, north-west, 2021
This list includes records all birds listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). In total 150 bird species were recorded within 2km of the Site since 2013.								
Invasive non-native species								
Marsh frog *Pelophylax ridibundus*	X	X	✓	X	✓	✓	1.29km, north, 2020	0.3km, south, 2017
Mandarin duck	X	X	✓	?	✓	✓	Within 2km of Site in 2021	Within 2km of Site in 2021
Egyptian goose	X	X	✓	?	✓	✓	Within 2km of Site in 2021	Within 2km of Site in 2021
Canada goose	X	X	✓	?	✓	✓	Within 2km of Site in 2021	Within 2km of Site in 2021
Barnacle goose	X	X	✓	?	✓	✓	Within 2km of Site in 2021	Within 2km of Site in 2021
Red-crested pochard	X	X	✓	?	✓	✓	Within 2km of Site in 2020	Within 2km of Site in 2020
Ring-necked parakeet	X	X	✓	?	✓	✓	1.7km, south-east, 2021	1.7km, south-east, 2021
Few-flowered garlic *Allium paradoxum*	X	X	✓	X	✓	✓	1.8km west, 2013	1.8km, west, 2013
Three-cornered garlic *Allium triquetrum*	X	X	✓	X	✓	✓	Within 2km of the Site in 2017	Within 2km of the Site in 2017

Species	Legally Protected Species?	Species of Principal Importance?	Other Notable Species?	Present on Site?	Possibly Present on Site?	Present / Potentially Present in Wider Zone of Influence?	Most recent record (distance, bearing and date)	Closest record (distance, bearing and date)
Giant hogweed *Heracleum mantegazzianum*	X	X	✓	X	✓	✓	1.6km, south, 2021	0.4km, south-west, 2017
Bluebell *Hyacinthoides non-scripta x hispanica = H. x massartiana*	X	X	✓	X	✓	✓	Within 2km of the Site in 2017	Within 2km of the Site in 2017
Himalayan balsam *Impatiens glandulifera*	X	X	✓	X	✓	✓	1.6km, south, 2021	1.6km, south, 2021
Lamiastrum galeobdolon subsp. Argentatum	X	X	✓	X	X	✓	Within 2km of the Site in 2017	Within 2km of the Site in 2017
CherrylLaurel *Prunus laurocerasus*	X	X	✓	X	✓	✓	Within 2km of the Site in 2017	Within 2km of the Site in 2017
Rhododendron *Rhododendron ponticum*	X	X	✓	X	✓	✓	1.7km, south, 2021	1.5km, south, 2021
Duck-potato *Sagittaria latifolia*	X	X	✓	X	✓	✓	1.6km, south, 2021	1.6km, south, 2021
Harlequin ladybird *Harmonia axyridis*	X	X	✓	X	✓	✓	1.6km, south, 2020	1km, south, 2020
Harmonia axyridis form conspicua	X	X	✓	X	✓	✓	1.4km, south-east, 2013	1.4km, south-east, 2013
American mink *Neovison vison*	X	X	✓	X	✓	✓	1.4km, east, 2016	1.4km, east, 2016
Eastern grey squirrel *Sciurus carolinensis*	X	X	✓	?	✓	✓	1.6km, south, 2022	1.6km, south-east, 2013

Key to symbols: ✓ = yes, see Supporting Comments for further rationale.

Legally protected species are those listed under Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended); and, Schedules 2 and 4 of The Conservation of Habitat & Species Regulations 2017 (as amended).

Species of Principal Importance as those listed under Section 41 of the NERC Act 2006. Planning Authorities have a legal duty under Section 40 of the same Act to consider such species when determining planning applications.

Other notable species include native species of conservation concern listed in the LBAP (except species that are also of Principal Importance), those that are Nationally Rare, Scarce or Red Data List, and non-native controlled weed species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

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Appendix C Fugitive Release Impact Assessment

Hazardous Event			Risk Assessment			Controls and Mitigations	Mitigation	Residual
Event	Pathway	Receptor	Probability	Consequence	Risk		Factor	Risk
1. *Releases To Air*								
Dust, particulates and litter during loading and unloading of vehicles	▪ Air	▪ Staff ▪ Public ▪ Local Environment	6	2	12	• Materials for processing will be offloaded into designated areas. • Site is equipped with equipment which can be used to suppress dust and particulates. • Incoming waste which has been allowed to drain, or dry process outputs, are not loaded in high winds. • Materials being placed in the external skips (e.g. metals) are unlikely to produce aerial releases. Materials are placed in enclosed skips and no handling is required as full skips will be removed to relevant offsite treatment, recovery or disposal facility. • All loads (incoming/despatch) are fully contained or sheeted, to minimise the potential for material becoming airborne. • Site operators and drivers are fully trained. • Material clean-up via sweeping or vacuum is utilised in the event of a spillage. • Dusty waste to be rejected at the weighbridge. • Dusty waste identified upon discharge will be immediately sprayed with water.	5	2.4
Windblown dust from external roads, pathways and other surfaces	▪ Air	▪ Public ▪ Staff	5	2	10	• A hard surfaced access road will be provided from the installation entrance. • Subsidiary installation roads will be constructed from hardcore or other suitable material to provide sufficient run off for vehicles using the installation. Internal road surfaces will be maintained through regular grading of haul roads to remove loose materials from the surface; and will be designed to avoid sharp corners and steep gradients that would encourage sharp breaking • Speed restrictions of 10mph will be imposed for all vehicles driving on the site, in order to minimise emissions of dust from internal road surfaces • All vehicles using the installation will be required to ensure that all loads (waste or aggregates) are adequately sheeted or otherwise contained prior to exiting the site onto the public highway. • Road and yard surfacing are subject to routine inspection and maintenance – any accumulation of materials is removed promptly. ▪ Water suppression to abate dust emissions is available for use during dry periods.	5	2
Windblown dust from storage of incoming waste and product outputs	▪ Air	▪ Public ▪ Staff ▪ Local environment	6	2	12	• OWC reception area is constructed from concrete bays. • Good housekeeping standards will ensure that the site areas are kept clean to prevent build-up of spillage waste. • Storage of process outputs is within a designated storage bays/areas and waste can be covered as necessary to minimise the release of dust during periods of high wind. • External stockpiles will be located to minimise wind-whipping as far as practicable; • Drop heights will be minimised during placement of materials into the stockpiles; • Profiling of stockpiles within the storage bay walls and keeping height 0.5m below the top of the storage bay height will be used to prevent emissions by wind-whipping; • Use of appropriate dust suppression systems to maintain the condition of the stockpiles during dry, windy conditions.	4	3
Windblown emissions from the windrows	▪ Air	▪ Public ▪ Staff ▪ Local environment	5	2	10	• Formation of windrows is within a designated treatment area and monitoring of windrows for moisture and conditioning as required.	5	2
Windblown dust from processing materials through the OWC processes.	▪ Air	▪ Public ▪ Staff ▪ Local environment	5	2	10	• The proposed screening and separation process is situated within a building at the north side of waste reception/storage area. • The shredder will be equipped with dust suppression. • Good housekeeping standards will ensure that the site areas are kept clean to prevent build-up of spillage waste.	5	2
Windblown emissions from processing oversize materials through crusher at the ATRF.	▪ Air	▪ Public ▪ Staff ▪ Local environment	5	2	10	• Oversize materials will be stored within materials storage bays and/or stockpiles positioned to minismise wind-whipping as far as possible. • Crushing will take place on a campaign basis by mobile enclosed mechanical crusher. • Drop heights will be minimised when material is being loaded into and discharged from the screen. • Misting will be used in and around the screening area, and in particular on the feed hopper and conveyors	5	2
2. ***Releases to Land and Water***								
Spillage of waste and materials during the operation of OWC and crushing processes	▪ Water • Land	▪ Surface water ▪ Ground water	4	3	12	• High standards of housekeeping will be maintained across the site. • Spill kits will be available to deal with any leaks.	5	2.4

Hazardous Event			Risk Assessment			Controls and Mitigations	Mitigation	Residual
Event	Pathway	Receptor	Probability	Consequence	Risk		Factor	Risk
		▪ Sewer system						
Leaks from tanks, valves or pipework	▪ Water • Land	▪ Surface water ▪ Groundwater ▪ Sewer system	4	1	4	• Flanged connections will be kept to a minimum • All tanks, pipes and valves will be designed to appropriate industry standards • All tanks, pipes and valves will have a preventative maintenance programme to ensure ongoing integrity and effectiveness. • Operator daily checks for signs of leak. • Spill kits will be available to deal with any leaks.	5	0.8
Contaminated surface run-off	• Water • Land	▪ Surface water ▪ Groundwater ▪ Sewer system	4	4	16	• Engineered site drainage system which allows the collection of potentially contaminated surface water, which is either recycled through the wash process or is discharged to foul sewer. • Drainage system is subject to routine inspection along with a preventative maintenance regime. • Emergency spills kits used in conjunction with a site emergency plan is available to help mitigate the effects of any contamination. • Discharges of clean surface water to will be subject to daily visual inspection.	5	3.2
Contamination of groundwater	• Water • Land	▪ Ground water	4	4	16	Site surfacing for all areas accessed by vehicles are concrete designed to a BS and containing anti-crack mesh to improve surface durability.	5	3.2
3. Nuisance Issues								
Mud/litter carried onto highway	• Water ▪ Land	▪ Public	5	2	10	• All incoming and outgoing loads will be sheeted • All internal roads, storage and processing areas will be hard-surfaced with concrete or tarmac, and swept regularly Arrangements for washing wheels will be available and when deemed necessary by the Site Manager, vehicles exiting the installation will wash wheels in order to prevent materials being deposited on the highway	5	2
Pest, vermin and scavengers	▪ land	▪ Staff ▪ Public	4	1	4	• Use of registered pest control contractors and rodenticide will be considered if required.	6	0.67
	▪ land	▪ Staff ▪ Public	4	1	4	• Robust waste acceptance procedures • Quarantine and rejection of such material	6	0.67
4. ***Odour***								
Odour from loading, treatment and unloading of incoming waste	• Air	▪ Staff ▪ Public	6	3	18	• Staff training includes raising employee awareness with respect to normal plant operational odour levels and actions to be taken to rectify any faults. • Dust suppression available when required. Mist sprays can be supplemented with de-odourising agents if required. • Screening and crushing will be enclosed. • Rejection of highly odorous materials at acceptance stage screening. Implement odour management plan.	5	3.8
Odour release from storage of Organics	• Air	▪ Staff ▪ Public	6	3	18	• Staff training includes raising employee awareness with respect to normal plant operational odour levels and actions to be taken to rectify any faults. • Implement odour management plan.	5	3.8
5. Noise and Vibration								
Noise and vibration from motors and other equipment	• Air	▪ Staff ▪ Public	6	3	18	• Staff training includes raising employee awareness with respect to normal plant operational noise levels and actions to be taken to rectify any faults. • During periods of downtime, all plant is switched off. • Site plant is maintained in line with manufacturer's recommendations this includes checking for deterioration of plant condition (e.g. bearings becoming worn). Repairs will be undertaken as appropriate to rectify any identified defects.	5	3.6
Noise from vehicles delivering/collecting waste	• Air	▪ Staff ▪ Public	6	3	18	• Reversing is minimised where possible • Engines are switched off when not in use.	5	3.6
Noise from on-site mobile plant movements	• Air	▪ Staff ▪ Public	6	3	18	• Mobile plant is maintained in accordance with manufacturer's recommendations to ensure potential vehicle noise is minimised. • Plant operator training includes using the plant effectively to minimise noise emissions, switching off when not in use, ensuring daily vehicle checks are completed to identify defects as early as possible and ensuring vehicle inspection hatches are kept closed when vehicle in use.	5	3.6
6. Bioaersols								
From waste reception, processing and compost windrows	• Air	▪ Staff ▪ Public	6	3	18	• Implement the controls and mitigations as specified in the Bioaerosol Risk Assessment (60684371-ACM-XX-00-RP-EN -BIORA-R03, Application Part 10)	5	3.6

Appendix D Noise Impact Assessment

Brookhurst Wood, Open Windrow Composting Facility

Noise Assessment

Biffa Waste Services Ltd

Project number: 60684371
Noise Assessment Report

03 August 2023

Delivering a better world

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
R01	27/07/2023	Initial Draft	27/07/2023	Angela Graham	Project Manager
R02	02/08/2023	Final Draft	03/08/2023	Angela Graham	Project Manager
R03	04/08/2023	Final Draft	04/08/2023	Angela Graham	Project Manager
R04	11/10/2023	Inclusion of crusher			

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Figures

Tables

1. Introduction

1.1 Competency of Assessors

This assessment has been conducted and the document authored by a senior member of AECOM Acoustics team with 8 years' experience with substantial prior experience in managing the technical delivery for several previous industrial acoustics assessments and holding MIOA status. Supporting staff, including for measurements, all hold (or were operating under the direct supervision of someone with) AMIOA status as a minimum.

1.2 Background

AECOM has been appointed by Biffa Waste Services Ltd to undertake an environmental noise impact assessment for their Brookhurst Wood site to support the permit variation for a new Open Windrow Composting (OWC) facility on the site and the existing aggregates treatment and recycling facility (ATRF), in particular the use of crushing equipment at the ATRF, and including the noise associated with new noise-generating equipment and additional heavy goods vehicles (HGVs) entering, departing, and moving within the site. There is no proposed change to existing plant, nor other processing methods on site, nor the numbers or timings of vehicles entering and exiting the site that are associated with other site processes or facilities.

This report provides an assessment of the noise impacts arising from the OWC and the ATRF crushing equipment. Sound emissions from fixed plant and vehicle movements associated with the proposed development have the potential to cause impacts beyond the application site boundary. As fixed plant and other associated sound from the remainder of the site are unchanged and will be accommodated within the existing restrictions for the whole site, these have not been assessed but are considered within the context of the assessment.

A summary of acoustic terminology used within this report is provided in Appendix A.

1.3 Site Description and Nearest Receptors

The site is located approximately 1 km to the north of Horsham, and approximately 1.5 km to the north-east of the village of Warnham. The Horsham to Dorking railway line bounds the site to the west and the A24 runs in a north-south direction approximately 400 to 500 m to the west of the site. The east of the site is bound by Langhurst Wood Road.

The current activities that take place in the wider site involve:

- Mechanical Biological Treatment of waste;
- recycling of road sweepings and similar waste through an aggregates treatment and recycling facility (ATRF); and
- landfill currently undergoing restoration (due to be completed end-2023).

The site where the OWC is proposed to be situated is currently vacant hardstanding which is located adjacent to the eastern boundary of the ATRF facility.

The site is long established and there is a substantial planning history, with several permits and permissions that apply to site operations. The hours of operation for the OWC would reflect those currently permitted for the ATRF activities (Permission WSCC/003/14/NH).

The nearest noise-sensitive receptors are detailed below in Table 1-1. A plan showing the layout of the proposed facility is shown in Figure 1. The location of the site and the closest identified receptors are shown in Figure 2.

Table 1-1 Environmental Noise Receptors

Receptor ID	Description	Approx. Grid Coordinates	Approx. Distance from RLB (m)*	Direction from Planning Application Site Boundary
R1	Bramblehurst	517388, 134230	400	Southeast
R2	Graylands Lodge	517422, 134572	250	East
R3	Kingcoate House	516855, 135411	650	Northwest
R4	Cox Farm	516692, 134685	350	West
R5	Andrew's Farm	516528, 134071	650	Southwest
R6	18 Station Road	516951, 133962	600	South
R7	South Lodge	517470, 134924	300	Northeast

*not including access route through site

Figure 1 Site Layout Plan

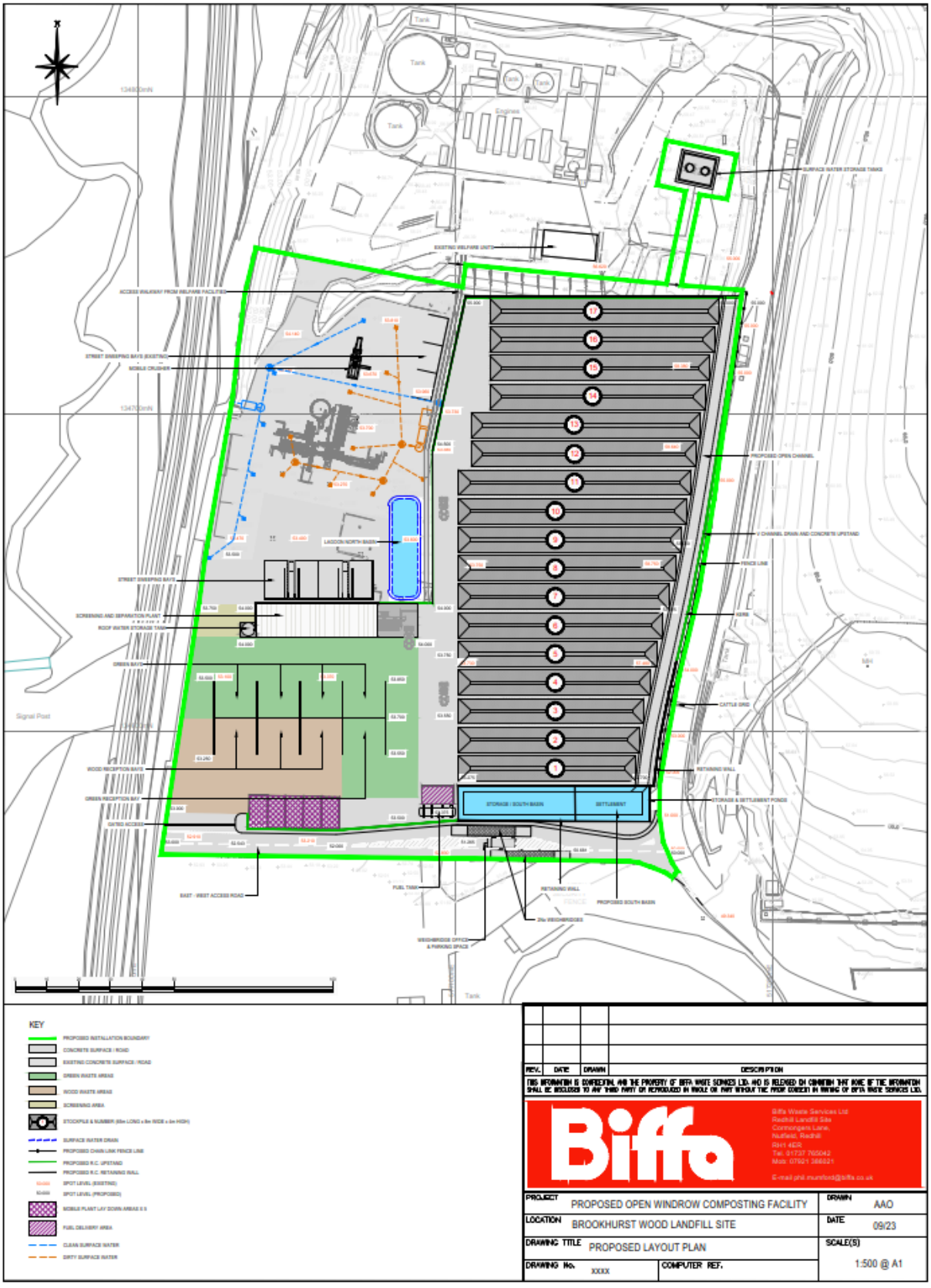
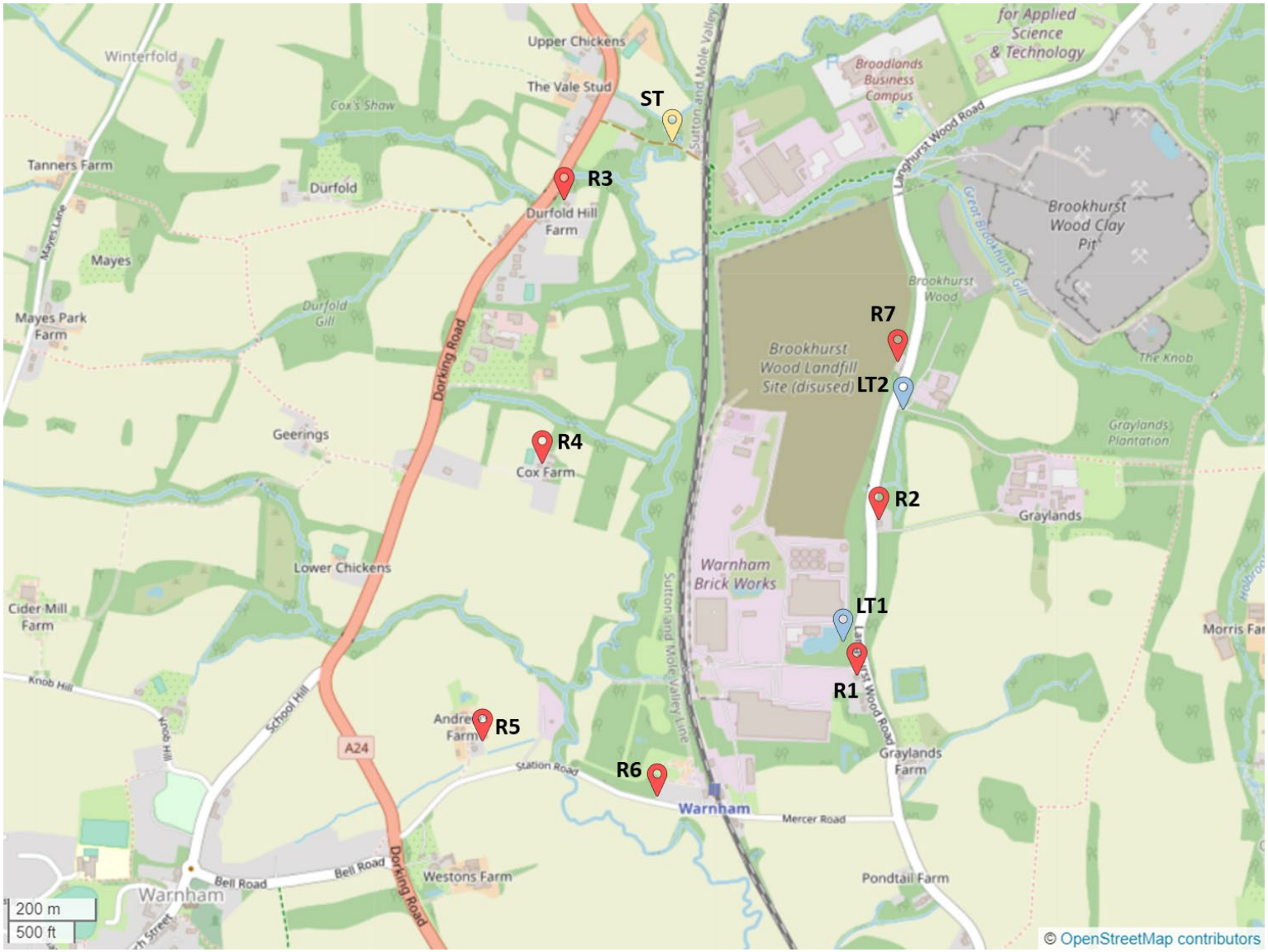


Figure 2 Receptor and Measurement Locations Map



1.4 Existing Operations

The development site is currently vacant, however, the operating hours proposed are the same as those defined by planning permission reference WSCC/003/14/NH for the ATRF facilities. The operating hours are set out in condition 8 as follows:

> *"No operation of the facility shall take place except between the hours of:*
>
> - *07:00 and 18:00 on Monday to Saturdays inclusive;*
> - *07:00 and 10:00 on Public Holidays; and*
> - *No operation of the facility shall take place on Sundays."*

1.5 Proposed New Operations

The proposed new operations will typically result in an average of 60 additional HGV movements per day (30 HGVs entering and 30 exiting the site) to deliver a mixture of compostable materials, with a maximum of 76 additional HGV movements per day, in line with the above operating hours. Eight additional HGV movements per hour have been assumed as a reasonable worst-case. These additional movements will take place during the existing site operational hours. In addition, a small number of mobile plant will be used to transport materials around the site area. Two excavators or similar vehicles have been assumed to be operating continuously in the proposed development area.

A plant room containing screening and separation plant will be installed as part of the development, which will include shredder and sifter plant. These will be generally enclosed within the plant room, but with some of the plant protruding from the plant room on its eastern façade.

A stationary crusher associated with the ATRF activities will be used for two to three weeks once a quarter for the treatment of specific waste inputs (19.12.12 inputs to separate out glass).

2. Guidance Documents

2.1.1 British Standard 4142:2014+A1:2019

BS 4142 '*Methods for rating and assessing industrial and commercial sound'*[1] can be used for assessing the effect of sound of an industrial nature (such as from electrical equipment) on residential dwellings. The method compares the difference between *'rating level'* of the industrial sound, with the *'background sound level'* at the receptor position. The standard uses the following definitions to describe various aspects of the soundscape of the scenario being assessed:

- Background sound level, $L_{AF90,T}$ dB - defined in the Standard as the 'A-weighted sound pressure level that is exceeded by the residual sound for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels'.
- Specific sound level, $L_s = L_{Aeq,Tr}$ dB - the 'sound source at the assessment location over a given reference time interval, Tr,'.
- Rating level, $L_{Ar,Tr}$ – the 'specific sound level plus any adjustment made for the characteristic features of the sound'.
- Ambient sound level, $L_{Aeq,T}$ dB - defined in the standard as 'the totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far when present. The ambient sound comprises the residual sound and the specific sound.'
- Residual sound level, Lr = $L_{Aeq,T}$ - the 'Ambient Sound remaining at the assessment location when the Specific Sound source is suppressed to such a degree that it does not contribute to the Ambient Sound'.

BS 4142:2014+A1:2019 allows for acoustic character corrections to be applied based upon the presence or expected presence of the following:

- Tonality: up to +6 dB penalty;
- Impulsivity: up to +9 dB penalty (this can be summed with tonality penalty); and
- Other sound characteristics (neither tonal nor impulsive but still distinctive): + 3 dB penalty.
- Intermittency: +3 dB

Once any adjustments have been made, the background sound level and the rating level are compared. The standard states that:

a. *"Typically, the greater the difference, the greater the magnitude of impact.*

b. *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending upon the context.*

c. *A difference of around +5 dB is likely to be an indication of an adverse impact, depending upon the context.*

d. *The lower the rating level is to the measured background sound level, the less likely it is that the specific sound 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, depending upon the context."*

2.1.2 British Standard 7445-1:2003

BS 7445 *'Description and Measurement of Environmental Noise. Part 1 – Guide to Quantities and Procedures'*[2] defines the parameters, procedures and instrumentation requirements for noise measurement and analysis.

[1] BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound', British Standards Institution, 2019
[2] BS 7445-1:2003 'Description and environment of environmental noise – Part 1', British Standards Institution, 2003

2.1.3 British Standard 5228:2009+A1:2014

BS: 5228-1 *'Code of practice for noise and vibration control on construction and open sites"*[3] provides a 'best practice' guide for noise control and includes Sound Power Level (L_w) data for individual plant as well as a calculation method for noise from construction activities. BS 5228-2 *'Code of practice for noise and vibration control on construction and open sites. Vibration'* (BSI, 2014) provides comparable 'best practice' for vibration control, including guidance on the human response to vibration.

BS 5228-1 Part 1: Noise, Annex E.3.2 '*Example method 1 The ABC Method'* presents an example method for the assessment of construction noise. The ABC Method, shown in Table E.1 of the Standard reproduced below as Table 2-1, shows an example of the threshold of potential significant effect at dwellings when the site noise level, rounded to the nearest decibel, exceeds the listed value. The table can be used as follows: for the appropriate period (night, evening/weekends or day), the ambient noise level is determined and rounded to the nearest 5 dB. This is then compared with the site noise level. If the site noise level exceeds the appropriate category value, then a potential significant effect is indicated.

Table 2-1 BS 5228 ABC Method - Example Threshold of Potential Significant Effect at Dwellings

Assessment category and threshold value period	Threshold value, in decibels (dB) ($L_{Aeq,T}$)		
	Category A [A)]	Category B [B)]	Category C [C)]
Night-time (23.00−07.00)	45	50	55
Evenings and weekends [D)]	55	60	65
Daytime (07.00−19.00) and Saturdays (07.00−13.00)	65	70	75

NOTE 1 A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.

NOTE 3 Applied to residential receptors only.

[A)] Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

[B)] Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

[C)] Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

[D)] 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

2.1.4 Design Manual for Roads and Bridges

The Highways England Design Manual for Roads and Bridges Sustainability & Environment Appraisal LA 111 Noise and Vibration[4] (DMRB) sets out the requirements for assessing and reporting the effects of highways noise and vibration from construction, operation and maintenance projects.

DMRB sets out in Table 3.17 the level of change in road traffic noise due to construction traffic that would result in varying magnitudes of noise impact, which is reproduced as Table 2-2 below. The same changes and magnitudes of effect are also applicable to short-term changes in operational traffic noise, given in DMRB Table 3.54a.

Table 2-2 DMRB Magnitude of Impact due to Change in Road Traffic Noise

Magnitude of Effect	Change in road traffic noise level, dB $L_{A10,18h}$
Major	≥5.0
Moderate	3.0 to 4.9
Minor	1.0 to 2.9
Negligible	<1.0

[3] BS 5228:2009 + A1:2014 'Code of practice for noise and vibration control on construction and open sites', British Standards Institution, 2014

[4] Highways England (2020), Design Manual for Road and Bridges LA 111 Noise and Vibration, Revision 2

2.1.5 Calculation of Road Traffic Noise

The Department of Transport/Welsh Office Memorandum 'Calculation of Road Traffic Noise[5]' (CRTN) describes procedures for traffic noise calculation and is suitable for environmental assessments of schemes where road traffic may have an effect.

2.1.6 IEMA Guidelines

The Institute of Environmental Management & Assessment (IEMA)'s 'Guidelines for Environmental Noise Impact Assessment (IEMA Guidelines)[6] address the key principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur. The guidelines provide specific support on how noise impact assessment fits within the Environmental Impact Assessment (EIA) process.

In particular, Section 2.7 of the IEMA Guidelines states that:

"For broad band sounds which are very similar in all but magnitude, a change or difference in noise level of 1 dB is just perceptible under laboratory conditions, 3 dB is perceptible under most normal conditions, and a 10 dB increase generally appears to be twice as loud. These broad principles may not apply where the change in noise level is due to the introduction of a noise with different frequency and/or temporal characteristics compared to sounds making up the existing noise climate. In which case, changes of less than 1 dB may be perceptible under some circumstances..

[5] Department of Transport/Welsh Office (1998); Calculation of Road Traffic Noise
[6] Institute of Environmental Management & Assessment (2014), Guidelines for Environmental Noise Impact Assessment

3. Assessment Scope and Methodology

The assessment of the proposed OWC focuses on airborne noise from proposed OWC construction activities and the operation of the OWC facility and ATRF crusher, including delivery movements, mobile plant, and fixed plant. No major operational vibration sources are proposed. While some construction vibration may occur, DMRB recommends a construction vibration study area of 100 m. Due to the distances between the site boundary and vibration-sensitive receptors (minimum 250 m – see Table 1-1), the assessment of vibration has been scoped out.

3.1 Construction Noise

The construction of the proposed OWC is likely to be relatively short-duration and limited to daytime periods. Precise details of the enabling and construction works are currently not finalised and will be once a contractor is appointed. Therefore, a quantitative assessment on construction noise is currently not possible. A qualitative assessment has therefore been undertaken which focuses on best practise measures to minimise sound levels. Guidance has been taken from BS 5228-1 to inform this assessment.

3.2 Operational Sound

Operational sound has been assessed following BS 4142 guidance, whereby the rating level of sound emissions from activities are compared against the background sound levels pre-development. Background sound levels are identified based on a detailed review of measurement data. Measurement data is presented in Appendix B.

Predictions of the operational sound levels have been undertaken using SoundPLAN (version 8.2), which implements the calculation procedures of ISO 9613 *'Acoustics – Attenuation of Sound During Propagation Outdoors'*[7], to predict the propagation of sound away from the proposals in all directions and to quantify resultant sound levels at the identified noise sensitive receptor locations. HGV movements off the public highway are considered to be a legitimate part of the site's sound emissions, but the context of these sound sources must be carefully considered. Source data and model settings for operational sound calculations are presented in Appendix C.

When undertaking the assessment, it is important to consider the context of the site and the nature of the existing sound sources in the area. However, it is also necessary to consider the risks of new sources causing the ambient sound levels in the area to 'creep' up, resulting in a cumulative impact, even if the introduction of the proposed facility may not result in a direct impact. These considerations are evaluated within the contextual component of the assessment.

3.3 Operational Traffic Noise

Operational traffic noise has been assessed following guidance in DMRB and using the calculation methods in CRTN. A simple screening calculation is used to determine the level of traffic required in order to result in non-negligible changes in road traffic noise.

3.4 Measurement Methodology

The sound climate in the vicinity of the site has been established by undertaking unattended long-term monitoring at two locations and attended short-term monitoring one location. The locations were selected to be representative of the surrounding noise-sensitive receptors. These locations are shown as LT and ST in Figure 2. Table 3-1 provides a description and GPS co-ordinates of the monitoring locations.

Long-term measurements were carried out between Thursday 2nd February and Thursday 9th February 2023, capturing approximately one week of measurement data.

The sound monitoring was undertaken with the monitoring equipment housed in weatherproof outdoor cases with an appropriate outdoor windshield used on the microphones. Sound measurements were carried out following guidance from BS: 7445 'Description and Measurement of Environmental Noise. Part 1 – Guide to Quantities and

[7] ISO 9613 Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation. International Organisation for Standardisation (ISO), 1996

Procedures'[8] wherein the parameters, procedures and instrumentation requirements for noise measurement and analysis are defined. Additional guidance from BS 4142:2014+A1:2019 and is also adopted.

The measurements were undertaken with the microphone mounted on a pole 1.5 m above ground level, under free-field conditions (i.e. greater than 3.5 m away from any reflective surface other than the ground).

No site noise or site-related activities were audible during site observations at the set-out and collection of the equipment, or during the short-duration attended measurement at ST. The dominant sound source at all locations was identified as road traffic noise from the B1383. Other observed sound sources included birdsong, foliage movement in the wind, and occasional aircraft (from Stansted Airport approx. 5 km to south). At ST, insect chirping was also observed.

Measured data is used to identify a typical background sound level for reference in the operational assessment, as described in BS 4142, as well as the ambient sound level for reference in the construction assessment, as described in BS 5228.

Table 3-1 Description of Monitoring Locations

Monitoring location	Description	GPS coordinates
Long-term 1 (LT1)	Representative of residential receptor R1	51.095727, -0.325192
Long-term 2 (LT2)	Representative of receptors R2 and R7	51.100685, -0.323619
Short-term (ST)	Representative of receptors R3, R4, R5, R6	51.105981, -0.330669

The sound level meters were field calibrated with an acoustic calibrator both prior to commencement and after completion of the sound measurements. No significant (>0.5 dB) drift in calibration occurred between calibration checks. Details of the equipment are given in Table 3-2.

Table 3-2 Measurement Equipment

Equipment	Manufacturer	Model	Serial number	Calibration Date
Type 1 Sound level meter	01 dB	DUO	12039	22/03/2022
Type 1 Sound level meter	Rion	NL-52	420764	23/01/2023
Type 1 Sound level meter	01 dB	DUO	12049	18/11/2021
Sound calibrator	Brüel & Kjær	Type 4231	2642980	04/01/2022

[8] BS 7445-1:2003 'Description and environment of environmental noise – Part 1', British Standards Institution, 2003

4. Background Sound Levels

The typical background sound levels for the assessment have been determined through a review of the measured data and observations (see Appendix B). An overview of the measured values is shown below in Table 4-1 and Table 4-2 for weekend and weekday time periods, while a comparison of short-term measurements against equivalent periods of long-term measurements is shown in Table 4-3.

For the purposes of the initial numerical assessment, the most typical background sound levels at LT1 have been used in the assessment for R1, while the most typical background sound levels at LT2 have been used in the assessment for R2 to R7. The variation in background sound levels over time and by location is discussed in the uncertainty section of the assessment.

While operation of the site is anticipated to be daytime only, evening and night-time sound levels are also provided for context and, in the case of ambient sound levels, for the purposes of the construction noise assessment.

Table 4-1 Typical background and ambient sound levels for LT1

Measurement Location	Background Sound Level, $L_{A90,T}$, dB				Ambient Sound Level*, $L_{Aeq,T}$	
	Most Typical Weekday	Typical Range weekday	Most Typical Weekend	Typical Range Weekend	Representative Level	Typical Range Weekday
Daytime (07:00-18:00)	51	49-56	48	47-50	62	58-65
Evening (18:00-23:000	48	47-52	47	47-49	58	49-62
Night-time (23:00-07:00)	46	45-47	46	46	54	46-54

*Calculated based on the definitions for Daytime, Evening, and Night-time given in BS 5228 and set out in Table 2-1, respectively

Sound levels at LT1 were not observed to drop below 45 dB and are likely to be dominated by nearby site facilities which operate 24/7. These values are only representative of receptor R1 and are not representative of receptors more distant from the site.

Table 4-2 Typical background and ambient sound levels for LT2

Measurement Location	Background Sound Level, $L_{A90,T}$, dB				Ambient Sound Level*, $L_{Aeq,T}$	
	Most Typical Weekday	Typical Range weekday	Most Typical Weekend	Typical Range Weekend	Representative Level	Typical Range Weekday
Daytime (07:00-18:00)	44	39-53	37	33-42	54	50-58
Evening (18:00-23:00)	41	37-47	37	35-39	50	44-55
Night-time (23:00-07:00)	36	29-43	30	29-37	45	30-56

*Calculated based on the definitions for Daytime, Evening and Night-time given in BS 5228 and set out in Table 2-1, respectively

Sound levels at LT2 are notably lower than those at LT1, and are considered to be representative of the sound levels in the area surrounding the site that are not dominated by sound from the site, particularly at R2, and R7.

Table 4-3 Background and ambient sound levels for ST compared with LT1 and LT2

Measurement Location	Range of Background Sound Levels observed, $L_{A90,T}$, dB			Range of Ambient Sound Levels observed, $L_{Aeq,15min}$		
	ST	LT1	LT2	ST	LT1	LT2
Daytime (15:30-16:45)	46-52	51-53	44-47	51-53	60-63	52-53

The measurements undertaken at location ST suggest that background and ambient sound levels are similar, albeit generally slightly higher, to those observed at LT2. It is therefore determined that levels at LT2 are representative primarily of receptors R2, R3, R4 and R7, and to some extent representative of R5, and R6, as a worst-case. These measurements were only undertaken for a short period during a weekday daytime, so there is some uncertainty around how the sound levels in this area would vary over longer time periods.

A summary of background sound levels adopted for each identified receptor location is shown in Table 4-4. Detailed justification for the background sound levels identified for the assessment, including histograms of the $L_{A90,15min}$ levels for these periods are shown in Appendix B.

Table 4-4 Background sound levels for operational assessment

Receptor	Daytime Representative Background Sound Levels (Free-field), dB $L_{A90,T}$
R1 – Bramblehurst	51
R2 – Graylands Lodge	44
R3 – Kingcoate House	44
R4 – Cox Farm	44
R5 – Andrew's Farm	44
R6 – 18 Station Road	44
R7 – South Lodge	44

5. Construction Assessment

5.1 Construction Noise Limits

5.1 Based on the sound levels in Table 4-1 and Table 4-2, and using the ABC method as provided by BS 5228 (given in Table 2-1), all of the receptors have ambient noise levels of 60 dB or lower when rounded to the nearest 5 dB, and therefore fall within the lowest baseline noise level category. A construction noise threshold of 65 dB is therefore recommended for all receptors, which should be achieved by adopting the Best Practicable Means (BPM) measures set out below.

5.2 It is anticipated that at a distance of 250 m to the nearest receptor, the threshold of 65 dB would be unlikely to be exceeded. No significant construction noise effects would be anticipated.

5.3 Best Practicable Means

5.4 All reasonable steps should be taken to mitigate and minimise adverse noise effects through adoption of BPM during construction, as defined in section 72 of the Control of Pollution Act 1974. Noise and vibration mitigation measures and management plans covering BPM should be put into place to ensure that noise and vibration is minimised at all times throughout the construction programme.

5.5 Works will be carried out following the good practice guidelines detailed in BS 5228-1 Annex B 'Noise Sources, Remedies, and their Effectiveness'. General measures should include the following as appropriate:

- Careful selection of plant, construction methods, and programming will be undertaken. Only plant that complies with the noise limits quoted in the relevant European Commission Directive 200/14/EC/United Kingdom Statutory Instrument (SI) 2001/1701 will be used;
- Shrouding around noisy plant in fixed locations, for example Heras fencing and acoustic blankets around generators;
- Daily plant and equipment inspections to identify any maintenance requirements;
- Careful planning of the sequence of work in order to minimise the transfer of noise to neighbouring receptors;
- Careful handling of materials and waste, such as lowering rather than dropping items;
- Avoidance of unnecessary noise (such as engines idling between operations, shouting, loud radios or excessive revving of engines) by effective site management;
- Where control at source is not practicable or adequate, the distance between noise sources and sensitive receptors would be maximised and the transmission path interrupted, with options considered in the order of source-pathway-receptor;
- Methods and programme of work and vehicular routes will be selected with regard to minimising noise and vibration impact;
- Regular site inspections, specialist BPM checks, random senior management tours and unannounced audits will assess whether noise levels are acceptable and take steps to reduce them and all BPM mitigation measures have been implemented if required;
- Site personnel will be instructed on BPM to reduce noise and vibration as part of their induction training and as required prior to specific work activities;
- Careful handling of tools, placement, and shouting on the Site will be covered in activity plans and/or briefings as appropriate; and

Training and briefings will be delivered to the site team to inform them of noise and vibration issues and the location of nearby receptors.

6. Operational Assessment

6.1 Traffic Noise – Off site

Calculations of Basic Noise Levels (BNL) can be used to identify the expected increase in traffic noise level. Increases in noise of less than 1.0 dB are considered to be negligible, as outlined in DMRB (see Table 2-2).

Where speeds and traffic composition (i.e. the percentage of HGVs) remain the same, a simple calculation can be used to identify a predicted change in road traffic noise as a result of the additional traffic using the following formula: 10 × LOG(Future vehicle movements ÷ Existing vehicle movements).

In a simple worst-case scenario, no traffic other than the existing permitted 392 HGV movements from the site are assumed on the public roads. Where other road traffic is present, this would result in a lower change in road traffic noise. This allows the simplest calculation method above to be used, as only HGV movements are considered for both the existing and future scenarios.

The addition of 76 HGV movements would result in a maximum of 468 HGV movements in total, compared to 392 existing HGV movements. This would be anticipated to result in off-site road traffic noise increasing by no more than 0.8 dB as a worst-case. Accounting for light vehicle traffic and HGVs passing or accessing other facilities, this value would be further reduced in practice, but this analysis is sufficient to demonstrate that a negligible change would occur.

Due to the identified presence of existing HGV movements associated with the existing site operations and the relatively low numbers of proposed additional HGV movements, increases in traffic noise off site would result in a negligible impact.

6.2 Specific and Rating Sound Level Predictions

Sound levels from the proposals have been predicted using 3D acoustic modelling. Details of the modelling are set out in Appendix C.

A summary of the predicted specific sound levels at the nearest sensitive receptors relative to the operational site during the daytime is given in Table 6-1. Predicted sound levels are at a height of 1.5 m as free-field equivalent levels, representative of a garden location, or a ground-floor window of a typical residential property.

With respect to the determination of rating levels (per guidance from BS4142 section 9.2 ‘Subjective method’), the proposed facility comprises fixed plant noise, mobile plant noise, and additional HGV movements, which is typical of existing operations. As such, the new facility is unlikely to be distinctive against the residual sound. No acoustic feature correction has been applied and the rating levels are equal to the specific sound levels. The potential for character corrections is discussed in the uncertainty section of the assessment.

Table 6-1 Predicted Sound Levels at Sensitive Receptors

Receptor	Daytime Predicted Specific Sound Level (Free-field), dB $L_{Aeq,T}$	Character Correction, dB	Daytime Rating Levels, dB $L_{A,Tr}$
R1 – Bramblehurst	61	+0	61
R2 – Graylands Lodge	53	+0	53
R3 – Kingcoate House	43	+0	43
R4 – Cox Farm	53	+0	53
R5 – Andrew’s Farm	43	+0	43
R6 – 18 Station Road	41	+0	41
R7 – South Lodge	40	+0	40

These predicted specific sound levels are dominated by the noise from the crusher at all receptors apart from receptors R1, R6 and R7 where HGV movements are dominant. The crusher is expected to operate for two to three weeks every quarter and while HGVs away from the public highways are a legitimate part of the site’s sound emissions for the purposes of an assessment, their relevance is subject to additional contextual

consideration. Predictions of sound levels from the proposed facility without the additional HGV movements are shown in Table 6-2.

Table 6-2 Predicted Sound Levels at Sensitive Receptors without HGV Noise

Receptor	Daytime Predicted Specific Sound Level (Free-field) without HGVs, dB $L_{Aeq,T}$
R1 – Bramblehurst	42
R2 – Graylands Lodge	53
R3 – Kingcoate House	43
R4 – Cox Farm	52
R5 – Andrew's Farm	41
R6 – 18 Station Road	36
R7 – South Lodge	37

Predictions of sound levels from the proposed facility without the additional HGV movements or crusher are shown in Table 6-3.

Table 6-3 Predicted Sound Levels at Sensitive Receptors without HGV or Crusher Noise

Receptor	Daytime Predicted Specific Sound Level (Free-field) without HGVs or Crusher, dB $L_{Aeq,T}$
R1 – Bramblehurst	38
R2 – Graylands Lodge	46
R3 – Kingcoate House	35
R4 – Cox Farm	44
R5 – Andrew's Farm	34
R6 – 18 Station Road	34
R7 – South Lodge	35

Predicted rating levels (including HGV and crusher noise) have been compared against representative background levels (as established in Table 4-4) at each receptor to assess impacts, with the nearest categorisation of impact as per BS 4142 guidance shown in Table 6-4. However, final conclusions regarding the impact are dependent on context which is discussed separately.

Table 6-4 BS 4142 Initial Numerical Assessment

Receptor	Predicted Rating Level, dB $L_{Ar,Tr}$	Background Level, dB $L_{A90,T}$	Difference between Rating and Background Level, dB	BS 4142 Guidance Categorisation
R1 – Bramblehurst	61	51	+10	'Significant adverse impact'
R2 – Graylands Lodge	53	44	+9	'Adverse impact'
R3 – Kingcoate House	43	44	-1	'Low impact'
R4 – Cox Farm	53	44	+9	'Adverse impact'
R5 – Andrew's Farm	43	44	-1	'Low impact'
R6 – 18 Station Road	41	44	-3	'Low impact'
R7 – South Lodge	40	44	-4	'Low impact'

The initial estimation of the noise impact is assessed as a 'low impact' at R3, R5, R6, and R7, as an 'adverse impact' at R2 and R4, and as a 'significant adverse impact' at R1. However, impacts must be evaluated in context, which is discussed below. For contextual reference, the numerical assessment of impacts excluding sound from HGVs is presented in Table 6-5 and additionally without the crusher in Table 6-6.

Table 6-5 BS 4142 Initial Numerical Assessment without HGVs

Receptor	Predicted Rating Level, dB $L_{Ar,Tr}$	Background Level, dB $L_{A90,T}$	Difference between Rating and Background Level, dB	BS 4142 Guidance Categorisation
R1 – Bramblehurst	42	51	-9	'Low impact'
R2 – Graylands Lodge	53	44	+9	'Adverse impact'
R3 – Kingcoate House	43	44	-1	'Low impact'
R4 – Cox Farm	52	44	+8	'Adverse impact'
R5 – Andrew's Farm	41	44	-3	'Low impact'
R6 – 18 Station Road	36	44	-8	'Low impact'
R7 – South Lodge	37	44	-7	'Low impact'

Table 6-6 BS 4142 Initial Numerical Assessment without HGVs or Crusher

Receptor	Predicted Rating Level, dB $L_{Ar,Tr}$	Background Level, dB $L_{A90,T}$	Difference between Rating and Background Level, dB	BS 4142 Guidance Categorisation
R1 – Bramblehurst	38	51	-13	'Low impact'
R2 – Graylands Lodge	46	44	+2	'Low impact'
R3 – Kingcoate House	35	44	-9	'Low impact'
R4 – Cox Farm	44	44	0	'Low impact'
R5 – Andrew's Farm	34	44	-10	'Low impact'
R6 – 18 Station Road	34	44	-10	'Low impact'
R7 – South Lodge	35	44	-9	'Low impact'

6.3 Context

The general context of the site is that of a long-established industrial premises in a semi-rural area. The site has a long-standing historic operation as a landfill and waste processing site. The residual acoustic environment in the surrounding area is comprised predominantly by anthropogenic sound sources, namely road traffic noise and other existing industrial and commercial facility operations, including a brickworks and a recycling facility, as well as the potential for sound from the nearby railway line. As such, the acoustic nature of the area will not be changed due to the proposals, and in general the noise impacts are anticipated to be slightly lower than those suggested above.

With respect to the adverse impacts initially predicted at R2 and R4, and the significant adverse impact initially predicted at R1, the absolute ambient and specific sound levels are also considered, alongside the potential change in ambient sound levels. In general, a change in ambient sound levels of 3 dB are considered to represent a just noticeable increase in sound levels, as outlined by the IEMA Guidelines.

Currently, ambient sound levels ($L_{Aeq,T}$ without the development) are dominated by road traffic noise at levels similar to, often higher than, the predicted specific sound levels from the development, which is similarly dominated by noise from HGV movements. The change in ambient sound levels is set out in Table 6-7, where the levels suggest that there is unlikely to be a noticeable increase in ambient sound levels at these locations, with the possible exception of R1, R2 and R4 some of the time, especially given the similarity of the respective dominant sound sources.

Table 6-7 Change in Ambient Sound Level with Crusher

Receptor	Predicted Specific Sound Level, dB $L_{Ar,Tr}$	Existing Ambient Sound Level, dB $L_{Aeq,T}$	Combined Ambient Sound Level, dB $L_{Aeq,T}$	Change in Ambient Sound Level, dB
R1 – Bramblehurst	61	62	65	+3
R2 – Graylands Lodge	53	54	57	+3
R3 – Kingcoate House	43	54	54	0
R4 – Cox Farm	53	54	57	+3
R5 – Andrew's Farm	43	54	54	0
R6 – 18 Station Road	41	54	54	0
R7 – South Lodge	40	54	54	0

The change in ambient sound levels without the crusher is set out in Table 6-8 where at R2 and R4 the increase in ambient sound levels is unlikely to be unnoticeable. At R1 increases in ambient noise levels may still be noticeable.

Table 6-8 Change in Ambient Sound Level without Crusher

Receptor	Predicted Specific Sound Level, dB $L_{Ar,Tr}$	Existing Ambient Sound Level, dB $L_{Aeq,T}$	Combined Ambient Sound Level, dB $L_{Aeq,T}$	Change in Ambient Sound Level, dB
R1 – Bramblehurst	61	62	65	+3
R2 – Graylands Lodge	49	54	55	+1
R3 – Kingcoate House	35	54	54	0
R4 – Cox Farm	46	54	55	+1
R5 – Andrew's Farm	40	54	54	0
R6 – 18 Station Road	41	54	54	0
R7 – South Lodge	40	54	54	0

A consideration of the change in road traffic noise from HGVs also provides additional context, particularly at R1 and R2, which are adjacent to the site access road and Langhurst Wood Road respectively. Considering the existing permissions for 392 HGV movements per day (which does not include any light vehicle traffic or vehicles associated with the brickworks or recycling centre as a worst-case estimate), a simple calculation of an additional 76 HGV movements would be anticipated to amount to no more than a 0.8 dB increase in traffic noise levels from the site, equivalent to a negligible impact. Therefore, the absolute sound levels without HGVs shown in Table 6-2 are likely to be as relevant or more relevant to the perceived impacts at receptors, particularly at R1 and R2 which are closer to HGV access routes. The numerical assessment in Table 6-5 suggests a change to low impact at R1.

Considering the crusher will only be operational for two to three weeks in a quarterly period the levels shown in Table 6-5 are only going to be typical for 15 – 25% of the time and for the other 75 – 85% of the time, taking into consideration the contextual factors regarding the HGV movements, noise levels shown in Table 6-6 are more likely to be relevant for this period. The numerical assessment in Table 6-6 suggests a change to low impact at all receptors during the period the crusher is not operating. Table 6-7 suggests that the ambient noise levels with HGVs and crusher noise included is predicted to increase by 3dB. This indicates that the increase in noise may just be perceptible at receptors R1, R2 and R4 for the 15 – 25% of the time the crusher is operating. At R2 and R3 this change in ambient noise level is predicted to instead be 1dB when the crusher is not operating. Given the low percentage of time the crusher operates and the impact it has on the ambient noise level it is considered that the crusher would have a low impact on nearby receptors.

The sound levels without HGVs or crusher are less relevant to the R4 location as it is farther back from the HGV access routes and crusher location, and still results in a rating level of 2 dB above background sound level at R2. There could be seen to still be some residual risk of adverse impacts at R2 and R4. However, given the small margin by which the rating level exceeds the background sound level and the consideration above that sound

from the site is anticipated to generally result in slightly lower impacts than suggested by the initial numerical assessment, this risk is considered to be low. A low impact is therefore concluded to be likely at all locations.

6.4 Uncertainty

Measured background sound levels were undertaken at ground floor level (1.5 m) and different sound levels may occur at first floor height. Model outputs suggest that this difference would be up to 1 dB difference in specific sound levels, and in many cases results in lower sound levels. Background sound levels may also be higher at first floor level due to reduced shielding and ground absorption effects. This is unlikely to affect the outcome of the assessment.

No character corrections have been applied to determine the rating level. There is some uncertainty regarding whether the intermittency of the HGVs would warrant a character correction. However, given the existing regular HGV movements, this is considered unlikely to be a noticeable feature of the sound from the proposals. Similarly, as the equipment are not yet installed or operating, it is not known whether the equipment would be perceptibly tonal, impulsive, or otherwise distinctive. These are generally considered to be unlikely, given the large distances to most receptors and the types of equipment involved.

The variability in background sound levels can lead to a rise in the degree of uncertainty about the level of impact at different times of day and on different days, as well as at different locations. The most typical and representative measured background sound level for each period has been used in the assessment, based on professional judgement. It should be noted background sound levels are highly variable and differences between equivalent periods on different days have been recorded in some cases up to 5 dB. Generally, the greater the period of monitoring, the greater variation in sound levels is recorded and over a greater range of conditions. The background sound levels were undertaken over a period of 6 days, which is considered a suitably representative period.

The inherent uncertainty in the measurement equipment is ±0.5 dB, and as such this factor is unlikely to affect the conclusions.

Sound power levels of the plant comprising the proposals have been derived from manufacturer information, and from the sound emissions library given in BS 5228-1, while the acoustic performance of the plant building is based on conservative assumptions of the acoustic performance of the structure (see Appendix C). There is inherent uncertainty in the reliability of these values, however modern equipment tends to be quieter than equivalent levels in the BS 5228-1 library. This is evidenced by the mismatch between the calculated change in ambient sound level at R1 (+3 dB, see Table 6-7) and the expected change due to additional HGV movements (<1 dB increase, as outlined above).

Further worst-case assumptions have been adopted, for example assuming the maximum 76 additional HGV movements per day, rather than the expected average 60 HGV movements, and the assumption of 2 continuously operating excavators for the site's mobile plant. These assumptions skew the uncertainty such that higher sound levels than those predicted are unlikely.

The inherent uncertainty in the modelling software and procedures is ±3 dB. This has some potential to affect the outcome of the assessment but could result in higher or lower sound levels than those presented.

Given the strength of the conclusions and the worst-case assumptions adopted, while there is some potential for several uncertainty factors to align unfavourably to result in higher impacts than predicted, this is considered to be unlikely.

6.5 Cumulative Impacts

Cumulative impacts are also a potential consideration, whereby background and ambient sound levels can 'creep' upwards through multiple developments over time or combine with simultaneous developments. There is some potential for cumulative impacts from multiple developments at R2 and R4, if future developments were to occur. The potential for cumulative impacts at R3, R5, R6, and R7 is considered to be substantially lower due to the clear low impacts identified in this assessment with rating levels at least 3 dB lower than background sound levels, and around 10 dB below background sound level when excluding HGV movements (which also includes at R1).

Previous applications in the area that are yet to be implemented include:

- Waste Transfer and Recycling Site – WSCC/006/18/NH
  - With permission for EfW (not implemented to date) – APP/P3800/W/18/3218965

The former Wealden Brickworks is identified as a potential cumulative impact. A planning application at the Former Wealden Brickworks on Langhurst Wood Road for a "Recycling, Recovery and Renewable Energy Facility and Ancillary Infrastructure" was refused planning permission on 11th July 2018. Following an appeal, planning permission for the site was granted in February 2020.

The application includes a noise assessment which identified low impacts at all surrounding locations, with specific sound levels of 38 dB at R2 and 32 dB at R4, with a highest predicted specific sound level of 45 dB near to R1. At all locations, the combined specific sound level from both developments would be less than 1 dB greater than the specific sound level from either development alone. As such, the cumulative effect of the developments is considered to be a negligible to minor impact.

7. Summary and Conclusions

A detailed noise and vibration assessment has been undertaken to consider the effects of the introduction of an open windrow composting (OWC) facility at the Brookhurst Wood site. The assessment has considered the effects from construction noise, operational noise due to off-site traffic, and operational noise due to on-site operations.

A qualitative assessment of construction noise and vibration effects has been carried out. Construction noise effects are anticipated to be short-term and would be mitigated through the use of Best Practicable Means (BPM) outlined in Section 72 of the Control of Pollution Act 1974 (as amended) to minimise noise and vibration effects.

An assessment of the operational noise effects has been carried out. Potential increases in traffic noise on surrounding roads has been determined to be negligible.

Operational noise from on-site operations has been assessed using the methods in BS 4142:2014+A1:2019. The assessment indicates that at Locations 2 and 4 an adverse impact may occur when the crusher is operating. However contextual factors including the existing noise character of the area is industrial, the crusher is operating for only 15-25% of the time and that it might be just perceptible above existing ambient noise levels during its operation indicates that the impact at these locations may not be as high. At all other locations a low impact is anticipated.

Cumulative operational effects with other potential future developments have been considered. Although there is the potential for simultaneous effects to occur, the cumulative effect is likely to be result in a negligible to minor adverse impact.

In conclusion, while there is the potential some minor adverse impacts to occur, no significant effects are predicted.

Appendix A Acoustics Terminology

Noise	Unwanted or unexpected sound.
"A" Weighting (dB(A))	The human ear does not respond uniformly across the audible frequency range. The "A" weighting is commonly used to simulate the frequency response of the ear.
Decibel (dB)	The decibel is a logarithmic ratio of two values of a variable. The range of audible sound pressures is approximately 2×10^{-5} Pa to 200 Pa. Using decibel notation presents this range in a more manageable form, 0 dB to 140 dB.
Sound pressure level (L_p)	Equal to 20 times the logarithm to the base 10 of the ratio of the root mean squared (RMS) sound pressure to the reference sound pressure. In air the reference sound pressure is 2×10^{-5} Pa. Mathematically: Sound Pressure Level (dB) $=20 \log_{10} \{p(t) / P_0\}$ where $P_0 = 2 \times 10^{-5}$ Pa
Sound power level (L_w)	Equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power. In air the reference sound power is 1×10^{-12} Pa. Mathematically: Sound Power Level (dB) $= 10 \log_{10} \{W / W_0\}$ Where $W_0 = 1 \times 10^{-12}$ Pa
Background sound level, $L_{A90,T}$	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using fast time weighting, F, and quoted to the nearest whole number of decibels
Ambient sound level, $L_{Aeq,T}$	The equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time that is usually composed of sound from many sources near and far.
Specific sound source	The sound source(s) being assessed
Specific sound level, $L_{Aeq,Tr}$	The equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr
Rating level, $L_{Ar,Tr}$	The specific sound level plus any adjustment for the characteristic features of the sound
Reference time Interval, Tr	The specified interval over which the specific sound level is determined (1-hour during the daytime, 07:00-23:00, and 15-mminutes during the night-time, 23:00-07:00)
Free-field position	Sound pressure levels measured or predicted at a position greater than 3.5m from any reflective surface other than the ground.

Appendix B Measurement Data

After a detailed review of the measured data and observations during measurements, and considering the sound sources in this area, the typical background sound levels for the assessment have been determined by professional judgement. These are shown in Table 4-1, Table 4-2, and Table 4-3. Details of the measurements used to determine these values are shown in Section 4.

Background sound levels are highly variable, with differences between equivalent periods on different days, in some cases up to 5 dB.

At LT1, the L_{A90} levels do not often drop below 45 dB during the night-time (23:00-07:00) and 47 dB during the evening (19:00-23:00) periods, and do not often drop below 49 dB during the daytime (07:00-23:00). Histograms of the $L_{A90,15min}$ levels for these periods are shown in Figure 3, Figure 4 and Figure 5.

Overview time-history plots of the long-term measured $L_{A90,15min}$ levels are shown below in Figure 6

At LT2, the L_{A90} levels do not often drop below 29 dB during the night-time (23:00-07:00) and 37 dB during the evening (19:00-23:00) periods, and do not often drop below 39 dB during the daytime (07:00-23:00). Histograms of the $L_{A90,15min}$ levels for these periods are shown in Figure 7, Figure 8, and Figure 9.

Overview time-history plots of the long-term measured $L_{A90,15min}$ levels are shown below in Figure 10.

Figure 3 Daytime variation in Long-term $L_{A90,15min}$ Levels by Hourly Period LT1

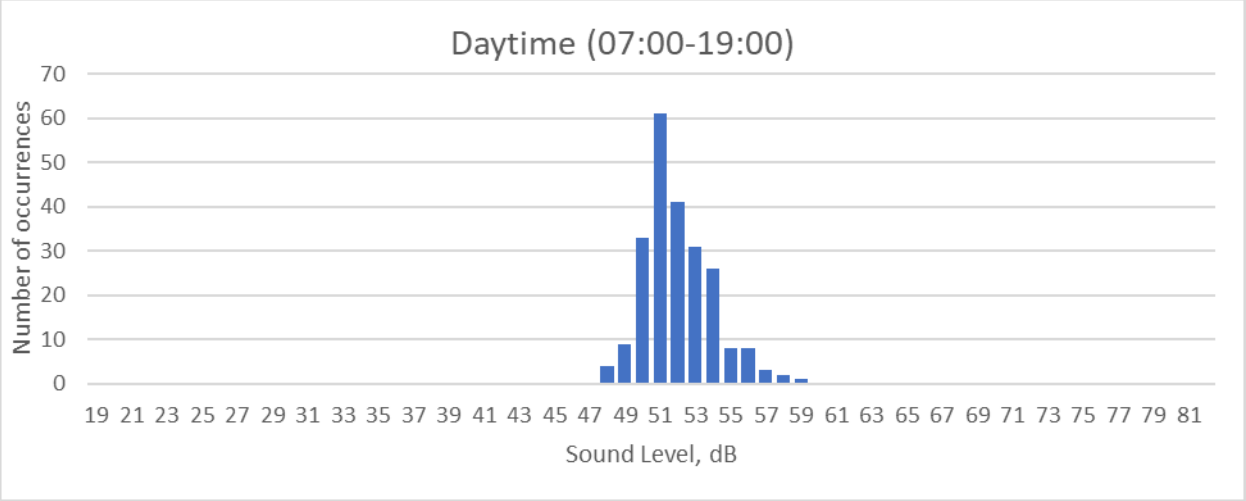


Figure 4 Evening variation in Long-term $L_{A90,15min}$ Levels by Hourly Period LT1

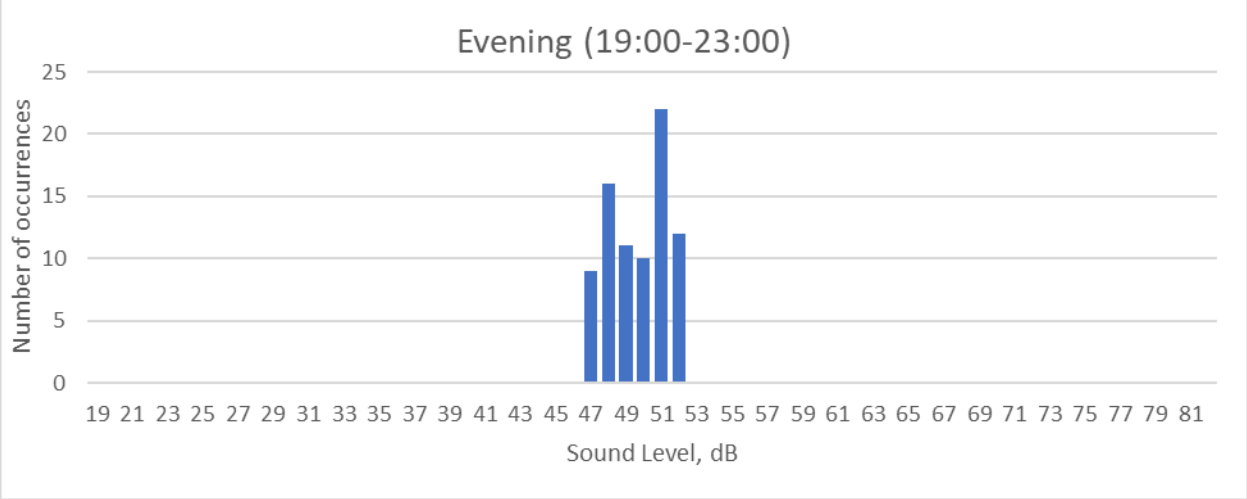


Figure 5 Night-time variation in Long-term $L_{A90,15min}$ Levels by Hourly Period LT1

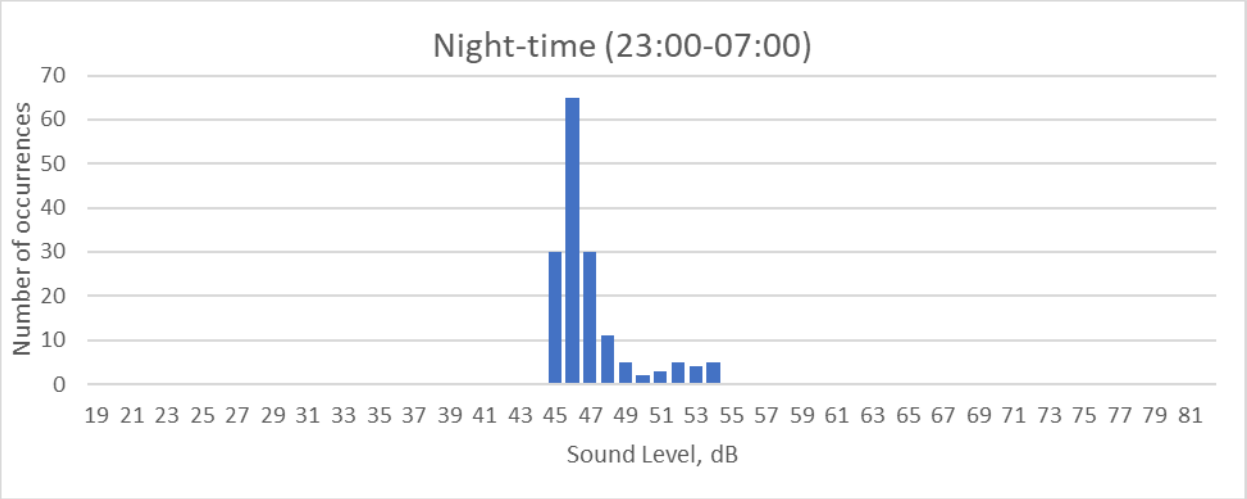


Figure 6 Measured Sound Levels at LT1 2nd to 9th February 2023

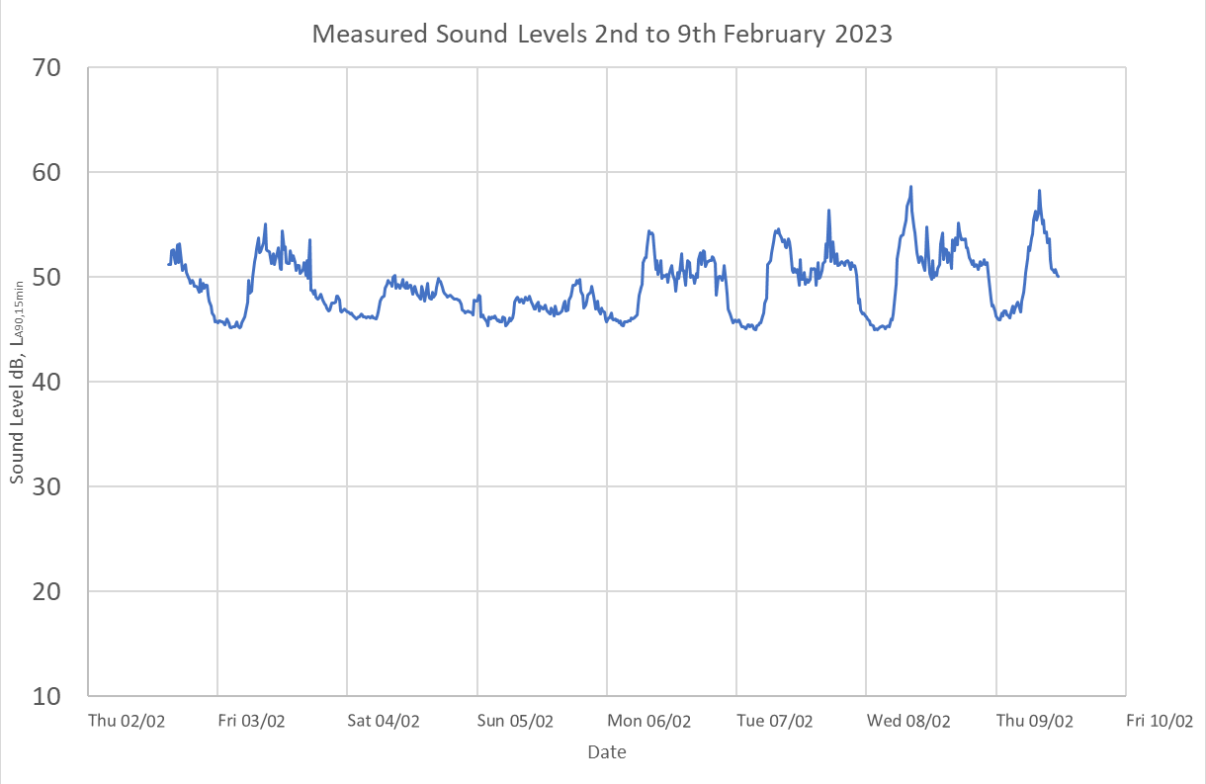


Figure 7 Daytime variation in Long-term $L_{A90,15min}$ Levels by Hourly Period LT1

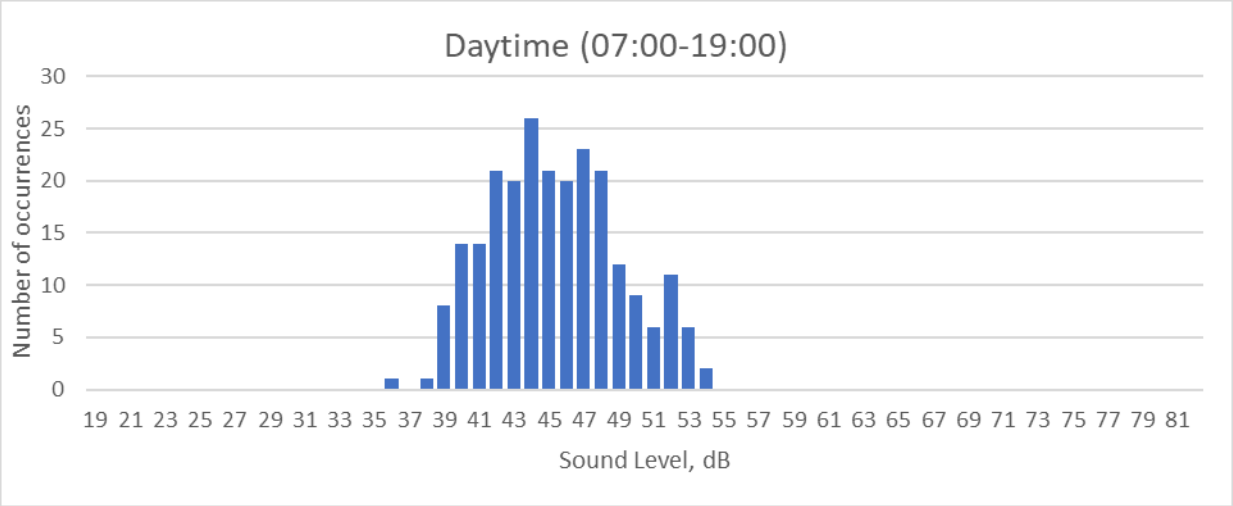


Figure 8 Evening variation in Long-term $L_{A90,15min}$ Levels by Hourly Period LT1

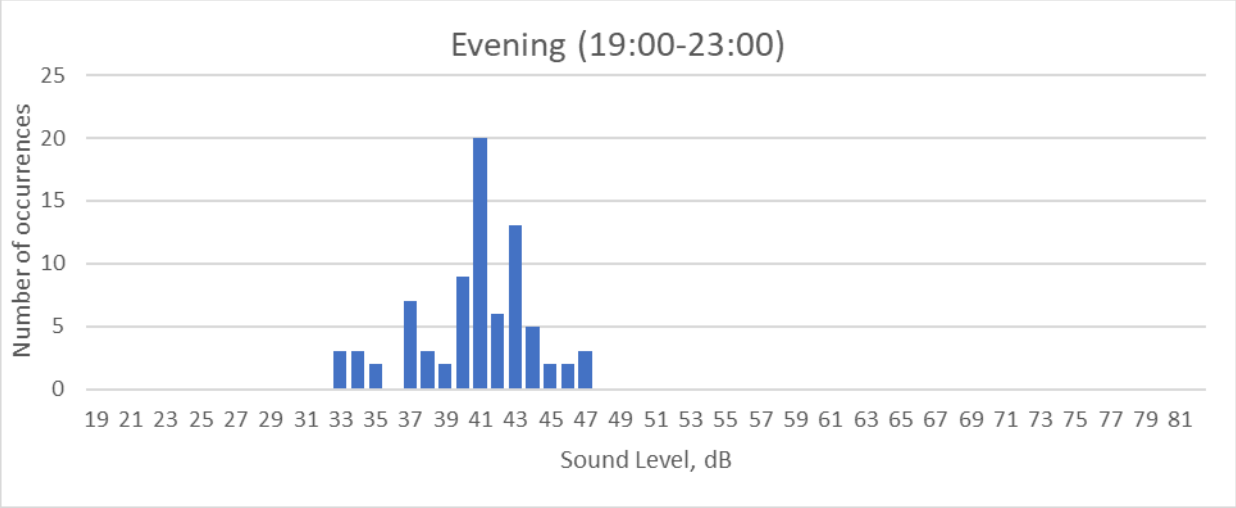


Figure 9 Night-time variation in Long-term $L_{A90,15min}$ Levels by Hourly Period LT1

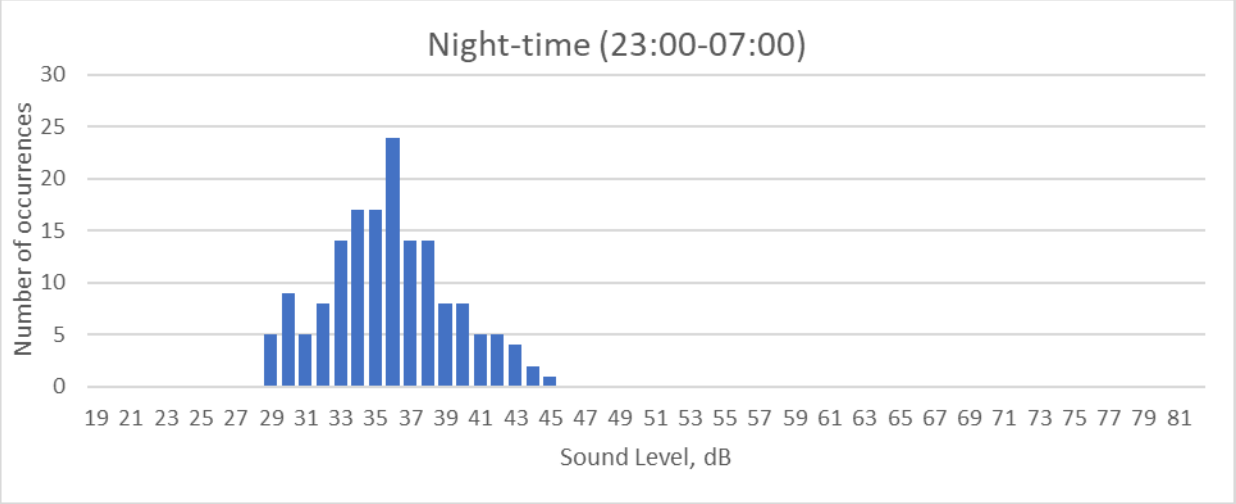
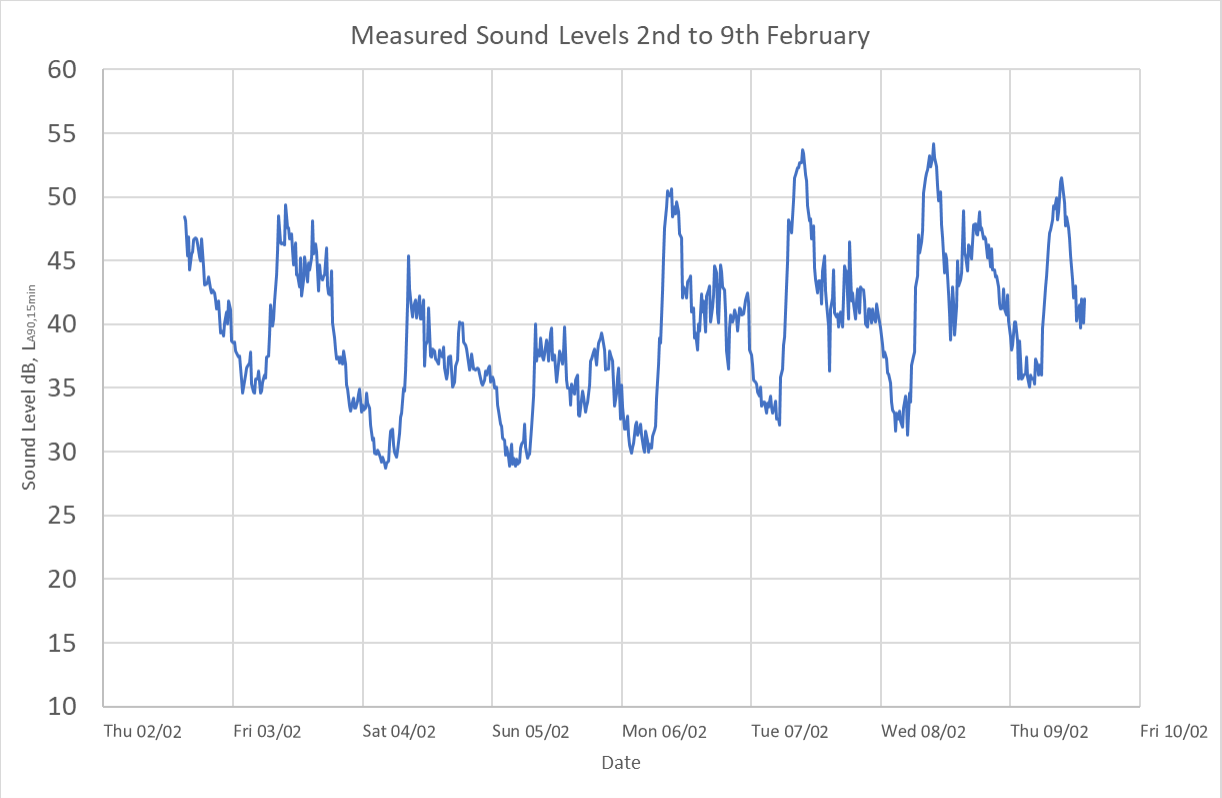


Figure 10 Measured Sound Levels at LT1 2nd to 9th February 2023



Appendix C Acoustic Modelling Settings and Inputs

SoundPLAN® acoustic modelling software (version 8.2) implementing the calculation procedures of ISO 9613[9] has been employed to predict the propagation of sound from the Site in all directions and to quantify resultant sound levels at the identified noise-sensitive receptor locations.

The settings used within the model are detailed in Table C-1.

Table C-1 Acoustic Model Settings and Details

Setting	Value
Reflection Order	3
Maximum reflection distance to receiver	200 m
Maximum reflection distance to source	500 m
Search radius	5000 m
Weighting	dB(A)
Allowed tolerance (per individual source)	0.1 dB
Create ground effect areas from road surfaces	No
Industrial Sound Calculation Standard	ISO 9613-2: 1996
Air / ground absorption Standard	ISO 9613-1 – automatic alternative ground effect for sources without a spectrum
Air Pressure	1013.3 mbar
Relative Humidity	70%
Temperature	10℃
Meteorological correction	0.0
Assessment period	Constant; no time-variation included

The main sound sources associated with the proposals are mobile plant, HGVs, and the screening and separation plant within a plant building. The building walls are assumed to have an acoustic performance equivalent to 1 mm sheet steel with a layer of mineral wool. The roof is assumed to be similarly equivalent to 1 mm corrugated sheet steel. An opening at the western end of the building is assumed, with a height and width of 5 m.

Sound power levels for sources included in the model are set out in Table C-2.

Table C-2 Sound Sources

Source	Model Source Type	Number of Items	Source Level	Sound Level Adopted
Mobile plant	Area source	2	71 dB at 10 m	99 dB L_W
HGV delivery vehicles	Line source	4*	83 dB at 10 m, travelling at 20 km/h	68 dB L_w per metre
Screening and separation plant building with dimensions 50 m x 10 m x 9 m Plus an opening at the western end with dimensions 5 m x 5 m	Area source (walls)	4	Two 92 dB L_p sources internally	70 dB L_w per square metre surface area
	Area source (roof)	1		70 dB L_w per square metre surface area
	Area source (opening)	1		88 dB L_w per square metre surface area

*single hour

BS 7445-1:2003 'Description and environment of environmental noise – Part 1', British Standards Institution, 2003 sound by the atmosphere (1993) and Part 2: General Method of Calculation (1996).

Appendix E Abnormal Operations and Accidents

Hazardous Event			Risk Assessment			Controls and Mitigations	Mitigation Factor	Residual Risk
Event	Pathway	Receptor	Probability	Consequence	Risk			
Flooding	• Water	▪ Surface or ground water	2	4	8	• Site is not located in a floodplain and no history of flooding • Site drainage has been designed taking 1:30 year and 1:100-year flood events	6	1.33
Main services failure	• Air • Water	▪ Staff ▪ Public	4	1	4	• Failure of mains services from the local grid will result in an emergency generator being utilised	5	0.8
Operator Error	• Air • Water • Land	▪ Staff ▪ Public	5	3	15	• Provision of appropriate operator training • Technically competent person available at site • Internal operational control procedures • Strict compliance with site integrated management system	5	3
Site Security Breach: • entry by intruders • damage to equipment • theft • fly-tipping • arson	• Air • Water • Land	▪ Staff ▪ Public ▪ Surface or ground water	4	3	12	• Site secured by a perimeter fence and lockable gates • Site monitored by CCTV • Vehicle number recording system is utilised	5	2.4
Major vehicle accident – leading to a significant loss of waste	• Air • Water • Land	▪ Staff ▪ Public	3	4	12	• Site speed restrictions in place and compliance with highway speed restrictions • Approved carriers (i.e. trained hauliers employed by WCA) • Material clean-up arrangements in place. • Road vehicles are robust and designed to withstand high speed collisions that may occur on public highways • Suitable barriers to prevent moving vehicles damaging equipment	5	2.4
Inadequate waste acceptance procedures	• Air • Water • Land	▪ Staff ▪ Public	3	4	12	• Site operates a vehicle licence plate recording system. • All loads are checked against the details provided on the waste transfer documentation. • Clear and legible labelling of waste	5	2.4

Hazardous Event			Risk Assessment			Controls and Mitigations	Mitigation Factor	Residual Risk
Event	Pathway	Receptor	Probability	Consequence	Risk			
						• All loads are visually inspected at the point of discharge/off-loading. • Non-permitted waste identified will be quarantined and transfer arranged to a suitably licensed facility.		
Inappropriate waste storage (including incoming waste and recycling plant outputs)	• Water • Land	▪ Staff ▪ Public	5	1	5	• Wastes accepted at the facility are off-loaded to the relevant storage area. • Wastes accepted for transfer are off-loaded to the appropriate covered storage skips or secure storage containers. • Storage of waste containers allows easy inspection. • Storage of recycling plant outputs are within designated storage bays and materials can be covered as necessary to minimise the release of dust during periods of high wind. • Water suppression is available when required. • Waste will be stored in locations that minimise the handling of waste. • Waste handling will only be carried out by competent staff using appropriate equipment. • Waste storage areas will be away from watercourses and sensitive perimeters and within a secure area of the facility to prevent unauthorised access and vandalism.	5	1
Transfer of substances	• Water • Land	▪ Surface or ground water	4	2	8	• Water suppression is available when required.	5	1.6
Failure of containment on Water Storage Tank	• Water • Land	▪ Surface or ground water	4	2	8	• Storage tank designed in line with industry standards. • Containment is inspected daily for accumulation of material or damage to integrity – repairs will be completed as a priority. • Containment integrity testing is incorporated into the maintenance regime. • Tank will be emptied in the event that a leak is detected and repairs will be completed. • Any release of liquid due to failure of containment on the tank will be captured within the enclosed drainage system and can be sampled for testing prior to removal from site for treatment/disposal.	5	1.6

Hazardous Event			Risk Assessment			Controls and Mitigations	Mitigation Factor	Residual Risk
Event	Pathway	Receptor	Probability	Consequence	Risk			
Overflow of Water Storage Tank	• Water • Land	▪ Surface or ground water	4	2	8	• The tank is equipped with a level alarm and level will be checked at least daily and following any significant period of heavy rain. • Any material overflow will be directed to and collected in the enclosed drainage system – the material can be sampled for testing prior to removal from site for treatment/disposal.	5	1.6
Failure of containment on Fuel Tank	• Water • Land	• Surface or ground water	4	2	8	• Storage tank designed in line with industry standards. • Containment is inspected daily for accumulation of material or damage to integrity – repairs will be completed as a priority. • Containment integrity testing is incorporated into the maintenance regime. • Tank will be emptied in the event that a leak is detected and repairs will be completed. • Any release of liquid due to failure of containment on the tank will be captured within the enclosed drainage system and can be sampled for testing prior to removal from site for treatment/disposal.	5	1.6
Overflow of Fuel Tank	• Water • Land	• Surface or ground water	4	2	8	• The tank is equipped with a level alarm and level will be checked at least daily and following fuel delivery. • Any material overflow will be directed to and collected in the enclosed drainage system – the material can be sampled for testing prior to removal from site for treatment/disposal.	5	1.6
Failure of plant and equipment	• Air • Water • Land	• Staff • Public ▪ Surface or groundwater	3	4	12	• Plant/equipment is designed in accordance with relevant design and fabrication standards. • Preventative maintenance includes regulator inspection and maintenance regimes. • Plant is subject to a first use check on a daily basis to facilitate defect detection and reporting.	5	2.4
Wrong connections in drains or other systems	• Water • Land	▪ Surface or ground water	3	4	12	• Drainage design undertaken by suitably qualified engineers • Drainage design has been completed using appropriate modelling software • Construction of drainage will be undertaken in accordance with the specified designs	5	2.4

Hazardous Event			Risk Assessment			Controls and Mitigations	Mitigation Factor	Residual Risk
Event	Pathway	Receptor	Probability	Consequence	Risk			
Incompatible substances coming into contact with each other	• Air • Water • Land	• Staff • Public ▪ Surface or groundwater	2	4	8	• Unlikely that incompatible wastes will be accepted due to the nature of the waste streams being treated and robust waste pre-acceptance and acceptance procedures. However, if such material was identified during waste acceptance then it will be segregated based on substances present and their hazardous properties • Robust handling procedures which will ensure segregation of incompatible waste types into bays. At a minimum a kerbed perimeter and separate drainage collection will be used.	5	1.6
Very high winds	• Air	• Staff ▪ Public	3	4	12	• Dust suppression and other controls as stipulated in the Dust Management Plan will be implemented. • In conditions where winds exceed 25 mph, waste acceptance to the site will cease.	5	2.4
Accessibility of control equipment in emergency situations	• Air • Water • Land	• Staff • Public ▪ Surface or groundwater	3	4	12	• Emergency spill kits, fire extinguishers and access to water supplies in the event of an emergency are available from various locations both on the OWC and in the wider Brookhurst Wood site.	5	2.4
Hazardous atmospheres in confined spaces	• Air • Water • Land	• Staff • Public • Surface or groundwater	2	4	8	• Given the nature of the wastes and the treatment of the waste in well ventilated external area, there is low likelihood of hazardous atmospheres occurring. • All work in confined spaces will be subject to permit-to-work requirements including the monitoring for hazardous atmospheres.	5	1.6