WINGATE FIELD DECOMMISSIONING PROJECT

Environmental Appraisal

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Environmental Appraisal

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Rev 0	26/03/2024	Draft for OPRED review	NM/FERB	PEV	LHA
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NON-TECHNICAL SUMMARY

The Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) decommissioning guidance (BEIS 2018) states that a Decommissioning Programme should be supported by an Environmental Appraisal (EA). This report forms part of the information submitted to Department for Energy Security and Net Zero (DESNZ) in support of the Wingate Decommissioning Programme, on behalf of Wintershall Noordzee B.V. (Wintershall) by Intertek Metoc (Intertek). A Comparative Assessment (CA) has also been undertaken (Intertek, 2024a) to support the preparation of the Decommissioning Programme.

The Wingate platform, situated approximately 177 kilometres (km) off the UK coastline (and 10.4km from the UK/Netherlands median line) within the Dogger Bank Special Area of Conservation (SAC) in the Southern North Sea (SNS), is scheduled to cease production in Q4 2024 at the earliest. Decommissioning activities, involving the flushing of the production system and export pipeline, alongside the plugging and abandonment (P&A) of wells and removal of conductors and the platform structure are then to take place. It is likely that operations will be undertaken in the Summer months – between April and September. The total seabed footprint for these decommissioning activities is estimated to be 4,686m².

The impact assessment defines the existing baseline environment surrounding the activities location, identifies the potential activities that may have an impact on the baseline environment, and the severity and likelihood of an impact using the severity classes set out in environmental risk assessment guidance produced by United Kingdom Offshore Operators Association (UKOOA) (1999).

The environmental sensitivities at Wingate are summarised as follows:

- The Dogger Bank SAC is characterised by dynamic seabed features, including active sandbanks and sand waves, which are influenced by tidal and current regimes. The benthic environment surrounding the Wingate platform is predominantly classified as 'Atlantic circalittoral sand' (MC52), 'Atlantic offshore circalittoral sand' (MD52), and 'Atlantic offshore circalittoral coarse sediment' (MD32). A 2009 survey found that the area around the Wingate platform hosts moderately diverse sandy biotopes, primarily characterised by the presence of species such as *Fabulina fabula* (bivalve), *Bathyporeia guilliamsoniana* (amphipod), and *Polinices pulchellus* (gastropod), alongside various other benthic and epifaunal organisms.
- During the operational period (April – September), benthic spawning fish species, including herring (*Clupea harengus)* and sand eels (*Ammodytidae spp.*), utilise the area for nursing or spawning activities. Benthic species are potentially susceptible to disturbance from decommissioning activities at Wingate. Mitigation measures to reduce seabed disturbance includes minimising rock protection placement, vessel movement, and use dynamic positioning techniques where feasible.
- Seabird distribution in the SNS varies throughout the year contains peak numbers of birds following the breeding season and through the winter (BEIS 2022). The density and distribution of seabirds varies throughout the year, pre-breeding and breeding seasons, generally between March and August. Harbour porpoise and white beaked dolphin are known to frequent the SNS throughout most of the year, and minke whale as a seasonal visitor. Both seabirds and marine mammals are anticipated to be relatively unaffected by decommissioning activities, with noise disturbance identified as the primary concern. However, there exists a potential for overlap between the hearing ranges of marine mammals and high-frequency sounds generated by decommissioning tools and survey equipment. Nevertheless, considering factors such as the location of cutting, marine mammal hearing capabilities, avoidance behaviours, and operation duration, the risk of injury or disturbance is considered to be low. Mitigation strategies to reduce noise emissions includes scheduling decommissioning activities to minimise cumulative noise impacts and reducing vessel usage where feasible.

Overall, the risks posed by the decommissioning activities have been assessed, with the conclusion that potential environmental impacts are generally acceptable; however, it has been identified that the emissions associated with burning hydrocarbon fuels will contribute to the UK greenhouse gas emissions.

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GLOSSARY

AHV
Anchor Handling Vessel

ALARP
As Low As Reasonably Practicable

Ba
Barium

BEIS
Business, Energy and Industrial Strategy

BP
Before Present

CA
Comparative Assessment

Cd
Cadmium

CO
Carbon Monoxide

CO_2
Carbon Dioxide

CoP
Cessation of Production

CPT
Cone Penetration Tests

Cr
Chromium

Cu
Copper

Defra
Department for Environment, Food and Rural Affairs

DESNZ
Department for Energy Security and Net Zero

DP
Dynamic Positioning

DTI
Department for Trade and Industry

EA
Environmental Appraisal

EEMS
Environmental and Emissions Monitoring System

EMS
Environmental Management System

ENVID
Environmental Risk Identification

EPS
European Protected Species

FCS
Favourable Conservation Status

g
Gram

GJ
Gigajoule

GHG
Greenhouse Gas

GWP
Global Warming Potential

HLV
Heavy Lift Vessel

HSE
Health, Safety, Environmental

Hz
Hertz

ICES
International Council for the Exploration of the Sea

JNCC
Joint Nature Conservation Committee

kHz
Kilohertz

km
Kilometres

LAT
Lowest Astronomical Tide

m
Metres

mm
Millimetres

MBES
Multi-Beam Echo Sounder

MCZ
Marine Conservation Zone

MeOH
Methanol

MMO
Marine Management Organisation

MP
Marine Plan

MPA
Marine Plan Area

mya
Million Years Ago

NFFO
National Federation of Fishermen's Organisation

Ni
Nickel

NNS
Northern North Sea

NORM
Naturally Occurring Radioactive Material

NOx
Nitrogen Oxide

NSTA
North Sea Transition Authority

NUI
Normally Unmanned Installation

OBM
Oil Based Mud

OEUK
Offshore Energies UK

OGA
Oil and Gas Authority

OPRED
Offshore Petroleum Regulator for Environment and Decommissioning

OPRED-ODU
Offshore Petroleum Regulator for Environment and Decommissioning - Offshore Decommissioning Unit

OPRED-EMT
Offshore Petroleum Regulator for Environment and Decommissioning - Environmental Management Team

OSPAR
Oslo and Paris Convention

PAH
Polyaromatic Hydrocarbons

Pb
Lead

PTS
Permanent Threshold Shift

P&A
Plug and Abandonment

SAC
Special Area of Conservation

SNS
Southern North Sea

SOPEP
Shipboard Oil Pollution Emergency Plan

SOSI
Seabird Oil Sensitivity Index

SO_2
Sulphur Dioxide

SPA
Special Protected Area

Te
Tonne

THC
Total Hydrocarbon Content

TTS
Temporary Threshold Shift

UKBAP
UK Biodiversity Action Plan

UKCS
United Kingdom Continental Shelf

V
Vanadium

VOC
Volatile Organic Compounds

Wintershall
Wintershall Noordzee B.V.

Zn
Zinc

µm
Micrometres

1. INTRODUCTION

1.1 Overview

Wintershall Noordzee B.V. (Wintershall) own and operate the Wingate field, which is situated in the Southern North Sea (SNS) within United Kingdom Continental Shelf (UKCS) Blocks 44/18d, 44/23f, 44/24b and 44/19f. The platform is approximately 177 kilometres (km) from the UK coastline and 10.4km from the UK/Netherlands median line, in a water depth of 29m. The platform and 7km of the pipelines are located within the Dogger Bank Special Area of Conservation (SAC) as shown in Figure 1-1 (Drawing number: P1841V-LOC-002).

The field produces gas and condensate. Of the initial six development wells, there are still four live gas wells (two currently producing, one intermittently producing and one not producing) and two abandoned gas wells (44/24b-A2Z Phase 1 and 44/24b-A6 Phase 2). Export from the field is via the Wingate Normally Unmanned Installation (NUI) platform and a 12" gas export pipeline (PL2850), piggybacked with a 2" chemical supply line (PL2851) to the D15-FA-1 platform, in the Netherlands sector of the North Sea. It is anticipated that the field will cease production in Q4 2024 at the earliest.

1.2 Purpose of this Report and Scope

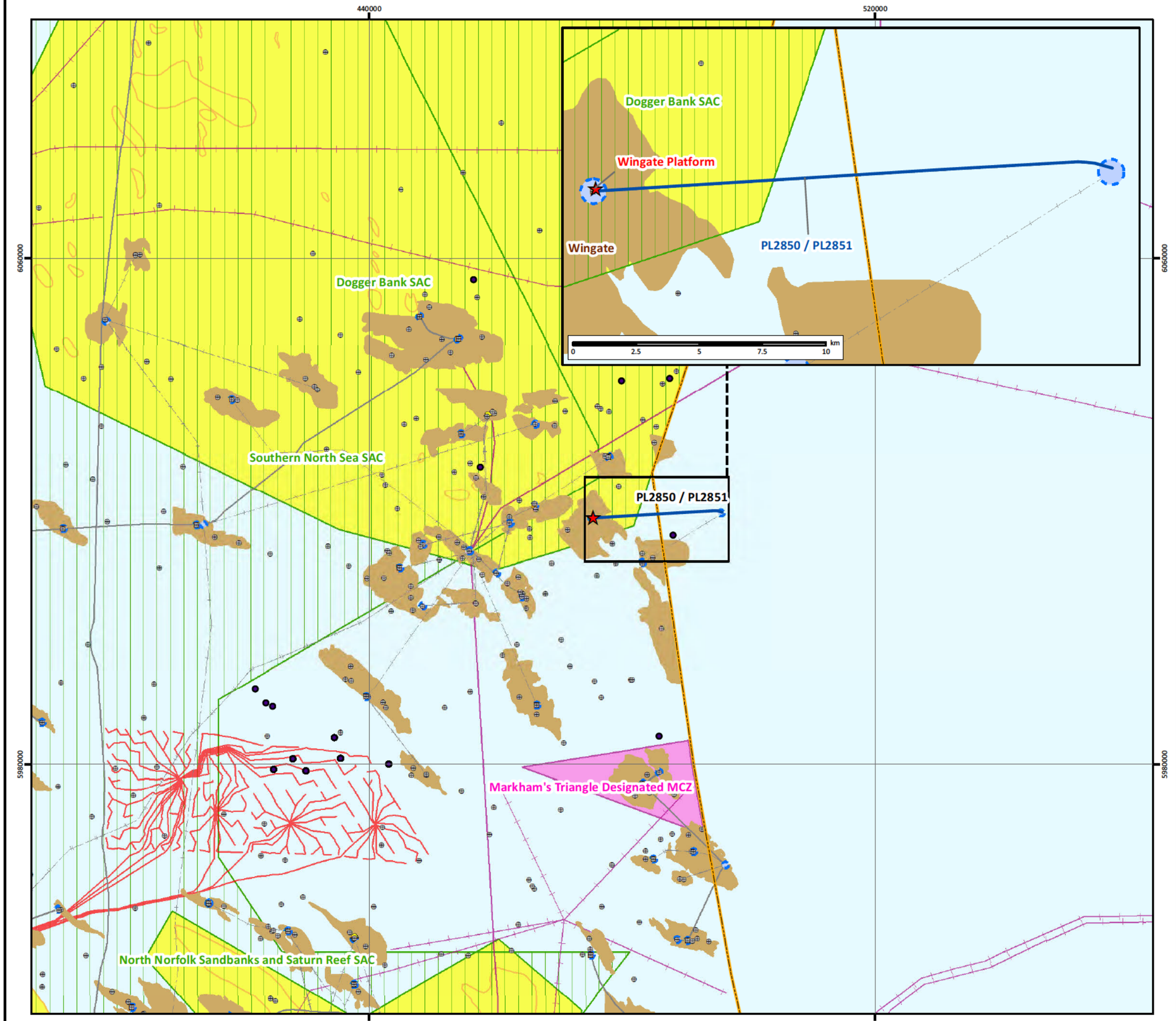
The purpose of this Environmental Appraisal (EA) report is to identify potential impacts that the decommissioning of Wingate field could have on the surrounding environment and assess the significance of those impacts. The EA focuses on the impacts that have been identified as potentially significant. The EA will consider mitigation and control measures to avoid, reduce and if possible, remedy significant adverse effects, to as low as reasonably practicable (ALARP).

The Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) decommissioning guidance (BEIS 2018) states that a Decommissioning Programme should be supported by an EA and outlines that the report should be proportionate to the complexity and the magnitude of the project. This guidance has been taken into account in the production of this report.

The EA will consider all offshore operations associated with the decommissioning of the Wingate NUI and associated pipelines (PL2850 and PL2851); return to shore of materials is included in summary but is not included in the assessment, as this is considered an onshore issue and not relevant to impacts in the marine environment.

This report forms part of the information submitted to Department for Energy Security and Net Zero (DESNZ) in support of the Wingate Decommissioning Programme.

All wells will be abandoned and the production system and export pipeline plus 2-inch piggyback line flushed, under the current Production Permit (PRA/150); all conductors will be cut during Plug and Abandonment and removed during the removal of the Wingate platform. Further details of the decommissioning programme are presented in Section 2.



WINTERSHALL NOORDZEE B.V.

PL2850/PL2851 DECOMMISSIONING
Location Overview

Drawing No: P1841V-LOC-002	B

N
W E
S

Legend

- Wingate Platform
- PL2850/PL2851
- EEZ Boundary
- 500m Safety Zone
- Hydrocarbon Field

Infrastructure

- Well
- Platform
- Buoy

Pipelines

- Active
- Abandoned

Cables

- Power (Active)
- Telecom (Active)
- Telecom (Disused)

Environmental Designations

- SAC
- MCZ
- Sandbank Area

NOTE: Not to be used for Navigation

Date	25 January 2024
Coordinate System	ED 1950 UTM Zone 31N
Projection	Transverse Mercator
Datum	European 1950
Data Source	NSTA; MarineRegions; JNCC; NE; KISCA; ESRI
File Reference	J:\P1841\Mxd\P1841V\01_LOC\ P1841V-LOC-002.mxd
Created By	Oliver Bula
Reviewed By	Emma Langley
Approved By	Emma Langley

wintershall intertek

0 10 20 30 40 km

1.3 Policy and Regulatory Context

The Petroleum Act 1998 (as amended by the Energy Act 2008 and the Energy Act 2016) is the principal legislation covering decommissioning of offshore oil and gas infrastructure, including pipelines, on the UKCS. The responsibility for ensuring compliance with the Petroleum Act 1998 rests with DESNZ, (previously Department for Business, Energy and Industrial Strategy (BEIS)).

DESNZ is also the Competent Authority on decommissioning in the UK for Oslo and Paris Convention (OSPAR) purposes and relevant legislation. The Petroleum Act 1998 requires that an approved Decommissioning Programme is in place before commencing activities. A formal environmental impact assessment is not required however according to BEIS Guidance (2018) an environmental appraisal must be conducted to determine the potential impact of the proposed activities. The Decommissioning Programme outlines in detail the infrastructure being decommissioned and the method by which the decommissioning will take place (Wintershall 2024).

1.3.1 Comparative Assessment

As stated in the BEIS Guidance (BEIS, 2018) where a decommissioning programme includes a pipeline a Comparative Assessment is required to be carried out for all feasible options to inform decisions relating to the decommissioning. A Comparative Assessment (CA) has been undertaken (Intertek, 2024a) to support the preparation of the Decommissioning Programme. The scope of the CA was for the UK sections of the two pipelines (PL2850 and PL2851). Eight options for decommissioning the pipelines were screened to shortlist technically feasible options.

The CA assessed each shortlisted option against a set of criteria. The options assessed were:

- Option 1: Leave in-situ;
- Option 2: Partial removal;
- Option 4A: Full removal – reverse s-lay; and
- Option 4C: Full removal – cut and lift.

Criteria were defined in line with the BEIS Guidance (BEIS, 2018) and Guidelines for Comparative Assessment in Decommissioning Programmes (OGUK, 2015). The criteria were grouped into five main sections to include Safety, Environment, Technical, Societal and Commercial. Sub-criteria were developed for each criteria. Options were scored on a scale of 1 to 5 and weightings applied to allow for differing opinions on the relative importance of the criteria.

A series of workshops were run to identify, assess and score the options for the pipeline including:

I An Environmental Risk Identification (ENVID) workshop was undertaken to identify the environmental risks associated with each option. This workshop was also used to identify the options to be carried forward to CA.

II An internal CA workshop was undertaken to score and comparatively assess the feasible options.

III A subsequent CA workshop was held with stakeholders to review and verify the scoring and ensure all concerns were identified and assessed.

The recommended decommissioning option for the Wingate pipeline based on the scoring of the CA is Partial Removal (Option 2).

The CA concludes the following:

- Partial removal is considered the best option in 9 of the 12 sub-criteria.
- Partial removal is assessed as having the lowest safety risk.

- Partial removal and leave in-situ are assessed as having the same environmental risk, technical risk, societal impact and similar economic costs.

The outcome of the CA has been integrated in the Wingate Decommissioning Programme and is considered within this EA.

1.3.2 Marine Plans

A marine planning system was introduced by the *Marine and Coastal Access Act 2009* (as amended). This system, in addition to legislation aims to supply a clear approach to the management of the UK's marine areas, their resources and the activities and interactions that take place within them. These Marine Plans (MPs) together with the Marine Policy Statement underpin the planning system for English seas.

1.3.2.1 Marine Plan Areas (MPAs)

MPs cover the management of both English inshore waters (out to 12 nautical miles) and offshore waters (12 to 200 nautical miles). The aim of MPs are to inform and guide regulation and management of Marine Plan Areas (MPAs) ensuring that they are protected and developed sustainably. The proposed operations described in this EA have been assessed against the Marine Plan Objectives and policies.

The UK is divided into marine planning regions, each with an allocated plan authority who develop a MP for each area. In England, the planning authority is the Marine Management Organisation (MMO). In English waters, there are eleven MPAs. The Wingate NUI and the associated pipelines (within the UKCS) are located within the East Offshore Marine Plan (Defra 2014). This area extends from 12 nautical miles out to the Exclusive Economic Zone (the maritime borders with the Netherlands, Belgium and France), covering an approximate area of 49,000km^2. The Plan was adopted in 2014 and lays out an approach to managing the resources, activities and interactions within and between each of the Plan areas.

The MMO have determined that there is compelling evidence to suggest that the East Marine Plans should be replaced. The Secretary of State for Environment, Food and Rural Affairs agreed with this recommendation (Defra 2023) and the MMO and the Department for Environment, Food and Rural Affairs (Defra) are working together to develop the process to replace the East Marine Plans, this is currently at public and stakeholder consultation.

This EA needs to consider the proposed decommissioning activities in line with the current MPs policies. There are no specific policies for decommissioning, therefore, other relevant policies have been included.

The Plan defines 17 policy areas for activities undertaken within the boundary (Defra 2014). The most relevant ones are presented in Table 1-1 with a summary of how the proposed operation complies with the requirements of the policy (or refers to where this has already been covered).

The proposed operations do not contradict any of the MP objectives and policies. Wintershall will ensure they comply with all the current MP policies and objectives that have been introduced. In particular, the following objectives: 1, 6, 7, 8, 9, and 10 and policies: ECO1, ECO2, BIO1, MPA1, CC2, OG1, FISH1 and FISH2 will be considered.

Table 1-1 Relevant East Offshore Marine Plan Policies

Policy Area	Objective	Policy Reference	Policy Description	Comments
Environment	6	ECO1	Cumulative impacts affecting the ecosystem of the East marine plans and adjacent areas (marine, terrestrial) should be addressed in	Cumulative impacts have been addressed in Section 5.5.

Policy Area	Objective	Policy Reference	Policy Description	Comments
			decision making and plan implementation	
	6	ECO2	The risk of release of hazardous substances as a secondary effect due to any increased collision risk should be taken account of in proposals that require an authorisation.	Releases due to unplanned events are considered in Section 4.2.
	7	BIO1	Appropriate weight should be attached to biodiversity, reflecting the need to protect biodiversity as a whole, taking account of the best available evidence including on habitats and species that are protected or of conservation concern.	Section 3.4 describes the existing biodiversity.
	8	MPA1	Any impacts on the overall MPA network must be taken account of in strategic level measures and assessments, with due regard given to any current agreed advice on an ecologically coherent network.	Potential impacts on MPAs are considered in Section 5.
	9	CC2	Proposals for development should minimise emissions of greenhouse gases as far as is appropriate. Mitigation measures will also be encouraged where emissions remain following minimising steps. Consideration should also be given to emissions from other activities or users affected by the proposal	Emissions of greenhouse gases and potential impacts on air quality are considered in Section 5.1.
Oil and Gas	10	OG1	Proposals within areas with existing oil and gas production should not be authorised except where compatibility with oil and gas production and infrastructure can be satisfactorily demonstrated.	It is considered that this activity is compatible with the oil and gas activity that is occurring within the area.
Fisheries	10	FISH1	Within areas of fishing activity, proposals should demonstrate that they will not prevent fishing activities on, or access to fishing grounds or how, if there are significant adverse impacts on the ability to undertake fishing activities or access to fishing grounds, they will minimise them.	There will be a (temporary) exclusion zone during the operation. However once the operation is complete, access to the area will be returned to normal. In addition, if it is considered necessary, over-trawl assessments will be undertaken to ensure the pipeline is safe for fishing activities (Section 2.8).
	10	FISH2	Proposals should demonstrate that they will not have an adverse impact upon spawning and nursery areas and any associated habitat	Sections 5.3.5 and 5.4.6 considers fish spawning and nursing in the area and determines that there will not be a significant impact.

1.4 Stakeholder Engagement

Stakeholder engagement is an important aspect of the appraisal process. During the preparation of the EA and CA stakeholder engagement has been sought from a number of organisations including Joint Venture partners XTO UK Ltd. and GazProm UK Resources S.A. and the following stakeholders:

- Department for Energy Security and Net Zero (DESNZ);
- Health and Safety Executive (HSE);
- Joint Nature Conservation Committee (JNCC); and
- National Federation of Fishermen's Organisation (NFFO).

Involving interested parties throughout the project, from initial planning to termination, ensures that opinions can be heard, ideas evolved and expectations managed.

Informal responses received from stakeholders have been incorporated as appropriate and the formal consultation process will be undertaken on submission of the draft Decommissioning Programme.

Table 1-2 Stakeholder Engagement

Stakeholder and date	Details of consultation
OPRED 04/09/2023	Update on Wingate decommissioning planning
JNCC 02/11/2023	Pre-meeting to introduce the Wingate Decommissioning Programme.
HSE 27/11/2023	Pre-meeting to introduce the Wingate Decommissioning Programme.
OPRED (Offshore Decommissioning Unit (ODU), OPRED Environmental Management Team (EMT), HSE & NFFO 28/11/2023	CA Workshop to review and verify the scoring and ensure all concerns were identified and assessed. OPRED-ODU and OPRED-EMT attended workshop in an observational capacity.
JNCC 30/11/2023	Follow up meeting with JNCC to summarise CA Workshop and present final scoring of options assessed.
JNCC, NFFO, HSE & DESNZ 18/12/2023	Draft CA report shared for comment.
JNCC 16/01/2024	JNCC provided comments on draft CA report.
XTO 01/02/2024	Workshop on the Wingate decommissioning process.

2. DECOMMISSIONING ACTIVITIES

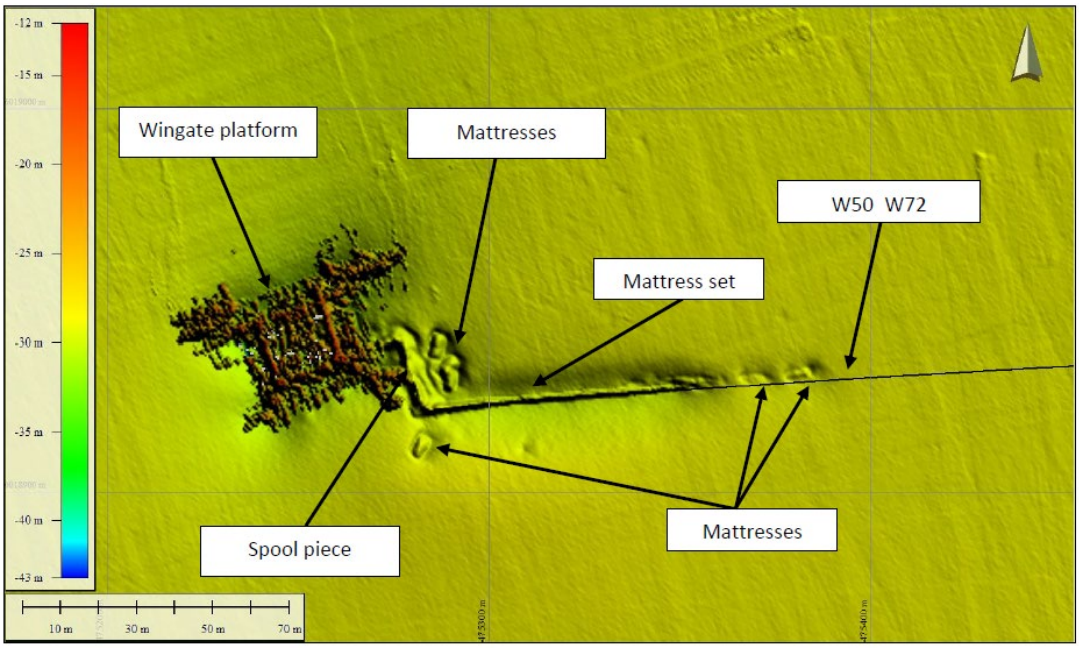
This Section summarises the proposed decommissioning activities and methodologies that have been selected and are described in the Decommissioning Programme.

2.1 Overview

The Wingate field is located in the SNS and produces gas and condensate. As noted in Section 1-1 the platform and 7km of the pipelines are located within the Dogger Bank SAC, which is designated for the Annex I habitat "Sandbanks which are slightly covered by seawater all the time".

The Wingate field was discovered in October 2008. Its development was approved in 2010 and the single NUI platform was installed and production began in 2011. The Wingate platform subsea arrangement and tie-in are shown in Figure 2-1. This most recent Multi-Beam Echo Sounder (MBES) image of the Wingate platform is from 2022.

Figure 2-1 MBES Overview of the Pipeline Departure at Wingate Platform (GeoXYZ, 2023)



Export from the field is via the Wingate NUI platform and a 12" gas export pipeline (W50, PL2850), piggybacked with a 2" Methanol chemical supply line (W72, PL2851) to the D15-FA-1 platform, in the Netherlands sector of the North Sea. It is anticipated that the field will cease production in Q4 2024 at the earliest. The economic lifetime of the Wingate field is strongly dependent on the gas price and operating cost share on the D15-FA facility.

The decommission strategy is based on an immediate reduction of operating cost of the facility once production ceases. The facility will be brought into a hydrocarbon free state by temporary plugging the wells and depressurizing and cleaning the pipelines. This increases the safety and reduces the platform maintenance scope and visit frequency, whereby monitoring of the wells and platform navigation will remain operational. Final well plug and abandonment (P&A) and platform removal will most likely be carried out in a later campaign together with other Wintershall operated facilities. The schedule for decommissioning is presented in Section 2.11.

2.2 Infrastructure

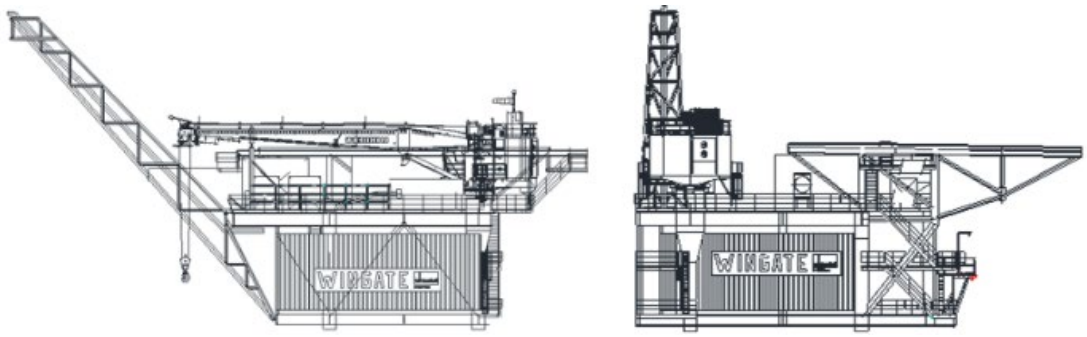
The Wingate Decommissioning Programmes document (Wintershall, 2023) concerns the following infrastructure:

- Wingate platform: topside (894 Te) and fixed steel jacket (803 Te);
- Export line (PL2850): 12" x 20.56km; and
- Methanol line (PL2851): 2" x 20.56km.

2.3 Wingate Platform

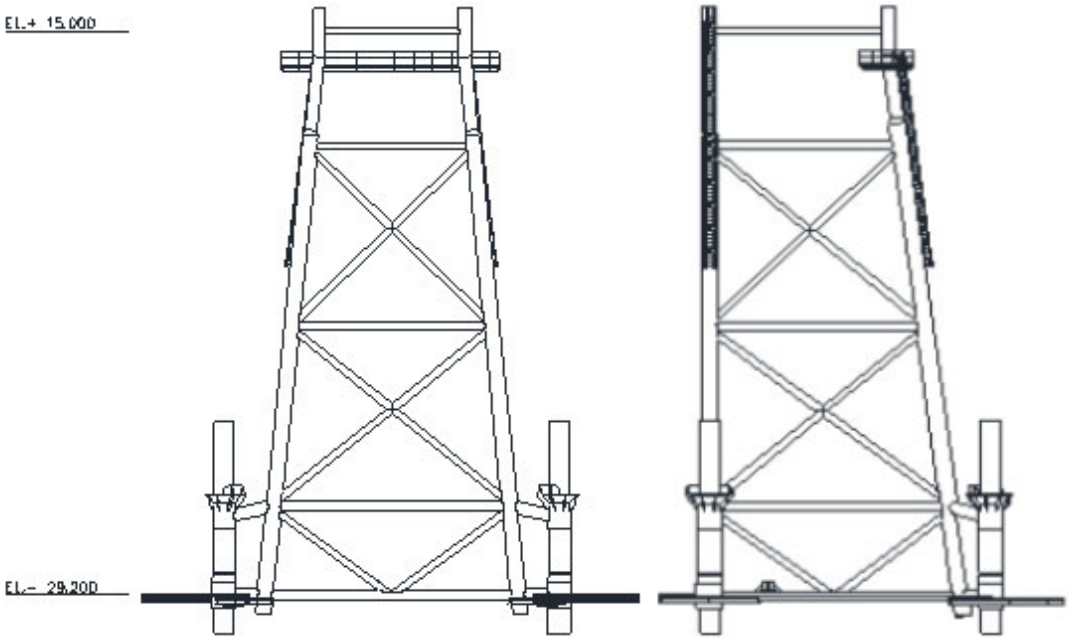
The Wingate NUI platform is a small, fixed steel platform (Figure 2-2), with an 894 Tonne (Te) topside structure, supported on a four legged, piled 803 Te steel jacket (Figure 2-3). The jacket weight excludes the 119 Te of pile sections (total weight of piles 451 Te) to be removed, which will be cut 3m below the seabed. The platform and jacket were designed to be removable at the end of field life.

Figure 2-2 Wingate Platform Topside (South and East Elevations)



Source: Wintershall 2023

Figure 2-3 Wingate Platform Jacket (South and East Elevations)



Source: Wintershall 2023

The platform was designed with six well slots. There are currently four live gas wells (two currently producing, one intermittently producing and one not producing) and two abandoned gas wells (44/24b-A2Z Phase 1 and 44/24b-A6 Phase 2) (Table 2-1).

Table 2-1 Wingate Platform Wells

Well designation	Status
44/24b-A1 (sidetrack of 44/24b-7, renamed from 44/24b- 7Z after installation of the platform	Live
44/24b-A2 (pilot hole)	Abandoned (Phase 1)
44/24b-A2Z (sidetrack of 44/24b-A2, still pilot hole)	Abandoned (Phase 1)
44/24b-A2Y (sidetrack of 44/24b-A2Z)	Live
44/24b-A3	Abandoned (Phase 1)
44/24b-A3Z (sidetrack of 44/24b-A3)	Live
44/24b-A4 (pilot hole)	Abandoned (Phase 1)
44/24b-A4Z (sidetrack of 44/24b-A4)	Live
44/24b-A5	Abandoned (Phase 1)
44/24b-A5Z (sidetrack of 44/24b-A5)	Plugged
44/24b-A6	Abandoned (Phase 2)
44/24b-7 (pilot hole, drilled prior to platform installation)	Abandoned (Phase 1)

Note: Phase 1: Reservoir abandonment | Phase 2: Intermediate abandonment

2.4 Wingate Pipelines

The two pipelines associated with the Wingate field (PL2850 and PL2851) run from the Wingate NUI to the D15-FA facility in the Dutch sector; these are 20.56km in length. The pipelines run in the UK sector for 10.40km (PL2850) and 10.38km (PL2851) of their 20.56km length and are trenched and buried for their total length. Details of the pipelines are summarised in Table 2-2.

Table 2-2 Wingate Pipelines

Description	Pipeline Number	Diameter (inches)	Length (km)	Description of Component Parts	Product Conveyed	Burial Status	Current Content
Export line	PL2850	12"	20.56 (10.40 in UK sector)	3-layer PP coated Carbon steel	Gas	Trenched and buried, no exposure	Hydrocarbon
Methanol (MeOH) line	PL2851	2"	20.56 (10. 38 in UK sector)	3-layer PP Coated Carbon steel	Chemicals	Trenched and buried, no exposure	Chemicals – injection water transport

2.4.1 Depth of Burial

Acoustic inspection surveys undertaken in 2018 (Fugro, 2018) and 2022 (GEOXYZ, 2023) indicated that there are no areas of spans, exposure or shallow burial throughout the pipeline length. Figure 2-4 presents an indication of burial depths (2013) along the whole length of the pipelines (between the Wingate platform and the D15-FA-1 platform). The length of the section from the Wingate platform to where the piggybacked pipelines are trenched and buried is approximately 100m (as shown in Figure 2-1). From this point, the majority of the pipelines routes are trenched and buried to a depth

greater than 1m below seabed surface, with a minimum depth of 0.7m, until reaching the D15-FA-1 platform.

Figure 2-4 Wingate Pipelines Depth of Burial (2013)

Source: Wingate 2013 pipeline inspection survey (Wintershall, 2013)

A technical study was undertaken by Wintershall in 2019 to determine the risk of pipeline exposure. The study assessed historical seabed data around the pipeline and combined this with seabed dynamics and development of exposures and free spans and technical information on the pipeline.

The study concluded that the seabed has been stable over the period assessed (2011 to 2018) and the pipelines are at low risk of exposure and free spans (Wintershall, 2019). The last depth of burial survey was performed in 2013. The last acoustic inspection survey was in 2022. The pipeline was seen to be trenched and buried over >99% of its length with no exposures reported. Depth of Burial surveys are undertaken on a rotating interval and the next one is planned for 2026.

2.4.2 Stabilisation Material

Stabilisation material was used to protect unburied sections of pipeline within 100m of the Wingate platform (Table 2-3).

There are grout bags installed below the spool piece, connecting of the pipeline to the riser section at the Wingate NUI to support the connecting spool. The dimensions and quantity of grout bags that were used is not mentioned in the as built documentation, but the area is known to cover a section 20m long x 3m wide.

Table 2-3 Stabilisation Material

Stabilisation feature(s)	Number	Dimensions (m)	Total footprint (m^2)
Concrete mattresses	22 (on Wingate side)	6.0 Length x 3.0 Wide x 0.3 High	396
Grout bags	Unknown	Unknown	60

2.4.3 Drill Cuttings

All oil based muds were contained and returned to shore, all cuttings and slops created while drilling were also returned to shore, burned and the fluid part distilled and reused for building or treating oil based mud. No oil based drill cuttings were discharged to sea or deposited on the seabed. Water based muds were discharged during the drilling of the six wells.

2.5 Pre-Decommissioning Activities

It is anticipated that the following activities will be carried out prior to removal of the platform:

- A pre-decommissioning survey will be conducted to confirm depth of burial of the pipeline and confirm environment baseline. The results of these surveys will be used to verify the baseline and the environmental appraisal.
- Wells will be plugged and abandoned in accordance with Offshore Energies UK (OEUK) Guidelines (OEUK 2022) for the suspension and abandonment of wells.
- Conductors will be cut.
- Production facilities and export pipeline and 2-inch piggyback line will be fully flushed.

2.6 Proposed Decommissioning Activities

The decommissioning programme identifies the proposed solution and approach for the decommissioning of each element related to the Wingate field. This is summarised in Table 2-4.

Table 2-4 Proposed Decommissioning Solutions and Justification

Infrastructure	Proposed Decommissioning Solution	Reason for Selection
Topsides	Complete removal by Heavy Lift Vessel (HLV) and transported to appropriate land-based facility for dismantlement, disposal and recycling. Cleaned equipment refurbished for reuse where possible. Equipment which cannot be reused will be recycled or processed via other disposal routes as appropriate. The operation will involve one HLV vessel, one anchor handling vessel (AHV) and potentially one guard vessel. HLV anchoring will be outside of the 500m zone and it is likely that operations will be undertaken in the Summer months – between April and September.	Wintershall indicates that Wingate topside could be reused for other developments in the SNS.
Jacket	Complete removal by HLV, transported to appropriate land-based facility for dismantlement, recycling and disposal. Piles will be severed at 3m below the seabed. Once disposal methods are selected DESNZ will be advised. The operation will involve one HLV vessel, one AHV and one guard vessel. The removal of topsides and Jacket will take up to 21 days. All operations will be confined to the 500m zone (excluding anchoring) and it is likely that operations will be undertaken in the Summer months – between April and September.	Leaves clear seabed, removes any potential obstruction to fishing operations and other users and maximises recycling of materials. To comply with OSPAR requirements.
Pipelines, Flow Line and Risers	Flush, clean and leave buried in situ. The abandonment of the 12-inch pipeline (number PL2850) and 2-inch piggyback line (number PL2851) was subjected to CA. Sections of the pipeline on the seabed immediately adjacent to the platform will be removed up to where the pipe goes into burial and cut ends covered with rock protection. Rock protection (rock dump) will be placed at the cut ends of the two pipelines and will be 5m long, 2m wide and 1m high. This equates to a maximum footprint of 10m^3 at each of the two pipeline cut ends (20m^3 total). The spool pieces will be removed and recovered to shore, recycled where possible and remainder sent to landfill for disposal. The remaining pipeline will be left in place as there are no areas of spans, exposure or shallow burial. The operations will last three days and involve one vessel.	The last acoustic inspection survey in 2022 indicated that the pipeline was trenched and buried over most, >99%, of its length (no exposure on the pipeline reported in 2022 survey). Minimal seabed disturbance, lower energy usage, reduced risk to personnel.

Infrastructure	Proposed Decommissioning Solution	Reason for Selection
	Degradation will occur over a long period within the seabed. Buried, decommissioned, pipelines are not expected to represent a hazard to the environment and other users of the sea. Inspection surveys will be undertaken after decommissioning to provide a general inspection on the in-situ pipelines.	
Stabilisation Features	Mattresses and grout bags will be recovered (if possible) to shore unless noted otherwise. These will be recovered using a Dive Support Vessel, which will involve one vessel and supported by a guard vessel the operations will last up to 10 days. All operations will be confined to the 500m zone and it is likely that operations will be undertaken in the Summer months – between April and September.	Leaves clear seabed, removes any potential obstruction to fishing operations and other users and maximises recycling of materials.
Wells	Abandoned in accordance with Offshore Energies UK Guidelines (OEUK 2022) for the suspension and abandonment of wells. Applications under the relevant regulations will be submitted in support of works carried out. Conductors will be cut during P&A activities (to 3m below the seabed) and removed using a HLV and transported on deck of the HLV to shore for disposal and recycling.	Meets NSTA and HSE regulatory requirements.
Inter-dependencies	There is a pipeline crossing (Minke – D15-FA 8-inch Pipeline and 4-inch umbilical) in the Dutch sector. Decommissioning in the Dutch sector will be completed under Dutch regulations and discussions will be held with the operators to discuss the decommissioning approach.	

2.7 Onshore Activities

Appropriate licenced sites will be selected. The facility selected must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver innovative recycling options.

2.8 Post-Decommissioning Activities

Post decommissioning activities will be carried out in accordance with BEIS Guidance (currently BEIS 2018) and subject to Marine Licencing requirements (implemented under the Marine & Coastal Access Act 2009):

- A post-decommissioning survey will be conducted covering a 500m radius around the Wingate NUI site and a 100m corridor along the pipeline route up to the UK/Netherlands median line.
- Seabed debris related to oil and gas activities, if present, will be recovered and transported to shore for recycling or disposal as appropriate and in line with existing disposal methods.
- An over-trawlability survey will be carried out; however, this may not be necessary if the MBES survey indicates that there is no significant seabed disturbance or debris present.
- A close out report will be submitted to DESNZ within one year of completion.
- On completion a clear seabed certificate or equivalent will be submitted to Regulators.

2.9 Waste Management

2.9.1 Waste Material Comprises

- Non-hazardous waste, e.g., metals, concrete and plastics.
- Hazardous materials, e.g., contaminated plastics and concrete, chemicals and waste oils.

- Naturally Occurring Radioactive Material (NORM).
- All material recovered during the decommissioning programme will be returned to shore where it will be assessed for onward processing. Onshore treatment of waste has not been considered further as it will be reviewed as part of onshore activities (BEIS 2018).

2.10 Vessel Use

While the exact vessel requirements are not yet able to be confirmed, Table 2-5 provides an overview of the anticipated vessel types, their expected operational days and fuel consumption and associated emission to the atmosphere. This information is based on experience in other decommissioning operations and other Wintershall operations. It is anticipated Anchor Handling Vessels (AHV) will be required during the operations to remove the topside and jacket. Vessels will be audited during contractor selection and pre-mobilisation. Work programmes will be planned to optimise vessel time in the field. Each vessel will have its own Shipboard Oil Pollution Emergency Plan (SOPEP) which it will put in to action should it be responsible for unplanned release of hydrocarbons.

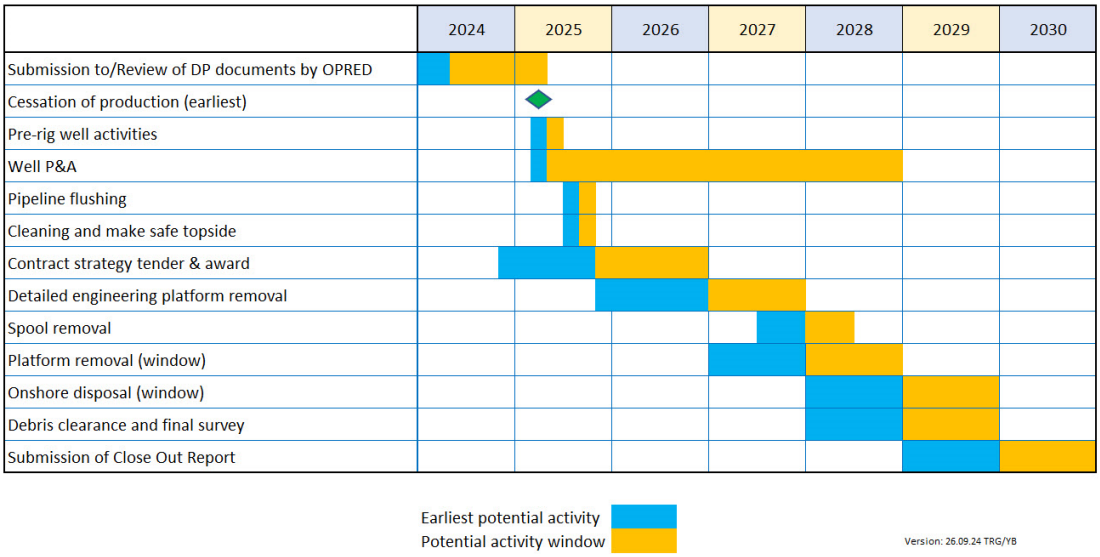
Table 2-5 Vessel Use

Vessel type	Use	Days	Fuel use (Te/day)	CO_2 Total (Te)	Energy Consumption (Gigajoule (GJ))
HLV	Platform and jacket removal	21	28	588	23,520
AHV	Anchor handling during HLV operations	21	10	210	8,400
Tug/ Guard vessel	Support for HLV/ Operation protection	30	15	450	18,000
Trenching vessel	Seabed dredging to enable pipeline cutting	5	100	500	20,000
Dive support vessel	Pile/pipeline cutting Pipeline and pipeline stabilisation material removal	10	10	100	4,000
Survey vessel	As-left survey	3	10	30	1,200
Total				1,878	75,120

2.11 Schedule

It is currently anticipated that pre-decommissioning activities will start in Q4 2024 at the earliest, following cessation of production (CoP) from the Wingate field; however, economic circumstances may influence CoP date. The overall decommissioning programme, including activities while the Wingate NUI is still in place, is expected to take place over a period of six years from CoP. The current decommissioning schedule is shown in Figure 2-5.

Figure 2-5 Decommissioning Schedule (draft)



2.12 Environmental Management

Wingate environmental policies have the underlying principle of conducting business with respect and care for the environment in which they operate. Wintershall implements such policies through an environmental management system (EMS), last certified in June 2022 (Wintershall 2020). The EMS is managed by the Wintershall Health, Safety, Environmental (HSE) Department, which has responsibility for the environmental management of the proposed activities, including drilling, subsea activities, development, execution, commissioning, production and decommissioning.

3. ENVIRONMENTAL BASELINE

An understanding of the potential impacts from an operation on the environment requires a clear understanding of the present state of the environmental baseline. For the purposes of this report the environment has been split into three categories: physical, biological and human. The below description is focused on the environmental receptors that could be affected by the operations in question and that will be included in the final assessment.

3.1 Data Sources

This description is based on the following primary data sources:

- Dimple exploration well site survey (Fugro Survey Limited 2007);
- Wingate to D15-FA-1 site and pipeline route survey (DeepOcean 2009, DeepOcean 2010, Fugro Alluvial 2010, Fugro Survey 2009);
- Winchelsea I Site Survey (44/23b), Environmental Baseline Report, surveyed July 2014 (Fugro 2014);
- Winchelsea I Site Survey, Winchelsea Geophysical Survey Report, surveyed December 2016 (Fugro 2016);
- Offshore Energy Strategic Environmental Assessment 3 (Department for Energy and Climate Change (DECC) 2016);
- European Marine Observation and Data Network (EMODnet 2023); and
- Pipeline inspection surveys (Fugro, 2018; GEOXYZ 2023).

All other relevant data sources are referenced throughout the EA.

3.2 Data Gaps and Limitations

There is limited post installation environmental survey data available to inform the environmental baseline, with the most recent environmental survey undertaken in 2009 to inform the development of the Wingate field (DeepOcean 2010). Additional data from nearby site surveys at Winchelsea I have been drawn upon from 2014 and 2016. Winchelsea I is located in the neighbouring licencing block, 15.6km from the Wingate NUI and, therefore, considered representative to support baseline characterisation. To supplement this, benthic samples collected as part of a separate monitoring survey undertaken for the JNCC, (Eggleton *et al*. 2016) have been used.

It is considered that the information presented below provides a satisfactory characterisation of the baseline environment in order to undertake an EA.

As noted in Section 2.5, a pre-decommissioning survey will be undertaken to confirm aspects of the environmental baseline (currently planned for 2026), if deviations are identified from the baseline presented below the EA may need to be revisited.

3.3 Physical Environment

3.3.1 Atmosphere

3.3.1.1 Meteorology

Winds in the SNS area are principally from the southwest and northeast. In winter, wind strength typically ranges on the Beaufort scale 1-6 (1-11ms^{-1}) with higher winds of force 7-12 (14-32ms^{-1}) being much less frequent. In January, force 7 (14ms^{-1}) winds are recorded 20% of the time and only 2-4 %

of the time in July. As is to be expected, the strongest winds occur during the winter months, whereas summer months are calmer. Easterly winds are uncommon but bring exceptionally cold weather in winter (DECC 2016). Air temperatures vary from a mean of 4°C to 6°C between January and February to 16°C at the highest between July and August.

3.3.1.2 Air Quality

Air quality (as indicated by concentrations of the combustion products carbon monoxide (CO), nitrogen oxides (NO_x), sulphur dioxide (SO_2), and volatile organic compounds (VOC)) is not generally considered to be an issue for offshore developments, such as those within the North Sea, though overall between 2011 and 2012, SO_2 emissions increased by 33%, Carbon Dioxide (CO_2) decreased by 7% and NO_x remained stable (DECC 2016). Offshore installations, such as those within the North Sea are generally too remote from the onshore receptors to have a discernible impact on air quality when compared to urban, industrial and transport related terrestrial sources.

3.3.2 Water

3.3.2.1 Oceanography

Inputs of North Atlantic water strongly influence the hydrography of the North Sea, with minor inflows from the English Channel and the Baltic Sea (Department for Trade and Industry (DTI) (DTI, 2002; Pätsch *et al.* 2017). Water movement in the North Sea is generally anti-clockwise, with North Atlantic water moving south, balanced by a northerly outflow along the Norwegian coast (Nauw *et al*. 2015). The SNS water moves in a broadly northeasterly direction as part of this general circulation (DTI 2002).

The North Sea has a predominantly tidal current regime, with a weak background circulation which contributes to a small eastward drift at the project area. The SNS is characterised by shallow, well-mixed waters, which undergo large seasonal temperature variations (OSPAR 2010; Mathis *et al*. 2015). Unlike more northern and central parts of the NS, the shallow parts of the SNS do not show water column stratification in the summer months. Normally, water column average currents are in the range 0.05ms^{-1} to 0.37ms^{-1}, the latter during spring tides. However, exceptional tides and storm surges may give rise to stronger currents (Wintershall 2013).

3.3.3 Water Quality

Historically there have been two main sources of contaminants from oil and gas activity in the North Sea: produced water, mainly in the context of production facilities rather than drilling operations, and drill cuttings, with the latter predominantly affecting sediment quality. With the introduction of OSPAR decision 2000/3, hydrocarbon input from drill cuttings has been essentially eliminated, as Oil Based Mud (OBM) is no longer discharged to sea. Produced water is now the main source of contamination to the water column as it potentially contains geologically sourced contaminants such as hydrocarbons, trace metals and NORM. In addition, produced water may be contaminated with chemicals used downhole. However, there is no evidence for any general influence of offshore oil and gas activity on water quality beyond the immediate vicinity of the source (Defra 2010).

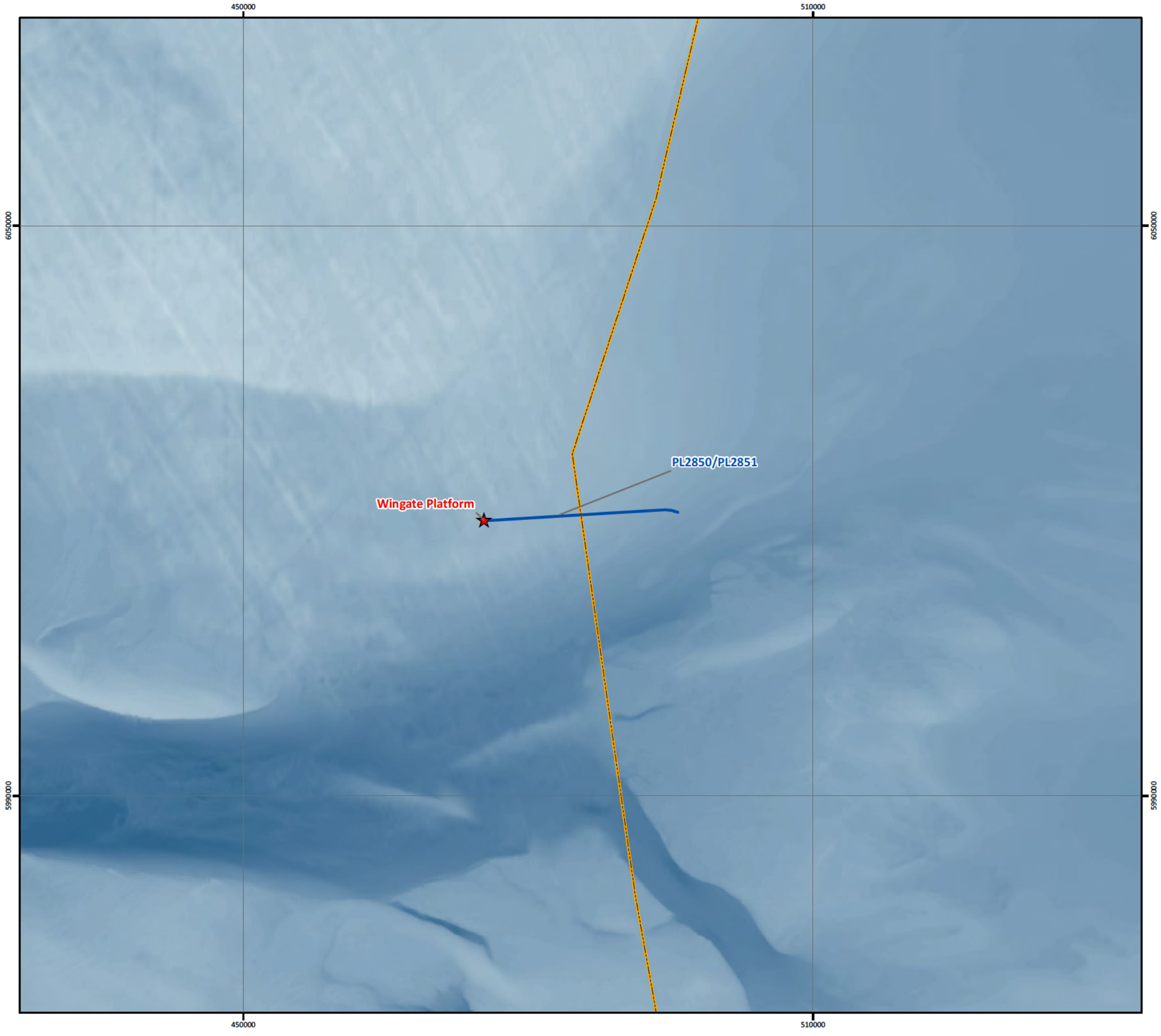
Hazardous substances enter the marine environment due to natural processes and as a result of anthropogenic activity (UKMMAS 2010). Water quality in the UKCS generally reflects the sources and modes of transport of potential contaminants to the marine environment. Contaminants that are volatile and pre-dominantly sourced through combustion processes (e.g. mercury and its compounds, VOCs), polyaromatic hydrocarbons (PAH)), and, therefore, have an atmospheric transport route, tend to be widely distributed. Contaminants which are mainly water borne (most metals, nutrients) are largely restricted to estuarine and coastal waters, with concentrations rapidly decreasing offshore. As a result, concerns over water quality in UK waters are largely restricted to industrialised estuaries (DTI 2001; UKMMAS 2010).

3.3.4 Seabed

3.3.4.1 Bathymetry

The majority of the SNS lies within the shallow water of the southern embayment of the North Sea where water depths are generally less than 50m, as shown in Figure 3-1 (Drawing number: P1841V-BATH-001). The maximum depth is 98m at Silver Pit, which is just to the south of the Dogger Bank. The highest point is the Dogger Bank, which at its shallowest is just 15m below sea level (Cameron *et al.* 1992; Roberts *et al.* 2018).

Water depths along the pipeline shoal gently from 29.0m Lowest Astronomical Tide (LAT) at the Wingate platform (KP0.0) to a minimum water depth of 27.9m LAT between KP4.0 and KP5.0. From this point the seabed gradually deepens to 39.2m LAT at the D15-FA-1 platform. There are a number of isolated maximum depths of greater than 40.0m LAT in areas of scour in the immediate vicinity of the Wingate platform. Slope gradients along the route are very slight to negligible with a maximum gradient of 12.5% at KP20.6. This is within the immediate vicinity of the D15-FA-1 platform and is associated with rock dump of a 10" Dutch sector pipeline (DeepOcean 2010).



WINGATE FIELD DECOMMISSIONING PROJECT

BATHYMETRY
EMODnet Bathymetry 2022

Drawing No: P1841V-BATH-001	A

Legend

- Wingate Platform
- PL2850/PL2851
- EEZ Boundary

EMODnet Bathymetry 2022

Value

High : 0

Low : -80

N
W E
S

NOTE: Not to be used for Navigation

Date	13 March 2024
Coordinate System	ED 1950 UTM Zone 31N
Projection	Transverse Mercator
Datum	European 1950
Data Source	MarineRegions; EMODNET; NSTA; ESRI
File Reference	J:\P1841\Mxd\P1841V\04_BATH\ P1841V-BATH-001.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

wintershall intertek

0 5 10 15 20 km

3.3.4.2 Sediments and Seabed Features

The upper sediment layers in the SNS are the result of a series of glaciation events occurring during the Pleistocene epoch of the Quaternary period, occurring from 1.8 million years ago (mya) to 10,000 years before present (BP). Overlying these Pleistocene deposits are terrestrially derived, more or less mobile, recent (Holocene) muds, sand and gravels of the Holocene epoch, 10,000 years BP to present (Cameron *et al.* 1992; Fitch *et al.* 2022).

The majority of sediments across the Dogger Bank are classified as sand to muddy sand, with underlying clay material. Sands of variable thickness overlie the geological Dogger Bank formation, reaching 20m thickness in the southeast, while thinner layers cover the west and north of the site (JNCC 2022a). Sand waves and mega ripples occur across the south-west and east central areas.

The Wingate field is located within the Blocks 44/18d, 44/23f, 44/24b and 44/19f. Shallow geology within this area has been collected during previous geophysical and geotechnical surveys supported by evidence from the vibrocore and Cone Penetration Tests (CPTs). These surveys highlighted shallow soils and slightly muddy sand (<10% mud) within the project area which extend to approximately 35m below the seabed. These are the sediments covering the pipeline. The sand is of reworked Pleistocene glacial and peri-glacial deposits. The Holocene unit constitutes the Terschellinger bank Member of the Nieuw Zeeland Gronden Formation (DeepOcean 2010). The seabed is generally featureless and smooth in appearance.

Additionally, along the pipeline route the seabed is described as gravelly, mud rich diamictons. The sea floor is featureless with a slightly mottled appearance. As the pipeline progresses towards the median line the upper sands remain essentially homogeneous but are underlain in parts by the Elbow Formation at depths greater than 5m below the seabed (DeepOcean 2010). Trawl scars were observed in the western and central areas of the pipeline corridor.

The D15-FA-1 platform lies within a sub glacial valley that has been eroded into the Pleistocene deposits. The valley has been in-filled with soft sediments of the Early Holocene Elbow formation and Pleistocene Botney Cut formation, which overly the deeper Bolders Bank formation (DeepOcean 2010).

The following section summarises the findings of the analysis as reported in Fugro Survey Ltd (2010).

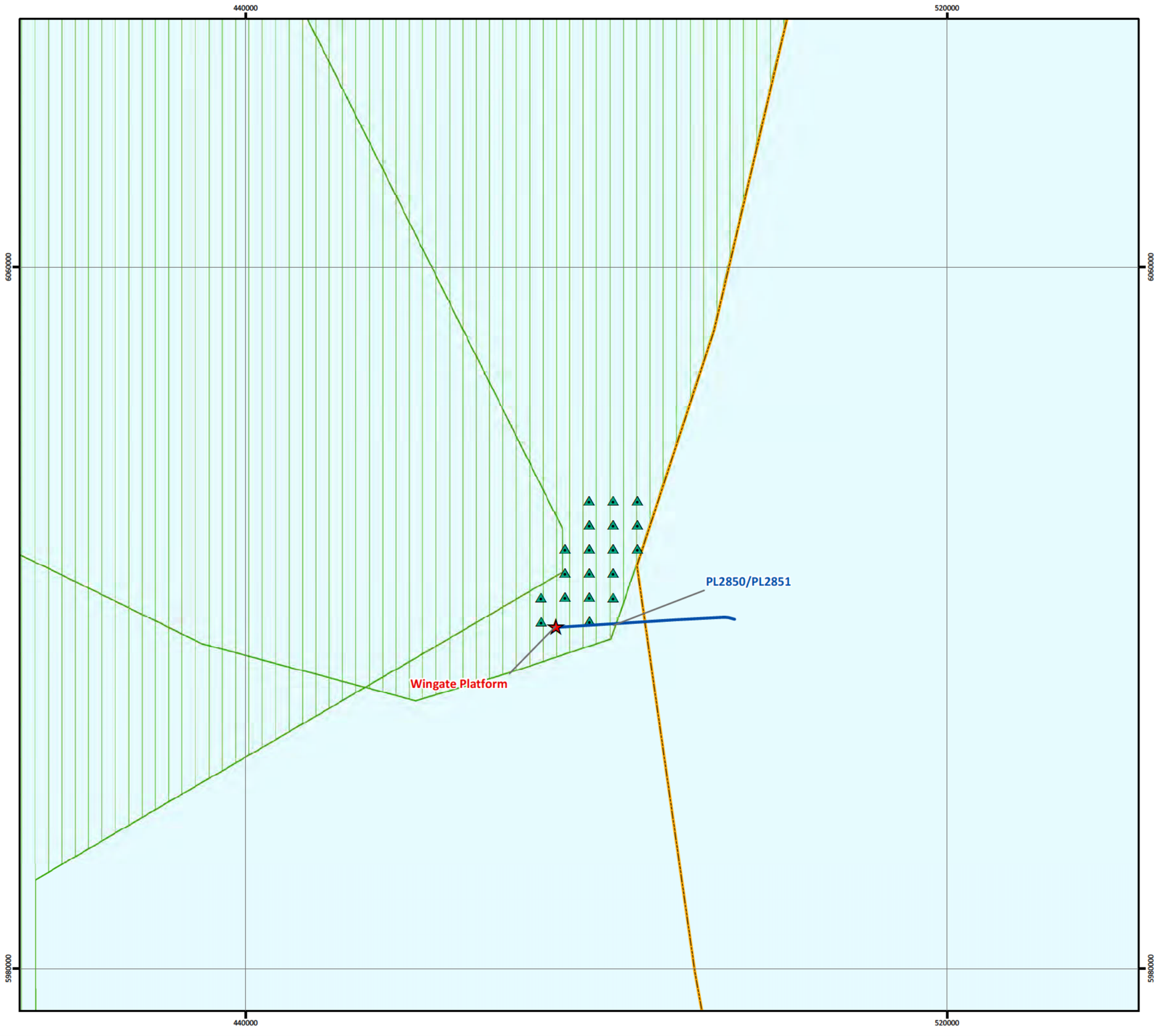
Findings from the Fugro Survey (2010) further displayed that surface sediments within the vicinity of the pipelines and project area are homogeneous very fine brown sand. Seabed photographs and video footage showed sand is rippled with shell fragments. Analysis of particle size and distribution indicates sediments are moderately well sorted with a mean particle size of 192.8µm.

Sediments are dominated by sand sized particles (63µm – 2mm), with the proportion of sand ranging from 98.82% at Station 12 to 99.76% at Station 11a. The proportion of fines (<63µm) and coarse (>2mm) material is also consistent ranging from 0.0% to 0.6% for fines and 0.24% to 1.18% for coarse material. A higher proportion of coarse material was observed at Station 10, but this is likely to be due to sub-sampling a larger number of shells than being indicative of a change in sediment. Seabed photographs and grab samples showed that the coarse material generally consisted of shell fragments.

Broadscale habitat maps from publicly available data (EMODnet 2023) suggest that the habitat in the vicinity of the Wingate platform is Atlantic circalittoral sand (MC52). This habitat is also present along the pipeline route, as well as Atlantic offshore circalittoral sand (MD52) and Atlantic offshore circalittoral coarse sediment (MD32). Subtidal coarse sediment and subtidal sand habitats are illustrative biotopes of the UK Biodiversity Action Plan (UKBAP; now known as the UK Post-2010 Biodiversity Framework) habitat 'Subtidal Sands and Gravels' (BRIG, 2008). The habitats are also sub-features of the feature 'Sandbanks which are slightly covered by seawater all the time', of which the Dogger Bank SAC is designed for (JNCC 2023a). The habitat 'Sandbanks which are slightly covered by seawater all the time' consists of sandy sediments that are permanently covered by sea water and

is listed under Annex I of EC Directive (JNCC 2023b). The Dogger Bank SAC is designated for this feature and is the largest sandbank in UK waters.

An overview map showing the locations of the most recent benthic surveys is provided in Figure 3-2 (Drawing number: P1841V-LOC-003).



WINGATE FIELD DECOMMISSIONING PROJECT

LOCATION OVERVIEW
Environmental Surveys

Drawing No: P1841V-LOC-003	A

N
W E
S

- Wingate Platform
- PL2850/PL2851
- EEZ
- JNCC/Cefas 2014 Benthic Survey

NOTE: Not to be used for Navigation

Date	13 March 2024
Coordinate System	ED 1950 UTM Zone 31N
Projection	Transverse Mercator
Datum	European 1950
Data Source	NSTA; JNCC; CEFAS; FRS; FUGRO; ESRI
File Reference	J:\P1841\Mxd\P1841V\01_LOC\ P1841V-LOC-003.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

wintershall intertek

0 8 16 24 32 km

3.3.4.3 Sediment Contamination

Background concentrations of hydrocarbons and heavy and trace metals in sediments generally increase from the SNS to the NNS. This trend is linked to the spatial distribution of sediment type, with higher background concentrations generally found in fine sediments, such as mud and silt, rather than coarser sediments, such as sands and gravels. This is due to fine sediments having a greater surface area and adsorptive capacity. In addition, the strong currents in the SNS lead to greater dispersion and dilution of chemicals after discharge. In general, contamination of offshore sediments tends to be very localised and focused around point discharge sources such as oil and gas installations. Sediments within 500m of an installation are typically contaminated by hydrocarbons and a range of heavy and trace metals. This is due to the rapid fall-out of heavy elements from discharges such as drill cuttings and produced water (DTI 2001).

The seven sediment samples acquired around the Wingate site were analysed for hydrocarbons and trace and heavy metal contamination. This section summarises the analysis as reported in Fugro Survey Ltd (2010).

Total hydrocarbon (THC) concentrations were similar across the site ranging from 0.9µg.g^{-1} to 2.2µg.g^{-1}. The highest concentration (2.2µg.g^{-1}) was found at Station 7. THC concentrations were marginally higher at stations within 100m of the exploration well (e.g., Stations 2, 7, 9 and 11a) than during the pre-drill survey, which could be the result of drilling muds dispersing away from the drilling location.

Concentrations at other stations remained the same or were reduced. All THC concentrations recorded in the 2009 survey were substantially lower than typically expected background levels for the SNS (Table 4-1).

Concentrations of n-alkanes showed a similar pattern to THC concentrations and ranged from 0.05µg.g^{-1} to 0.14µg.g^{-1} (Table 4-1). However, in general, concentrations were lower during the post-drilling survey compared to the pre-drilling conditions, with the exception of raised levels of a series of alkanes from NC_{12-19}. These alkanes were not present in sediments during the pre-drill survey suggesting they are drilling related. All n-alkane values were lower than typically expected background levels for the SNS (mean 0.33µg.g^{-1}).

All stations, but particularly stations 2, 6 and 7, showed elevated levels of Barium (Ba) post-drilling compared to pre-drill (Table 4-1). Concentrations varied widely from 20µg.g^{-1} at Station 12 to 355µg.g^{-1} at Station 7. Concentrations at Station 7 exceeded the 95th percentile for typically expected background levels in the SNS. The elevated concentrations were likely to be related to the drilling muds used for the 44/24b-7z exploration well. The high Ba concentrations at Station 6 also suggested that drilling muds dispersed at least 200m away from the drilling location with the prevailing current.

Concentrations of Chromium (Cr), Nickel (Ni), Vanadium (V) and Zinc (Zn) were also elevated in comparison to pre-drilling levels (Table 4-1). Lead (Pb) concentrations were generally similar in the pre-drilling and post-drilling surveys but were elevated at Station 2 in 2009. Cadmium (Cd), Copper (Cu) and Tin concentrations were below detectable levels at all stations. With the exception of Ba all recorded concentrations of heavy metals were below expected background levels for the SNS.

Table 3-1 Comparison of Sediment Contaminant

Station	Offset distance (m)	THC (µg.g^{-1})		Total n-alkanes (µg.g^{-1})		Ba (µg.g^{-1})		Cu (µg.g^{-1})		Ni (µg.g^{-1})		V (µg.g^{-1})		Zn (µg.g^{-1})	
		2007	2009	2007	2009	2007	2009	2007	2009	2007	2009	2007	2009	2007	2009
11(a)*	0	1.3	1.4	0.15	0.10	7	85	<2.0	1.8	<2.0	3.3	7	9.0	5	11.5
2	100	1.5	1.6	0.12	0.14	10	169	<2.0	2.2	<2.0	4.0	8	10.3	5	12.8
7	100	1.4	2.2	0.16	0.12	18	355	<2.0	2.3	<2.0	3.4	8	11.4	6	11.4
9	100	1.0	1.3	0.12	0.09	12	44	<2.0	1.2	<2.0	2.7	8	8.8	5	10.8
10	100	1.3	1.2	0.15	0.10	16	48	<2.0	1.9	<2.0	3.0	7	10.0	5	9.3
6	200	1.2	0.9	0.14	0.06	16	146	<2.0	0.9	<2.0	2.5	8	10.5	5	8.2
12	1055	1.0	1.0	0.11	0.05	11	20	<2.0	0.9	<2.0	2.3	8	10.1	5	7.2
Mean		1.2	1.4	0.14	0.09	13	124	-	1.6	-	3.0	8	10.0	5	10.2
Standard Deviation		0.2	0.4	0.02	0.03	4	116	-	0.6	-	0.6	0	0.9	0	1.9
SNS Background Level		<8 (UKOOA 2001)		0.33 (Fugro Survey Ltd 2010)		303 (Fugro Survey Ltd 2010)		20 (OSPAR 2005)		30 (OSPAR 2005)		60-110 (OSPAR 2005)		90 (OSPAR 2005)	

*Station 11a in the post-drill survey was located 16m NE of Station 11 in the pre-drill survey due to the presence of the wellhead protection structure.

Source: Adapted from Fugro Survey Ltd (2010)

No data on sediment contamination along the pipeline route was collected as part of this survey. However, given that there are no input sources for contaminants along the route, it is likely that sediment contamination will be similar if not better than at the Wingate field.

All drill cuttings were returned to shore, burned and the fluid part distilled and reused for building or treating oil based mud.

3.4 Biological Environment

3.4.1 Plankton

The most abundant groups of phytoplankton in the SNS are the dinoflagellate genus Ceratium, followed by the diatom genus *Chaetoceros*. *Thalassiorsira spp.* and *Protoperidinium spp.* are also present within the region. Copepods dominate the zooplankton community, with small species including *Para-Pseudocalanus spp., Acartia* and *Calanus* being the most abundant. Echinoderm larvae are the second most abundant group of zooplankton. Phytoplankton growth (also termed primary productivity) generally increases in spring as a result of increased light availability, combined with high nutrient levels in the water column. This leads to an increase in reproduction. Later in the season, nutrient availability becomes limiting on phytoplankton growth; however, mixing by storms may lead to a secondary bloom in autumn. Unusually, primary productivity over the Dogger Bank occurs throughout the year (Kröncke & Knust 1995; Stoeck & Kröncke 2001).

Zooplankton in the SNS are dominated by copepod species but include eggs and larvae of the majority of commercially important fish species, considered in Section 3.4.3. Increases in zooplankton abundance are related to food supply and generally lag behind phytoplankton blooms by a period of days to weeks.

Superimposed on the annual cycle of plankton abundance in the North Sea are further changes in community structure that occur over longer periods of time. Previous studies suggest that climatic variability is the overriding influence on primary productivity offshore (Defra 2010).

Plankton populations and succession are typical of those of the SNS. Plankton are potentially vulnerable to chemical and hydrocarbon discharges and high intensity sound in the immediate vicinity of the source. However, DECC (2016) noted that plankton in UK waters are unaffected by anthropogenic influences.

3.4.2 Benthic Communities

For the purpose of this assessment, benthic communities comprise those species (excluding commercially exploitable shellfish and demersal fish) that live on (epifauna) or in (macrofauna or infauna) seabed sediments. In general terms, the type and distribution of the community is greatly influenced by sediment type and hydrodynamic conditions.

3.4.2.1 Regional Context

The North Sea is a large shallow sea with a surface of around 750,000km^2 (Stanev *et al.* 2019). The SNS is shallow, with water depths of approximately 50m or less (Cameron *et al.* 1992; Sørensen *et al.* 2021). Benthic sediments in this area consist of sand and muddy sand, with patches of coarse sediment. Seabed features in the SNS include active sandbanks and sand waves which are maintained by the tidal and current regimes. Examples of this include the North Norfolk and Dogger Bank sandbanks. The Dogger Bank is home to a variety of infauna, including polychaete worms, amphipods and bivalves, and epifauna such as hermit crabs, flatfish and starfish. Dogger Bank is exposed to waves, of which prevent shallower parts of the bank becoming vegetated. Sandeels can be found on the sides of the sandbank and are a food source for seabirds, cetaceans and fish (JNCC 2023a).

3.4.2.2 Local Benthic Environment

Benthic communities observed in the 2009 survey were typical of moderately diverse sandy biotopes of the biotope '*Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand' (SS.SSa.IMuSa.FfabMag). No rare or protected species were identified in the baseline survey. The Wingate platform is located in area of seabed which is considered 'Atlantic circalittoral sand' (MC52) from broadscale habitat maps (EMODnet 2023). This habitat is also present along the pipeline route, as well as 'Atlantic offshore circalittoral sand' (MD52) and 'Atlantic offshore circalittoral coarse sediment' (MD32).

Surveys undertaken in 2008 observed 'Circalittoral fine sand' (A5.25) and 'Deep circalittoral sand' (A5.27) in stations sampled within 7km of the Wingate platform (Diesing *et al.* 2009). Local monitoring surveys undertaken in 2014 observed 'Subtidal Sand' (A5.2) within 1.7km of the Wingate platform and 'Subtidal Coarse Sediment' (A5.1) within 0.4km of the pipeline (Eggleton *et al.* 2016).

3.4.2.3 Macrofauna

75 discrete macrofaunal taxa were recorded during the course of the 2009 survey, excluding 21 juvenile, six colonial, two meiofaunal, one pelagic, one piscine and two incomplete taxa as recommended by OSPAR commission guidelines. Of the taxa recorded 39.2% were annelid, 23.0% were molluscan, 21.6% were crustacean and 8.1% were echinoderm. The remaining 8.1% is made up of representatives from the taxa Cnidaria, Nemertea, Chelicerata and Phoronida.

The top three most abundant species were the bivalve *Fabulina fabula*, the amphipod *Bathyporeia guilliamsoniana* and the gastropod *Polinices pulchellus*. *B. guilliamsoniana* is a burrowing deposit feeder with a preference for very fine, well sorted sands. *F. fabula* is also known to prefer sandy sediments, whilst *P. pulchellus* is a predator which feeds on bivalves such as *F. fabula*. The remainder of the most dominant species comprised two polychaetes (*Magelona johnstoni* and *Scoloplos armiger*), two amphipods (*Bathyporeia elegans* and *B. tenuipes*), two bivalve molluscs (*Corbula gibba* and *Nucula nitidosa*) and nemertean worms (see Table 3-2). Although none of the taxa were recorded in all of the samples, the most abundant taxa were recorded in at least eight of the samples. Overall, the mean species abundances were relatively low and the dominance ranks closed mirrored the abundance ranks indicative of a sparsely distributed fairly homogeneous community. The community is considered to be moderately diverse and typical for this region of the SNS and is classed as biotope *Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand (A5.242/SS.SSa.IMuSa.FfabMag).

Table 3-2 Overall Species Ranking

Species / Taxon	Rank Abundance	Mean Abundance	Rank Dominance
Fabulina fabula	1	7.1	2
Bathyporeia guilliamsoniana	2	6.9	1
Polinices pulchellus	3	5.1	3
Magelona johnstoni	4	4.2	4
Bathyporeia elegans	5	2.4	6
Nemertea	6	2.3	5
Scoloplos armiger	7	2.2	7
Corbula gibba	8	1.7	8
Nucula nitidos	9	1.6	13
Echinocyus pusillus	10	1.4	11
Nephtys cirrosa	11	1.3	9

Species / Taxon	Rank Abundance	Mean Abundance	Rank Dominance
Bathyporeia tenuipes	12	1.2	15
Acrocnida brachiata	13	1.1	12
Spio decorata	14	1.0	10

Source: Fugro Survey Ltd (2010)

Along the pipeline route, lower number of taxa were observed, however abundance of individuals was similar. Although diversity was generally lower, higher abundances of some taxa were recorded. This included the bivalve *Nucula nitidosa*, the brittle star *Amphiura filiformis* and the polychaete *Diplocirrus glaucus*. Sand dwelling taxa such as *B. guilliamsoniana*, *F. fabula* and *P. pulchellus* were absent. The observed difference in community structure is due to the change in sediment from very fine sand at Wingate to muddy/silty sediment along the pipeline route.

A monitoring survey conducted in 2014 collected benthic samples throughout Dogger Bank (Eggleton *et al.* 2016). Of this sample station, one was collected in close proximity to the Wingate platform (1.7km) and another adjacent to the pipeline route (0.4km). The top three most abundant species in the sample collected near to the Wingate platform were the polychaete *M. johnstoni*, the bristleworm *Magelona filiformis* and the bivalve *F. fabula*. The remainder of the most dominant species comprised amphipods (*Urothoe poseidonis*), polychaetes (*Chaetozone christiei, Sigalion*) and worm-like invertebrates (Enteropneusta). A variety of amphipods (*B. guilliamsoniana*, Urothoe), bivalves (Bivalvia, *Parathyasira equalis, Tellimya ferruginosa, Thyasira, Spisula*), gastropods (*Euspira nitida*), hydroids *(*Leptothecata), ribbon worms (Nemertea) and echinoderms (Echinoidea) were observed. Polychaetes (*Glycinde nordmanni, Goniada maculate, Lanice conchilega, Owenia borealis, Sigalion mathildae, Spiophanes bombyx, Phyllodoce, Nephtys, S. armiger*) were the most frequently observed group of taxa.

The top three most abundant species in the sample collected close to the pipeline route were *Urothoe elegans*, the polychaete *M. johnstoni* and the bivalve *F. fabula*. A variety of polychaetes (*C. christiei, G. nordmanni, S. armiger, S. bombyx, Sigalion, G. maculate*, *Nephtys, S. mathildae, Glycera lapidum*), bivalves (Bivalvia, *T. ferruginosa*), amphipods (*Bathyporeia elegans, B. guilliamsoniana, Abludomelita obtusata*), gastropods (*E. nitida*), ribbon worms (Nemertea), starfish (Asteroidea), brittlestars (Ophiuroidea), anemones (*Edwardsia claparedii*), urchins (*Echinocardium cordatum*) and flatworms (Platyhelminthes) were also observed.

A summary of observed taxa in these two stations is displayed in Table 3-3.

Table 3-3 Taxa Abundance in Dogger Bank Monitoring Survey

Taxa	Abundance	
	Wingate platform	Pipeline
Abludomelita obtusata	0	1
Asteroidea	0	1
Bathyporeia elegans	0	4
Bathyporeia guilliamsoniana	1	2
Bivalvia	1	1
Chaetozone christiei	2	4
Echinocardium cordatum	0	1
Echinoidea	1	0
Edwardsia claparedii	0	2

Taxa	Abundance	
	Wingate platform	Pipeline
Enteropneusta	2	0
Euspira nitida	1	1
Fabulina fabula	6	4
Glycera lapidum	0	1
Glycinde nordmanni	1	3
Goniada maculata	1	1
Lanice conchilega	1	0
Leptothecata	1	0
Magelona filiformis	9	0
Magelona johnstoni	12	5
Nemertea	1	1
Nephtys	1	1
Ophiuroidea	0	1
Owenia borealis	1	0
Parathyasira equalis	1	0
Phyllodoce	1	0
Platyhelminthes	0	1
Scoloplos armiger	1	2
Sigalion	2	1
Sigalion mathildae	1	1
Spiophanes bombyx	1	2
Spisula	1	0
Tellimya ferruginosa	1	1
Thyasira	1	0
Urothoe	1	0
Urothoe elegans	0	13
Urothoe poseidonis	3	0

Source: Eggleton *et al.* (2016)

3.4.3 Fish

Over 330 species of fish have been recorded on the UKCS (DECC 2016). The SNS is characterised by its sandy, flat, shallow seabed with considerable tidal mixing (DECC 2016). Species diversity within this region is therefore abundant, more so compared to the central or northern North Sea (BEIS 2022), with the greatest diversity observed in the west of the SNS (DECC 2016). Previous studies have identified an abundance in small demersal fish within the SNS (BEIS 2022). Furthermore, fish communities of the SNS consist of species with complex interactions with one another and the natural environment, acting as predators consuming a wide range of prey species including benthic invertebrates, and/or as prey supporting larger predators (DTI 2001). The majority of published information on distribution is concerned with commercial fish; however, recent data (Ellis *et al*. 2012) includes some consideration of species of conservation, rather than commercial, significance.

Reiss *et al.* (2010) identified whiting, dab, plaice, grey gurnard, and lesser weever to be characteristic demersal species within the SNS. Additionally, there are populations of herring and sprat, which have nursery grounds at the Dogger Bank and Southern Bight (DECC 2016).

Fisheries sensitivity maps (Ellis *et al.* 2012, Coull *et al.* 1998) have been used to identify the spawning (location where eggs are laid) and nursery grounds (location where juveniles are common) for commercial fish species in the operational area (Table 4-3). Figure 3-3 (Drawing Number: P1841V-FISH-011) and 3-4 (Drawing Number: P1841V-FISH-012) display fish spawning and nursery areas. Figures 3-5 (Drawing number: P1841V-FISH-006) and 3-6 (Drawing number: P1841V-FISH-007) illustrate the probability of fish species being present within and around the operational area.

The North Sea has been divided into a number of rectangles by the International Council for the Exploration of the Sea (ICES), which are used to report fisheries statistics. The Wingate NUI and associated pipelines lie within the ICES rectangle 37F2, where there are spawning or nursery grounds of up to 15 fish and shellfish species of commercial or conservation importance (Ellis *et al.* 2012). Of the species shown in Table 3-4, only those which are bottom spawning (lay eggs on the seabed), and cod, which use the seabed during courtship behaviour (González-Irusta and Wright 2016), are potentially vulnerable to decommissioning activity at Wingate. For the purpose of this assessment, it has been assumed that all fish species (with the exception of common ling) to be nursing throughout the entire year, unless sources state otherwise. For example, when species are displayed to be spawning.

Table 3-4 Fish Spawning and Nursing

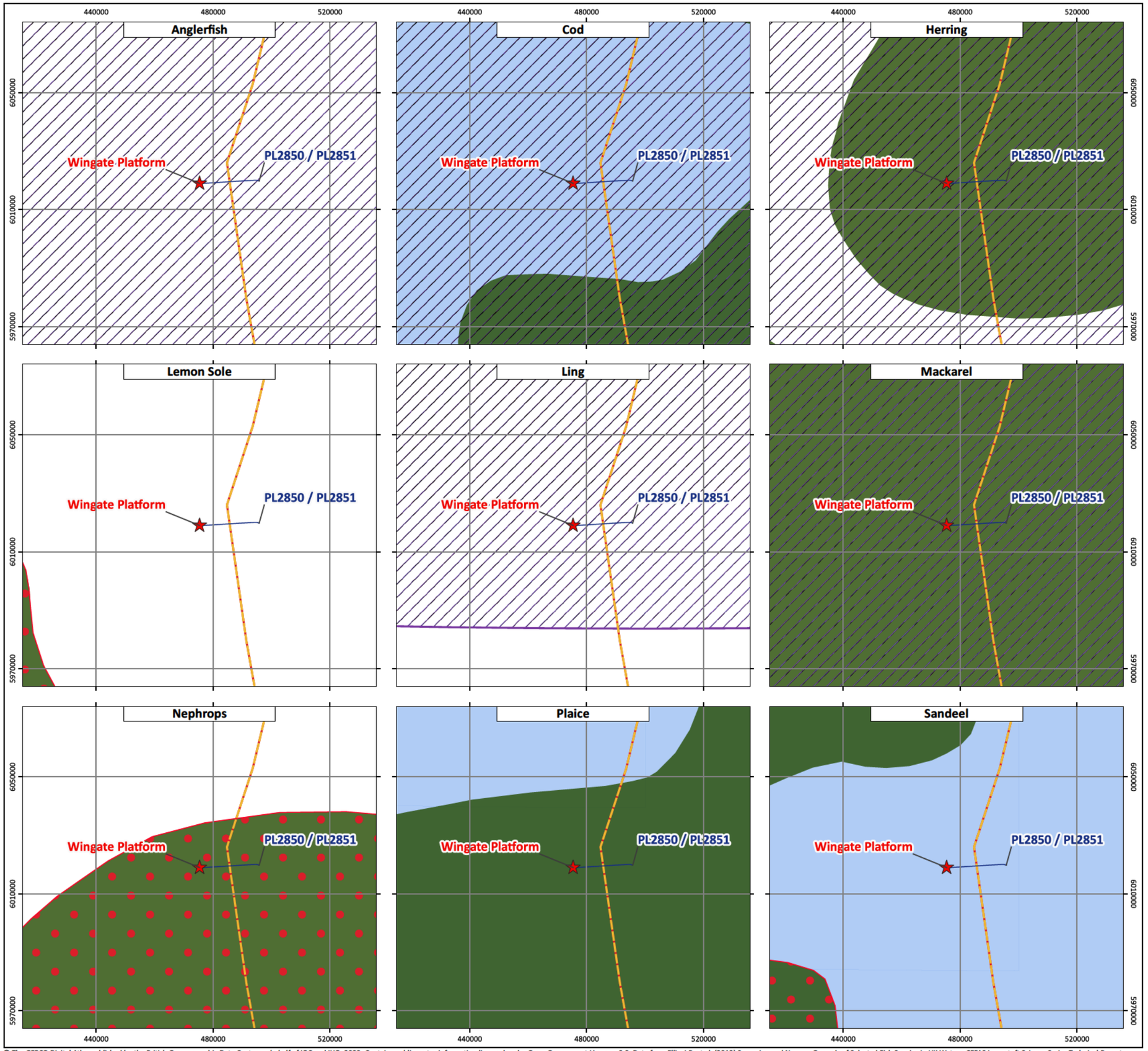
Species		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Spawning and nursing, bottom spawning, planktonic larvae													
Herring	*Clupea harengus*	N	N	N	N	N	N	N	SN	SN	N	N	N
Nephrops	*Nephrops norvegicus*	SN	SN	SN	SN	SN	SN	SN	SN	SN	SN	SN	SN
Sand eel	*Ammodytidae spp.*	SN	SN	N	N	N	N	N	N	N	N	N	N
Spawning and nursing, planktonic eggs and larvae													
Atlantic Cod	*Gadus morhua*	SN	SN	SN	SN	N	N	N	N	N	N	N	N
Atlantic Mackerel	*Scomber scombrus*	N	N	N	N	SN	SN	SN	SN	N	N	N	N
European Sprat	*Sprattus sprattus*	N	N	N	N	SN	SN	SN	SN	N	N	N	N
Whiting	*Melangus merlangus*	N	SN	SN	SN	SN	SN	N	N	N	N	N	N
Spawning only, planktonic eggs and larvae													
European Plaice	*Pleuronectes platessa*	S	S	S	N	N	N	N	N	N	N	N	N
Common Sole	*Solea solea*	N	N	S	S	S	N	N	N	N	N	N	N
Nursing only, planktonic eggs and larvae													
Anglerfish	*Lophius piscatorius*	N	N	N	N	N	N	N	N	N	N	N	N
Blue Whiting	*Micromesistius poutassou*	N	N	N	N	N	N	N	N	N	N	N	N
Common Ling	*Molva molva*		N	N	N	N	N	N					
European hake	*Merluccius merluccius*	N	N	N	N	N	N	N	N	N	N	N	N
Viviparous fish													

Species		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Spurdog	*Squalus acanthias*	Gravid females can be found all year, juveniles mobile at birth											
Tope shark	*Galeorhinus galeus*	Gravid females can be found all year, juveniles mobile at birth											
Key	Spawning (S)				Nursing (N)						Spawning and nursing (SN)		

Note: Species in bold identify UKBAP species.

Source: Ellis *et al.* 2012, Coull *et al.* 1998

The UKBAP list of priority species and habitats sets out a conservation approach for 15 species of marine fish/elasmobranchs; anglerfish, blue whiting, Atlantic cod, common skate, European hake, herring, horse mackerel, common ling, European plaice, spurdog, thornback ray, tope shark, undulate ray and whiting. It is possible that any of these species could occur in the operational area during decommissioning at Wingate. Their inclusion on the list means that the UK government will take actions to maintain their current range and abundance.



WINGATE FIELD DECOMMISSIONING PROJECT

FISHING ACTIVITY

Fish Spawning and Nursery Areas (Sheet 1 of 2)

Drawing No: P1841V-FISH-011 | A

Legend

- Wingate Platform
- PL2850/PL2851

Adminstrative Boundaries

- Exclusive Economic Zone (EEZ) Boundary

Nursery and Spawning Grounds

- UK Nursery Grounds (2010)
- UK Nursery Grounds (1998)
- UK Spawning Grounds (1998)
- UK Spawning Grounds (2010)

N

NOT TO BE USED FOR NAVIGATION

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Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

wintershall intertek

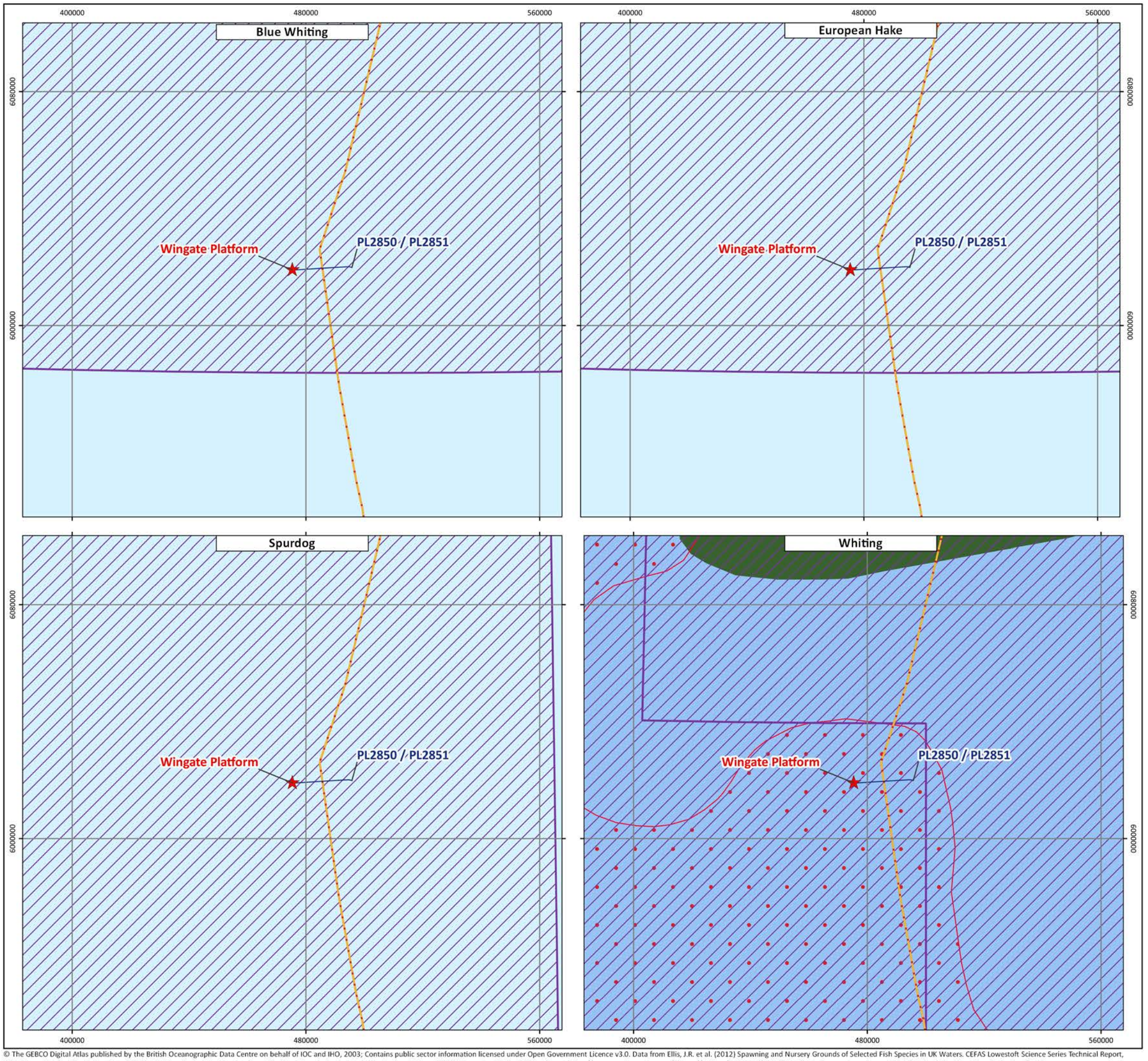
0 20 40 60 80 km

WINGATE FIELD DECOMMISSIONING PROJECT

FISHING ACTIVITY

Fish Spawning and Nursery Areas (Sheet 2 of 2)

Drawing No: P1841V-FISH-012 | A



Legend

- Wingate Platform
- PL2850/PL2851

Adminstrative Boundaries

- Exclusive Economic Zone (EEZ) Boundary

Nursery and Spawning Grounds

- UK Nursery Grounds (2010)
- UK Nursery Grounds (1998)
- UK Spawning Grounds (1998)
- UK Spawning Grounds (2010)

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Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

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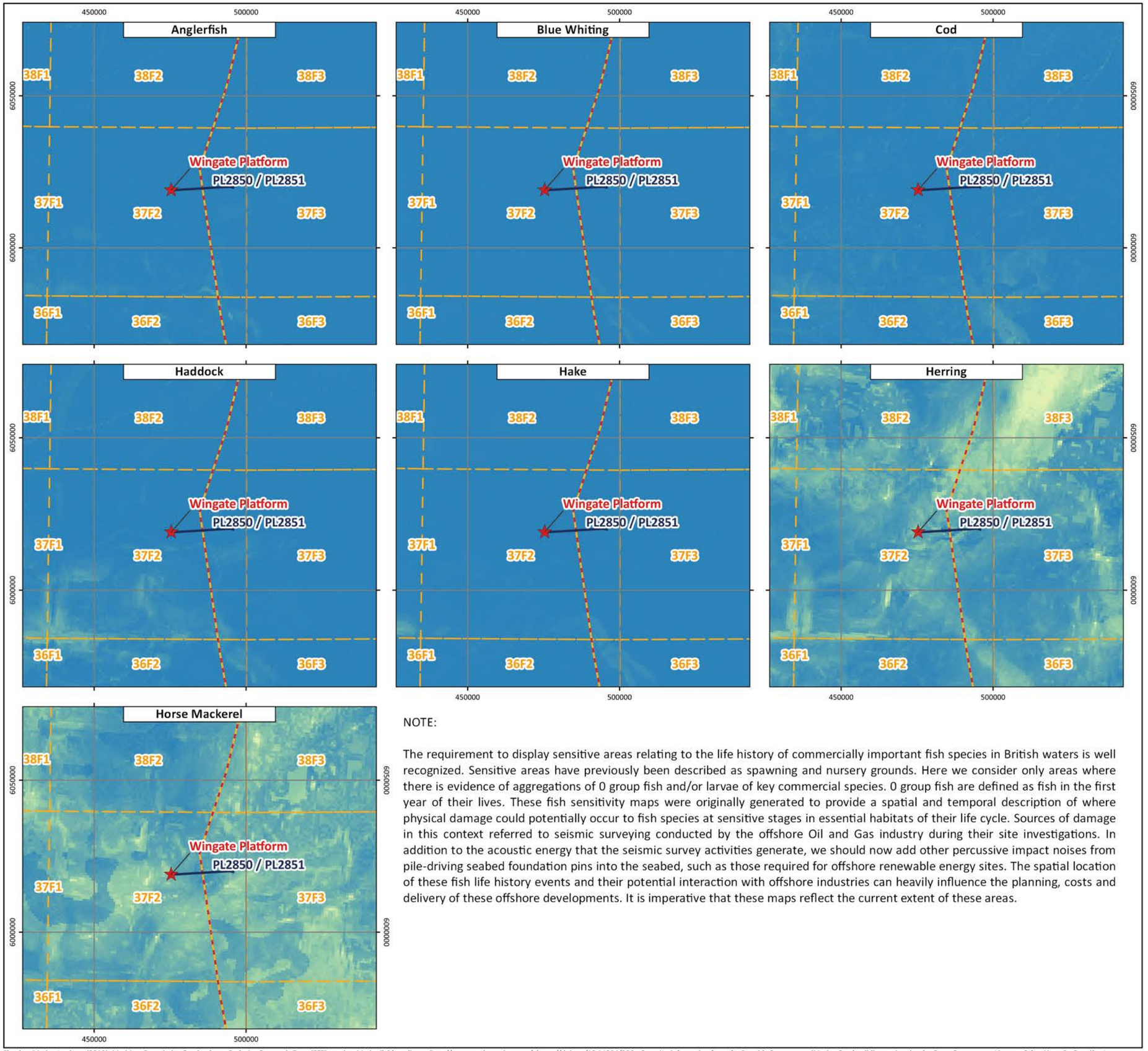

NOTE:

The requirement to display sensitive areas relating to the life history of commercially important fish species in British waters is well recognized. Sensitive areas have previously been described as spawning and nursery grounds. Here we consider only areas where there is evidence of aggregations of 0 group fish and/or larvae of key commercial species. 0 group fish are defined as fish in the first year of their lives. These fish sensitivity maps were originally generated to provide a spatial and temporal description of where physical damage could potentially occur to fish species at sensitive stages in essential habitats of their life cycle. Sources of damage in this context referred to seismic surveying conducted by the offshore Oil and Gas industry during their site investigations. In addition to the acoustic energy that the seismic survey activities generate, we should now add other percussive impact noises from pile-driving seabed foundation pins into the seabed, such as those required for offshore renewable energy sites. The spatial location of these fish life history events and their potential interaction with offshore industries can heavily influence the planning, costs and delivery of these offshore developments. It is imperative that these maps reflect the current extent of these areas.

WINGATE FIELD DECOMMISSIONING PROJECT

FISH AND FISHING ACTIVITY

Probability of 0 Group Presence

Sheet 1 of 2

Drawing No: P1841V-FISH-006 | A

Legend

- Wingate Platform
- PL2850/PL2851
- EEZ Boundary
- ICES Rectangle

Probability of Presence

1

0

N

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Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

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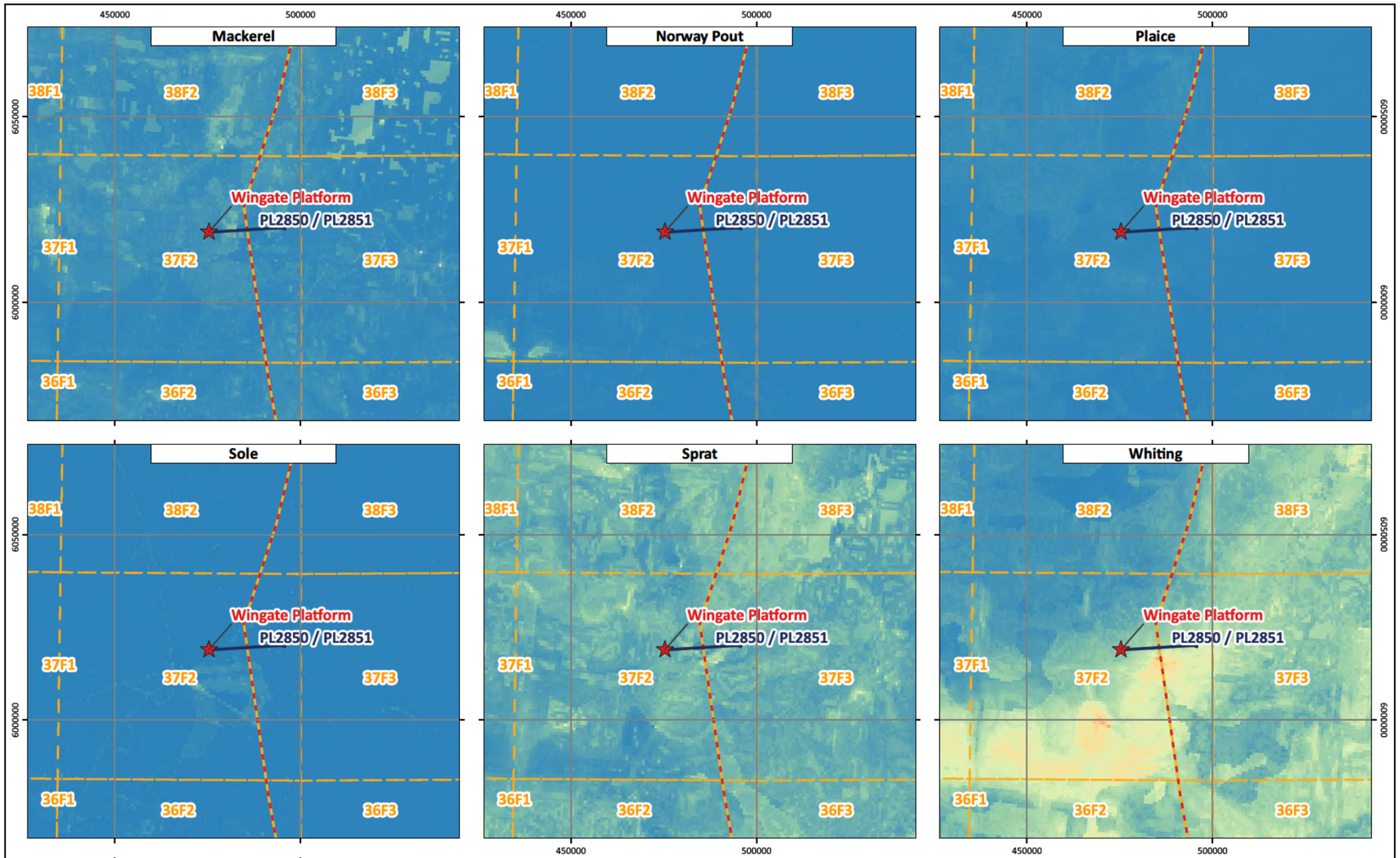
0 20 40 60 80 km

Flanders Marine Institute (2019). Maritime Boundaries Geodatabase: Exclusive Economic Zone (EEZ), version 11. Available online at http://www.marineregions.org/. https://doi.org/10.14284/386; Contains information from the Scottish Government (Marine Scotland) licensed under the Open Government Licence v3.0. ; Aires, C., González-Irusta, J.M., Watret, R. (2014) Updating Fisheries Sensitivity Maps in British Waters. Scottish Marine and Freshwater Science Vol 5 No 10. Edinburgh: Scottish Government, 88pp. DOI: 10.7489/1555-1, https://data.marine.gov.scot/dataset/updating-fisheries-sensitivity-maps-british-waters; ©ICES; ©Esri



NOTE:

The requirement to display sensitive areas relating to the life history of commercially important fish species in British waters is well recognized. Sensitive areas have previously been described as spawning and nursery grounds. Here we consider only areas where there is evidence of aggregations of 0 group fish and/or larvae of key commercial species. 0 group fish are defined as fish in the first year of their lives. These fish sensitivity maps were originally generated to provide a spatial and temporal description of where physical damage could potentially occur to fish species at sensitive stages in essential habitats of their life cycle. Sources of damage in this context referred to seismic surveying conducted by the offshore Oil and Gas industry during their site investigations. In addition to the acoustic energy that the seismic survey activities generate, we should now add other percussive impact noises from pile-driving seabed foundation pins into the seabed, such as those required for offshore renewable energy sites. The spatial location of these fish life history events and their potential interaction with offshore industries can heavily influence the planning, costs and delivery of these offshore developments. It is imperative that these maps reflect the current extent of these areas.

The lesser sandeel Ammodytes marinus is a key component of the North East Atlantic ecosystem but little is known about its distribution outside of fished areas. In this study, species distribution models were developed to predict the occurrence and density of sandeels in parts of the North Sea and Celtic Seas regions. A hurdle model was found to be the best fitting model with the highest predictive performance; model evaluation with independent data demonstrated that it had significant discrimination ability across the study region. The distribution model helps refine past inferences about sandeel availability to predators and indicates to marine planners potential areas where anthropogenic impacts should be considered. Lesser Sandeel is shown as the probablility of presence of buried Sandeels in the North Sea and Celtic Sea regions, irrespective of age.

Flanders Marine Institute (2019). Maritime Boundaries Geodatabase: Exclusive Economic Zone (EEZ), version 11. Available online at http://www.marineregions.org/. https://doi.org/10.14284/386; Contains information from the Scottish Government (Marine Scotland) licensed under the Open Government Licence v3.0. ; Aires, C., González Irusta, J.M., Watret, R. (2014) Updating Fisheries Sensitivity Maps in British Waters. Scottish Marine and Freshwater Science Vol 5 No 10. Edinburgh: Scottish Government, 88pp. DOI: 10.7489/1555 1, https://data.marine.gov.scot/dataset/updating fisheries sensitivity maps british waters; ©ICES; ©Esri

WINGATE FIELD DECOMMISSIONING PROJECT

FISH AND FISHING ACTIVITY

Probability of 0 Group Presence

Sheet 2 of 2

Drawing No: P1841V-FISH-007 | A

Legend

- Wingate Platform
- PL2850/PL2851
- EEZ Boundary
- ICES Rectangle

Probability of Presence

1

0

N

NOT TO BE USED FOR NAVIGATION

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Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

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3.4.4 Seabirds

Seabird sensitivity refers to susceptibility to surface pollutants, specifically hydrocarbons, following breeding and during moulting at sea.

Seabird distribution in the SNS varies throughout the year, with offshore areas in general, containing peak numbers of birds following the breeding season and through the winter (BEIS 2022). Numbers of seabirds at sea are generally lower in Regional Sea 2 (SNS) compared with waters further north.

At different times of the year the region surrounding the Wingate platform is important for fulmar (*Fulmarus glacialis*), great cormorant (*Phalacrocorax carbo*), European shag (*Phalacrocorax aristotelis*), northern gannet (*Morus bassanus*), black-legged kittiwake (*Rissa tridactyla*), great black-backed gull (*Larus marinus*), lesser black-backed gull (*Larus fuscus*), which all breed around the North Sea coasts. In addition, auks (particularly common guillemot (*Uria aalge*) and razorbills (*Alca torda*)), are dependent on the SNS for feeding purposes for at least part of the year (Furness, 2015).

The density and distribution, and hence sensitivity of seabirds varies throughout the year. During the pre-breeding and breeding seasons, generally between March and August, large numbers of seabirds congregate in coastal breeding colonies. Most seabird species prefer isolated sea cliffs as a breeding habitat.

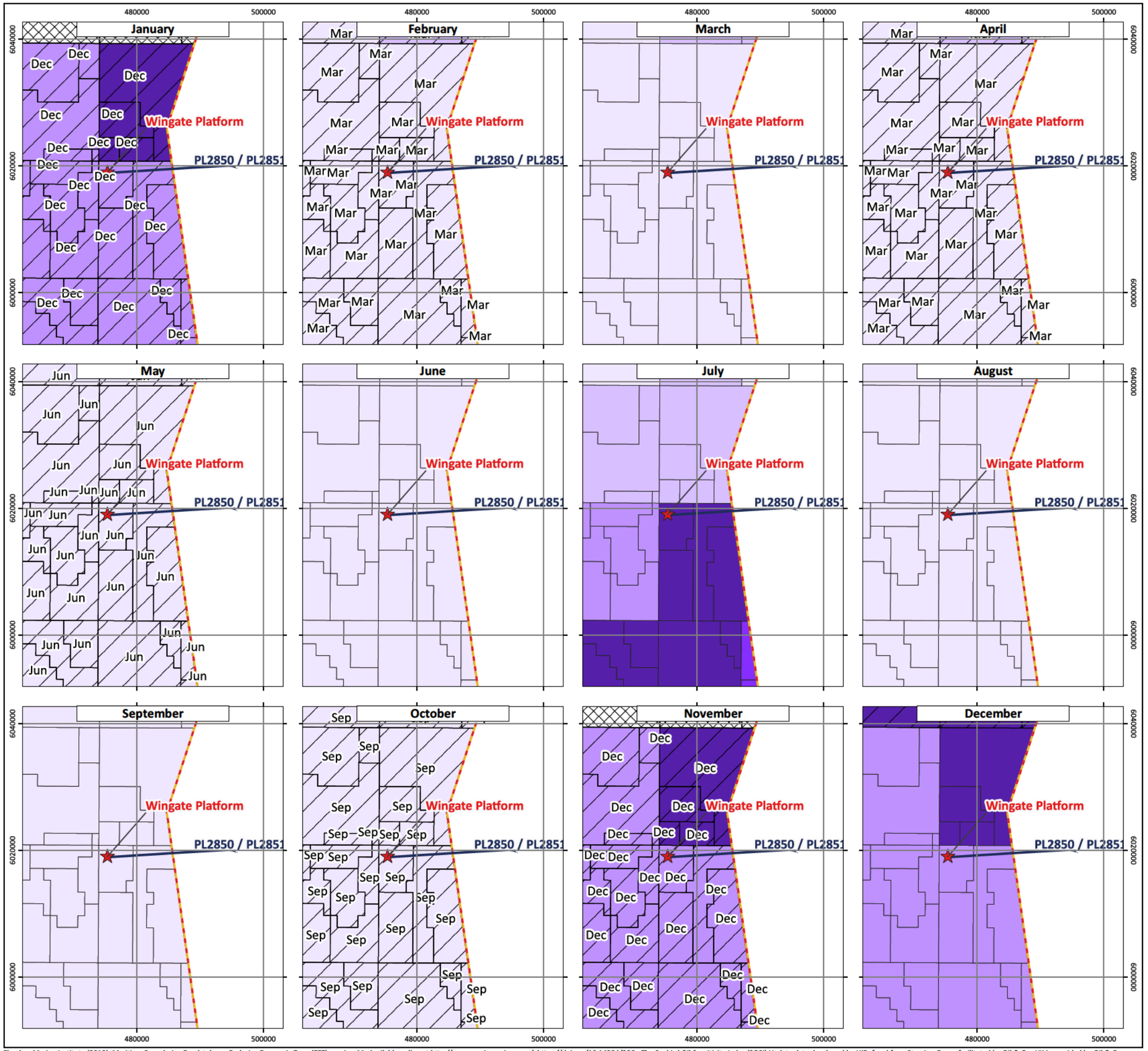
Seabirds are vulnerable to oil on the sea surface, particularly when moulting at sea, following breeding periods (Marine Scotland 2020). The degree of sensitivity, indicated by the Seabird Oil Sensitivity Index (SOSI) (Webb *et al*. 2016), has been assessed for Block 44/24 (which includes the Wingate platform site) and the surrounding UKCS Blocks (Figure 3-7 (Drawing number: P1841V-BIRD-002)). The SOSI indicates that during the operational period, worst-case sensitivity across Block 44/24 and the surrounding blocks is extremely high in January, July, October, November and December, and low the remainder of the year.

WINGATE FIELD DECOMMISSIONING PROJECT

SEABIRD SENSITIVITY

Monthly Seabird Sensitivity

Drawing No: P1841V-BIRD-002 | A



Legend

- Wingate Platform
- PL2850/PL2851
- EEZ Boundary
- Licence Block of Interest

Median Seabird Oil Sensitivity Index (MED SOSI)

- No Data
- Low
- Medium
- High
- Very High
- Extrememly High
- Interpolated

N

NOTE:

Where coverage gaps are identified, data has been interpolated from the most sensitive category for the same block from adjacent months. If data gaps remain, values are taken from the most sensitive category from directly adjoining blocks within the same month.

NOT TO BE USED FOR NAVIGATION

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Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

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0 10 20 30 40 km

Flanders Marine Institute (2019). Maritime Boundaries Geodatabase: Exclusive Economic Zone (EEZ), version 11. Available online at http://www.marineregions.org/. https://doi.org/10.14284/386; The Seabird Oil Sensitivity Index (SOSI) Update data developed by HiDef and for a Steering Group facilitated by Oil & Gas UK is provided by Oil & Gas UK in good faith to JNCC, but Oil & Gas UK accepts no responsibility for any damage or losses that may arise from use of this SOSI dataset. © ESRI; © Intellectual property and copyright 2022 North Sea Transition Authority

The majority of seabirds which occur on the UKCS are included either in Annex I (threatened bird species) of the EC Birds Directive or are regularly occurring migratory species. The directive requires that Special Protection Areas (SPA) should be established in order to conserve these species. There are no SPAs within the vicinity of the project area (See Section 3.4.6).

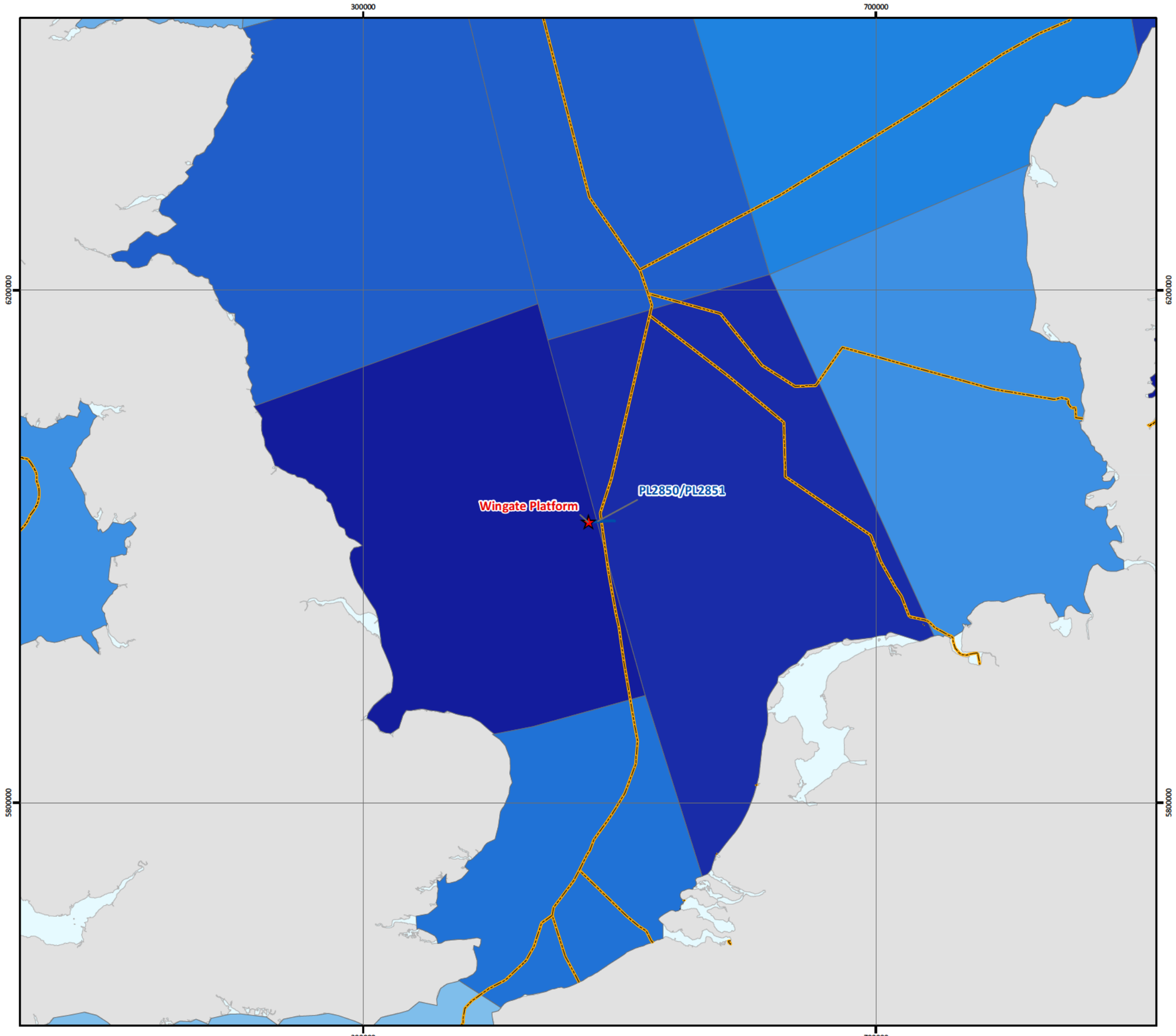
As directed by DESNZ, Wintershall have prepared a Bird Management Plan (Intertek, 2024b).

3.4.5 Marine Mammals

Cetaceans

The distribution of cetacean species in UK waters are recorded within the Atlas of Cetacean Distribution in North-West European Waters (Reid *et al*. 2003). A total of 28 cetacean species have been recorded in UK waters from sightings and strandings. Of, which, 12 are known to occur regularly (JNCC 2021). Cetacean species regularly recorded within the North Sea include harbour porpoise *Phocoena Phocoena*, bottlenose dolphin *Tursiops truncates*, Atlantic white-sided dolphin *Lagenorhynchus acutus*, white-beaked dolphin *Lagenorhynchus albirostris*, minke whale *Balaenoptera acutorostrata*, and killer whale *Orcinus orca*. From these species, only the harbour porpoise and white-beaked dolphin are known to frequent the SNS throughout most of the year, and minke whale as a seasonal visitor. The majority of marine mammal sightings are said to occur during the period of May to September, however, this may reflect observing conditions and effort rather than species abundance. Additionally, the number of species of cetacean and the frequency of sightings (considered here as a measure of abundance) tends to decrease southwards through the North Sea (BEIS 2022).

Harbour porpoises are present in most of the North Sea throughout majority of the year. Using SCANS IV data, the predicted harbour porpoise density local to the project area was taken from the most recent Small Cetaceans in European Atlantic Waters and the North Sea (Gilles *et al.* 2023). Results displayed a density of 0.61 animals/km^2 within the vicinity of the operational area, which is a higher density compared to the rest of the UK. Considering that Dogger Bank is an important site for harbour porpoise, which are the most common cetaceans in UK waters, it is possible that they will be present in the project area all year. Harbour porpoise mean density in the area is displayed in Figure 3-8 (Drawing Number: P181V-MAMM-003).



WINGATE FIELD DECOMMISSIONING PROJECT

MARINE MAMMALS
Harbour Porpoise Density

Drawing No: P1841V-MAMM-003	A

Legend

- Wingate Platform
- PL2850/PL2851
- EEZ Boundary

SCANS III Harbour Porpoise Density per Survey Block

Mean Density (Animals/km²)

- < 0.01
- 0.02 - 0.10
- 0.11 - 0.20
- 0.21 - 0.30
- 0.31 - 0.40
- 0.41 - 0.50
- 0.51 - 0.60
- 0.61 - 0.70
- 0.71 - 0.80
- 0.81 - 0.90
- 0.91 - 1.00
- 1.01 - 1.10
- > 1.10

NOTE: Not to be used for Navigation

Date	13 March 2024
Coordinate System	ED 1950 UTM Zone 31N
Projection	Transverse Mercator
Datum	European 1950
Data Source	GEBCO; NSTA; SMRU; MarineRegions; ESRI
File Reference	J:\P1841\Mxd\P1841V\05_MAMM\ P1841V-MAMM-003.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

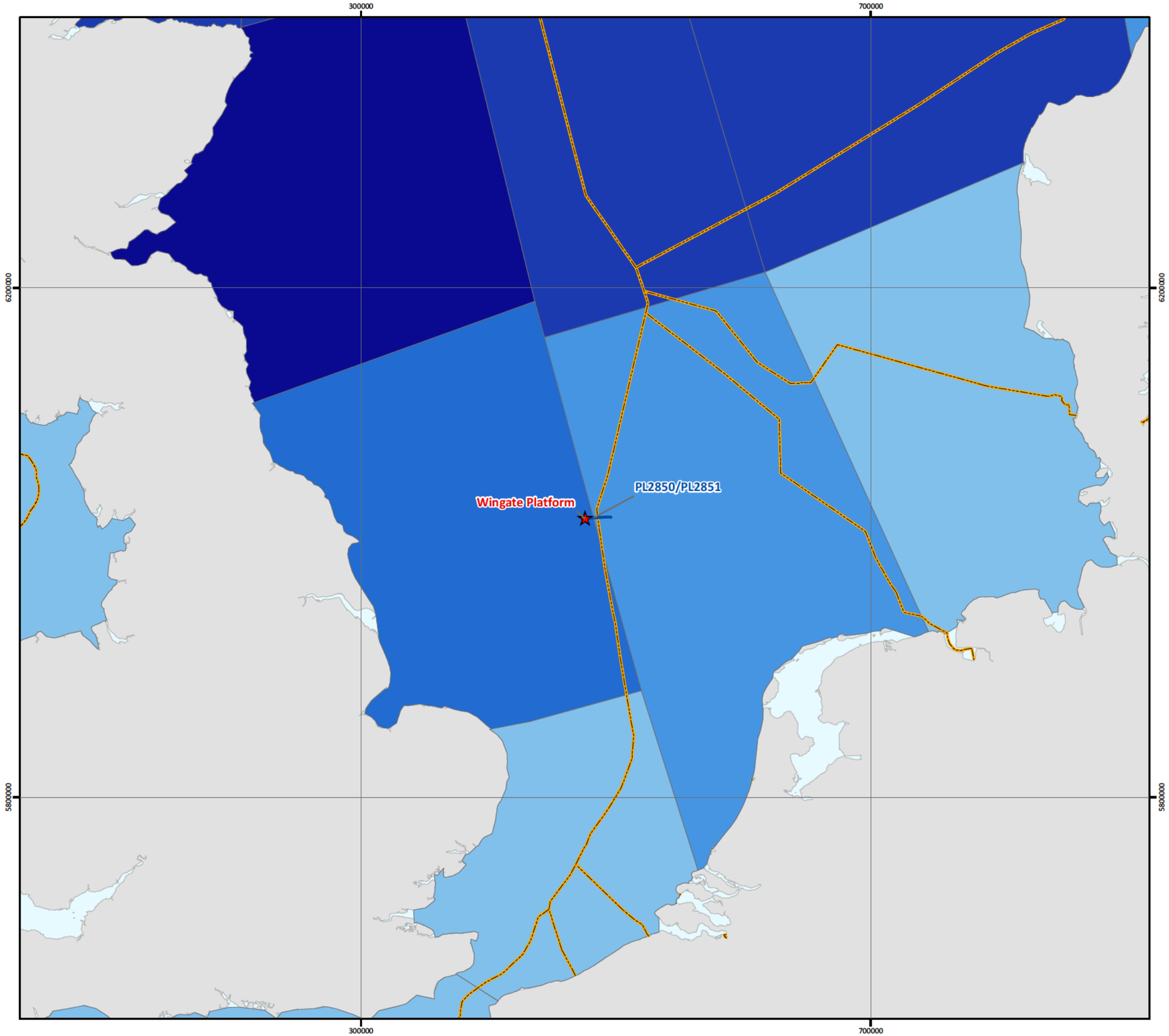
0 50 100 150 200 km

White-beaked dolphins have been documented all year in nearshore areas within the North Sea, with the highest densities recorded within the central and northern North Sea. However, although less common, there have also been regular sightings of these cetaceans in the SNS (BEIS 2022). They are typically found at depths of between 50 and 100m in groups or 10 or more. Within the vicinity of the operational area, SCANS IV data was used to determine approximate densities of 0.0025 animals/km^2 (Gilles *et al.* 2023). The results from the SCANS IV survey indicate that there have been no overall changes in abundance in the North Sea since 1994 (Gilles *et al.* 2023). White-beaked dolphin mean density in the area is displayed in Figure 3-9 (Drawing Number: P181V-MAMM-004).

WINGATE FIELD DECOMMISSIONING PROJECT

MARINE MAMMALS
White Beaked Dolphin Density

Drawing No: P1841V-MAMM-004 | **A**



Legend

- Wingate Platform
- PL2850/PL2851
- EEZ Boundary

SCANS III White Beaked Dolphin Density per Survey Block

Mean Density (Animals/km²)

- < 0.002
- 0.003 - 0.004
- 0.005 - 0.010
- 0.011 - 0.100
- > 0.100

N W E S

NOTE: Not to be used for Navigation

Date	13 March 2024
Coordinate System	ED 1950 UTM Zone 31N
Projection	Transverse Mercator
Datum	European 1950
Data Source	GEBCO; NSTA; SMRU; MarineRegions; ESRI
File Reference	J:\P1841\Mxd\P1841V\05_MAMM\ P1841V-MAMM-004.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

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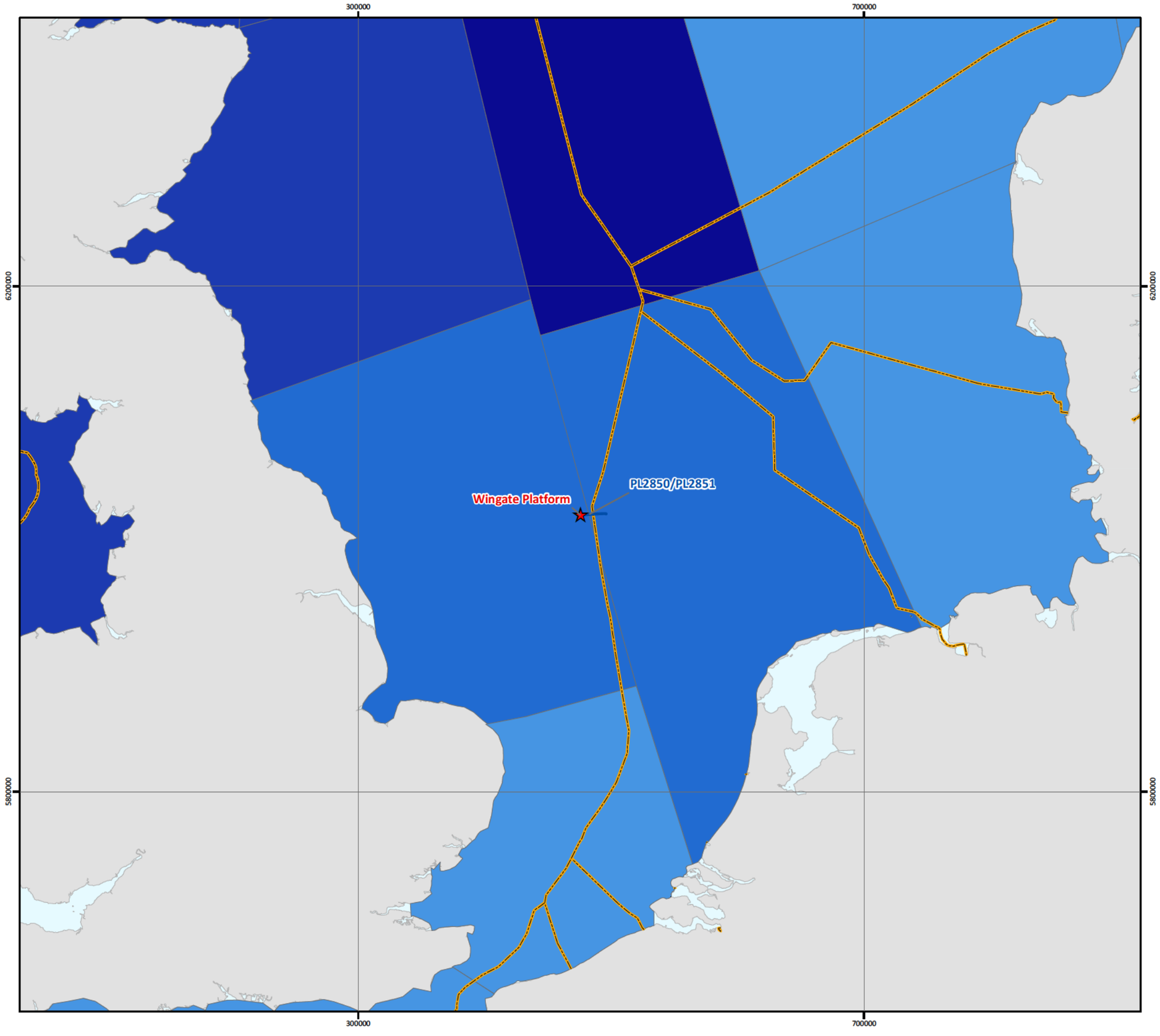
0 50 100 150 200 km

Minke whales are said to be rare in the southernmost North Sea, however, sightings have been recorded as far as the Dogger Bank area (BEIS 2022). More specifically, on the slopes of the Dogger Bank and adjacent areas, there have been reasonably high densities of Minke whales reported in spring and summer months (Reid *et al.* 2003). These cetaceans are typically found at depths of 200m or less. Minke whale density is estimated to be approximately 0.01 animal/km^2 within the vicinity of the operational area from recent SCANS IV survey data (Gilles *et al*. 2023). There was no direct evidence in decline of Minke whales within this survey data. Minke whales mean density in the area is displayed in Figure 3-10 (Drawing Number: P181V-MAMM-005).



WINGATE FIELD DECOMMISSIONING PROJECT

MARINE MAMMALS
Minke Whale Density

Drawing No: P1841V-MAMM-005	A

N
W E
S

- Wingate Platform
- PL2850/PL2851
- EEZ

Mean Density

- < 0.001
- 0.002 - 0.010
- 0.011 - 0.020
- 0.021 - 0.030
- > 0.030

NOTE: Not to be used for Navigation

Date	13 March 2024
Coordinate System	ED 1950 UTM Zone 31N
Projection	Transverse Mercator
Datum	European 1950
Data Source	GEBCO; NSTA; SMRU; MarineRegions; ESRI
File Reference	J:\P1841\Mxd\P1841V\05_MAMM\ P1841V-MAMM-005.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

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0 50 100 150 200 km

Table 3-5 Marine Mammal Observations for Block 44/24

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Harbour porpoise (*Phocoena phocoena*)		3	3	3	3	3	3	3			3	
Minke whale (*Balaenoptera acutorostrata*)			3	3								
White-beaked dolphin (*Lagenorhynchus albirostris*)				2		3	3			3	3	3
Key	High (1)				Moderate (2)				Low (3)			

2 – moderate density

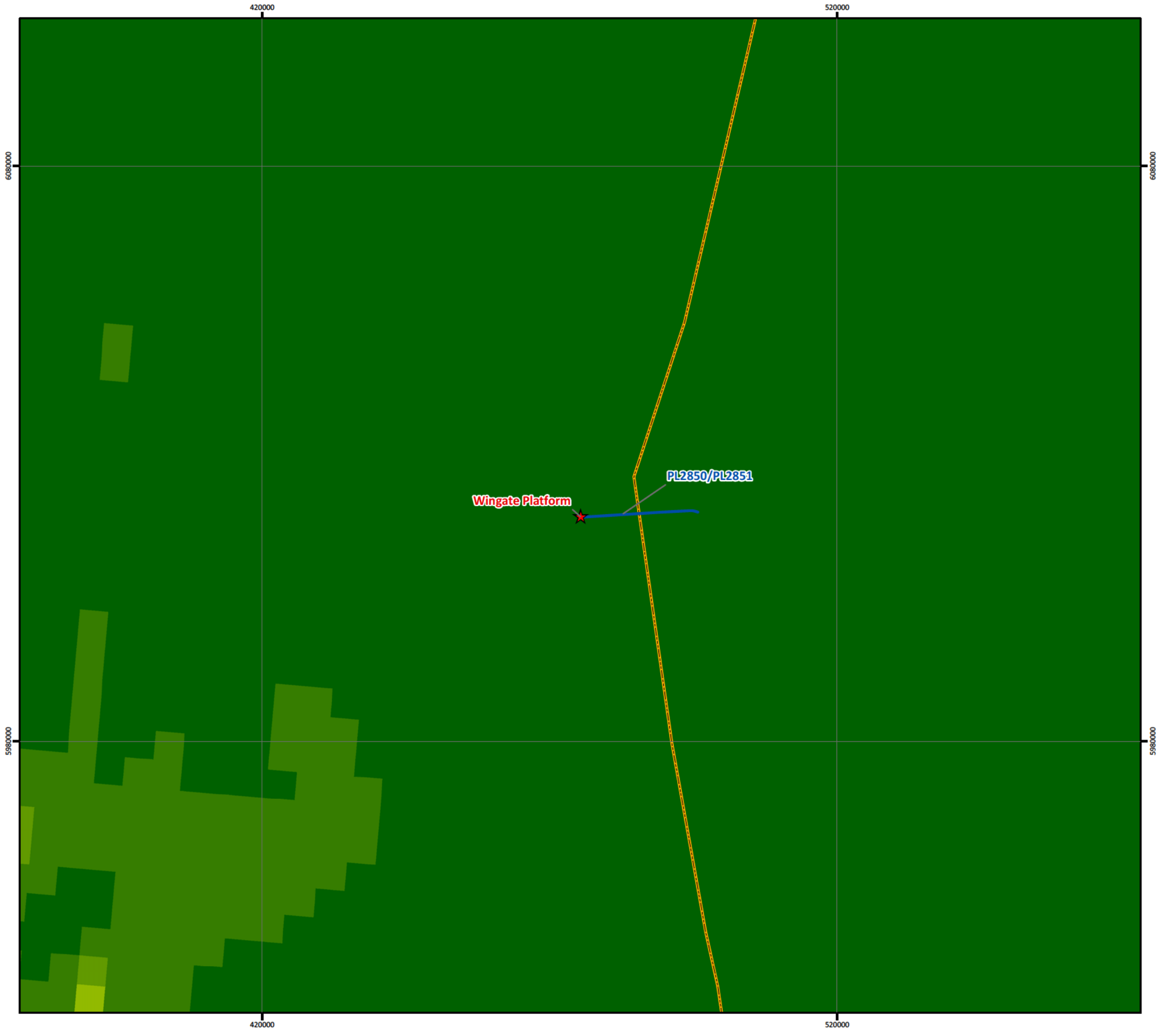
3 – low density

Source: Reid *et al.* 2003

Pinnipeds

The distribution of pinnipeds in the North Sea is limited by their need to return to land periodically. Until recently, data showed that they were unlikely to be found more than 60km from the coast. However, satellite telemetry studies displays that there is a wider distribution across the North Sea and long distance movements are therefore possible; although these tend to be between haul-out sites (Carter *et al.* 2022).

Two species of pinniped have been recorded in SNS waters: harbour seal (*Phoca vitulina*) (BAP) and grey seal (*Halichoerus grypus*). Densities of seals at sea vary over the year in relation to different stages in their life cycles. Harbour seals and grey seals are known to frequent the Dogger Bank area. Expected numbers of harbour seal and grey seal (predicted number of individuals per 5 x 5 km^2) are displayed in Figure 3-11 (Drawing number: P1841V-MAMM-001) and Figure 3-12 (Drawing number: P1841V-MAMM-002), respectively.



WINGATE FIELD DECOMMISSIONING PROJECT

MARINE MAMMALS
Harbour Seal At Sea Usage

Drawing No: P1841V-MAMM-001 | **A**

Legend

- Wingate Platform
- PL2850/PL2851
- EEZ Boundary

Harbour Seal Usage

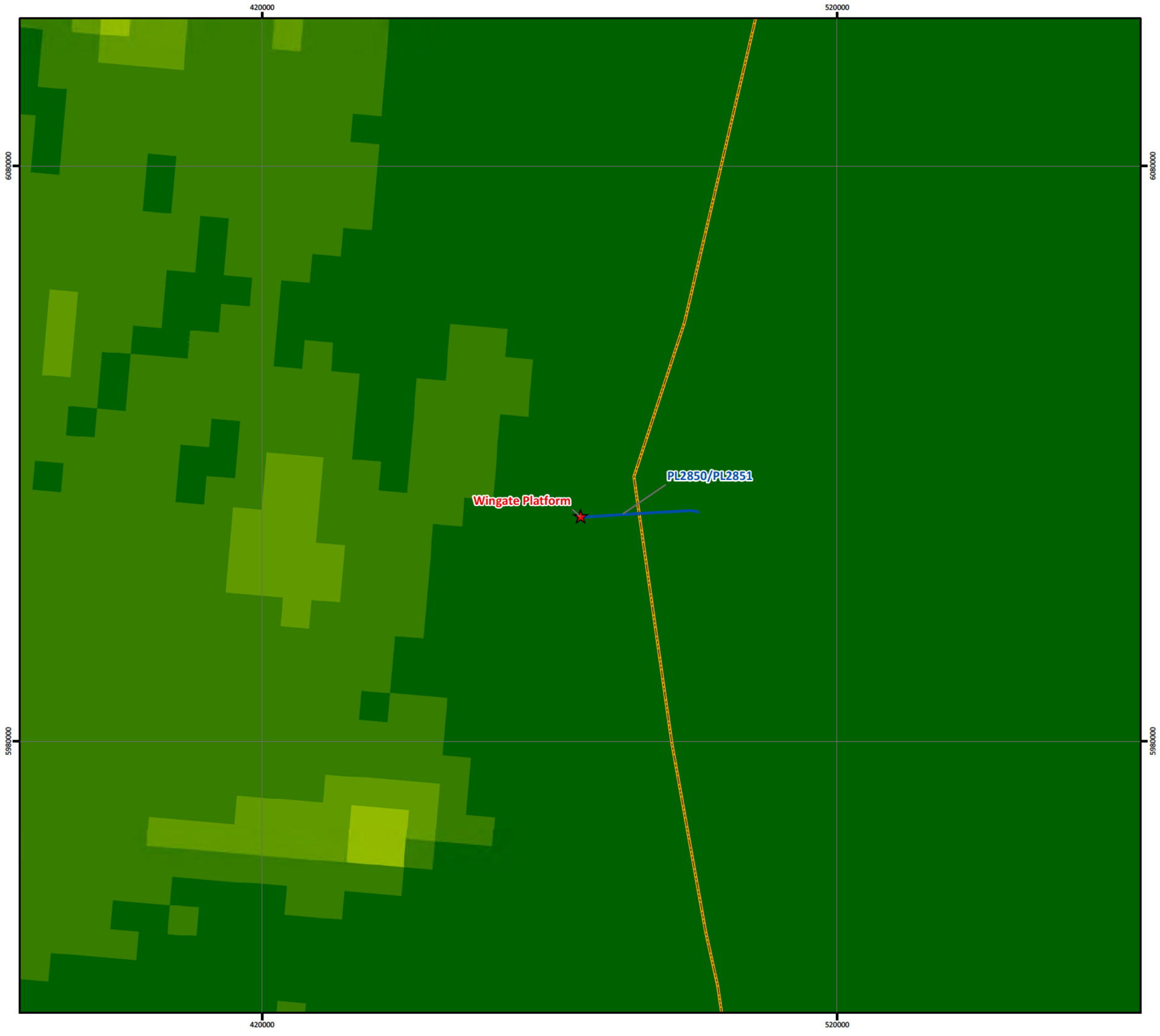
Expected Number of Seals (1991 - 2016 mean)

- 0 - 1
- 2 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 150
- 151 - 250
- 251 - 500
- 501 - 1,000
- > 1000

NOTE: Not to be used for Navigation

Date	13 March 2024
Coordinate System	ED 1950 UTM Zone 31N
Projection	Transverse Mercator
Datum	European 1950
Data Source	NSTA; SMRU; MarineRegions; ESRI
File Reference	J:\P1841\Mxd\P1841V\05_MAMM\ P1841V-MAMM-001.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

0 10 20 30 40 km



WINGATE FIELD DECOMMISSIONING PROJECT

MARINE MAMMALS
Grey Seal At Sea Usage

Drawing No: P1841V-MAMM-002	A

Legend

- Wingate Platform
- PL2850/PL2851
- EEZ Boundary

Grey Seal Usage

Expected Number of Seals (1991 - 2016 mean)

- 0 - 1
- 2 - 10
- 11 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 150
- 151 - 250
- 251 - 500
- 501 - 1,000
- > 1,000

NOTE: Not to be used for Navigation

Date	13 March 2024
Coordinate System	ED 1950 UTM Zone 31N
Projection	Transverse Mercator
Datum	European 1950
Data Source	NSTA; SMRU; MarineRegions; ESRI
File Reference	J:\P1841\Mxd\P1841V\05_MAMM\ P1841V-MAMM-002.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

km
0 10 20 30 40

The **harbour seal** is one of the most widespread pinniped species and has a practically circumpolar distribution in the Northern Hemisphere. They are found in all coastal waters around the North Sea, with important haul out and breeding sites in the Wash area.

Grey seals use outlying islands and remote coastlines as moulting, pupping and general haul-out sites. There are large populations in Scotland, predominantly in the Hebrides and Orkney, and have been recorded to be increasing in small numbers along the coast of the SNS (BEIS 2022). Grey seals have been seen to forage up to several hundred kilometres from haul out sites, although usually feed within 100km of their haul out site (NatureScot 2020). However, in previous surveys it was noted that there are no known colonies of either species within 40km of Wingate or within the area that could potentially be impacted by a well blowout.

All cetaceans are listed in Annex IV of the EC Habitats Directive and are European Protected Species (EPS). Animals are protected regardless of their location. It is an offence to deliberately disturb or physically injure any EPS.

Harbour porpoise, bottlenose dolphin, grey and common seals are listed in Annex II of the EC Habitats Directive. Protection under the Directive is dependent on the presence of sites established for their conservation in the vicinity of the proposed operation. Harbour porpoise are the qualifying species for the Southern North Sea SAC. No marine mammals (cetacean or pinniped) are listed as qualifying feature for the Dogger Bank SAC; however, harbour porpoise, grey and common seals are included as non-qualifying features.

3.4.6 Protected Sites

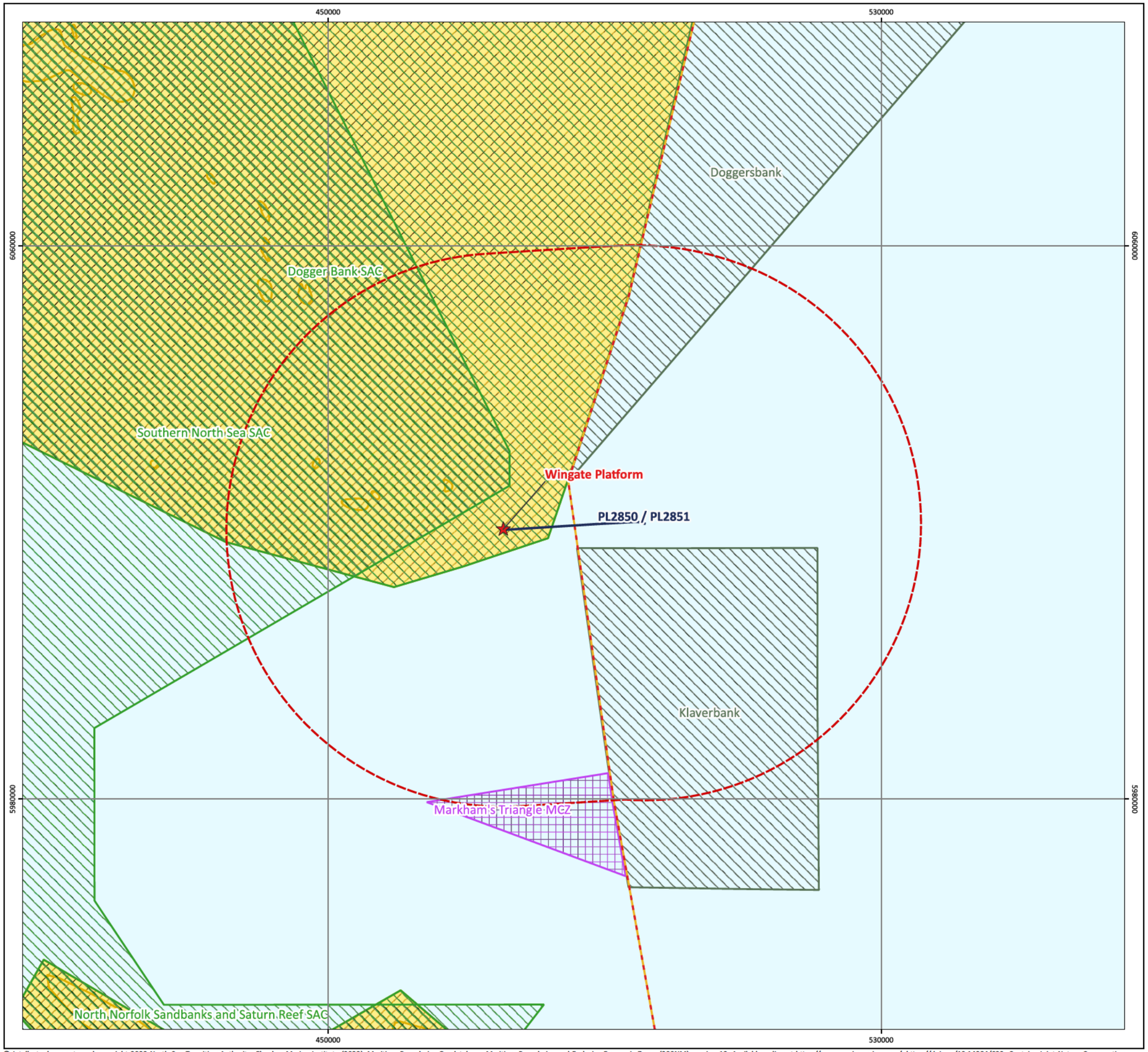
There are a number of different types of designation for offshore protected sites in UK and adjacent (Netherlands) waters. A geographical information system was used to identify which were within 40km of the proposed operation. The sites identified are discussed below and illustrated on Figure 3-13 (Drawing number: P1841V-PROT-002).

WINGATE FIELD DECOMMISSIONING PROJECT

PROTECTED SITES

Environmental Designations Within 40km

Drawing No: P1841V-PROT-002	A



Legend

- Wingate Platform
- PL2850/PL2851
- 40km Buffer
- EEZ Boundary

Environmental Designations

- SAC
- MCZ

Natura 2000 Sites

- B - Habitats Directive

Protected Sandbank

- High

N

NOT TO BE USED FOR NAVIGATION

Date	2024-03-13 11:28:50
Coordinate System	ED50 / UTM zone 31N
WKID	EPSG:23031
Scale @A3	1:550,000
Data Sources	NSTA; MarineRegions; JNCC; NE; EEA; ESRI
File Reference	J:\P1841\Mxd\P1841V \P1841V.qgz
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

wintershall intertek

0 8 16 24 32 km

3.4.6.2 Dogger Bank SAC

Wingate NUI and the pipelines (PL2850 and PL2851) are within the boundary of the Dogger Bank SAC, designated in 2017 (see Figure 3-13 (Drawing number: P1841V-PROT-002)). This SAC, identified for "sandbanks which are slightly covered by sea water all the time", covers an area of 12,338km^2 and is the largest single continuous expanse of shallow sandbank in UK waters. The core habitat is restricted to water <20m in depth but the SAC includes areas sloping down to 35 – 40m (JNCC 2023a). The bank was formed by glacial processes, with a thin layer of sand overlying glacial till.

The site description (JNCC 2023a) for the Dogger Bank states:

Its location in the open sea exposes the bank to substantial wave energy and prevents the colonisation of the sand by vegetation on the shallower parts of the bank. Sediments range from fine sands containing many shell fragments on top of the bank to muddy sands at greater depths supporting invertebrate communities, characterised by polychaete worms, amphipods and small clams within the sediment, and hermit crabs, flatfish, starfish and brittlestars on the seabed. Sandeels are an important prey resource found at the bank supporting a variety of species including fish, seabirds and cetacean.

The conservation objectives for the site (JNCC 2019b) are:

For the feature to be in favourable condition thus ensuring site integrity in the long term and contribution to Favourable Conservation Status of Annex I Sandbanks which are slightly covered by seawater all the time.

This contribution would be achieved by maintaining or restoring, subject to natural change:

- *The extent and distribution of the qualifying habitat in the site;*
- *The structure and function of the qualifying habitat in the site; and*
- *The supporting processes on which the qualifying habitat relies.*

As per JNCC's conservation advice (JNCC, 2022a), it should be noted that several of the features of the Dogger Bank SAC, namely the extent and distribution, have 'recovery' targets. This means that these features are already in unfavourable condition due to human impacts. Consequently, any further impacts to these features will lead to further deterioration.

3.4.6.3 Southern North Sea SAC

Wingate NUI and the pipelines (PL2850 and PL2851) are close to (approximately 5km south of) the southern boundary of the Southern North Sea SAC (IAMMWG 2016). This SAC has been identified for the conservation of harbour porpoises. The Conservation Objectives of the site are:

- *To avoid deterioration of the habitats of the harbour porpoise or significant disturbance to the harbour porpoise, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to maintaining Favourable Conservation Status (FCS) for the UK harbour porpoise.*
- *To ensure for harbour porpoise that, subject to natural change, the following attributes are maintained or restored in the long term:*
- *The species is a viable component of the site.*
- *There is no significant disturbance of the species.*
- *The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.*

3.4.6.4 NG-7 Markham's Triangle MCZ

Wingate NUI is approximately 37.4km north, and the pipelines (PL2850 and PL2851) are located approximately 36km north of the Markham's triangle Marine Conservation Zone (MCZ). This

protected site is designated for Subtidal coarse sediment, Subtidal sand, Subtidal mud and Subtidal mixed sediments. The conservation objectives (JNCC 2021) for this site are that:

The protected features:

- *so far as already in favourable condition, remain in such condition; and*
- *so far as not already in favourable condition, be brought into such condition, and remain in such condition*.

In addition to the above, there are two protected sites within 40km of the Wingate NUI and pipeline in the Netherlands sector:

Doggersbank SCI, approximately 16km from Wingate NUI and 11km from the point where PL2850/PL2851 crosses the median line, designated for sandbanks which are slightly covered by sea water at all times.

Klaverbank SCI, approximately 18km from Wingate NUI and 14km from the point where PL2850/PL2851 crosses the median line, designated for reefs, harbour porpoise, common seals and grey seals.

3.5 Human Environment

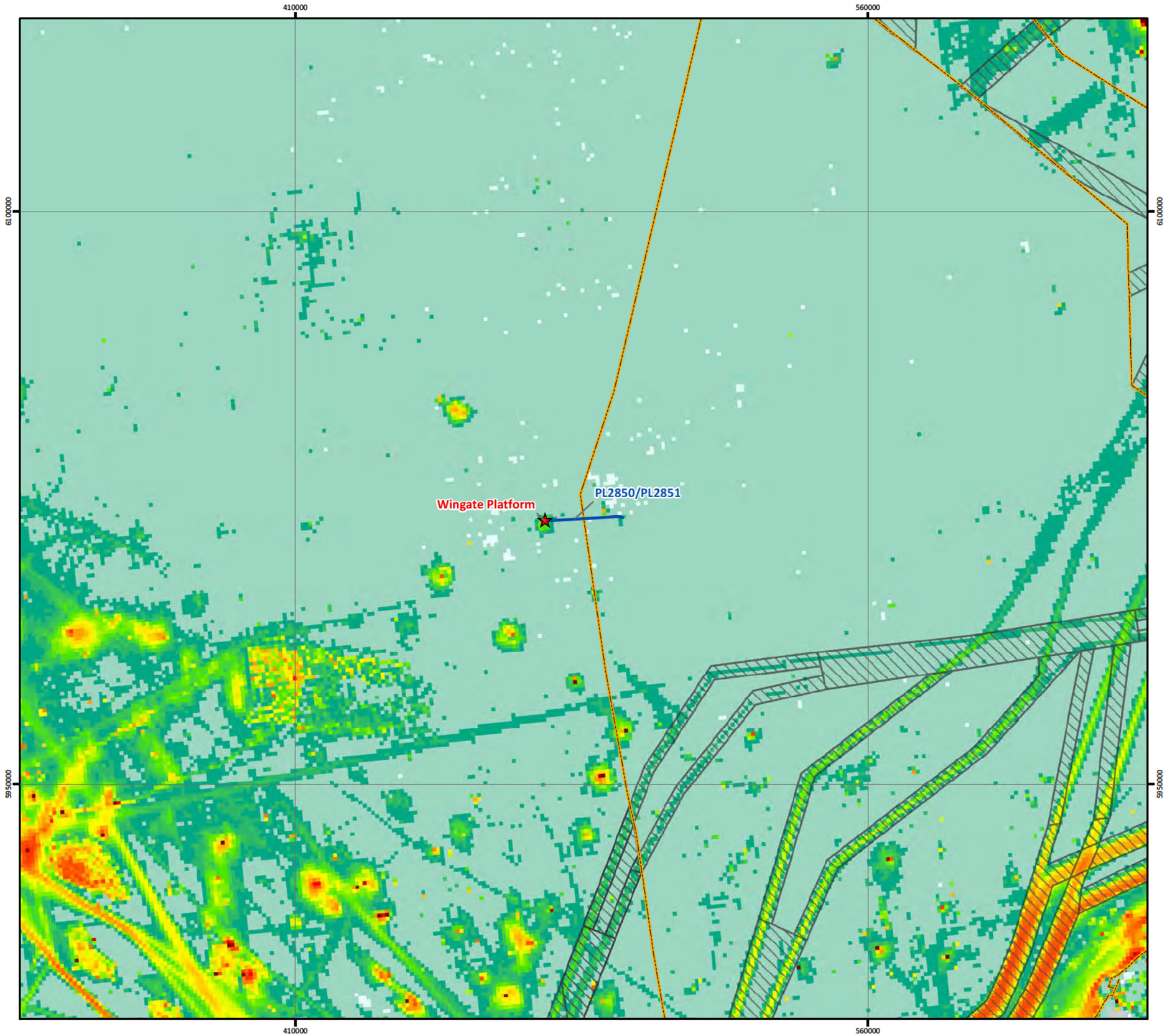
3.5.1 Shipping

Shipping density within Block 44/24 is given as moderate, with 10 shipping routes passing within 10 nautical miles (18.5km) of the Wingate NUI, with the closest approach being 1.5 nautical miles (2.8km). However, as the NUI is within a permanent 500m safety exclusion zone, established when the platform was installed, and all operations during decommissioning will be carried out within this zone, there is no increased risk to navigation. Figure 3-14 (Drawing Number: P1841V-AIS-001) illustrates vessel density in the area.

WINGATE FIELD DECOMMISSIONING PROJECT

AUTOMATIC IDENTIFICATION SYSTEM
EMODNet Vessel Density (2021)

Drawing No: P1841V-AIS-001 | **A**



Legend

- Wingate Platform
- PL2850/PL2851
- EEZ Boundary
- Shipping Lanes

EMODNet Vessel Density (2021)

Avg. Vessel Hours Per Month (VHPM)

High : 100

Low : 0

N
W E
S

NOTE: Not to be used for Navigation

Date	13 March 2024
Coordinate System	ED 1950 UTM Zone 31N
Projection	Transverse Mercator
Datum	European 1950
Data Source	NSTA; MarineRegions; EMODNET; UKHO; ESRI
File Reference	J:\P1841\Mxd\P1841V\07_AIS\ P1841V-AIS-001.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

wintershall intertek

0 15 30 45 60 km

3.5.2 Commercial Fishing

Fisheries in the UK can be broken down into following sectors: demersal, pelagic and shellfish, with the shellfish sector typically the most valuable; crabs, lobsters, Nephrops and scallops are all high value catch. While demersal and shellfish landings are relatively similar throughout the year, with increased fishing activity correlated with spawning aggregations of herring and mackerel and migratory passage of mackerel through the English Channel and around the north of Scotland (MMO 2023).

The Wingate NUI, and 50 pipelines, lie within ICES rectangle 37F2. Table 3-6 shows the changes in fishing over the period 2018-2022. From this it can be seen that fishing effort and quantities landed have generally decreased significantly over the period 2018 to 2022, with the exception of the relatively low value pelagic fishery. The total catch weight and value averaged 0.15% and 0.21% respectively of the UK totals over the period 2018 to 2022 (MMO 2023).

Table 3-6 Fishing Statistics for ICES Rectangle 37F2

	Quantity (Te)			Price (£)				UK Totals	
Year	Demersal	Pelagic	Shellfish	Demersal	Pelagic	Shellfish	Effort (days)	Quantity (Te)	Value (£)
2018	503	1	102	£1,153,240	£641	£278,572	606	£1,432,453	2018
2019	164	0	98	£240,719	£661	£261,925	262	£503,305	2019
2020	252	8	21	£162,297	£6,833	£44,438	281	£213,568	2020
2021	78	8	62	£77,710	£8,246	£81,839	147	£167,796	2021
2022	30	10	28	£55,429	£21,535	£103,147	68	£180,111	2022

Note: All figures are rounded to the nearest whole value

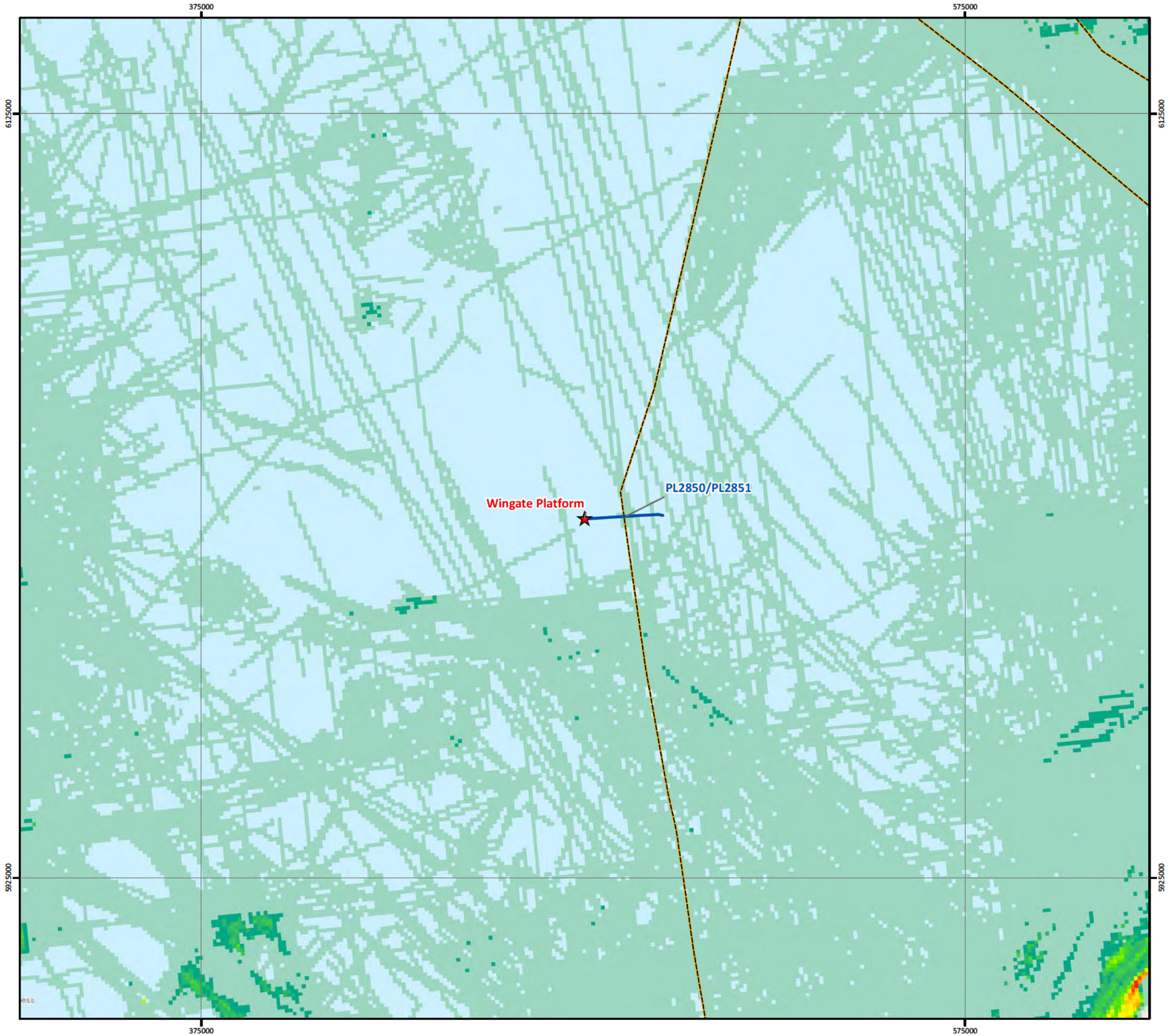
Source: MMO (2023)

Fishing vessel density and trawling intensity are displayed in Figure 3-15 (Drawing number: P1841V-FISH-009) and Figure 3-16 (Drawing number: P181V-FISH-010) respectively.

WINGATE FIELD DECOMMISSIONING PROJECT

AUTOMATIC IDENTIFICATION SYSTEM
EMODNet Vessel Density (2022) - Fishing Vessels

Drawing No: P1841V-FISH-009 | **A**



Legend

- Wingate Platform
- PL2850/PL2851
- EEZ Boundary

EMODNet Fishing Vessel Density (2022)

Avg. Vessel Hours Per Month (VHPM)

High : 100

Low : 0

N
W E
S

NOTE: Not to be used for Navigation

Date	13 March 2024
Coordinate System	ED 1950 UTM Zone 31N
Projection	Transverse Mercator
Datum	European 1950
Data Source	NSTA; MarineRegions; EMODNET; ESRI
File Reference	J:\P1841\Mxd\P1841V\03_FISH\ P1841V-FISH-009.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

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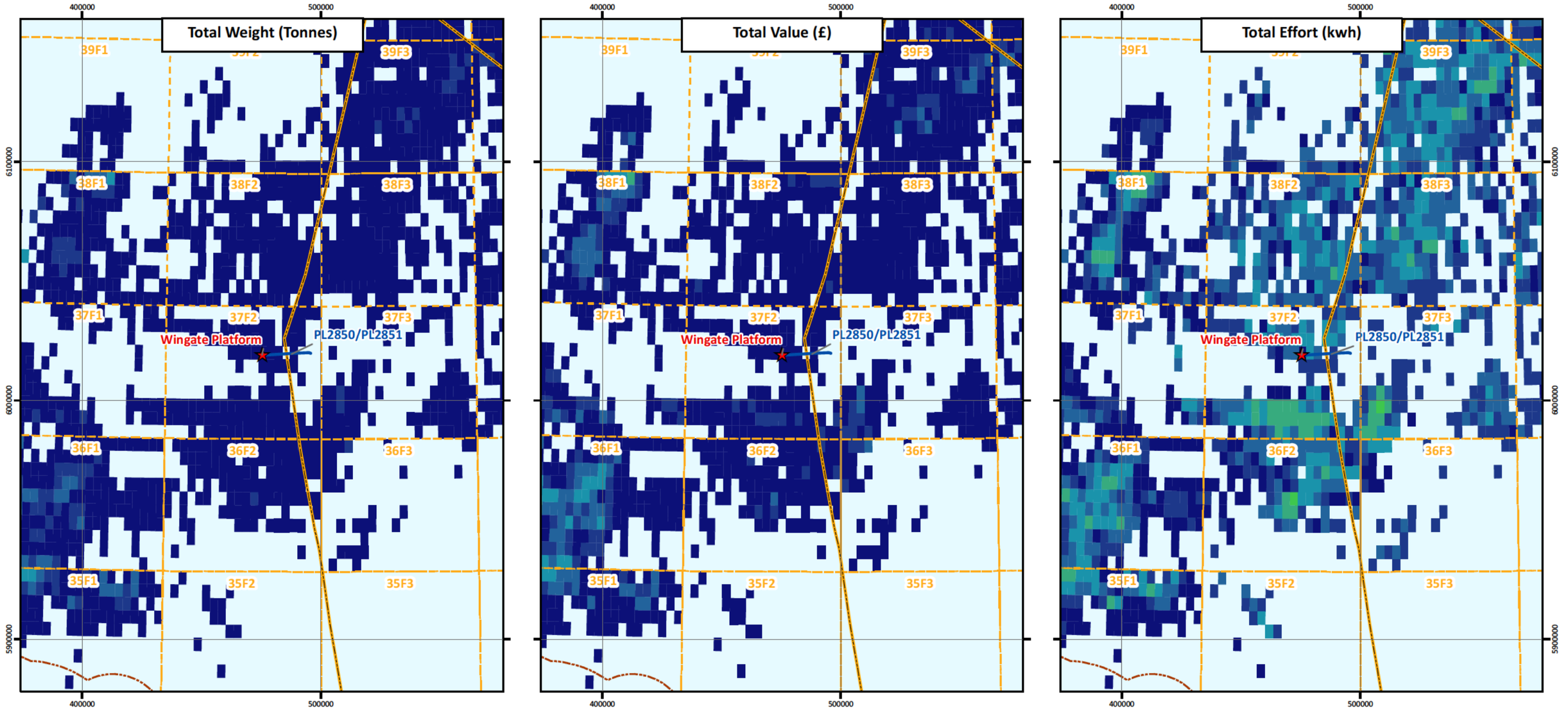
0 15 30 45 60 km



WINGATE FIELD DECOMMISSIONING PROJECT | **FISHING ACTIVITY** | Fishing Activity for ≥ 15m UK Vessels 2020 by ICES Sub Rectangle | Drawing No: P1841V-FISH-010 | A

Legend

- Wingate Platform
- PL2850/PL2851
- 12nm Territorial Sea Limit
- EEZ Boundary
- ICES Rectangle

Total Weight (Tonnes)	Total Value (£ Sterling)	Total Fishing Effort (kilowatt/hours)
> 0 - 10	> £0 - £10,000	> 0 - 2,500
> 10 - 20	> £10,000 - £20,000	> 2,500 - 5,000
> 20 - 40	> £20,000 - £40,000	> 5,000 - 10,000
> 40 - 80	> £40,000 - £80,000	> 10,000 - 20,000
> 80 - 160	> £80,000 - £160,000	> 20,000 - 40,000
> 160 - 320	> £160,000 - £320,000	> 40,000 - 80,000
> 320 - 640	> £320,000 - £640,000	> 80,000 - 160,000
> 640 - 1,280	> £640,000 - £1.28 million	> 160,000 - 320,000
> 1,280 - 2,560	> £1.28 - £2.56 million	> 320,000 - 640,000
> 2,560	> £2.56 million	> 640,000

N W E S

NOTE: Not to be used for Navigation

Date	13 March 2024
Coordinate System	ED 1950 UTM Zone 31N
Projection	Transverse Mercator
Datum	European 1950
Data Source	NSTA; MarineRegions; UKHO; ICES; MMO; OSOD; ESRI
File Reference	J:\P1841\Mxd\P1841V\03_FISH\ P1841V-FISH-010.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

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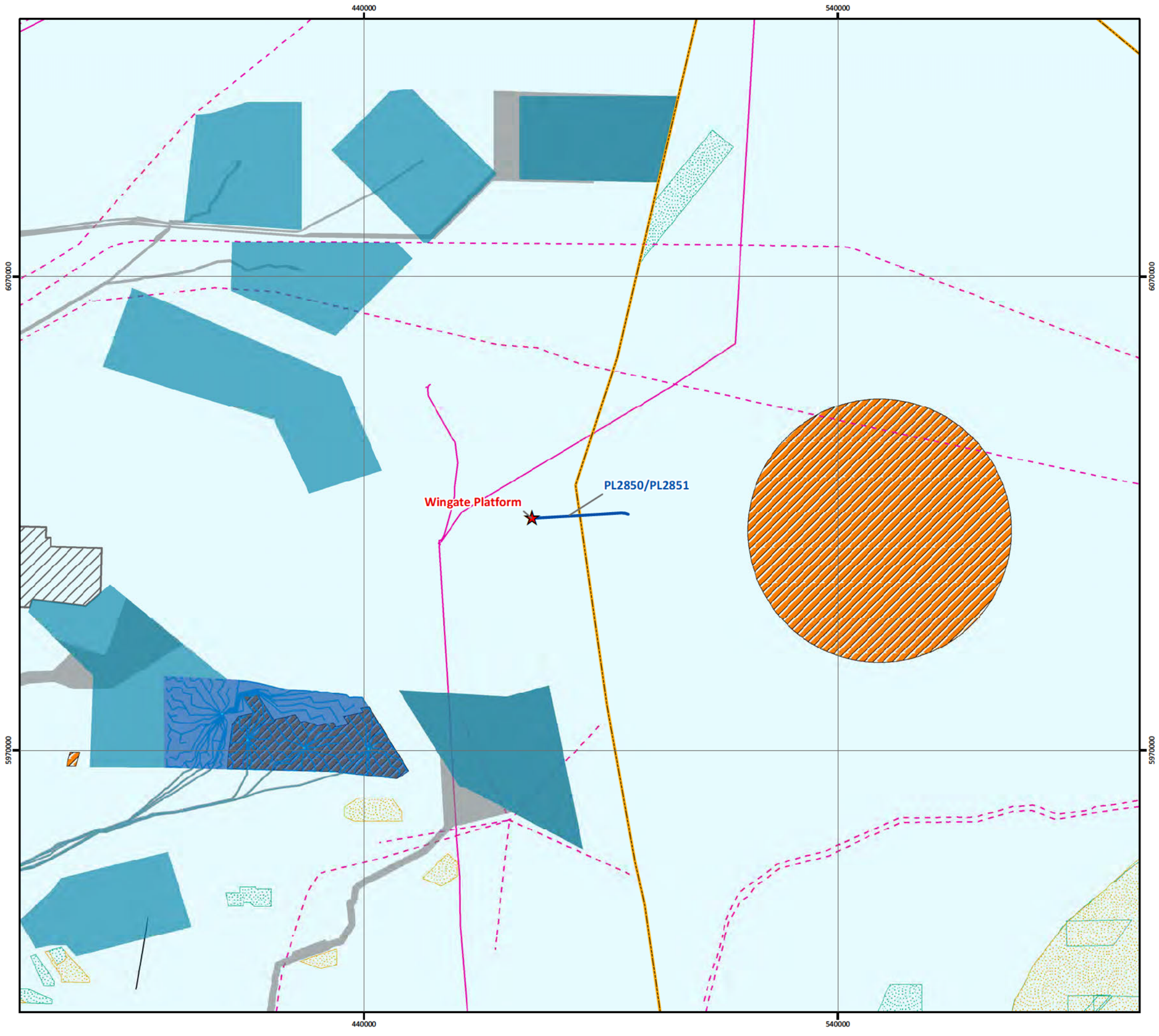
0 20 40 60 80 km

3.5.3 Other Marine Users

The Wingate NUI lies:

- Within the D323D Southern military defence area of intense aerial activity.
- Approximately 9.3km east of the Kelvin platform, 9.5km south of the Katy platform, 17km south of the Tyne platform, 20km east of the Murdoch platform, 25km east of the Munro platform, 30km east of the Ketch platform, 31km east of the Boulton platform, and 35km south of the Cygnus A platform.
- Approximately 6.5km south of PL2894, the Katy to Kelvin gas export pipeline.
- At the UK/Netherlands median line PL2850/PL2851 is approximately 5.9km north of the disused Minke to D15-FA-1 gas export pipeline.
- Approximately 35km from PL3088, Cygnus to ETS gas pipeline, and PL3086, Cygnus A to Cygnus B gas pipeline.
- Approximately 8.7km south east of the Tampnet telecommunications cable, 30km south of the BT telecommunications cable, and passes within 10km of the Viking Link Interconnector.
- 33km east of the R4 Project 4 (Dogger Bank South East) RWE windfarm and 35km north of the Hornsea Round 3 windfarm zone.
- To the south of a medium use recreational cruising route for yachts.

Figure 3-17 (Drawing Number: P1841V-INFR-001) illustrates the location of relevant infrastructure such as offshore wind site agreements, cables and aggregate agreements.



WINGATE FIELD DECOMMISSIONING PROJECT

INFRASTRUCTURE
Surrounding Marine Use

Drawing No: P1841V-INFR-001	A

Legend

- Wingate Platform
- PL2850/PL2851
- EEZ Boundary
- Dredge Spoil Dump
- CCS Site Agreement

OWF Site Agreements

- In Operation
- Proposed/In Construction
- OWF Export Cable Agreement

Cables

- Power (Active)
- Telecom (Active)
- Telecom (Decommissioned)

Aggregate Agreements

- Extraction area
- Extraction area (in use)

NOTE: Not to be used for Navigation

Date	13 March 2024
Coordinate System	ED 1950 UTM Zone 31N
Projection	Transverse Mercator
Datum	European 1950
Data Source	NSTA; MarineRegions; EMODNET; TCE; KISCA; ESRI
File Reference	J:\P1841\Mxd\P1841V\06_INFR\ P1841V-INFR-001.mxd
Created By	Oliver Bula
Reviewed By	Lewis Castle
Approved By	Emma Langley

wintershall intertek

0 10 20 30 40 km

3.6 Summary of Key Environmental Sensitivities and Periods of Concern

There are periods during the year when one or more organisations have indicated concerns to the NSTA (formally OGA) about possible environmental effects of O&G activities in certain areas of the UKCS. Marine Directorate, (formerly known as Marine Scotland) and JNCC have indicated that there are no periods of concern for seabirds relating to drilling activities within block 44/24 (JNCC 2019d). Drilling activities are not planned under the Wingate decommissioning programme.

A summary of seasonal sensitivities for fish, seabirds and marine mammals is provided in Table 3-7 below. Seasonal sensitivities for fish are high throughout the whole year. Seabird seasonal sensitivities are extremely high during July, and high in August and September. Marine mammal seasonal sensitivities are moderate within April.

Table 3-7 Table Key Seasonal Sensitivities

Species	J	F	M	A	M	J	J	A	S	O	N	D
Operational period												
Fish												
Seabirds												
Marine Mammals												
Key	Extremely High		Very High		High		Moderate		Low		No data/sightings	

Sources: Coull *et al.*, (1998), Reid *et al.*, (2003), Ellis *et al.*, (2012), Webb *et al.*, (2016).

Note 1: Fish sensitivities are measures for the ICES rectangle that the operation is located in.

Criteria for fish sensitivity grading:

Very high: Regulator has identified a period of concern for drilling or seismic operations for fish spawning / juveniles in the area.

High: Block of interest is used by demersal spawning species.

Moderate: Block of interest is used by either demersal juveniles and/or pelagic spawners and/or activities require a sound assessment (e.g. vertical seismic profiling, conductor driving).

Low: Block of interest used by pelagic juveniles and activities do not require a sound assessment.

Criteria for seabird sensitivity grading as per SOSI (Webb *et al.* 2016): Extremely high, Very high, High, Medium, Low.

Criteria for marine mammal sensitivity grading: Occur in **high, medium** or **low** density within a 40km radius of the block of interest.

Note 2: Extremely high sensitivity related to seabird sensitivity only.

The worst-case SOSI across the block of interest as well as the eight surrounding blocks is used in the characterisation of seabird sensitivity. In the event that data has been interpolated from adjacent months, the highest SOSI sensitivity has been used in the interpolation.

Criteria for seabird sensitivity grading as per SOSI (Webb *et al.*, 2016):

Extremely high

Very high

High

Medium

Low

3.7 Summary of Receptors

The baseline environment within the project area is summarised in the Table 3-8 below. This table includes a summary of each environment and its corresponding receptors. These receptors have been discussed in more detail within the environmental baseline in the above sections. Where it was determined, by expert opinion, that an interaction between the operation and a receptor was highly unlikely the receptor was scoped out of the final assessment.

Table 3-8 Key Sensitivities

Environmental Receptor	Description of Sensitivities
Physical Environment	
Atmosphere (Meteorology and Air Quality)	The strongest winds occur in the SNS area within winter months (Jan to March), whereas summer months (May to August) are calmer. Air temperatures vary from a mean of 4°C to 6°C between January and February to 16°C at the highest between July and August. Emissions generated will be localised to the worksite and short term. As such, air quality is not considered to be an issue for offshore developments, as they are too remote from onshore receptors to have an adverse impact on them.
Water (Oceanography)	The hydrography of the North Sea is strongly influenced by inputs from North Atlantic waters, with minor inflows from the English Channel and the Baltic Sea (4°C to 6°C between January and February to 16°C at the highest between July and August). The North Sea has a predominately tidal current regime. More specifically, the SNS is characterised by shallow, well-mixed waters, which undergo large seasonal temperature variations (OSPAR 2010). Shallow parts of the SNS do not show water column stratification during summer months.
Water Quality	Produced water from offshore oil & gas installations is the main source of contamination to the water column and may be contaminated with chemicals used downhole. However, it was concluded that there is no evidence for influence on water quality from produced water beyond the immediate vicinity of the source (Defra 2010). Hazardous substances enter the marine environment due to natural processes and as a result of anthropogenic activity (UKMMAS 2010). Water quality in the UKCS generally reflects the sources and modes of transport of potential contaminants to the marine environment. Concerns over water quality in UK waters are largely restricted to industrialised estuaries (DTI 2001; UKMMAS 2010).
Seabed	
Bathymetry	The majority of the SNS lies in water depths under 50m and the maximum depth is 98m. Dogger Bank is the highest point, of which is 15m below sea level at its shallowest. Water depths range between 27.9m LAT and 40m LAT along the pipeline and platform. Slope gradients along the route are very slight to negligible with a maximum gradient of 12.5% at KP20.6. This is within the immediate vicinity of the D15-FA-1 platform.
Sediments and Seabed Features	The Wingate field consists of shallow soils and slightly muddy sand, of which extends to approximately 35m below the seabed and covers the pipeline. The seabed is generally featureless and smooth. Trawl scars were observed in the western and central areas of the pipeline corridor. Findings from surveys suggest sediments are homogenous very fine brown sand, of which is rippled with shell fragments. Sediments are dominated by sand sized particles, with some fine and coarse material present. Publicly available data suggests the habitat surrounding the platform is Atlantic circalittoral sand (MC52) with some Atlantic offshore circalittoral sand (MD52) and Atlantic offshore circalittoral coarse sediment (MD32) along the pipeline.
Sediment Contamination	Surveys show that THC concentrations were similar across the site, with stations close to the exploration well displaying marginally higher concentrations due to the dispersal of drilling muds. N-alkanes concentrations showed a similar pattern

Environmental Receptor	Description of Sensitivities
	however, concentrations were lower during the post-drilling survey compared to the pre-drilling conditions, with the exception of raised levels of a series of alkanes from NC12-19 of which are most likely drilling related. All stations showed elevated levels of Ba post-drilling compared to pre-drill. Two stations had elevated concentrations, with one likely to be related to the drilling muds used for the 44/24b-7z exploration well and another suggesting that drilling muds dispersed at least 200m away from the drilling location with the prevailing current. Concentrations of Cr, Ni, V and Zn were also elevated in comparison to pre-drilling levels. Pb concentrations were generally similar in the pre-drilling and post-drilling surveys but were elevated at one station. Cd, Cu and Tin concentrations were below detectable levels at all stations. All n-alkane, THC and heavy metal concentrations were below expected background levels for the SNS, with the exception of Ba.
Biological Environment	
Plankton	The most abundant phytoplankton in the SNS are dinoflagellates and diatoms. Primary productivity increases in spring, leading to an increase in reproduction, and mixing by storms can lead to a secondary bloom occurs in autumn. Primary productivity over the Dogger Bank occurs throughout the year. Copepods and echinoderm larvae dominate the zooplankton community. The eggs and larvae of commercially important fish species are also present. Increases in zooplankton abundance are related to food supply and generally lag behind phytoplankton blooms by a period of days to weeks. Plankton populations and succession are typical to those in the SNS. Plankton are potentially vulnerable to chemical and hydrocarbon discharges and high intensity sound in the immediate vicinity of the source. However, it is noted that plankton in UK waters are unaffected by anthropogenic influences.
Benthic Communities	Benthic communities observed in the survey were typical of moderately diverse sandy biotopes of the biotope '*Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand' (SS.SSa.IMuSa.FfabMag). 75 discrete macrofaunal taxa were recorded including annelids, molluscs, crustacean, echinoderms. No rare or protected species were identified in the baseline survey. Another monitoring survey (Eggleton *et al.* 2016) collected a benthic samples in close proximity to the Wingate platform (1.7km) and pipeline (0.4km) with the most abundant species including the polychaetes, bristle worms, amphipods and bivalves.
Fish	Fish species diversity is rich in the SNS, more so compared to the central or northern North Sea (BEIS 2022). The greatest species diversity is observed in the west of the SNS (DECC 2016). The North Sea has been divided into a number of ICES rectangles, the Wingate NUI and associated pipelines are situated within the ICES rectangle 37F2. Within this rectangle, there are spawning or nursery grounds of up to 25 fish and shellfish species of commercial or conservation importance (Ellis *et al.* 2012).
Seabirds	Seabird distribution in the SNS varies throughout the year. Numbers of seabirds at sea are generally lower in Regional Sea 3 (SNS) compared with waters further north. Seabirds are vulnerable to oil on the sea surface, particularly when moulting at sea, following breeding periods (Marine Scotland 2020). The SOSI indicates that during the operational period, worst-case sensitivity across Block 44/24 and the surrounding blocks is extremely high in January, July, October, November and December, and low the remainder of the year.
Marine Mammals	Overall, the number of species of cetaceans and the frequency of sightings tends to decrease southwards through the North Sea (BEIS 2022). From the cetacean species regularly recorded in the North Sea, those likely to be present within the operational area include harbour porpoise and white-beaked dolphin throughout the year and minke whale as a seasonal visitor. The distributed of pinnipeds in the North Sea is limited by their need to return to land periodically. Two species of pinniped have been recorded in SNS waters:

Environmental Receptor	Description of Sensitivities
	harbour seal (*Phoca vitulina*) (BAP) and grey seal (*Halichoerus grypus*), which are both known to frequent the Dogger Bank area.
Protected Sites	
Special Areas of Conservation (SACs)	The Wingate field is located within the boundaries of the Dogger Bank SAC. The Dogger Bank SAC is protected for 'sandbanks which are slightly covered by sea water all the time', covering an area of 12,388km^2 and is the largest single continuous expanse of shallow sandbank in UK waters. The project area is also 5km south of the southern boundary of the southern North Sea SAC, the largest SAC in the UK (IAMMWG 2016). This SAC has been identified for the conservation of harbour porpoises, providing habitat for them during winter and summer.
Marine Conservation Zones (MCZs)	The closest MCZ to the project area is the NG-7 Markham's Triangle MCZ, which is located approximately 37.4km north of this protected site. It is designated for Subtidal coarse sediment, Subtidal sand, Subtidal mud, and Subtidal mixed sediments.
Special Protected Areas (SPAs)	There are no SPAs in the vicinity of the project area.
Annex I Habitats	No Annex I habitats were identified in the project area.
Other Regulatory Issues	
Block 44/24	Other periods of concern including seismic survey and seabed surveys were included in this section of the baseline. The decommissioning programme will not include either seismic survey or drilling activity.
Human Environment	
Shipping	Shipping density within Block 44/24 is given as moderate, with 10 shipping routes passing within 10 nautical miles (18.5km) of the Wingate NUI, with the closest approach being 1.5 nautical miles (2.8km). However, as the NUI is within a permanent 500m safety exclusion zone, established when the platform was installed, and all operations during decommissioning will be carried out within this zone, there is no increased risk to navigation.
Commercial Fishing	The Wingate NUI, and associated pipelines, lie within ICES rectangle 37F2. Generally, fishing effort and quantities landed have decreased over the period 2018 to 2022.

4. ENVIRONMENTAL ISSUES IDENTIFICATION

4.1 Environmental Appraisal Process

BEIS guidance (2018) identifies that the environmental appraisal should be proportional with respect to the proposed decommissioning activities, the potential environmental impacts and the sensitivities of the marine environment in the vicinity of the activities. It should provide a satisfactory level of information in order to describe the potential environmental impacts of the selected decommissioning option and should provide a more detailed assessment of any potentially significant environmental impacts.

4.1.1 Introduction

This Section outlines the impact assessment methodology used to assess the impacts of each decommissioning option. For this assessment, the likelihood and severity of the impact is considered once standard mitigation inherent in the design of the operation is incorporated e.g., measures taken to ensure legal compliance.

The impact assessment has been carried out in three stages as follows:

1. Definition of the existing baseline environment surrounding the project location, in terms of the physical, biological, and human environments (Section 3),
2. Identification of the activities that have the potential to impact the baseline environment (Section 2),
3. Impact assessment in terms of the potential severity and likelihood of an impact, taking account of all current legislation and industry best practice (Section 5).

Definitions of the terminology used are provided in Table 4-1.

Table 4-1 Terminology Definitions

Word	Definition
ALARP	As Low as Reasonably Practical, a concept that forms the primary basis for determining the tolerability of impacts and the adequacy of arrangements for managing impacts to health, safety and environment. Duty holders have a responsibility to reduce impact to as low as reasonably practicable (ALARP).
Likelihood	Likelihood is expressed as the probability of the worst-case impact occurring.
Risk	A term used to express the combination of the likelihood of a specific impact occurring and the severity of the consequences that might be expected to follow from it i.e. what is the risk of an impact occurring.
Residual Risk	The risk that remains after all known threats have been eliminated, reduced, or countered.
Severity	How severe the impact has the potential to be

4.1.2 Impact Assessment Criteria

Potential environmental impacts have been categorised using the severity classes set out in environmental impact assessment guidance produced by United Kingdom Offshore Operators Association (UKOOA 1999) as shown in Table 4-2.

These potential impacts have been assessed using the impact matrix shown in Table 4-3, based upon International Standard British Standard EN ISO 17776:2002. This has been adapted for use by Intertek to provide the criteria for O&G permitting.

The assessment considers the possibility that a receptor group may be exposed to a number of different potential impacts under each activity and that for each impact there may be different combinations of severity and likelihood e.g., low severity and high likelihood or high severity but low likelihood. Impact is scored according to the worst-case combination provided similar mitigation and controls apply to both. The coloured zones in Table 4-3 indicate broad impact acceptability and tolerability levels. Considering this table, impact is determined as significant, requiring further mitigation when there is a major – severe severity and a high or very high probability. If an impact is determined as significant, further mitigation to ALARP and a residual assessment will be required.

The impacts associated with each decommissioning option are discussed in Section 5.

Note: Where impacts are considered to be significant despite legal compliance and industry standard best practise, additional mitigation may be required to reduce the impact to ALARP, and a residual impact assessment carried out. Of importance however, identification of additional mitigation measures and residual impact assessments have *not* been included within this document as the very purpose of the document is to inform application of the mitigation hierarchy i.e. where impacts are significant, can we do it another way?

Table 4-2 Severity Classification

Severity Class		Criteria
1	Negligible	Change unlikely to be noticed against background variability. Area impacted restricted to immediate vicinity (<10m) of operation. Water column changes restricted to 100m of source
2	Minor	Change within normal variability but could be noticed / monitored. Some users may need to modify behaviour e.g. ships may need to re-route. Area impacted may extend to 50m in some places. Water column changes restricted to 500m from source.
3	Moderate	Localised effect but with full recovery back to existing variability. May contribute to cumulative impact. Area impacted may extend to 100m in some places. Water column impacts may extend beyond 500m for short periods. Nuisance potential to some users.
4	Major	Medium term (2 year) change in ecosystem or activity over a wide area with recovery to normal variability unlikely within 10 years.
5	Severe	Long-term (10 year) change to ecosystem over wide area with low probability of recovery to normal range.

Table 4-3 Impact Matrix

Severe [5]	Severity	5-A	5-B	5-C	5-D	5-E
Major [4]		4-A	4-B	4-C	4-D	4-E
Moderate [3]		3-A	3-B	3-C	3-D	3-E
Minor [2]		2-A	2-B	2-C	2-D	2-E
Negligible [1]		1-A	1-B	1-C	1-D	1-E
		Likelihood				
		Very Low [A]	**Low [B]**	**Medium [C]**	**High [D]**	**Very High [E]**
		Plausible but no known occurrences in the industry	Plausible and believed to have occurred in the industry	Possible (known isolated occurrences in the North Sea region)	Probable (several known occurrences in the North Sea region)	Very likely (expected to occur)

Table 4-4 Impact Acceptability Levels

	Acceptable: Impacts are accepted without further reduction other than the routine management process of continual improvement.
	Tolerable: Impacts which are accepted in a given context based on the current values of society. This generally means provided that the impacts are reduced to ALARP.
	Unacceptable: Impacts cannot be justified under the current criteria.

4.2 Initial Impact Identification

An initial impact identification was undertaken to determine the potential impacts that may arise from the proposed decommissioning activities and methods presented in Section 2.

The following impacts have been identified:

- Atmospheric emissions and energy use;
- Disturbance to nesting seabirds;
- Marine discharges;
- Physical presence of infrastructure decommissioned in situ;
- Physical presence of vessels;
- Resource use;
- Seabed disturbance;
- Underwater noise emissions;
- Unplanned events; and
- Waste.

The identified impacts were screened to determine if further assessment was required. Table 4-5 presents a summary of the potential impacts on environmental receptors and conclusion on whether further assessment is required or not along with justification.

In addition, transboundary and cumulative impacts have been discussed separately.

Table 4-5 Environmental Impact Identification Summary

Aspect/Impact	Environmental Receptor												
	Climate	Water quality	Seabed sediments	Plankton	Benthic communities	Fish	Seabirds	Marine mammals	Protected sites	Shipping	Commercial fishing	Other marine users	Justification
Atmospheric emissions and energy use	X	-	-	-	-	-	-	-	-	-	-	-	Further assessment required (see Section 5.1). Emissions during decommissioning activities will comprise greenhouse and other gases emitted as a result of vessel use. Atmospheric emissions will be short term and localised. In addition, under the prevailing metocean conditions of the area, it is anticipated that emissions generated will disperse quickly. Operations will contribute to the generation greenhouse gases including CO_2, NO_x, SO_2 and unburned hydrocarbons. Furthermore, the energy consumption from Project Vessels has been considered in the assessment. This has been represented as energy spent in GJ.
Disturbance to nesting seabirds	-	-	-	-	-	-	X	-	-	-	-	-	No further assessment required. There is no known evidence of nesting seabirds on the Wingate NUI but Offshore platforms have been recognised as potential nesting sites for seabirds, particularly species such as kittiwake and herring gulls. The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) secure protection of wild birds, their eggs and nests in the offshore marine area, including offshore marine installations. It is an offence under Regulation 40 to deliberately injure or kill any wild bird or take, damage or destroy the nest whilst in use or being built or take or destroy an egg. Prior to the commencement of decommissioning activities, assurances must be made that any potential adverse impacts associated with the activities will be minimised with respect to protected species such as seabirds. Wintershall will undertake additional surveys once a year to monitor for presence of seabird nests. This will continue after CoP to ensure that any presence of birds is identified prior to removal of the topsides. An awareness of the birds utilising the platform will allow the operator the opportunity to implement a deterrence strategy, and/or apply for a licence to disturb if operations will lead to disturbance of nests that cannot be mitigated against. The survey data can be used to inform the planning and scheduling of works in order to avoid the risk of an offence and/or to determine whether a disturbance licence needs to be sought.

Aspect/Impact	Environmental Receptor												
	Climate	Water quality	Seabed sediments	Plankton	Benthic communities	Fish	Seabirds	Marine mammals	Protected sites	Shipping	Commercial fishing	Other marine users	Justification
Marine discharges	-	X	X	X	X	X	-	-	-	-	-	-	No further assessment required. Discharges from vessels are regulated activities which are managed through existing legislation and compliance controls. All infrastructure will be flushed and cleaned prior to removal. Any discharges from infrastructure occurring during decommissioning activities will be assessed as part of the environmental permitting process.
Physical presence of infrastructure decommissioned in situ	-	-	X	-	X	-	-	-	X	-	X	-	Further assessment required (see Section 5.2). The decommissioning of the pipelines in situ has the potential to impact the environment in the longer term and other sea users.
Physical presence of vessels	-	-	-	-	-	X	-	-	-	X	X	X	No further assessment required. The presence of a small number of vessels for a short period (maximum of three weeks) within the 500m safety exclusion zone will not lead to an increased risk or disturbance to other sea users. The presence of vessels undertaking decommissioning will temporarily modify the area of available fishing grounds but this will not lead to a significant impact on the commercial fishing industry.
Resource use	X	-	-	-	-	-	-	-	-	-	-	-	No further assessment required. Resource use from the activities will be limited in terms of use of raw materials. This will be limited to fuel use and rock for rock protection of the cut end of the pipeline.
Seabed disturbance	-	X	X	-	X	X	-	X	X	-	-	-	Further assessment required (see Section 5.3). There is potential for activities to cause disturbance to the seabed through removal of jacket and mattressing and grout bags and the decommissioning of the pipelines in situ. There will also be seabed disturbance through use of the anchoring from the HLV.
Underwater noise emissions	-	-	-	-	-	X	X	X	X	-	-	-	Further assessment required (see Section 5.4). There is potential for activities to cause impacts on marine mammals. The Wingate NUI is located within 5km of the Southern North Sea SAC, which is designated for harbour porpoise.

Aspect/Impact	Environmental Receptor												
	Climate	Water quality	Seabed sediments	Plankton	Benthic communities	Fish	Seabirds	Marine mammals	Protected sites	Shipping	Commercial fishing	Other marine users	Justification
Unplanned events	-	X	X	X	X	X	-	-	-	-	-	-	No further assessment required. All wells associated with the Wingate NUI will have been plugged and abandoned prior to decommissioning and there will be no chemical use during the decommissioning programme. As a result, the risk of accidental releases will be restricted to vessel fuel, with a major spill on envisaged in the event of a collision. Modelling for the Wingate NUI production OPEP considered a potential spill of up to 1,220m^3 (1098 Te) of diesel fuel, from the platform site, based on the fuel capacity of the largest rig likely to be used at Wingate NUI. This represents 22 days fuel for the HLV or 11 days continuous trenching using a trenching vessel. It is therefore regarded as a reasonable maximum fuel load likely to be at risk of release, in the unlikely event of an incident involving loss of vessel fuel inventory. Modelling indicated that there was up to 84% probability of diesel crossing the UK/Netherland median line and a low risk (<2%) of up to 24m^3 of diesel beaching on the Norfolk coast.
Waste	X	-	-	-	-	-	-	-	-	-	-	-	No further assessment required. The onshore treatment of waste from the decommissioning activities will be undertaken according to the principles of the waste hierarchy. Bulk liquids removed from vessels are transported to shore. Bulk fluids taken onshore for handling at the appropriately permitted facilities prior to onshore treatment and disposal. There may be elements of infrastructure returned to shore which is contaminated (e.g. by NORM). These will be taken onshore with the infrastructure identified for removal and decontamination at the appropriately permitted disposal yard prior to onshore disposal. Where possible elements of the jacket and topsides will be recycled.

Key	Further Assessment Required	No Further Assessment Required

5. ENVIRONMENTAL ASSESSMENT

5.1 Atmospheric Emissions and Energy Use

5.1.1 Potential Impacts

Enhanced levels of greenhouse gases (GHGs) from anthropogenic sources have been linked to global climate change (IPCC 2013), including increases in global temperatures (Hansen *et al.* 2023), rising sea-levels (Song *et al*. 2023), ocean acidification (Kloenne *et al* 2023), changes in ocean circulation (Williams *et al.* 2023), and potentially more frequent extreme weather events (Chen *et al*. 2023). In addition to the associated effects with atmospheric GHGs, atmospheric emissions can also impact air quality. Poor air quality can have significant effects on human health, the wider environmental, as well as infrastructure. Anthropogenic influence has been displayed as the principal driver of many of the impacts mentioned above (IPCC 2021). A 47% increase in CO_2 concentrations since 1750 has been recorded (IPCC 2021), this is considerably higher than expected natural multi-millennial changes, providing evidence for fossil fuel combustion as the primary contributor to climate change.

Atmospheric emissions were identified within Section 4 as being a potential source of impact from activities associated with the Wingate decommissioning programme. Sources of emissions include:

I Combustion emissions from vessels.

II The recycling of materials returned to shore.

5.1.1.1 Combustion Emissions from Vessels

Atmospheric emissions will be emitted during the proposed decommissioning activities from vessel use. Polluting emissions emitted include CO_2, CO, CH_4, NO_x, SO_x and small amounts of N_2O as quantified in Table 5-1. The emissions of relevant gas species have been estimated for each atmospheric emission source. Specifically, Table 5-1 presents the anticipated worst case vessel usage, which was calculated using associated standard Environmental and Emissions Monitoring System (EEMS) and conversion factors (DECC 2009), which were additionally used to estimate the global warming potential (GWP). A resultant total worst case fuel consumption of 1878 Te was calculated during the course of decommissioning activities. Additionally, a total worst case energy use from project vessels (Table 2-4) of 75,120 GJ was calculated using the energy density and density of marine diesel.

Table 5-1 Atmospheric Emissions Arising from Vessel Use

	Fuel Consumption (Tonnes)	**Emissions (Te)**							
		CO_2	**CO**	**NO_x**	**N_2O**	**SO_x**	**CH_4**	**VOC**	**CO_2 eq**
Fuel use	1878 tonnes	6010	29	111	0	2	0	4	6141
GWP		1			298		25		
CO_2 eq		6009.6			123.1		8.45		6141.17
Energy consumption (GJ)		75,120							

The P&A of the producing wells is not included in the assessment within the EA. The P&A will be permitted under the existing Production Permit (PRA/150) prior to the commencement of the decommissioning programme.

The greenhouse gas emissions of 6141.17 Te carbon dioxide equivalent (CO_2 eq) will contribute to the overall UK greenhouse gas emissions, estimated at 427.7 million Te in 2021 (BEIS 2022), of which approximately 17 million Te was emitted by the UK offshore oil and gas industry (OGA 2021).

5.1.1.2 Emissions Associated with Material Recycling

As stated in Section 1.2 onshore activities are not included in the assessment as this is not relevant to impacts in the marine environment. Onshore treatment of waste will be considered further as part of onshore activities (BEIS 2018).

5.1.2 Mitigation Measures

Emissions emitted from vessels will be minimised wherever possible following relevant industry best practices to limit atmospheric emissions will be implemented including:

- Advanced planning of operations to reduce time required for vessels and ensure efficient operations;
- Emissions controlled to MARPOL Annex VI standards via use of cleaner low emission fuels;
- Limiting vessel speed to minimise fuel consumption;
- Generators will be running on the minimum power required to avoid unnecessary emissions; and
- Regular monitoring of fuel consumption.

While contractors are yet to be selected during the selection process, contractors will be selected that satisfy modern and fuel efficiency standards.

5.1.3 Conclusion

Although there will be atmospheric emissions from the Wingate decommissioning activities, their residual impact on air quality is expected to be insignificant.

It is predicted that the GHG emissions generated during the proposed decommissioning activities will disperse rapidly, dropping to levels approaching the marine background within a few kilometres of the source. Any contribution to GHG concentrations in the atmosphere must be considered as potentially deleterious; however, the quantity emitted during decommissioning of Wingate NUI and the associated pipelines will not be detectable against the background.

Given the distance to the shore from the decommissioning activities (177km) the impact of atmospheric emissions generated by decommissioning vessels on air quality is expected to be minor. They will not contribute to atmospheric contamination at sensitive (terrestrial) sites, such as cities.

It is not expected that there will be any increases in concentrations of atmospheric pollutant emissions, including greenhouse gases over the median line between the UK and Netherlands. In conclusion impacts from atmospheric emissions are assessed as **Tolerable.**

5.2 Physical Presence of Infrastructure Decommissioned *In Situ*

5.2.1 Potential Impacts

The proposed decommissioning activities have the potential to impact upon users of the sea due to the physical presence of the pipeline left *in situ*. Sea users, other than commercial fisheries, are unlikely to be affected by the proposed decommissioning solution, therefore this section focuses on the impact on the physical presence of subsea infrastructure decommissioned in situ posing a potential risk for commercial fisheries. In addition, both the steel pipeline and plastic polymer coating have the potential to degrade over time. This could impact local seabed sediments, benthic communities and protected sites.

The degradation of the pipeline itself would only begin to occur after many decades (of the order of 60 to 100 years) and the degradation of plastic would likely occur very gradually over hundreds of years (HSE 1997; OGUK 2013; Thompson, Gall & Northam 2023). The coating is made of polymer, of which has an extremely slow degradation rate of up to several hundreds of years (Oluwoye *et al*. 2023). Pipelines will be flushed and cleaned. As such, the degradation of these materials would therefore have little detrimental effect to the local marine environment and sediments. Due to the highly localised nature of any degradation products and the low concentrations of contaminants being released over an elongated period, it is highly unlikely that these products would be detectable above current background conditions.

5.2.2 Seabed Sediments

The Wingate pipelines, of which is coated with plastic polymer, is proposed to be left in situ. Pipelines and plastic coating have the potential to degrade or corrode over time and become incorporated into the sediment. The slow degradation of the pipeline and coating would have little detrimental effect to the local marine environment and sediments and it is highly unlikely that these products would be detectable above current background conditions. It is considered that as the pipeline is trenched and buried to a sufficient depth the inert material within the seabed does not pose a high risk to the environment.

As a result, the impacts of the physical presence of infrastructure decommissioned in situ on seabed sediments is assessed as **acceptable**.

5.2.3 Benthic Communities

The degradation of the Wingate pipeline and coating may lead to the products becoming bioavailable to benthic fauna in the immediate vicinity. Where plastics remain large (macro), they are more likely to remain in situ in the seabed. However, once these pieces are broken into smaller particles (micro) these may become bioavailable and transported away from the source (Thompson, Gall & Northam 2023). The ingestion of microplastics in the marine environment can lead to reduced growth, development and reproduction as well as tissue and cell damage and reduced survival rates (Wright *et al.* 2013).

Due to the slow release of any chemicals, degradation is not likely to result in a significant transfer of metals and plastics into the food chain (HSE 1997; OGUK 2013; Oluwoye *et al*. 2023; Thompson, Gall & Northam 2023). The potential uptake of degradation products would be limited to local fauna and is expected to have a negligible impact on the local environment. A risk assessment of the impact of degradation of subsea plastic-containing flowlines resulted in an outcome of no risk to the local marine community (Testoff *et al.* 2022). As a result, the impacts of the physical presence of infrastructure decommissioned in situ on benthic communities is assessed as **acceptable**.

5.2.4 Protected Sites

The pipelines and any associated protective material remaining in the seabed is not expected to impact conservation sites, such as Dogger Bank SAC. Habitats Regulations Assessment (HRA) of decommissioning of pipelines in the Dogger Bank SAC (BEIS, 2019) states that pipelines that are trenched and buried are not predicted to have an impact on the structure or function of the Dogger Bank sandbank.

In terms of pipeline degradation, metals and plastics being released over an elongated period would likely not be detectable above current baseline conditions (HSE 1997; OGUK 2013; Oluwoye *et al.* 2023; Thompson, Gall & Northam 2023). Therefore the in situ pipeline would have little detrimental effect to the local marine environment. It is considered that as the pipeline is trenched and buried to a sufficient depth the inert material within the seabed does not pose any risk to the environment.

As per Section 3.4.6.2, it was highlighted that certain features within the Dogger Bank SAC have recovery targets owing to the already unfavourable conditions of these features, due to human impacts. It is stated that any further human impacts will cause additional deterioration to these features (JNCC 2022a). However, the impacts of Wingate decommissioning activities is not considered to pose a likely significant effect to these features. As a result, the impacts of the physical presence of infrastructure decommissioned in situ on protected sites is assessed as **acceptable**.

5.2.5 Commercial Fisheries

The physical presence of the platform and pipeline left *in situ* has the potential to affect other users of the sea through disruption of their activities, including commercial fishing. The scale of effect is limited by fishing activity in the area. Potential effects on commercial fishing activity are restricted to temporary spatial conflict. Decommissioning activities will take place within ICES rectangle 37F2. Fishing effort and quantities landed have decreased significantly since 2018, with the exception of the relatively low value pelagic fishery. During operations, safety exclusion zones will be in place around vessels and these would not be accessible for fishing. There will be limited temporary displacement to fisheries during the legacy monitoring surveys, but the impact is expected to be minimal. Decommissioning activities will represent a short-term increment in vessel presence over that which the area normally receives and it is not considered that this will result in a significant effect on commercial fisheries.

The potential longer term source of effect to commercial fisheries, is the physical presence of the pipeline to be left *in situ*. The options for decommissioning the pipelines were subject to a CA (see Section 1.3.1), with the preferred option being the flushing, cleaning of the pipeline, leaving it buried *in situ*. Sections of the pipeline in the seabed immediately adjacent to the platform will be removed up to where the pipe goes into burial and cut ends covered with rock protection. Spool pieces will be removed, recovered to shore and recycled. There are no areas of pipeline span, exposure or shallow burial and so remaining pipeline will be left in place.

Snagging risk from leaving the pipeline *in situ* is minimal as trenched and buried, decommissioned, pipelines are not expected to represent a hazard to the environment and other users of the sea. In addition, any rock protection will be over-trawlable and the fisheries snagging potential is considered low. As a result, the impacts of the physical presence of infrastructure decommissioned in situ on commercial fisheries is assessed as **acceptable**.

5.2.6 Mitigation Measures

The impacts of the physical presence of infrastructure decommissioned *in situ* will be minimised wherever possible and mitigation will include:

- Vessel movements and the HLV, and any other, anchors will be notified to fishermen and others through the normal routes, including publication in Notice to Mariners and in Kingfisher bulletins detailing positionings, activities and timings. In addition, there will be full navigation lighting on HLV and associated vessels. All vessels used in the decommissioning activities will meet applicable national and international standards, for example in terms of signals and lighting.
- A post decommissioning survey will be carried out and although not expected, if large seabed depressions or mounds from the decommissioning activities are evident which could potentially be a hazard to fishing gear, these will be notified through the Kingfisher notices system. Inspection surveys will be undertaken after decommissioning to provide a general inspection on the in-situ pipelines. An agreed monitoring programme with the regulator will be established to identify future exposure of the pipeline decommissioned *in situ,* although this is not expected. An over-trawlability verification exercise will likely be carried out post decommissioning to ensure that the *in situ* pipeline is over-trawlable and does not present a snagging hazard.

- The position of the pipeline remaining *in situ* will be charted through normal routes.

No specific additional mitigation is considered necessary beyond application of established operational controls.

5.2.7 Conclusion

Interactions with commercial fishing will be short lived. The safety exclusion zones will be removed when decommissioning activities have been completed, allowing access for users. Details of infrastructure remaining *in situ* will be publicised and marked on navigation and fisheries charts, and an agreed monitoring programme for these will be established. The pipelines have been present in the seabed for over a decade, are charted features and to date there have been no offshore shipping or fisheries related incidents. The potential for significant effects on fisheries from legacy material left *in situ,* following normal operational controls described above, are considered very low. In addition, due to the highly localised nature of any degradation products and the low concentrations of contaminants being released over an elongated period, it is expected to have a negligible impact on the local environment including seabed sediments, benthic communities and protected sites.

As a result, the impacts of the physical presence of infrastructure decommissioned in situ on seabed sediments, benthic communities, protected sites and commercial fisheries is assessed as **acceptable**.

5.3 Seabed Disturbance

5.3.1 Potential Impacts

The decommissioning activities have the potential to impact the seabed in the following main ways:

- Direct impact through:
  - Removal of subsea infrastructure including jackets, subsea structures and stabilisation materials;
  - Presence of subsea infrastructure decommissioned in situ (i.e. trenched and buried pipeline);
  - Removal of pipeline ends; and
  - Rock-placement for pipeline ends.
- Indirect impact through:
  - Re-suspension and re-settling of sediment; and
  - Footprint of remaining infrastructure.

The disturbance of seabed sediments may lead to an increase in sedimentation, potential destabilisation of the surrounding sediments and a localised increase in turbidity.

5.3.1.1 Anchoring

The HLV, to be used during the removal of the topsides and jacket, will be anchored. The anchors are expected to be set approximately 900m from the worksite, with cable on the seabed for 800m from the anchor. Following siting of the anchor the HLV will not move significantly from the platform site. As a worst case it is estimated that each anchor will have a footprint of 20m^2 and each anchor cable will impact a corridor 1m wide along the length on the seabed, with a resulting footprint of 800m^2 per cable. The total anticipated footprint associated with anchoring is therefore 3280m^2. Anchor and cable scars are expected to be temporary.

All other vessels involved in pipeline works will use dynamic positioning (DP) and no anchoring will be required. Seabed disturbance will therefore be limited to works surrounding the platform itself.

5.3.1.2 Removal of Infrastructure, Protective Material and Burial of Pipeline Ends

While the methodology has not yet been determined, pipelines PL2850 and 2851 will require to be cut. The length on the seabed (approximately 90m x 0.33m) will be recovered. Removal of stabilisation material (Table 2-3) will also be required. In order to cut and ensure burial of the exposed end to be left in-situ it is anticipated that a trench up to 3m x 5m x 1m depth will need to be dug. It is anticipated that this will be backfilled following trenching and burial of the pipeline and cut ends of the pipeline will be covered with rock protection. Removal of the Wingate NUI platform, with its associated seabed infrastructure is also expected to cause seabed disturbance within the platform area. Following the decommissioning programme it is anticipated that any scars left on the seabed, including around the pipeline burial point, will rapidly infill and recolonise, allowing benthic fauna and fish to re-establish natural conditions.

Disturbance of the seabed is quantified in Table 5-2 and the total expected impact is approximately 4,686m^2 of seabed, with rapid recovery following the operation.

Table 5-2 Expected Seabed Disturbance

Decommissioning Activity	Seabed Disturbance (approx. m^2)
Removal of stabilisation material	456
Cutting of pipelines (PL2850 and PL2851)	30
Rock protection	20
Removal of Wingate NUI platform and associated infrastructure	900
Anchoring footprint	3280
Total	**4686**

5.3.2 Water Quality

The removal of seabed infrastructure and subsequent disturbance of seabed sediments may impact the local water quality through an increase in sedimentation, potential destabilisation of the surrounding sediments and a localised increase in turbidity. However, the residual impact is expected to be minor and will be highly localised and temporary in nature. Water quality in the immediate vicinity will be reduced slightly, but effects are usually minimised by the dynamic nature of the local environment. In addition, the seabed area likely to experience disturbance is relatively small compared to similar seabed habitats present in the SNS and the areas of impact are expected to recover quickly due to the nature of the local currents and sediment type. As a result, the impacts of disturbance on the water quality are assessed as **acceptable.**

5.3.3 Seabed Sediments

Direct disturbance of the seabed during decommissioning activities will cause sediment suspension and resettlement. Most suspended sediment is expected to settle within the direct disturbance area, however, some may settle in adjacent areas not directly affected by decommissioning activities. In order to account for this, the potential area of direct seabed disturbance is calculated by doubling the direct disturbance footprint (4780m^2) resulting in a potential indirect area of impact from sediment resettlement of 9560m^2.

Impacts arising from sediment re-suspension are short term, ranging from a few days to a few weeks, are likely to return to baseline conditions following cessation of decommissioning activity (Defra 2010). This is particularly the case in this sandbank region of the SNS, where the shallow sediments experience increased mobility. As a result, the impacts of disturbance on the seabed sediments are assessed as **acceptable.**

5.3.4 Benthic Communities

Seabed disturbance will result in direct physical effects on benthic communities which may include mortality as a result of physical trauma and smothering by excavated and re-suspended sediments. Disturbance during removal operations would be limited to the benthic fauna colonising the hard surfaces of the protective material to be lifted, the soft sediment fauna along the pipeline routs and the biota present on and immediately around infrastructure. Physical disturbance as a result of removing the subsea infrastructure may cause mortality or displacement of benthic species in the impacted zone, direct loss of habitat and direct mortality of sessile seabed organisms that cannot move away from the contact area. Several factors minimise these impacts:

- Biological communities are in a continual state of flux and are able to adjust to disturbed conditions or rapidly recolonise areas that have been disturbed;
- The area has already been exposed to oil and gas exploitation of the seabed as well as being subjected to historical benthic trawling, therefore historic disturbance has already taken place;
- No sensitive species or Annex I habitats of conservation importance were identified around the Wingate Development (DeepOcean 2010);
- The mobile nature of the seabed sediments in the SNS area will aid the rapid recovery of the disturbed areas, although some seabed scars may persist in the medium term; and
- The scale of impact is negligible considering the large extent of similar sandy sediment available in the SNS.

The disturbance of seabed sediments may also lead to an increase in sedimentation, potential destabilisation of the surrounding sediments and a localised increase in turbidity. This can have an impact on benthic suspension feeders. However, the impacts will be highly localised and the seabed area likely to experience disturbance is relatively small compared to similar seabed habitats present in the SNS. In addition, species which are tolerant to a natural variability of sedimentation are present in the SNS and in the Wingate area. This has been corroborated by surveys where benthic communities were found to be dominated by annelids, molluscs and echinoderms (DeepOcean 2010). These taxa are relatively tolerant to smothering and increases in suspended sediment (Hill & Wilson 2008).

Re-colonisation and recovery is anticipated to take place in a number of ways; including mobile species moving in from edges of the area, juvenile recruitment or from burrowing species digging back to the surface. The seabed is expected to recover within a year of operations and subsequent legacy monitoring surveys would not cause disturbance of the seabed. As a result, the impacts of disturbance on the benthic fauna are assessed as **acceptable.**

5.3.5 Fish

The disturbance of seabed sediments can have an impact on fish, however, the impacts will be highly localised and the seabed area likely to experience disturbance is relatively small compared to similar seabed habitats present in the SNS.

This said, commercially and ecologically important fish species such as herring and sand eels have spawning and nursing grounds in the vicinity of the platform and are bottom spawning. The deposit of rock on the seabed will result in the long-term loss of soft sediment habitat, however the spatial extent of these effects will be limited to 20m^2. Given the mobile nature of the fish species, any displaced fish are likely to find suitable spawning areas in adjacent locations. The spawning grounds in the vicinity are likely part of wider spawning grounds for these species in the Dogger Bank Area and the area is not considered to be critical spawning habitat for these species.

Exposure to increased turbidity through sediment resuspension may also temporarily displace fish species from their spawning and nursing areas and may reduce the visual acuity of fish potentially affecting foraging behaviour. However, any disturbance of this nature is considered to be highly localised and of short duration and mobile species would be expected to return shortly after cessation of the operations.

Egg development and hatching success is also vulnerable to the effects of smothering. Several studies have been undertaken investigating the impact of sedimentation on fish egg development of commercially valuable fish species. Some studies demonstrate mortality of fish eggs when smothered by a thin veneer of sediment (Clarke & Wilber 2000) and other show no significant effect (Auld and Schubel, 1978; Kiørboe *et al.*, 1981). This said, sediment in this area is in the form of sandbanks and is highly mobile. Once decommissioning activities are complete, the seabed sediments are likely to re-settle and be subject to the natural tidal-influences in sediment transport in the area.

Given the above, the impact to fish spawning and nursey grounds from physical disturbance, increased turbidity and smothering is therefore considered to be **acceptable.**

5.3.6 Marine Mammals

Due to the distance of the Wingate NUI to the Southern North Sea SAC (5km), which is designated for the conservation of harbour porpoise, there is potential for seabed disturbance to impact marine mammals. Seabed disturbance from decommissioning activities has the potential to disturb the supporting habitats of marine mammals. For example, as discussed in Section 5.3.5, seabed disturbance could impact ecologically important fish species, including eels, which are supporting prey species to harbour porpoise, and other marine mammals. These fish species have spawning and nursery grounds within the vicinity of the platform and are bottom spawning, meaning that they could be susceptible to any seabed disturbance caused by operational activities. Consequently, any impact to supporting prey fish species could have a knock-on effect to any marine mammals relying on these fish species as food sources within the operational area. However, due to the small spatial extent of the effects being limited to 20m^2, any impacts to supporting prey sources and therefore, marine mammals, are expected to be negligible.

As a result, the impacts to Marine mammals from physical disturbances, through impacts to supporting prey are assessed as **acceptable**.

5.3.7 Protected Sites

The Dogger Bank SAC protects the Annex I habitat 'Sandbanks which are slightly covered by sea water all the time'. Threats to this protected habitat include 'marine construction' activities (JNCC 2022a). Decommissioning is a form of reverse installation and may be perceived to contribute to this potential pressure pathway.

The marine environment in the SNS is dynamic in nature and suspended sediment will most likely be transported away from the source of the disturbance. Anticipated disturbance is, therefore, highly localised and will be similar to baseline sediment dispersion and movement. Whilst there is potential to alter the fine-scale sediment topography of this site during the decommissioning of subsea infrastructure, such changes will occur within a limited area for a very short duration. Any such temporary changes will be recoverable and will not have any impact on the extent, distribution, structure, or function of the sandbank habitat forming the qualifying feature of this site. This said, the addition of hard substrate results in a change to the sandbank habitat which forms the qualifying feature of this SAC. JNCC (2022c) identify that decommissioning operations may also result in further permanent impacts, due to deposition of material (e.g. rock dump) which can differ in size from sandbank substrate, which may cause localised changes to the sediment type. The spatial scale of this impact is negligible when considering the spatial extent of the site. The total footprint represents less than 2 x 10^{-5}% of the Dogger Bank SAC, the only protected site with the potential to be impacted by

the footprint of the decommissioning programme. Natural conditions within the footprint are expected to rapidly re-establish following completion of the programme. As a result, the impacts on the conservation objectives of the Dogger Bank SAC are assessed as **acceptable**.

The decommissioning activities will occur in close proximity (within 5km) of the southern boundary of the Southern North Sea SAC, of which is designated for the conservation of harbour porpoises. No impacts to harbour porpoises are anticipated from seabed disturbance. However, there is potential that seabed impacts generated during decommissioning activities may damage relevant habitats which support their prey species. Harbour porpoises are highly dependent upon prey distributions and impacts to their relevant habitats could impact their prey species (JNCC 2019b).

The impacts of decommissioning activities on prey species, such as whiting and sandeels, will be highly localised and the seabed area likely to experience disturbance is relatively small compared to similar seabed habitats present in the SNS. Mobile fish are adapted to varying levels of sediment suspension within the water column, especially in areas of highly mobile sediments such as the SNS. Any disturbance is considered to be highly localised and of short duration and mobile fish species would be expected to return shortly after cessation of the operations. As a result, the impacts on the conservation objectives of the Southern North Sea SAC are assessed as **acceptable**.

5.3.8 Mitigation Measures

Impacts of seabed disturbance will be minimised wherever possible and mitigation will include:

- Work will be undertaken in an environmentally sound manner with interfaces detailing responsibilities development, including environmental responsibilities, and regular HS&E meetings, as required.
- Rock protection quantity will be minimised and placed as accurately as possible from the vessel.
- Project planning includes minimising, as far as practicable, vessel movements, including the use and movement of anchored vessels; the HLV will predominantly be located within the Wingate NUI 500m exclusion zone (however, if HLV uses anchors, the footprint will be outside of the 500m zone) existing footprint. It also includes assessing the nature and scale of seabed disturbance post-decommissioning.
- Subsea infrastructure and stabilisation material removal methods will be assessed prior to decommissioning operations beginning, with a view to implement the removal method with the least impact to the seabed.
- To avoid the impact of anchors, vessels involved will use DP, where possible. In addition, the HLV will be positioned in a single location, if possible, during decommissioning to reduce the number of instances that anchors and anchor chains will be deployed on the seabed.

No specific additional mitigation was considered necessary beyond application of established operational controls.

5.3.9 Conclusion

Decommissioning activities have the potential to impact the seabed through direct impacts, such as the removal of subsea infrastructure and introduction of rock-placement, as well as indirect impacts such as the re-suspension of settlement. In conclusion, although the placement of anchors and anchor chains on the seabed will impact the water column and seabed sediments, by limiting the number of locations for the HLV any effects will be highly localised in nature and, therefore, the impact on the marine environment is considered to be minor. In addition, the removal of infrastructure, protective material and the trenching and burial of pipeline ends will cause seabed disturbance. This could impact water quality, seabed sediments, benthic communities, fish and protected sites. To mitigate these impacts, vessel movements and rock protection quantities will be minimised. The disturbance

is likely to be short term and relatively small compared to the surrounding similar habitats present in the SNS and the areas of impact are expected to recover quickly due to the nature of the local marine environment.

As a result, the impacts of seabed disturbance on water quality, seabed sediments, benthic communities, fish and protected sites is assessed as **acceptable**.

5.4 Underwater Noise Emissions

5.4.1 Potential Impacts

Anthropogenic noise in the marine environment is widely considered as a potential disturbance to marine life, especially marine mammals (Richardson *et al.* 2007). This is considering that many marine species use sound to communicate and assess their surrounding environment. More specifically, some marine mammals also use sound detect prey and predators through echolocation. Therefore, the addition of anthropogenic sound sources in marine environments may result in impacts to marine species. Potential impacts are broad, ranging from masking biological communications and small behavioural changes to chronic disturbance, auditory injury and even mortality. As well as direct effects, indirect effects such as those on prey may also occur.

The primary source of underwater sound generation during the Wingate decommissioning activities is vessel noise, from the following activities:

- Vessels, including the use of thrusters for positioning.
- The cutting of the jacket and pipeline – Diamond wire or cutting shears (method not yet determined).
- Pre-decommissioning survey .

Table 5-3 Summary of Principal Noise Sources from Decommissioning Activities

Noise Source	Indicative broadband source level (dB re 1 µPa@1m)	Indicative dominant frequency	Source
Vessels 50-100m length (e.g. DSVl)	165-180	<1,000Hz	OSPAR (2009)
Vessels of 100-300m length (HLV)	175-195	<200Hz	OSPAR (2009), McKenna *et al.* (2012), Veirs *et al.* (2016)
Diamond wire cutting tool	na; at 100m from source: ≤130dB re 1 µPa2 per 1/3 octave band for all recorded frequencies from 5,000-40,000Hz	>10,000Hz	Pangerc *et al.* (2017)
Multibeam echosounder (post-decommissioning survey)	245dB re 1 µPa @ 1m (SPL RMS)	210-245Hz	Genesis (2011)
Side scan sonar (post-decommissioning survey)	223	114 or 440kHz	Kongsberg (2014)

5.4.1.2 Cutting Noise Emissions

The method for cutting the pipeline, piles and conductors has not yet been finalised. However, techniques such as cutting by shears or diamond wire are not generally considered harmful to sensitive receptors as they are similar to vessel noise (Pangerc *et al*. 2017). Considering that field

measurements to record the effects of noise emissions from cutting on marine mammals are lacking, a worse case assumption for noise emitted from diamond-wire cutting has been used in this assessment (Table 5-3). Although it is not possible to provide any further information regarding the emissions of this method of cutting, it is likely that this would generate less noise compared to mechanical cutting techniques. Furthermore, any noise generated from cutting will be localised and over a short duration.

5.4.1.3 Vessel Noise Emissions

Noise is emitted from vessels from multiple sources, including from propellers/thrusters, and from the hull as it moves through the water. Noise emissions from vessels take place continuously throughout the duration of vessel operation. Continuous noise sources such as these are considered less of a concern compared to intermittent sources.

The largest vessel to be used during decommissioning is the HLV which would be on site for approximately 21 days. The majority of activity will be completed by smaller vessels, which, emit less noise. Exposure to sound pressure levels above >180 dB re 1 µPa rms is improbable, sound levels >160 dB re 1 µPa rms are only expected within the immediate vicinity of activity and sound levels >120 dB re 1 µPa rms will be experienced up to a few kilometres from the source (Neptune LNG 2016; Fairweather 2016). Furthermore, species with established hearing are expected to be able to avoid sound sources that are 50 to 90dB above their hearing thresholds (Nedwell *et al*. 2007). Considering that the schedules operations are located 5km of the Southern North Sea SAC, which is designated for harbour porpoise, it is possible that noise emissions from vessels could cause some disturbance.

5.4.1.4 Pre-decommissioning Survey

A pre-decommissioning environmental survey will be carried out to re-enforce the baseline and confirm the depth of pipeline burial. There will also be use of echosounders, multibeam echosounders and side scan sonar during this survey; however, these instruments transmit at frequencies >160kHz, and are therefore outside the acoustic range (7Hz to 160kHz, Southall *et al*. 2019) of marine mammals and fish.

5.4.2 Marine Mammals

Marine mammals have been shown to be more sensitive to sound compared to fish, due to their ability to perceive higher frequencies (Nedwell *et al.* 2012). Both cetaceans and pinnipeds have evolved to use sound as an important aid in navigation, communication, and hunting (Richardson *et al*. 1995). It is generally accepted that exposure to anthropogenic sound above background levels can induce a range of behavioural changes. For example, alterations in noise levels may mask communicative or hunting vocalisations, preventing social interactions and effective hunting. Further, in extreme circumstances, anthropogenic sound can lead to permanent injury in marine mammals.

High intensity noises can cause temporary or permanent changes to animals' hearing if they are exposed to sound in proximity. In some cases, this can result in the death of the animal (Richardson *et al*. 1995). Where the threshold of hearing is temporarily damaged, it is considered a temporary threshold shift (TTS), and the animal is expected to recover. When there is permanent damage (Permanent threshold shift (PTS)), the animal is not expected to recover, resultantly, the animal may become socially isolated and its ability to locate food may be restricted, potentially leading to death (Southall *et al*. 2007).

For a sound to be detected by an animal, it must be louder than background and above the animal's hearing sensitivity at the relevant sound frequency. Continuous sound sources are likely to be emitted the use of vessels. The estimated sound generated from project vessels will be between <200Hz to <1000Hz, pre-decommissioning surveys could generate sound 114 – 440Hz cutting activities could emit sounds >10,000Hz (Table 5-3). However, noise emitted from cutting activities is intermittent, occurring over a short period of time and kept to a localised area.

There is potential for harbour porpoise, white-beaked dolphin, minke whale, harbour seal and grey seal to be present within the operational area throughout the operational period. Harbour porpoises are of particular relevance considering that they are protected within the within the Southern North Sea SAC, which is 5km from the Wingate NUI.

Table 5-4 displays the hearing ranges and injury thresholds of the marine mammals that could be present within the operational area, as defined by Southall *et al* (2007). As stated in Table 5-3, noise emissions from vessels span over a large range, however, the dominant frequency is largely low (<200Hz). Although all marine mammal species are expected to be able to detect these sounds, low-frequency marine mammals including minke whales are expected to be the most susceptible to noise disturbance from decommissioning activities.

Furthermore, as these sound sources are continuous, they are expected to have less of an impact than intermittent sound sources. It is also assumed that all marine mammals will move away at a speed of 1.5m/s from a sound source level (Otani *et al*. 2000). This is considered conservative as there is data to suggest that animals will move away at much greater speeds (e.g. harbour porpoise at 1.9m/s, at least initially (McGarry *et al*. 2017, Kastelein *et al*. 2018). The baseline sound environment also needs to be considered. Shipping density within the area has been described as moderate. This suggests that individuals could already be habituated to reasonably high levels of noise disturbance and therefore operational noise is not anticipated to have a significant effect.

Table 5-4 Hearing Ranges and Injury Thresholds for Marine Mammals Within the Operational Area

Species likely to be present within operational area	Hearing range	Injury threshold criteria to non-pulsed sounds
Low frequency cetaceans Minke whale (*Balaenoptera acutorostrata*)	7Hz to 22kHz 7Hz to 35kHz	230 dB re 1µPa
Mid-frequency cetaceans White-beaked dolphin *Lagenorhynchus albirostris*	150Hz to 160kHz	230 dB re 1µPa
High-frequency cetaceans Harbour porpoise *Phocoena phocoena*	200Hz to 180kHz 275Hz to 160kHz	200 dB re 1µPa
Pinnipeds Harbour seal *Phoca vitulina* Grey seal *Halichoerus grypus*	75Hz to 75kHz 50Hz to 8kHz	218 dB re 1µPa

Source: Southall *et al*. (2007)

The hearing ranges of mammals (Table 5-4) have the potential to overlap with high frequency sounds generated by the diamond wire cutting tool and the multibeam echosounder and side scan sonar used within the pre-decommissioning survey. However, based on the locality of cutting, the hearing capabilities and avoidance behaviours of marine mammals, and the duration of operations, any risk of injury or disturbance is expected to be unlikely. In conclusion, the impacts of underwater noise emissions from decommissioning activities on marine mammals is assessed as **acceptable.**

5.4.3 Fish

The ability of fish to hear noise is dependent on their hearing structures, which indicate their sensitivity to sound. Only fish species that possess a swim bladder can detect sound pressure. Many fish species with the ability to detect sound and vibration are highly sensitive to local changes, high sensitivity

hearing species include clupeids (e.g. herring, sprat). However, while impacts from vessels to fish including other sound sources have been identified, including avoidance behaviour (De Robertis & Handegard 2013), there is no evidence of mortality to fish from vessel noise.

Clupeids are expected to show strong avoidance behaviour within 8m of sound changes from works and significant avoidance is expected (85% of individuals will react to noise) within 66m of works (Nedwell *et al*. 2012). However, shipping density within the area has been described as 'Moderate' (See Section 3.4.8.1) such that it could be expected that existing background noise levels from shipping within the Wingate NUI will mask the disturbance effect to fish within the area of works. Additionally, due to the temporary nature of proposed works, it is likely that individuals will be able to return once works are complete. Therefore, no injury or notable behavioural changes to fish species are expected from underwater noise emissions from operations. As a result, the impacts of underwater noise emissions from decommissioning activities on fish is assessed as **acceptable**.

5.4.4 Seabirds

Birds can experience both direct and indirect effects from additional sound and vibrations. Direct effects can include disturbance to normal behaviour or physical damage. Considering that diving seabirds pursue their prey underwater, it is expected that they may be at most risk (Smith *et al.* 2023).

While there have been recorded behavioural changes over varying levels from noise disturbance, decommissioning activities at Wingate are not expected to be significant enough to cause permanent disturbance. Furthermore, vessel activity is not likely to cause noise disturbance greater than ambient levels considering the moderate shipping activities within the Wingate NUI. Therefore, considering the context of shipping activity within the region and the sound levels and periods to be emitted by decommissioning activities, significant disturbance to seabirds from noise emissions is not expected. As a result, the impacts of underwater noise emissions from decommissioning activities on seabirds is assessed as **acceptable**.

5.4.5 Mitigation

Considering the above, the extent of the potential noise emission impact from Wingate decommissioning activities are considered to be unlikely and therefore the impact is considered to be **acceptable**.

Mitigation measures can be used to reduce noise emission impact from decommissioning activities include:

- Advanced planning of decommissioning operations so that they don't overlap to reduce cumulative noise emission impacts;
- A further noise impact assessment will be submitted as part of relevant permits were required;
- Machinery and equipment will be well-maintained; and
- Number of vessels involved will be minimised where possible.

5.4.6 Conclusion

Although Wingate decommissioning activities will produce underwater noise emissions, the impact to marine organisms are expected to be minor. For example, as discussed above, any underwater noise emissions are expected to either be localised, over a short period, or not significantly above ambient levels.

The impact of underwater noise emissions from the Wingate decommissioning activities on marine organisms is assessed as **acceptable**.

5.5 Cumulative and Transboundary Impacts

5.5.1 Cumulative

In accordance with current guidelines (BEIS 2018), the assessment considers cumulative impacts resulting from decommissioning activities alongside other activities taking place in the area.

5.5.1.1 Other Marine Users

Considering the distance to other offshore activities in the locality of the Wingate Development, cumulative impacts may arise. Projects that could result in cumulative impacts with the Wingate Decommissioning include:

- R4 Project 4 Dogger Bank southeast RWE windfarm
- The Hornsea Project Round 3 windfarm
- Caister Pipeline Decommissioning Programme: CDP1b
- Caister-Murdoch III Decommissioning Programme CDP2
- Murdoch Decommissioning Programme: CDP3

RWE has secured lease agreements for the development of the Dogger Bank southeast windfarm. RWE are planning to submit the formal application for development consent in 2024. Considering this and the timeline of Wingate decommissioning activities, there is, therefore, the potential for cumulative impacts to arise. For example, vessel activity, especially during the development phase of windfarms could lead to cumulative impacts with vessel activities from decommissioning operations. However, considering that this windfarm is located 33km from the Wingate development, and that the Wingate NUI is located within a permanent 500m exclusion zone, cumulative impacts have been assessed as unlikely. In December 2023, Ørsted took the final investment decision on the Hornsea Three offshore wind farm. Although it is unknown when development will begin, this windfarm is expected to be completed around the end of 2027. Considering the schedule of the Wingate decommissioning activities, there is therefore, the potential for cumulative impacts to arise. However, considering that this windfarm is located 35km from the Wingate development, cumulative impacts have been assessed as unlikely.

The Murdoch asset, the platform of which is located 20km west of the Wingate platform, is currently in the process of being decommissioned. The decommissioning programmes associated with this platform are listed above. The scheduled programmes, state that decommissioning activities could start within 2024 and carry on up until 2029+. Therefore, there is potential for decommissioning operations at the Murdoch asset to overlap with those at the Wingate asset. However, it is considered unlikely that the major decommissioning events will take place at the same time. Furthermore, as the NUI is within a permanent 500m safety exclusion zone, established when the platform was installed, and all operations during decommissioning will be carried out within this zone, there is no increased risk to navigation. Furthermore, both decommissioning projects will only include localised activities, limiting the potential for cumulative impacts to arise.

Considering the above, cumulative impacts from the decommissioning activities and other marine users has been assessed as **acceptable.**

5.5.2 Dogger Bank SAC

The Wingate NUI and associated pipelines are within the Dogger Bank SAC, the conservation objectives of which are potentially vulnerable to any activity causing seabed disturbance. While the footprint of the Wingate NUI decommissioning programme (or seabed activities while the platform was active) impacts a very small proportion of the SAC cumulative impacts arise from the total footprint of all activities within the Dogger Bank SAC.

Activities which either impact or have the potential to impact the conservation objectives of the Dogger Bank SAC are shown in Table 5-5.

The Dogger Bank SAC Oil and Gas Decommissioning Strategic Habitats Regulations Assessment (HRA) (BEIS 2019) concluded that the Decommissioning activities will not cause a likely significant effect on any qualifying features connected with the designated site either alone or in combination with other plans or projects and will therefore not have an adverse effect on the integrity of Dogger Bank SAC.

Table 5-5 Areas of Seabed Impacted by Activities in the Dogger Bank SAC

Activity	Total footprint (km²)	Duration
Fishing	Unknown but occurred over 8,701 km² of the SAC in 2016	Temporary
Renewables (cable laying)	55.3	
Future Infrastructure	1.18	
Aggregate extraction	Unknown	
Total	Up to 8,757 (Up to 71% of area)	
Renewables – Wind turbines and Infrastructure	3.0	Permanent
Renewables – Cable protection	15.0	
Existing oil and gas pipelines	0.77	
Existing rock dump for rig stabilisation	0.52	
Existing rock dump along pipelines	0.33	
Existing Mattresses	0.02	
Future Infrastructure	0.06	
Aggregate Extraction	Currently inactive	
Subsea cables	0.02	
Total	19.7 (0.16% of area)	

Source: BEIS (2019)

Table 5-6 Percentage Area Coverage of the Dogger Bank SAC of Activities with the Potential for Cumulative Effects

Project	Operator	Total Area Impact (km²)	Area Impact within SAC (km²)	% of total SAC area
R4 Project 4 Dogger Bank southeast RWE windfarm	RWE Renewables	494.7	494.7	4.0%
The Hornsea Project Round 3 Windfarm	Ørsted	696	0	0%
Murdoch Decommissioning Programme (CDP1b, CDP2, CDP3)	Chrysaor Production (U.K.) Limited	0.093	0.07	0.006%
Wingate Decommissioning Programme	WINZ	0.004632	0.004632	0.00004%

Table 5-6 includes the percentage area coverage of the activities located within the Dogger Bank SAC that could result in cumulative impacts. Considering the small area of impact from all activities (Table

5-6), along with the distances from the Wingate decommissioning activities, it is unlikely that cumulative impacts will result in significant impact to marine environments.

Furthermore, considering the small footprint of impact from decommissioning activities, the cumulative impacts from Wingate decommissioning to the Dogger Bank SAC have been assessed as **acceptable.**

5.5.3 Transboundary

While the pipelines associated with the Wingate NUI (PL2851 and PL2852) cross the UK/Netherlands median line, activities, with the exception of pre-decommissioning surveys which will cover both sectors, will be restricted to the immediate vicinity of the Wingate NUI. The surveys will be non-intrusive and are expected to be carried out as a single operation.

5.6 Assessment of Marine Plan Objectives

As part of this assessment, Wintershall has considered the broader aims of the marine plan objectives detailed below.

5.6.1 Objective 6: Healthy Ecosystems

This objective aims to maintain a healthy, resilient and adaptable marine ecosystem within the East marine plan. The objective includes the requirement to prevent activities in the marine area from impacting the function of the marine ecosystem to protect the benefits it provides. It also accounts for the need to protect against cumulative impacts from multiple activities occurring in a particular space. Wintershall will ensure to reduce the impact of decommissioning activities to the health of ecosystems as far as practicably possible.

Policy ECO1

Within decision-making and plan implementation, this policy considers that cumulative impacts affecting the ecosystem of the East marine plan and adjacent areas (marine, terrestrial) should be addressed. Potential cumulative impacts have been assessed above in Section 5.5.1 and 5.5.2 and it was concluded cumulative impacts from the decommissioning activities and other marine users is assessed as **acceptable,** including when assessing cumulative impacts on the Dogger Bank SAC.

Policy ECO2

This policy states that the secondary effect risk of release of hazardous substances as a result of increased collision risk should be considered in proposals that require an authorisation. This has been considered in Section 4.2.

5.6.2 Objective 7: Biodiversity

The aim of this objective is to protect, conserve, and, where appropriate, restore biodiversity that is in or dependent upon the East MPAs. This objective considers the intrinsic value of biodiversity and the role it has in healthy, functioning ecosystems, provision of ecosystem services, support of sustainable development, and the enhancement of quality of life.

Policy BIO 1

This policy states that appropriate weight should be attached to biodiversity, highlighting the need to protect biodiversity as a whole, considering the best available evidence, specifically on habitats and species that are protected or of conservation concern in the East MPAs and adjacent areas (marine, terrestrial). Existing biodiversity has been described in Section 3.4. Wintershall will ensure that any potential impacts to biodiversity will be kept to a minimum, the assessment in the EA provides evidence of this commitment.

5.6.3 Objective 8: Designated Conservation Sites

This objective aims to support the objectives of MPAs (and other designated sites around the coast that overlap or are adjacent to the East MPAs), individually and as part of an ecologically coherent network. Conservation sites in proximity to the Wingate field are included in Section 3.4.6. Wintershall will strive to minimise impacts to conservation sites from decommissioning activities as much as practicable, in line with the following policy.

Policy MPA 1

This policy outlines that any impacts on the overall MPA network are required to be taken account of in strategic level measures and assessments, with consideration given to any current agreed advice on an ecologically coherent network. No impacts are predicted on the Dogger Bank SAC or MPA network.

5.6.4 Objective 9: Climate Change

This objective is central to facilitating action on climate change adaptation and mitigation in the East marine plan areas. Wintershall will minimise the output and resource use of atmospheric emissions associated with decommissioning activities as much as practicable in accordance with the following policies.

Policy CC2

This policy states that proposals for development should minimise emissions of greenhouse gases as far as appropriate. In addition to this, following minimising steps, mitigation measures are also encouraged. Consideration should also be given to emissions from other activities or users affected by the proposal. The impacts of atmospheric emissions is assessed in Section 5.1, where it is concluded that while there will be GHG emissions these will be low in quantity and only be emitted during operations and will not be detectable against the background.

5.6.5 Objective 10: Governance

This objective is in place to ensure integration with other plans, and in the regulation and management of key activities and issues, in the East MPs, and adjacent areas. Wintershall has considered this integration, with the inclusion of policies OG1, FISH1, and FISH2 detailed below. After inspection, these decommissioning activities are compatible with others occurring in the area. Additionally, Wintershall have mitigation measures in place to ensure that impacts to fishing activities are reduced as far as possible. Fish spawning and nursing in the area are considered in the assessment, where impacts from these decommissioning are concluded as not significant.

Policy OG1

This policy underlines that proposals within existing oil and gas production areas, should not be authorised except when compatibility with these activities can be demonstrated.

Policy FISH1

This policy outlines that within areas of fishing activity, proposals should demonstrate that there will be no impact to fishing activities on, or access to fishing grounds. If there are adverse impacts on the ability to undertake fishing activities, these must be minimised where possible. If impacts cannot be minimised, they will be mitigated. This is assessed in Section 5.2.5 and is concluded as **acceptable.** Snagging risk from leaving the pipeline in situ is minimal as trenched and buried, decommissioned, pipelines are not expected to represent a hazard to the environment and other users of the sea.

Policy FISH2

This policy states that proposals should demonstrate that activates will not have an adverse impact upon spawning and nursery areas, including any associated habitat. If there are adverse impacts,

these will be minimised, and if they cannot be minimised, they will be mitigated. This is assessed in Section 5.3.5 and 5.4.3 and is concluded as **acceptable** from both seabed disturbance and underwater noise emission perspectives.

6. MANAGEMENT AND MITIGATION

This section sets out proposed management and mitigation measures for the main environmental impacts associated with decommissioning operations.

6.1 Atmospheric Emissions and Energy Use

Emissions emitted from vessels will be minimised wherever possible. The following relevant industry best practices to limit atmospheric emissions will be implemented:

- Advanced planning of operations to reduce time required for vessels and ensure efficient operations;
- Emissions controlled to MARPOL Annex VI standards via use of cleaner low emission fuels;
- Limiting vessel speed to minimise fuel consumption;
- Generators will be running on the minimum power required to avoid unnecessary emissions; and
- Regular monitoring of fuel consumption.

While contractors are yet to be selected during the selection process, only contractors will be selected that satisfy modern and fuel efficiency standards. Vessels selected will comply with the Merchant Shipping (Prevention of Air Pollution from Ships) Regulations 2008.

6.2 Disturbance to Nesting Seabirds

The following management and mitigation will be implemented:

- Wintershall have developed a Bird Management Plan for the Wingate Platform. This will be a live document and supported by seabird surveys once a year in August/September to monitor for presence of nesting seabirds. This will continue after CoP to ensure that any presence of birds is identified prior to removal of the topsides.
- An awareness of the birds using the platform will allow Wintershall the opportunity to implement a deterrence strategy, and/or apply for a licence to disturb if operations will lead to disturbance of nests that cannot be mitigated against.
- The survey data can be used to inform the planning and scheduling of works in order to avoid the risk of an offence and/or to determine whether a disturbance licence needs to be sought. If possible, topside removal activities will be planned outside of the bird breeding season (i.e. outside of May-July).
- Wintershall will liaise with DESNZ and JNCC to confirm expectations and licensing requirements based on the nest status and scheduling, as appropriate.

6.3 Marine Discharges

The following management and mitigation will be implemented:

- Any chemicals identified to be high risk will be substituted for a more environmentally friendly alternative wherever practicable;
- All vessels/rigs involved in decommissioning activities will be equipped with suitable containment, treatment and monitoring systems;
- Each vessel/rig will have a Garbage Management Plan in place;
- All the drains from the rig floor will be directed to a containment tank and the fluids processed/filtered to remove hydrocarbons; and

- Wintershall will ensure that the contractor knows how to react to spills, that the necessary spill kits are available onboard and personnel are trained in their use.

6.4 Physical Presence of Infrastructure Decommissioned in Situ

The impacts of the physical presence of infrastructure decommissioned *in situ* will be minimised wherever possible and mitigation will include:

- Vessel movements and the HLV, and any other, anchors will be notified to fishermen and others through the normal routes, including publication in Notice to Mariners and in Kingfisher bulletins detailing positionings, activities and timings. In addition, there will be full navigation lighting on the HLV and associated vessels. All vessels used in the decommissioning activities will meet applicable national and international standards, for example in terms of signals and lighting.
- A post decommissioning survey will be carried out and although not expected, if large seabed depressions or mounds from the decommissioning activities are evident which could potentially be a hazard to fishing gear, these will be notified through the Kingfisher notices system. Inspection surveys will be undertaken after decommissioning to provide a general inspection on the in situ pipelines. An agreed monitoring programme with the regulator will be established to identify future exposure of the pipeline decommissioned in situ, although this is not expected. An over-trawlability verification exercise will likely be carried out post decommissioning to ensure that the in situ pipeline is over-trawlable and does not present a snagging hazard.
- The position of the pipeline remaining *in situ* will be charted through normal routes.

No specific additional mitigation is considered necessary beyond application of established operational controls.

6.5 Physical Presence of Vessels

The following management and mitigation will be implemented:

- Stakeholder engagement will continue prior to commencement of the decommissioning operations.
- Users of the sea will be notified of the presence and intended movements of vessels, the presence of any exclusion zones and the presence of new structures via the Kingfisher Fortnightly Bulletins, Notices to Mariners and very high frequency radio broadcasts.
- Appropriate navigation aids will be used in accordance with the Consent to Locate conditions to ensure users of the sea are made aware of the presence of vessels undergoing decommissioning activities.
- Automatic Identification System will be used to track all decommissioning vessel activities in accordance with national and international regulations.

6.6 Resource Use

No specific additional mitigation was considered necessary beyond application of established operational controls:

- Adherence to the Waste Hierarchy.
- Vessel management (i.e. control of fuel usage).

6.7 Seabed Disturbance

Impacts of seabed disturbance will be minimised wherever possible and mitigation will include:

- Work will be undertaken in an environmentally sound manner with interfaces detailing responsibilities development, including environmental responsibilities, and regular HS&E meetings, as required.
- Rock protection quantity will be minimised and placed as accurately as possible from the vessel.
- Project planning includes minimising, as far as practicable, vessel movements, including the use and movement of anchored vessels; the HLV will predominantly be located within the Wingate NUI (however, if HLV uses anchors, the footprint will be outside of the 500m zone) existing footprint. It also includes assessing the nature and scale of seabed disturbance post decommissioning.
- Subsea infrastructure and stabilisation material removal methods will be assessed prior to decommissioning operations beginning, with a view to implement the removal method with the least impact to the seabed.
- To avoid the impact of anchors, vessels involved will use DP, where possible. In addition, the HLV will be positioned in a single location, if possible, during decommissioning to reduce the number of instances that anchors and anchor chains will be deployed on the seabed.

No specific additional mitigation was considered necessary beyond application of established operational controls.

6.8 Underwater Noise Emissions

Mitigation measures can be used to reduce noise emission impact from decommissioning activities include:

- Advanced planning of decommissioning operations so that they don't overlap to reduce cumulative noise emission impacts;
- A further noise impact assessment will be submitted to OPRED, which will include noise impact assessments as part of relevant permits where required;
- Machinery and equipment will be well maintained; and
- Number of vessels involved will be minimised where possible.

6.9 Unplanned Events

Wintershall will ensure that the contractor knows how to react to spills, that the necessary spill kits are available onboard and personnel are trained in their use.

The Oil Pollution Emergency Plan (OPEP) will be updated to cover the decommissioning operations at Wingate.

To reduce the likelihood of collision during installation operations all vessels will follow the International Maritime Organisation (IMO) Standards and will be properly marked, and sound warnings will be broadcasted in poor visibility while undertaking the operation. Users of the sea will be notified of the presence and intended movements of vessels, the presence of any exclusion zones and the presence of new structures via the Kingfisher Fortnightly Bulletins, Notices to Mariners and very high frequency radio broadcasts.

6.10 Waste

The following management measures will be implemented:

- Wintershall will ensure that an efficient waste management plan is in place prior to commencement of decommissioning activities, including with respect to NORM.

- Wintershall will ensure all waste contractors are audited and meet the required legal requirements.
- Wintershall will seek to minimise the amount of recovered materials sent to landfill.

7. EA CONCLUSIONS

This report presents an environmental appraisal of the potential environmental impacts of the Wingate field decommissioning programme.

Infrastructure to be removed comprises the Wintershall NUI platform, the sections of the piggybacked PL2851 (12" gas export) and PL2852 (2" chemical supply) pipelines which are on the seabed surface immediately adjacent to the platform (~100m) and associated protective material (mattresses and grout bags). The remainder of the pipelines are trenched and buried to a minimum of 0.7m and will remain in situ, as has been concluded by comparative assessment.

The Wingate NUI is within UKCS Blocks 44/24 in the SNS, within the area covered by the Eastern Offshore Marine Plan, and it has been concluded that this operation is in line with its principles.

The Wingate development lies within the Dogger Bank SAC and is close to the Southern North Sea SAC (5km distant). NG-7 Markhams Triangle also lies with 40km of Wingate. It is also close to the Dogger bank SCI (11km distant) and Klaverbank SCI (14km distant) both in the Netherlands sector. The impact assessment concluded that none of the conservation objectives of these protected areas will be adversely affected by the decommissioning programme.

Background environmental information has been provided, and the risks posed by the decommissioning activities have been assessed, with the conclusion that potential environmental impacts are generally acceptable; however, it has been identified that the emissions associated with burning hydrocarbon fuels will contribute to the UK greenhouse gas emissions.

Table 7-1 presents the conclusions for the environmental appraisal.

Table 7-1 Environmental Appraisal Summary

Aspect/Impact	Environmental Receptor											
	Climate	Water quality	Seabed sediments	Plankton	Benthic communities	Fish	Seabirds	Marine mammals	Protected sites	Shipping	Commercial fishing	Other marine users
Atmospheric emissions		-	-	-	-	-	-	-	-	-	-	-
Physical presence of infrastructure decommissioned in situ	-	-		-		-	-	-		-		-
Seabed disturbance	-			-			-			-	-	-
Underwater noise emissions	-	-	-	-	-					-	-	-

Key:

	Acceptable: Impacts are accepted without further reduction other than the routine management process of continual improvement.
	Tolerable: Impacts which are accepted in a given context based on the current values of society. This generally means provided that the impacts are reduced to ALARP.
	Unacceptable: Impacts cannot be justified under the current criteria.

All activities associated with the decommissioning of the Wingate field will be carried out under the Wintershall Environmental Management System, last certified in June 2022.

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