Lincoln Recycling Facility Environmental Permit Application

Environmental Risk Assessment

GBCTR Limited

Unit 16, Electric Avenue, Witham St Hughs, Lincoln LN6 9BJ

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Basis of Report

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Appendices

1.0 INTRODUCTION

SLR Consulting Limited (SLR) has been instructed by A Great British Clean Tech Recycling Company Limited (GBCTR) to prepare an application for an Environmental Permit for the proposed Lincoln Recycling Facility, located at Unit 16, Electric Avenue, Witham St Hughs, Lincoln LN6 9BJ.

The proposed facility will be regulated as a multi-activity installation under the Environmental Permitting (England and Wales) Regulations 2016 (as amended) (EPR).

This Environmental Risk Assessment (ERA) has been undertaken in accordance with the Environment Agency's (EA) guidance 'Risk assessments for your environmental permit' (January 2025).

It provides an assessment of the risks to the environment and human health from emissions that may be associated with the proposed activities to be operated at the Site. The aim of the assessment is to identify any significant risks and demonstrate that the risk of pollution or harm will be acceptable by implementing appropriate measures to manage these risks.

1.1 Overview of Proposed Activities

The proposed facility will carry out a number of waste recycling activities to treat the following waste streams:

- End-of-life solar panels; and
- End-of-life batteries from solar farms and Electric Vehicles.

Up to 42,000 tonnes per annum of end-of-life solar panels will be processed at the facility consisting of the following steps:

- Temporary storage of end-of-life panels pending treatment;
- Manual dismantling of the aluminium metal frames from the panels;
- Shredding of the aluminium metal frames;
- Shredding of the panels;
- Separation of the panel shredding outputs into plastic and metal fractions; and
- Temporary storage of the outputs from both shredding activities pending transfer for recovery at an appropriately regulated facility.

Up to 17,000 tonnes of end-of-life batteries will be processed at the facility consisting of the following steps:

- Temporary storage of the end-of-life batteries pending treatment;
- Discharging of the end-of-life batteries;
- Shredding of the batteries;
- Collection of the liquid electrolyte fraction and temporary storage pending transfer off-site for recovery at an appropriately regulated facility;
- Separation of the solid battery shredding outputs into plastic, metal and 'black mass' fractions; and
- Temporary storage of the solid fractions pending transfer off-site for recovery at an appropriately regulated facility.

Treatment of solar panels will be carried out in a number of lines of approximate capacity 4.8 tonnes per hour. The Site will commence with 2 lines initially with plans to increase this to 4 lines in total.

Treatment of batteries will be carried out in a single line of approximately 2 tonnes per hour.

All treatment will take place within a fully enclosed building. The building is a new-build and benefits from an impermeable surfacing and sealed drainage.

Some waste will be stored externally to the building in fully enclosed containers or weatherproof packaging. The external yard also benefits from impermeable surfacing and a sealed drainage system. Uncontaminated rainfall-derived surface water run-off will be discharged via an attenuation pond to the municipal sewer. Process effluent will be collected and transferred off site for treatment at an appropriately regulated facility.

1.2 Overview and Approach

This ERA has been prepared in support of the permit application and has been undertaken in accordance with the Environment Agency (EA) guidance Risk assessments for your environmental permit[1] (January 2025). The purpose of the assessment is to identify any significant risks that may affect receptors and demonstrate that the risk of pollution or harm will be acceptable by taking the appropriate measures to manage these risks.

This ERA uses the following approach, as set out in the EA's guidance, for identifying and assessing the risks from the proposed:

Step One	Identify risks and their sources for the Site
Step Two	Identify receptors at risk from the Site
Step Three	Identify pathways between sources and receptors
Step Four	Assess risks relevant to the Site activities and determine if they can be screened out
Step Five	State measures proposed to control unacceptably high risks
Step Six	Present your assessment

2.0 IDENTIFYING THE RISKS

This section considers the potential risks to the environment listed in the EA's guidance to identify those which will apply to the proposed activities and which require assessment, and to screen out those which are not relevant.

The EA Guidance identifies the potential risks that may require assessment for 'most sites' as follows:

- any discharge, for example sewage or trade effluent to surface or groundwater;
- accidents;
- odour (not for standalone water discharge and groundwater activities);
- noise and vibration (not for standalone water discharge and groundwater activities);
- uncontrolled or unintended ('fugitive') emissions, for which risks include dust, litter, pests and pollutants that should not be in the discharge;

[1] https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

- visible emissions, e.g. smoke or visible plumes; and
- release of bioaerosols, for example from shredding, screening and turning, or from stack or open point source release such as a biofilter.

In addition, the EA guidance identifies risks from specific activities for which additional risk assessments must be completed depending on the activity being carried out and where substances are released or discharged into the environment.

Table 2-1 provides a summary of the risks for the proposed extension to the permitted boundary, identifying those that can be screened out as not relevant (grey shaded) and the type of risk assessment carried out for those that are identified as relevant.

Table 2-1 Scope of Risk Assessment

Risk Type	Relevant	Justification	Type of Risk Assessment
Air Emissions	Yes	Point source emissions to air from the shredding activities.	Quantitative
Global Warming Impact	Yes	Direct releases of VOCs, CO, NOx and CO_2 from the thermal oxidiser and indirect emissions of CO_2 from electricity supply.	Semi-quantitative using factors
Groundwater	No	There are no direct or indirect releases to groundwater from thefacility.	Not required
Surface Water	No	Only uncontaminated rainfall derived run-off is released to sewer. Process effluent is collected and tankered off site for treatment.	Not required
Accidents and Incidents	Yes	Potential risks from equipment failure, spillage etc	Qualitative
Odour	Yes	Potential release of VOCs from battery shredding.	Qualitative
Noise & Vibration	Yes	Operation of mechanical equipment, pumps and fans.	Quantitative
Fugitive Emissions	Yes	Emissions of dust may arise from the shredding processes	Qualitative
Visible Emissions	No	No visible plume or emissions as a result of existing or proposed activities on Site	Not required
Bioaerosols	No	None emitted	Not required

3.0 SITE SETTING AND RECEPTORS

This section identifies the potentially sensitive receptors in the vicinity of the Site that could be harmed (at potentially significant risk) by emissions from the activities to be carried out at the facility.

The EA's guidance requires all receptors that are near the Site and could reasonably be affected by the proposed activities to be identified and considered as part of the ERA. The following buffer distances have been used to identify the relevant receptors:

- a 2km radius for SSSIs and sites of ecological interest; and

- a radius of 500m for all other potentially sensitive receptors (for example, residential, commercial, industrial, agricultural and surface water receptors).

3.1 Site Setting

The site is centred on National Grid Reference (NGR) SK 8861 8294 and is located at Unit 16, Electric Avenue, Witham St Hughs, Lincoln LN6 9BJ. The site location is illustrated on Drawing 001 Site Location Plan.

The Environmental Site Setting is illustrated on Drawing 003 and Cultural and Natural Heritage on Drawing 004.

The site is located within a predominantly industrial area, with industrial facilities associated with Modwen Park Lincoln located to the north and west. Residential properties in Witham St Hughs are located to the east of the site.

The immediate land uses in the vicinity of the site are as follows:

Table 3-1 Immediate Land Uses Surrounding the Site

Direction	Land-Use
North	Industrial premises
East	Open land and residential properties
South	Open land and the CEMEX Swinderby Quarry
West	Industrial premises and former RAF Swinderby site

3.1.1 Industrial and Commercial

The site lies within the Indurent Park Lincoln business park and therefore industrial premises lie adjacent to the site to the north and west. Industrial premises include DHL eCommerce Depot and GS Services Ltd to the north and George H Kime to the west.

3.1.2 Local Transport Network

The site is situated on Electric Avenue which runs immediately to the northeast and west of the EP boundary.

Camp Road lies 125m east and the A46 is approximately 670m northwest of the site boundary.

The wider local road network is illustrated on Drawing 001.

3.1.3 Open Land

The land to the south is currently open, but is planned for development of further industrial units.

3.1.4 Residential

There is an area of residential properties located to the northeast and east of the site in Witham St Hughs. The closest residential properties are located approximately 155m from the eastern EP boundary.

3.2 Geology, Hydrogeology and Hydrology

3.2.1 Geology

A review of the British Geological Survey (BGS)[2] mapping reveals that the site is directly underlain by superficial deposits of the Balderton Sand and Gravel Member (BSG) overlying the bedrock of mudstone and limestone from the Scunthorpe Mudstone Formation (SMF).

3.2.2 Hydrogeology

The mudstone bedrock underlying the site is identified as a Secondary B aquifer on the Multi-Agency Geographical Information for the Countryside (MAGIC) map[3]. This is defined as 'predominantly lower permeability strata which may in part have the ability to store and yield limited amounts of groundwater by virtue of localised features such as fissures, thin permeable horizons and weathering'.

Superficial drift is recorded as Secondary A.

3.2.3 Groundwater Vulnerability

MAGIC map shows that the Site lies in an area of medium-high groundwater vulnerability.

3.2.3.1 Source Protection Zones

The site is not located within a source protection zone for groundwater. The closest source protection zone is located approximately 8km east of the site.

3.2.4 Hydrology

The nearest surface water feature to the site is a pond which lies adjacent to the site's northwestern boundary, followed by a pond 20m to the northeast of the site and a lake located 610m to the south. There are several drains to the northwest, north, east and southeast of the site, the nearest is located 410m north of the site.

3.2.5 Flood Risk

The Flood Map for Planning identifies the site as lying within a Flood Zone 1, defined as locations that have a low probability of flooding meaning land that has a less than 0.1% chance of flooding from rivers or the sea.

3.3 Ecology

A 2km radius was employed in identifying all ecological receptors of importance. A search on MAGIC identified that none of the following features of ecological importance are within 2km of the Site:

- Local Nature Reserves (LNR);
- Special Protection Areas (SPA);
- Areas of Outstanding Natural Beauty;
- National Nature Reserves;
- Special Areas of Conservation (SAC); and

[2] British Geological Survey (BGS) Available at www.bgs.ac.uk, accessed in September 2025

[3] Multi-Agency Geographical Information for the Countryside Map, available at www.magic.gov.uk, accessed in September 2025

- RAMSAR sites.

There are no Sites of Special Scientific Interest (SSSI) within 2km of the Site.

A Conservation Screening Report provided by the EA (Appendix A) identifies three Local Wildlife Sites within a 2km radius of the site:

- Butt Lane Pit;
- Hawdin's Wood; and
- Norton Big Wood.

In addition, an area of ancient woodland is identified:

- Hawdin's Wood/Norton Big Wood

3.3.1 Cultural Heritage

Searches on MAGIC identified several grade II Listed Buildings within 2km of the EP boundary as shown in Table 3-2. There is one Scheduled Monument within 2km of the EP boundary.

None of the following are present within 2km of the EP boundary:

- Registered Parks and Gardens; and
- Registered Battlefields.

3.4 Identified Receptors

Table 3-2 below identifies receptors which are considered to be potentially sensitive and could reasonably be affected by activities at the Site.

Table 3-2 Identified Receptors

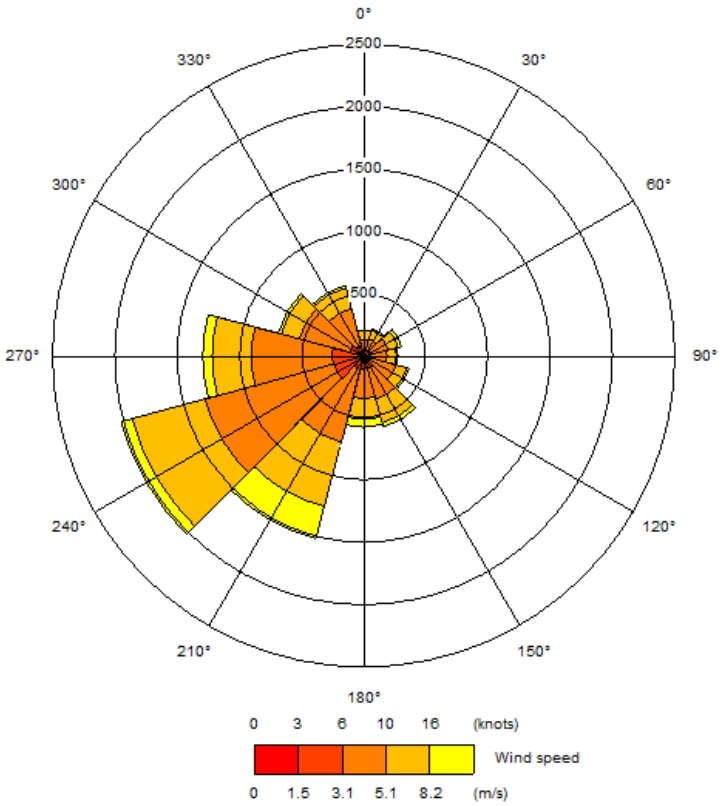
Receptor Name	Receptor Type	Direction from Site	Approximate Distance from Site Boundary at closest point (in metres)
Environmental Receptors within 500m of the EP boundary			
St Mowden Park	Industrial premises	North	Adjacent
Small pond	Surface water receptor	North-west	Adjacent
Open land	Agricultural receptors	East	Adjacent
DHL eCommerce Depot	Industrial premises	North	Adjacent
GS Services Ltd	Industrial premises	North	Adjacent
George H Kime	Industrial premises	West	Adjacent
Electric Avenue	Local transport network	North-east	Adjacent
Small pond	Surface water receptor	North-east	20
Former RAF Swinderby Site	Historical site	West	120
Camp Road	Local transport network	East	125
Witham St Hughs	Residential properties	East	155
CEMEX Swinderby Quarry	Commercial premises	South	200
Witham St Hughs Academy primary school	Educational facilities	North-east	325

Receptor Name	Receptor Type	Direction from Site	Approximate Distance from Site Boundary at closest point (in metres)
Cultural and Ecological Receptors and European Designated Ecological Sites within 2km of the EP boundary			
Half Way House	Grade II listed building	North	815
Butt Lane Pit	Local Wildlife Site	South-west	1,100
Hawdin's Wood/Norton Big Wood	Ancient Woodland & Local Wildlife Site	South-west	1,285
Morton Grange	Grade II listed building	North	1,740
Thurlby Hall & Outbuildings	Grade II listed building	East	1,860
Rectory	Grade II listed building	South-east	1,860
Churchyard Cross, St Germain's Churchyard	Scheduled monuments	East	1,910
Morton Manor	Grade II listed building	North	1,930
Church of St Germain	Grade II* listed building	East	1,935
The Cottage	Grade II listed building	North-west	1,945
Old School House	Grade II listed building	North-west	1,955
Nos 1&2 Old School Yard	Grade II listed building	North-west	1,970

3.5 Windrose

Figure 3-1 shows the wind patterns from 2017 as identified by the Waddington Meteorological Station, located approximately 10km northeast of the Site. The most prominent wind directions are from the southwest and west. Winds from the north, north-east, east and south are relatively infrequent by comparison.

Figure 3-1: Wind Rose from Waddington Station (2017)



4.0 ENVIRONMENTAL RISK ASSESSMENT

This section considers the potential pathways between source and receptor for each potential impact and where appropriate, how the risk of pollution or harm can be mitigated by measures to manage these risks and/or block the pathways. An assessment in terms of hazards posed, receptors and pathways, along with management and residual risks is presented for the impact types relevant to the proposed recycling facility as identified in Table 4-1 of this report.

Qualitative risk assessments are presented in this report for the following potential impacts:

- Accidents & Incidents;
- Odour; and
- Fugitive Emissions of dust, pests, litter, mud & debris.

A semi-quantitative assessment of Global Warming Potential is provided in this report.

Detailed quantitative assessments have been carried out for air quality and noise and vibration impacts, which are provided as separate documents to this application.

4.1 Accidents

The potential consequences from accidents and mitigation of risks are provided in Table 4-1. It is considered that the mitigation measures proposed for the proposed facilitywill mean that the risk of impacts from accidents on receptors will be low.

Table 4-1 Accidents Risk Assessment and Management Plan

WHAT DO YOU DO THAT CAN HARM AND WHAT COULD BE HARMED			MANAGING THE RISK	ASSESSING THE RISK		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequences	What is the overall risk
What has the potential to cause harm?	What is at risk/What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? Who is responsible for what?	How likely is the contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Unauthorised waste receipt and processing: Unconforming waste that may lead to dust, odour nuisance or contamination to surface water run-off	Industrial & commercial businesses, land quality, surface water and groundwater	Airborne dust, odour. Runoff to surface water and percolation through ground	Strict pre-acceptance procedures will be in place to ensure only waste allowed by the permit is accepted at the facility. Waste loads will be inspected visually as they arrive on site. On the discovery of any non-permitted wastes once unloaded, the load will be segregated and stored in an area designed for this purpose. The materials will be removed from site as waste under the appropriate designation. Any unauthorised hazardous material found during inspection will be quarantined into a holding area and lawfully removed from site.	Very low	Contamination of land, groundwater and surface water	**Negligible**
Vehicle collision: fuel spillage, damage to equipment, loss of containment	Local land quality, surface water and groundwater	Runoff to surface water and percolation through ground.	A Traffic Management Plan will be implemented on site to ensure appropriate segregation of pedestrians, mobile plant and other vehicles. Banksmen are used to control the flow of traffic in operational areas. Vulnerable areas are space protected with appropriate bollards or fencing. There is a speed limit of 5mph across the Site.	Very low	Contamination of land, groundwater and surface water	**Negligible**
Failure of site surfacing resulting in ground contamination	Local land quality, surface water and groundwater	Percolation through ground	Weekly inspections on the integrity of the impermeable paving. Areas susceptible to particularly heavy wear, for example entrances and exits, may be monitored more regularly. A record of infrastructure inspections and a log of any remedial actions taken will be made on the relevant EMS/QMS inspection form and entered onto the maintenance tracking system.	Very low	Contamination of land, groundwater and surface water	**Negligible**
Spillage of solid and liquid waste materials leading to odour or contamination to surface water run-off	Local land quality, surface water and groundwater	Runoff and percolation through ground. Airborne odour nuisance	Minor or insignificant leaks or spills will be identified through routine site measures and general housekeeping. The procedures for responding to more significant spillages are included in the Accident Management Plan. Significant spillages or leaks of liquids which may be miscible with water will be contained and controlled via the use of suitable absorbent materials kept in spill kits positioned at strategic locations around the site. Staff will be trained in the proper use of the spill kits. Immiscible spillages (such as oils) on to the impermeable surface will be controlled and prevented from leaving the site by oil water interceptors installed in the site's drainage system. The outlet from the site drainage system is fitted with a Penstock valve which will be used in the event of a significant spillage to isolate the site from the public sewer. Contamination will be contained on side until it has been addressed and discharges to sewer pose no further risk.	Low	Contamination of land, surface water and ground water	**Not significant**

Fire – emissions to air	Nearby commercial/industrial premises and surface water features	Air (smoke)	The Site will operate under a Fire Prevention Plan (FPP). The FPP follows EA guidance for FPPs and will consider the mitigation and management methods to prevent a fire of combustible materials stored on Site and to ensure that if a fire does occur, that it is managed in line with FPP requirements to minimise nuisance from combustion products. Provisions are in place to ensure the storage of waste is managed in accordance with the appropriate procedures and considers the managing of waste piles, preventing fire spreading and quarantine measures. The site will have appropriate fire detection and suppression systems in place in accordance with FPP requirements.	Low	Smoke nuisance, releases to surface water	**Low**
Security & vandalism leading to loss of containment	Local land quality, surface water and groundwater	Runoff and percolation through ground. Airborne odour nuisance	Security measures will be in place at the Site to limit the likelihood of arson or vandalism. These include: • Total enclosure with fencing; • Single access lockable entrance gate locked out of hours; • External security firm that patrols the Site out of hours; • 24-hour surveillance CCTV coverage available for viewing in Site managers office and security office. Senior management also have 24-hr access to the cameras via a mobile phone app; and • An alarm system. Site boundary checks will be completed daily to identify any weaknesses or defects. Any defects identified will be repaired with a temporary solution within 24 hours and with a permanent fix implemented within 7 days unless a timescale is otherwise agreed with the EA. All inspections and any defects, damage or repairs will be recorded on the EHS management system incident record.	Very low	Contamination of land, groundwater and surface water	**Negligible**
Failure to contain fire water	Local land quality, surface water and groundwater	Runoff and percolation through ground	The site will operate under a FPP which includes consideration of fire-water containment and management. The Site benefits from impermeable paving and has a sealed drainage system with a penstock valve to prevent water from entering the sewer in the case of a fire event. The maximum amount of firewater that is anticipated to need capturing is ca. 170m^3. This volume can be contained within the site drainage system and bunded area for testing prior to release to sewer or pumped into tankers to be taken off site for treatment.	Very low	Contamination of land, groundwater and surface water	**Negligible**
Explosion	Site workers, nearby commercial/industrial premises, equipment on-site, surface water and soil	Direct blast impact, airborne dispersion, fire and secondary contamination	None of the wastes proposed to be treated carry a risk of explosion. Strict waste acceptance procedures will be in place to minimise the risk of unauthorised wastes being received at the site. If any are identified, they would be segregated from other wastes in a dedicated quarantine area pending transfer off site to an appropriately regulated treatment or disposal facility. The end-of-life batteries include an electrolyte which has combustible properties. This is not separated before batteries are introduced to the shredding process. In order to minimise risk of combustion or deflagration of vaporised electrolyte, the battery shredder and associated hopper and conveying equipment will be fully enclosed and nitrogen blanketed. The shredder and discharge hopper will be further protected with oxygen monitoring and fire extinguishing systems. The electrolyte will be removed from the shredder outputs by vaporisation and condensation and the liquid will be collected in a receiving vessel. The electrolyte tank and associated ADR transport loading facility will be designed to meet the requirements of HSG176 (the Storage of Flammable Liquids in Tanks) in terms of separation distances,	Very low	Risk of injury, damage to equipment, contamination of surface water and soil from firefighting runoff or debris	**Negligible**

			bunding, etc. The electrolyte storage tank is nitrogen blanketed and will vent to the Gas Clean-up plant. The electrolyte is transferred to ADR Transport and transported off-site to an approved recovery or incineration process.			
Flooding	Nearby commercial/industrial premises and surface water features.	Surface water	The Site lies within a Flood Zone 1, which is defined as an area with low probability of flooding. In the event that the site operations are impacted by pluvial flooding requiring temporary evacuation of the site, all equipment and processing would cease operation via controlled shutdown. Before re-commencement of site operations, checks would be carried to ensure that equipment can start safely and to ensure that any residues / contamination was addressed. GBCTR maintains a business continuity plan which provides contingency measures should the Lincoln facility be made non-operational. This involves diverting incoming waste to other locations and notifying suppliers that the site is closed.	Very low	Contamination of land, groundwater and surface water	**Negligible**
Failure of equipment leading to excessive noise, dust	Industrial & commercial businesses, surface water	Airborne dust Runoff to surface water	All equipment will be subject to pre-planned preventative maintenance checks and maintained to the manufacturer's recommendations. Equipment will be inspected daily in line with site operating procedures for plant and machinery. GBCTR utilises a Computerised Maintenance Management System (CMMS) to log findings of maintenance inspections. It also includes a preventive and reactive maintenance programme. All equipment will be subject to application of the CMMS. In the event that there is a failure of abatement equipment or other control measures such that a breach of the permit conditions occurs or could occur, the relevant equipment will be safely shut down and only recommence once the failure is rectified. GBCTR has contingency measures as part a Business Continuity Plan in the unlikely event that of plant and equipment failure significantly affects site operations. The Business Continuity Plan will ensure that GBCTR will comply with permit conditions and operating procedures during maintenance or shutdown at the Site due to unforeseen circumstances. In events of planned or unplanned shutdown where waste cannot be stored on Site, in the short term, measures are in place so that waste can be diverted back to its source. The Site Manager or acting person of authority would ensure that the Site is closed and communicate with the holder of the waste so it could be diverted back to its source or to a suitable authorised alternative facility. If the Site cannot accept waste for more than a week, then the Site Manager would ensure suppliers are notified.	Very low	Contamination of land, groundwater and surface water	**Negligible**

4.2 Odour

Emissions of odour may arise from fugitive releases of VOCs associated with battery shredding. A qualitative assessment of fugitive emissions risk is provided in Table 4-2 which assesses the probability of exposure in terms of the likelihood of the receptors being exposed to the hazard.

Table 4-2 Odour Emissions Risk Assessment and Management Plan

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequences	What is the overall risk
What has the potential to cause harm?	What is at risk/What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? Who is responsible for what?	How likely is the contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
To Air:						
Fugitive odour emissions	Site workers, nearby commercial/industrial premises	Air	Waste solar panels and batteries are not inherently odorous waste and the Site will have waste acceptance procedures in place including checks for any non-conforming materials. Checks are made upon arrival and unloading of waste as well as when material from the storage locations is taken for processing within the process building. If non-conforming wastes are delivered to the Site, they will be returned to the delivery vehicle or quarantined. The storage and treatment of waste materials takes place in enclosed buildings and equipment which will reduce the potential for any exposure to odour at off-site receptors. The removal and condensing of electrolyte from battery shredding will take place in fully enclosed, nitrogen blanketed systems due to the flammability of the electrolyte. Measures to limit fugitive emissions are incorporated into the design of the equipment, including capturing, scrubbing, and filtering (Carbon, and HEPA H14) all gases and VOCs. The electrolyte is anticipated to mainly consist of the following components as described below: • Dimethyl carbonate (flash point 18°C, boiling point 90°C) – mild non-offensive odour • Ethyl methyl carbonate (FP 24°C, BP 101°C) – ether odour • Diethyl carbonate (FP 25°C, BP 126°C) – mild pleasant odour • Propylene carbonate - odourless None of these components has a significant odour and therefore the risk of odour impacts from any fugitive emissions of electrolyte are considered not to be significant. The proposed facility will employ HEPA14 and charcoal filtration where all non-condensable combustible gas from the shredding, drying and separation processes as well as the vent from the nitrogen-blanketed electrolyte storage tank would be directed. Combustion of the gases in this unit will effectively remove any odorous compounds contained in the feed gas before the emissions are exhausted to the atmosphere. All finished products including recovered black mass, metals and plastics will be stored within sealed containers and industrial bulk bags. The Site will be kept clean and tidy by way of a regularised housekeeping regime and regular checks will be undertaken by the Plant Manager or designated individual of odour at the Site boundary.	Very low	Odour nuisance	**Negligible**

4.3 Fugitive Emissions

Fugitive emissions of dust, litter, pests, mud and debris may arise from the proposed activities. A qualitative assessment of fugitive emissions risk is provided in Table 4-3 which assesses the probability of exposure in terms of the likelihood of the receptors being exposed to the hazard.

Table 4-2 Fugitive Emissions Risk Assessment and Management Plan

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequences	What is the overall risk
What has the potential to cause harm?	What is at risk/What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? Who is responsible for what?	How likely is the contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Dust from: shredding of PV panels, aluminium frames and battery material as well as subsequent handling, conveying, screening and separation processes.	Nearby commercial/industrial premises	Air	The following mitigation measures will be in place at the site to minimise the risk of fugitive dust emissions: • The waste types to be treated are not dusty; • All treatment of waste batteries and solar panels is undertaken within enclosed buildings; • Shredding will take place in enclosed systems; • Dust extraction and filtration systems will be is used to control any dusty emissions from the mechanical separation stage; and • All waste incoming is in large form and all outgoing waste (following size reduction) will be stored in enclosed containers; there are no open stockpiles of waste at the site. In addition, a number of operational measures will be in place: • The site will operate under a Dust & Emissions Management Plan; • No dusty wastes will be received at the Site. Waste acceptance checks will be undertaken prior to acceptance of any waste on to the Site; • Care will be taken during the unloading and loading of wastes into the feed points and from the bagging stations, for example, drop heights will be kept to a minimum; • Traffic calming measures are implemented to enforce speed limits and reduce emissions of dust. Speed limits will be implemented for vehicles on Site. Site surfacing will be maintained and repaired to minimise the mobilisation of dust particles; • The Site will be kept clean and tidy by way of a regularised housekeeping regime. Regular checks will be undertaken by the Plant Manager or designated individual of dust on site and at the Site boundary; • In the event that dust is detected, investigations will be undertaken to determine the cause and appropriate remedial action; • In the event that non-conforming wastes are delivered to the Site, they will be returned on the delivery vehicle; and • The Plant Manager will be responsible for implementing risk management measures in accordance with this environment risk assessment.	Very low	Dust nuisance	**Negligible**

Fugitive VOCs	Site workers, surface water	Air, deposition and runoff	There will not be significant fugitive emissions of VOCs because: • All exhaust gases will be condensed and scrubbed using a sodium hydroxide (NaOH) solution alongside charcoal filtration to filter and remaining VOC's; • The battery recycling plant stores the condensed electrolyte in palletised 500-litre IBC containers for storage and collection; • The electrolyte storage tank will be fitted with pressure vacuum valves and a nitrogen blanket, with the vent routed to the gas cleaning unit, surrounded by a leakage containment bund capable of containing at least 110% of the volume of the tank; • Inspection and maintenance programmes will ensure continued integrity of equipment; and • A spillage action plan will require clean up as soon as possible.	Very low	Odour nuisance, surface water contamination	**Negligible**
Pests	Workers on site, nearby commercial/industrial premises Groundwater – if pest activity leads to waste dispersal	Direct contact, groundwater	The risk of pests at the site is expected to be very low as the site does not process any biological wastes. However, in order to prevent pests, the following measures will be in place: • Waste acceptance checks will ensure that no non-conforming material, including biological waste with the potential to attract pests, will be accepted on to the Site; • Operators will be required to only eat in the dedicated canteen area and food waste will be kept in enclosed waste bins; • The Site will be inspected daily for signs of pests. If pests are encountered, appropriate remedial action will be undertaken; • A nominated sub-contractor for the control and monitoring of pests will be appointed as required; • The Plant Manager will be responsible for monitoring the Site. Records will be maintained of monitoring, complaints and remedial actions taken.	Very low	Odour, visual nuisance	**Negligible**
Litter	Workers on site, nearby commercial/industrial premises Surface water, soil and land quality	Airborne dispersal – waste blown off-site Surface water	The risk of litter is expected to be very low as the wastes to be treated do not generally include any loose material. However, in order to maintain the Site in a tidy condition and prevent the escape of any litter arising onto surrounding land the following measures will be in place: • The Site will be kept clean and tidy by way of a daily housekeeping regime; • All processing of waste will take place in enclosed buildings; • Wastes produced as part of the process will be stored within dedicated containers or bags prior to removal off-site. As such, it is unlikely to generate litter; • Regular monitoring will be carried out by the Plant Manager or a designated individual. Litter picking will be undertaken as necessary in response; • Fences surrounding the Site will reduce the chance of litter blowing off Site. If necessary, additional netting will be erected to reduce the escape of wind-blown litter; • Litter arising from the activities will be cleared from affected areas outside the Site as soon as practicable; and • The Plant Manager will be responsible for monitoring the Site and maintain it free of litter. Records will be maintained of monitoring, complaints and remedial actions taken.	Very low	Visual nuisance, surface water and soil contamination	**Negligible**

Mud & debris	Site workers, surface water, soil	Vehicle tracking, wind dispersal, surface water	The risk of mud and debris is expected to be very low given the types of waste to be treated and the site infrastructure. Nonetheless, the following measures will be in place to prevent nuisance from mud and debris on local receptors: • Operational and vehicle delivery areas of the Site are surfaced such that there will be no areas with the potential to generate mud on site. This removes the possibility of vehicles tracking dirt or mud off Site; • Regular monitoring will be conducted by the Plant Manager or a designated individual; • The Site will be kept clean and tidy by way of a regularised housekeeping regime; • Areas of hard standing will be maintained free of significant quantities of mud & debris; and • The Plant Manager will be responsible for monitoring the Site. Records will be maintained of monitoring, complaints and remedial actions taken.	Very low	Visual nuisance, surface water and soil contamination	**Negligible**

4.4 Global Warming Potential

The activities at the site result in direct emissions of 374.5 tonnes CO_2 and indirect emissions of 1,975 CO_2 from the use of electricity from the national grid.

The global warming potential of the direct and indirect emissions is summarised in Table 4-4.

Table 4-4 Annual Direct and Indirect CO_2 emissions

Source	Estimated annual Energy Consumption MWh	Conversion factor (t/MWh)	Tonnes $CO2_e$
Electricity (grid)	11,160	0.177[4]	1,975
Natural gas	1,750	0.214[4]	374.5
Total			2,349.5

To minimise direct and indirect carbon emissions, the following measures are in place:

- Plant and equipment will be subject to regular maintenance to ensure it continues to operate at optimum energy efficiency and that energy consumption does not increase due to inefficient performance;
- Energy use will be monitored and recorded and periodically reviewed to identify areas of improvement and to ensure that any inefficiency is investigated, and appropriate actions taken;
- Energy use and energy minimisation will be included within the management system for the control of resources. Within the management system the review process will identify energy use by source for the different site operations. The results will be used to identify potential measures for improving energy efficiency; and
- Staff will undergo awareness training in energy efficient practices.

In addition, a number of features have been incorporated within the design of the Site in order to minimise energy use:

- A regenerative thermal oxidiser is used for abatement of pollutants;
- Solar panels provide electricity for the offices;
- Power from the discharging of batteries will be fed back to the grid, where practicable;
- efficient LED lighting, smart building controls, and careful insulation;
- BREEAM (The industrial unit is rated “Excellent” under BREEAM);
- The building energy-performance certificate is A+;
- The warehouse benefits from efficient insulation, tight air-sealing, and design principles that reduce energy waste.

It is considered that the above measures will ensure that carbon emissions are satisfactorily minimised at the Site.

[4] https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2025

5.0 CONCLUSION

This ERA has been undertaken in accordance with the EA guidance *Risk assessments for your environmental permit* in support of the environmental permit application for the Lincoln Recycling facility.

A qualitative risk assessment has been carried out on potential impacts of accidents, odour and fugitive emissions resulting from the operation of the facility, together with a semi-quantitative assessment of the Global Warming Potential of direct and indirect emissions of greenhouse gases. These risk assessments demonstrates that the plant does not pose a significant risk of harm to sensitive receptors in the vicinity of the Site for these emissions.

It is therefore concluded that with the implementation of the risk management measures described in the above sections, that the potential hazards from the operation of the operation of the proposed facility for are not likely to be significant and no further assessment is required.

Appendix A

Conservation Screening Report

Nature and Heritage Conservation

Screening Report: Bespoke installation

Reference	EPR/QP3323MQ/P001
NGR	SK 88842 61942
Buffer (m)	60
Date report produced	09/02/26
Number of maps enclosed	1

This nature and heritage conservation report

The nature and heritage conservation sites, protected species and habitats, and other features identified in the table below **must be considered in your application**.

In the further information column, there are links which give more information about the site or feature type and indicate where you are able to self-serve to get the most accurate site boundaries or feature locations.

Most designated site boundaries are available on Magic map. Using Magic map allows you to zoom in and see the site boundary or feature location in detail, Magic map also allows you to measure the distance from these sites and features to your proposed boundary. Help videos are available on Magic map to guide you through.

Where information is not publicly available, or is only available to those with GIS access, we have provided a map at the end of this report.

Sites and Features within screening distance	Screening distance (km)	Further Information
Local Wildlife Sites (LWS) (see map below)	2	Appropriate Local Record Centre (LRC)
Butt Lane Pit		
Hawdin's Wood		
Norton Big Wood		

Ancient Woodland **Hawdin's WoodNorton Big Wood**	2	Woodland Trust Forestry Commission Natural England and Magic map

Where protected species are present, a licence may be required from Natural England to handle the species or undertake the proposed works.

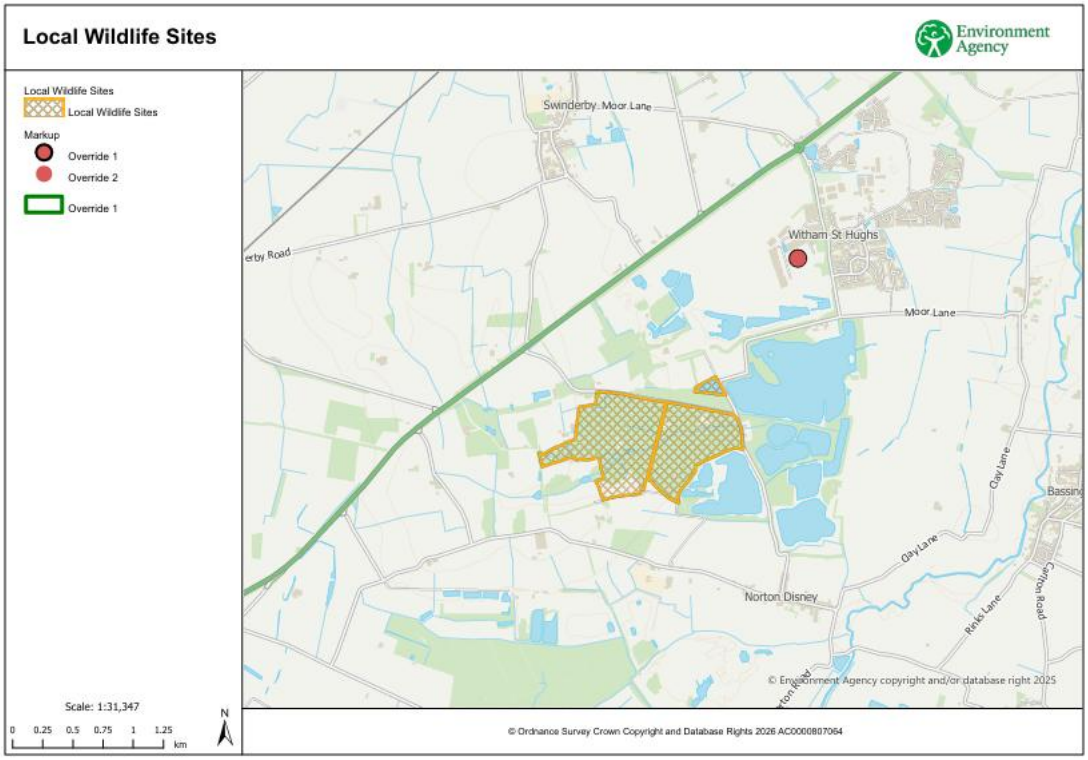
The relevant Local Records Centre must be contacted for information on the features within local wildlife sites. A small administration charge may also be incurred for this service.

The following nature and heritage conservation sites, protected species and habitats, and other features have been checked for, where they are relevant for the permit type requested, but have not been found within screening distance of your site unless included in the list above.

Special Areas of Conservation (cSAC or SAC), Special Protection Area (pSPA or SPA), Marine Conservation Zone (MCZ), Ramsar, Sites of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Local Nature Reserve (LNR), Local Wildlife Sites (LWS), Ancient Woodland, relevant species and habitats.

Please note we have screened this application for features for which we have information. It is however your responsibility to comply with all environmental and planning legislation, this information does not imply that no other checks or permissions will be required.

The nature and heritage screening we have conducted as part of this report is subject to change as it is based on data we hold at the time it is generated. We cannot guarantee there will be no changes to our screening data between the date of this report and the submission of the permit application, which could result in the return of an application or requesting further information.


Local Wildlife Sites
Environment Agency
Local Wildlife Sites
Local Wildlife Sites
Markup
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Override 2
Override 1
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Witham St Hughs
Moor Lane
Norton Disney
Clay Lane
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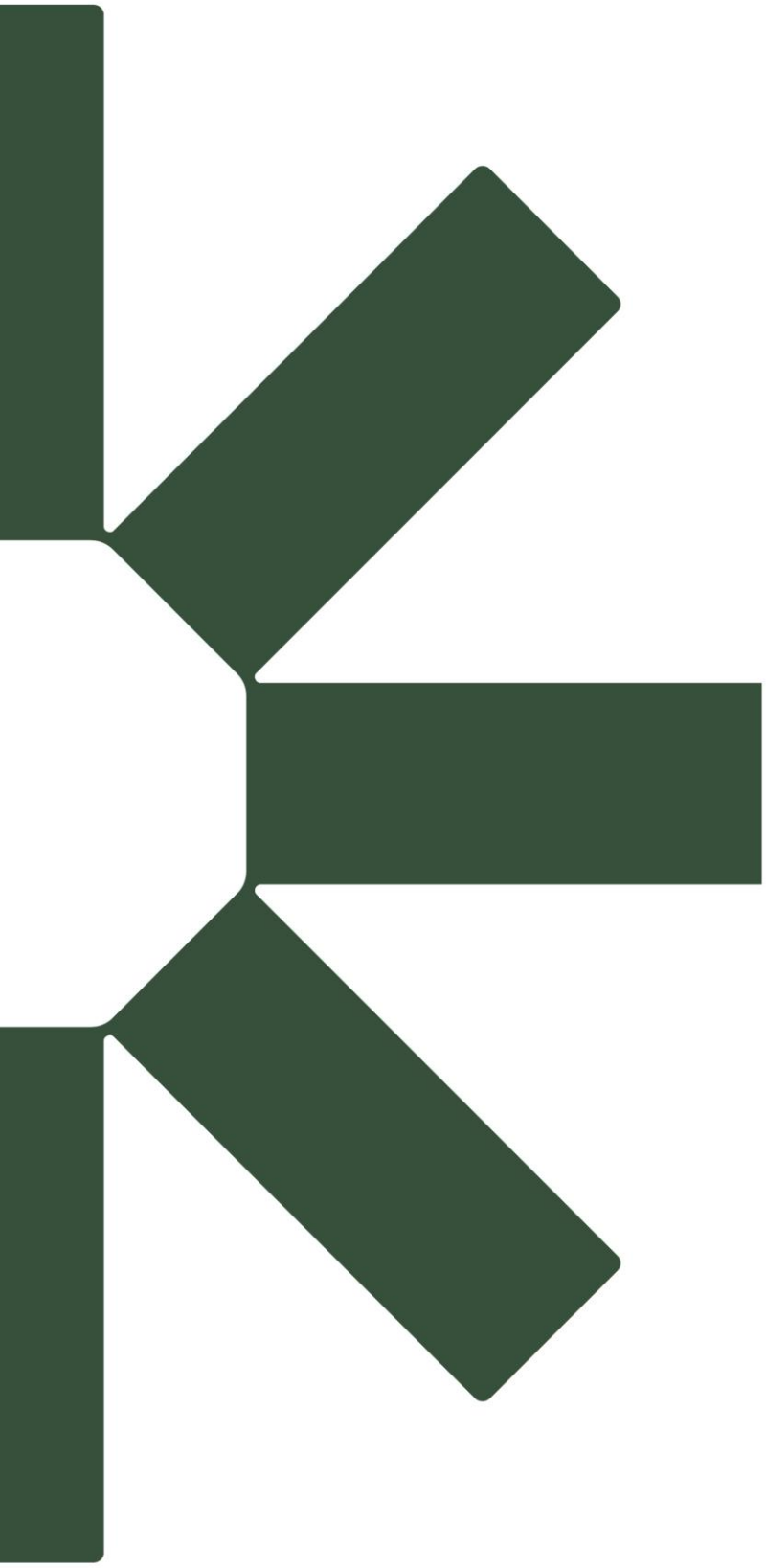

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