



Hornsea Project Four: Environmental Statement (ES)

PINS Document Reference: A6.3.5
APFP Regulation 5(2)(a)

Volume A6, Annex 3.5: Great Crested Newt Environmental DNA (eDNA) Survey Report

Prepared Royal HaskoningDHV, July 2021
Checked Ant Sahota, Orsted, July 2021
Accepted Thomas Watts, Orsted, August 2021
Approved Julian Carolan, Orsted, September 2021

A6.3.5
Version B

Table of Contents

1	Introduction.....	5
1.1	Project Background.....	5
1.2	Aims	5
2	Legislation.....	6
3	Methodology.....	7
3.1	Study Area	7
3.2	Survey Methodology.....	7
3.2.1	Desk study	7
3.2.2	Field survey.....	9
3.2.3	Habitat Suitability Index Assessment	9
3.2.4	eDNA Survey Methodology.....	10
3.3	Limitations	11
4	Results.....	12
4.1	HSI Assessment Results.....	12
4.2	eDNA Survey Results	17
5	Conclusion.....	44
6	Proposed Mitigation.....	45
7	References	46

List of Tables

Table 1: Summary of key legislation and policy relevant to GCN.	6
Table 2: HSI score definitions.....	10
Table 3: Summary of 2019 and 2021 HSI Assessment.....	13
Table 4: Summary of eDNA Laboratory Analysis (for ponds subject to an eDNA sample as listed in Table 3).	17
Table 5: 2019 and 2021 GCN eDNA Survey Pond Descriptions and Photographs.....	56

List of Figures

Figure 1: GCN Study Area.....	8
Figure 2: GCN Survey Area and Pond Survey Access (Sheet 1 of 24).	20
Figure 3: GCN Survey Area and Pond Survey Access (Sheet 2 of 24).	21
Figure 4: GCN Survey Area and Pond Survey Access (Sheet 3 of 24).	22
Figure 5: GCN Survey Area and Pond Survey Access (Sheet 4 of 24).	23
Figure 6: GCN Survey Area and Pond Survey Access (Sheet 5 of 24).	24
Figure 7: GCN Survey Area and Pond Survey Access (Sheet 6 of 24).	25
Figure 8: GCN Survey Area and Pond Survey Access (Sheet 7 of 24).	26
Figure 9: GCN Survey Area and Pond Survey Access (Sheet 8 of 24).	27
Figure 10: GCN Survey Area and Pond Survey Access (Sheet 9 of 24).	28
Figure 11: GCN Survey Area and Pond Survey Access (Sheet 10 of 24).	29
Figure 12: GCN Survey Area and Pond Survey Access (Sheet 11 of 24).	30
Figure 13: GCN Survey Area and Pond Survey Access (Sheet 12 of 24).	31
Figure 14: GCN Survey Area and Pond Survey Access (Sheet 13 of 24).	32
Figure 15: GCN Survey Area and Pond Survey Access (Sheet 14 of 24).	33
Figure 16: GCN Survey Area and Pond Survey Access (Sheet 15 of 24).	34
Figure 17: GCN Survey Area and Pond Survey Access (Sheet 16 of 24).	35
Figure 18: GCN Survey Area and Pond Survey Access (Sheet 17 of 24).	36
Figure 19: GCN Survey Area and Pond Survey Access (Sheet 18 of 24).	37
Figure 20: GCN Survey Area and Pond Survey Access (Sheet 19 of 24).	38
Figure 21: GCN Survey Area and Pond Survey Access (Sheet 20 of 24).	39
Figure 22: GCN Survey Area and Pond Survey Access (Sheet 21 of 24).	40
Figure 23: GCN Survey Area and Pond Survey Access (Sheet 22 of 24).	41
Figure 24: GCN Survey Area and Pond Survey Access (Sheet 23 of 24).	42
Figure 25: GCN Survey Area and Pond Survey Access (Sheet 24 of 24).	43

Glossary

Term	Definition
Commitment	<p>A term used interchangeably with mitigation and enhancement measures. The purpose of Commitments is to reduce and/or eliminate Likely Significant Effects (LSEs), in EIA terms.</p> <p>Primary (Design) or Tertiary (Inherent) are both embedded within the assessment at the relevant point in the EIA (e.g. at Scoping, Preliminary Environmental Information Report (PEIR) or ES).</p> <p>Secondary commitments are incorporated to reduce LSE to environmentally acceptable levels following initial assessment i.e. so that residual effects are acceptable.</p>
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Projects (NSIP).
Energy balancing infrastructure (EBI)	The onshore substation includes energy balancing Infrastructure. These provide valuable services to the electrical grid, such as storing energy to meet periods of peak demand and improving overall reliability.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Statement (ES).
Environmental Statement (ES)	A document reporting the findings of the EIA and produced in accordance with the EIA Directive as transposed into United Kingdom (UK) law by the EIA Regulations
Export cable corridor (ECC)	The specific corridor of seabed (seaward of Mean High-Water Springs (MHWS)) and land (landward of MHWS) from the Hornsea Project Four array area to the Creyke Beck National Grid substation, within which the export cables will be located.
High Voltage Alternating Current (HVAC)	High voltage alternating current is the bulk transmission of electricity by alternating current (AC), whereby the flow of electric charge periodically reverses direction.
High Voltage Direct Current (HVDC)	High voltage direct current is the bulk transmission of electricity by direct current (DC), whereby the flow of electric charge is in one direction.
Hornsea Project Four Offshore Wind Farm	The term covers all elements of the project (i.e. both the offshore and onshore). Hornsea Four infrastructure will include offshore generating stations (wind turbines), electrical export cables to landfall, and connection to the electricity transmission network. Hereafter referred to as Hornsea Four.
Landfall	The generic term applied to the entire landfall area between Mean Low Water Spring (MLWS) tide and the Transition Joint Bay (TJB) inclusive of all construction works, including the offshore and onshore ECC, intertidal working area and landfall compound. Where the offshore cables come ashore east of Fraisthorpe.
Macrophyte	Macrophytes are aquatic plants growing in or near water. They may be either emergent (i.e. with portions above the water surface), submerged or floating.
National Grid Electricity Transmission (NGET) substation	The grid connection location for Hornsea Four at Creyke Beck.

Term	Definition
Onshore substation (OnSS)	Comprises a compound containing the electrical components for transforming the power supplied from Hornsea Project Four to 400 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid. If a HVDC system is used the OnSS will also house equipment to convert the power from HVDC to HVAC.
Order Limits	The limits within which Hornsea Project Four (the 'authorised project') may be carried out.
Orsted Hornsea Project Four Ltd.	The Applicant for the proposed Hornsea Project Four Offshore Wind Farm Development Consent Order (DCO).
Planning Inspectorate (PINS)	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).

Acronyms

Acronym	Definition
DCO	Development Consent Order
EA	Environment Agency
EBI	Energy Balancing Infrastructure
ECC	Export Cable Corridor
EclA	Ecological Impact Assessment
eDNA	Environmental DNA
EIA	Environmental Impact Assessment
EP1HS	Extended Phase 1 Habitat Survey
EPS	European Protected Species
ES	Environmental Statement
EU	European Union
GCN	Great Crested Newt
HSI	Habitat Suitability Index
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effect
NE	Natural England
NGET	National Grid Electricity Transmission
OnSS	Onshore Substation
OS	Ordnance Survey
PEIR	Preliminary Environmental Information Report
PRoW	Public Right of Way
RSPB	Royal Society for the Protection of Birds
YWT	Yorkshire Wildlife Trust

1 Introduction

1.1 Project Background

1.1.1.1 Orsted Hornsea Project Four Limited (the 'Applicant') is proposing to develop Hornsea Project Four Offshore Wind Farm (hereafter 'Hornsea Four'). Hornsea Four will be located approximately 69 km offshore the East Riding of Yorkshire in the Southern North Sea and will be the fourth project to be developed in the former Hornsea Zone. Hornsea Four will include both offshore and onshore infrastructure including an offshore generating station (wind farm), export cables to landfall, and on to an onshore substation (OnSS) with energy balancing infrastructure (EBI), and connection to the electricity transmission network.

1.1.1.2 Royal HaskoningDHV was commissioned to undertake a Great crested newt (GCN) *Triturus cristatus* survey within and around the Hornsea Four Order Limits (i.e. the landfall, onshore export cable corridor (ECC), OnSS including EBI and 400 kV National Grid Electricity Transmission (NGET) connection area). This technical annex has been produced to characterise the baseline environment to inform and support the ecological impact assessment set out in [Volume A3, Chapter 3: Ecology and Nature Conservation](#) of the Hornsea Four Environmental Statement (ES).

1.2 Aims

1.2.1.1 The aims of the GCN survey were to:

- Complete a Habitat Suitability Index (HSI) assessment of all identified ponds within and up to 250 m from the Hornsea Four Order Limits; and
- Collect an environmental DNA (eDNA) survey sample of all identified ponds where landowner access had been granted to determine the likely presence/absence of GCN.

1.2.1.2 The purpose of this report is to present the findings of the 2019 and 2021 Hornsea Four GCN survey and to provide an initial understanding of the presence or likely absence of GCN in ponds within 250 m of the Hornsea Four Order Limits.

1.2.1.3 This report has been prepared following the guidelines as set out in the Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidelines on Ecological Report Writing (CIEEM 2017).

2 Legislation

2.1.1.1 **Table 1** summarises the relevant policy and legislation relating to the legal protection afforded to GCN. It should be noted that this is for information only and is not intended to be comprehensive or to replace specialised legal advice.

Table 1: Summary of key legislation and policy relevant to GCN.

Legislation	Relevance
European Union (EU) Directive 92/43/EEC (The Habitats Directive) (Habitats Directive, 1992)	This Directive provides protection for specific habitats listed in Annex I and species listed in Annex II of the Directive. The Directive sets out decision making procedures for the protection of Special Areas of Conservation (SAC) and Special Protection Areas (SPA) and these are implemented in the United Kingdom (UK) through The Conservation of Habitats and Species Regulations 2017. GCN are listed on Annex II of this directive.
The Conservation of Habitats and Species Regulations 2017 (as amended) (Conservation of Habitats and Species Regulations, 2017)	Codifies the EU Directive 92/43/EEC (The Habitats Directive) into UK law; provides legal protection for European Protected Species (EPS). GCN are an EPS.
The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019,	Makes changes to the Conservation of Habitats and Species Regulations 2017 following the UK's exit from the European Union (EU).
Wildlife and Countryside Act 1981 (as amended) (WCA, 1981)	This Act makes it an offence to intentionally kill, injure or take any animal listed in Schedule 5 of the Act and protects occupied and unoccupied places used for shelter or protection. GCN are listed on Schedule 5 of this Act.
Natural Environment and Rural Communities Act 2006 (NERC, 2006)	Section 41 of the Act requires the Secretary of State to compile a list of habitats and species of principal importance for the conservation of biodiversity in England. Decision makers within public bodies, in the execution of their duties, must have regard to the conservation of biodiversity in England, and the list is intended to guide them. Natural England (NE) have compiled a list of species of Principal Importance and GCN are on this list.
Policy	Relevance
UK Post-2010 Biodiversity Framework (Joint Nature Conservation Committee (JNCC), 2012)	Supersedes the UK Biodiversity Action Plan (UK BAP), which fulfilled a legal obligation under the Convention on Biological Diversity to identify and produce action plans for priority habitats and species.

3 Methodology

3.1 Study Area

- 3.1.1.1 The Hornsea Four GCN study area consists of the landfall, onshore ECC, OnSS including EBI and the 400kV NGET connection area, which together comprise the onshore Hornsea Four Order Limits. An additional 250 m around all of these elements was included as current accepted research indicates that although GCN can travel up to 500 m from a breeding pond they are unlikely to do so where barriers to their movement may be present and if there are limited hibernation and/or foraging opportunities within 250 m of a breeding pond (Cresswell and Whitworth 2004).
- 3.1.1.2 The updated Extended Phase 1 Habitat Survey (EP1HS) undertaken in 2019 confirmed that the predominant habitat surveyed consisted of arable fields, either in crop or ploughed, which act as a natural barrier to GCN movement. This was discussed and confirmed in consultation with Natural England, The Yorkshire Wildlife Trust (YWT), the Royal Society for the Protection of Birds (RSPB) and the Environment Agency (EA) during the third Hornsea Four Ecology and Nature Conservation Evidence Plan meeting on 8th April 2019 (ON-ECO-1.6 and ON-ECO-1.8). Subsequent agreement was obtained from Natural England at the sixth Hornsea Four Ecology and Nature Conservation Evidence Plan meeting on the 1st April 2020 (ON-ECO-1.15).
- 3.1.1.3 For further details on the EP1HS see [Volume A6, Annex 3.1: Extended Phase 1 Habitat Survey Report](#) and [Volume A6, Annex 3.2 Extended Phase 1 Target Note Tables](#).
- 3.1.1.4 The Hornsea Four GCN study area is shown on [Figure 1](#).

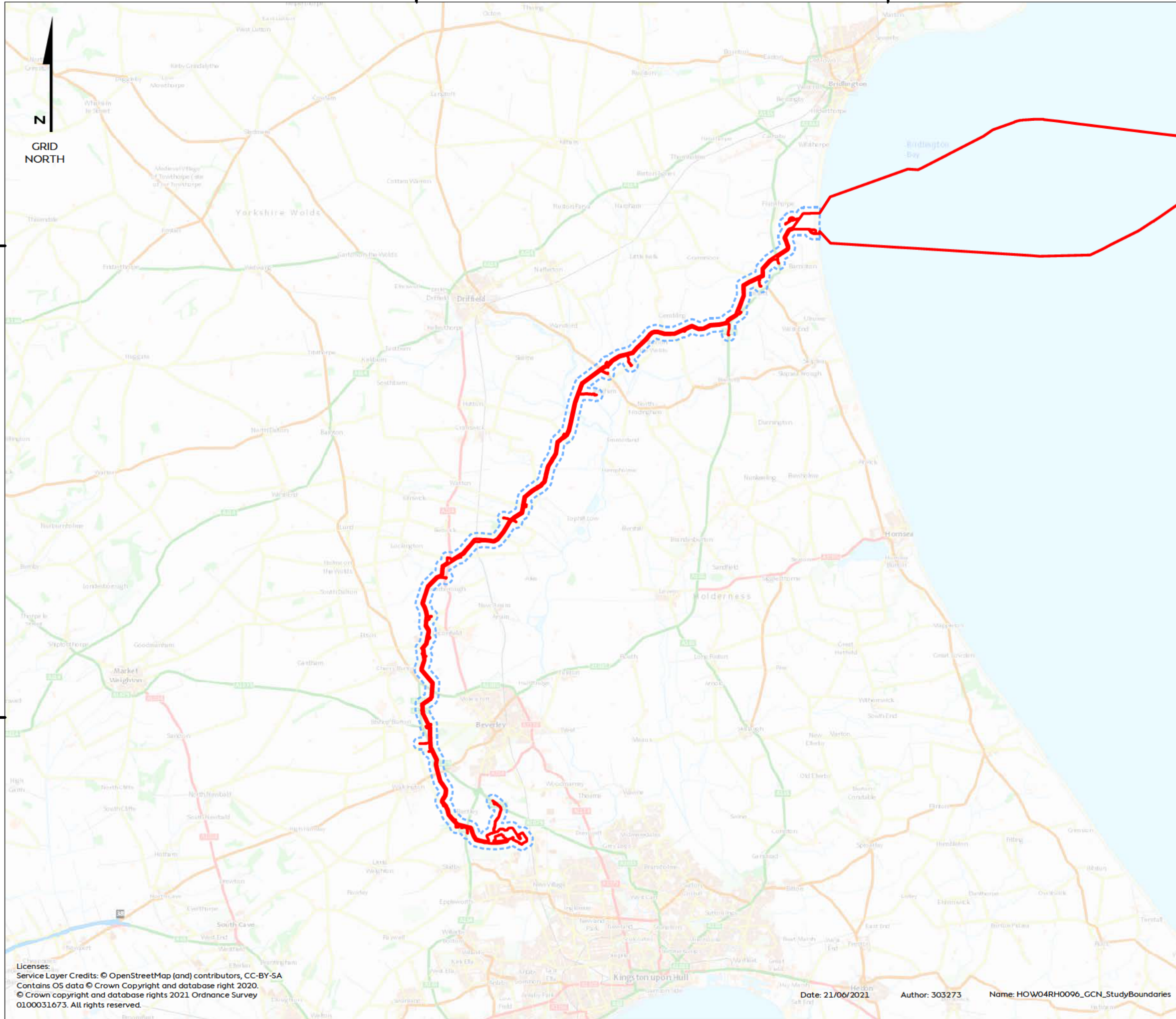
3.2 Survey Methodology

3.2.1 Desk study

- 3.2.1.1 Biological data received from the North and East Yorkshire Data Centre (NEYEDC) during the scoping stages, and more recently updated in April 2020, was reviewed for information on the presence of GCN within the Hornsea Four GCN study area (as set out in [Paragraph 3.1.1.1](#)). There is no specific date for determining that desk study records of a certain age are no longer valid, and therefore each record has been considered on its own merits. As the biological records data was updated in April 2020 it is therefore considered to remain valid.
- 3.2.1.2 Ordnance Survey (OS) mapping was then used to identify all ponds within the Hornsea Four GCN study area.

500000

520000

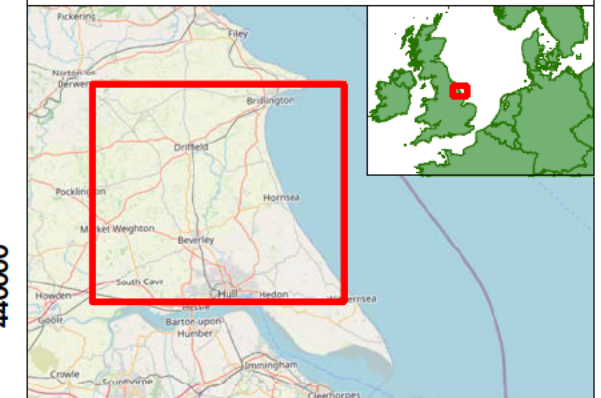


Hornsea Four

Figure 1

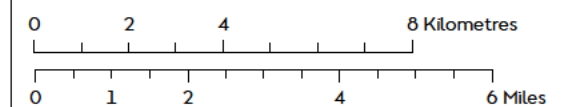
GCN Study Area

- Order Limits
- 250 m GCN Study Area



Coordinate system: British National Grid

Scale@A3: 1:160,000



REV	REMARK	DATE
	First Issue for PEIR	10/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
 Contains OS data © Crown Copyright and database right 2020.
 © Crown copyright and database rights 2021 Ordnance Survey
 0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0096_GCN_StudyBoundaries

Title: GCN Study Area
 Document no: HOW04RH0096
 Created by: AZ
 Checked by: CC
 Approved by: CS



500000

520000

460000

460000

440000

440000

3.2.2 Field survey

- 3.2.2.1 The GCN survey was undertaken using the eDNA approach (Briggs et al 2014). This is an approved and valid method for undertaking a GCN presence/absence survey and its use was discussed and agreed with Natural England, YWT, RSPB and the EA during the third Hornsea Four Ecology and Nature Conservation Evidence Plan meeting on the 8th April 2019 (ON-ECO-1.8). Subsequent agreement was obtained from Natural England at the sixth Hornsea Four Ecology and Nature Conservation Evidence Plan meeting on the 1st April 2020 (ON-ECO-1.15).
- 3.2.2.2 Surveys using the eDNA method have a benefit over more traditional surveys as they can be completed within a single visit to each water body at any point within the survey window which runs from mid-April until the end of June.
- 3.2.2.3 The 2019 GCN field survey was conducted in two stages, to accommodate the available survey access at the time. The first GCN eDNA survey was undertaken in April 2019 and a subsequent survey visit was undertaken in June 2019.
- 3.2.2.4 Landowner access was granted to 55 of the 62 ponds identified to be within and up to 250 m from the Hornsea Four Order Limits for the 2019 GCN eDNA survey effort. Therefore, seven ponds were unsurveyed in 2019. Ongoing consultation with landowners has been undertaken by The Applicant's land agents and consequently access to six of these seven ponds has since been granted and were subject to a HSI and eDNA survey in June 2021. A single pond (Pond A_27) remains unsurveyed due to no landowner permission being granted in 2019 or 2021

3.2.3 Habitat Suitability Index Assessment

- 3.2.3.1 All ponds surveyed for their potential to support GCN using the HSI were surveyed in accordance with standard methodology (Oldham et al. 2000). These HSI assessments were undertaken in April 2019, June 2019 and June 2021 by two GCN licensed ecologists with experience of undertaking HSI assessments.
- 3.2.3.2 Each HSI assessment considered the following ten standard habitat attributes that are considered to influence the suitability of a pond for breeding GCN:
- **Location** – within a UK-wide context reflecting the differences in national distribution of this species;
 - **Area** – water bodies between 100 and 300 m² in size are considered to represent the most suitable habitat for GCN;
 - **Drying** – occasional drying kills fish, which is beneficial for GCN, but the species predominantly favours ponds that do not dry out every year.
 - **Water quality** – qualitative evidence-based assessment to infer good (diverse aquatic invertebrate assemblage), moderate (moderate invertebrate diversity), poor (low invertebrate diversity, few submerged plants) or bad (clearly polluted) water quality.

- **Shade** – percentage of pond perimeter shaded to at least 1 m from the shore. GCN favour lightly shaded water bodies;
- **Waterfowl** – qualitative evidence-based assessment of presence or absence and numbers is made. Large numbers of waterfowl can result in nutrient enrichment of the water and habitat damage, which is less favourable for GCN;
- **Fish** – qualitative evidence-based assessment of likely presence or absence is made. GCN favour breeding ponds that do not support fish because their open-water swimming larvae are vulnerable to fish predation;
- **Number of waterbodies within 1 km** – GCN populations are typically best developed where they have access to a network of ponds, and therefore the species is more likely to be found where there are several ponds within 1 km that are linked by suitable terrestrial habitat; and
- **Macrophyte cover** – percentage of pond surface area occupied by macrophyte cover. Female GCN require aquatic vegetation for egg-laying.

3.2.3.3 An HSI score between 0 and 1 is then determined by scoring the pond against these 10 criteria. HSI scores give an approximate indication of habitat suitability as shown in [Table 2](#).

Table 2: HSI score definitions

HSI score	Definition
< 0.5	Poor
0.5-0.59	Below average
0.6-0.69	Average
0.7-0.79	Good
≥ 0.8	Excellent

3.2.3.4 Where a pond was not suitable to support GCN, no HSI assessment was undertaken and no eDNA survey was conducted. The rationale for such a determination includes:

- Pond not existing and/or no longer present;
- Pond fully dry at the time of the survey;
- Fishing ponds are not deemed suitable for GCN due to predation of young GCN by fish; and
- High concentration of ducks, geese or other waterfowl which result in high nutrient conditions in a waterbody, altering its ecological state towards eutrophication and reducing its viability for GCN.

3.2.4 eDNA Survey Methodology

3.2.4.1 Water samples were collected by Royal HaskoningDHV ecologists in April 2019, June 2019, and June 2021. The 2019 survey was undertaken by two GCN licenced ecologists, Charlotte Clements (survey class licence (Level 1) – Licence reference: 2016-25773-CLS-CLS) and Paul Hiscocks (survey class licence (Level 1) – Licence reference: 2015-18845-CLS-CLS). The 2021

survey was undertaken by Claire Smith (survey class licence (Level 1) – Licence reference: 2015-18666-CLS-CLS).

- 3.2.4.2 All samples were sent to Fera Science Limited for analysis for eDNA in accordance with the approved laboratory protocols (Briggs et al, 2014). No ponds were entered by the surveyors during collection of the water sample, in accordance with the eDNA survey methodology, and new sterile equipment supplied by Fera Science Limited was used to collect each water sample, to prevent contamination between samples. General site biosecurity measures were also adhered to during the survey, including boot disinfection (using Virkon S biosecurity tablets) and hand sanitisation.
- 3.2.4.3 The presence or absence of GCN from each of the surveyed ponds was determined based on the results of the eDNA analysis. If eDNA is detected, this provides confirmation of presence and the relevant ponds could represent a constraint that requires further consideration. If eDNA is not detected then it is considered that there is no reasonable likelihood of GCN being present in the relevant ponds, and they therefore require no further assessment with regards to GCN.

3.3 Limitations

- 3.3.1.1 At the time of the eDNA survey (i.e. April and June 2019), a total of 85 potential ponds were identified, the location of which are shown on [Figure 2](#) to [Figure 25](#). These 85 ponds formed the basis of the 2019 GCN eDNA survey. However, since this time, the Hornsea Four Order Limits have been refined and consequently the total number of ponds has been recalculated to include only those within 250 m of the Hornsea Four Order Limits.
- 3.3.1.2 The refinement of the Hornsea Four Order Limits has resulted in a total of 23 ponds being excluded as they are no longer present within the GCN study area, with no additional ponds identified. These 23 ponds are shown in [Table 3](#) and on [Figure 2](#) to [Figure 25](#) for completeness, although they are not considered further within this report. Of the 23 ponds that have now been removed from the Hornsea Four GCN study area, two ponds (namely Pond_A08 and Pond_A11) returned a positive eDNA result. However, as these two ponds are now located outside of the Hornsea Four GCN study area they are no longer considered within this report. The remaining 62 ponds are considered within this report.
- 3.3.1.3 Access was granted to a total of 55 ponds (out of the 62 ponds identified within the GCN study area) in April and June 2019. Of those 55 accessible ponds, 15 ponds were dry, and 9 ponds were recorded as no longer present. These ponds can be seen on [Figure 2](#) to [Figure 25](#). Furthermore, two ponds were inaccessible due to electric fencing and locked gates. However, a visual assessment was undertaken of these two ponds which noted that are both large fishing ponds with a high number of geese, swans and ducks as well as chickens foraging within the surrounding areas of grassland (see [Appendix B](#)). Considering these observations, both ponds were therefore assessed as being unsuitable for GCN and have not been considered or surveyed any further. As such, a total of 29 surveyed ponds were assessed for their potential to support GCN using the HSI (see [Section 3.2.3](#)) and were subsequently sampled for eDNA (see [Section 3.2.4](#)). A total of seven ponds were unable to

be surveyed for the presence of GCN in 2019 as access to these ponds was not granted at the time of the 2019 eDNA survey effort. However, ongoing consultation with landowners has been undertaken by The Applicant's land agents and access to six of these seven ponds has since been granted and were subject to a HSI and eDNA survey in June 2021. Therefore, a single pond (Pond A_27) remains unsurveyed due to no landowner permission being granted in 2019 or 2021.

- 3.3.1.4 The eDNA sampling technique does not enable an estimate of population size class. Instead the eDNA technique provides confirmation of presence or likely absence of GCN in the pond concerned. Pre-construction surveys will be undertaken using traditional survey methods in order to understand population sizes, for which the appropriate mitigation will apply. For further information on pre-construction surveys see [Volume F2, Chapter 3: Outline Ecological Management Plan](#) (oEMP). This approach was discussed and agreed with NE during the third Hornsea Four Ecology and Nature Conservation Evidence Plan Meeting held on the 8th April 2019 (ON-ECO-1.8). Subsequent agreement was obtained from Natural England at the sixth Hornsea Four Ecology and Nature Conservation Evidence Plan meeting on the 1st April 2020 (ON-ECO-1.15).
- 3.3.1.5 Based on Natural England's standing advice on GCN, the window for collecting eDNA samples is between the 15th April until the 30th June. All eDNA samples from 2019 or 2021 were collected during this period and therefore are compliant with the eDNA methodology and analysis.
- 3.3.1.6 For three ponds (Pond_A15, Pond_A30 and Pond_A31, see [Appendix B](#)) the photographs taken during the survey were corrupted beyond recovery. No additional photographs of these ponds were requested by consultees during consultation, and therefore none are proposed to be taken prior to submission of the ES. As set out in [Paragraph 6.1.1.3](#) a pre-construction survey will be undertaken for all ponds within the GCN study area. All photographs were taken with an iPad 8 megapixel camera ($f/2.4$ aperture).

4 Results

4.1 HSI Assessment Results

- 4.1.1.1 The results of the 2019 and 2021 HSI assessment are shown in [Table 3](#). For completeness, all 85 ponds originally identified prior to the refinement of the Hornsea Four Order Limits have been included in the table and where a pond was not subject to the HSI assessment (or subsequent eDNA sampling) a justification is provided. All ponds that were subject to the HSI assessment and subsequent eDNA sampling are highlighted in green in [Table 3](#) and are shown on [Figure 2](#) to [Figure 25](#) in this report. All ponds that are no longer within the GCN study area as a result of the refinement of the Hornsea Four Order Limits are highlighted in grey.

Table 3: Summary of 2019 and 2021 HSI Assessment.

Pond reference	Description	HSI Score	Scoped in to eDNA Survey (Yes/No)
Pond_A01	Small pond on field margin closed with vegetation. Very little open water. No feed, rainwater only.	0.50	Yes
Pond_A02	Large pond dries to edges. Set in BL woodland, only centre of pond has water (30 x 15). Rainwater fed.	0.68	Yes
Pond_A03	Dry pond	n/a	No
Pond_A04	Dry pond	n/a	No
Pond_A05	Dry pond	n/a	No
Pond_A06	Small pond in garden. Detritus and leaf litter on pond bottom. Lily, bramble, hawthorn, beech, field maple, ash and dock leaf were all present.	0.65	Yes
Pond_A07	Large pond within gardens. Bulrush and glyceria present around edges, soft rush. Fenced, mowed short sward grass.	0.75	Yes
Pond_A08	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A09	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A10	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A11	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A12	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A13	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A14	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A15	Dry pond.	n/a	n/a
Pond_A16	Dry pond.	n/a	No
Pond_A17	Dry pond.	n/a	No
Pond_A18	Large pond within grassland, majority of bank covered in glyceria, island in middle of pond. Good connectivity to A_06 and A_07. 2 eDNA kits used.	0.83	Yes
Pond_A19	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a

Pond reference	Description	HSI Score	Scoped in to eDNA Survey (Yes/No)
Pond_A20	Large pond in small woodland. Highly overgrown and therefore difficult to access. Very little marginal vegetation.	0.66	Yes
Pond_A21	Round ornamental pond in garden surrounded by iris and rush pond weed. Pond and duck weed also present.	0.69	Yes
Pond_A22	Large pond with a gravel base, remnant from sand/gravel extraction. Clear water with little vegetation. Edges dominated by iris, bulrush and willow scrub. Connecting habitat between this pond and other ponds in the wider area.	0.66	Yes
Pond_A23	L shaped pond remnant from sand/gravel extraction (as Pond_A22). Surrounded by semi-improved grassland comprising birds foot trefoil, cock's foot and teasel. Good connectivity to other ponds.	0.69	Yes
Pond_A24	Pond in centre of woodland. Pondweed, iris and bulrush. Water quality good, excellent connectivity to surrounding terrestrial habitats.	0.84	Yes
Pond_A25	No access - fishing pond with high concentration of ducks and geese, fenced and locked. Deemed to be unsuitable for GCN.	n/a	n/a
Pond_A26	No access - fishing pond with high concentration of ducks and geese, fenced and locked. Deemed to be unsuitable for GCN.	n/a	n/a
Pond_A27	No access granted at the time of the survey.	n/a	n/a
Pond_A28	Dry pond.	n/a	No
Pond_A29	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A30	Dry pond.	n/a	No
Pond_A31	Dry pond.	n/a	No
Pond_A32	Round ornamental pond in front of factory. Steep sided naturally fed with lots of invertebrates, small fish present and water lily abundant.	0.70	Yes
Pond_A33	Large pond once stocked with trout, little vegetation in bottom, spring fed with a gravel bottom.	0.85	Yes
Pond_A33a	Small man-made pond approximately 100 m from onshore cable route. Overgrown with duckweed, iris and bulrush.	0.64	Yes
Pond_A34	Dry pond.	n/a	No
Pond_A35	Dry pond	n/a	No
Pond_A36	Scape in the ground in the centre of a field completely covered in vegetation. Small areas of standing water.	0.42	Yes
Pond_A37	No pond present.	n/a	No
Pond_A38	No pond present.	n/a	No
Pond_A39	No pond present.	n/a	No
Pond_A40	No pond present.	n/a	No

Pond reference	Description	HSI Score	Scoped in to eDNA Survey (Yes/No)
Pond_A41	No pond present.	n/a	No
Pond_A42	No pond present.	n/a	No
Pond_A43	Linear spring fed stream, slight slow flow towards Bealeys Beck within a plantation woodland.	0.70	Yes
Pond_A44	Small, heavily shaded pond at edge of arable fields, adjacent to hedgerow and public right of way, feeds into ditch, partially dry.	0.61	Yes
Pond_A45	Dry pond.	n/a	No
Pond_A46	No pond present.	n/a	No
Pond_A47	Small pond/hollow within an arable field completely covered in vegetation/buttercup and dog rose. Water 5 to 8 cm deep.	0.52	Yes
Pond_A48	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A49	Dry pond	n/a	No
Pond_A50	Small pond within woodland (habitat rich, potentially ancient woodland); glyceria duckweed, sycamore, field maple, willow, ramsons, nettle, bramble, red-dead nettle, white-dead nettle, bluebells, red campion, forget me not, lesser celandine, ground ivy.	0.55	Yes
Pond_A51	Pear shaped ornamental pond (lined). Few iris and bulrush planted around edge. Bitumen lined with large fish ad moorhen present. Mowed lawns surround.	0.53	Yes
Pond_A52	Small round pond fed by pipe under the road/runoff. Steep bank with no vegetation.	0.44	Yes
Pond_A53	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A54	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A55	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A56	Dry pond	n/a	No
Pond_A57	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A58	Medium sized fishpond within animal paddock surrounded by alder, bramble and nettle.	0.33	Yes
Pond_A59	No pond present.	n/a	No
Pond_A60	Medium pond within garden and fenced horse paddock. Willow, hawthorn, broad leaf dock, glyceria, bulrush, soft rush. Common frogs present.	0.84	Yes

Pond reference	Description	HSI Score	Scoped in to eDNA Survey (Yes/No)
Pond_A61	Small pond in woodland adjacent to grassland. Sycamore, bramble, ribwort plantain, nettle, cow parsley, cleavers, dog mercury. Shallow pond approximately 15 cm deep	0.74	Yes
Pond_A62	Small pond in woodland, some aquatic vegetation at margins.	0.71	Yes
Pond_A63	Small ephemeral pond between arable fields and a Public Right of Way (PRoW). Water mint present, broad leaf dock, nettle, bramble, hawthorn and sycamore.	0.56	Yes
Pond_A64	Medium pond at corner of arable field adjacent to PRoW, hedgerows, grassy field margins. Bulrush dominant throughout, bramble, nettle and hawthorn.	0.86	Yes
Pond_A65	Small pond at edge of arable field with wide field margins and hedgerow, tadpoles present. Bulrush, glyceria, hawthorn, soft rush and dandelion.	0.69	Yes
Pond_A66	Small pond at edge of arable field with wide grassy margins and scrub vegetation. Bulrush and glyceria throughout.	0.81	Yes
Pond_A67	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A68	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A69	No pond present.	n/a	No
Pond_A70	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A71	Medium pond located to the east of a residential property but within arable surrounding. Pond is located adjacent to hard standing and public footpath. Pond is shaded and steep backed with key scrub species (e.g. hawthorn, nettle) present.	0.72	Yes
Pond_A72	Small pond at confluence of arable fields, ditch and PRoW. Yellow flag iris, cherry trees, hawthorn, nettle, cow parsley.	0.76	Yes
Pond_A73	Large pond within golf course.	0.67	Yes
Pond_A74	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A75	Pond within golf course	0.67	Yes
Pond_A76	Small pond within golf course	0.58	Yes
Pond_A77	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A78	Pond within golf course	0.69	Yes
Pond_A79	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a

Pond reference	Description	HSI Score	Scoped in to eDNA Survey (Yes/No)
Pond_A80	Pond within golf course	0.84	Yes
Pond_A81	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A82	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A83	No longer within the GCN study area, therefore not considered further in this report.	n/a	n/a
Pond_A84	Dry pond	n/a	No

4.2 eDNA Survey Results

4.2.1.1 All 35 ponds subject to an HSI assessment (as listed in [Table 3](#)) were then subject to the collection of water samples which were subsequently sent for laboratory eDNA analysis. A summary of the results of the eDNA analysis for each pond is summarised in [Table 4](#), with full laboratory analysis results provided in [Appendix A. Table 4](#) should be read in conjunction with [Figure 2](#) to [Figure 25](#).

Table 4: Summary of eDNA Laboratory Analysis (for ponds subject to an eDNA sample as listed in Table 3).

Pond reference	eDNA Result	FERA (laboratory) reference
Pond_A01	Negative	S19-015705
Pond_A02	Negative	S19-015703
Pond_A06	Negative	S19-015702
Pond_A07	Negative	S19-015688
Pond_A08	No longer within the GCN study area, therefore not considered further in this report.	n/a
Pond_A11	No longer within the GCN study area, therefore not considered further in this report.	n/a
Pond_A12	No longer within the GCN study area, therefore not considered further in this report.	n/a
Pond_A13	No longer within the GCN study area, therefore not considered further in this report.	n/a
Pond_A18	Negative	S19-015704

<i>Pond reference</i>	<i>eDNA Result</i>	<i>FERA (laboratory) reference</i>
Pond_A20	Negative	S19-015714
Pond_A21	Negative	S19-015783
Pond_A22	Negative	S19-015786
Pond_A23	Negative	S19-015781
Pond_A24	Negative	S19-015787
Pond_A29	No longer within the GCN study area, therefore not considered further in this report.	n/a
Pond_A32	Positive	S19-015680
Pond_A33	Negative	S19-015682
Pond_A33a	Inconclusive	S10-015697
Pond_A36	Negative	S19-015681
Pond_A43	Negative	S19-015689
Pond_A44	Negative	S19-015698
Pond_A47	Negative	S19-015684
Pond_A48	No longer within the GCN study area, therefore not considered further in this report.	n/a
Pond_A50	Negative	S19-015690
Pond_A51	Negative	S19-015691
Pond_A52	Negative	S19-015695
Pond_A53	No longer within the GCN study area, therefore not considered further in this report.	n/a
Pond_A54	No longer within the GCN study area, therefore not considered further in this report.	n/a
Pond_A55	No longer within the GCN study area, therefore not considered further in this report.	n/a
Pond_A57	No longer within the GCN study area, therefore not considered further in this report.	n/a
Pond_A58	Negative	S19-015686
Pond_A60	Negative	S19-015711
Pond_A61	Negative	S19-015788
Pond_A62	Negative	S19-015785
Pond_A63	Negative	S19-015800
Pond_A64	Negative	S19-015708

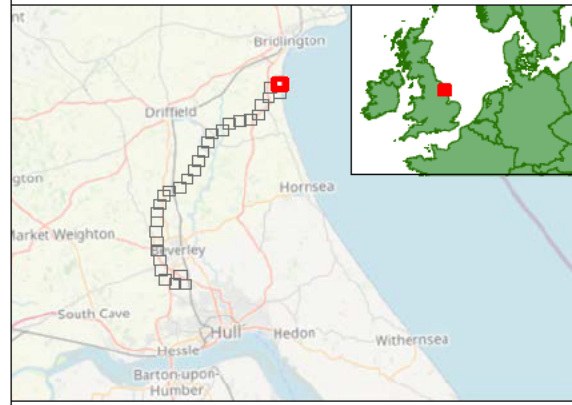
<i>Pond reference</i>	<i>eDNA Result</i>	<i>FERA (laboratory) reference</i>
Pond_A65	Negative	S19-015799
Pond_A66	Negative	S19-015779
Pond_A68	No longer within the GCN study area, therefore not considered further in this report.	n/a
Pond_A70	No longer within the GCN study area, therefore not considered further in this report.	n/a
Pond_A71	Negative	S21-012407
Pond_A72	Negative	S19-015793
Pond_A73	Negative	S21-012409
Pond_A75	Negative	S21-012408
Pond_A76	Negative	S21-012412
Pond_A78	Negative	S21-012411
Pond_A80	Negative	S21-012413
Pond_A82	No longer within the GCN study area, therefore not considered further in this report.	n/a



Hornsea Four

Figure 2
GCN Survey Area and Pond
Survey Access - Sheet 1 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- Samples collected - Negative Result



Coordinate system: British National Grid
Scale@A3: 1:5,000

0 100 200 Metres


0 50 100 200 Yards

REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021 Ordnance Survey
0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNA Survey Report

Title: GCN Study area and pond survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS

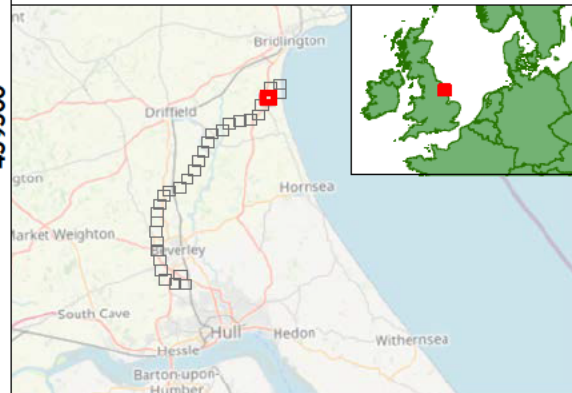




Hornsea Four

Figure 3
GCN Survey Area and Pond
Survey Access - Sheet 2 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- No Pond or Pond Dry
 - Samples collected - Negative Result



Coordinate system: British National Grid
Scale@A3: 1:5,000

REV	REMARK	DATE
	First issue for PER	16/07/2019
A	Updated following PER consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021. Ordnance Survey
0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport

Title: GCN Study area and pond
survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS



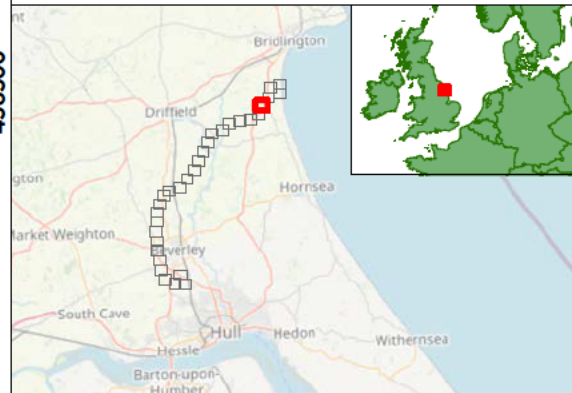
Hornsea Four

Figure 4
GCN Survey Area and Pond
Survey Access - Sheet 3 of 24

- Order Limits
- 250 m GCN Study Area

Pond Survey Result

- No Pond or Pond Dry



Coordinate system: British National Grid
Scale@A3: 1:5,000

0 100 200 Metres

0 50 100 200 Yards

REV	REMARK	DATE
	First issue for PER	16/07/2019
A	Updated following PER consultations, for DCO	21/06/2021

Title: GCN Study area and pond survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS



Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021. Ordnance Survey 0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCN_GCNeDNASurveyReport

511000

511500

512000



Hornsea Four

Figure 5 GCN Survey Area and Pond Survey Access - Sheet 4 of 24

- Order Limits
- 250 m GCN Study Area
- Pond Survey Result**
- No Pond or Pond Dry
- Samples collected - Negative Result
- Pond no longer within GCN Study Area

457000
GRID NORTH

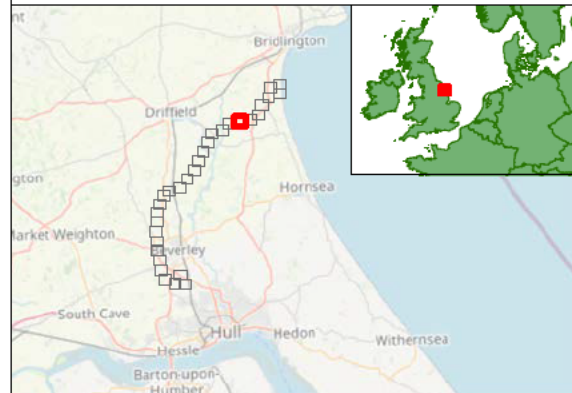
457000

456500

456500

456000

456000



Coordinate system: British National Grid
 Scale@A3: 1:5,000

0 100 200 Metres


0 50 100 200 Yards

REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Licenses:
 Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
 Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
 USDA, USGS, AeroGRID, IGN, and the GIS User Community
 © Crown copyright and database rights 2021 Ordnance Survey
 0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport

Title: GCN Study area and pond survey access
 Document no: HOW04RH0042
 Created by: AZ
 Checked by: CC
 Approved by: CS



511000

511500

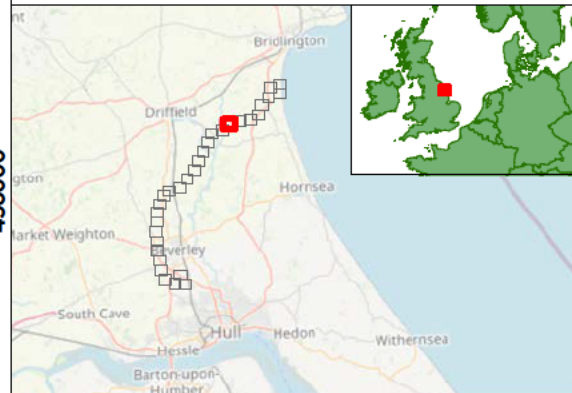
512000



Hornsea Four

Figure 6
GCN Survey Area and Pond
Survey Access - Sheet 5 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- Samples collected - Negative Result
 - Pond no longer within GCN Study Area



Coordinate system: British National Grid
Scale@A3: 1:5,000

0 100 200 Metres


0 50 100 200 Yards

REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021 Ordnance Survey
0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport

Title: GCN Study area and pond
survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS



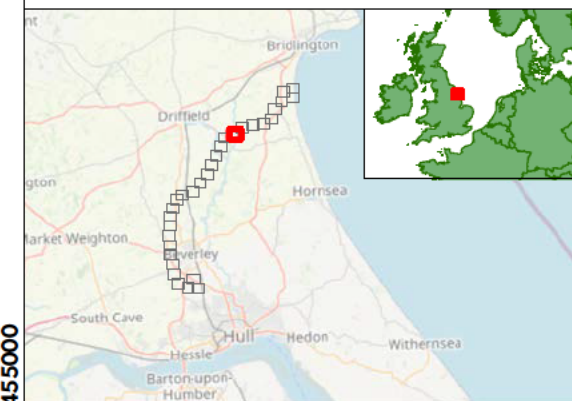


Hornsea Four

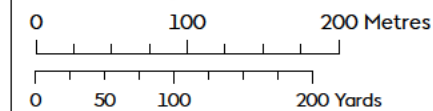
Figure 7

GCN Survey Area and Pond Survey Access - Sheet 6 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- Samples collected - Negative Result



Coordinate system: British National Grid
Scale@A3: 1:5,000



REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Title: GCN Study area and pond survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS



Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021. Ordnance Survey 0100031673. All rights reserved.

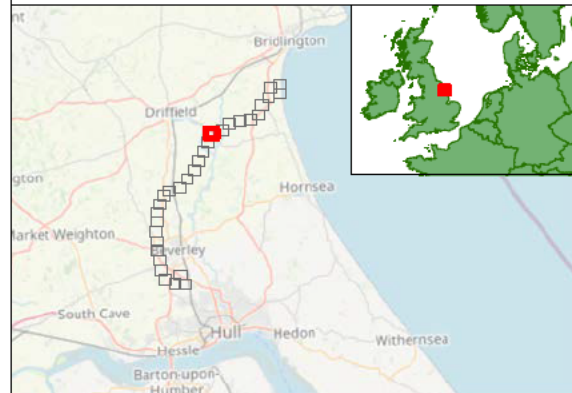
Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport



Hornsea Four

Figure 8
GCN Survey Area and Pond
Survey Access - Sheet 7 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- No Access
 - Samples collected - Negative Result



Coordinate system: British National Grid
Scale@A3: 1:5,000

REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021. Ordnance Survey
0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNA_SurveyReport

Title: GCN Study area and pond survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS



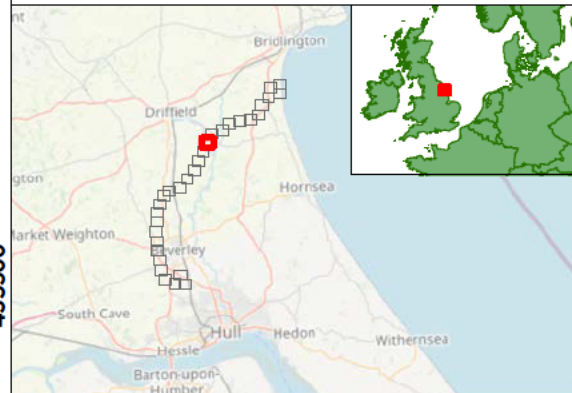
Hornsea Four

Figure 9
GCN Survey Area and Pond
Survey Access - Sheet 8 of 24

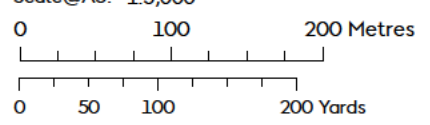
- Order Limits
- 250 m GCN Study Area

Pond Survey Result

- No Access



Coordinate system: British National Grid
Scale@A3: 1:5,000



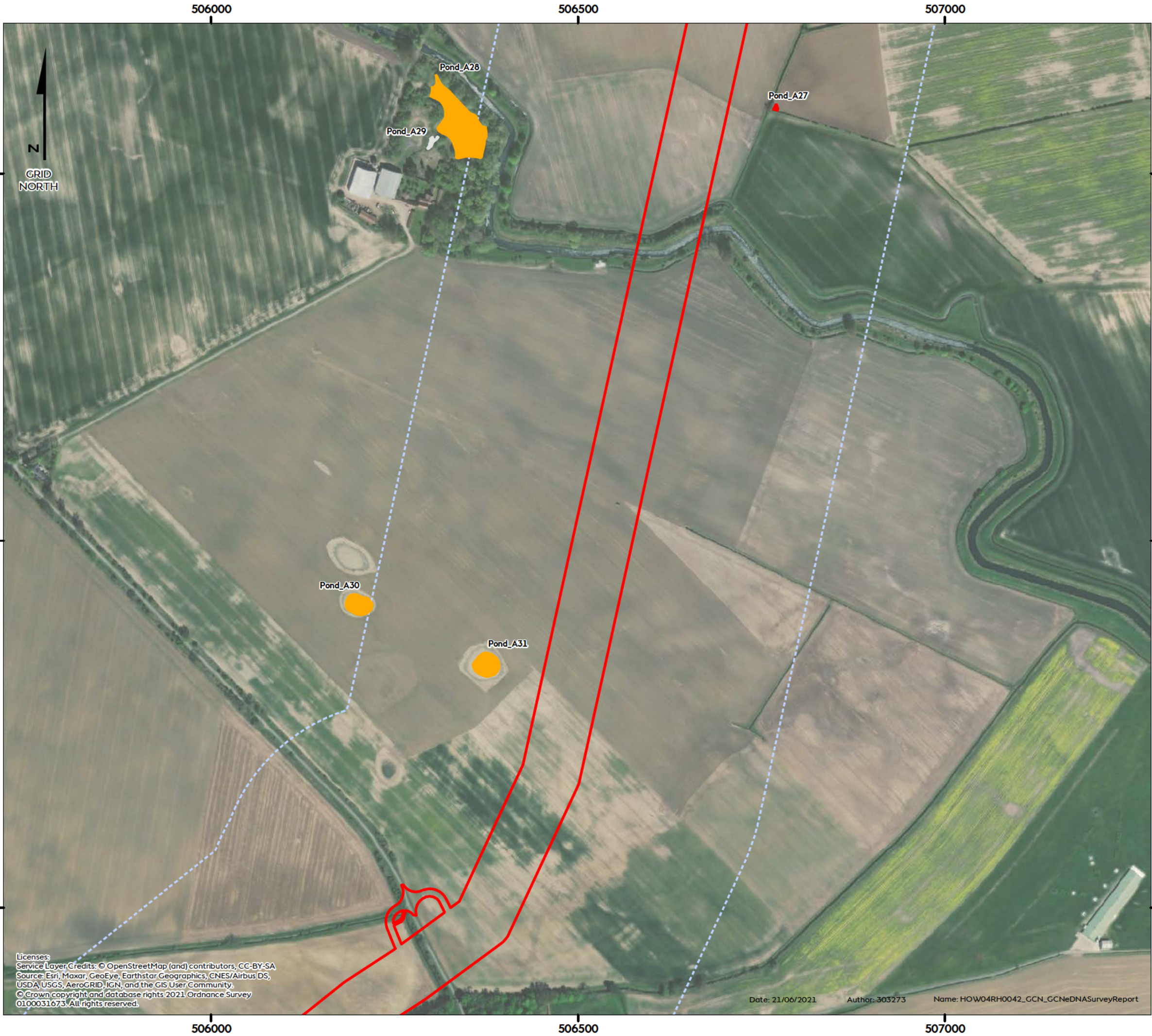
REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Title: GCN Study area and pond
survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS



Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021 Ordnance Survey
0100031673. All rights reserved.

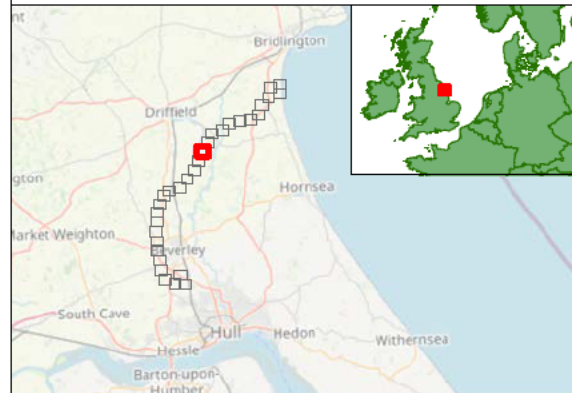
Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport



Hornsea Four

Figure 10
GCN Survey Area and Pond Survey Access - Sheet 9 of 24

- Order Limits
- 250 m GCN Study Area
- Pond Survey Result**
- No Access
- No Pond or Pond Dry
- Pond no longer within GCN Study Area



Coordinate system: British National Grid
Scale@A3: 1:5,000

0 100 200 Metres

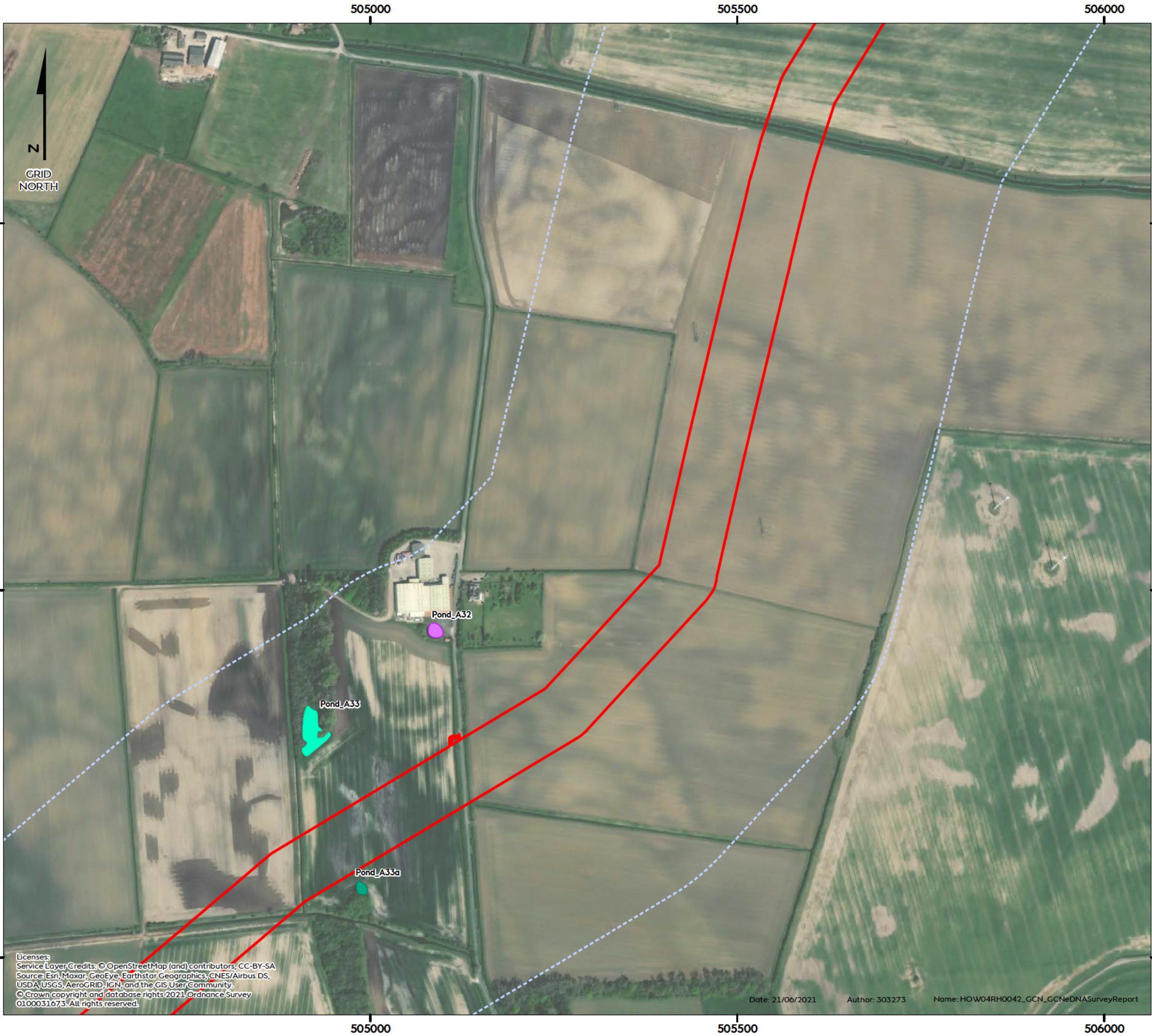
0 50 100 200 Yards

REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021 Ordnance Survey 0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport

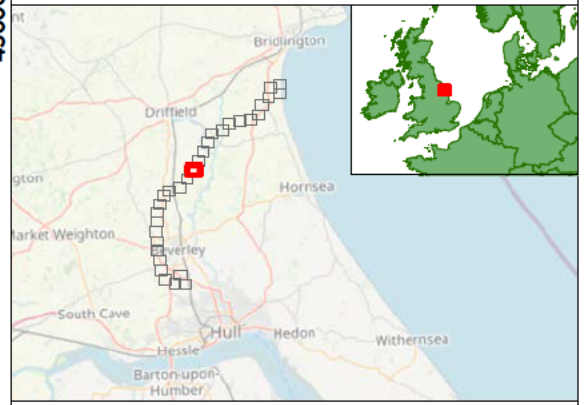
Title: GCN Study area and pond survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS



Hornsea Four

Figure 11
GCN Survey Area and Pond
Survey Access - Sheet 10 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- Samples collected - Negative Result
 - Samples collected - Positive Result
 - Samples collected - Results Inconclusive



Coordinate system: British National Grid
Scale@A3: 1:5,000

0 100 200 Metres



0 50 100 200 Yards

REV	REMARK	DATE
	First issue for PER	16/07/2019
A	Updated following PER consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA/USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021. Ordnance Survey
0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport

Title: GCN Study area and pond
survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS

504000

504500

505000

449500

449500

449000

449000

448500

448500

504000

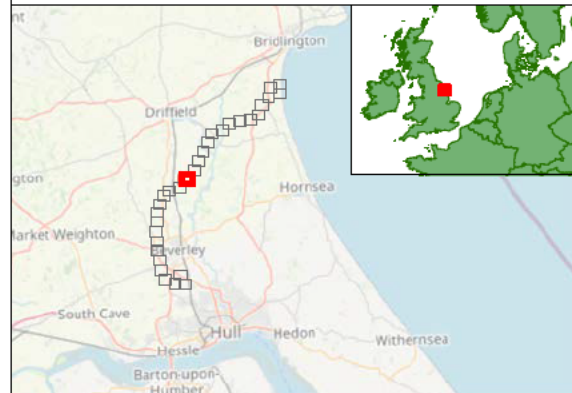
504500

505000

Hornsea Four

Figure 12 GCN Survey Area and Pond Survey Access - Sheet 11 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- No Pond or Pond Dry
 - Samples collected - Results Inconclusive



Coordinate system: British National Grid
 Scale@A3: 1:5,000

REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Title: GCN Study area and pond survey access
 Document no: HOW04RH0042
 Created by: AZ
 Checked by: CC
 Approved by: CS

Licenses:
 Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
 Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
 USDA, USGS, AeroGRID, IGN, and the GIS User Community
 © Crown copyright and database rights 2021. Ordnance Survey
 0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCN_GCNeDNASurveyReport

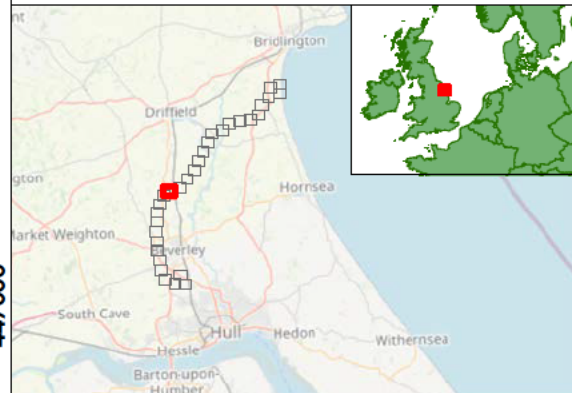




Hornsea Four

Figure 13
GCN Survey Area and Pond
Survey Access - Sheet 12 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- Samples collected - Negative Result



Coordinate system: British National Grid
Scale@A3: 1:5,000

REV	REMARK	DATE
	First issue for PER	16/07/2019
A	Updated following PER consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021. Ordnance Survey
0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport

Title: GCN Study area and pond
survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS



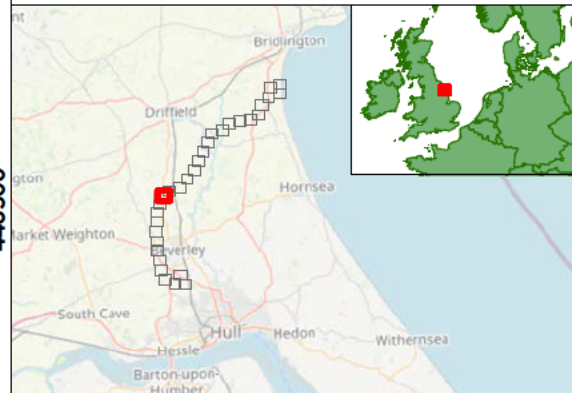
Hornsea Four

Figure 14
GCN Survey Area and Pond
Survey Access - Sheet 13 of 24

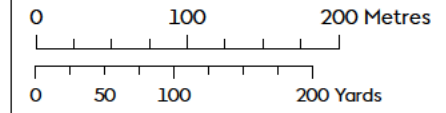
- Order Limits
- 250 m GCN Study Area

Pond Survey Result

- No Pond or Pond Dry



Coordinate system: British National Grid
Scale@A3: 1:5,000





REV	REMARK	DATE
	First issue for PER	16/07/2019
A	Updated following PER consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021 Ordnance Survey
0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport

Title: GCN Study area and pond
survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS

500500

501000

501500

446000

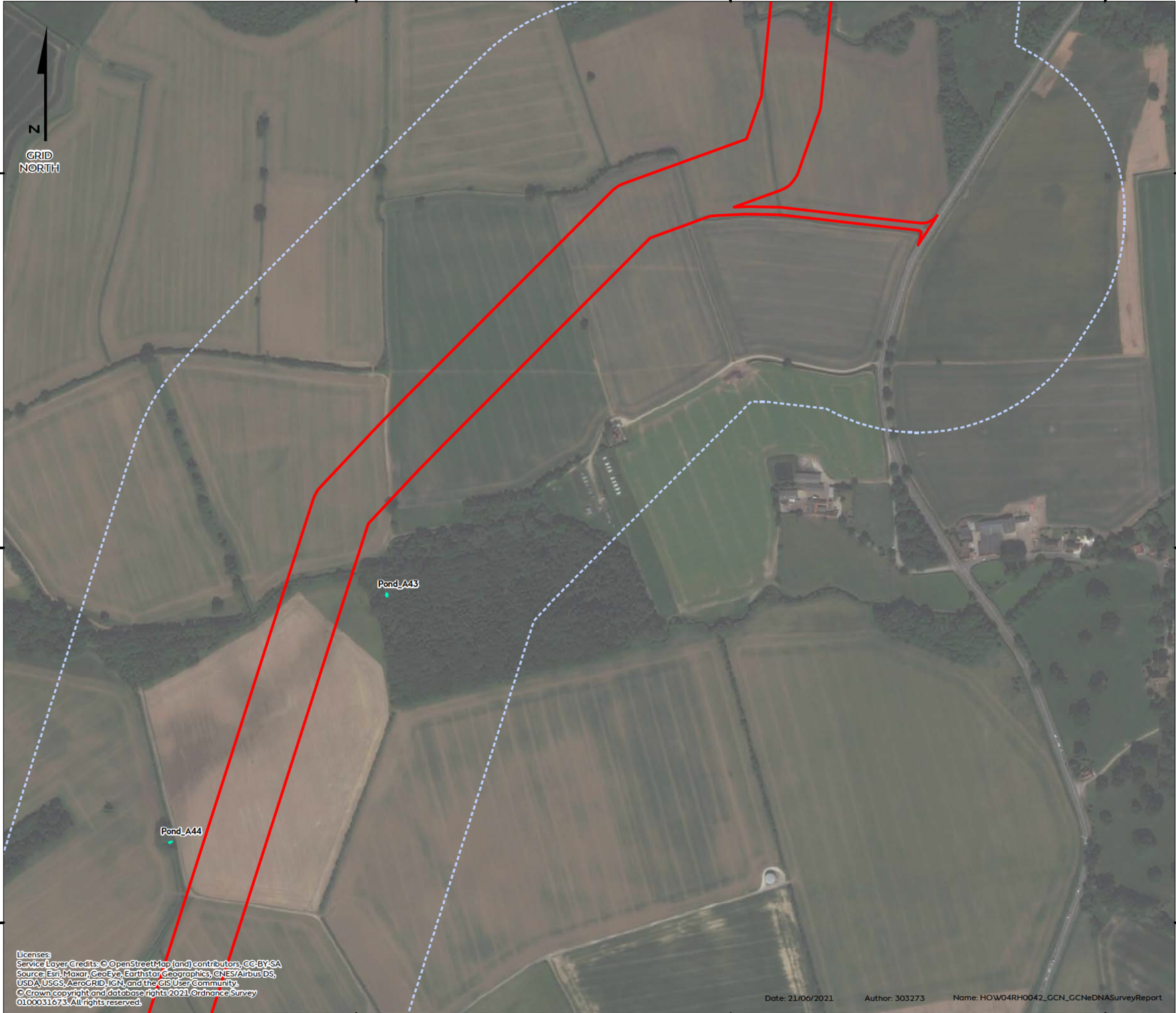
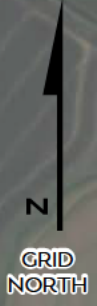
445500

445000

446000

445500




445000

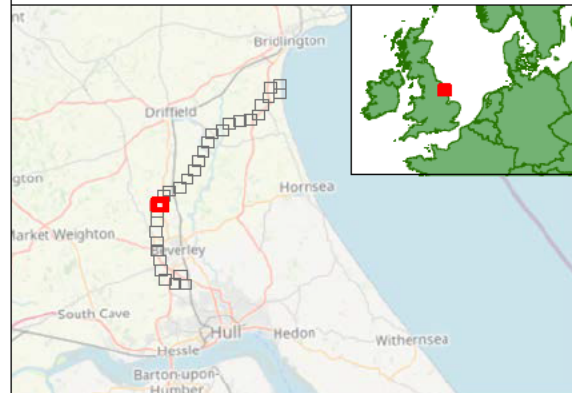


Hornsea Four

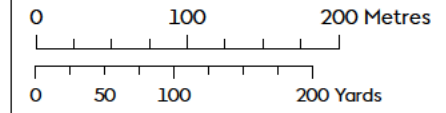
Figure 15

GCN Survey Area and Pond Survey Access - Sheet 14 of 24

-  Order Limits
 -  250 m GCN Study Area
- Pond Survey Result**
-  Samples collected - Negative Result



Coordinate system: British National Grid
Scale@A3: 1:5,000





REV	REMARK	DATE
	First issue for PER	16/07/2019
A	Updated following PER consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021. Ordnance Survey
0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport

Title: GCN Study area and pond survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS

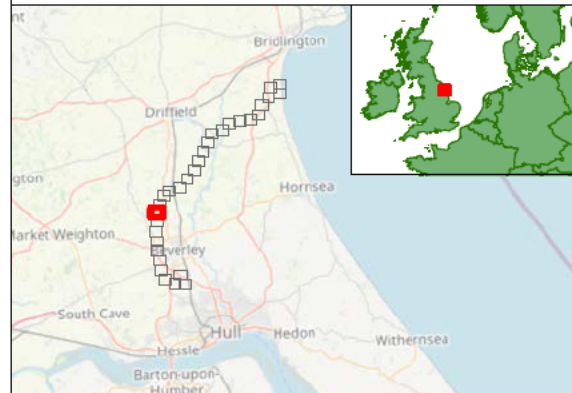





Hornsea Four

Figure 16
GCN Survey Area and Pond
Survey Access - Sheet 15 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- Samples collected - Negative Result



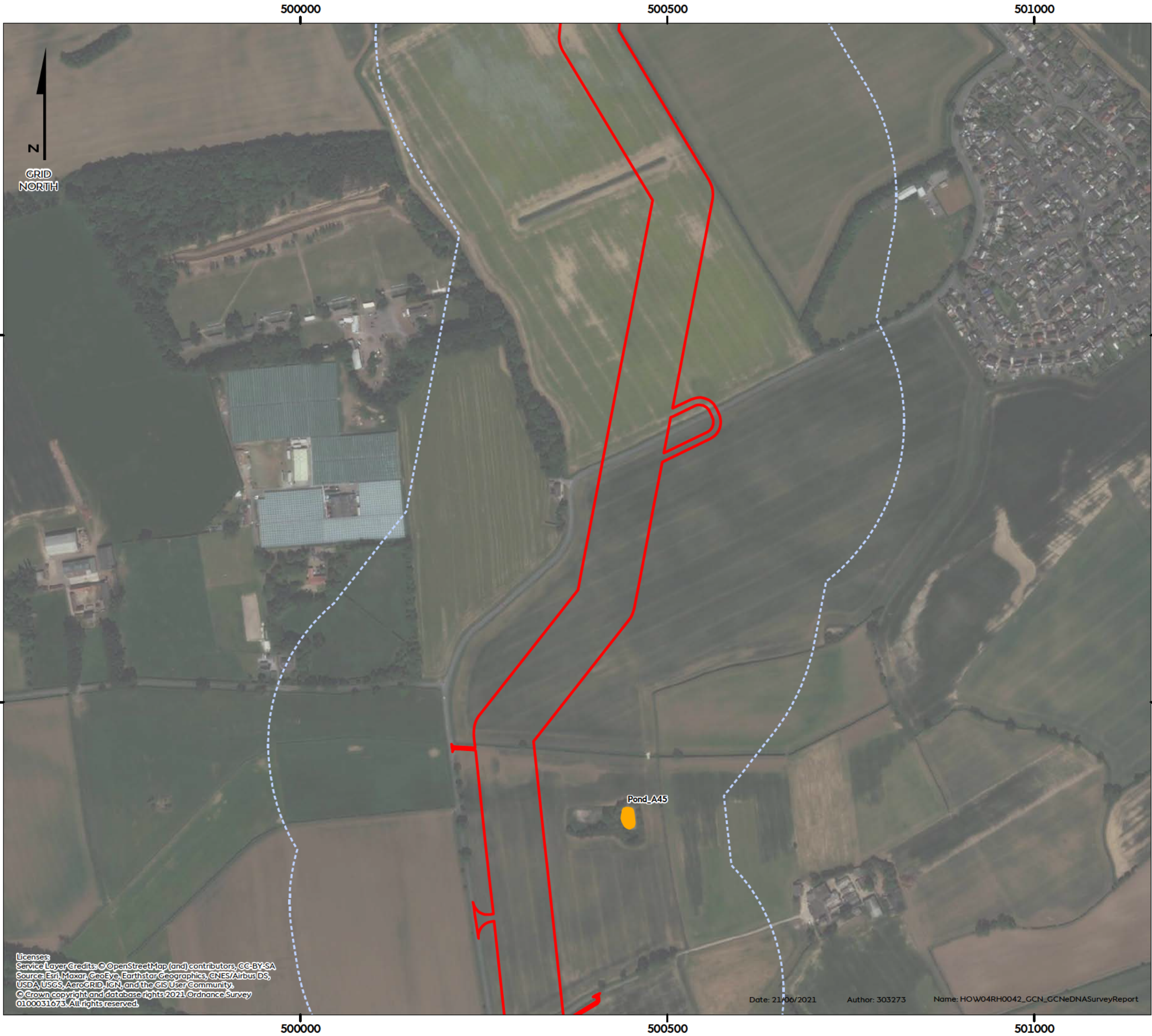
Coordinate system: British National Grid
Scale@A3: 1:5,000

REV	REMARK	DATE
	First issue for PER	16/07/2019
A	Updated following PER consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021. Ordnance Survey
0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport

Title: GCN Study area and pond
survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS



Hornsea Four

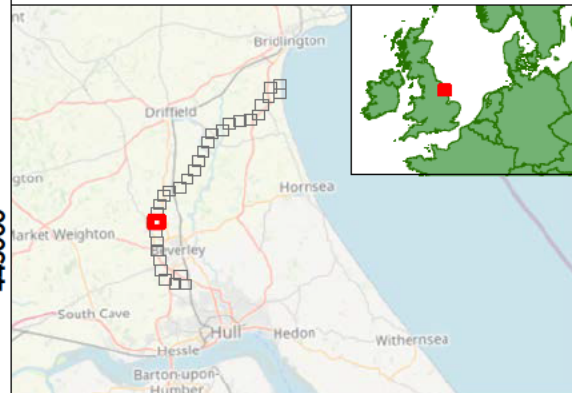
Figure 17

GCN Survey Area and Pond Survey Access - Sheet 16 of 24

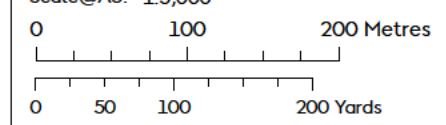
- Order Limits
- 250 m GCN Study Area

Pond Survey Result

- No Pond or Pond Dry



Coordinate system: British National Grid
Scale@A3: 1:5,000



REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021. Ordnance Survey
0100031673. All rights reserved.





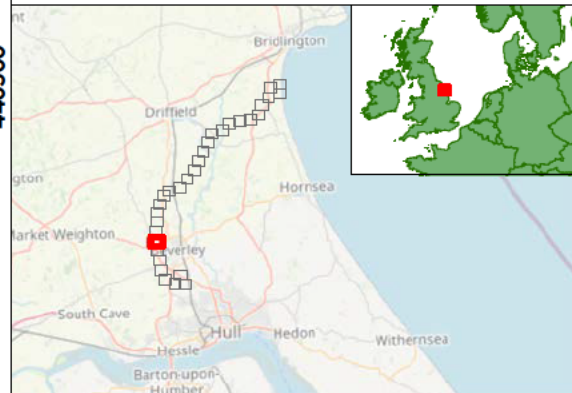
Hornsea Four

Figure 18
GCN Survey Area and Pond
Survey Access - Sheet 17 of 24

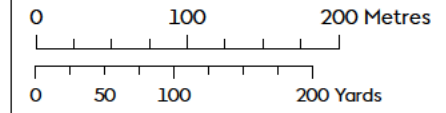
- Order Limits
- 250 m GCN Study Area

Pond Survey Result

- No Pond or Pond Dry



Coordinate system: British National Grid
Scale@A3: 1:5,000



REV	REMARK	DATE
	First issue for PER	16/07/2019
A	Updated following PER consultations, for DCO	21/06/2021

Title: GCN Study area and pond
survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS



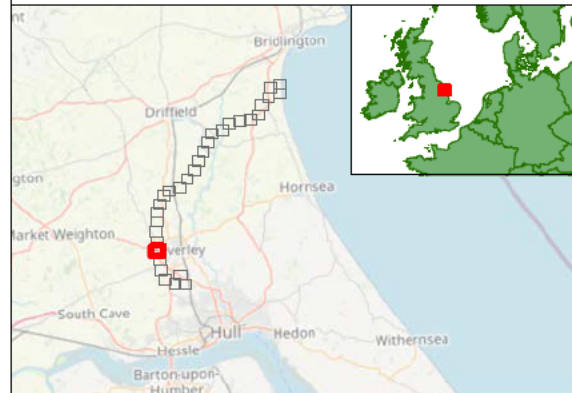
Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021. Ordnance Survey
0100031673. All rights reserved.



Hornsea Four

Figure 19
GCN Survey Area and Pond
Survey Access - Sheet 18 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- Samples collected - Negative Result
 - Pond no longer within GCN Study Area



Coordinate system: British National Grid
Scale@A3: 1:5,000

0 100 200 Metres


0 50 100 200 Yards

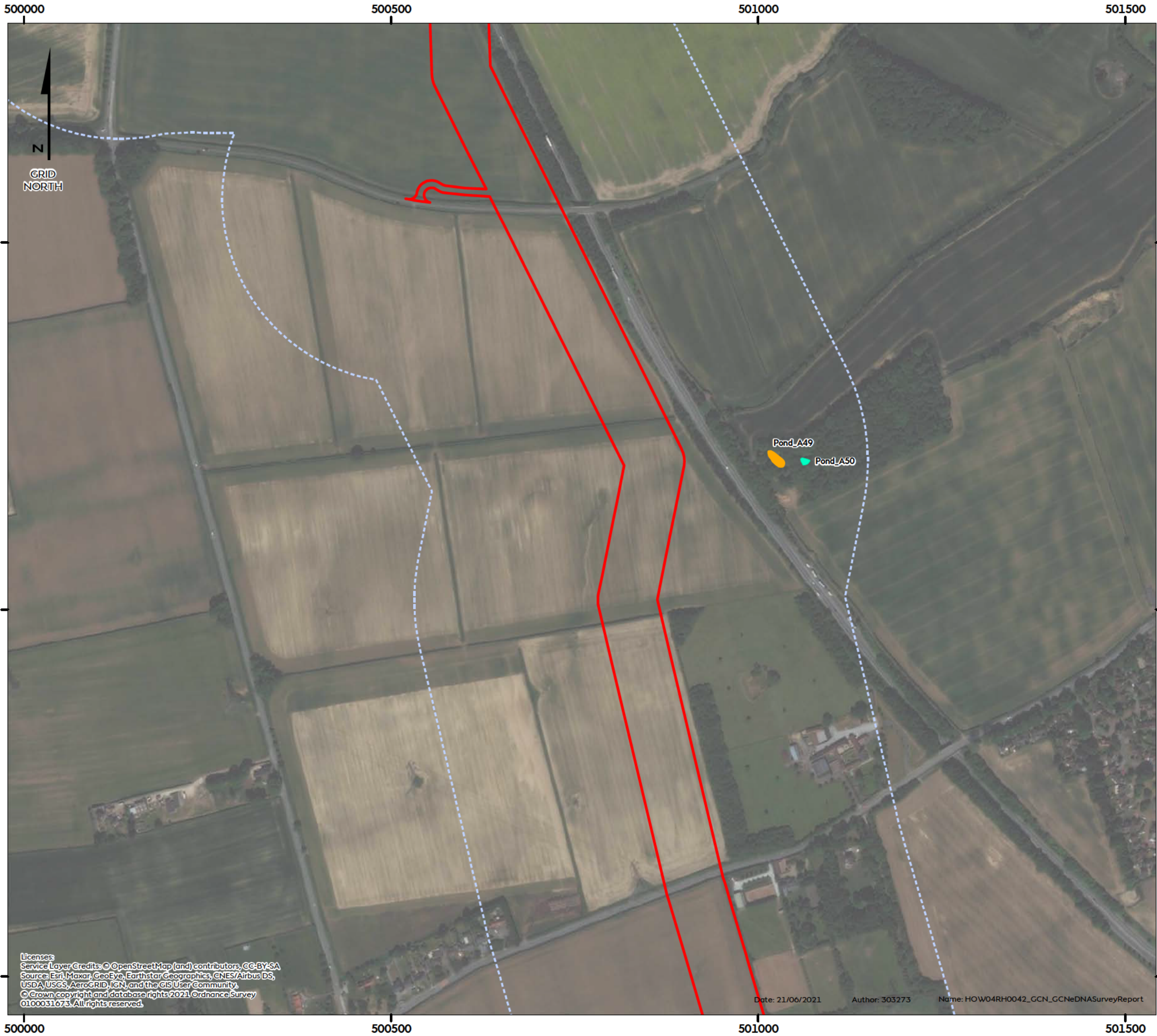
REV	REMARK	DATE
	First issue for PER	16/07/2019
A	Updated following PER consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021. Ordnance Survey
0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport

Title: GCN Study area and pond
survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS

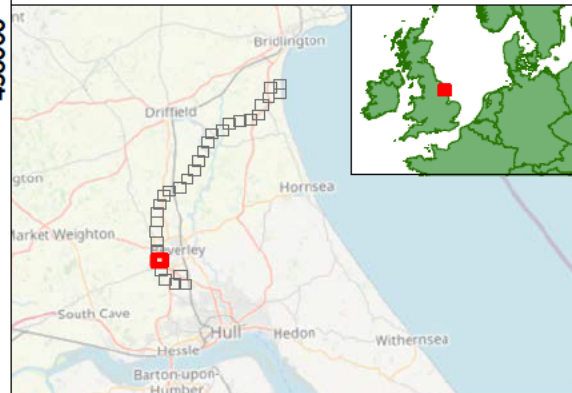




Hornsea Four

Figure 20
GCN Survey Area and Pond
Survey Access - Sheet 19 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- No Pond or Pond Dry
 - Samples collected - Negative Result



Coordinate system: British National Grid
Scale@A3: 1:5,000

0 100 200 Metres



0 50 100 200 Yards

REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021. Ordnance Survey
0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNA_SurveyReport

Title: GCN Study area and pond survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS

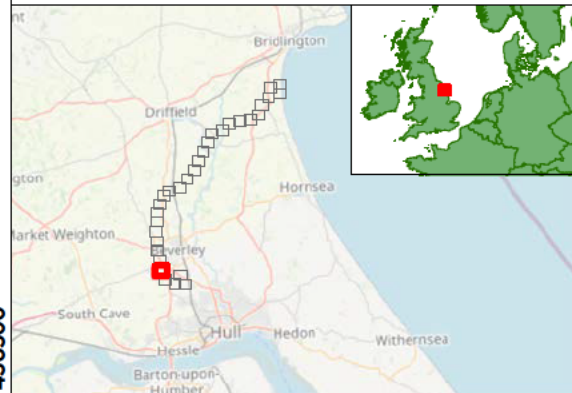


Hornsea Four

Figure 21

GCN Survey Area and Pond Survey Access - Sheet 20 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- Samples collected - Negative Result



Coordinate system: British National Grid
 Scale@A3: 1:5,000

0 100 200 Metres

0 50 100 200 Yards

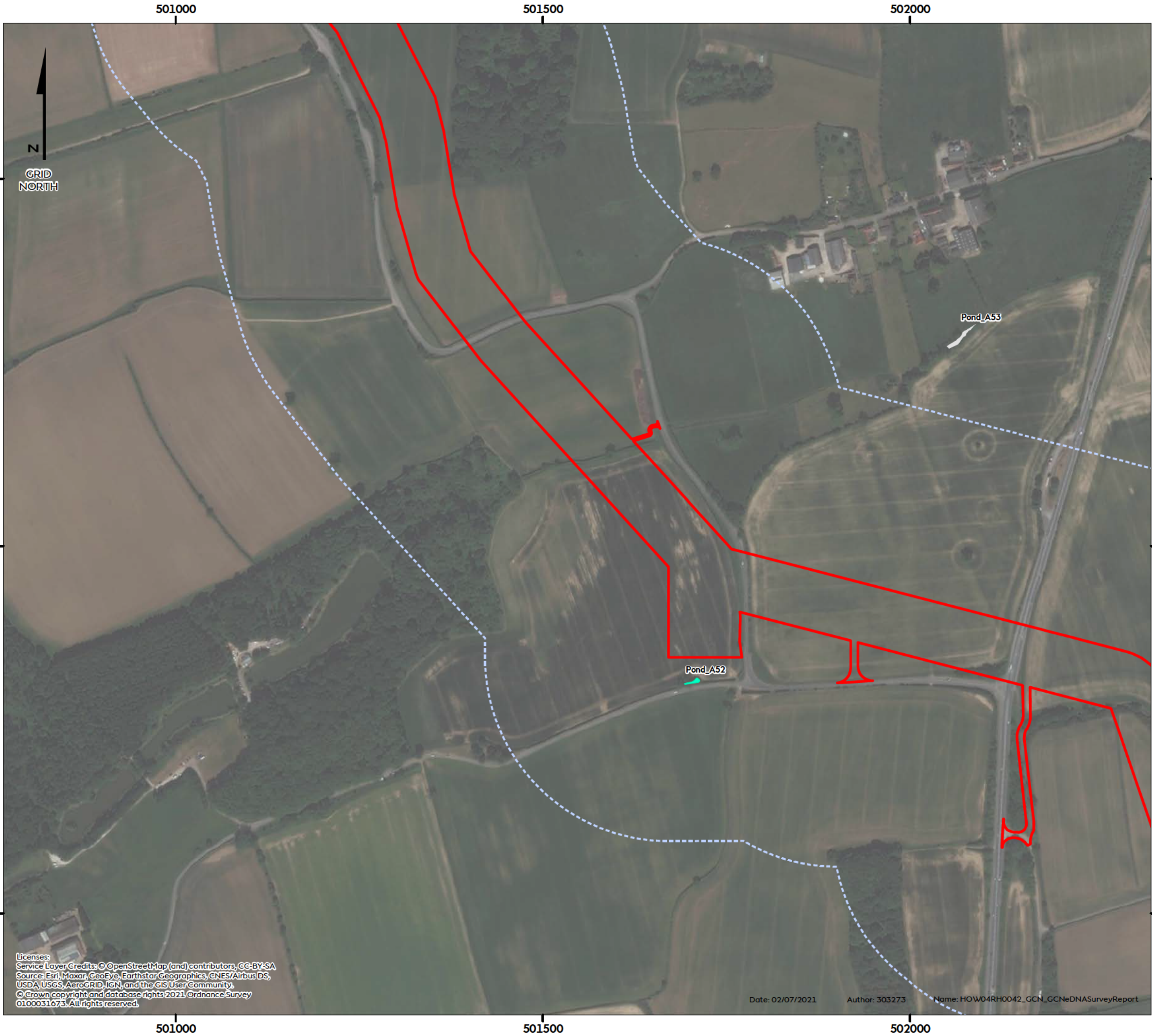
REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Title: GCN Study area and pond survey access
 Document no: HOW04RH0042
 Created by: AZ
 Checked by: CC
 Approved by: CS



Licenses:
 Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
 Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
 USDA, USGS, AeroGRID, IGN, and the GIS User Community
 © Crown copyright and database rights 2021. Ordnance Survey
 0100031673. All rights reserved.

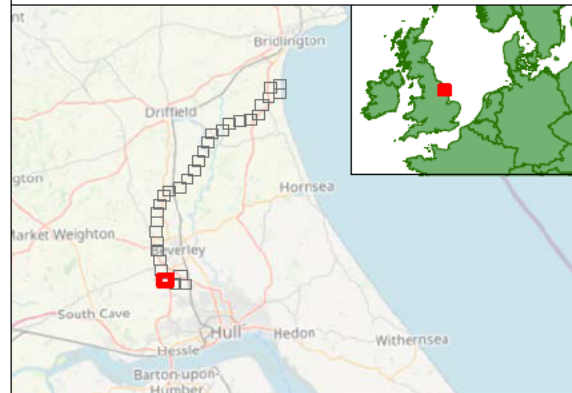
Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCN_GCNeDNASurveyReport



Hornsea Four

Figure 22
GCN Survey Area and Pond
Survey Access - Sheet 21 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- Samples collected - Negative Result
 - Pond no longer within GCN Study Area



Coordinate system: British National Grid
Scale@A3: 1:5,000

0 100 200 Metres

0 50 100 200 Yards

REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	02/07/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021 Ordnance Survey
0100031673. All rights reserved.

Date: 02/07/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport

Title: GCN Study area and pond
survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS

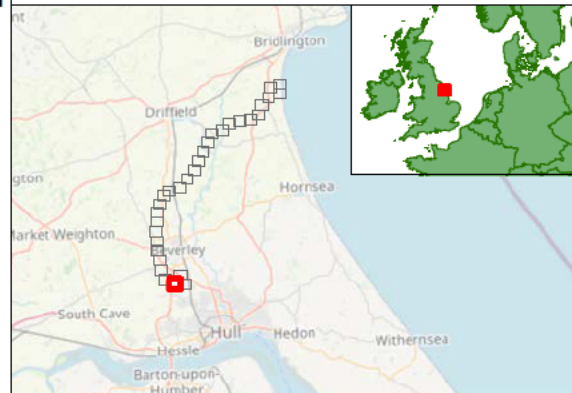
502500 503000 503500



Hornsea Four

Figure 23 GCN Survey Area and Pond Survey Access - Sheet 22 of 24

- Order Limits
- 250 m GCN Study Area
- Pond Survey Result**
- Samples collected - Negative Result
- No Pond or Pond Dry
- Pond no longer within GCN Study Area
- 2021 Pond Survey Result**
- Samples collected - Negative Result



Coordinate system: British National Grid
 Scale@A3: 1:5,000

REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	14/07/2021

Licenses:
 Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
 Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
 USDA, USGS, AeroGRID, IGN, and the GIS User Community
 © Crown copyright and database rights 2021 Ordnance Survey
 0100031673. All rights reserved.

Title: GCN Study area and pond
 survey access
 Document no: HOW04RH0042
 Created by: AZ
 Checked by: CC
 Approved by: CS

502500 503000 503500

435500

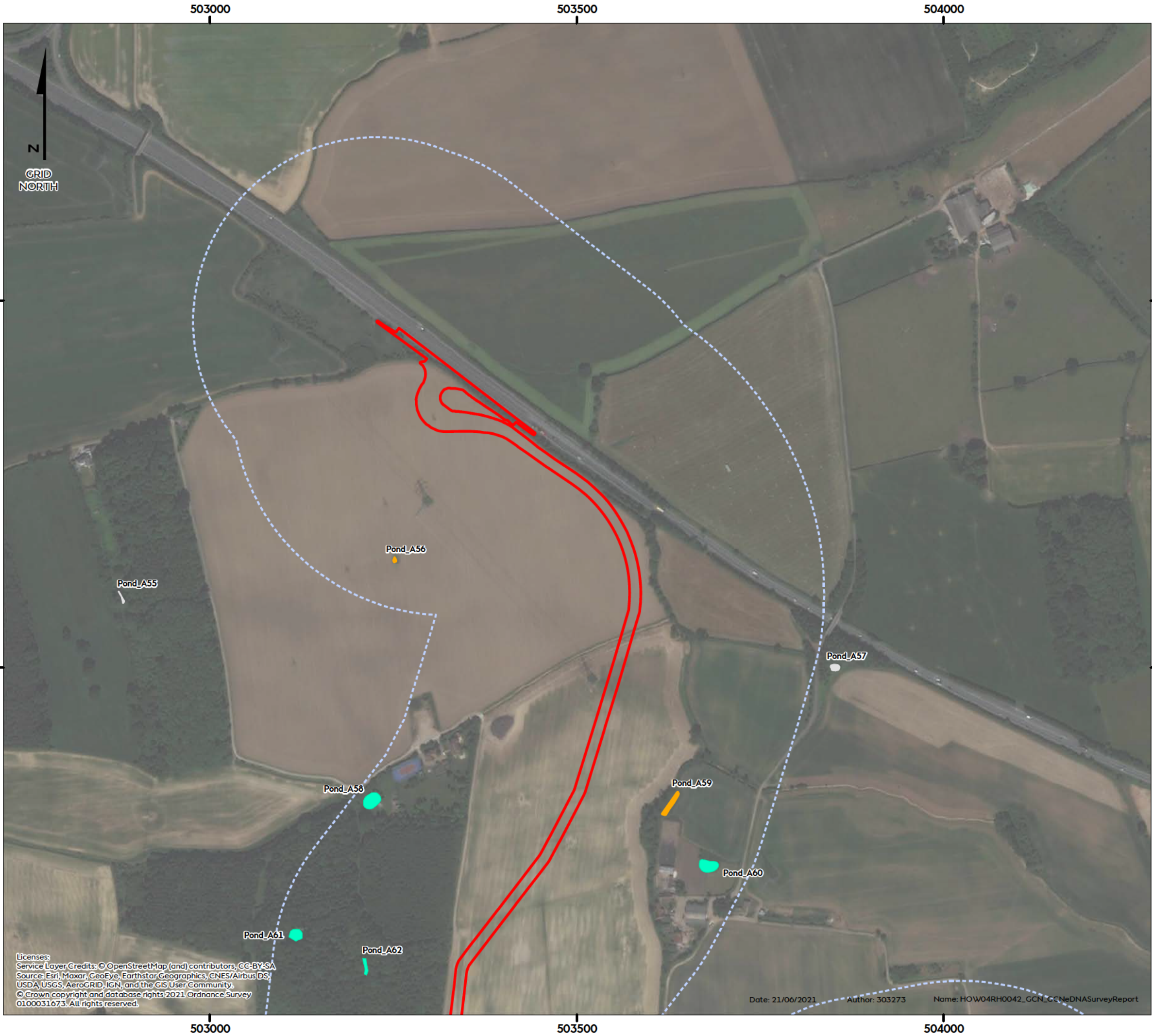
435000

434500

435500

435000

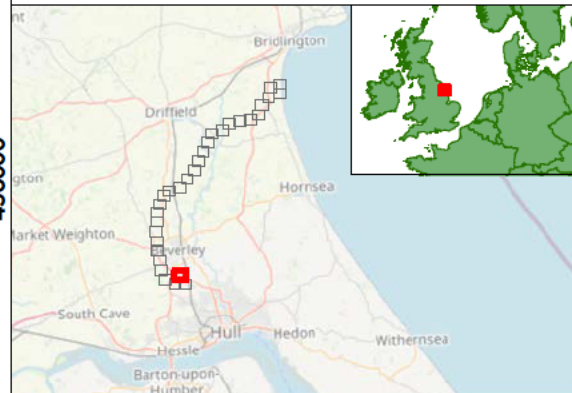
434500



Hornsea Four

Figure 24
GCN Survey Area and Pond
Survey Access - Sheet 23 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- No Pond or Pond Dry
 - Samples collected - Negative Result
 - Pond no longer within GCN Study Area



Coordinate system: British National Grid
Scale@A3: 1:5,000

0 100 200 Metres



0 50 100 200 Yards

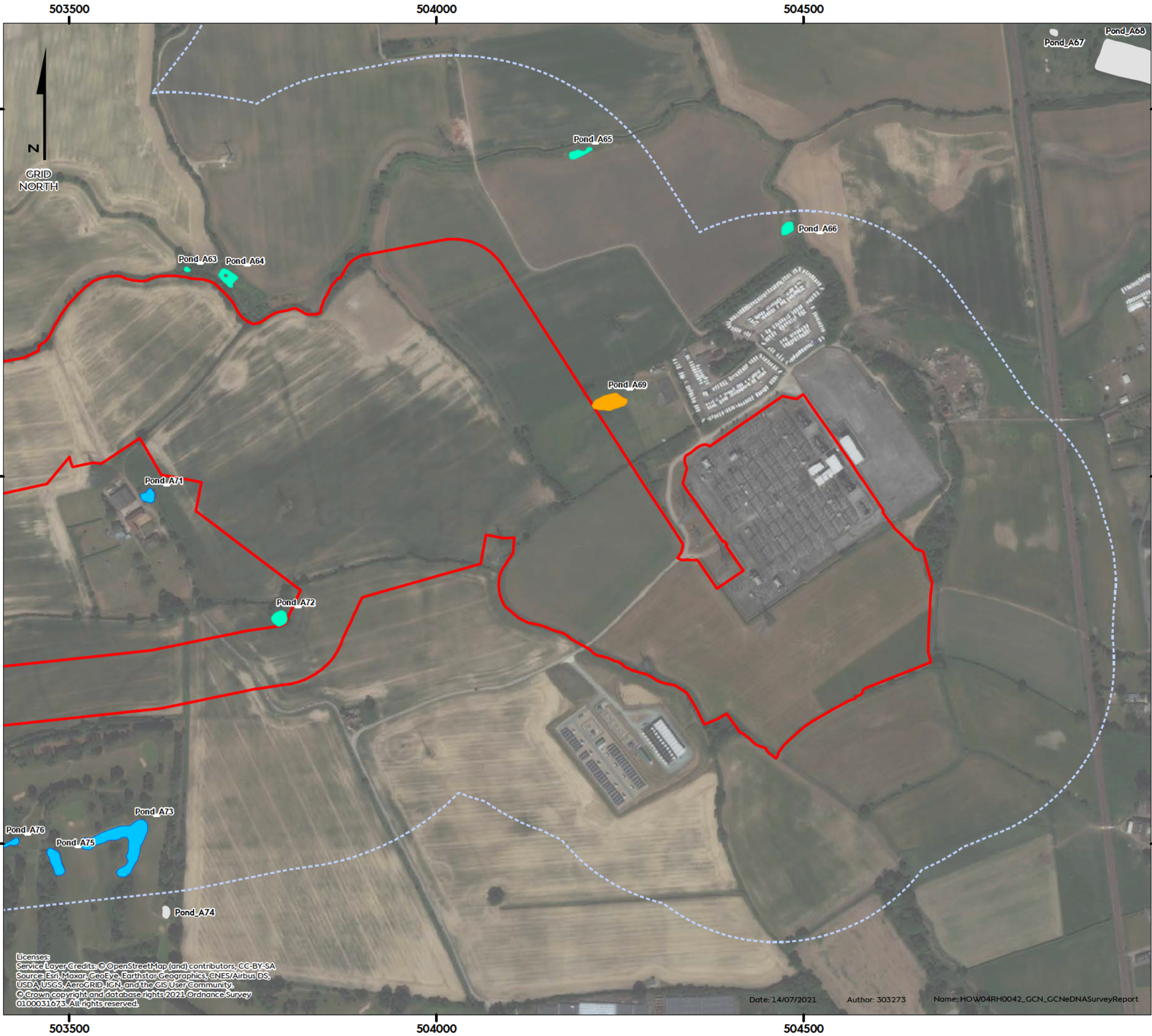
REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	21/06/2021

Licenses:
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
© Crown copyright and database rights 2021 Ordnance Survey
0100031673. All rights reserved.

Date: 21/06/2021 Author: 303273 Name: HOW04RH0042_GCNeDNASurveyReport

Title: GCN Study area and pond
survey access
Document no: HOW04RH0042
Created by: AZ
Checked by: CC
Approved by: CS

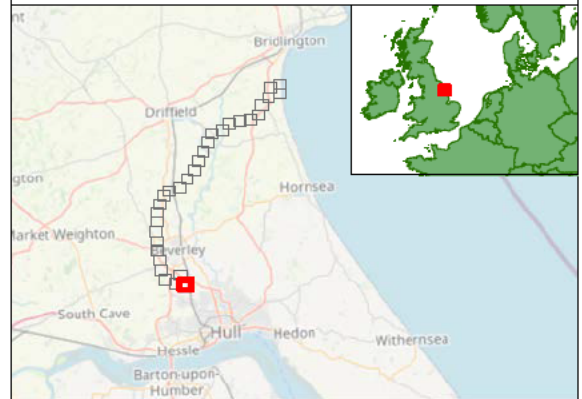


Hornsea Four

Figure 25

GCN Survey Area and Pond Survey Access - Sheet 24 of 24

- Order Limits
 - 250 m GCN Study Area
- Pond Survey Result**
- Samples collected - Negative Result
 - No Pond or Pond Dry
 - Pond no longer within GCN Study Area
- 2021 Pond Survey Result**
- Samples collected - Negative Result



Coordinate system: British National Grid
 Scale@A3: 1:5,000

0 100 200 Metres


0 50 100 200 Yards

REV	REMARK	DATE
	First issue for PEIR	16/07/2019
A	Updated following PEIR consultations, for DCO	14/07/2021

Licenses:
 Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
 Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
 USDA, USGS, AeroGRID, IGN, and the GIS User Community
 © Crown copyright and database rights 2021. Ordnance Survey
 0100031673. All rights reserved.

Date: 14/07/2021 Author: 303273 Name: HOW04RH0042_GCNeDNA Survey Report

Title: GCN Study area and pond survey access
 Document no: HOW04RH0042
 Created by: AZ
 Checked by: CC
 Approved by: CS



5 Conclusion

- 5.1.1.1 A GCN eDNA survey was undertaken over three survey visits, specifically in April 2019, June 2019 and June 2021. A total of 85 ponds were identified, however following the refinement of the Hornsea Four Order Limits a total of 23 ponds were no longer present within the GCN study area. The locations of these 23 ponds are detailed within this report for completeness purposes but they have not been considered further within this survey report.
- 5.1.1.2 A total of 62 ponds are located within the GCN study area, with access granted to 61 of the 62 ponds. A total of 35 ponds were subject to an HSI assessment and subsequent eDNA sampling survey (see [Figure 2](#) to [Figure 25](#)). Of the remaining ponds surveyed, a total of 25 were either dry or no longer present, and two ponds were inaccessible due to electric fencing (See [Figure 2](#) to [Figure 25](#) and [Appendix B](#)).
- 5.1.1.3 One of the 35 ponds subject to the 2019 or 2021 GCN eDNA survey returned a positive result for GCN, 33 ponds returned a negative result and one pond returned an inconclusive result. The pond with confirmed GCN presence is Pond_A32 ([Figure 11](#)).
- 5.1.1.4 GCN are known to exist as meta-populations within small aggregations or clusters of ponds (within a 500 m area), i.e. individual GCN may travel between several ponds that are in proximity to one another (English Nature, 2001). This allows genetic diversity within the breeding populations and allows the population to move freely, depending on changing conditions. Based on this information, clusters of ponds within distinct areas (500 m) can be classified as potentially supporting genetically distinct meta-populations of GCN.
- 5.1.1.5 Pond_A32 ([Figure 11](#)) is an ornamental pond within the grounds of a water bottling factory, situated approximately 200 m from the onshore ECC. The habitat between Pond_A32 and the onshore ECC is an arable field (in crop at the time of the survey). The arable field is bounded by hedgerows and ditches, meaning that there is the possibility of GCN movement between the two locations.
- 5.1.1.6 Of the remaining ponds that were subject to the 2019 or 2021 GCN eDNA survey, a total of 33 returned a negative result for GCN, and therefore it is concluded that there is no reasonable likelihood of this species being present within these ponds. Consequently, there are likely to be no impacts on GCN associated with these 33 ponds and therefore no mitigation measures are required.
- 5.1.1.7 One pond returned an inconclusive result for the presence of GCN, therefore this pond (Pond_A33a) will require a further eDNA survey prior to the commencement of Hornsea Four construction to determine the presence of likely absence of GCNs from this pond. Further information relating to proposed mitigation can be found in [Volume F2, Chapter 3: Outline Ecological Management Plan](#).
- 5.1.1.8 As presented within this report, there is one pond where access was not granted during the 2019 or 2021 GCN eDNA survey. It is currently proposed that should survey access be

granted, this pond will be included in the pre-construction survey effort (as set out in [Paragraph 6.1.1.3](#)), with the results being made available once the laboratory analysis has been completed. .

6 Proposed Mitigation

- 6.1.1.1 Consultation with Natural England has been undertaken as part of the Hornsea Four Ecology and Nature Conservation Evidence Plan process, to discuss the eDNA results and mitigation measures for GCN in those ponds where a positive eDNA result has been returned.
- 6.1.1.2 A draft GCN European Protected Species (EPS) mitigation licence application was submitted to Natural England in June 2021 and approved (by Natural England), with a Letter of No Impediment (LoNI) issued on the 22nd June 2021.
- 6.1.1.3 Due to the temporal nature of water levels and the mobility of the species, a further survey effort of all ponds within the Hornsea Four GCN study area will be required prior to the commencement of any construction activities, as detailed in the oEMP ([Volume F2, Chapter 3: Outline Ecological Management Plan](#)).

7 References

Briggs, J., Ewald, N., Valentini, A., Gaboriaund, C., Griffiths, R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. & Dunn, F. (2014) Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

Chartered Institute of Ecology and Environmental Management (CIEEM) (2017) Guidelines for Ecological Report Writing (2nd Edition). Technical Guidance Series.

The Conservation of Habitats and Species Regulations 2017 (as amended). Available at <http://www.legislation.gov.uk/ukxi/2017/1012/contents/made> (accessed: April 2020).

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Available at <http://www.legislation.gov.uk/ukxi/2019/579/contents/made> (accessed: April 2020).

Cresswell and Whitworth (2004) An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt *Triturus cristatus*. English Nature Research Reports.

English Nature (2001) Great Crested Newt Mitigation Guidelines. English Nature, Peterborough

Joint Nature Conservation Committee (JNCC) and Defra (on behalf of the Four Countries' Biodiversity Group). (2012). UK Post-2010 Biodiversity Framework. July 2012. Available from: <http://jncc.defra.gov.uk/page-6189>. (Accessed: April 2020)

Natural England (2015). Great crested newts: surveys and mitigation for development projects. Natural England Standing Advice.

Natural Environmental and Rural Communities (NERC) Act 2006. Available at <https://www.legislation.gov.uk/ukpga/2006/16/contents> (accessed: April 2020).

Oldham, R.S., Keeble, J., Swan, M.J.S. & Jeffcote, M. (2000) Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10 (4): 143 – 155.

Wildlife and Countryside Act (WCA) 1981 (as amended). Available at <https://www.legislation.gov.uk/ukpga/1981/69> (accessed: April 2020).

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043> (accessed: April 2020).

Appendix A – 2019 and 2021 eDNA Laboratory Analysis

DNA Analysis Report - Commercial in Confidence



Customer: Royal Haskoning DHV
Address: 2 Abbey Gardens,
 Great College Street
 London
 SW1P 3NL

Contact: [REDACTED]
Email: [REDACTED]
Tel: [REDACTED]

Report date: 08-May-2019

Order Number: GCN19-0999

Samples: Pond Water

Analysis requested: Detection of Great Crested Newt eDNA from pond water.

Thank you for submitting your samples for analysis with the Fera eDNA testing service. The details of the analysis are as follows:

Method:

The method detects pond occupancy from great crested newts (GCN) using traces of DNA shed into the pond environment (eDNA). The detection of GCN eDNA is carried out using real time PCR to amplify part of the cytochrome 1 gene found in mitochondrial DNA. The method followed is detailed in Biggs J., et al, (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

The limits of this method are as follows: 1) the results are based on analyses of the samples supplied by the client and as received by the laboratory, 2) any variation between the characteristics of this sample and a batch will depend on the sampling procedure used. 3) the method is qualitative and therefore the levels given in the score are for information only, they do not constitute the quantification of GCN DNA against a calibration curve, 4) a 'not detected' result does not exclude presence at levels below the limit of detection.

The results are defined as follows:

Positive: DNA from the species was detected.
eDNA Score: Number of positive replicates from a series of twelve.
Negative: DNA from the species was not detected; in the case of negative samples the DNA extract is further tested for PCR inhibitors and degradation of the sample.
Inconclusive: Controls indicate degradation or inhibition of the sample, therefore the lack of detection of GCN DNA is not conclusive evidence for determining the absence of the species in the sample provided.

page 1 of 3

This test report may not be reproduced except in full, without the written approval of Fera. Fera hereby excludes all liability for any claim, loss, demands or damages of any kind whatsoever (whether such claims, loss, demands or damages were foreseeable, known or otherwise) arising out of or in connection with the preparation of any technical or scientific report, including without limitation, indirect or consequential loss or damage; loss of actual or anticipated profits (including loss of profits on contracts); loss of revenue; loss of business; loss of opportunity; loss of anticipated savings; loss of goodwill; loss of reputation; loss of damage to or corruption of data; loss of use of money or otherwise, and whether or not advised of the possibility of such claim, loss demand or damages and whether arising in tort (including negligence), contract or otherwise. This statement does not affect your statutory rights. Nothing in this disclaimer excludes or limits Fera's liability for: (a) death or personal injury caused by Fera's negligence (or that of its employees, agents or directors); or (b) the tort of deceit; or (c) any breach of the obligations implied by Sale of Goods Act 1979 or Supply of Goods and Services Act 1982 (including those relating to the title, fitness for purpose and satisfactory quality of goods); or (d) any liability which may not be limited or excluded by law (e) fraud or fraudulent misrepresentation. The parties agree that any matters are governed by English law and irrevocably submit to the non-exclusive jurisdiction of the English courts.

DNA Analysis Report - Commercial in Confidence



Customer Reference	Fera Reference	GCN Detection	eDNA Score	Inhibition	Degradation
A63	S19-015800	Negative	0	No	No
A65	S19-015799	Negative	0	No	No
A68	S19-015794	Negative	0	No	No
A72	S19-015793	Negative	0	No	No
A57	S19-015791	Negative	0	No	No
A61	S19-015788	Negative	0	No	No
A62	S19-015785	Negative	0	No	No
A66	S19-015779	Negative	0	No	No
A55	S19-015726	Negative	0	No	No
A54	S19-015723	Negative	0	No	No
A53	S19-015720	Negative	0	No	No
A60	S19-015711	Negative	0	No	No
A64	S19-015708	Negative	0	No	No
A18	S19-015704	Negative	0	No	No
A06	S19-015702	Negative	0	No	No
A18	S19-015700	Negative	0	No	No
A44	S19-015698	Negative	0	No	No
A48	S19-015696	Negative	0	No	No
A50	S19-015690	Negative	0	No	No
A07	S19-015688	Negative	0	No	No
A58	S19-015686	Negative	0	No	No
A08	S19-015694	Positive	1	n/a	n/a
A11	S19-015692	Positive	2	n/a	n/a

The results indicate that eDNA for great crested newts was detected in two of the samples and in the remaining samples eDNA was not detected (as detailed in the table above). Analysis was conducted in the presence of the following controls: 1) extraction blank, 2) appropriate positive and negative PCR controls for each of the TaqMan assays (GCN, Inhibition, and Degradation). All controls performed as expected.

This test procedure was developed using research funded by the Department of Environment, Food and Rural Affairs.

page 2 of 3

This test report may not be reproduced except in full, without the written approval of Fera. Fera hereby excludes all liability for any claim, loss, demands or damages of any kind whatsoever (whether such claims, loss, demands or damages were foreseeable, known or otherwise) arising out of or in connection with the preparation of any technical or scientific report, including without limitation, indirect or consequential loss or damage; loss of actual or anticipated profits (including loss of profits on contracts); loss of revenue; loss of business; loss of opportunity; loss of anticipated savings; loss of goodwill; loss of reputation; loss of damage to or corruption of data; loss of use of money or otherwise, and whether or not advised of the possibility of such claim, loss demand or damages and whether arising in tort (including negligence), contract or otherwise. This statement does not affect your statutory rights. Nothing in this disclaimer excludes or limits Fera's liability for: (a) death or personal injury caused by Fera's negligence (or that of its employees, agents or directors); or (b) the tort of deceit; [or (c) any breach of the obligations implied by Sale of Goods Act 1979 or Supply of Goods and Services Act 1982 (including those relating to the title, fitness for purpose and satisfactory quality of goods);] or (d) any liability which may not be limited or excluded by law (e) fraud or fraudulent misrepresentation. The parties agree that any matters are governed by English law and irrevocably submit to the non-exclusive jurisdiction of the English courts.

DNA Analysis Report - Commercial in Confidence



Issuing officer: Steven Bryce



page 3 of 3

This test report may not be reproduced except in full, without the written approval of Fera. Fera hereby excludes all liability for any claim, loss, demands or damages of any kind whatsoever (whether such claims, loss, demands or damages were foreseeable, known or otherwise) arising out of or in connection with the preparation of any technical or scientific report, including without limitation, indirect or consequential loss or damage; loss of actual or anticipated profits (including loss of profits on contracts); loss of revenue; loss of business; loss of opportunity; loss of anticipated savings; loss of goodwill; loss of reputation; loss of damage to or corruption of data; loss of use of money or otherwise, and whether or not advised of the possibility of such claim, loss demand or damages and whether arising in tort (including negligence), contract or otherwise. This statement does not affect your statutory rights. Nothing in this disclaimer excludes or limits Fera's liability for: (a) death or personal injury caused by Fera's negligence (or that of its employees, agents or directors); or (b) the tort of deceit; [or (c) any breach of the obligations implied by Sale of Goods Act 1979 or Supply of Goods and Services Act 1982 (including those relating to the title, fitness for purpose and satisfactory quality of goods);] or (d) any liability which may not be limited or excluded by law (e) fraud or fraudulent misrepresentation. The parties agree that any matters are governed by English law and irrevocably submit to the non-exclusive jurisdiction of the English courts.

DNA Analysis Report - Commercial in Confidence



Customer: Royal Haskoning DHV
Address: 2 Abbey Gardens,
 Great College Street
 London

 SW1P 3NL

Contact: Charlotte Clements
Email: [REDACTED]
Tel: [REDACTED]

Report date: 04-Jul-2019

Order Number: GCN19-0999

Samples: Pond Water

Analysis requested: Detection of Great Crested Newt eDNA from pond water.

Thank you for submitting your samples for analysis with the Fera eDNA testing service. The details of the analysis are as follows:

Method:

The method detects pond occupancy from great crested newts (GCN) using traces of DNA shed into the pond environment (eDNA). The detection of GCN eDNA is carried out using real time PCR to amplify part of the cytochrome 1 gene found in mitochondrial DNA. The method followed is detailed in Biggs J., et al, (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

The limits of this method are as follows: 1) the results are based on analyses of the samples supplied by the client and as received by the laboratory, 2) any variation between the characteristics of this sample and a batch will depend on the sampling procedure used. 3) the method is qualitative and therefore the levels given in the score are for information only, they do not constitute the quantification of GCN DNA against a calibration curve, 4) a 'not detected' result does not exclude presence at levels below the limit of detection.

The results are defined as follows:

- Positive:** DNA from the species was detected.
- eDNA Score:** Number of positive replicates from a series of twelve.
- Negative:** DNA from the species was not detected; in the case of negative samples the DNA extract is further tested for PCR inhibitors and degradation of the sample.
- Inconclusive:** Controls indicate degradation or inhibition of the sample, therefore the lack of detection of GCN DNA is not conclusive evidence for determining the absence of the species in the sample provided.

page 1 of 2

This test report may not be reproduced except in full, without the written approval of Fera. Fera hereby excludes all liability for any claim, loss, demands or damages of any kind whatsoever (whether such claims, loss, demands or damages were foreseeable, known or otherwise) arising out of or in connection with the preparation of any technical or scientific report, including without limitation, indirect or consequential loss or damage; loss of actual or anticipated profits (including loss of profits on contracts); loss of revenue; loss of business; loss of opportunity; loss of anticipated savings; loss of goodwill; loss of reputation; loss of damage to or corruption of data; loss of use of money or otherwise, and whether or not advised of the possibility of such claim, loss demand or damages and whether arising in tort (including negligence), contract or otherwise. This statement does not affect your statutory rights. Nothing in this disclaimer excludes or limits Fera's liability for: (a) death or personal injury caused by Fera's negligence (or that of its employees, agents or directors); or (b) the tort of deceit; or (c) any breach of the obligations implied by Sale of Goods Act 1979 or Supply of Goods and Services Act 1982 (including those relating to the title, fitness for purpose and satisfactory quality of goods); or (d) any liability which may not be limited or excluded by law (e) fraud or fraudulent misrepresentation. The parties agree that any matters are governed by English law and irrevocably submit to the non-exclusive jurisdiction of the English courts.

DNA Analysis Report - Commercial in Confidence



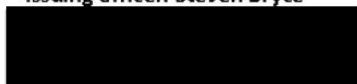
CustomerReference	Fera Reference	GCN Detection	eDNA Score	Inhibition	Degradation
-	S19-015786	Negative	0	No	No
-	S19-015783	Negative	0	No	No
-	S19-015781	Negative	0	No	No
-	S19-015780	Negative	0	No	No
-	S19-015717	Negative	0	No	No
-	S19-015714	Negative	0	No	No
-	S19-015705	Negative	0	No	No
-	S19-015703	Negative	0	No	No
-	S19-015701	Negative	0	No	No
-	S19-015697	Inconclusive	0	YES	YES
-	S19-015695	Negative	0	No	No
-	S19-015693	Negative	0	No	No
-	S19-015691	Negative	0	No	No
-	S19-015684	Negative	0	No	No
-	S19-015682	Negative	0	No	No
-	S19-015680	Positive	12	n/a	n/a

The results indicate that eDNA for great crested newts was detected in one of the samples and in the remaining samples eDNA was not detected (as detailed in the table above). However, with sample S19-015697 we detected PCR inhibitors and degradation of the internal control. Therefore, due to the risk of inhibition of the eDNA assay and any eDNA also being degraded resulting in a false negative, we have issued an inconclusive result for this sample. We did note a substantial amount of sediment in this sample which may have contributed to this result.

Analysis was conducted in the presence of the following controls: 1) extraction blank, 2) appropriate positive and negative PCR controls for each of the TaqMan assays (GCN, Inhibition, and Degradation). All controls performed as expected.

This test procedure was developed using research funded by the Department of Environment, Food and Rural Affairs.

Issuing officer: Steven Bryce



page 2 of 2

This test report may not be reproduced except in full, without the written approval of Fera. Fera hereby excludes all liability for any claim, loss, demands or damages of any kind whatsoever (whether such claims, loss, demands or damages were foreseeable, known or otherwise) arising out of or in connection with the preparation of any technical or scientific report, including without limitation, indirect or consequential loss or damage; loss of actual or anticipated profits (including loss of profits on contracts); loss of revenue; loss of business; loss of opportunity; loss of anticipated savings; loss of goodwill; loss of reputation; loss of damage to or corruption of data; loss of use of money or otherwise, and whether or not advised of the possibility of such claim, loss demand or damages and whether arising in tort (including negligence), contract or otherwise. This statement does not affect your statutory rights. Nothing in this disclaimer excludes or limits Fera's liability for: (a) death or personal injury caused by Fera's negligence (or that of its employees, agents or directors); or (b) the tort of deceit; or (c) any breach of the obligations implied by Sale of Goods Act 1979 or Supply of Goods and Services Act 1982 (including those relating to the title, fitness for purpose and satisfactory quality of goods); or (d) any liability which may not be limited or excluded by law (e) fraud or fraudulent misrepresentation. The parties agree that any matters are governed by English law and irrevocably submit to the non-exclusive jurisdiction of the English courts.

DNA Analysis Report - Commercial in Confidence



Customer: Royal Haskoning DHV
Address: 2 Abbey Gardens,
Great College Street
London
SW1P 3NL
Contact: Charlotte Clements
Email: [REDACTED]
Tel: [REDACTED]
Report date: 19-Jul-2019
Order Number: GCN19-0999
Samples: Pond Water
Analysis requested: Detection of Great Crested Newt eDNA from pond water.

Thank you for submitting your samples for analysis with the Fera eDNA testing service. The details of the analysis are as follows:

Method:

The method detects pond occupancy from great crested newts (GCN) using traces of DNA shed into the pond environment (eDNA). The detection of GCN eDNA is carried out using real time PCR to amplify part of the cytochrome 1 gene found in mitochondrial DNA. The method followed is detailed in Biggs J., et al, (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

The limits of this method are as follows: 1) the results are based on analyses of the samples supplied by the client and as received by the laboratory, 2) any variation between the characteristics of this sample and a batch will depend on the sampling procedure used. 3) the method is qualitative and therefore the levels given in the score are for information only, they do not constitute the quantification of GCN DNA against a calibration curve, 4) a 'not detected' result does not exclude presence at levels below the limit of detection.

The results are defined as follows:

Positive: DNA from the species was detected.

eDNA Score: Number of positive replicates from a series of twelve.

Negative: DNA from the species was not detected; in the case of negative samples the DNA extract is further tested for PCR inhibitors and degradation of the sample.

Inconclusive: Controls indicate degradation or inhibition of the sample, therefore the lack of detection of GCN DNA is not conclusive evidence for determining the absence of the species in the sample provided.

page 1 of 2

This test report may not be reproduced except in full, without the written approval of Fera. Fera hereby excludes all liability for any claim, loss, demands or damages of any kind whatsoever (whether such claims, loss, demands or damages were foreseeable, known or otherwise) arising out of or in connection with the preparation of any technical or scientific report, including without limitation, indirect or consequential loss or damage; loss of actual or anticipated profits (including loss of profits on contracts); loss of revenue; loss of business; loss of opportunity; loss of anticipated savings; loss of goodwill; loss of reputation; loss of damage to or corruption of data; loss of use of money or otherwise, and whether or not advised of the possibility of such claim, loss demand or damages and whether arising in tort (including negligence), contract or otherwise. This statement does not affect your statutory rights. Nothing in this disclaimer excludes or limits Fera liability for: (a) death or personal injury caused by Fera's negligence (or that of its employees, agents or directors); or (b) the tort of deceit; [or (c) any breach of the obligations implied by Sale of Goods Act 1979 or Supply of Goods and Services Act 1982 (including those relating to the title, fitness for purpose and satisfactory quality of goods);] or (d) any liability which may not be limited or excluded by law (e) fraud or fraudulent misrepresentation. The parties agree that any matters are governed by English law and irrevocably submit to the non-exclusive jurisdiction of the English courts.

DNA Analysis Report - Commercial in Confidence



CustomerReference	Fera Reference	GCN Detection	eDNA Score	Inhibition	Degradation
-	S19-015681	Negative	0	No	No
-	S19-015683	Negative	0	No	No
-	S19-015689	Negative	0	No	No
-	S19-015787	Negative	0	No	No

The results indicate that eDNA for great crested newts was not detected in any of the samples submitted. Analysis was conducted in the presence of the following controls: 1) extraction blank, 2) appropriate positive and negative PCR controls for each of the TaqMan assays (GCN, Inhibition, and Degradation). All controls performed as expected.

This test procedure was developed using research funded by the Department of Environment, Food and Rural Affairs.


Issuing officer: Steven Bryce



Appendix B – 2019 and 2021 GCN eDNA Survey Pond Descriptions and Photographs


Table 5: 2019 and 2021 GCN eDNA Survey Pond Descriptions and Photographs.



Pond Reference	Pond Description	Photograph
Pond_A01	Small pond on field margin closed with vegetation. Very little open water. No feed, rainwater only.	
Pond_A02	Large pond dries to edges. Set in BL woodland, only centre of pond has water (30 m x 15 m). Rainwater fed.	



Pond Reference	Pond Description	Photograph
Pond_A03	Dry pond. Small scrape set in middle of pasture field – heavily scraped and no water.	



Pond Reference	Pond Description	Photograph
Pond_A04	Dry pond. Small scrape set in middle of pasture field – heavily scraped.	

Pond Reference	Pond Description	Photograph
Pond_A05	Dry pond. Small scrape set in middle of pasture field – heavily scraped, no water.	
Pond_A06	Small pond in garden. Detritus and leaf litter on pond bottom. Lily, bramble, hawthorn, beech, field maple, ash and dock leaf were all present.	



Pond Reference	Pond Description	Photograph
Pond_A07	Large pond within gardens. Bulrush, glyceria and soft rush present. Fenced and surrounded by maintained short sward grass.	



Pond Reference	Pond Description	Photograph
Pond_A08	Small pond with limited aquatic vegetation; willow, dock leaf, soft rush, fenced through middle of pond.	
Pond_A09	Dry pond.	

Pond Reference	Pond Description	Photograph
Pond_A10	Dry pond.	
Pond_A11	Long narrow pond surrounded by vegetation including; hawthorn, willow, bramble, nettle, soft rush. Within grassland used for silage.	

Pond Reference	Pond Description	Photograph
Pond_A12	Small crescent shaped pond, very shallow in small wooded copse. Fed by drainage ditches from arable fields.	
Pond_A13	Ornamental pond next to farmhouse. Set in amenity grassland with woodland to north east and arable fields.	



Pond Reference	Pond Description	Photograph
Pond_A14	Dry pond. Small ditch joins Pond_A13 and Pond_A14, completely dry and dense vegetation.	
Pond_A15	Dry pond	No photograph available as photograph was corrupted beyond recovery.
Pond_A16	Dry pond. Small vegetated scrape in the ground poached by cattle under ash trees, no water.	


Pond Reference	Pond Description	Photograph
Pond_A17	Dry pond. Small vegetated scrape in the ground poached by cattle under ash trees, no water.	
Pond_A18	Large pond within grassland, majority of bank covered in glyceria, island in middle of pond. Good connectivity to Pond_A06 and Pond_A07. Due to size of pond, two eDNA kits were used.	

Pond Reference	Pond Description	Photograph
Pond_A19	No pond present.	 A photograph showing a field of tall, dense green grass and weeds. In the background, there are several trees with green foliage under a bright sky.
Pond_A20	Large pond in small woodland. Highly overgrown and therefore difficult to access. Very little marginal vegetation.	 A photograph of a narrow, shallow pond or stream. The water is dark and reflects the surrounding dense green trees and bushes. The banks are heavily overgrown with vegetation, making the pond difficult to access.



Hornsea 4

Pond Reference	Pond Description	Photograph
Pond_A21	Round ornamental pond in garden surrounded by iris and rush pond weed. Duckweed also present.	
Pond_A22	Large pond with a gravel base, remnant from sand/gravel extraction. Clear water with little vegetation. Edges dominated by iris, bulrush and willow scrub. Connecting habitat between this pond and other ponds in the surrounding area.	



Pond Reference	Pond Description	Photograph
Pond_A23	L shaped pond remnant from sand/gravel extraction (as Pond_A22). Surrounded by semi-improved grassland comprising cock's foot, birds foot trefoil and teasel. Good connectivity to other ponds.	
Pond_A24	Pond in centre of woodland. Pondweed, iris and bulrush. Water quality good, excellent connectivity to surrounding terrestrial habitats.	

Pond Reference	Pond Description	Photograph
Pond_A25	Fishing pond with high concentration of ducks and geese, fenced and locked. Deemed to be unsuitable for GCN	
Pond_A26	Fishing pond with high concentration of ducks and geese, fenced and locked. Assessed as being unsuitable for GCN.	
Pond_A27	No access granted at the time of the 2019 survey.	No photograph available as no access granted at the time of the 2019 survey.



Pond Reference	Pond Description	Photograph
Pond_A28	Dry pond. Large pond fed by adjacent river. However, dry at time of survey.	
Pond_A29	Small remnant of Pond_A28 divided by mound of vegetated earth, choked with water lily, water quality okay, surrounded by chest high vegetation. Good connectivity	
Pond_A30	Dry pond. Middle of arable fields planted with crop; owner says may contain small amounts of water over winter.	No photograph available as photograph was corrupted beyond recovery.
Pond_A31	Dry pond. Middle of arable fields planted with crop; owner says may contain small amounts of water over winter.	No photograph available as photograph was corrupted beyond recovery.

Hornsea 4

Pond Reference	Pond Description	Photograph
Pond_A32	Round ornamental pond in front of factory. Steep sided naturally fed with rainwater. Lots of invertebrates, small fish present and water lily abundant.	
Pond_A33	Large pond once stocked with trout, little vegetation in bottom, spring fed with a gravel bottom.	

Hornsea 4



Pond Reference	Pond Description	Photograph
Pond_A33a	Small man-made pond 100 m from onshore cable route. Overgrown with iris and bulrush.	
Pond_A34	Dry pond. Small scrape in ground full of grasses.	

Hornsea 4


Pond Reference	Pond Description	Photograph
Pond_A35	Dry pond. Small scrape in the ground, no water grasses only.	
Pond_A36	Scrape in the ground in the centre of a field completely covered in vegetation. Small areas of standing water.	


Hornsea 4

Pond Reference	Pond Description	Photograph
Pond_A37	No pond, small scrape in ground chocked with vegetation. Looks like flood plain for the Bryan Mills Beck.	
Pond_A38	No pond, small scrape in ground chocked with vegetation. Looks like flood plain for the Bryan Mills Beck.	

Hornsea 4



Pond Reference	Pond Description	Photograph
Pond_A39	No pond, small scrape in ground choked with vegetation. Looks like flood plain for the Bryan Mills Beck.	
Pond_A40	No pond, small scrape in ground choked with vegetation. Looks like flood plain for the Bryan Mills Beck.	
Pond_A41	No pond, small scrape in ground choked with vegetation. Looks like flood plain for the Bryan Mills Beck.	
Pond_A42	No pond, small scrape in ground choked with vegetation. Looks like flood plain for the Bryan Mills Beck.	


Pond Reference	Pond Description	Photograph
Pond_A43	Linear spring fed stream, slight slow flow towards Bealeys Beck in area of plantation woodland.	



Pond Reference	Pond Description	Photograph
Pond_A44	Small, heavily shaded pond at edge of arable fields, adjacent to hedgerow and public right of way, feeds into ditch, partially dry.	

Hornsea 4







Pond Reference	Pond Description	Photograph
Pond_A45	Dry pond.	
Pond_A46	No pond present.	

Pond Reference	Pond Description	Photograph
Pond_47	Small pond/hollow within an arable field completely covered in vegetation/buttercup and dog rose. Water 2" to 3" deep.	
Pond_A48	<p>This is not a pond but a wide section of ditch that is currently dry. However, a garden pond is present, and this is referenced Pond_A48 and therefore surveyed.</p> <p>Small pond, glyceria throughout, fishpond adjacent (not connected).</p>	


Pond Reference	Pond Description	Photograph
Pond_A49	Dry pond.	
Pond_A50	Small pond within woodland (habitat rich, potentially ancient woodland); glyceria duckweed, sycamore, field maple, willow, ramsons, nettle, bramble, red-dead nettle, white-dead nettle, bluebells, red campion, forget me not, lesser celandine, ground ivy	



Hornsea 4

Pond Reference	Pond Description	Photograph
Pond_A51	Pear shaped ornamental pond (lined). Few iris and bulrush planted around edge. Bitumen lined with large fish ad moorhen present. Mowed lawns surround.	
Pond_A52	Small round pond fed by pipe under the road/runoff. Steep bank with no vegetation.	



Pond Reference	Pond Description	Photograph
Pond_A53	Pond is a wide section of a (dry) ditch, between an arable field (ploughed) and grassland, fenced. Sycamore, nettle, bramble, dock, cleavers, white dead nettle and hawthorn. Grassland potentially used as grazing for farm	
Pond_A54	Medium sized pond in middle of arable field (in crop - oilseed), fenced and gated (gate sign stated 'pollution control'). Manhole cover visible at bottom of pond. Surrounded by grass, broad leaf dock and hawthorn, some pond scum on surface, could potential be SUDS for A164. Disconnected from wider habitat by arable crops and roads	


Pond Reference	Pond Description	Photograph
Pond_A55	Small pond in woodland adjacent to grassland. Sycamore, bramble, ribwort plantain, nettle, cow parsley, cleavers, dog mercury. Shallow pond approximately 15cm deep	



Pond Reference	Pond Description	Photograph
Pond_A56	Dry pond.	
Pond_A57	Small pond adjacent to woodland. Bulrush and glyceria. Tadpoles, arable crop adjacent	

Pond Reference	Pond Description	Photograph
Pond_A58	Medium sized fishpond within animal paddock surrounded by alder, bramble and nettle	
Pond_A59	No pond present.	



Hornsea 4

Pond Reference	Pond Description	Photograph
Pond_A60	Medium pond within garden and fenced horse paddock. Willow, hawthorn, broad leaf dock, glyceria, bulrush, soft rush. Common frogs present	
Pond_A61	Small pond in woodland adjacent to grassland. Sycamore, bramble, ribwort plantain, nettle, cow parsley, cleavers, dog mercury. Shallow pond approximately 15cm deep	

Pond Reference	Pond Description	Photograph
Pond_A62	Small pond in woodland, some aquatic vegetation at margins	

Pond Reference	Pond Description	Photograph
Pond_A63	Small ephemeral pond between arable fields and PRow. Water mint present, broad leaf dock, nettle, bramble, hawthorn and sycamore	
Pond_A64	Medium pond at corner of arable field adjacent to PRow, hedgerows, grassy field margins. Bulrush dominant throughout, bramble, nettle and hawthorn	

Hornsea 4



Pond Reference	Pond Description	Photograph
Pond_A65	Small pond at edge of arable field with wide field margins and hedgerow, tadpoles present. Bulrush, glyceria, hawthorn, soft rush and dandelion	
Pond_A66	Small pond at edge of arable field with wide grassy margins and scrub vegetation. Bulrush and glyceria throughout.	


Pond Reference	Pond Description	Photograph
Pond_A67	No pond present.	



Hornsea 4



Pond Reference	Pond Description	Photograph
Pond_A68	Large lagoon within ruderal/scrub habitat, borders railway line and major road (A1079). Potentially SUDS from road so potentially polluted. Steep sides. Willow, ash, water mint, yellow flag iris, bramble, nettle, gorse	

Hornsea 4



Pond Reference	Pond Description	Photograph
Pond_A69	No pond present.	
Pond_A70	Large concrete pond with bitumen liner. Surrounded by overhanging paving slabs set in amenity grassland and concrete.	


Pond Reference	Pond Description	Photograph
Pond_A71	<p>Medium pond located to the east of a residential property and adjacent to a public footpath. Surrounding area is arable fields. Pond is shaded with steep banks. Key scrub species include cow parsley, nettle and grass spp. Occasional overhanging trees (willow) present.</p>	

Pond Reference	Pond Description	Photograph
Pond_A72	Small pond at confluence of arable fields, ditch and PRow. Yellow flag iris, cherry trees, hawthorn, nettle, cow parsley	
Pond_A73	Large pond within golf course. Minimal in-channel and/or marginal vegetation present. Key species comprising glyveria. Sections of banks are exposed and comprise earth. Presence of wildfowl and fish also noted.	

Pond Reference	Pond Description	Photograph
Pond_A74	No access granted at the time of the 2019 survey.	No photograph available as no access granted at the time of the 2019 survey. However, pond is no longer within the GCN study area and therefore not considered further.
Pond_A75	Pond within golf course. Key species present include grass spp, rush and reeds. Part of pond is shaded by overhanging trees. Wildfowl and fish also noted as present.	
Pond_A76	Small pond within golf course, heavily shaded by vegetation.	
Pond_A77	No access granted at the time of the 2019 survey.	No photograph available as no access granted at the time of the 2019 survey. However, pond is no longer within the GCN study area and therefore not considered further.

Hornsea 4

Pond Reference	Pond Description	Photograph
Pond_A78	Pond within golf course. Evidence of some drying out noted and large amount of algae boom note within pond.	
Pond_A79	No access granted at the time of the 2019 survey.	No photograph available as no access granted at the time of the 2019 survey. However, pond is no longer within the GCN study area and therefore not considered further.
Pond_A80	Large pond within golf course. Algae bloom present and marginal channel vegetation noted. Key species is glyceria.	
Pond_A81	No access granted at the time of the 2019 survey.	No photograph available as no access granted at the time of the 2019 survey. However, pond is no longer within the GCN study area and therefore not considered further.

Pond Reference	Pond Description	Photograph
Pond_A82	Concrete ornamental pond with no vegetation. Pump visible and no fish.	
Pond_A83	No pond – removed and re-landscaped in 2004.	No photograph available as photograph was corrupted beyond recovery. Buildings and areas of hard standing present. However, no longer within the GCN study area and therefore not considered further.

Pond Reference	Pond Description	Photograph
Pond_A84	Dry pond.	