CONTENTS

1 INTRODUCTION

BACKGROUND AND AIMS OF THE TERRESTRIAL EMMP

1.1 The development of the Able Marine Energy Park (AMEP) east of North Killingholme on the Lincolnshire Coast will partly affect the Humber Estuary Special Area of Conservation (SAC) and the Special Protection Area (SPA) / Ramsar site, as well as habitats (some of which are designated at a local level) and species inland from the new quay. Measures to mitigate for the effects of AMEP on these habitats and species have been identified, and are to be implemented in areas within the AMEP site boundary and at North Killingholme Haven Pits (NKHP).

1.2 This document is an Environmental Management and Monitoring Plan (EMMP) for the terrestrial works and it has been drawn up taking account of guidance on management planning produced by the Conservation Management System (CMS) Consortium (www.cmsconsortium.org). It describes the mitigation measures that are required and lists specific objectives which are fundamental to their delivery. Further it includes targets and management actions which support the objectives and the monitoring which will be undertaken to confirm progress towards the objectives, and ultimately confirming that they have been achieved. Limits of acceptable change are defined and any necessary remedial actions which will be undertaken if the monitoring shows that these limits have not been met.

PROCESS OF FINALISING OUTSTANDING TARGETS

1.3 The mitigation proposals for AMEP are complex, and the objectives and targets / management options included in the EMMP have been subject to extensive discussions with stakeholders.

1.4 The EMMP is a live working document which will be in place for as long as it is deemed necessary to achieve the agreed objectives set out in it. Updates to it will be overseen by the Steering Group, whose role is explained below and includes undertaking a complete review of the EMMP every five years.

STEERING GROUP

1.5 Able Humber Ports Limited (AHPL) will have overall responsibility for the implementation and delivery of the EMMP. However, the involvement of statutory organisations and other stakeholders is essential for the effective working of the EMMP, and hence AHPL will establish a Steering Group whose members and terms of reference are set out in a '*Deed in Relation to the Able Marine Energy Park'*, between Able Humber Ports Limited, Natural England (NE).

1.6 An agenda will be drawn up in advance of each Steering Group meeting by AHPL and minutes will be produced after the meeting by them for agreement.

1.7 Unless otherwise stated, the default duration for the ecological survey work described within this document is 10 years. It is expected that some components of the mitigation will require on-going management to ensure that the objectives continue to be met.

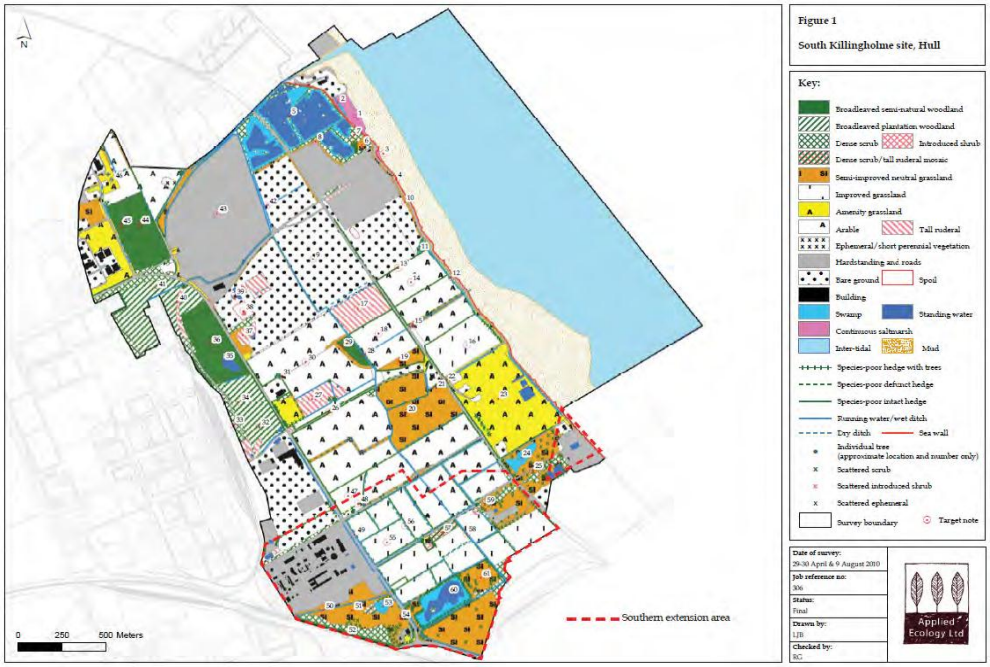
2 ENVIRONMENTAL BASELINE AND IDENTIFIED IMPACTS

HABITAT

Baseline

2.8 An area of arable, pasture and farmland mosaic habitat will be lost as a direct result of the proposed AMEP development. The majority of the semi-naturalised habitat will be removed and replaced with gravel or hard standing. The main habitats present and their locations are mapped in Figure 1 below.

Figure 1: Phase 1 Habitat Survey Map



IMPACTS

2.9 The main habitats lost due to AMEP are bare ground, hard standing and arable fields, and to a lesser extent grassland fields (see Table 1).

2.10 The only designated terrestrial habitat lost is the Station Road Local Wildlife Site (LWS) which consists of a neutral grassland strip, associated elm hedge and field ponds supporting great crested newts. The neutral grassland component of the Station Road LWS and a new elm hedge will be accommodated in Mitigation Area A (see Objective BB1), whilst new ponds and terrestrial habitat for great crested newts will be created in Mitigation Area B (see Objective GCN1).

Table 1: Habitat Loss

Habitat Type	Loss (ha)
Bare ground	60.12
Arable fields	54.78
Hard standing	54.22
Semi-improved natural grassland	22.11
Improved grassland	13.94
Tall ruderals	10.78
Amenity grassland	3.68
Dense scrub	2.47
Broadleaved semi-natural woodland	1.35
Swamp	1.15
Ephemeral/ short perennial vegetation	0.96
Buildings	0.47
Standing water	0.31
Hedgerow	1.14 (km)

2.11 Where other habitat loss leads to impacts on protected species (including loss of fields for SPA birds), the specific mitigation is discussed in the following sections on protected species. Noise and visual impacts in particular during construction and operation could result in disturbance to birds at NKHP a location that supports significant numbers (i.e. greater than 1%) of SPA bird populations and to birds which use Mitigation Area A. The control measures for this are presented under the Noise and Visual Impact objective (Objective NV1).

WATER VOLE

Baseline

2.12 Water vole surveys were conducted in 2006 and 2010. In 2006, five areas of the site were identified for their potential to support water voles during the Extended Phase 1 survey. Surveys conducted in 2010 identified a total of 82 breeding females of which 22 were within the development site and 60 were in ditches that included Mitigation Area A (but extend to the south of the AMEP site as described in EX11.26 – Water Vole Mitigation).

Impacts

2.13 In total 2.5 km of drainage ditch will be removed as part of the AMEP development process. Of the drainage ditches to be removed, 1.82 km is currently unsuitable or of low value to water vole. The remaining 0.68 km of ditch to be replaced, is currently of moderate suitability for water vole.

BATS

Baseline

2.14 Bat surveys as part of the AMEP application were undertaken in 2006, 2010 (July / August) and 2011 (May). Six species of bat (Common pipistrelle, Nyctalus sp., Myotis sp., Soprano pipistrelle, Brown long-eared and Nathusius pipistrelle) were identified foraging and commuting within the AMEP development site area. The most common species recorded were common pipistrelles, and only at one location was the number of contacts regarded as frequent (near NKHP). Other species were either occasional or rare, with contacts largely relating to occasional commuting passes. No evidence of occupied resting or roosting places was found within the development site (see EX 11.19 AMEP Bat Surveys Supplementary Note). As a result, no significant impacts to bats are predicted, however temporary loss of foraging habitat may occur (see EX 20.3 Additional Landscape Masterplan).

Impacts

2.15 The AMEP development will result in the loss of habitat which is suitable for bat foraging and commuting including the small woodland at the Old Copse and hedgerows. Consequently mitigation objectives are proposed to replace hedges, ditches and foraging areas; allow safe access over roads to existing woodland at Burkinshaw's Covert, provide roost sites, and control light pollution (see Table 1 for habitat losses).

GREAT CRESTED NEWTS

Baseline

2.16 Surveys conducted in 2006, 2010, 2011 and 2012 identified 25 ponds within the AMEP development site boundary and a 500 m buffer around it. A further four ponds with potential to support breeding populations of great crested newts were identified within a radius of 500 m of the site boundary. Presence/ absence surveying of ponds within the development site confirmed a medium population of great crested newts within two of the surveyed ponds, forming a meta-population. Only one pond within the 500 m buffer could not be assessed due to access difficulties, but a survey at this pond in 2010 as part of the North Killingholme Power Project EIA did not record any great crested newts.

2.17 Two of the surveyed ponds were found to accommodate a medium great crested newt meta-population of approximately 19 individuals. The ponds are located centrally within the AMEP development site boundary, in an area of land currently in arable production.

Impacts

2.18 Ten ponds within the AMEP development site are planned for removal; following a walk over survey in 2011 three of these were found to no longer exist. Both ponds where the meta-population of great crested newts were identified will be removed as part of the development.

BREEDING BIRDS

Baseline

2.19 Two dedicated breeding bird surveys were undertaken at the AMEP site, a Breeding Bird Survey (BBS) in 2010 and a Common Bird Census (CBC) in 2011. These surveys added to a previous five visit CBC at East Halton and Killingholme, which was undertaken between April – June 2007 (Catley, 2007), data collected from 2006 across the site by Just Ecology (2006) (see AMEP Environmental Statement *Annex 11.5*), and records from the . Lincolnshire Bird Club (1998-2005 All Species Records).

Impacts

2.20 The AMEP development will cause the loss of dense scrub, standing water, ephemeral/ short perennial vegetation, species poor hedgerow, tall ruderal vegetation, semi-natural woodland, arable farmland, semi- improved and improved grassland, bare ground and hard standing (see Table 1). The effects on birds was reassessed by Percival in light of comments by NE (Percival, 2012), and based on the assumption that there would be a complete loss of the bird populations within the existing industrial areas, within the current arable/grassland areas that will become industrial areas, and where coastal reclamation occurs.

2.21 Column three of Table 2 provides an estimate of the number of pairs that would be present on the site after the construction of AMEP and incorporating mitigation provided in Mitigation Areas A and B, together with areas of planting and ditch creation within the site. In addition re-profiling of existing islands within NKHP will encourage their future use by breeding waders. In most cases the number of pairs predicted to be breeding within the site post construction is based on the availability of 0.62 km^2 of habitat (the sum of proposed areas of mitigation and planting). In some circumstances the availability of specialised habitat, such as the newly profiled gravel islands in NKHP, has been taken into account when predicting density. Column four indicates the gains and losses that occur based on the difference between the number of pairs estimated to be breeding pre and post AMEP, taking account of mitigation.

2.22 A range of breeding densities have been used based on published literature, and in most circumstances a precautionary approach to densities has been adopted. In some circumstances, such as for tree sparrows where the habitat provision is close to ideal, higher assumptions of breeding density have been presented, and this is explained in the notes column.

Table 2: Baseline Data and Impact of Breeding Birds

Species	Baseline Pairs	Predicted number of pairs after mitigation	Difference in number of pairs present in the site after mitigation applied	Explanation
Mute Swan	1	1	0	The provision of ponds in Mitigation Area B will provide breeding opportunities and mitigate predicted losses.
Shelduck	10	3	-7	The provision of shelduck nest boxes within Mitigation Area A will provide breeding opportunities and mitigate some predicted losses.
Mallard	16	10	-6	The creation and enhancement of ditches within the development area and ponds within Mitigation Area B will provide breeding opportunities.
Shoveler	1	1	0	The creation and enhancement of ditches within the development area and ponds within Mitigation Area B will provide breeding opportunities and mitigate predicted losses.
Red-legged Partridge	13	3	-10	Unmanaged field margins and wild bird cover plots will reduce some impacts of loss of arable ground. Predicted breeding pairs based on 5 pairs per km²
Pheasant	21	5	-16	Unmanaged field margins and wild bird cover plots will reduce some impacts of loss of arable ground. Predicted breeding pairs based on 7.5 pairs per km².
Sparrowhawk	2	1	-1	Hedgerow with standards provided and likely these will provide some replacement value.
Kestrel	1	1	0	The provision of Kestrel bird boxes will provide breeding opportunities and mitigate predicted losses.
Water Rail	1	1	0	The creation and enhancement of ditches within the development area and ponds within Mitigation Area B will provide breeding opportunities and mitigate predicted losses.
Ringed Plover	3	3	0	The re-profiling of islands in NKHP will provide breeding opportunities and mitigate predicted losses.
Little Ringed Plover	2	2	0	The re-profiling of islands in NKHP will provide breeding opportunities and mitigate predicted losses.
Oystercatcher	4	2	-2	The re-profiling of islands in NKHP will provide breeding opportunities and mitigate predicted losses.
Moorhen	6	6	0	The creation and enhancement of ditches within the development area and ponds within Mitigation Area B will provide breeding opportunities.
Stock Dove	14	1	-13	The removal of woodland within the development site will limit breeding opportunity. However, hedgerow creation, farmland bird mixes, provision of nest boxes and enhancement will provide partial mitigation of predicted losses. Predicted breeding pairs based on 2 pairs per km ².

Lapwing	8	1	-7	The provision of wet grassland within Mitigation Area A will provide breeding opportunities and partially mitigate predicted losses. Predicted breeding pairs based on 1.25 pairs per km².
Woodpigeon	150	6	-144	The removal of woodland within the development site will limit breeding opportunity. However, hedgerow creation and enhancement will provide partial mitigation of predicted losses. Predicted breeding birds based on 9 pairs per km². NB the original baseline figure appears high given the area and landscape available.
Skylark	42	6	-36	The removal of open arable land within the development site will limit breeding and foraging opportunity. The creation of wet grassland within Mitigation Area A will provide sub-optimal habitat which may assist mitigation of predicted losses. Predicted breeding pairs based on 10 pairs per km².
Swallow	19	5	-14	The construction of new buildings within the development site may provide new nesting opportunities. Cattle grazing, wet grassland, muddy scrapes and ponds within Mitigation Area B will provide improved feeding. Predicted breeding pairs based on 8 pairs per km² in favourable habitat.
Meadow Pipit	19	2	-17	Wet grassland with uncultivated margin and wetland edges will provide some mitigation for loss of farmland. Predicted breeding pairs based on 3 pairs per 1 km².
Yellow Wagtail	9	6	-3	Mitigation Area A with wet grassland and cattle grazing will provide optimal conditions. Predicted breeding pairs based on 10 pairs per km².
Pied Wagtail	10	2	-8	The provision of newly created and enhanced hedgerows within the development site will provide potential breeding opportunity. Predicted breeding pairs based on 2.5 pairs per km².
Wren	22	16	-6	The creation and enhancement of hedgerows within the development site will provide breeding opportunities. Predicted breeding birds based on 25 pairs per km².
Dunnock	7	12	+5	The creation and enhancement of hedgerows within the development site will provide breeding opportunities. Predicted breeding birds based on 20 pairs per km².
Robin	6	8	+2	The creation and enhancement of hedgerows within the development site will provide breeding opportunities and mitigate predicted losses. Predicted breeding birds based on 12.5 pairs per km².
Blackbird	14	15	+1	The creation and enhancement of hedgerows within the development site will provide breeding opportunities and wild bird cover will increase overwinter survival. Predicted breeding pairs based on 25 pairs per km².
Song Thrush	3	3	0	The creation and enhancement of hedgerows within the development site will provide breeding opportunities and wild bird cover will increase overwinter survival. Predicted breeding birds based on 5 pairs per km².
Mistle Thrush	5	2	-3	The creation and enhancement of hedgerows within the development site will provide breeding opportunities. Predicted breeding pairs based on 2.5 pairs per km².

Sedge Warbler	28	2	-26	The creation and enhancement of ditches within the development area will provide breeding opportunities. Likely to colonise Mitigation Area B. Predicted breeding pairs based on 4 pairs per km². In optimal habitats such as those around the ponds in Area B and along ditches densities can be significantly higher but a worst case scenario has been reported.
Reed Warbler	11	2	-9	As ponds mature in Mitigation Area B some colonisation possible. However, as this is uncertain given this species preference for larger stands of reed the worst case scenario has been reported.
Blackcap	6	2	-4	Provision of hedges, scrub, and rough grassland will reduce but not eliminate impacts on this species. Predicted breeding pairs based on 3.75 pairs per km².
Garden Warbler	4	1	-3	As for Blackcap, although this bird tends to prefer more parkland types of landscape which provision of standards within hedges may mimic.
Lesser Whitethroat	9	1	-8	Requires dense scrub, preferably with bramble and this will take time to establish. Longer term some colonisation possible but due to uncertainty worst case scenario reported. Predicted breeding pairs based on 1 pairs per km² of pasture.
Whitethroat	46	31	-15	A density of 50 pairs/ km ² assumed. Will benefit from increase and improvement of hedgerows.
Chiffchaff	1	2	+1	Provision of hedgerows with standards will produce some parkland type habitat. Predicted breeding pairs based on 2.5 pairs per km².
Willow Warbler	3	9	+6	Prefers patchwork of scrub trees with understory of grass to breed. May respond to ditch and hedgerow provision. Predicted breeding pairs based on 15 pairs per km².
Long-tailed Tit	6	2	-4	Improvements at Chase Hill, hedgerows and insect rich rough grazing will moderate losses. Predicted breeding pairs based on 3.75 pairs per km².
Blue Tit	17	15	-2	The provision of Tit nest boxes will provide breeding opportunities. Predicted breeding pairs based on 25 pairs per km² woodland.
Great Tit	12	6	-6	The provision of Tit nest boxes will provide breeding opportunities. Predicted breeding pairs based on 10 pairs per km².
Treecreeper	1	1	0	The removal of woodland within the development site will limit breeding opportunity. No planned mitigation measures will directly benefit the species. May be able to utilise hedgerow with standards to compensate for woodland losses but as some uncertainty worst case scenario reported. EBCC data indicates 5-10 pairs per km^2.
Magpie	11	11	0	Provision of standard trees will provide nesting opportunities sufficient to offset losses.
Carrion Crow	11	11	0	Provision of standard trees will provide nesting opportunities sufficient to offset losses.
House Sparrow	1	1	0	Species only recorded in mitigation area; therefore no losses are predicted. Provision of wild bird cover may lead to population increase through better overwinter survival.
Tree Sparrow	24	31	+7	The combination of nest boxes, ditches and hedges and increased winter survival through the provision of winter bird crop indicates potentially optimal conditions leading to increased populations. Predicted breeding pairs based on 5 pairs per 10 ha.

Chaffinch	34	31	-3	The creation and enhancement of hedgerows within the development site will provide breeding opportunities. Wild bird cover will increase overwinter survival. Predicted breeding pairs based on 50 pairs per km².
Goldfinch	24	12	-12	The provision of ponds within Mitigation Area B and the creation and enhancement of hedgerows within the development site will provide breeding opportunities. Predicted breeding pairs based on 20 pairs per km².
Linnet	59	6	-53	The provision of ponds within Mitigation Area B and the creation and enhancement of hedgerows within the development site will provide breeding opportunities. Wild bird cover crops will increase overwinter survival. Predicted breeding pairs based on 10 pairs per km².
Bullfinch	4	1	-3	Enhancement of hedgerows within the development site will provide breeding opportunities and feeding areas. Predicted breeding pairs based on 1.5 pairs per km².
Yellowhammer	11	4	-7	Increase in hedgerows, uncultivated grass strips and winter bird cover will benefit this species and lead to a net gain. Predicted breeding pairs based on 6.2 pairs per km².
Reed Bunting	18	6	-12	The provision of ponds within Mitigation Area B and newly created and enhanced hedgerows within the development site will provide breeding opportunities and mitigate some of the predicted losses. Predicted breeding pairs based on 10 pairs per km².

SPA BIRDS

Baseline

2.23 Six species were recorded using the fields on and around the AMEP site, black-tailed godwit (*Limosa limosa*), lapwing (*Vanellus vanellus*), redshank (*Tringa totanus*), whimbrel (*Numenius phaeopus*), shelduck (*Tadorna tadorna*) and curlew (*Numenius arquata*)) and the main areas are shown in Figure 2.

Figure 2 Key Inland Sites on South Humber Bank

2.24 Curlew has been recorded in numbers ≥1 % of the Humber Estuary SPA population, however, the remaining species have been recorded only either infrequently, or in very low numbers.

2.25 Table 3 details the numbers of curlew recorded during the latest 2010/2011 winter survey on key fields in the AMEP site and immediate surrounds. A peak of 158 birds (ie 3.6% of the SPA population) was recorded in week 3 (13th – 19th September 2010), of which 123 (ie 2.8%) were within Fields K (235) and J (240) within the AMEP site.

Table 3 Curlew Numbers Recorded on Weekly Surveys: September 2010 – April 2011

Field Ref		Week Number																														
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*
L	**225**	0	0	0	7	0	12	15	0	0	10	10	0	1	0	0	2	0	0	0	0	2	65	8	62	23	81	54	9	16	66	28
L	**226**	0	0	35	0	37	0	46	0	0	13	0	0	0	0	0	0	4	2	20	0	0	42	0	0	52	0	0	90	0	0	28
K	**235**	1	0	61	0	0	0	0	0	22	0	3	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	52	0
J	**240**	0	28	62	43	20	0	16	0	35	54	75	38	48	1	0	0	0	16	15	0	0	20	38	19	15	30	35	4	0	0	0
-	**236**[1]	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-	**241**[2]	0	0	0	0	0	0	0	0	6	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] – Field immediately north of and parallel to Station Road.

[2] – Field immediately north of Field J.

2.26 Only two of the main onshore areas used by curlew at Killingholme Fields lie within the AMEP site and will be lost. These are Fields J (approximately 8 ha) which is the most heavily used, and K (approximately 13 ha) totalling 21 ha. Fields L, which like J and K have been predominantly permanent pasture/hay crop will remain either unaffected (southern part of Fields L) or be part of the mitigation strategy for AMEP and be enhanced for waders such as curlew (northern part of Fields L).

2.27 Curlew can be present in any month between July to April on fields affected by AMEP although numbers are variable ranging from 0-123 (based on 2010/2011 winter data).

Impacts

2.28 100.3 ha of terrestrial fields will be lost to AMEP including 26.5 ha of field regularly used by up to 2.8% of the Humber population of curlew (max 123) based on 2010/2011survey data.

2.29 SPA birds at NKHP and Mitigation Area A will be affected by noise and visual disturbance, and this will be controlled by mitigation described in Objective NV1.

NOISE AND VISUAL DISTURBANCE

Baseline

2.30 Baseline noise levels were monitored at four locations on and around the AMEP site considered to be representative of the general area (see *Figure A1 in Annex A – Supporting Information on Noise*):

- on Station Road close to NKM foreshore (Location S1);
- on Station Road close on Killingholme fields (Location S2);
- on Killingholme fields (Location S3); and
- in NKHP (ECO 1).

2.31 Location S1, is located to the west of the flood defences, as it was not practical to undertake measurements actually on the mudflats, but is still representative of the foreshore area.

2.32 The average L_{A1} noise level and the range of L_{A1} noise levels recorded at each location are listed in Tables A1 – A4 in *Annex A – Supporting Information on Noise*. L_{A1} represents the noise level that is exceeded for 1% of the measurement period, and often reflects the noise level associated with more infrequent and noisy events. It can be considered as a *"repeatable maximum"* noise level.

2.33 The data show that along the foreshore and at NKHP, typical average L_{A1} noise levels during the mid-winter can, at times, reach 75 dB(A). Similarly at Killingholme Fields which is a short distance inland, typical average L_{A1} noise levels can reach 79 dB(A). Average levels are generally lower along the foreshore and at NKHP compared to the Killingholme Fields (see *Table A2*). Statistical analysis of the noise monitoring data, reveals maximum (L_{AMax}) noise levels of up to 87 dB(A) at both NKHP and the foreshore where L_{AMax} noise levels exceeded 55 dB(A) for a large proportion of the time. The analysis shows that L_{AMax} noise levels at NKHP exceed 55 dB (A) for 91% of the time (see *Table A5 in Annex A*). Key noise sources identified as contributing to the existing noise climate were from related to typical activities at

the docks (see below). Whilst the survey was undertaken over a period of six days in December 2010, the activities recorded are considered typical of those which will occur at the docks throughout the year. The noise survey reported that the environmental noise at NKHP was *"….significantly dominated by activities from Immingham Docks. The use of vehicle tugs was witnessed carrying loads to and from the docked vessels, which created bangs and clatters along with the vehicle movement itself. A stream of local HGV movements was also noted as lorries queued in that area"*. In addition the report states that:

- *"Two large vessels were noted to be docked at the Immingham Dock (1) north of the site during the observational periods. Engine noise could be heard from the vessels along with loading activities from the same area"*; and

- *"Industrial noise was noticeable emanating from the metal work yard to the east of measurement position ECO1. Specific noises from this location were observed as intermittent bangs and clatters of steelwork, along with loading and unloading of lorries. Given the infrequency of noises from this location, the overall influence of noise from this source is considered to be relatively low when compared to noises from Immingham Docks"*.

2.34 The foreshore survey location at the eastern end of Station Road (S1) was defined as *"….a reasonably remote location on the bank of the Humber River; with little pass through traffic and remote houses about a coastal lighthouse. Local traffic noise at this location was noted to be very low, with no moving vehicles witnessed in the area during the observational periods. Ambient traffic could be heard as a consistent source in the distance towards the south-west of the site"*.

2.35 *Typically, loading noise would constitute of intermittent clatters and bangs, being heard over engine and vehicle movement noises. Industrial noise to the west of this location could be identified by intermittent sirens at approximately 800Hz-1kHz, with no apparent constant pattern to the frequency of alarms. The noise level of alarms heard at this location was noticeable and at a similar level to the ambient traffic. Industrial noise from the west was subjectively less significant than north-west dock activities during the daytime"*.

(1) This refers to Humber Sea Terminals

3 OBJECTIVES

CONSTRUCTION

Rationale and Objectives

3.36 Construction impacts have been identified within the AMEP site, and at the site boundary with the Humber Estuary and at NKHP objectives to ensure appropriate mitigation and legal compliance during construction are provided below.

3.37 Impacts requiring mitigation have been identified for water vole, bats, great crested newts, breeding birds and SPA birds. Objectives for these species are detailed separately but there are some of the objectives for each species that overlap.

3.38 At NKHP indirect construction impacts arising from noise and visual disturbance will be controlled through the mitigation described in Objective NV1. Direct construction effects at NKHP will arise during re-profiling of the existing islands to encourage their use by little ringed plover. This will require vegetation clearance and the creation of breeding islands topped with gravel (as described in Section 6.2.3 of the Statement of Common Ground (SoCG) on Shadow Habitats Regulation Assessment (HRA)).

3.39 Good construction practice and adherence to Pollution Prevention Guidance will be embedded into any works undertaken on site. In particular Best Practice Guidance under PPG1 will be applied to the storage and use of hazardous materials. In locations where works are likely to occur in or near watercourses care will be taken to avoid contamination. Site compounds will be bunded and all chemicals stored in appropriate containers. Sediment or contaminant traps such as hay bales, or booms in the water, will be used if necessary. Where working in or near watercourses cannot be avoided it will be carried out using PPG5 best practice.

Objective C1: Construction will comply with legal requirements and best practice with regard to water voles, bats and great crested newts.

Target	• No killing or injuring of protected species, and no damage to newly created habitat.
Management	• Replacement habitats for protected species are provided prior to construction as detailed in species specific objectives and licence conditions. • Translocation of species is undertaken as prescribed in species objectives and licences • Habitat checks to be undertaken as specified in species specific objectives. In particular all waterbodies and surrounding areas will be checked prior to construction to ensure no water voles or great crested newts are present. • As stated in Objective B1 all potential bat roost sites will be examined prior to clearance and if there is evidence of roost use (current or historical) a licence will be obtained. • For bats construction mitigation for roosts will include the use of one way excluders where bats are still present. Use of such excluders would be confined to periods when bats are least vulnerable (e.g.. for a maternity colony it would avoid the May-August period) and the timing of felling would avoid the period bats are likely to be present. All roost and potential roost trees will be soft felled. Soft felling (taking the tree down in sections which are lowered to the ground) would be overseen by a licensed bat worker. • Ecological briefing for workforce (including recognition, contact procedures, action to be taken) will be provided pre-construction. • Construction lighting will be controlled to prevent light spill onto remaining bat commuting areas such as ditches, hedgerows and treelines.
Monitoring	• Undertake pre-construction surveys of suitable habitat
Who	• Survey by suitably experienced and where appropriate licensed surveyors • Briefing by Environmental Manager (1) / Ecological Clerk of Works (2).
When	• Pre-construction
Limits of Acceptable Change	• N/A
Remedial Action	• Cease work if animals found in work area and consult with Environmental Manager
Notes	• A pre-construction survey will be undertaken and the need for any other remedial action identified if necessary.

(1) The Environmental Manager is the person responsible for the implementation of the EMMP.

(2) An Ecological Clerk of Works (ECoW) is a suitably qualified professional ecologist who will have direct responsibility for monitoring compliance of the on-site works with the requirements of the EMMP, particularly the mitigation and against environmental legislation and policy.

Objective C2: Prevent harm to breeding birds.

Target	• No destruction of nests or eggs, killing or injuring of chicks of wild birds. • No disturbance of breeding Schedule 1 bird species.
Management	• Remove suitable nesting habitat during September-March (including removal of gravel and brownfield areas suitable for nesting little ringed and ringed plover) • Strim areas fortnightly to reduce suitability. • Ecological briefing for workforce (including recognition, contact procedures, action to be taken) • Where potential nesting habitat exists and works have to take place during April-August, the affected area will be checked to confirm that there are no nesting birds.
Monitoring	• Undertake pre-construction survey of suitable habitat for nesting birds, and in any areas where works has to commence within the breeding season.
Who	• Survey by suitably qualified surveyor • Briefing by Environmental Manager/ Ecological Clerk of Works
When	• Pre-construction • During construction in specific works areas if required.
Limits of Acceptable Change	• N/A
Remedial Action	• Cease work if nesting birds found in work area and consult with Ecological Clerk of Works or in their absence the Environmental Manager. • Any active nests not to be disturbed until young have fledged and capable of sustained flight.

Objective C3: Minimise construction disturbance to SPA populations at NKHP and Mitigation Area A

Target	• No significant disturbance of birds at NKHP or Mitigation Area A due to construction of AMEP, or at NKHP from the works on the inlet /outfall structure which links NKHP to the River Humber. • Minimise disturbance to birds at NKHP during re-profiling of existing islands to encourage use by little ringed plover.
Management	• Construction practice to incorporate mitigation on noise and visual impacts described in Objective NV1. • Re-profiling of the existing islands to encourage use by little ringed plover, and work on the inlet/outfall will be undertaken between December-March. This is the period of least roost use and avoids conflicts with breeding birds (IECS TTTC data indicates that peaks of 0-126 birds roost at NKHP during this period). Any vegetation removal will also be undertaken at this time. • Subject to obtaining all necessary consents, the NKHP outfall channel will be excavated so that discharge is not impeded, and there will be periodic excavation of the channel to maintain flows. Rock armour will be applied in areas where erosion is an issue. These works will take place behind a bund and within an area subject to existing noise disturbance, and hence the timing constraints applied to the island re-profiling (see above) will not apply. • Detailed method statements (including timings) for the island re-profiling and the work to the inlet / outfall structures to NKHP will be agreed with NE and LWT in advance of work commencing. • The work will be subject to a SSSI Consent Licence from NE. • PPG 5 will be implemented due to the working being in, or near to water.
Monitoring	• The approach and methods will be part of the wider monitoring programme set out in the Compensation EMMP, and the noise/bird monitoring protocol developed as part of Objective NV1.
Who	• Suitably experienced ornithological and acoustic surveyor(s) for monitoring. • Environmental Manager/ Ecological Clerk of Works to monitor construction.

When	• Monitoring during construction as part of wider monitoring programme on twice monthly basis (spring and neap tides)
Limits of Acceptable Change	• As described in Objective NV1.
Remedial Action	• Review construction methods and implement appropriate management action. • Such management could include repair of faulty equipment, changing the siting of facilities or equipment causing excess disturbance, providing additional screening, changing the phasing / timing of some work.

WATER VOLE

Rationale and Objectives

3.40 2.5 km of ditch will be lost due to site construction, thus resulting in loss of water vole habitat if left unmitigated.

Objective WV1: The site will have sufficient suitable ditch habitat to sustain or enhance water vole populations.

Target	• Create and enhance suitable water vole habitat throughout the development site, resulting in a net increase in suitable water vole habitat of approximately 2 km.
Management	• Creation or realignment of c2.7 km of drainage ditch throughout the development site • Design of ditch to provide a habitat of high suitability for water vole. This will include permanent slow running water with aquatic and emergent macrophytes, bordered by gently sloping banks on either side with 2-5m swathes of vegetation, and with soils suitable for burrowing. • Creation and realignment works will take place 12 months prior to the removal of any existing water vole habitat, to allow for the establishment of the new drainage ditches. • Incremental strimming of existing sites will be undertaken after this time to displace water voles into new habitat. If this is unsuccessful animals will be trapped and relocated under licence. • Retention of the majority of drains with high or moderate water vole activity and enhancement of these through removal of excessive in-drain and overhanging vegetation.
Monitoring	• Water vole survey to determine population size and distribution. • Survey of ditches to ensure continued suitability for water vole.
Who	• Suitably qualified surveyor. • Responsibility of the Environmental Manger to commission surveys.
When	• An annual survey between April and October for up to five years • If population remains with the Limits of Acceptable Change after three years, monitoring can cease if agreed by the Steering Group.
Limits of Acceptable Change	• Population of water voles is maintained at least 78 breeding females (ie does not decrease by >5%).
Remedial Action	• Careful removal of excessive surrounding vegetation where it is resulting in overshading. • Removal of excessive aquatic vegetation in drains. • Control of mink.

BATS

Rationale and Objectives

3.41 Although the site currently provides sub-optimal habitat for bats, temporary loss of foraging habitat and disruption to commuting routes is predicted to occur as a result of the works. The objectives are designed to ensure mitigation is put in place and its effectiveness monitored. Targets relate to maintaining the species diversity of the baseline, although Nathusius pipistrelle was recorded only as a *"possible"* record and is not included within the diversity target.

Objective B1: The site will provide suitable foraging, commuting and roosting habitat for bats

Target	• Creation and enhancement of bat habitat including green corridors and roosting opportunities. • Sustaining the diversity of species and levels of activity present in the baseline. • During tree removal ensure all legal requirements are met.
Management	• All suitable trees will be checked prior to removal by a licensed batworker either by climbing (subject to compliance with any health and safety requirements), or emergence surveys to ensure no roosts are present. • If tree roosts are present a licence application accompanied by an appropriate method statement will be made to NE. • Enhancement of existing hedgerows and drains. • Creation of new hedgerows. • Planting of trees to provide future roosting opportunities. • Installation of bat boxes in suitable trees. • Creation of foraging areas linked to green corridors. • Direction of site lighting away from green corridors and foraging areas to minimise disturbance. • Creation of green bridge to allow safe access over road to Burkinshaw's Covert and increase connectivity.
Monitoring	• Bat activity surveys: Single walked transect undertaken during suitable conditions (light winds, dry, mild >10ºC) undertaken within the same two week period annually. Supplemented by passive detectors at fixed points (including green road crossing, NKHP foraging area, central hedge and ditch). • Bat boxes checks for signs of use.
Who	• Suitably qualified and licensed bat surveyor. • Responsibility of the Environmental Manger to commission surveys.
When	• Transect surveys annually between May and September for up to five years repeated within same two week period each year. • Bat box surveys September each year (when young can reasonably be expected to be active). • If five or more species are recorded each year, and activity levels and patterns remain equal to or greater than the original baseline monitoring can cease after three years.
Limits of Acceptable Change	• If bat activity falls below baseline levels in two consecutive years. • If species diversity falls below four species per annum.
Remedial Action	• Review survey data to establish potential causes. • Relocation of unused bat boxes • Additional habitat enhancement

GREAT CRESTED NEWTS

Rationale and Objectives

3.42 The works will result in the loss of pond habitat from the site, including two confirmed breeding ponds and one pond which may be used for foraging. In addition, terrestrial habitat in the 250 m buffer surrounding the ponds will be lost. This will be subject to a Habitats Regulations Mitigation licence that will cover the process of destroying existing breeding and resting places, moving animals and the provision of alternative habitat. The objectives in this section are therefore closely linked to the licence conditions and reflect the method statement that underpins the licence application.

Objective GCN1: Maintain breeding population by providing suitable alternative ponds and associated terrestrial habitat.

Target	• Creation of six replacement ponds, four measuring 100 m^2 and two measuring 400 m^2 to more than compensate for the loss of 114.5 m^2 of lost habitat • Maintain population of minimum 19 great crested newts including at least one breeding female. • Comply with the licence requirements.
Management	• Construction of new ponds in Mitigation Area B between Chase Hill Wood and Rosper Road, approximately 1 km from existing breeding ponds in accordance with NE guidance • Replacement of the two existing breeding ponds with four new ponds. • Replacement of the foraging pond with two new ponds. • Design and planting specification of the replacement ponds to reflect those of the breeding ponds to be removed and agreed by NE. • Pond creation will occur one year in advance of capture and translocation works to ensure establishment of suitable conditions. • Location of new ponds at a site which has connectivity to 10 ha of established broadleaf wood, allowing a larger meta-population to be supported. • Enhancement of surrounding terrestrial habitat through conversion of existing arable field surrounding the new ponds to permanent species-rich grassland. • Enhancement of surrounding hedgerows and verges for wildlife. • Creation of refugia within the 50 m buffer surrounding each pond. • Installation of amphibian-proof barrier around woodland edge to minimise road mortality.
Monitoring	• Monitoring of existing and new ponds to monitor meta-population size and continued utilisation of new ponds. • Recording of pond physical attributes including photographic records.
Who	• Suitably qualified and licensed GCN surveyor. • Responsibility of the Environmental Manager to commission surveys.
When	• Six visits annually between March and June for up to five years. • If population remains above 20 animals including at least one gravid female for three consecutive years, monitoring can cease with agreement of Steering Group.
Limits of Acceptable Change	• A medium meta-population of newts of not less than 15 animals continue to inhabit the area. • At least one gravid female must be present.
Remedial Action	• Dependent of review of monitoring survey findings but examples listed below. • Maintenance of surrounding terrestrial habitat as permanent species-rich grassland. • Removal of fish from ponds. • Increase emergent vegetation at bankside where this will provide increased

	in-water refuges from predators. • Clearance of overhanging vegetation to reduce shading. • Clearing of excessive in-pond vegetation. • If waterfowl grazing an issue protect areas of vegetation used for egg laying with large open mesh fencing. • Provide additional smaller refuge ponds unsuitable for waterfowl. • If habitat management fails and waterfowl are a cause of GCN target failure then in extremis discouragement of waterfowl from ponds will be implemented
Notes	• The amphibian fencing does not cover the north of the site where it connects with Fox Covert.

BREEDING BIRDS

Rationale and Objectives

3.43 Mitigation Areas A and B are provided, together with enhancement of boundary features, hedgerows, and ditches to offset the loss of breeding birds. The management objectives relate to specific areas, and habitat and management monitoring will be site specific. Monitoring of bird territories will be undertaken over the whole site as breeding birds are likely to rely on a range of features over the site; for example granivores may use hedges or bird boxes to breed in, insect rich grassland to find food for juveniles, but rely on farmland bird cover crops for winter survival. As a consequence bird targets are set across the whole site rather than split into individual sites. Breeding bird targets have been set for 3 years after mitigation has been implemented, to reflect the need for habitat to mature, whilst balancing a need for early intervention if mitigation is not succeeding.

3.44 The baseline and impact assessment indicated predicted changes in bird populations, Table 4 below presents targets based on those predictions. Generally the 3 year target is approximately 50% of the 5 year target. Targets are based on the predicted populations post construction and with the application of mitigation. Targets are subject to natural variability, and in assessing if a target has been reached or not external factors such as national population trends would need to be applied.

Table 4: Bird Targets for AMEP Site Post-construction.

Species	Target Pairs (3yrs)	Target Pairs (5 yrs)
Mute Swan	1	1
Shelduck	1	3
Mallard	5	10
Shoveler	1	1
Red-legged Partridge	1	3
Pheasant	2	5
Sparrowhawk	1	1
Kestrel	1	1
Water Rail	1	1
Moorhen	3	6
Oystercatcher	1	2
Little Ringed Plover	1	2
Ringed Plover	1	3
Lapwing	1	1
Stock Dove	1	1
Woodpigeon	3	6
Skylark	3	6
Swallow	2	5
Meadow Pipit	1	2
Yellow Wagtail	3	6
Pied Wagtail	1	2
Wren	8	16
Dunnock	6	12
Robin	4	8
Blackbird	7	15
Song Thrush	1	3
Mistle Thrush	1	2
Sedge Warbler	1	2
Reed Warbler	1	2
Blackcap	1	2
Garden Warbler	1	1
Lesser Whitethroat	1	1
Whitethroat	15	31
Willow warbler	4	9
Chiffchaff	1	1
Long-tailed Tit	1	2
Blue Tit	7	15
Great Tit	3	6
Treecreeper	1	1
Magpie	5	11
Carrion Crow	5	11
House Sparrow	1	1
Tree Sparrow	15	31
Chaffinch	15	31
Goldfinch	6	12
Linnet	3	6
Bullfinch	1	1
Yellowhammer	2	4
Reed Bunting	3	6

Objective BB1: Manage Mitigation Area A to assist in reducing impacts on breeding birds arising from AMEP

Target	• Provide mitigation in the southern part of the AMEP site of approximately 48 ha (16.7 ha core with a 150 m (1) buffer). The majority of the area is to be wet grassland (44.7 ha), with additional areas of neutral grassland, wild bird cover, a tree belt and hedgerows (see Figure 3)..
Management	• Wet grassland management to follow specifications of Objective SPA 2 and SPA 3. • Creation of new hedgerows along eastern and southern edges. • Tree belt to screen highway traffic along western side of Mitigation Area A, which will include resistant cultivars of elm (to provide potential habitat for white-letter hairstreak). • Minimally managed (i.e. no application of herbicides other than as spot treatment, or fertilisers and subject to light cutting or grazing) field boundary strips 2-5 m wide under and adjacent to hedges. • Creation of minimum of 1.7 ha of neutral grassland immediately south of the operational buffer on the northern side. This to be sown with seed harvested from original Station Road Local Wildlife Site and/or a MG5 or MG8 mix of suitable provenance (see http://www.snh.org.uk/publications/on-line/advisorynotes/106/106.htm for list of such suppliers). • Neutral grassland to be established using fine seed-bed prepared through repeated harrowing and rolling. This will also encourage the germination of seeds in the soil seed bank, depleting the seed bank before sowing (creating a stale seed-bed). Sowing will be by a fertiliser broadcaster and the seedbed will then be rolled. The first cut or introduction of light grazing should not occur until 3-6 months after sowing. Weed control of perennials will be by spot control or weed wipe. • Neutral grassland to be managed by light grazing or cutting regime that allows a tussocky sward range of 5 - 20 cm. Occasional liming may be required to maintain pH. • A 15m wide 1.38 ha strip of wild bird cover crop will be established along the southern edge of Mitigation Area A immediately adjacent to the hedgerow. This is near remaining farmland habitat and the hedgerow will provide cover close to the feeding area. This is within the wet grassland area but close to the existing hedge and therefore within an area unlikely to be used by wading birds. • The biannual wild bird cover crop mix to include kale, quinoa, mustard, oil-seed rape, oats, red clover. It will be planted as two separate blocks (0.69 ha per year) to provide an overlapping continuous seed source. • The wild bird cover crop will be rotated so that is grows in a band along the shorter eastern or western edges of Mitigation Area A. This will allow the ground to recover and any necessary weed control to be undertaken. To maintain a similar area of cover, a slightly wider strip of 20 m will be planted when the shorter eastern and western edges are used. • Light grazing will be allowed unless it causes problems with establishment, or reduces grazing levels within the wet grassland.
Monitoring	• CBC monitoring and mapping with six visits. • 60 permanent quadrats to be established measuring 1m x 1m within the wet grassland area. • Plant species and abundance to be recorded for each quadrat. • Mapping of the extent of wet or damp grassland; and neutral grassland.
Who	• Monitoring by suitably qualified ecological surveyor organised by the site Environmental Manager. • Establishment and management of grassland and wild bird cover boundary strips by suitably qualified contractor overseen by the site Environmental Manager

(1) Within the area of c 48 ha, the northern buffer comprises 100 m grassland. The other 50 m of the northern buffer is an operational buffer. This is an un-vegetated area within the operational part of the site, and is subject to noise and visual controls (see Objective NV1)

When	• Bird Monitoring annually for five years. Option to cease surveying after this point if bird populations monitored within development have met minimum number of pairs target detailed in Table 4. Any such change in monitoring subject to review and agreement of the Steering Group. • Grassland Monitoring to undertaken annually in June for the first five years. • Grassland Monitoring can cease if the target is achieved for three consecutive years after the first five years of monitoring provided that the management regime remains unchanged and subject to the agreement of the Steering Group.
Limits of Acceptable Change	• 3 year targets for birds not met, and failure cannot be explained by national trends. • At least one species characteristic of wet grasslands must be present throughout all of the 60 permanent quadrats. • At least four species characteristic of neutral grasslands must be present throughout all of the 60 permanent quadrats. • Wet or damp grassland vegetation community to occur across at least 80% of Mitigation Area A. • Wild bird cover crop to have 75% viable plants.
Remedial Action	• Where the monitoring data identifies bird species at risk, then the existing management approach will be reviewed and new measures implemented for those species. • Supplementary winter feeding for birds. • Adjustment of drainage regime to increase wetness across the grassland and promote wet or damp grassland establishment. • For wild bird cover additional application of fertiliser or Farmyard Manure, use of disease resistant seed stock, overseeding with radish and mustard and/or re-seeding in failed areas, if high weed burdens periodic use annual mixtures to clean seedbed.

Objective BB2. Manage Mitigation Area B to assist in reducing impacts on breeding birds arising from AMEP

Target	• Species rich grassland and six new ponds within the triangular shaped area of land between Chase Hill Wood and Rosper Road.
Management	• Conversion of existing arable field to species rich grassland. • Enhancement of existing roadside and field drains. • Enhancement of the existing hedgerows around Area B. • Creation of six new ponds (two ponds of 400 m² and four ponds of 100 m²).
Monitoring	• CBC monitoring and mapping with six visits annually.
Who	• A suitably qualified ecological surveyor organised by the site Environmental Manager.
When	• Bird Monitoring annually for five years. Option to cease surveying after this point if bird populations monitored within development have met minimum number of pairs target detailed in Table 4. Any such change in monitoring subject to review and agreement of the Steering Group.
Limits of Acceptable Change	• 3 year targets not met and failure cannot be explained by national trends.
Remedial Action	• Where the monitoring data identifies bird species at risk, then the existing management approach will be reviewed and new measures implemented for those species. • Control of sycamore. • Supplementary winter feeding.

Objective BB3: Enhancement of the AMEP development site out with Mitigation Area A and Mitigation Area B to assist in reducing impacts on breeding birds arising from AMEP.

Target	• Habitat Improvement throughout site to sustain breeding birds (see Figure 3).
Management	• Minimum of 20 Nest boxes erected on suitable mature trees within the site of which 12 are to have a hole diameter of 28 mm suitable for tree sparrows and be placed in close proximity to promote colonial breeding. • Nest boxes to be fitted to semi-mature tree stock used for more formal planting along main access roads. • Autumn/winter food source from berry bearing plants will be provided through planting up of boundary features and amenity areas. Use of Native species such as rowan, guelder rose, hawthorn, holly, beech, hazel and elder in boundary features but also cotoneaster, sweet briar (R*osa rubiginosa)* would be considered in amenity areas. • Minimal management to grassland and ditch flora associated with water vole areas to provide seed and insect resource. • Water vole areas to have hedgerows and tree planting set 3-5m back from ditch; these boundary features will also be of native trees and shrubs and provide feeding and nesting resource.
Monitoring	• CBC monitoring and mapping with six visits annually.
Who	• Suitable ecological surveyor organised by the site Environmental Manager
When	• Bird Monitoring annually for five years. Option to cease surveying after this point if bird populations monitored within development have met minimum number of pairs target detailed in Table 4. Any such change in monitoring subject to review and agreement of the Steering Group.
Limits of Acceptable Change	• 3 year targets not met and failure cannot be explained by national trends.
Remedial Action	• Where the monitoring data identifies bird species at risk, then the existing management approach will be reviewed and new measures implemented for those species. • Supplementary winter feeding.

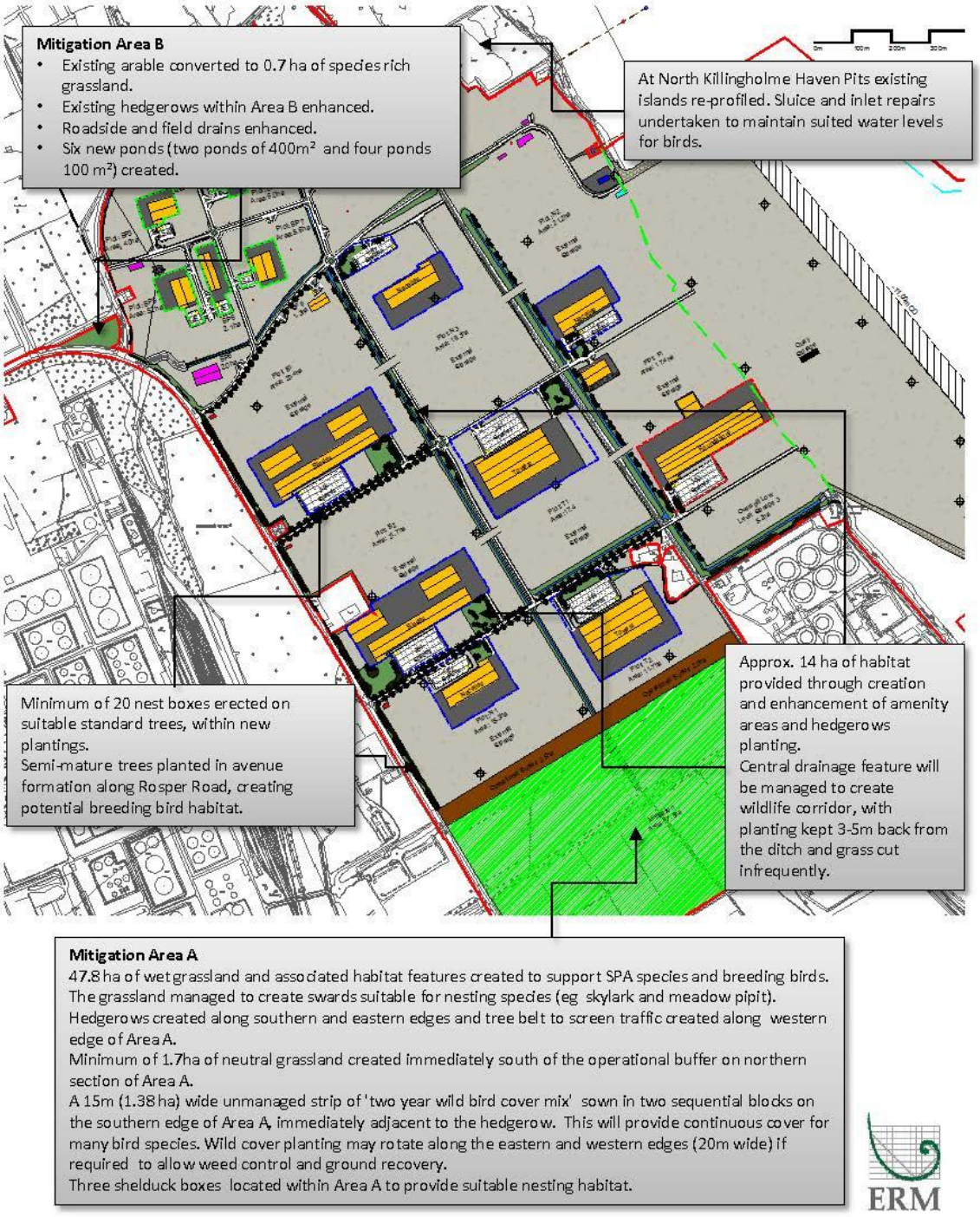


Figure 3
Breeding Birds Proposed Mitigation

Rationale and Objectives

3.45 The AMEP development site supports >1% of the Humber Estuary population of Curlew; it has recorded a peak count of 123 birds per annum. The curlew roost and feed within grassland fields. The Humber Estuary qualifies as a Special Protection Area under the Birds Directive partly because it supports more than 20,000 waterfowl. Curlew is one of the waterfowl species listed on the citation. The principal objective for Mitigation Area A is to support peak numbers of curlew that are currently found on the development site at least once per annum subject to national trends. This will be done through the provision of newly created wet (or damp) grassland habitat. The grassland habitat should also be of benefit for other wintering bird species.

Objective SPA1: Mitigation Area A provides compensatory habitat for Curlew

Target	• Support a peak count of 123 curlew at least once per annum subject to national trends.
Management	• Maintenance of suitable habitat for curlew within Mitigation Area A (see SPA2 and SPA3). This will comprise 46.4 ha of which 44.7 ha is wet grassland and 1.7 ha is neutral grassland (see Figure 3).
Monitoring	• Monthly counts of birds using fields within the site around the high tide. Counts to include details of any disturbance and disturbance response behaviour (especially alert and flushing distances).
Who	• A suitably qualified ecological surveyor organised by the site Environmental Manager
When	• Monthly counts August-April for minimum of five years. If site regularly supports over 2% of SPA curlew population after this time, the Steering Group can agree cessation of counting
Limits of Acceptable Change	• Counts of ≥1 % Humber population of curlew occur in less than 3 months between August-April (compared to WeBS data collected during the same months)
Remedial Action	• Make adjustments to habitat and environmental conditions to facilitate achievement of the objective, where a review of the monitoring data identifies any obvious cause for failure to reach the target. These adjustments could include management of disturbance, increase/decrease of soil moisture, changing the number, size, location and shape of wader scrapes, and adding biomass to increase worm numbers.

Objective SPA2: Mitigation Area A provides open, wet (or damp) grassland habitat

Target 1	• Establishment of wet or damp vegetation community within Mitigation Area A.
Management	• Sowing with a wet grassland seed mix (for example mix NV7 from Naturescape) and leaving uncut and un-grazed for 3 to 6 months, as appropriate. • 0.2 livestock units per hectare per year in April to August inclusive in Year 1; and • 0.3 livestock units per hectare per year in April to August inclusive in all subsequent years; or • Equivalent management by cutting the grassland. • No fertilisers to be used except if needed to boost earthworm biomass. • No herbicides to be used except if needed to control problem plant species, with application by knapsack sprayer or weed-wipe.
Monitoring	• 60 permanent quadrats to be established measuring 1m x 1m within the wet grassland area. • Plant species and abundance to be recorded for each quadrat. • Visual assessment of the extent of wet or damp grassland; and species rich

	grassland.
Who	• A suitably qualified ecological surveyor organised by the site Environmental Manager.
When	• Monitoring to undertaken annually in June for the first five years. • Monitoring can cease if the target is achieved for three consecutive years after the first five years of monitoring provided that the management regime remains unchanged. • Any changes in monitoring to be reviewed and agreed by the Steering Group.
Limits of Acceptable Change	• At least one species characteristic of wet or damp grasslands must be present throughout all of the 60 permanent quadrats. • Wet or damp grassland vegetation community across at least 80% of Mitigation Area A
Remedial Action	• Adjustment of drainage regime to increase wetness across the grassland to promote establishment of wet or damp grassland.
Target 2	• Average sward height of 10 cm across Mitigation Area A each month from September to April.
Management	• 0.2 livestock units per hectare per year in April to August inclusive in Year 1; and • 0.3 livestock units per hectare per year in April to August inclusive in all subsequent years; or • Equivalent management by cutting the grassland.
Monitoring	• Measurement of sward height at 100 sampling points.
Who	• Environmental Manager.
When	• Monitoring to occur once every two months month from April to October, annually for 5 years. • Monitoring can cease if the target is achieved for three consecutive years after the first five years of monitoring provided that the management regime remains unchanged. • Any changes in monitoring to be reviewed and agreed by the Steering Group.
Limits of Acceptable Change	• Average sward height of 15 cm across Mitigation Area A each month in October and April.
Remedial Action	• Increase livestock density to achieve shorter swards at the end of August, or cut grass once in August / early September.

Target 3	• No scrub (including bramble) or trees across the entirety of Mitigation Area A.
Management	• 0.2 livestock units per hectare per year in April to August inclusive in Year 1; and • 0.3 livestock units per hectare per year in April to August inclusive in all subsequent years; or • Equivalent management by cutting the grassland
Monitoring	• Visual Assessment.
Who	• Environmental Manager.
When	• Monitoring to undertaken annually in June for the first five years. • Monitoring to occur in June once every three years thereafter if limits of acceptable change have not been exceeded in the first five years. • All changes in monitoring to be agreed with Steering Group.
Limits of Acceptable Change	• No more than 5% scrub or trees across the entirety of the Mitigation Area A.
Remedial Action	• Cutting down vegetation and treatment of stumps with herbicide.

Objective SPA3: Mitigation Area A provides biomass levels similar to that provided by natural wet grasslands

Target	• Average earthworm biomass levels of 65 gm^{-2} (wet weight) in 2-4 years and maintained thereafter.
Management	• Maintenance of damp but un-flooded grassland through appropriate management of site drainage; for example: o blocking of field drains; o raising or lowering sluice heights; or o pumping water onto the site.
Monitoring	• Annual collection of 50 soil samples measuring 25 x 25 x 10 cm at standard sample locations, with subsequent soil biomass calculations.
Who	• Environmental Manager.
When	• Annually in September until target is achieved and then for three years thereafter. • Monitoring may cease if earthworm biomass levels greater than target levels for more than three consecutive years subject to the agreement of the Steering Group.
Limits of Acceptable Change	• Minimum average earthworm biomass levels of 50 gm^{-2} (wet weight) after 3 years
Remedial Action	• Addition of organic matter as a top dressing to promote biomass increase. • Adjustments to soil moisture content or extent of flooding as appropriate.
Notes	Biomass target is derived from approximate average of natural, un-flooded wet grasslands (Ausden *et al*, 2001) (1).

NOISE AND VISUAL DISTURBANCE

Rationale and Objectives

3.46 Noise and visual impacts are expected from the AMEP and may affect SPA bird species. Consequently, restrictions on noise levels and container storage heights within AMEP in relation to NKHP and Mitigation Area A have been agreed with NE.

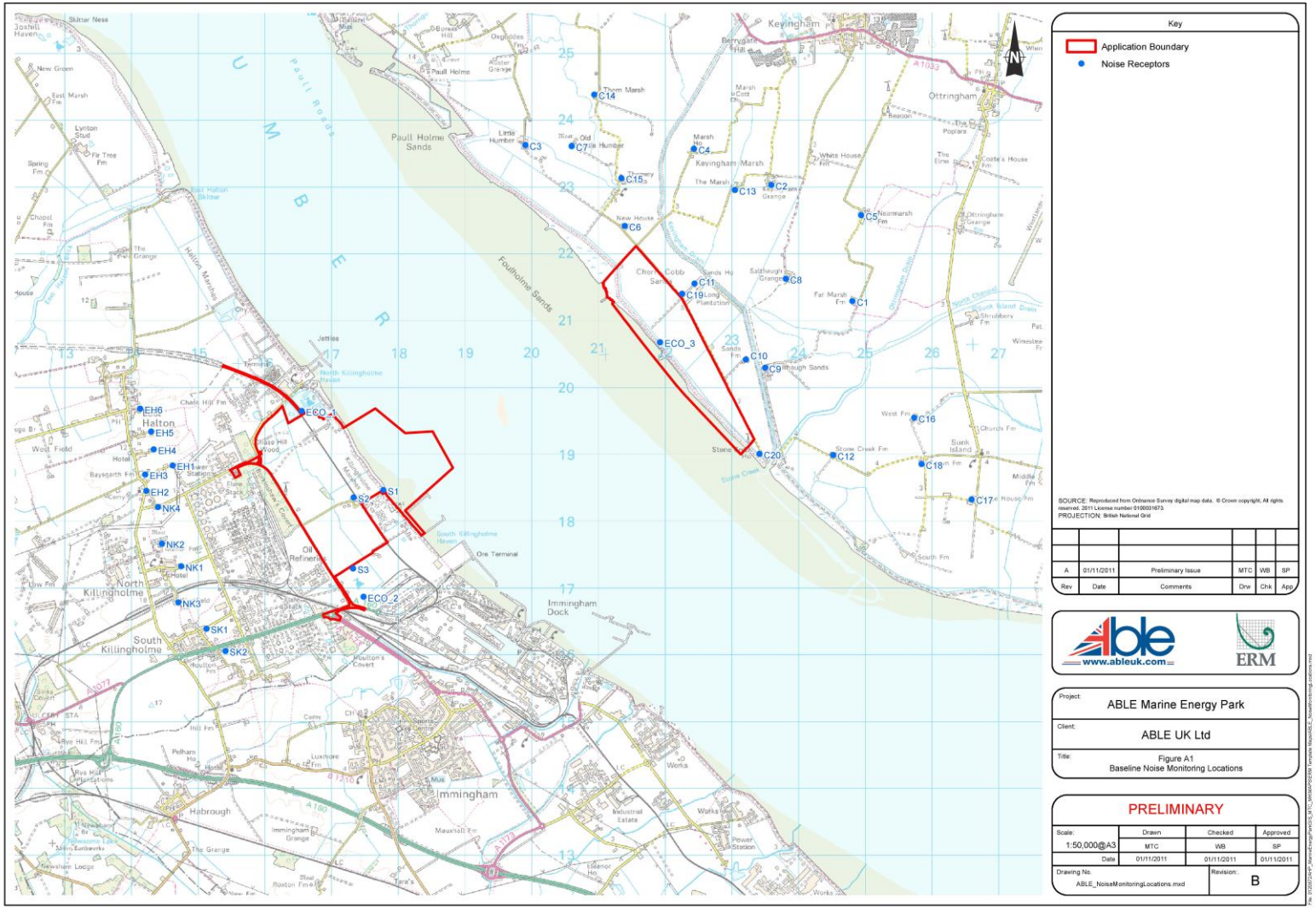
Objective NV1: Avoid significant noise and visual disturbance to SPA birds at NKHP and Mitigation Area A.

Target	• No significant noise or visual disturbance to SPA species at NKHP and Mitigation Area A.
Management	• Development of a noise / visual and bird monitoring programme and protocol in agreement with NE including agreed monitoring locations. • Noise levels will not exceed 65dB LAmax at the boundary of NKHP, or within the core area of Mitigation Area A (see Figure A2), as a result of AMEP, unless otherwise agreed with NE as set out in the DCO (see Notes below). • Maintain storage heights in AMEP during construction and operation as agreed with NE and set out in the DCO (see Notes below).
Monitoring	• Implementation of the monitoring programme agreed with NE (see above). • Collate monthly WeBS data to use in contextual analysis.
Who	• Noise monitoring specialist(s). • Competent and experienced bird surveyor / specialist(s). • Surveys and monitoring to be managed by Environmental Manager.
When	• To be agreed with NE as part of the development of the monitoring approach.

(1) Ausden M., Sutherland W J & James R. (2001) The Effects of Flooding Lowland Wet Grassland on Soil Macro-invertebrate Prey of Breeding Wading Birds. *Journal of Applied Ecology*, **38**: 320–338.

Limits of Acceptable Change	• Noise levels from AMEP within levels agreed with NE. • Any one year where decline of a single species is greater than natural variability, or any two years of consecutive decline in peak means, taking account of any external causes of decline in bird numbers.
Remedial Action	• Those activities on AMEP causing elevated noise levels will be identified and adjustments will be made to working practices in consultation with NE • Increase management of NKHP and/or Mitigation Area A for birds (eg supplementary feeding, improve roosting sites).
Notes	• Requirement 40 of Schedule 11 to the DCO states: *"Mitigation site requirements* *1) During the construction and operation of the authorised development, no storage, use of plant or other development shall take place:* *a) at a height greater than 3m from ground level within 70m of the North Killingholme Haven Pits Site of Special Scientific Interest, or* *b) at a height greater than 6m from ground level between 70m and 150m from the North Killingholme Haven Pits Site of Special Scientific Interest, or* *c) at a height greater than 9m from ground level between 150m and 200m from the North Killingholme Haven Pits Site of Special Scientific Interest, or* *d) at a height greater than 10m from ground level within the 60m* [to be changed to 50 m] *operational buffer strip adjacent to Mitigation Area 'A'* *unless otherwise agreed in writing by the relevant planning authority in consultation with Natural England.* *2) Before any activity referred to in sub-paragraph (1) takes place on the Order land, the buffer areas referred to in sub-paragraph (1) shall be clearly marked on-site (by pegs or otherwise) to the written satisfaction of the relevant planning authority.* *3) The construction and operation of the works shall not exceed 65 dB (A) [LAmax] at the boundary of the North Killingholme Haven Pits Site of Special Scientific Interest, unless otherwise agreed in writing Natural England based on the findings of the monitoring programme and taking account of the noise level duration.* *4) The construction and operation of the works shall not exceed 65 dB (A) [LAmax] anywhere in the core area of Mitigation Area 'A' (as specified in the terrestrial environmental monitoring and management plan), unless otherwise agreed in writing by Natural England based on the findings of monitoring programme and taking account of the noise level duration.* *5) The terrestrial environmental management and monitoring plan will include a monitoring programme to ensure compliance with these noise levels and the container storage locations and heights."*

ANNEX A – SUPPORTING INFORMATION ON NOISE


Key
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Noise Receptors
SOURCE: Reproduced from Ordnance Survey digital map data. © Crown copyright, All rights reserved. 2011 License number 0100031673.
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Approved SP
Date 01/11/2011 01/11/2011 01/11/2011
Drawing No. ABLE_NoiseMonitoringLocations.mxd
Revision: B
Paull Holme Sands
Foulholme Sands
Keyingham
Ottringham
Halton
North Killingholme
South Killingholme
Immingham
Immingham Dock
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
ECO_1
ECO_2
ECO_3
S1
S2
S3
EH1
EH2
EH3
EH4
EH5
EH6
NK1
NK2
NK3
NK4
SK1
SK2

Table A1 Baseline Noise Sampling from Killingholme Marshes Foreshore (S1)

Date	Average Day Time LA90 (dB (A))	Average Day Time LAeq (dB (A))	Average Day Time LA10 (dB (A))	Average Day Time LA1 (dB (A))	Range LA1 (dB (A))
09-12-10	45	52	50	54	73 – 50
10-12-10	46	51	51	54	69 – 48
11-12-10	40	47	47	51	64 – 43
12-12-10	35	45	45	50	63 – 37
13-12-10	43	51	50	54	72 – 39
14-12-10	29	39	36	43	63 – 31
Overall Level	**40**	**49**	**47**	**51**	**Overall Level**

Table A2 Baseline Noise Sampling from Station Road close to Killingholme Fields (S2)

Date	Average Day Time LA90 (dB (A))	Average Day Time LAeq (dB (A))	Average Day Time LAeq (dB (A))	Average Day Time LAeq (dB (A))	Average Day Time LAeq (dB (A))
09-12-10	46	56	55	65	79 – 56
10-12-10	48	56	55	65	76 - 53
11-12-10	40	51	48	53	74 - 45
12-12-10	38	52	45	51	73 - 42
13-12-10	39	56	50	66	76 - 49
14-12-10	38	58	52	67	77 - 41
Overall Level	**42**	**55**	**51**	**61**	

Table A3 Baseline Noise Measurements for Killingholme Fields (S3)

Date	Average Day Time LA90 (dB (A))	Average Day Time LAeq (dB (A))	Average Day Time LAeq (dB (A))	Average Day Time LAeq (dB (A))	Average Day Time LAeq (dB (A))
06-01-11	47	55	55	59	72 - 54
07-01-11	55	59	62	65	74 – 52
08-01-11	54	59	60	65	69 – 60
09-01-11	47	53	55	58	65 – 55
10-01-11	52	59	62	64	71 – 58
11-01-11	56	59	61	64	73 – 58
Overall Level	**52**	**58**	**59**	**63**	

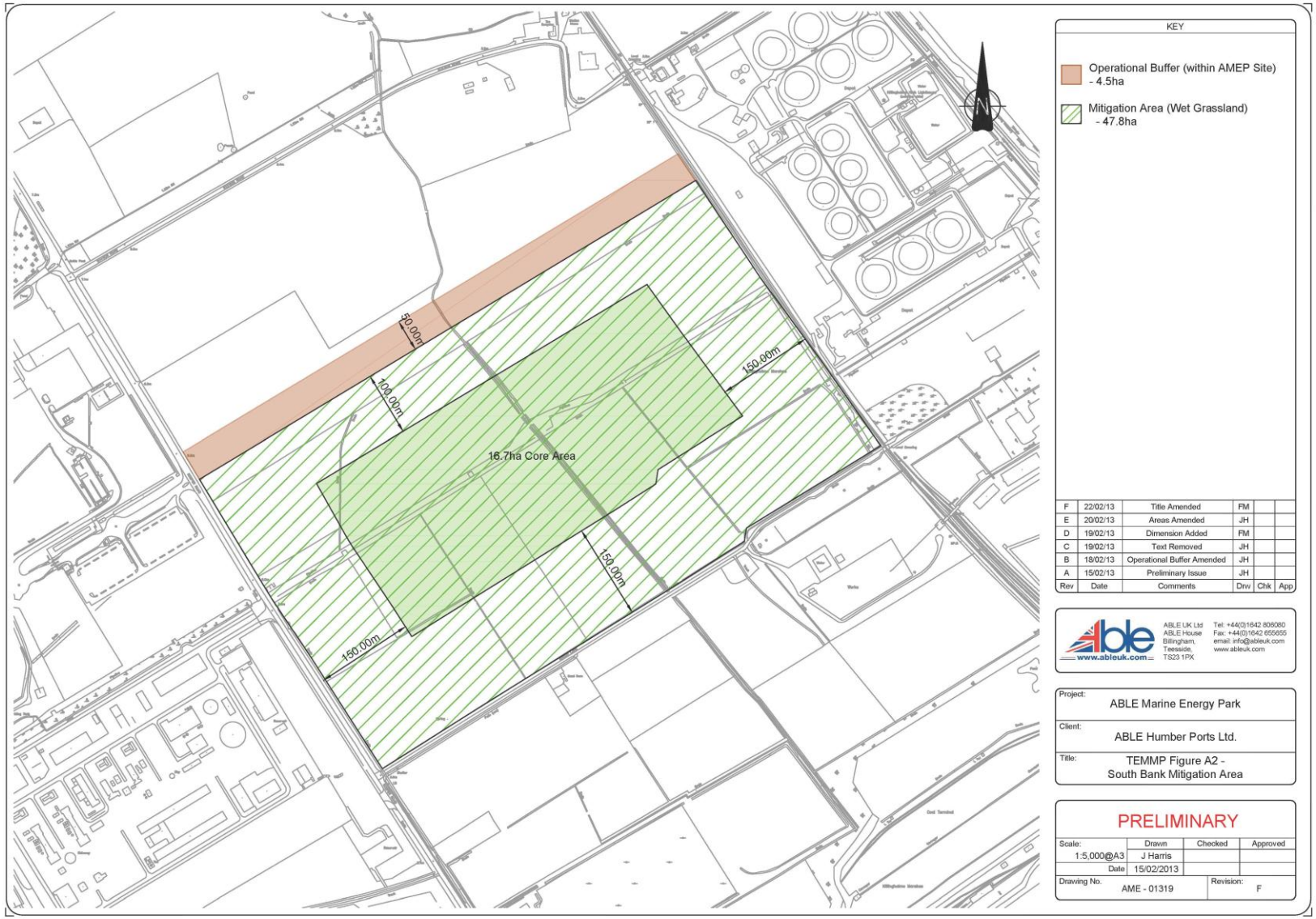
Table A4 Baseline Noise Measurements for North Killingholme Haven Pits (ECO-1)

Date	Average Day Time LA90 (dB (A))	Average Day Time LAeq (dB (A))	Average Day Time LA10 (dB (A))	Average Day Time LA1 (dB (A))	Range LA1 (dB (A))
09-12-10	45	53	54	59	75 - 53
10-12-10	43	52	53	58	69 – 48
11-12-10	45	51	52	55	67 – 47
12-12-10	42	51	54	57	64 – 45
13-12-10	42	53	55	59	67 – 44
14-12-10	42	55	56	61	70 – 42

Date	Average Day Time LA90 (dB (A))	Average Day Time LAeq (dB (A))	Average Day Time LA10 (dB (A))	Average Day Time LA1 (dB (A))	Range LA1 (dB (A))
Overall Level	**43**	**53**	**54**	**58**	

Table A5 Analysis of L_{AMax} Noise Levels (December 2010)

Parameter	*ECO1*	*S1*
Occurrence of L_{AMax} noise levels > 55 dB(A)	91%	71%
Occurrence of L_{AMax} noise levels ≥ 75 dB(A)	5%	2%
Statistical Mean	65	60
Standard Deviation (SD)	7	8
Mode (noise level which occurs the most frequently)	68 (7%)	64 (7%)
Range within 1 SD	58 – 72	52 - 68
Occurrence of L_{AMax} levels within 1 SD	73%	69%
Occurrence of L_{AMax} between 55 and 75 dB(A)	86%	79%
Occurrence of L_{AMax} between 58 and 72 dB(A)	73%	-
Occurrence of L_{AMax} between 52 and 68 dB(A)	-	69%


KEY
Operational Buffer (within AMEP Site) - 4.5ha
Mitigation Area (Wet Grassland) - 47.8ha
30.00m
100.00m
16.7ha Core Area
150.00m
150.00m
150.00m
N
F 22/02/13 Title Amended FM
E 20/02/13 Areas Amended JH
D 19/02/13 Dimension Added FM
C 19/02/13 Text Removed JH
B 18/02/13 Operational Buffer Amended JH
A 15/02/13 Preliminary Issue JH
Rev Date Comments Drw Chk App
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www.ableuk.com
Project: ABLE Marine Energy Park
Client: ABLE Humber Ports Ltd.
Title: TEMMP Figure A2 - South Bank Mitigation Area
PRELIMINARY
Scale: 1:5,000@A3
Drawn: J Harris
Checked:
Approved:
Date: 15/02/2013
Drawing No. AME - 01319
Revision: F