



ARCUS

TECHNICAL APPENDIX 8.5: OUTLINE RESTORATION STRATEGY

RETFORD CIRCULAR ECONOMY PROJECT

LOUND HIVE LIMITED

FEBRUARY 2023



TABLE OF CONTENTS

| | | |
|----------|----------------------------------------------------------------------|-----------|
| 1 | SUMMARY | 3 |
| 2 | INTRODUCTION AND BACKGROUND | 3 |
| | 2.1 Introduction | 3 |
| | 2.2 Site Description | 3 |
| | 2.3 Design Vision | 4 |
| | 2.4 Purpose of the Document | 4 |
| 3 | TIMELINE - A PHASED APPROACH TO RESTORATION | 5 |
| 4 | POLICY AND CONSULTATION | 6 |
| | 4.1 Consultation | 6 |
| | 4.2 Landscape and Biodiversity Baseline Conditions | 9 |
| 5 | RESTORATION DESIGN | 9 |
| | 5.1 Aims | 9 |
| | 5.2 Objectives | 9 |
| | 5.3 Biodiversity and Habitats | 9 |
| 6 | FUTURE MANAGEMENT AND AFTERCARE | 14 |
| | 6.1 Proposed Habitat Management | 14 |
| | 6.2 ROLES AND RESPONSIBILITIES | 15 |
| | 6.3 Securing the Restoration and Aftercare | 16 |
| 7 | SUMMARY AND CONCLUSION | 16 |
| 8 | APPENDIX A: FIGURES | 17 |
| 9 | APPENDIX B: INDICATIVE LANDSCAPE RESTORATION MASTERPLAN | 18 |

1 SUMMARY

This report provides an overarching strategy for restoration works forming an integral component of the Retford Circular Economy Project. The project ('the Proposed Development') aims to extract pulverised fuel ash from former ash disposal lagoons on land south of Lound Low Road, Nottinghamshire ('the Site').

Lound Hive Limited (the Applicant), part of Hive Aggregates and the wider Hive Energy Group, is proposing to significantly improve the biodiversity value of the Site, which currently provides a predominance of low-quality grazing land. This would include:

- A more diverse range of managed habitats, providing significantly improved biodiversity value than the existing grazed agricultural land reflected in a biodiversity net gain of in excess of 10%, as detailed in the Technical Appendix 8.4: Biodiversity Net Gain Assessment
- Creating habitat within the Site that complements the wider landscape context;
- Restoring priority habitats that were historically present in the Idle valley; and
- Increasing connectivity to neighbouring habitats of interest.

This Outline Restoration Scheme can most easily be described as an enhancement of the biodiversity value through the provision of habitats that complement and connect to those in the neighbouring Idle Valley, including woodlands, wet species rich grassland, reed beds, and water bodies.

The approach outlined is deliverable and in accordance with planning policy and guidance. Given the long operational duration of the Proposed Development, future planning policy and guidance would be considered across its lifetime.

2 INTRODUCTION AND BACKGROUND

2.1 Introduction

This Outline Restoration Strategy report has been prepared by Arcus Consultancy Services Ltd (Arcus) on behalf the Applicant to summarise the restoration of the Site as part of the Proposed Development.

2.2 Site Description

The Site is separated into three distinct areas as shown in Appendix A. They are described as:

Area A: Main Operational Site (where PFA extraction is to take place)

Area B: Conveyor and Link road; and

Area C: Temporary Optimisation Site/Main Processing Site.

Area A is the largest (105.84 ha) and is the focus of this outline restoration strategy.

The Site comprises former PFA disposal lagoons to the south of the village of Lound, the majority of which are raised above ground level. The lagoons have been restored to low value pasture, with a thin layer of soil/sand placed over the deposited PFA. The Site covers an area of approximately 105.84 hectares ('ha').

The Site is relatively isolated from settlements with the village of Lound located approximately 500 m to the north and the village of Sutton-cum-Lound located approximately 400 m to the northwest. The town of Retford is located approximately 1.5 kilometres ('km') to the south. The closest residential properties comprise the farmhouse

and two other properties associated with Sutton Grange Farm, located immediately to the north of the Site; Bellmoor Farm located approximately 100m to the west; and two dwellings associated with the Wetlands Fishery on the opposite side of Lound Low Road to the north.

The area has historically been subject to a significant amount of sand and gravel extraction and is therefore not alien to extractive industries. The Site is also well screened owing to a combination of topography and existing vegetation, including tree planting and hedgerows along its perimeter and woodland blocks and hedgerows in the surrounding area.

The Site borders the Sutton and Lound Gravel Pits Site of Special Scientific Interest (SSSI) and the Idle Valley Nature Reserve, managed by the Nottinghamshire Wildlife Trust. The Site includes 1.47ha of the neighbouring SSSI designation along a narrow strip within the southern boundary of the Site

2.3 Design Vision

The Outline Restoration Strategy (hereafter, 'the Strategy') has been carefully developed with regard to local (including landowner), and wider and national priorities. It is capable of delivering Local Biodiversity Action Plan priority habitat and the resulting habitats are appropriate to the relevant National Character Area¹. Mineral Local Plan Policy SP2² requires biodiversity led forms of restoration and this should therefore inform the entire approach to the development.

The strategy, whilst biodiversity led, has been designed in consultation with the landowner (farmer) and the Applicant, balancing the expectations of policy and relevant external stakeholders. In planning terms it is appropriate to return this site to agricultural land use (including using sheep to manage habitat). It is also appropriate to have regard to the functionality and operability of the extraction operation while seeking opportunities for advance planting where possible. The design vision for restoration offers a significantly more diverse range of managed habitats, providing significantly improved biodiversity value and an improved footpath route which links to the neighbouring nature reserve.

The outline strategy provides the intention for wet grassland, reedbeds, waterbodies, woodland, and species rich grassland at the Site. It is expected that details can be refined throughout the lifetime of the Proposed Development, to ensure habitats are achievable according to Site conditions, and remain relevant to conservation priorities.

2.4 Purpose of the Document

The purpose of this strategy is to provide an overarching strategy for the restoration of the Site to higher value habitat. It sets out aims, objectives and practical measures to increase biodiversity value of the Site within the wider landscape context. This report should be read in conjunction with the following reports:

- Environmental Statement (ES) Chapter 8: Ecology and Ornithology; and
- Technical Appendix 8.4: Biodiversity Net Gain Assessment.

The remainder of this report is structured as follows:

- Section 3 – sets out project timeline;
- Section 4 – summarises policy and consultation process;
- Section 5 – sets out restoration design;

¹ Nottinghamshire National Character Area Available at: [Nottinghamshire, Derbyshire and Yorkshire Coalfield - Natural England \(nationalcharacterareas.co.uk\)](https://nationalcharacterareas.co.uk) [Accessed Jan 23]

² Nottinghamshire Local Mineral Plan Policy SP2, Available at: [Minerals Local Plan | Nottinghamshire County Council](#) [Accessed Jan 23]

- Section 6 – sets out the future management and aftercare;
- Section 7 – provides summary and conclusion; and
- Section 8 – Appendices

3 TIMELINE - A PHASED APPROACH TO RESTORATION

The Proposed Development is a long-term project that would span over a 22-25 year period (for PFA extraction), using a phased approach.

Initially two site establishment phases are planned:

- Establishment Phase 1: the whole Site is secured, protection is put in around retained woodland, advance planting carried out and the construction of the western section of haul route/conveyor takes place.
- Establishment Phase 2: haul route/conveyor extended to its full length, settlement and soakaway ponds, and overburden store created.

Establishment is followed by excavation of the pulverised fuel ash (PFA) and subsequent infilling and restoration which would take place over 11 phases throughout the Site. Table 3.1 below, extracted from the draft working scheme and described further within the Environmental Statement (ES) Chapter 5, Volume 1³, provides an estimate for the timescales for each Phase.

Note that the below assumes the full production tonnage is extracted from the Site from year 1. However, it is likely that extraction would scale up to full production over a longer period, hence the estimated extraction period of 22-25 years.

| Phase | Size | Year work commencing | Restoration Finalised (Year) |
|-----------------------------|--------|----------------------|------------------------------|
| HR Phase 1 | 8.2 ha | 1 | 4 |
| LR Phase 1 – Soakaway Ponds | 4.0 ha | 3 | 22 |
| LP Phase 2 – Filter Ponds | 3.5 ha | 3 | 22 |
| HR Phase 2 | 7.5 ha | 5 | 5 |
| LR Phase 3 | 7.0 ha | 8 | 9 |
| LR Phase 4 | 7.0 ha | 9 | 10 |
| LR Phase 5 | 7.0 ha | 10 | 11 |
| HR Phase 3 | 7.5 ha | 11 | 14 |
| HR Phase 4 | 7.5 ha | 14 | 17 |
| HR Phase 5 | 7.5 ha | 17 | 20 |
| HR Phase 6 | 7.5 ha | 20 | 20 |

Once the PFA is extracted (or progressively as the PFA is extracted) the adjacent embankment(s) would be utilised to infill the void up to the required restoration level,

³ Arcus (2022) Environmental Statement. Retford Circular Economy Project, Lound Hive Limited.

thereby progressively restoring the Site as extraction commences in the next phase. The areas would then be capped with stripped and stored topsoil, as necessary.

This document primarily focuses on phased extraction and restoration.

4 POLICY AND CONSULTATION

The following adopted planning policy documents from the statutory development plan are considered most relevant to the Proposed Development:

- Nottinghamshire Minerals Local Plan (SP2)²;
- Nottinghamshire Local Plan (adopted 2014)⁴;
- Nottinghamshire Biodiversity Action Plan (BAP)⁵; and
- UK BAP/Sn41 priorities for this Natural Character Area¹.

4.1 Consultation

Consultation has been completed in relation to the Proposed Development, including some input from key consultees on their expectations for the scheme. Relevant consultation has included:

- Natural England (online meeting, July 2021);
- Nottinghamshire Wildlife Trust (Online meeting, August 2021);
- Nottinghamshire Wildlife Trust (Site visit, January 2022); and
- Nottinghamshire County Council (online meeting, Mar 2022).
- Scoping response, received October 2022. Lound Hive Limited

Natural England's (NE) primary concern is the SSSI and potential impacts on the bird assemblages. NE agreed that the scope of the surveys carried out is sufficient to inform the impact assessment. They are happy with the results and surveys to-date and, in principal and as long as all ecology features (both within and outside the Site) are given due consideration within the impact assessment, do not see any major constraints for the Proposed Development. NE would be happy with wet grassland, and interconnected wetland habitats included within the restoration scheme.

Nottinghamshire Wildlife Trust have stated that they expect to see extensive wet grasslands including ridges, furrows, and ephemeral pools to complement the habitat provided in neighbouring land. They suggested ditches were used instead of hedgerows to manage sheep movement and the plans were changed accordingly (using ditches and fences where necessary, including in wet grassland areas).

The key issues and concerns raised by public consultees, particularly those opposed, included the potential impact of increased traffic on the local community, dust emissions and, debris on local roads. A comprehensive dust management and vehicle cleanliness regime has been created for the Proposed Development⁶.

Table 4.1 summarises local policy and primary responses from consultees, and how they have been taken into consideration for the development of the landscape plan (Appendix B)..

Table 4.1:

| Policy and Consultee Opinion | Applicant's Response |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Nottinghamshire Minerals Local Plan (NMLP): Policy SP2: <i>Biodiversity Led-Restoration - Restoration schemes that seek to maximise</i> | The proposed restoration greatly increases the area of priority habitat within the Site compared to the baseline. A BNG increase of 12.66% is |

⁴ Nottinghamshire Local Plan, 2014 Available at: [The Adopted Local Plan - Nottingham City Council](#) [Accessed Jan 23]

⁵ Nottinghamshire Biodiversity Action Plan, Available at: <https://nottsbaq.org.uk/lbap/lbap-introduction-and-sections-1-to-6/> [Accessed Feb 23]

⁶ Dust Impact Assessment, SLR, January 2023

| Policy and Consultee Opinion | Applicant's Response |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>biodiversity gains and achieve a net gain in biodiversity, in accordance with the targets and opportunities identified within the Nottinghamshire Local Biodiversity Action Plan, will be supported.</i> | achieved but due to the delays associated with removal and reinstating habitats, does not fully reflect the benefits of the proposals, which are significantly greater in that the scheme would restore over 50 % of land area as biodiverse habitats. |
| <u>NMLP:</u> <i>It is recognised that restoration for leisure uses or for agriculture may be appropriate. Nevertheless, such restorations can still be 'biodiversity-led', for example by ensuring that agricultural restorations reinstate native hedgerows with wide field margins, and create new areas of species-rich grassland, copses and ponds.</i> | The proposed restoration does seek to balance farming and biodiversity interest in the restoration. Sheep grazing, as per the baseline, is included but is balanced with more ecologically valuable grassland, reedbeds and waterbodies, and increased woodland planting, amongst other things, as suggested by policy. Measures to keep wet grassland areas more open have also been taken, including using ditches rather than hedgerows in some areas. |
| <u>NMLP:</u> <i>Restoration schemes should be carefully considered so that they can deliver as much LBAP priority habitat as possible and that such habitats are appropriate to the relevant National Character Area. Applicants are therefore encouraged to engage in early discussions with the County Council and other appropriate bodies in relation to restoration proposals.</i> | Consultation with local stakeholders and appropriate bodies including the Wildlife Trust, Natural England and Local Council began early in the design process and have been considered in the creation of the restoration strategy. Habitats that are sympathetic to the wider landscape context have been prioritised with BAP habitats including ditches, reedbeds, wet grassland and open water forming a significant part of the plan. |
| <u>NMLP:</u> <i>It is also expected that Eutrophic Standing Waters (lakes) may be created as a result of quarrying, although this habitat should be minimised as far as possible in favour of the other [priority habitats for the area] listed.</i> | The restored landform includes lakes to prevent the need for importation of infill material from off-site. Such habitats are listed as a priority and landform design and habitat features, such as reedbeds, seek to maximise value from this opportunity. |
| Scoping Response: <i>An outline restoration plan is expected to be submitted after taking into account views of key consultees</i> | The outline plan can be found in Appendix A to this document. This table describes the way in which consultation impacted design. |
| Scoping Response: <i>This development proposal offers a significant opportunity to deliver valuable BAP habitats to complement those within the SSSI. Getting the balance right between the extent and depth of PFA extraction and what restored landform and habitats can then be achieved will be crucial. Mineral Local Plan Policy SP2 requires biodiversity led forms of restoration and this should therefore inform the entire approach to the development.</i> | The proposed restoration is centred on habitats that complement the neighbouring SSSI. Nottinghamshire BAP habitats including ditches, reedbeds, wet grassland and open water form a significant part of the plan. The restoration represents a 12.66% increase in biodiversity, more than the 10% required |
| Scoping Response: <i>A phased, biodiversity-led restoration (as proposed) offers a significant opportunity to deliver valuable habitats to complement those within the SSSI and LWS. As well as those habitats mentioned in section 3.1.3 of the EIA SR, opportunities to create wetland scrapes (as present in the nearby Idle Valley Nature reserve) should be explored.</i> | A significant area of wet grassland and reedbeds are proposed. It is anticipated that in order to prevent backfill (likely inert waste), the creation of larger water bodies in the form of two lakes is required. |
| Nick Crouch (LPA Ecologist, meeting March 2022): <i>...maximise wet grassland, reed beds, large open extents and avoid smaller compartments.</i> | Ditches rather than hedgerows would be used where applicable to separate grazing units whilst maintaining open extents of wetland habitats. This facilitates continuous wet grassland and |

| Policy and Consultee Opinion | Applicant's Response |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>Ecology should take precedence to landscape enhancements.</i></p> <p><i>Include scrapes, shallow sinuous water bodies, ditches to form compartments; areas flooded for part of year</i></p> <p><i>[Nick] would be happy to look at further iterations of the restoration plan or provide additional advice.</i></p> | <p>reedbeds form a significant percentage of the overall restoration area.</p> |
| <p>Scoping response: <i>Were this scheme to proceed, NWT would expect to see extensive wet grasslands, reedbeds, ponds and species rich grassland restored on this site, based on the underlying edaphic conditions and in accordance with Notts BAP and UK BAP/Sn41 priorities for this Natural Character Area. The final topography should be designed to accommodate diverse range of wetland features including clusters of ponds suited to amphibians, as well as ridges, furrows and ephemeral pools and scrapes in wet grasslands, so as to meet those priority habitats identified in the BAP.</i></p> | <p>This outline restoration strategy recognises the need for a reactionary design according to edaphic conditions on site. Water bodies would be designed to maximise edge habitat. Final topography would be designed as variable as possible whilst also meeting extraction targets.</p> |
| <p>Janice Bradley (meeting in August 2021): <i>wet grassland and reed beds, wet woodland, small ponds; species rich grassland and keep sheep grazing; as much as possible, worst would be 60-70% BAP habitats, must maximize priority biodiversity habitats, norm is 70-80%</i></p> <p><i>Mineral sites expect massive conversion of habitats – in line with the most recent Nottinghamshire adopted minerals local plan.</i></p> | <p>The Site represents 92.4 ha of local and nationally identified BAP habitats.</p> |
| <p>Janice Bradley (meeting in January 2022): <i>Priority habitat is wet grassland and reedbed, not woodland. The minerals plan sets out the highest priorities incl. wet grassland, reedbed, and small ponds for amphibians etc. Clusters of field corner ponds would be desirable.</i></p> | <p>Limited woodland planting to offset losses caused by access in Phase 1.</p> |
| <p>DAS meeting (August 2021): <i>The Restoration will be key in obtaining the necessary planning permission.</i></p> <p><i>...[recommended habitats to include are] Wet Woodland... but also the flat area is good for wet grassland and interconnected wetland habitats</i></p> | <p>Wet grassland has been optimised as part of the Strategy..</p> |
| <p>Joel Marshall (March 2021): <i>.... considerable opportunity to create a high-quality biodiversity-led form of restoration to complement adjacent habitats and the Idle Valley Landscape</i></p> <p><i>...[appropriate habitats to include are] reedbeds, wet grassland, pond scrapes and wet woodland</i></p> <p><i>... The emerging plans would need to consider policies SP2 and DM12 of the new Minerals Local Plan and will need to demonstrate a calculated BNG.</i></p> | <p>BNG delivery of the restoration plan has been calculated as being above the required 10% (Chapter 8, ES Technical Appendix 8.4) with reedbeds, and wet grassland forming a significant part of the design plan.</p> |

4.2 Landscape and Biodiversity Baseline Conditions

A range of ecological surveys have been completed to identify the baseline condition at the Site and inform the impact assessment (as presented in ES Chapter 8, Volume 1). Results of the surveys are available in the associated Technical Appendices (TAs), particularly the TA 8.1 (Ecology Survey Results, Volume 1) and TA 8.3 (Ornithology Survey Results, Volume 1).

The results of the surveys and the ecological baseline at the Site has been taken into account in the design of the strategy, to ensure any habitats of value are replaced and enhanced and, where relevant, appropriate compensation for species is included.

5 RESTORATION DESIGN

5.1 Aims

The overarching aims of the outline design strategy are to:

- Provide a more diverse range of managed habitats, providing significantly improved biodiversity value;
- Compensate for habitats lost during the extraction phase of the Proposed Development;
- Increase climate change resilience;
- Provide a new network of ditches and improved/managed drainage; and
- Ensure that appropriate mechanisms are in place to secure the restoration, management and aftercare.

These aims have been defined having regard to planning policy and consultation feedback and would be delivered through the objectives set out below.

5.2 Objectives

The objectives are as follows:

- Enhance the wider biodiversity value of the Site through appropriate habitat creation and management, complementing habitats already present within the area;
- Monitor the establishment of new habitats to support delivery of biodiversity objectives;
- Replicate the principal elements of the Idle Valley Nature Reserve sympathetically within the landscape and biodiversity design, with woodland, hedgerows and grassland arranged to ensure connectivity of habitats;
- Implement the proposed extraction in a phased manner that ensures extraction activities (for the most part) move from east to west on the Site; and
- Remove all extractive infrastructure from the Site to provide a 'natural' landscape view.

5.3 Biodiversity and Habitats

The habitat creation and enhancement measures incorporated into the outline restoration scheme are summarised in Table 5.3 and are visually represented in Appendix B of this Strategy.

The habitats in this table (overleaf) are indicative only as soil condition and pH may dictate the feasibility of habitats in the proposed locations. Each part of the restoration would be reviewed ahead of implementation to ensure feasibility and suitability to inform detailed design and management of each area.

Table 5.3 Proposed Habitats

| Habitat | Area | Description | Justification |
|---------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Open Water | 8.2 ha | <p>Two lakes would be created within the restored landform, one in the northeast of the Site, and the other by restoring the filter/settling lagoons into a more natural habitat.</p> <p>Lakes would be created with naturalistic gradients, and varied land levels to produce variations in water depth and create micro habitats and increase biodiversity potential. Water depths in excess of 1.5 m in the centre of the waterbody would prevent reedbed dominance and maintain open water. Islands have been included within the lake design to increase edge length.</p> | <p>Eutrophic and Mesotrophic Standing Water is a Nottinghamshire Priority Habitat;</p> <p>Substantive new flower-rich pond margin habitat for invertebrates in accordance the National Pollinator Strategy;</p> <p>Habitat complementary to surrounding areas of wet grassland and wetland;</p> <p>Extensive enhanced habitat provision for protected species already using the neighbouring SSSI.</p> |
| Reedbed | 8.56 ha | <p>Reedbed would be planted where conditions are suitable at the restored lakeside fringes and along ditches.</p> <p>Reedbeds would either be sown with locally sourced reed seed in saturated soil or directly planted into submerged soil with cut reed stalks from an approved donor site. Reedbed areas would vary in depth and include deeper channels and pools, to ensure patches of open water remains within the habitat.</p> | <p>Reedbed is a UK BAP Priority and Nottinghamshire priority habitat with historical presence within the Idle Valley. This habitat complements habitats within the adjacent SSSI and supports a number of priority species;</p> <p>Reedbeds help clean water, filtering and purifying wastewater and providing a buffer against pollutants from industry and farming;</p> <p>Reedbeds are successional ecosystems, temporal and spatial variation in habitats is key to maintaining high diversity of flora and fauna;</p> |
| Ditches | 3.93km | <p>A ditch network would be created, with a gentle flow from north to south across the Site, and then to the northeast, where water would join the wider hydrological network.</p> <p>Ditches have been designed to bound wet grassland areas, as is advisable and to aid seasonal inundation.</p> <p>Ditches would be designed so as to maintain a wet flush through the Site, year around.</p> | <p>Ditches are a Nottinghamshire Priority Habitat;</p> <p>Within the strategy, they aid drainage of the restored landform and act as field boundaries in wet grassland. Additionally, they will provide a mechanism for water level management, such as seasonal flooding of wet grassland.</p> |
| Wet Grassland | 33.22 ha | <p>Wet grassland would be created, primarily around the northern lake and along the southern boundary of the Site.</p> <p>Seasonal/managed grazing by sheep would maintain a habitat with a mix of short grass and tussocks in the</p> | <p>Wet grassland is a UK BAP Priority habitat with historical presence in the Idle Valley that complements habitats within the adjacent reserve and supports a number of priority species;</p> <p>The habitat is listed as a priority for the area in the Nottinghamshire Mineral Local Plan and has been suggested by consultees;</p> <p>Wet grassland is a Nottinghamshire Priority Habitat.</p> |

| Habitat | Area | Description | Justification |
|---------------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <p>spring suitable for breeding waders and wintering waterbirds.</p> <p>Created suitably close to the water table the area/s would be subject to seasonal inundation and would be set at a lower level than surrounding land A ridge and furrow profile would promote different degrees of wetness and with a network of foot drains and scrapes, if necessary, to help to hold water for much of the year and enhance foraging opportunities. It is anticipated that scrapes and pools would form naturally for the most part.</p> <p>Habitat would initially be created through seeding using grasses and flower species suited to the conditions and ideally sourced from the local area.</p> | |
| Species-rich Grassland | 10.47 ha | <p>Species-rich grassland would be created as a 6 m wide strip around most boundaries within the Site.</p> <p>Species selection would be confirmed following soil test results.</p> <p>Strip or inoculation seeding or the use of local provenance 'Green Hay' transfers in either linear swathes or large scrapes (approximately 3 to 5 m²) would be used. This enables floristically diverse areas to be established and spread out naturally.</p> <p>Managed to reduce soil fertility and enable species to set seed with aftermath grazing in the late summer.</p> | <p>Species rich grassland is a UK BAP Priority Habitat providing increased floristic diversity on Site and of benefit to invertebrate populations;</p> <p>The habitat is listed in the Nottinghamshire Mineral Local Plan as a potential feature to include within a partly agricultural restoration and was suggested by consultees;</p> <p>The habitat would act as a buffer between habitat types, such as pasture and woodland, and help improve biodiversity corridors through the Site;</p> <p>This habitat complements habitats within the adjacent SSSI and supports a number of priority species.</p> |
| Improved Grassland – Proposed Pasture | 31.95 ha | <p>Improved grassland used as pasture would be seeded to the north of the wet grassland habitats on Site to provide grazing that does not risk animal welfare concerns. This grassland would not be seasonally inundated and would be subject to modifications such as reseeding such that the dominant species are rye grasses, clovers and other grass species typical of enriched soil conditions.</p> <p>Species selection would be confirmed following soil test results.</p> | <p>Improved Grassland is a Nottinghamshire Priority Habitat;</p> <p>Intended to provide year-round grazing opportunity, to maintain flock size and provide pasture when grazing is stopped or reduced on priority habitats to protect sensitive areas from damage.</p> |

| Habitat | Area | Description | Justification |
|-----------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hedgerow Enhancement | 0.42km | The existing hedgerows, including that which lines the existing track which runs from north to south on the Site would be enhanced through gapping up and planting tree standards along its length. | Hedgerows are a Nottinghamshire Priority Habitat; The hedgerow would provide visual and auditory screening of the development. It would also provide connectivity between habitats in the wider landscape and feeding/transit corridors for a range of features; Hedgerows support a number of priority species. |
| New Hedgerow | 0.88 km | Perimeter hedge and tree planting to be removed during the initial construction of the haul road and associated infrastructure and during the phased extraction would be replaced. | As above |
| Native Broadleaved Woodland | 6.42 ha | Significant area of new woodland planting provided along north-western boundary to replace trees currently situated in the lagoon embankments. This would include UK grown and certified plant stock to be planted in a naturalistic pattern, with a scalloped edge with rides and glades frequent throughout. | The trees would become an effective carbon store that provides visual and auditory screening of the development; Substantive new flower-rich woodland edge and ground flora habitat for invertebrates in accordance the National Pollinator Strategy; Extensive enhanced habitat provision for European Protected Species already using the site and neighbouring SSSI; Extensive foraging and nesting habitat for birds, including priority species such as song thrush and linnet; Extensive new habitat optimal for other protected species such as badger, and hedgehog. |
| Retained Woodland | 4.6ha | A significant proportion of the perimeter is currently wooded as predominantly deciduous plantation woodland along the western, southern, eastern and north-western boundary of the Site, including within Sutton and Lound LWS in the west of the Site. The majority of trees are relatively young and are still protected with tree guards. The understorey includes creeping jenny, ground ivy, dove's foot-cranesbill, mouse-ear chickweed and yarrow. | Effective carbon store that provides visual and auditory screening of the development; It would also provide connectivity between habitats in the wider landscape; Extensive enhanced habitat provision for European Protected Species already using the site and neighbouring SSSI; Extensive foraging and nesting habitat for birds, including priority species such as song thrush and linnet. |
| Scattered Trees/Parkland | 1.12 ha | An area of scattered trees would be planted within an area of species rich grassland to the north of the improved grassland in the southern most parcel of grazing on the Site. Seasonal grazing of sheep would maintain the species richness in this habitat, and in time | Parkland is a Nottinghamshire Priority Habitat; The trees would become an effective carbon store that provides visual and auditory screening of the development. They would also provide valuable future deadwood beyond the life of the project that can be of benefit to a number of species of conservation concern. |

| Habitat | Area | Description | Justification |
|---------|------|-------------------------------------------------------------------------------------------|---------------|
| | | would establish as a strip of parkland habitat between the pasture and off-site woodland. | |

6 FUTURE MANAGEMENT AND AFTERCARE

6.1 Proposed Habitat Management

The restoration will be subject to a suitable aftercare period, in accordance with the Environment Act (including the as yet unpublished results of consultation), and will be agreed with the LPA. An agreed Habitat Management Plan will be provided following planning approval. The aim of the management and monitoring would be to achieve and record habitat condition as required by the Biodiversity Net Gain assessment (TA 8.4) and maximise value of habitats for some target species and biodiversity aspirations.

Management by its nature would be reactive, subject to environmental conditions and the proposed restoration may change following necessary tests and modelling, and therefore it is not desirable to commit to prescriptive management at this stage. Table 9.1 provides examples of potential monitoring and management within each habitat type.

Table 9.1 Habitat Management Summary

| Habitat | Potential habitat management measures |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Open Water | Monitoring to ensure water quality does not become eutrophic. Island vegetation management. Barley Bales may be needed according to waterfowl numbers to ensure water quality. Silt may need to be pumped to a sacrificial pump pit on site in the long term in order to maintain open aspect dependent on water depth. This is not expected to be required within the initial management period. Edge management to prevent excessive shading by trees Invasive species management – should they arise. |
| Reedbed | Cut on a 5-year rotation. Manage scrub and vegetation to maintain a predominantly open reedbed Manage water levels and distribution of water flow through site to ensure this habitat does not dry out. |
| Ditches | Manage water levels through the Site to ensure this habitat does not dry out. Invasive species management and monitoring. Maintain open aspect though cutting regime. |
| Wet Grassland | Sheep grazing with managed stocking rate during spring/summer and higher rates in Autumn/Winter adjusted following monitoring of ground conditions. Manual removal of pernicious weeds. No supplementary feeding on the Site. |
| Species-rich Grassland | Seasonal grazing to be adjusted according to monitoring of ground conditions. Manual removal of pernicious weeds. No supplementary feeding. |
| Improved Grassland | Manual removal of pernicious weeds. Poaching kept to a minimum. |
| Hedgerow | Cut back during the winter months. Protected from browsing. |

| | |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Retained Broadleaved Woodland | <p>Managed for natural regeneration of broadleaved species.</p> <p>Protected from excessive invasive grazing such as deer impacts.</p> <p>Halo releasing future veteran trees.</p> <p>Ring barking during required thinning to provide standing deadwood.</p> <p>Biosecurity of timber to prevent the spread of disease.</p> |
| New woodland | <p>Managed for natural regeneration of broadleaved species through thinning, scarification and planting.</p> <p>Deadwood provision.</p> <p>Protected from excessive invasive grazing such as deer impacts.</p> |
| Scattered Trees/Parkland | <p>Protection from browsing pressures on trees.</p> <p>Sheep grazed.</p> |

6.2 ROLES AND RESPONSIBILITIES

The Applicant and/or the appointed main contractor/site operator would be responsible for:

- i. correct instruction of all parties contributing to delivery of the approved Final Restoration Plan (including but not restricted to Site operational staff, ecologists, landscape architects, landscape contractors, construction contractors and management organisations);
- ii. compliance with the approved Final Restoration Plan (to be secured by suitable planning condition(s)), relevant legislation and any related planning commitments;
- iii. keeping the appointed ecologist/landscape architect informed of work activities that require support and supervision, so that it is clear when attendance at site is required;
- iv. enacting/enforcing recommendations made by the ecologist/landscape architect, or otherwise agreeing an appropriate alternative course of action if it is subsequently determined that previous advice is not practicable or is out of date; and
- v. keeping a record of measures taken to deliver the requirements of the approved Final Restoration Plan to provide an auditable record of compliance.

The appointed ecologist would be responsible for:

- i. advising the Applicant on ecological matters and requirements for compliance with relevant legislation, providing support as instructed, and monitoring compliance with the approved Final Restoration Plan; and
- ii. providing the applicant with survey reports and other written evidence required by the applicant in accordance with the agreed scope of work and contractual obligations.

The appointed landscape architect would be responsible for:

- iii. providing specialist site supervision in the form of walk over assessments relating to relevant landscape areas. This would be to assess landscape components and their condition and identify the need for landscape enhancement as instructed and in accordance with the agreed scope of work and contractual obligations, once the proposed scheme has been completed;
- iv. monitoring and assessing the landscape related elements of the approved Final Restoration Plan for their effectiveness on an annual basis for the first five years following the completion of the development;

- v. ensuring that the landscape related elements of the approved Final Restoration Plan are reviewed on an annual basis beyond the initial monitoring and assessment stage.

The Final Restoration Plan shall be amended accordingly to suit any changing landscape conditions and ultimately inform the maintenance operations associated with the Proposed Development throughout its operational life; and ensuring that any reviews associated with landscape related elements of the approved Final Restoration Plan clearly identifies any changes to site conditions and circumstances, and where identified changes are needed to existing management practices and timeframes

6.3 Securing the Restoration and Aftercare

Elements of the restoration would be refined as the Proposed Development progresses, with detailed design updated and agreed where appropriate. Any potential changes to the layout would follow due procedure and be agreed with the appropriate stakeholders.

It is anticipated that the overall design, detailed design, and management would be secured through an appropriately worded planning condition/legal agreement.

7 SUMMARY AND CONCLUSION

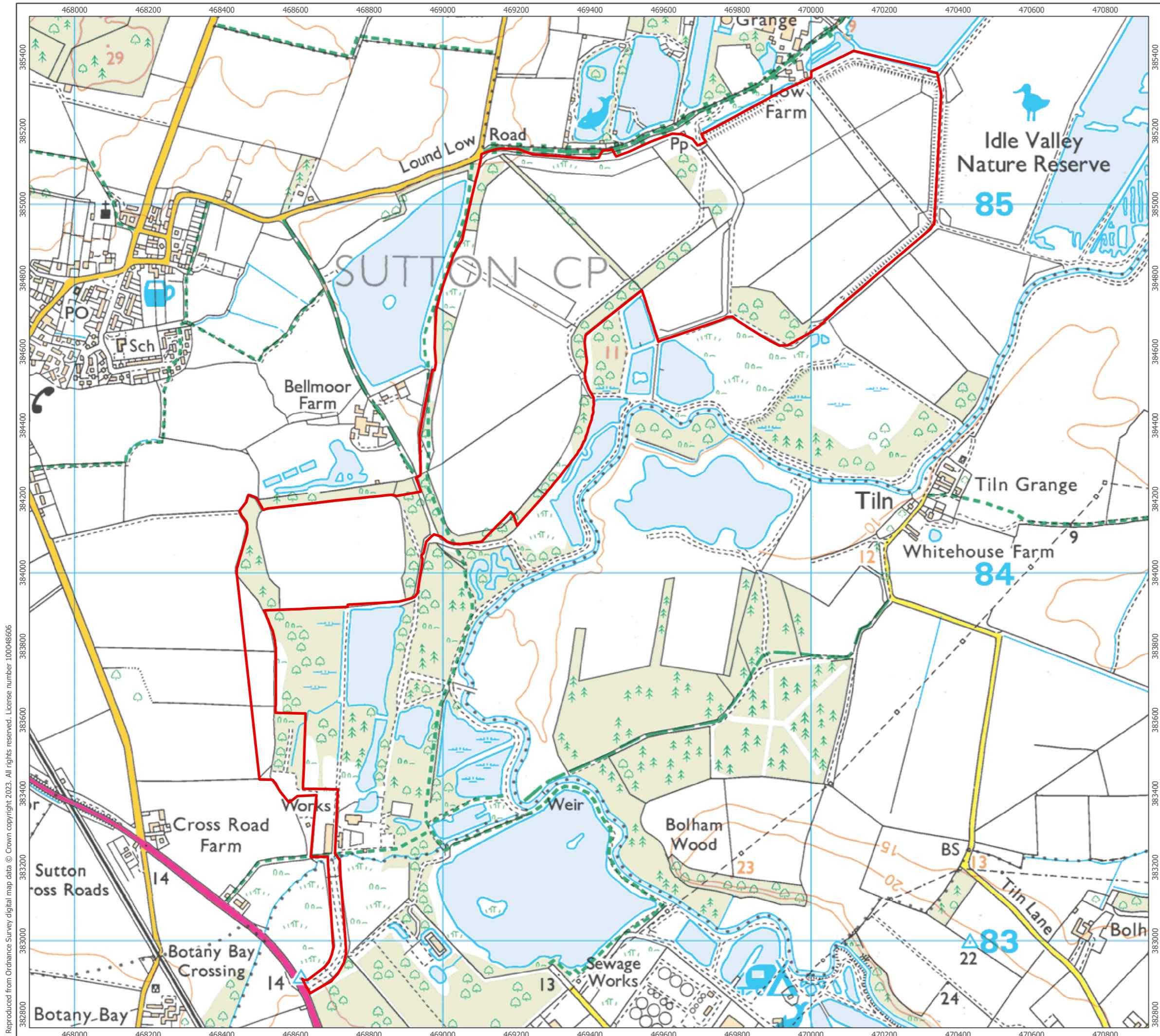
This report provides an overarching restoration and aftercare strategy for the Proposed Development. It has been prepared in response to comments made by Natural England, Nottinghamshire Wildlife Trust and others in respect of the planning application to extract PFA. The landscape restoration masterplan (Appendix B) was designed to provide a platform for habitat creation, it provides for a restoration to a mixture of open water, wet grassland, reedbeds, open water and broadleaved woodland that would be managed (aftercare) for biodiversity.

8 APPENDIX A: FIGURES

1.1 Site Location Plan

1.2 Site Location Plan Aerial

1.3 Site Area Plan



Site Boundary

1:10,000 Scale @ A3

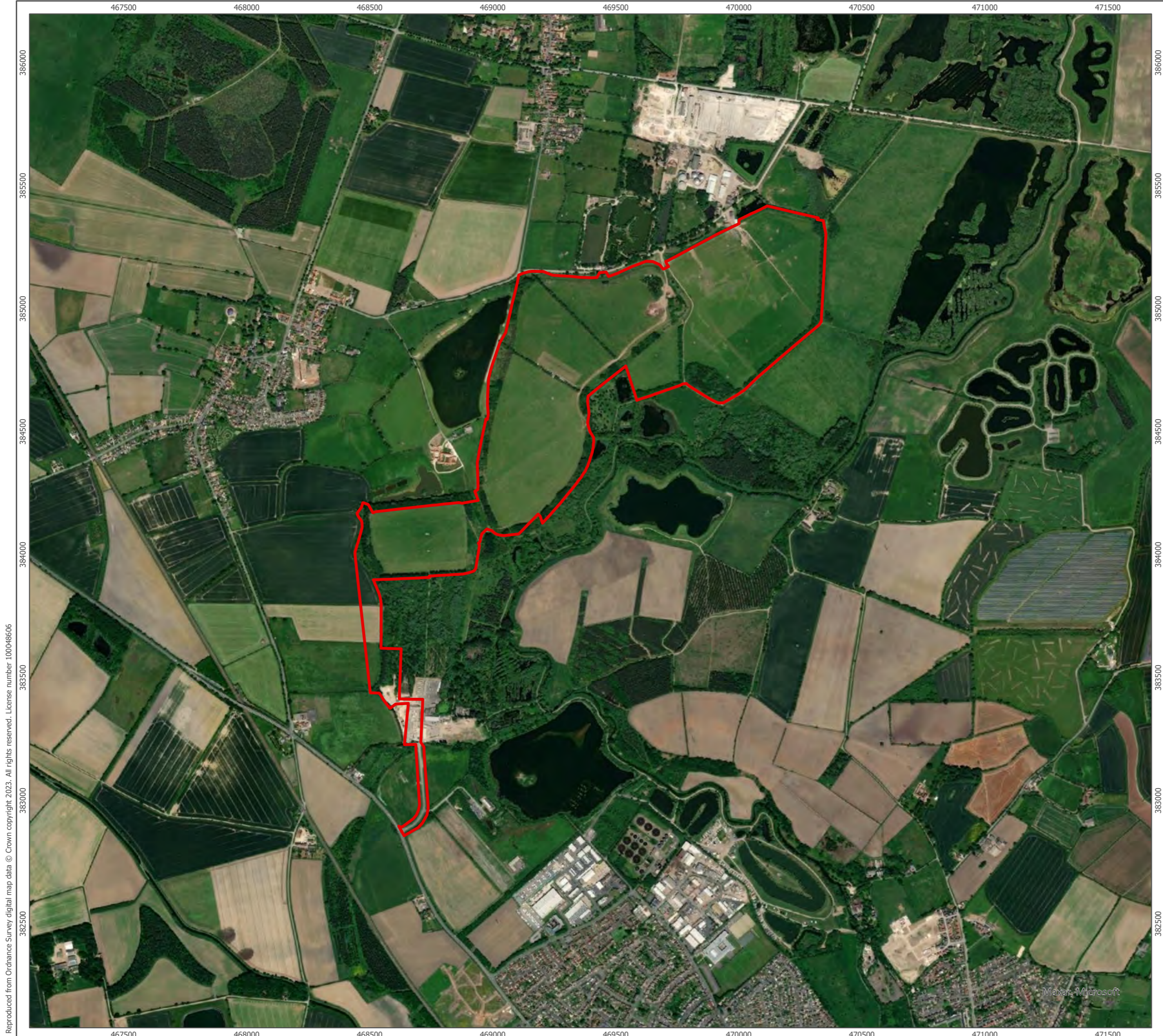
0 250 500 m NORTH

| | |
|-----------------|-------------------|
| Produced By: HG | Ref: 4092-REP-072 |
| Checked By: EB | Date: 02/03/2023 |

Site Location Plan
Figure 1.1

Retford Circular Economy Project
Environmental Statement

Y:\GIS\Environment\4092 Lound Ash Extraction\4092 Lound Ash Extraction.aprx\4092-REP-072 Fig1.1 Site Location Plan



Reproduced from Ordnance Survey digital map data © Crown copyright 2023. All rights reserved. License number 100048606



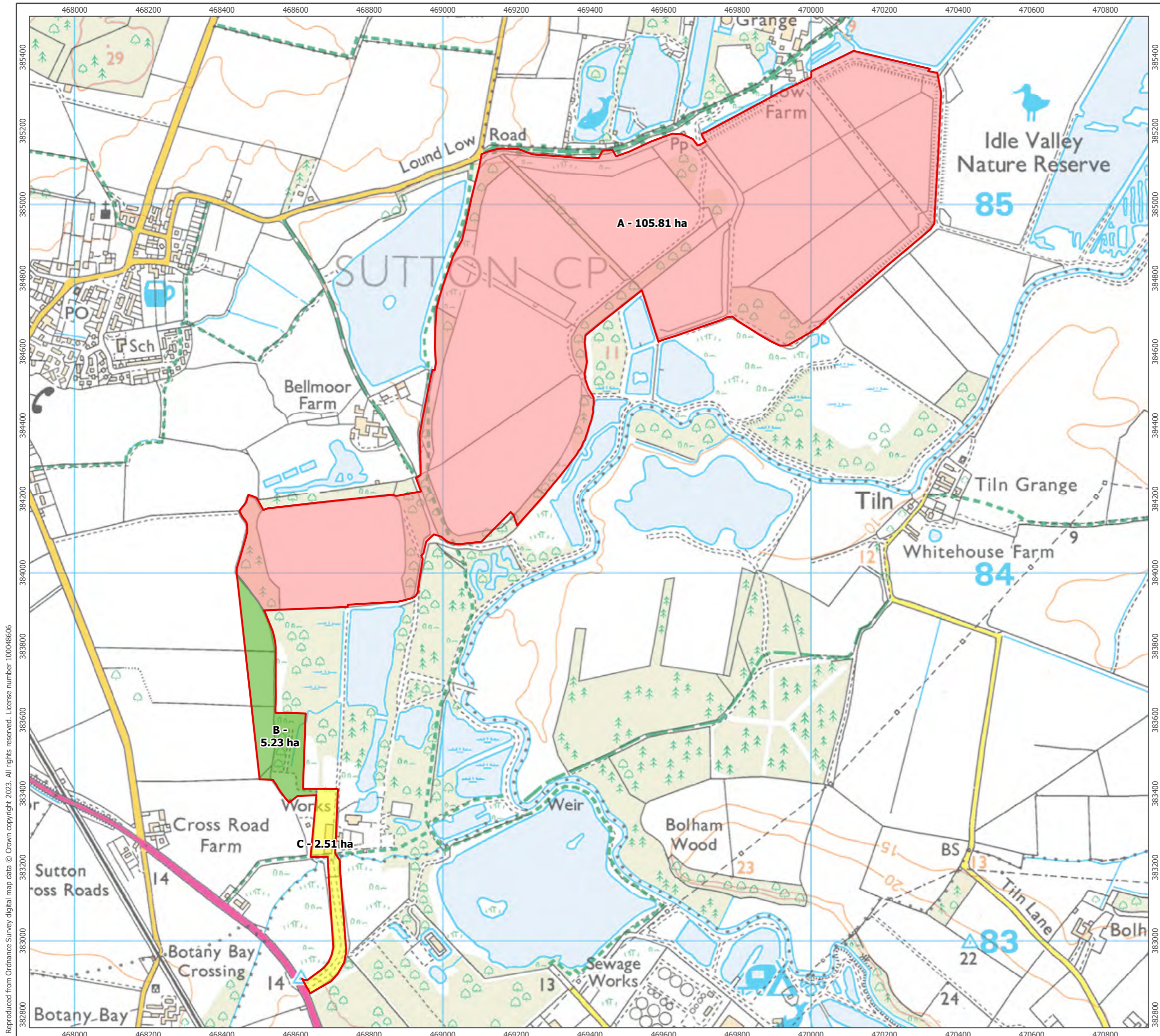
Site Boundary



| | |
|-----------------|-------------------|
| Produced By: SC | Ref: 4092-REP-042 |
| Checked By: EB | Date: 2/9/2023 |

Site Location Plan (Aerial)
Figure 1.2

**Retford Circular Economy Project
Environmental Statement**



- Site Boundary
- Areas**
- A - Main Operational Site
- B - Conveyor and Link Road
- C - Temporary Optimisation Site / Main Processing Site



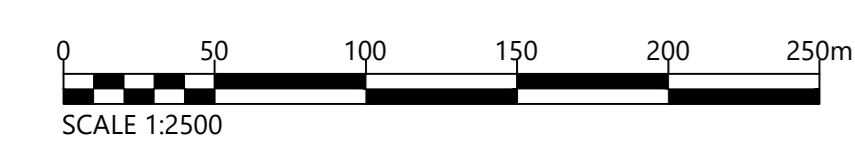
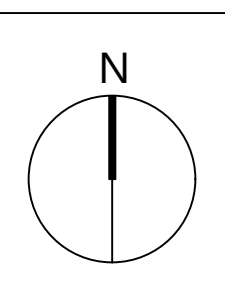
| | |
|-----------------|-------------------|
| Produced By: SC | Ref: 4092-REP-043 |
| Checked By: EB | Date: 2/9/2023 |

Site Area Plan
Figure 1.3

Retford Circular Economy Project
Environmental Statement

Reproduced from Ordnance Survey digital map data © Crown copyright 2023. All rights reserved. License number 100048606

9 APPENDIX B: INDICATIVE LANDSCAPE RESTORATION MASTERPLAN



Redrawn from Ordnance Survey digital map data © Crown copyright 2021. All rights reserved. Licence number 100048606



Wet grassland to include parcels restored at a lower level than surrounding land, bounded by ditches and waterbodies, and created with an undulating profile to provide varying degrees of saturation. Other measures to encourage seasonal inundation may include scrapes and food drains to provide some standing water and muddy edges to enhance foraging opportunities for bird species into spring. Ongoing groundwater monitoring and modelling would be carried out to inform the detailed design of landform features and management of the habitat.

Significant area of woodland planting provided along the north western boundary to replace trees currently situated on the lagoon embankments. This would include UK grown and certified plant stock comprised of, for example, locally appropriate species such as common sessile oak, hawthorn, hazel, holly, alder, and wild roses. With a preference for plants with nectar, nuts, and berries for foraging by wildlife.

An interpretation board with information on the habitats on site and the wildlife to be seen would be provided to the side of the footpath here. It is envisaged that the content, style, and location of the interpretation board would be agreed upon with the local planning authority and the local community.

Trees and scrub lost during operation to facilitate soil storage, the conveyor corridor and embankment removal would be replaced with perimeter tree planting and species-rich grassland.

Existing hedgerow retained and supplemented with tree planting

Sutton/BOAT7

Landform graded to provide fall from pasture and species-rich grassland areas to the lower level wet grassland areas.

Sutton/FP1

Sutton/BW4

Sutton/FP5

Sutton/FP5

Landform graded to provide fall from pasture and species-rich grassland areas to the lower level wet grassland areas.

Sutton/FP1

Livestock Handling Area

Naturalistic slopes and gradients would be created throughout. Backfilling of the lake voids would enable a 50mm to 1 m deep edge with a gentle slope profile of 1:10 to 1:40 for wetland vegetation to establish. Safely varied land levels and channels where lake edge backfilling is to occur would produce variations in water depth and create micro habitats and increase biodiversity potential. Water depths in excess of 1.5 m in the centre of the water body would prevent reed bed dominance and maintain open water.

New reed bed fringes would be planted where conditions are suitable at the restored lakeside fringes and along ditches. Reed beds would either be sown with locally sourced reed seed in saturated soil or directly planted into submerged soil with cut reed stalks from an approved donor site. Reed bed areas would vary in depth and include deeper channels and pools, to ensure patches of open water remains within the habitat. Reed beds would be managed through an annual rotational cut with at least one quarter or one seventh of the reeds cut each year and removal of saplings to minimise succession.

Log piles and hibernacula would be provided along the woodland and hedgerow planting and adjoining the wetland areas for reptiles and invertebrates. Suitable retained trees would be selected for a number of bat and bird boxes.

Graded edges to be established adjacent to woodland areas and along hedgerows. Strip or inoculation seeding or the use of local provenance 'Green Hay' transfers in either linear swathes or large scrapes (approximately 2 to 5 m²) would be used. This would enable floristically diverse areas to be established and spread out naturally.

KEY

- Planning Application Boundary
- Existing Track to be Retained
- Existing Public Rights of Way
- Existing Vegetation to be Retained
To be thinned and coppiced as appropriate to improve tree health and the range of habitats provided
- Existing Tree and Vegetation to be Removed
- Existing Watercourse
- Sutton and Lound Gravel Pits SSSI
- Proposed Native Species Tree
Species include: Common Oak, Spindle Oak, Hawthorn, Hazel, Holly and Alder
- Proposed Native Species Hedgerow with Tree
Species include: Field Maple, Hawthorn, Hazel, Spindle, Holly, Honeyusksle, Wild Cherry, Dog Rose
To be scattered or group planted within species rich grassland areas.
- Proposed Native Species Woodland Mix
Species include: Field Maple, Alder, Birch, Hazel, Crab Apple, Wild Cherry, Oak, Goat Willow, Small-leaved Lime, Common Oak, Sessile Oak, Hazel and Hawthorn.
- Proposed Pasture
Bespoke mix of native grasses and reed and white clover (98:2)
- Proposed Species Rich Verges
Strip or inoculation seeding of typical hedgerow verge species. Using local provenance seed or 'Green Hay' transfers in either linear swathes or large scrapes (approximately 2 to 5 m²).
- Proposed Wet Meadow Mix
Species selection would be confirmed after soil test.
- Proposed Reed Beds
Reed beds would either be sown with locally sourced reed seed in saturated soil or directly planted into submerged soil with cut reed stalks from an approved donor site.
- Proposed Track
- Footpath Section within the Site
- Proposed Ditch
- Proposed Waterbody
- Proposed Interpretation Board Location
- Indicative Access Point

NOTES:
Existing woodland around perimeter of the site to be thinned as appropriate and suitable species coppiced (on a 7 to 12 year rotational cycle) to provide a range of habitats and open glades.

REVISION SCHEDULE

| Rev | Date | Description |
|-----|----------|----------------------------------------|
| A | 01.02.23 | Revised following client comments (WM) |
| B | 02.02.23 | Revised following client comments (WM) |
| C | 07.02.23 | Revised following client comments (WM) |

THIS DRAWING HAS BEEN PREPARED IN ACCORDANCE WITH THE SCOPE OF WORK AGREEMENT WITH THE CLIENT AND IS SUBJECT TO THE TERMS OF THAT AGREEMENT. ARCUS ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS CLIENT AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.

NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
- ALL DIMENSIONS, CHANGES, LEVELS AND COORDINATES ARE IN METERS UNLESS DEFINED OTHERWISE.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.
- THIS DRAWING IS THE COPYRIGHT OF ARCUS AND CANNOT BE REPRODUCED IN ANY FORM WITHOUT THE EXPRESS CONSENT OF THE COMPANY. WRITTEN AND SCALED DIMENSIONS TO BE CHECKED ON SITE, AND ANY DISCREPANCIES SHOULD BE REPORTED TO ARCUS PRIOR TO WORK COMMENCING ON SITE.

STATUS: **FOR PLANNING**

BASE: Reproduced from Ordnance Survey digital map data © Crown copyright 2021. All rights reserved. Licence number 100048606

GRID REFERENCE: SK 692 847

PROJECT: Reford Circular Economy

TITLE: Indicative Landscape Restoration Masterplan

CLIENT: Lound Hive Limited

DATE: 26.01.23 **SCALE:** 1:2,500@A0

DRAWN: WM **DRAWING NO.:** 4092_DR_LAN_101

CHECKED: JH **REVISION:** C

ARCUS
Arcus Consultancy Services
Landscape Architecture &
Arbiculture
1C Swinegate Court East
3 Swinegate
York, YO1 5AJ
tel: +44 (0)1904 715 470
www.arcusconsulting.co.uk