

REPORT

Boston Alternative Energy Facility

Outline Landscape and Ecological Mitigation Strategy

Client:	Alternative Use Boston Projects Ltd.
Planning Inspectorate Reference	EN010095
Document Reference	7.4
Pursuant to	APFP Regulation: 5(2)(q)
Reference:	PB6934-RHD-ZZ-XX-RP-Z-3036
Status:	Final/0.0
Date:	23 March 2021



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Document title: Boston Alternative Energy Facility

Document short title: Outline Landscape and Ecological Mitigation Strategy

Reference: PB6934-RHD-ZZ-XX-RP-Z-3036

Status: 0.0/Final

Date: 23 March 2021

Project name: Boston Alternative Energy Facility

Project number: PB6934

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Classification

Project related

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Executive Summary

This 'Outline Landscape and Ecological Mitigation Strategy' (OLEMS) is for the Boston Alternative Energy Facility (the Facility) and relates to the landside and waterside works. This report is on behalf of the Applicant, Alternative Use Boston Projects Limited to support the application for a Development Consent Order (DCO) (the DCO application) that has been made to the Planning Inspectorate under Section 37 of the Planning Act 2008.

The purpose of this document is to set out the proposed strategy to mitigate the effects of the Facility on visual amenity, biodiversity features and to enhance the landscape and biodiversity value of the Application Site.

This OLEMS sets out the objectives behind the landscape proposals for the Application Site and outlines implementation techniques for landscape planting. The proposed landscape planting, habitats and biodiversity enhancements are shown on the **Illustrative Landscape Plans** (document reference 4.4)).

The OLEMS is a live document and will be updated post-submission as necessary following discussion with relevant stakeholders.

This OLEMS will form the basis for a final Landscape and Ecological Mitigation Strategy (Final LEMS), which will be prepared and submitted by the Principal Contractor prior to the commencement of construction activities associated with the Facility and is secured by Requirement 5 of the draft DCO (document reference 2.1).

The OLEMS has been informed by **Chapter 9 Landscape and Visual Impact Assessment** (LVIA), **Chapter 12 Terrestrial Ecology** and **Chapter 17 Marine and Coastal Ecology** of the ES (document references 6.2.9, 6.2.12 and 6.2.17 respectively).

The long-term objective of landscape planting is to filter or screen local views to lower level structures and ground activity, including vehicular movements and potential effects of night-time lighting. Planting will not be effective in screening upper sections of taller buildings and structures but will provide a visual framework to the Facility, visual separation to neighbouring industrial units and reduce the perceived scale of the Facility.

Mitigation measures include the following:

- Retention and reinforcement of existing woodland / scrub and hedgerow along the sea banks. Existing vegetation provides some visual structure to the Principal Application Site and potentially screens or filters views to ground level features and activity. Existing vegetation belts will be reinforced by the introduction of tree planting to improve screening.

- Establish mixed native species woodland planting along the southern, western and northern margins of the Principal Application Site (refer to **Illustrative Landscape Plans** (document reference 4.4)). Planting along southern and western margins would be on low earth mounds to enhance screening.
- Establish native species hedgerow with hedgerow trees along selected boundaries of the Principal Application Site.

Other measures include the introduction of species rich grassland, scrub and enhancement of existing ditches and waterbodies. These measures will further increase biodiversity and landscape value.

A baseline biodiversity unit and post development biodiversity unit calculation (using the Defra 2.0 metric) has been undertaken using the information available at the time of preparing this document.

The total existing biodiversity units for the landward side of the Facility is 188.54 (habitat areas) and 3.92 for hedgerows (linear habitats). Some of the existing habitats will either be temporarily or permanently lost as a result of the development. The Facility will result in a total net biodiversity unit change of -69.39 for habitats and a +2.25 for hedgerow units. The total net % change as a result of the Facility will result in a -36.80% total net unit change for habitat units (primarily as a result of the permanent loss of arable, tall ruderals and scrub) and a +57.27% total net % change for the hedgerow units (through the creation/enhancement of hedgerows).

An updated biodiversity unit calculation will be undertaken post DCO approval, using the most up-to-date information available at that time.

In addition to the mitigation measures proposed that are secured by condition 14 of the DML, there is a requirement for bird monitoring during the construction works to ensure that disturbance can be minimised. This would involve monitoring of bird numbers and behaviour associated with any noisy activities and stopping works if a threshold value is exceeded for numbers of birds within a 250 m radius. The thresholds of bird numbers will be agreed with Natural England. These monitoring measures are secured by Requirement 5 of the draft DCO which requires a final LEMS to be approved that is substantially in accordance with the OLEMS.

Habitat enhancement works within the Habitat Mitigation Area are proposed in order to enhance an area approximately 170 m south east of the Principal Application Site for the benefit of birds, notably redshank (*Tringa totanus*). A number of habitat enhancement measures are proposed including the translocation of boulders from the area to be lost to the wharf (to increase roosting opportunities for redshank), creation of scrapes/pools (to increase foraging opportunities) and reprofiling of an old bank to improve sightlines for

birds. Outline details of these works are set out in this OLEMS. An intertidal biodiversity net gain baseline is also provided and discussions to understand the biodiversity values that could be achieved through works offsite will be progressed. It is proposed that net gain value could be achieved through works undertaken within the RSPB reserves of Frampton Marsh and Freiston Shore in order to provide additional habitats for birds.

1 Introduction

1.1.1 This 'Outline Landscape and Ecological Mitigation Strategy' (OLEMS) is for the Boston Alternative Energy Facility (the Facility) and relates to both the terrestrial and intertidal area. This report is provided on behalf of the Applicant, Alternative Use Boston Projects Limited to support the application for a Development Consent Order (DCO) (the DCO application) that has been made to the Planning Inspectorate under Section 37 of the Planning Act 2008.

1.1.2 This OLEMS is submitted as part of the DCO application for the Facility. Draft DCO Requirement 5 sets out the need to secure a final Landscape and Ecological Mitigation Strategy (final LEMS) covering the construction and operation phases, which will be substantially in accordance with the OLEMS.

The Application Site

1.1.3 The Application Site covers 26.8 hectares (ha) and comprises two components (as shown on the **Location Plan**, document reference 4.1):

- the Principal Application Site (NGR TF33950 42241), which covers 25.3 ha and will contain all of the operational infrastructure; and
- the Habitat Mitigation Area, which covers 1.5 ha and is located approximately 170 m to the south east of the Principal Application Site, encompassing an area of saltmarsh and small creeks at the margins of The Haven that will be enhanced.

1.1.4 The Principal Application Site is neighbored to the east by the Riverside Industrial Estate and to the west by The Haven, a tidal waterway of the River Witham between The Wash and the town of Boston. The A16 public highway is approximately 1.3 km to the west. The Application Site is entirely within the administrative area of Boston Borough Council.

1.1.5 The Principal Application Site comprises undeveloped and previously developed land enclosed by a network of drainage ditches and forms part of a wider emerging industrial/commercial area.

1.1.6 A detailed description of the Application Site location and surroundings is provided in **Chapter 5 Project Description** of the Environmental Statement (ES) (document reference 6.2.5).

The Proposed Development

1.1.7 The proposed Facility would deliver approximately 80 megawatt electric (MWe) of renewable energy to the National Grid using RDF as a feedstock into a Thermal

Treatment facility generating power via steam turbine engines.

1.1.8 The Facility would comprise the following main elements:

- a wharf and associated infrastructure (including re-baling facility, workshop, transformer pen and welfare facilities);
- a refuse derived fuel (RDF) bale contingency storage area, including sealed drainage, with automated crane system for transferring bales;
- conveyor system running in parallel to the wharf between the RDF storage area and the RDF bale shredding plant. Part of the conveyor system is open and part of which is under cover (including thermal cameras);
- bale shredding plant;
- RDF bunker building;
- thermal treatment plant comprising three nominal 34 MWe combustion lines (circa 120 megawatt thermal (MWth)) and associated ductwork and piping, transformer pens, diesel generators, three stacks, ash silos and ash transfer network; and air pollution control residues (APCr) silo and transfer network;
- turbine plant comprising three steam turbine generators, make-up water facility and associated piping and ductwork;
- air-cooled condenser structure, transformer pen and associated piping and ductwork;
- Lightweight Aggregate (LWA) manufacturing plant comprising four kiln lines, two filter banks with stacks, storage silos for incoming ash, APCr, and binder material (clay and silt), a dedicated berthing point at the wharf, silt storage and drainage facility, clay storage and drainage facility, LWA workshop, interceptor tank, LWA control room, aggregate storage facility and plant for loading aggregate / offloading clay or silt;
- electrical export infrastructure;
- two carbon dioxide (CO₂) recovery plants and associated infrastructure, including chiller units;
- associated site infrastructure, including site roads, pedestrian routes, car parking, site workshop and storage, security gate, control room with visitor centre and site weighbridge; and
- habitat mitigation works for redshank and other bird species comprising of improvements to the existing habitat through the creation of small features such as pools/scrapes and introduction of small boulders (Habitat Mitigation Works) within the Habitat Mitigation Area.

- 1.1.9 The construction period for the whole development, including commissioning, is anticipated to be between 46 to 48 months.
- 1.1.10 The Facility would be designed to operate for an expected period of at least 25 years, after which ongoing operation will be reviewed and if it is not appropriate to continue operation the plant will be decommissioned. The wharf structure would replace a section of the current primary flood defence bank (without impacting on the integrity of the bank) and would form a permanent structure that is not anticipated to be decommissioned.
- 1.1.11 A detailed description of the Facility is provided within **Chapter 5 Project Description** of the ES (document reference 6.2.5).

1.2 The Purpose and Structure of this Document

- 1.2.1 This OLEMS sets out the objectives behind mitigation and landscape proposals for the Application Site and outlines implementation techniques for landscape planting. The proposed landscape planting, habitats and biodiversity enhancements are shown on the **Illustrative Landscape Plans** (document reference 4.4)).
- 1.2.2 This OLEMS is a live document and will be updated post-submission as necessary following discussion with relevant stakeholders.
- 1.2.3 This OLEMS will form the basis for a final LEMS, which will be prepared and submitted by the Principal Contractor prior to the commencement of construction activities associated with the Facility.
- 1.2.4 The OLEMS is structured as follows:
- Section 2 summarises relevant legislation and planning policy;
 - Section 3 describes the existing landscape features and effects of the Facility;
 - Section 4 describes the landscape strategy including proposed planting and seed mixes;
 - Section 5 describes the existing terrestrial ecological features of the Application Site;
 - Section 6 outlines the embedded terrestrial ecological mitigation measures;
 - Section 7 sets out the terrestrial ecological impacts associated with the Facility;
 - Section 8 sets out terrestrial biodiversity net gain calculations;

- Section 9 describes terrestrial ecological enhancement measures; and
- Section 10 provides management and maintenance measures for the landside works.

1.2.5 Whilst the main body of the OLEMS is directed predominantly to the terrestrial parts of the Principal Application Site (i.e. land landward of Mean Low Water Springs (MLWS)) **Appendix 1** presents the outline mitigation measures and the biodiversity net gain baseline calculation and proposed net gain works for the Facility. The biodiversity loss baseline is presented (along with the relevant calculations and methodology) and it is proposed that off-site net gain is provided as part of the development proposals. The detail on the final, agreed measures both for the mitigation and the biodiversity net gain will continue to be discussed with stakeholders with full details of this included in the Final LEMS, as secured by Requirement 5 of the draft DCO (document reference 2.1).

2 Legislation and Planning Policy Context

2.1 National Planning Policy

National Policy Statements

2.1.1 National Policy Statements (NPSs) form a principal part of the decision-making process for Nationally Significant Infrastructure Projects (NSIPs). The policy statements of relevance to the Facility are:

- The overarching NPS for Energy (**EN-1**) (Department of Energy and Climate Change (DECC) 2011a), and
- The NPS for Renewable Energy Infrastructure (**EN-3**) (DECC, 2011b).

2.1.2 Sections of the NPSs relevant to this strategy document are summarised in **Table 2-1**.

Table 2-1 National Policy Statement Requirements

National Policy Statement Requirements	NPS Reference	Document Reference
Overarching NPS for Energy (EN-1)		
Ecology		
<i>The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.</i>	Paragraph 5.3.4	Section 4 provides the landscape strategy which includes opportunities for conserving and enhancing biodiversity. Section 6 provides embedded mitigation measures and Section 8 details additional ecological enhancement measures.
<i>Development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design...</i>	Paragraph 5.3.15	Section 6 provides embedded mitigation measures and Section 8 details additional ecological enhancement measures.
<p><i>The applicant should include appropriate mitigation measures as an integral part of the proposed development. In particular, the applicant should demonstrate that:</i></p> <ul style="list-style-type: none"> <i>during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works;</i> <i>during construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements;</i> <i>habitats will, where practicable, be restored after construction works have finished; and</i> <i>opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals.</i> 	Paragraph 5.3.18	<p>Section 4 provides the landscape strategy which includes opportunities for conserving and enhancing biodiversity. Section 6 provides embedded mitigation measures and Section 8 details additional ecological enhancement measures.</p> <p>Management and monitoring measures are provided in Section 10.</p>
Landscape		
<i>...Virtually all nationally significant energy infrastructure projects will have effects on the landscape. Projects need to be designed carefully, taking account of the potential impact on the landscape. Having regard to siting, operational and other relevant constraints the aim should be to minimise harm to the landscape, providing reasonable mitigation where possible and appropriate.</i>	Paragraph 5.9.8	Section 4 provides the landscape strategy. Management and monitoring measures are provided in Section 10 .
<i>Depending on the topography of the surrounding terrain and areas of population it may be appropriate to undertake landscaping off site. For example, filling in gaps in existing tree and hedge lines would mitigate the impact when viewed from a more distant vista.</i>	Paragraph 5.9.23	Currently the landscape strategy is within the Application Site. The Illustrative Landscape Plans shows the proposed landscape

National Policy Statement Requirements	NPS Reference	Document Reference
		planting (document reference 4.4)).
NPS for Renewable Energy Infrastructure (EN-3).		
<i>The IPC should expect applicants to seek to landscape waste / biomass combustion generating station sites to visually enclose them at low level as seen from surrounding external viewpoints. This makes the scale of the generating station less apparent, and helps conceal its lower level, smaller scale features. Earth bunds and mounds, tree planting or both may be used for softening the visual intrusion and may also help to attenuate noise from site activities.</i>	Paragraph 2.5.52	Section 4 provides the landscape strategy. The Illustrative Landscape Plans shows the proposed landscape planting (document reference 4.4)).

National Planning Policy Framework

2.1.3 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2019) does not contain specific policies relating to NSIPs. It is however considered an important and relevant matter for the determination of the Facility and the relevant policies relating to this strategy document are detailed in **Table 2-2**.

Table 2-2 NPPF Requirements

National Policy Statement Requirements	Reference	Document Reference
<i>“an environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy”.</i>	Chapter 2 ‘Achieving sustainable development’	Section 4 provides the landscape strategy which includes opportunities for conserving and enhancing biodiversity. Section 6 provides embedded mitigation measures and Section 8 details additional ecological enhancement measures.
<i>“Planning policies and decisions should contribute to and enhance the natural and local environment by: a) protecting and enhancing valued landscapes ... (in a manner commensurate with their statutory status or identified quality in the development plan); b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including... trees and woodlands;” [...] d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent</i>	Chapter 15 ‘Conserving and enhancing the natural environment’	Section 4 provides the landscape strategy which includes opportunities for conserving and enhancing biodiversity. Section 6 provides embedded mitigation measures and Section 8 details additional ecological enhancement measures. Further details on the existing landscape

National Policy Statement Requirements	Reference	Document Reference
<i>ecological networks that are more resilient to current and future pressures”</i>		character is provided in Chapter 9 Landscape and Visual Impact Assessment of the ES (document reference 6.2.9).
<i>To protect and enhance biodiversity and geodiversity, plans should: b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.</i>		Section 4 provides the landscape strategy which includes opportunities for conserving and enhancing biodiversity. Section 6 provides embedded mitigation measures and Section 8 details additional ecological enhancement measures.

2.2 Local Planning Policy

Lincolnshire Minerals and Waste Local Plan, Adopted June 2016

2.2.1 The Lincolnshire Minerals and Waste Local Plan relates to waste management and waste development and its policies are relevant to the Facility (Lincolnshire County Council (LCC), 2016). The Core Strategy and Development Management Policies document (Adopted June 2016) includes the following policies.

2.2.2 Policy DM3: Quality of Life and Amenity refers to the importance of reducing visual intrusion *‘to an absolute minimum’*. It states:

‘Planning permission will be granted for minerals and waste development provided that it does not generate unacceptable adverse impacts arising from...visual intrusion... to occupants of nearby dwellings and other sensitive receptors’.

2.2.3 Measures to make living near to a ‘waste site’ acceptable include the creation of bunds and natural vegetation for screening. Waste development should be well designed and contribute positively to the character and quality of the area.

2.2.4 Policy DM6: Impact on Landscape and Townscape states:

‘Planning permission will be granted for minerals and waste development provided that due regard has been given to the likely impact of the proposed facility on landscape and townscape, including landscape character, valued or distinctive landscape features and elements, and important views. If considered necessary by the County Council, additional design, landscaping,

planting and screening will be required. Where planting is required it will be subject to a minimum 10-year maintenance period.

Development that would result in residual, adverse landscape and visual impacts will only be approved if the impacts are acceptable when weighed against the benefits of the scheme. Where there would be significant adverse impacts on a valued landscape considerable weight will be given to conservation of that landscape’.

2.2.5 Policy R2: After Use states:

“The proposed after-use should be designed in a way that is not detrimental to the local economy and conserves and where possible enhances the landscape character and the natural and historic environment of the area in which the site is located.

After- uses should enhance and secure a net gain in biodiversity and geological conservation interests, conserve soil resources, safeguard the potential of the best and most versatile agricultural land, and decrease the risk of adverse climate change effects. Such after-uses could include: agriculture, nature conservation, leisure, recreation/ sport, and woodland.”

South-East Lincolnshire Local Plan 2011-2036 (Adopted March 2019)

2.2.6 Planning decisions for non-waste (or mineral) developments within Boston Borough are guided by the South-East Lincolnshire Local Plan 2011-2036 (Adopted March 2019) (South East Lincolnshire Joint Strategic Planning Committee, 2019). The following section summarise local plan policy relevant to this document.

2.2.7 Policy 2: Development Management states that:

‘Proposals requiring planning permission for development will be permitted provided that sustainable development considerations are met, specifically in relation to:

1. size, scale, layout, density and impact on the amenity, trees, character and appearance of the area and the relationship to existing development and land uses;

2. quality of design and orientation;...

6. impact upon neighbouring land uses by reason of noise, odour, disturbance or visual intrusion;...’

2.2.8 Policy 3: Design of New Development, effectively provides a list of issues to be considered, consistent with NPPF.

All development will create distinctive places... Design which is inappropriate to the local area, or which fails to maximise opportunities for improving the character and quality of an area, will not be acceptable.

Development proposals will demonstrate how the following issues, where they are relevant to the proposal, will be secured:

1. creating a sense of place by complementing and enhancing designated and non-designated heritage assets; historic street patterns; respecting the density, scale, visual closure, landmarks, views, massing of neighbouring buildings and the surrounding area;...

3. the landscape character of the location;...

11. residential amenity;...

14. the incorporation of existing hedgerows and trees and the provision of appropriate new landscaping to enhance biodiversity, green infrastructure, flood risk mitigation and urban cooling;...

2.2.9 Policy 28: The Natural Environment:

3. Addressing gaps in the ecological network: by ensuring that all development proposals shall provide an overall net gain in biodiversity, by:

- i. protecting the biodiversity value of land, buildings and trees (including veteran trees) minimising the fragmentation of habitats;*
- ii. maximising the opportunities for restoration, enhancement and connection of natural habitats and species of principal importance;*
- iii. incorporating beneficial biodiversity conservation features on buildings, where appropriate; and maximising opportunities to enhance green infrastructure and ecological corridors, including water space; and*
- iv. conserving or enhancing biodiversity or geodiversity conservation features that will provide new habitat and help wildlife to adapt to climate change, and if the development is*

within a Nature Improvement Area (NIA), contributing to the aims and objectives of the NIA.

2.2.10 Policy 31: Climate Change and Renewable and Low Carbon Energy:

'A. Climate Change

All development proposals will be required to demonstrate that the consequences of current climate change has been addressed, minimised and mitigated by:

1. employing a high-quality design;...

5. incorporating measures which promote and enhance green infrastructure and provide an overall net gain in biodiversity as required by Policy 28 to improve the resilience of ecosystems within and beyond the site...

3 Existing Landscape Features and Effects of the Facility

- 3.1.1 The Principal Application Site is located on the eastern side of the Riverside Industrial Estate, occupying an area of approximately 25.3 ha. The north-eastern area includes the existing riverbank and waterside margin to The Haven. There are access tracks to areas of rough open grassland that include temporary material stockpiles. A densely vegetated sea bank is located within the central eastern Application Site boundary. The southern site area encompasses agricultural fields bounded by drainage ditches and low banks. There is a balancing pond on the south eastern boundary. The central western portion of the Application Site includes areas of rough grassland either side of Nursery Road; areas to the east of the road are bounded by galvanised steel security fencing. The area includes temporary compounds and material stockpiles.
- 3.1.2 A 132kV overhead powerline on pylons traverses the Application Site from north to south and bisects Biomass UK No. 3 Ltd site and the Principal Application Site.
- 3.1.3 There would be no loss of significant landscape features within the Application Site. The Facility would result in the loss of arable agricultural land to the south and areas of rough grassland on the northern and western site margins. Development of the wharf would result in the loss of established, gappy hedgerow (approximately 500 linear metres (lin m)) that runs along the landward side of the existing flood defence bank and a field boundary hedgerow with trees (approximately 210 lin m) in the central, eastern site area.
- 3.1.4 Scrub and hedgerow vegetation along the sea bank in the central, eastern site

area would be retained and protected during construction phases.

4 Landscape Strategy

- 4.1.1 The landscape strategy sets out the objectives behind landscape proposals for the Principal Application Site and outlines implementation techniques for landscape planting.
- 4.1.2 The landscape strategy has been informed by **Chapter 9 Landscape and Visual Impact Assessment** (LVIA) of the ES (document reference 6.2.9). The LVIA identified adverse visual effects to receptors within close proximity to the site. No significant landscape character or physical landscape effects were identified. The strategy therefore primarily addresses the mitigation of visual effects, although these will also provide secondary benefits to local landscape character.
- 4.1.3 The long term objective of landscape planting is to filter or screen local views to lower level structures and ground activity, including vehicular movements and potential effects of night-time lighting. Planting will not be effective in screening upper sections of taller buildings and structures but will provide a visual framework to the Facility, visual separation to neighbouring industrial units and reduce the perceived scale of the Facility.
- 4.1.4 Mitigation measures include the following:
- Retention and reinforcement of existing woodland / scrub and hedgerow along Roman Bank. Existing vegetation provides some visual structure to the Principal Application Site and screens or filters views to ground level features and activity. Existing vegetation belts will be reinforced by the introduction of tree planting to improve screening.
 - Establish mixed native species woodland planting along the southern, western and northern margins of the Principal Application Site (refer to **Illustrative Landscape Plans** (document reference 4.4)). Planting along southern and western margins would be on low earth mounds to enhance screening.
 - Establish native species hedgerow with hedgerow trees along selected boundaries of the Principal Application Site.
- 4.1.5 Other measures include the introduction of species rich grassland, scrub and enhancement of existing ditches and waterbodies. These measures will further increase biodiversity and landscape value.

4.2 Implementation Techniques

4.2.1 The following section provides an overview of techniques and specifications for the implementation of landscape proposals.

Site Clearance and Protection Works

4.2.2 Existing hedgerows within central eastern site areas will be removed to accommodate the Facility. Site clearance works will be subject to ecological survey and seasonal timing of works, including:

- removal of vegetation outside of the bird nesting season;
- checking for ground nesting birds in areas of proposed earthworks and cultivations;
- checking for amphibians and other species within existing watercourses and ponds; and
- for reptiles, habitat manipulation followed by a destructive search. Habitat manipulation will be carried out a maximum of one week prior to works commencing on site. Any potential sheltering features will be inspected (visually and by hand) before entire removal by an ecologist.

4.2.3 Root protection zones (RPZ) will be established around the outer canopies of existing dense vegetation and trees to be retained. No mobile plant access, storage of plant or materials and ground level changes will be permitted within the RPZ.

Soils and Cultivations

4.2.4 Topsoil and subsoil within existing arable fields will be stripped and stockpiled for re-use in proposed landscape planting and grassland areas. Subject to soil analysis, it is anticipated that there will be no requirement to import soils.

4.2.5 All operations will be carried out during suitable weather conditions in accordance with standard industry guidance (e.g. *'Good Practice Guide for Handling Soils'*, MAFF, 2000, or successor document).

4.2.6 Soils will be laboratory tested to determine suitability for purpose and to establish the requirement for slow release fertilisers and soil ameliorants.

4.2.7 Species rich grassland areas will be established directly on suitable existing substrates (low nutrient) wherever possible, or otherwise on a minimum depth of 300 mm subsoil placed on top of existing substrates. The subsoil surface will be shaped, ripped to 300 mm depth at 300 mm centres and lightly rolled to firm the

surface.

- 4.2.8 Woodland areas will receive 300 mm topsoil over previously cross ripped subsoils or, where existing substrates are unsuitable, topsoil will be placed on 900 mm depth respread subsoil, then further cross ripped with a winged tine to 600 mm depth at 600 mm centres.
- 4.2.9 Hedgerows will be planted into 800 mm wide, prepared strips of ground, either existing retained soils at site boundaries (former arable fields) or planting beds comprising of 300 mm depth topsoil over loosened, in-situ subsoils or 600 mm depth respread subsoil.
- 4.2.10 Proposed pond and marshy areas will be graded to form shallow, varied bank profiles. Topsoil will be stripped and removed with species rich grassland and marginal planting established directly on existing substrates.

4.3 Proposed Planting and Seed Mixes

Proposed Native Species Woodland

- 4.3.1 Specification of plant species will be guided by the Landscape Institute Technical Guidance Note 01/19, *Plant Health and Biosecurity: The Landscape Consultant's Toolkit*. Although restrictions on the movement and use of *Fraxinus* species (due to Ash Dieback, ADB) have been lifted, suitable offspring and clones may be difficult to source and also subject to dieback. At this stage Ash (*Fraxinus excelsior*) is not included in woodland plant mixes but may be introduced at detail design stage should ADB recede or suitable immune plants become available during the course of the Facility implementation.
- 4.3.2 The proposed woodland mix will comprise bare-root transplants and container grown plants between 35 and 60 cm tall, planted at 1.5 m centres. The proposed native species woodland mix is outlined below.
- 4.3.3 All native plant species will be planted direct into previously spread soils or ripped existing substrates, in an excavated planting pit sufficient to allow roots to fully spread. Plant handling and planting operations will be carried out in accordance with good horticultural practice between November – March planting season during periods when the ground is not waterlogged or frozen. UK native stock will be used.
- 4.3.4 Plants will be protected from rabbit and vole damage using suitable grow tubes with support stakes.

4.3.5 **Table 4-1** provides the proposed native species woodland mix.

Table 4-1 Proposed Native Species Woodland Mix

Proposed Native Species Woodland Mix				
Species	Common Name	%	Size (cm)	Type
<i>Acer campestre</i>	field maple	5	60-90	BR
<i>Betula pendula</i>	silver birch	25	45-60	BR
<i>Populus tremula</i>	aspen	15	60-90	BR
<i>Salix caprea</i>	goat willow	10	60-90	BR
<i>Sorbus aucuparia</i>	rowan	10	45-60	BR
<i>Corylus avellana</i>	hazel	5	45-60	BR
<i>Ilex aquifolium</i>	holly	5	30-45 min 3 breaks	2L
<i>Prunus avium</i>	wild cherry/ gean	10	45-60	BR
<i>Quercus robur</i>	pedunculate oak	15	20-40	BR
BR - Bare Root. 2L - Container grown. Planting Density = 2500 plants per hectare				

Proposed Scattered Feathered Trees

4.3.6 To provide variation in height and age structure at the time of planting, feathered trees will be planted amongst woodland areas and at random intervals along new hedgerows (see **Table 4-2**).

Table 4-2 Proposed Feathered Trees

Proposed Feathered Trees				
Species	Common Name	%	Size (cm)	Type
<i>Acer campestre</i>	field maple	25	60-90	BR
<i>Betula pendula</i>	silver birch	30	1.2 – 1.5m feathered	BR
<i>Quercus robur</i>	pedunculate oak	20	1.2 – 1.5m feathered	BR
<i>Sorbus aucuparia</i>	rowan	25	1.2 – 1.5m feathered	BR
BR - Bare Root.				

Proposed Native Species Scrub Mix within Grassland

4.3.7 At margins to existing and proposed ponds or marshy areas, native tree and shrub species will be planted at random centres to create areas of scattered 'open scrub', the proposed native scrub mix is shown in **Table 4-3**. Planting will be set within species rich grassland areas, providing a more open visual character

associated with naturally regenerating landscape margins.

Table 4-3 Proposed Native Scrub Mix within Grassland

Proposed Native Scrub Mix within Grassland				
Species	Common Name	%	Size (cm)	Type
<i>Betula pendula</i>	silver birch	15	1.2 – 1.5m feathered	BR
<i>Crataegus monogyna</i>	hawthorn	30	20-40	BR
<i>Prunus spinosa</i>	blackthorn	15	20-40	BR
<i>Rosa canina</i>	dogrose	5	45-60	BR
<i>Salix caprea</i>	goat willow	15	60-90	BR
BR - Bare Root. Planting Density - scattered and at varied densities				

Proposed Grassland Mix for Woodland Areas

4.3.8 Woodland areas will be sown with an understorey grass mix to bind the soil surface and reduce weed competition (proposed grass mix is provided below in **Table 4-4**). Red clover and bird's-foot trefoil will be included in the mix to fix nitrogen and provide nectar sources. Seeding will be by broadcast methods using low ground pressure tractors to minimise soil compaction. No fertiliser will be applied.

Table 4-4 Woodland Area Understorey Grass Mix

Proposed Woodland Area Understorey Grass Mix		
Species	Common Name	% of Mix (by weight)
<i>Festuca arundinacea</i>	tall fescue	10%
<i>Festuca rubra</i>	red fescue	35%
<i>Festuca filiformis</i>	fine-leaved sheep's fescue	25%
<i>Poa pratensis</i>	smooth stalked meadow grass	20%
<i>Trifolium pratense</i>	red clover	8%
<i>Lotus corniculatus</i>	bird's-foot trefoil	2%
Sowing Rate: 25gms per m ²		

Proposed Native Species Hedgerow

4.3.9 Proposed hedgerows will be planted along selected boundaries to provide localised screening of views into the Principal Application Site and create green

corridor links between areas of existing and proposed planting (see **Table 4-5**).

Table 4-5 Proposed Native Species Hedgerow

Proposed Native Species Hedgerow				
Species	Common Name	%	Size (cm)	Type
<i>Crataegus monogyna</i>	hawthorn	45	20-40	BR
<i>Prunus spinosa</i>	blackthorn	35	20-40	BR
<i>Corylus avellana</i>	hazel	10	45-60	BR
<i>Viburnum opulus</i>	guelder rose	5	45-60	BR
BR - Bare Root. Planting Density - 7 plants per linear metre.				

Proposed Species Rich Grassland

4.3.10 Extensive areas of the Principal Application Site will be sown with species rich grassland. The selection of appropriate seed mixes will be dependent on future detailed site and soil analysis. As an example, an *EM2 Standard General Purpose Meadow Mixture* (supplied by Emorsgate Seeds) will provide a core mix of species that grow across a wide range of soils and can be adapted as required. Alternative appropriate seed mixes will be introduced at pond / marshy margins, supported by planting of marginal and emerging native plant species.

5 Existing Terrestrial Ecological Features

5.1.1 **Chapter 12 Terrestrial Ecology** of the ES (document reference 6.2.12) presents the existing baseline conditions of the Principal Application Site and an assessment of the anticipated effects on ecological receptors during the construction, operational and decommissioning phases of the Facility.

5.1.2 The key habitats recorded within the Application Site include:

- Semi-improved neutral grassland with scattered scrub comprising species such as bramble *Rubus fruticosus*, teasel *Dipsacus spp.*, and nettle *Urtica dioica*);
- Area of tall ruderals (comprising predominantly nettle);
- Areas of scattered and dense scrub;
- Species poor intact hedgerows;
- Species rich hedgerows with trees;
- Areas of amenity grassland;

- Areas of bare ground (hard standing and areas or rubble);
- Areas of bare ground (with scattered shrub);
- Semi-natural broadleaved woodland;
- Dry ditches (drainage channels);
- Marginal vegetation; and
- Running water (brackish).

5.1.3 The habitats recorded within the Application Site were found to support breeding birds and foraging and commuting bats. Although no records of common reptile species are held for the Application Site, there are suitable habitat opportunities for which common reptile species could use. Mitigation measures in relation to these species have been identified and presented in **Section 7** of this document.

5.1.4 With the implementation of measures to avoid and reduce effects on ecological features that have been embedded into the design (**Section 6**), all adverse effects are considered to be not significant and no further mitigation is considered necessary. However, habitat creation/enhancements included in the Landscape Strategy as presented in **Section 4** will result in a significant beneficial ecological effect in the long term.

6 Embedded Terrestrial Ecological Mitigation Measures

6.1.1 As part of the project design, several embedded mitigation measures have been incorporated to reduce potential effects on terrestrial ecology. These measures are considered standard industry practice for this type of the development.

6.1.2 The proposed design has where possible avoided sensitive ecological receptors such as habitats and/or features known to support legally protected species. Where this is not possible, and habitats and/or features require removal, these will be programmed to be removed to avoid sensitive periods (i.e. outside of nesting bird season). In addition, suitable maintenance of any newly planted habitats following construction will have an aftercare period, with any failures being replaced.

6.1.3 Lighting requirements associated with the Facility would be designed to be sensitive to bats and birds in accordance with the relevant and most recent industry guidance. An outline lighting strategy (document reference 7.5) includes an overview of operational lighting requirements for the Facility.

7 Proposed Development Terrestrial Ecological Effects

7.1 Development Effects on Habitats

7.1.1 The Facility will result in the loss (temporary or permanent) of the following habitats:

- Hedgerows (species poor and species rich) 810 m (permanent);
- Semi-natural broadleaved woodland 0.14 ha (permanent) and 0.09 ha (temporary);
- Scrub 2.86 ha (permanent) and 3.94 ha (temporary);
- Semi-improved neutral grassland 2.7 ha (permanent) and 1.31 ha (temporary);
- Amenity grassland 0.01 ha (permanent) and 0.15 ha (temporary);
- Tall herb and ruderals 0.90 ha (permanent);
- Arable 8.12 ha (permanent);
- Bare ground 2.09 ha (permanent) and 2.66 ha (temporary);
- Approximately 1.54 ha of mudflat (permanent);
- Approximately 0.99 ha of saltmarsh (permanent);
- Earth bank 94.9 m (temporary); and
- Dry ditch 1,505 m (permanent) and 570 m (temporary).

7.2 Development Effects on Protected and Notable Species

7.2.1 Although no evidence of species such as badgers, water voles and otters have been recorded within the Principal Application Site, due to the mobility of these species and that suitable habitat for these species is present within the Principal Application Site, pre-construction surveys for these species will be undertaken. These surveys will be undertaken by a suitably qualified ecologist, at the appropriate time of year and in accordance with industry guidance.

7.2.2 As presented in **Chapter 12 Terrestrial Ecology** of the ES, the appropriate mitigation measures in respect to foraging/commuting bats, common reptile species and nesting birds are presented in **Paragraph 7.2.3– 7.2.8** below.

Foraging/Commuting Birds and Bats

7.2.3 Noise and visual disturbance from the Principal Application Site may result from any night working which may occur as part of the construction of the development.

This in turn may result in impacts to foraging/commuting birds and bats. As such, mitigation measures to manage this impact will include the use of low-pressure sodium lighting which will be located away from areas that could be used by bat/bird species (i.e. hedgerow and woodland habitats) where possible. All lights will also be pointed away from these features and designed in accordance with the Bat Conservation Trust (BCT) and Institute of Lighting Engineers (ILE) guidance relating to bats and artificial lighting.

Common Reptile Species

7.2.4 Although no specific reptile survey has been undertaken, suitable habitat is present for which reptiles could use. Therefore, there is the potential for the following effects to occur during the construction phase of the Facility:

- Temporary loss of suitable reptile habitat;
- A risk of killing or injuring reptiles which are active within these areas; and
- A risk of habitat degradation due to pollutant release during the construction phase.

7.2.5 Mitigation measures will include the adherence to a reptile pre-cautionary method of working (PMoW) during construction. This PMoW will include the details of implementing a reptile sensitive clearance methodology (under ecological supervision) prior to any construction works within the footprint of the Facility. This will ensure that any reptiles are safeguarded from the construction process.

7.2.6 The reptile sensitive methodology involves habitat manipulation followed by a destructive search. Habitat manipulation will be carried out a maximum of one week prior to works commencing on site. Any potential sheltering features will be inspected (visually and by hand) before entire removal by an ecologist. Any reptiles present can then be rescued and moved to an identified and suitable location (which has been identified prior to works commencing). Any vegetation removal works should start from the furthest extent so that any reptiles, should they be present, can move into an area that will not be accessed or disturbed by the works. All arisings will be removed from the works area immediately and either taken off-site or placed in a predetermined location well away from the works area (and any access). A method statement for these actions will be prepared by an ecologist in advance of any works starting on site. This work will be undertaken within the reptile activity season (March-October inclusive).

Nesting Birds (Common Species)

7.2.7 The Principal Application Site contains suitable nesting bird habitat for common bird species, such as areas of scattered and dense scrub, trees and hedgerows.

7.2.8 Although the Facility will intend to undertake all vegetation clearance works outside of the nesting bird season, there may be a requirement for vegetation to be removed during the nesting bird season. Therefore, and should there be a requirement for vegetation to be removed during the nesting bird season (March – August inclusive), a check of any vegetation (by a suitably qualified ecologist) will be undertaken prior to its removal. A suitably qualified ecologist will check the area for nesting birds a maximum of 48 hours prior to the commencement of the works. Active nests and their associated vegetation/location will remain until young birds have left the nest and during this period an alternative approach to the works will be undertaken.

8 Terrestrial Biodiversity Net Gain

8.1 Methodology

8.1.1 The current Biodiversity Value of the Facility has been calculated using the Defra Biodiversity Metric 2.0 (Defra, 2019). The metric takes a habitat-based approach to determining a proxy biodiversity value. These habitats are converted into measurable 'biodiversity units'. These biodiversity units are the 'currency' of the metric.

8.1.2 Biodiversity units are calculated using the size of a parcel of habitat and its quality, its condition and its connectivity to other habitats. The metric also accounts for whether or not the habitat is sited in an area identified locally, typically in a relevant policy of plan, as being of significance for nature.

8.1.3 For each habitat type present a Biodiversity Unit is calculated for the baseline or pre-intervention scenario. The calculation is then repeated for the post-intervention (either development or land management change) scenario. This calculation includes any measures to retain existing habitats and create or enhance habitats to generate additional biodiversity units. This calculates a 'post-intervention' biodiversity unit score. At this point because the metric is measuring predicted changes rather than existing habitats, additional factors to account for the risk associated with creating, restoring or enhancing habitats are also considered.

8.1.4 The predicted value of the habitats in biodiversity units 'post-intervention' is then deducted from the 'baseline' pre-intervention unit score to give a net change unit value.

8.2 Existing Terrestrial Biodiversity Value

8.2.1 **Table 8-1** presents the baseline biodiversity units for the terrestrial habitats that have been recorded within the Facility.

Table 8-1 Baseline biodiversity value of the terrestrial habitats within the Facility

Habitat Type (as defined by the Defra metric)	Total Habitat Area (ha)/Length (km)	Baseline Biodiversity Unit
Woodland and forest (lowland mixed deciduous woodland)	0.23	5.01
Heathland and shrub (mixed scrub)	6.8	98.74
Grassland (modified grassland)	4.01	29.11
Urban (amenity grassland)	0.16	0.53
Sparsely vegetated land (ruderal/ephemeral)	0.9	5.94
Cropland (cereal crops)	8.12	17.86
Urban (vacant/derelict land/bare ground)	4.75	31.35
Hedgerows	0.81 (km)	3.92

8.2.2 The total existing biodiversity units for terrestrial habitats affected by the Facility is 188.54 (habitat areas) and 3.92 for hedgerows (linear habitats). As detailed in **Paragraph 4.1.1**, these habitats will either be temporarily or permanently lost as a result of the Facility. As a result, habitat and biodiversity enhancements have been identified and these are shown on the **Illustrative Landscape Plans** (document reference 4.4).

9 Terrestrial Ecological Enhancement

9.1.1 The Landscape Strategy as presented in **Section 4** has sought to provide either replacement or new areas of habitats following the construction of the Facility. Regarding hedgerows, where these require removal, these will be replaced. Opportunities have also been sought to enhance these through increasing their existing species diversity or in-filling any gaps, to contribute towards an increased biodiversity value of the Principal Application Site.

9.1.2 The proposed habitats and biodiversity enhancements are shown on the **Illustrative Landscape Plans** (document reference 4.4)) and detailed in **Table 9-1**.

Table 9-1 Approximate lengths/areas of proposed landscape mitigation planting

Mitigation/Enhancement Measure		Total Length (m)	Total Area (ha)
Proposed Native Species Woodland		n/a	1.32
Proposed Native Species Scrub Mix within Grassland		n/a	0.25
Proposed Grassland Mix for Woodland Areas		n/a	1.35
Proposed Native Species Hedgerow	New hedgerows	1,160	n/a
	Improvement to retained hedgerows	170	0.26
Proposed Species Rich Grassland		n/a	3.02
Proposed pond and marshy areas	New pond/marshy area	n/a	0.067
	Existing balancing pond	n/a	0.31

9.1.3 Further information relating to these habitats and their objectives is provided in **Section 4.3**.

9.1.4 As a result of the proposed habitat and biodiversity enhancements and using the Defra 2.0 metric, **Table 9-2** presents the post development biodiversity units that have been calculated for the Facility.

Table 9-2 Baseline biodiversity value of the habitats within the Facility

Habitat Type	Post development Biodiversity Unit
Woodland and forest (lowland mixed deciduous woodland)	3.0
Heathland and shrub (mixed scrub)	18.5
Grassland (modified grassland)	14.5
Urban (amenity grassland)	4.2
Sparsely vegetated land (ruderal/ephemeral)	-5.9
Cropland (cereal crops)	0.0
Urban (vacant/derelict land/bare ground)	4.2
Hedgerows	6.17

9.1.5 As shown in **Table 9-2**, and when the total existing biodiversity units for terrestrial habitats affected by the Facility are compared with the post development biodiversity unit calculations, the Defra 2.0 metric calculates that the proposed habitat and biodiversity enhancement measures will result in a total net biodiversity unit change of -69.39 for habitats and a +2.25 for hedgerow units. The total net % change as a result of the Facility will result in a -36.80% total net unit

change for habitat units (primarily as a result of the permanent loss of arable, tall ruderals and scrub) and a +57.27% total net % change for the hedgerow units (through the creation/enhancement of hedgerows).

- 9.1.6 In addition to the reinstatement/creation of habitats presented in **Table 9-1**, opportunities to enhancement that the area for species will be implemented. Such opportunities include the creation of log pile refuges (for common reptile species, terrestrial invertebrates), the species of planting to include fruit/berry/nectar bearing species and the installation of bird and bat nesting boxes within areas of suitable habitat.
- 9.1.7 Through the reinstatement and/or creation of these habitats, these landscape mitigation proposals will provide an enhanced biodiversity value relative to the baseline conditions once construction is complete. This is in accordance with national and local planning policy as well as mitigating the predicted effects associated with the Facility.
- 9.1.8 Due to the land requirements of the construction process, it is anticipated that the implementation of the final landscape mitigation planting scheme will be undertaken during the first available planting season (between November to March) after the completion of the construction works. However, where areas are suitable for advanced planting are identified, the implementation of the agreed landscape mitigation planting scheme would be undertaken at the earliest opportunity.

10 Management and Maintenance of land-based works

- 10.1.1 The final LEMS will guide the long-term implementation and maintenance of the landscape strategy described above. The primary objectives are to:
- Retain and enhance existing scrub vegetation along Roman Bank.
 - Develop additional woodland cover to further enhance visual screening / filtering of views into the Principal Application Site and towards development features.
 - Achieve a Net Gain in biodiversity across the site.

10.2 Management Plan Period

- 10.2.1 The landscape will be managed for the operational life of the development. The management plan covers a period of 30 years, including the initial establishment period and long-term management objectives.

- 10.2.2 The management and aftercare operations will be reviewed annually and where necessary amended to ensure the long-term landscape and ecological objectives are achieved. The LEMS will be comprehensively reviewed every 5 years (refer to Monitoring and Review below) and submitted to the competent authority and other parties, as required.
- 10.2.3 It is intended that the LEMS will function as a live ‘working document’ for the Applicant or whoever the Applicant delegates as maintaining agents of the site during operation of the Facility. The LEMS will therefore evolve over time to respond to the establishment of the soft estate in both landscape and ecological terms and will be expanded and adapted as necessary to address future changes.

10.3 Start Date

- 10.3.1 The start date for the management period will be the completion of landscape planting and seeding phase.

10.4 Management Responsibilities

- 10.4.1 The management and maintenance of the structural landscape will be the responsibility of the Applicant or whoever the Applicant delegates as maintaining agents of the site during operation of the Facility. The Applicant will appoint a competent representative or management organisation to oversee the implementation and monitoring of the LEMS.
- 10.4.2 Landscape works will be undertaken by a suitably qualified landscape contractor appointed by management organisation.
- 10.4.3 Details of the management organisation and the appointed landscape contractor will be provided to the competent authority prior to commencement of the management works.
- 10.4.4 All managers, contractors, sub-contractors and third-party organisations carrying out work will adhere to the LEMS. All parties have a statutory responsibility to comply with planning and wildlife legislation, including the protection and encouragement of legally protected species and habitats.
- 10.4.5 The site will be managed to comply with all relevant health and safety legislation, approved codes of practice (ACOPs) and Health and Safety Executive (HSE) guidance.

10.5 Funding

- 10.5.1 The management works for the structural landscape will be funded by the

Applicant.

10.6 Management Prescriptions

10.6.1 This section sets out the management objectives and prescriptions for the establishment and aftercare of the following landscape components:

- Existing vegetation to be retained.
- Native species woodland, feathered trees and scrub planting.
- Native species hedgerows.
- Species rich grassland.
- Ponds / scrapes / marshy area grassland and marginal planting.

10.7 Management of Existing Vegetation to be Retained

10.7.1 The objectives for the management of existing scrub vegetation along the sea bank are to:

- Ensure vegetation is maintained in a safe and healthy condition;
- Provide an effective visual buffer between the LWA Plant and the neighbouring Biomass UK No. 3 Ltd gasification plant;
- Ensure longevity of the vegetation by varied composition of age, size and type of plant species, including occasional tree species, and
- Manage vegetation to ensure there is unhindered and safe access along the public right of way that follows Roman Bank.

Management Prescriptions

10.7.2 The management objectives will be achieved by the following prescriptions:

- Existing vegetation will be inspected annually to identify any dead, dying or dangerous growth that overhangs or obstructs access routes, publicly accessible areas and the public right of way. Vegetation will be cut back, coppiced or removed with arisings taken away from site or larger sections of timber left in piles (locations to be agreed) to provide habitat for invertebrates and other wildlife.
- Existing vegetation will be inspected annually for fire, disease, structural defects, vandalism, fly-tipping, or accumulations of litter. Any damage/defects will be recorded and where appropriate reinstated to leave the vegetation in a clean, tidy and safe condition. Any litter will be removed from site.

- To maintain structural and species diversity of dense vegetation and planting of native species (selected from **Table 4-1**, **Table 4-3** and **Table 4-5**) will be undertaken at natural breaks in vegetation.

10.7.3 Maintenance visits will be undertaken monthly (12 times per year). The operations to be undertaken each visit include:

- Watering, re-firming plants, fixing ties and guards of new planting (if required);
- Removing tree / shrub guards when plants have established;
- Weed control at new planting stations;
- Removing litter;
- Reviewing and reporting annual maintenance;
- Pruning / remedial works to vegetation;
- Selective vegetation thinning and coppicing.

10.8 Management of Proposed Native Species Woodland, Scattered Feathered Trees and Scrub Planting

10.8.1 Management objectives are to:

- Create healthy and diverse woodlands and scrub containing native species of varying age and densities;
- Develop woodlands to enhance visual screening / filtering of views into the Principal Application Site and towards development features;
- Aid landscape and visual assimilation of the proposed development with its surroundings, and
- Provide improved wildlife connectivity by linking / extending existing and proposed vegetation areas around the site, helping to increase biodiversity.

Management Prescriptions

10.8.2 The management objectives will be achieved by the following prescriptions:

- Newly planted trees and shrubs will be thoroughly watered during periods of drought, as necessary to ensure the health and vigour of the planting (Annually, Years 1 to 3).
- The stability of trees, shrubs, guards, stakes and ties, will be checked especially after strong winds and firm as necessary (Annually, Years 1 to 5).
- Woodland planting will be maintained weed free to a 900mm diameter around each planting station until the canopy of the planting has sufficiently closed to

reduce weed competition (Annually Years 1-5 years). A weed free zone will be achieved through the use of an appropriate method of the contractor's choosing e.g. mulch mat or suitable herbicide, or via hand pulling. Any weed growth within tree and shrub guards will be removed by hand (Annually Years 1 to 5).

- Invasive / noxious weeds will be controlled by hand pulling or mechanical means e.g. strimming of thistles or hand pulling of ragwort (Annually Years 1 to 30).
- Accumulated rubbish and debris will be removed from the planted areas and incidents of vandalism, theft or other damage will be recorded and repaired (Annually Years 1 to 30).
- Any dead and defective plant material will be replaced, at the end of each growing season (between 1 November and 31 March), in accordance with the planting specifications (Annually, Years 1 to 3).
- Tree/shrub guards, ties and stakes will be removed from the trees and shrubs, gradually over a four year period when individual specimens are sufficiently robust, so as not to require protection or support.
- Remedial pruning will be undertaken as necessary to maintain the health vigour and habit of the trees (Annually, Years 6 to 30),
- The proposed woodland planting will be selectively thinned to prevent overcrowding of tree canopies, encourage tree growth and a create a diverse understorey shrub and flora layer. Subject to annual review approximately 10% of the tree species will be removed annually over a four-year period, retaining approximately 40% of the original numbers (Years 6 to 10).
- 25% of hazel (*Corylus avellana*) will be coppiced every 5 years (Years 10, 15, 25 and 30).
- Opportunities will be identified for undertaking habitat creation measures, including wood piles and the provision of bird and bat boxes to be advised by the ecological consultant. (Years 10,15 & 30).
- The condition of the planting will be reviewed annually and a management report will be prepared setting out any remedial works required, or any changes to future management regimes necessary to ensure the design objectives are achieved.

Maintenance Operations

10.8.3 Maintenance visits will be undertaken monthly (12 times per year). The operations to be undertaken each visit include:

- Watering, re-firming plants, fixing ties and guards of new planting (if required);
- Removing tree / shrub guards when plants have established;
- Weed control at planting stations;
- Removing litter;
- Pruning / remedial works to vegetation;
- Selective vegetation thinning and coppicing;
- Reviewing and reporting annual maintenance.

10.9 Management of the Proposed and Existing Native Hedgerows

10.9.1 Management objectives are to:

- Create a continuous dense habitat of uniform height and shape;
- Ensure the health and vigour of the new planting and maintain the long-term integrity of the new and existing hedgerows;
- Provide additional wildlife habitat and connectivity between landscape features.

Management Prescriptions

10.9.2 The management objectives will be achieved by the following prescriptions:

- Newly planted hedgerows will be watered thoroughly during periods of drought, as necessary to ensure the health and vigour of the planting (Years 1 to 3).
- The stability of the hedge spiral guards and canes will be checked regularly, will be firmed as necessary, especially after strong winds and (Years 1 to 5).
- A 500 mm weed free strip will be maintained either side of the hedge by mechanical means, or by spraying with an approved translocated herbicide (Years 1 to 5).
- Accumulated rubbish and debris will be removed from the hedges.
- Any dead or defective plant material will be removed at the end of each growing season (between 1 November and 31 March), in accordance with the planting specifications (Years 1 to 3).
- Spiral guards, ties and canes from all hedgerow plants will be removed and disposed off-site (Year 6).
- Hedges will be trimmed annually to create a dense bushy habit with an ultimate height of 2.5 m (Years 3 to 10).

- The condition of the hedges will be reviewed annually and prepare an annual management report, identify any remedial works required, or any changes to future management regimes necessary to ensure the design objectives are achieved (Annually, Years 1 to 30).
- The potential requirement for laying hedges will be reviewed subject to condition and structure. (Years 10,15, 20, 25 and 30).

Maintenance Operations

10.9.3 Maintenance visits will be undertaken monthly (12 times per year). The operations to be undertaken each visit include:

- Watering, re-firming plants, fixing ties and guards of new planting (if required);
- Removing tree / shrub guards when plants have established;
- Weed control at planting stations;
- Removing litter;
- Pruning / remedial works to vegetation;
- Selective vegetation thinning and coppicing;
- Reviewing and reporting annual maintenance.

10.10 Management of Species Rich Grassland

10.10.1 Management objectives are to:

- Provide effective coverage of the ground cover to minimise surface erosion;
- Increase biodiversity and to create an attractive, species rich groundcover.

Management Prescriptions

10.10.2 The management objectives will be achieved by the following prescriptions:

- Following sowing, grassland areas will be watered as necessary to encourage seed germination and growth of the sward (Years 1 to 3).
- Areas that have failed to germinate or have germinated and have subsequently failed will be reseeded in spring of the following year (Years 2, and 3).
- Invasive/noxious weeds will be controlled by hand pulling or mechanical means (Annually, Years 1 to 30).
- Grassland swards will be cut in late summer after flowering and any arisings will be removed for disposal off site (Annually, Years 1 to 30).

- Any accumulated rubbish or debris will be removed from site and any incidents of vandalism, or damage will be repaired. (Annually, Years 1 to 30).
- The condition of the grasslands will be reviewed annually for inclusion in the annual management report. This will also identify any remedial works required, or any changes to future management regimes necessary to ensure the design objectives are achieved (Annually, Years 1 to 30).

Maintenance Operations

10.10.3 Maintenance visits will be undertaken monthly (12 times per year). The operations to be undertaken each visit include:

- Watering (if required);
- Re-seeding failed areas;
- Weed control;
- Cutting wildflower sward;
- Removing litter;
- Reviewing and reporting annual maintenance.

10.11 Management of Ponds / Scrapes and Marshy Areas

10.11.1 Management objectives are to:

- Maintain effective surface water collection and controlled discharge from the site,
- Maintain waterbodies in a clean and safe condition and ensure they are not a risk to site users, and
- Maximise biodiversity and create new wildlife habitats.

Management Prescriptions

10.11.2 The management objectives will be achieved by the following prescriptions:

- Following sowing species rich marginal grassland areas will be watered as necessary to encourage seed germination and growth of the sward (Years 1 to 3).
- Areas of marginal grassland that have failed to germinate or have germinated and have subsequently failed will be reseeded in spring of the following year (Years 2, and 3).
- Invasive / noxious weeds, self-sown tree saplings, tall ruderal species, or other woody / scrub within or encroaching into ponds etc will be removed by hand

pulling or by mechanical means (Annually, Years 1 to 30). No herbicides to be used.

- Following establishment of the wet seeding tall marginal species within the ponds and swales will be cut down on a rotational basis (25% margins every two years) to increase structural diversity and create habitat opportunities for wildlife.
- Any accumulated rubbish, obstructions or pollutants will be removed from the ponds and any incidents of vandalism, or damage will be repaired. (Annually, Years 1 to 30).

10.11.3 The condition of the ponds and swales will be reviewed annually for inclusion in the annual management report. This will include:

- Checks for bank and bed erosion;
- Inspection for obstructions that could restrict water flow;
- Identification of remedial works required, or any changes to future management regimes necessary to ensure the design objectives are achieved (Annually, Years 1 to 30).

Maintenance Operations

10.11.4 Maintenance visits will be undertaken monthly (12 times per year). The operations to be undertaken each visit include:

- Watering (if required);
- Re-seeding failed areas;
- Weed control;
- Cutting wildflower sward;
- Removing litter;
- Reviewing and reporting annual maintenance.

10.12 Process for Monitoring and Review

10.12.1 To ensure that the aims of the LEMS are being met and the plan remains appropriate, applicable and effective, a review of the site and the management operations will be undertaken at the end of each calendar year.

10.12.2 The review will be coordinated and completed by a suitably qualified landowner representative (or its successors). The review will include advice from specialist consultants as required (e.g. landscape architect, arboriculturist or ecologist), the landscape contractor, relevant stakeholders and competent authority.

Annual Review

10.12.3 The annual review will include (as appropriate):

- Details of works undertaken that year, any health and safety issues, plant losses, damage, remedial / reinstatement works undertaken.
- Records or attendance sheets demonstrating the maintenance work undertaken.
- Details of approval / permits obtained / required.
- Details of works to be undertaken in the subsequent year.

10.12.4 Within 1 calendar month of the annual site inspection, a report will be prepared and circulated to the competent authority.

Five Year Review

10.12.5 A comprehensive review of the site management will be undertaken every five Years. This will include:

- A walk over assessment of the estate to review the performance of the management in relation to the LEMS objectives, and to identify the need for enhancement or changes to the management regime.
- Updating the LEMS to reflect the findings of the assessment with specialist reports from the landscape architect, arboriculturist and ecologist

10.12.6 Within one calendar month of the assessment, a report will be prepared and issued to the competent authority.

10.12.7 Revisions to the landscape proposals or the management regime will be submitted to the competent authority as a non-material amendment to the approved plan.

10.13 Specification

10.13.1 Management and maintenance works will be fully specified, quantified and accompanied by detail drawings as required.

10.14 Ecological Management and Maintenance

Management of Proposed and Existing Native Hedgerows

10.14.1 All hedgerows will be planted as leafless whips during the winter and then be subject to maintenance and inspection visits through the summer where dead or

failed plants will be replaced. Any other remedial works, i.e. replacement of stakes and/or root protective measures, would also be undertaken. Replacement planting will be undertaken where identified.

Management of Ponds / Scrapes and Marshy Areas

10.14.2 The creation of pond and marshy areas within the Principal Application Site will provide opportunities for species such as water voles to colonise the area. Furthermore, and through the reduction in the intensity of ditch and marginal habitat management will enable the growth of the ditch vegetation to establish. By allowing the pond/ ditch vegetation to grow and be cut on a rotational basis will allow opportunities for animals to colonise the ditch network for shelter and/or as a food source.

Ecological Supervision

10.14.3 A suitability qualified ecologist will be appointed by the Applicant to be responsible for:

- Ensuring all construction personnel attend an ecological tool box talk briefing where the contents of this document will be presented and all parties understand the requirements that need to be implemented for the ecological receptors relevant to the Facility. A record of this meeting will be made along with attendees to ensure all construction personnel receive the required level of briefing;
- Ensure compliance with this document and/or updating of this document where required, throughout the construction and operation of the Facility;
- Enacting/enforcing the recommendations and requirements outlined in this document or agreeing an appropriate alternative course of action if it determined that previous advice is not practicable and/or has been superseded; and
- Maintaining a record of all surveys and/or measures that have been taken in respect to ecological receptors outlined in this document to provide an auditable record of compliance.

References

Department for Energy and Climate Change (DECC) (2011a). The overarching NPS for Energy (EN-1).

Department for Energy and Climate Change (DECC) (2011b). The NPS for Renewable Energy Infrastructure (EN-3).

Lincolnshire County Council (2016). Lincolnshire Minerals and Waste Local Plan Core Strategy and Development Management Policies. Available at: <https://www.lincolnshire.gov.uk/directory-record/61697/core-strategy-and-development-management-policies> [Accessed: 25/06/2020].

Ministry of Housing Communities and Local Government (MHCLG) (2019). National Planning Policy Framework.

South East Lincolnshire Joint Strategic Planning Committee (2019). South East Lincolnshire Local Plan 2011-2036. Available at: <http://www.southeastlincslocalplan.org/> [Accessed: 25/06/2020].

Appendix 1 Outline Intertidal Mitigation Works and Biodiversity Net Gain Measures

A1.1 Introduction

- A1.1.1 The proposed development will result in the loss of an area of saltmarsh and an area of mudflat within the footprint of the wharf and the area identified for deepening (through dredging). This part of the OLEMS outlines the measures to be taken to address these losses.
- A1.1.2 **Chapter 17** (Marine and Coastal Ecology) of the Environmental Statement (document reference 6.2.17) concluded that without mitigation, there was the potential for a moderate adverse impact due to loss of saltmarsh and a minor adverse impact for the loss of mudflat within the footprint of the proposed development.
- A1.1.3 The impact assessment addressed the implication for birds in terms of a loss of roosting habitat (saltmarsh and rocks situated just in front of the saltmarsh area where it transitions to mudflat) and a loss of foraging habitat (mudflat). The impact of this loss on birds was considered to be reduced in terms of its significance as it forms part of a larger roosting area which, with habitat mitigation (which are outlined below and defined as the Habitat Mitigation Area) within Area B, would still be able to support the same number of birds. The birds currently using the area identified for the wharf development that will be lost already use the adjacent area (where the habitat mitigation would occur) and so there should be no net loss of roosting or foraging habitat and no need for the birds to relocate to an alternative area. The habitats discussed above are shown in **Plate A1- 1 a-d** below, the areas described as Area A and Area B above are shown on **Plate A1- 2** and the mitigation measures are outlined further below in **Section A.1.2**.
- A1.1.4 The Facility is also addressing the loss of the intertidal habitat through a biodiversity net gain strategy. The methodology for the calculation is discussed further in **Section 8.1** of this document and the same methodology was used for

the calculation of the intertidal biodiversity valuation. This is discussed further below in **Section A1.3**.



Plate A1- 1 (clockwise from top left) a - showing existing rocks placed between saltmarsh and mudflat; b and c - showing saltmarsh habitat in the Habitat Mitigation Area; and d – close up of saltmarsh vegetation

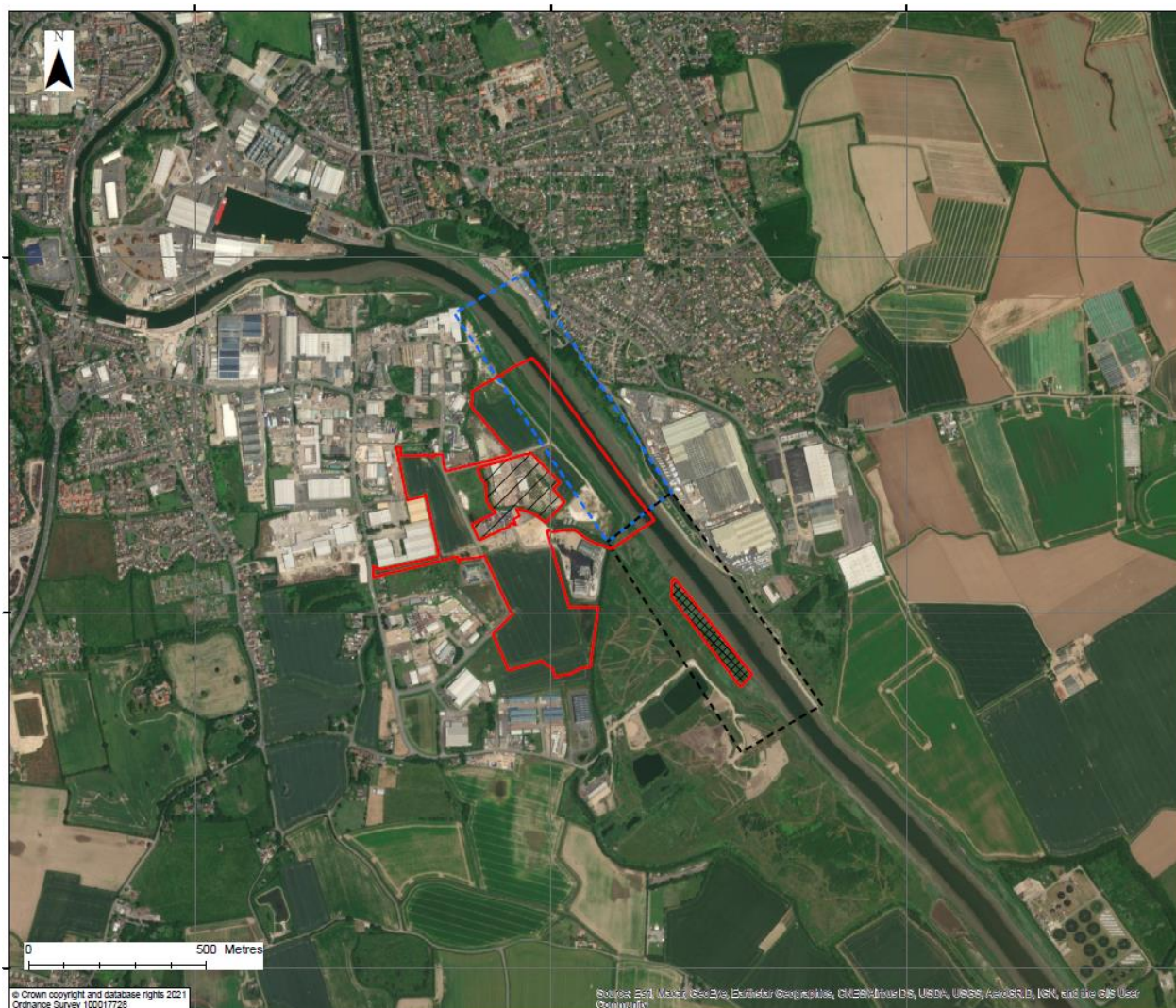


Plate A1- 2 Areas A (blue hatched) and Area B (black hatched) with the proposed development area (red line)

A1.2 Mitigation measures proposed for reducing impacts on birds

A1.2.1 In order to mitigate the habitat loss specifically for birds, the Habitat Mitigation Area will be enhanced to provide additional foraging and roosting habitat to ensure that the carrying capacity of the roosting and foraging site will still be able to accommodate the same number of birds as currently use Areas A and B combined. Re-profiling of one existing shallow scrape that is becoming overgrown will be reinstated and three new scrapes will be provided in the marsh area to provide enhanced foraging habitats that are a common component of saltmarsh habitats. Shallow pools already exist in this area, but the works would increase the number of pools. In addition, re-profiling of some of the existing low banks will

be undertaken to provide clear lines of sight for redshank. The large rocks currently located along the frontage of the proposed wharf area will be moved to landward of the existing rocks to increase the roosting habitat within the Habitat Mitigation Area (where similar rocks already exist). **Plate A1- 3** illustrates the mitigation measures proposed.

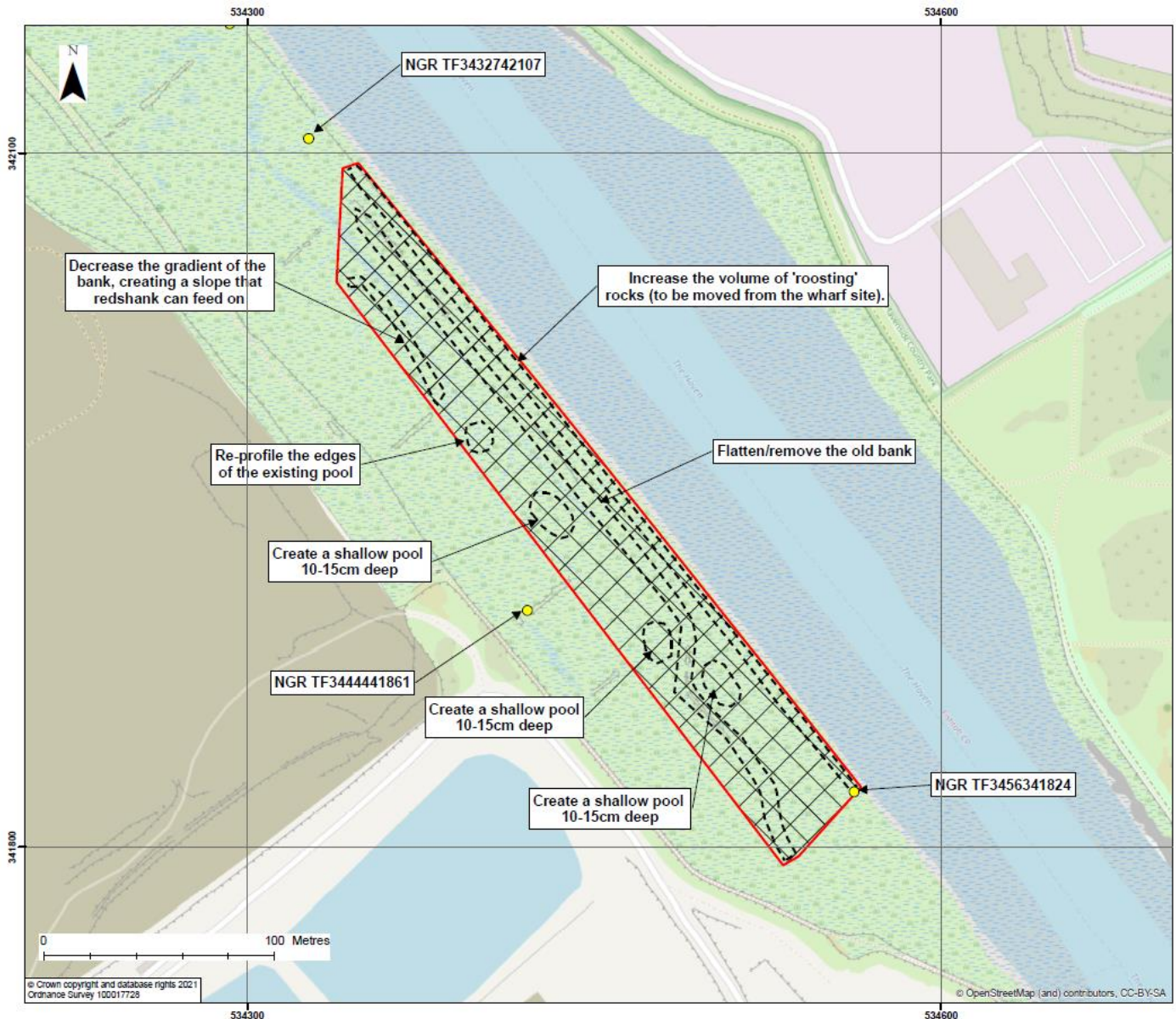


Plate A1- 3 Mitigation measures proposed for the Habitat Mitigation Area

A1.2.2 The introduction of these mitigation features are not expected to have any adverse impacts in themselves. The works are relatively minor and it is expected that they could be undertaken through the use of a small workforce using hand tools along with a long-reach excavator present on-site for less than a week, outside of the

overwintering bird season. The excavator may be brought to site on a floating barge (to avoid impacts on the saltmarsh or effects on the nearby Public Rights of Way). The works is unlikely to take longer than a week (weather and tide dependant) and will be undertaken under supervision by a suitably experienced ecologist.

- A1.2.3 Any material generated from creation of the scrapes, pools or reprofiling of the low bank would be retained in the marsh to provide benefits to the existing habitat (i.e. retention of any root systems that may be incorporated in to the sediments).
- A1.2.4 We have ascertained that the ‘old bank’ within the Habitat Mitigation Area has no flood risk function or specific historical interest according to the normal reference sources. We are awaiting final confirmation of the first point from the EA.
- A1.2.5 The proposed works are reinstating or increasing habitats that are already a feature of the marsh and are known to generally occur in healthy marsh systems. The works would be undertaken outside the overwintering period for birds to avoid disturbing any birds using these habitats at this time and in advance of the wharf construction.
- A1.2.6 Specific benefits of each of the proposed components are as follows:
- Rock translocation: To increase the usage of the area by roosting birds, in particular for redshank who like to roost on the rocks in this area
 - Scrapes / pools: to reinstate these features within the marsh which provide valuable foraging areas for waders and wildfowl
 - Lowering of the old bank: To improve sightlines for waders that like to have an open area to seaward, for example, redshank.
- A1.2.7 A vegetation survey would be undertaken prior to the works being undertaken to ensure that any activity did not affect any rare or scarce plants. The Boston Horsetail and Sea Wormwood are known to occur in the wider area but have not been recorded in this particular area in recent surveys undertaken for the Environment Agency (EA) and as part of the bird monitoring surveys as discussed in the ES, Chapter 17. Should they be found in the area then any works would be moved to avoid the plants. The habitat mitigation works, as shown in **Plate A1-3**, are located more than 16 m from the toe of the existing flood defence in this area The Haven and as such there is no need for permits for the works from the EA associated with flood defence implications.
- A1.2.8 A final Landscape and Ecological Mitigation Strategy (LEMS) will be produced prior to first commencement of the proposed development, which must be

substantially in accordance with this OLEMS. This is secured through Requirement 5 of the draft DCO (document reference 2.1). Further discussions with the relevant stakeholders will enable further refinement of the proposed works and development of the methodology and production of the LEMS.

A1.3 Securing the Measures

A1.3.1 Given that the wharf will not be decommissioned at the end of the lifetime of the Facility the Habitat Mitigation Area will be required for a 25+ year timeframe. The Applicant recognises the importance of securing the rights for the features to remain in place within the Habitat Mitigation Area over such a timeframe. We have identified that the land below Mean High Water Springs (MHWS) (i.e. the tidal creeks that permeate the area sporadically) is owned by The Crown Estate and they are, “supportive of its use as environmental mitigation land.” (Email of date 15th March 2021, provided in **Appendix A17.1.3** of **Appendix 17.1 Habitats Regulations Assessment** of the ES, document reference 6.4.18).

A1.3.2 A number of bodies have been contacted in relation to ownership of land above MHWS that is not owned by The Crown Estate. The EA, an adjacent landowner (a private waste firm with other nearby land interests) and Boston Borough Council have all confirmed that they do not consider themselves to be the owner of any of the required land. Following these diligent enquiries this land must be described as ‘unknown’ (and unregistered) within the DCO application and powers to compulsorily acquire the necessary rights to undertake the mitigation works and for them to be maintained and remain *in situ* are being sought in the DCO.

A1.4 Biodiversity Net Gain Measures

A1.4.1 As part of the proposed development, the Applicant has committed to undertake biodiversity net gain for any habitat loss that occurs. Biodiversity Net Gain is an approach to development that leaves biodiversity in a better state than before. Where a development has an impact on biodiversity it encourages developers to provide an increase in appropriate natural habitat and ecological features over and above that being affected in such a way it is hoped that the current loss of biodiversity through development will be halted and ecological networks can be restored.

A1.4.2 A biodiversity value has been calculated for the baseline intertidal habitat loss, following the method outlined in Section 8.1 of this document using the Defra Metric 2.0 (Defra, 2019). The metric takes a habitat based approach to determining a proxy biodiversity value. These habitats are converted into

measurable 'biodiversity units'. These biodiversity units are the 'currency' of the metric.

A1.4.3 Details on the baseline extent and condition of intertidal habitats as well as permanent and temporary habitat change are presented in Chapter 17 Marine and Coastal Ecology of the ES. Details of the construction and operation boundaries of the scheme and the development footprint are provided in Chapter 5 Project Description of the ES.

A1.5 Ecological Baseline

A1.5.1 As identified in the ES, mudflat and saltmarsh habitats are present in the intertidal within the study area. Within the Principal Application Site there is approximately 1.54 ha of mudflat and 1 ha of saltmarsh which would be lost due to the direct loss within the footprint of the wharf and the dredge footprint, potential loss due to scour protection (which is a worst case scenario) and some potential loss which could occur as a result of hydrodynamic changes following dredging. To put the amount of loss in context, within The Haven, there is a total of 36 ha of mudflat and 18 ha of saltmarsh along the banks of The Haven where it narrows at the mouth.

A1.5.2 The Intertidal mudflats in this area are relatively narrow and steep with a strip of rock placed between the mudflat and the saltmarsh transition zone. The flats support typical estuarine mudflat species and have been categorised as of good quality.

A1.5.3 The Lincolnshire Biodiversity Action Plan (BAP) states that saltmarshes are in a good condition within the county. However, survey data does not reflect this assessment. A survey carried out in 2011 near the location of the proposed wharf for the Facility defined the saltmarshes as of poor quality due to the limited extent, low diversity and negligible zonation (Jacobs, 2011). This definition was confirmed by a survey carried out in 2014 (EA, 2014) and the site visit in October 2018 by Royal HaskoningDHV marine ecology staff. The poor quality of the saltmarshes generally in The Haven (which includes the location of the Facility) was also confirmed by the most recent monitoring survey carried out by the EA in 2017 (Holden, 2017). Given the survey findings the saltmarsh has been entered into the assessment as being of poor condition.

A1.5.4 The Application Site is not identified as an area of Strategic Importance for habitat creation by the Marine Management Organisation (MMO, 2009). The areas surrounding the Application Site are identified as potential habitat networks in the South East Lincs Local Plan (Wash Estuary Project 2011) and also the

ReMeMaRe (Restore Meadows, Marshes and Reefs – an EA led initiative) Map. The network maps show potential, not actual, habitat networks that occur across the Plan's area.

Habitat Loss

A1.5.5 Direct loss of intertidal habitat will occur within the dredge footprint and, as a worst-case situation, areas of scour protection. There is the potential for indirect habitat loss in the areas directly adjacent to the dredge zone, this area is assessed separately within this assessment.

Baseline Habitat Units

A1.5.6 As described above, the proposed development is anticipated to result in direct and indirect habitat loss from the dredge zone and, potentially, direct habitat loss from scour protection. Baseline Habitat Units are presented against these categories for ease of assessment.

A1.5.7 Given the above, the Baseline Habitat Units within the area are:

- Mudflat in the dredge pocket = 30.42
- Saltmarsh in the dredge pocket = 6.2
- Mudflat at risk of indirect impact = 4.52
- Saltmarsh at risk of indirect impact = 0.25
- Saltmarsh under scour protection = 1.07

A1.5.8 The next steps in the biodiversity net gain calculation involve further discussions to understand the biodiversity values that could be achieved through works in the area. It is proposed that net gain value could be achieved through works undertaken within the RSPB reserves of Frampton Marsh and Freiston Shore in order to provide additional habitats for birds.

A1.5.9 A meeting was held on the 13th October 2020 with the RSPB to discuss and develop options for habitat creation within the RSPB reserves that could act as biodiversity net gain to be provided as a result of the loss of saltmarsh and mudflat at the proposed development site (see **Appendix A17.1.3** of the **Habitats Regulations Assessment**). Two options were discussed: habitat creation at Freiston Shore and habitat improvement at Frampton Marshes.

A1.5.10 The proposed measures that have been discussed to date, with positive discussions ongoing, are:

1. Habitat creation at Freiston Shore (a RSPB nature reserve);
 - a. improvements to two islands caused by breaches – placement of cockle shell or shingle;
2. Habitat improvement at Frampton Marshes (a RSPB nature reserve);
 - a. improvement of an existing saline lagoon;
 - b. a new shallow 19 hectare saline lagoon with islands for which the RSPB already has planning permission; and
 - c. vegetation clearance and general management to maintain a feeding habitat for waders with shallow drains also requiring maintenance.

A1.5.11 These measures that form part of the project are not novel, having been successfully carried out at numerous locations, and the deliverability of this on RSPB land gives us confidence that such measures would be likely to work in practice and be successful once implemented.

A1.5.12 Ongoing discussions are expected to develop these plans so that a full biodiversity net gain calculation could be undertaken to determine the gains that could potentially be achieved through this work.

A1.6 References

Marine Management Organisation (2019) Identifying sites suitable for marine habitat restoration or creation. BPmer and AER, Marine Management Organisation Project No: 1135, February 2019, 93pp

ReMaRe Potential Saltmarsh Habitat Creation locations Available at <https://theriverstrust.maps.arcgis.com/home/webmap/viewer.html?useExisting=1&layers=432e71d9c0db44f6a3231cadfca30805>

Wash Estuary Project (2011). Available at <http://www.southeastlincslocalplan.org/wp-content/uploads/2019/05/GIP-Text.pdf>