CALEDONIA
Offshore Wind Farm

Code: UKCAL-CWF-CON-EIA-RPT-00007-7B54

Volume 7B Proposed Development (Offshore) Appendices

Appendix 11-1 Airspace Analysis and Radar Modelling

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OCEAN WINDS

Volume 7B Appendix 11-1 Airspace Analysis and Radar Modelling

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Acronyms and Abbreviations

AARA	Air to Air Refuelling Area
AD	Air Defence
AD&OW	Air Defence and Offshore Wind
AIP	Aeronautical Information Publication
AMA	Area Minimum Altitude
AMSL	Above Mean Sea Level
ATC	Air Traffic Control
ATS	Air Traffic Service
BEIS	Former Department for Business, Energy and Industrial Strategy
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CTA	Control Area
DA	Danger Area
DESNZ	Department for Energy Security and Net Zero
DOC	Designated Operational Coverage
DTM	Digital Terrain Model
EIA	Environmental Impact Assessment
FIR	Flight Information Region
FL	Flight Level
Ft	Feet
GIS	Geographic Information System
HMRI	Helicopter Main Routing Indicator

IAC	Instrument Approach Chart
IFP	Instrument Flight Procedure
IFR	Instrument Flight Rules
Km	kilometres
LARS	Lower Airspace Radar Service
M	Metres
MoD	Ministry of Defence
MRT	Multi Radar Tracking
MSA	Minimum Sector Altitude
NAIZ	Non-Auto Initiation Zone
NATS	National Air Traffic Services
nm	Nautical Mile
NSTA	North Sea Transition Authority
OECC	Offshore Export Cable Corridor
OWF	Offshore Wind Farm
OWIC	Offshore Wind Industry Council
PSR	Primary Surveillance Radar
RAF	Royal Air Force
RLoS	Radar Line of Sight
RRH	Remote Radar Head
SAR	Search and Rescue
SSR	Secondary Surveillance Radar
SUA	Special Use Airspace
TRA	Temporary Reserved Area

TMZ	Transponder Mandatory Zone
UK	United Kingdom
VFR	Visual Flight Rules
WFF	Wind Farm Filter
WTG	Wind Turbine Generator

1 Introduction

1.1 Overview

1.1.1.1 This Airspace Analysis and Radar Modelling Report provides detailed airspace analysis and radar modelling across the Proposed Development (Offshore) and outlines potential mitigation options.

1.1.1.2 The Proposed Development (Offshore) is comprised of the Caledonia Offshore Wind Farm (OWF) (i.e., array area) which is located within the outer Moray Firth in the North of Scotland, and the Caledonia Offshore Export Cable Corridor (OECC). Onshore transmission infrastructure will facilitate connection of the Proposed Development (Offshore) to the National Grid.

1.1.1.3 Due to the volume of national grid reinforcement works required to connect offshore wind projects and commercial drivers, Caledonia Offshore Wind Farm Limited (the Applicant) has adjusted the consent application approach since scoping with the expectation to deliver the Proposed Development (Offshore) in phases. To support with the deliverability of these phases, the Applicant is submitting two offshore consent applications (Section 36 and associated Marine Licences) for the Proposed Development (Offshore). Within the Proposed Development (Offshore) Array Area, there are therefore two consent application areas, referred to as the Caledonia North Site and the Caledonia South Site.

1.1.1.4 Wind Turbine Generators (WTGs) within the Caledonia North Site will be installed using bottom-fixed foundations while within the Caledonia South Site there is the possibility for floating WTGs as well as bottom-fixed.

1.1.1.5 This technical report is intended to inform and support the assessment of the Proposed Development (Offshore) as well as Caledonia North and Caledonia South separately, as presented in the following Environmental Impact Assessment Report (EIAR) Chapters:

- Volume 2, Chapter 11: Military and Civil Aviation;
- Volume 3, Chapter 11: Military and Civil Aviation; and
- Volume 4, Chapter 11: Military and Civil Aviation.

1.2 Effects of Wind Turbine Generators on Aviation

1.2.1.1 WTGs can be problematic for aviation Primary Surveillance Radars (PSRs) as the characteristics of a moving WTG blade are like an aircraft. The PSR is unable to differentiate between wanted aircraft targets and clutter targets introduced by the presence of WTGs.

1.2.1.2 Secondary Surveillance Radars (SSRs) are less affected by WTGs, but turbine towers can cause physical blanking and diffracting effects and reflections can result in the SSR outputting false targets.

1.2.1.3 Potential impacts include the NATS (formerly National Air Traffic Services) PSR facility at Perwinnes, the Ministry of Defence (MoD) Air Traffic Control (ATC) PSRs at Royal Air Force (RAF) Lossiemouth, and the MoD Air Defence (AD) PSR at Buchan. In this technical report all airfield ATC PSRs within operational range of the Caledonia OWF (up to 60 nautical miles (nm) away) and any NATS and MoD AD PSRs with potential Radar Line of Sight (RLoS) of WTGs are assessed for potential impacts.

1.2.1.4 The significance of any radar impacts depends on the airspace usage and the nature of the Air Traffic Service (ATS) provided in that airspace. The classification of the airspace in the vicinity of the Proposed Development (Offshore) and the uses of that airspace (civil and military) are set out in this technical report. WTGs can also have a direct impact on airspace due to their physical presence. The airspace analysis considers the impact WTGs could have as obstacles for aviation activities such as military low flying, Search and Rescue (SAR) operations and offshore oil and gas helicopter operations.

1.2.1.5 Radar impacts may be mitigated by either operational or technical solutions, or a combination of both. In either case, the efficacy and acceptability of any operational and/or technical mitigation options available can only be determined through consultation with the radar operators and ATS providers.

1.3 Technical Data

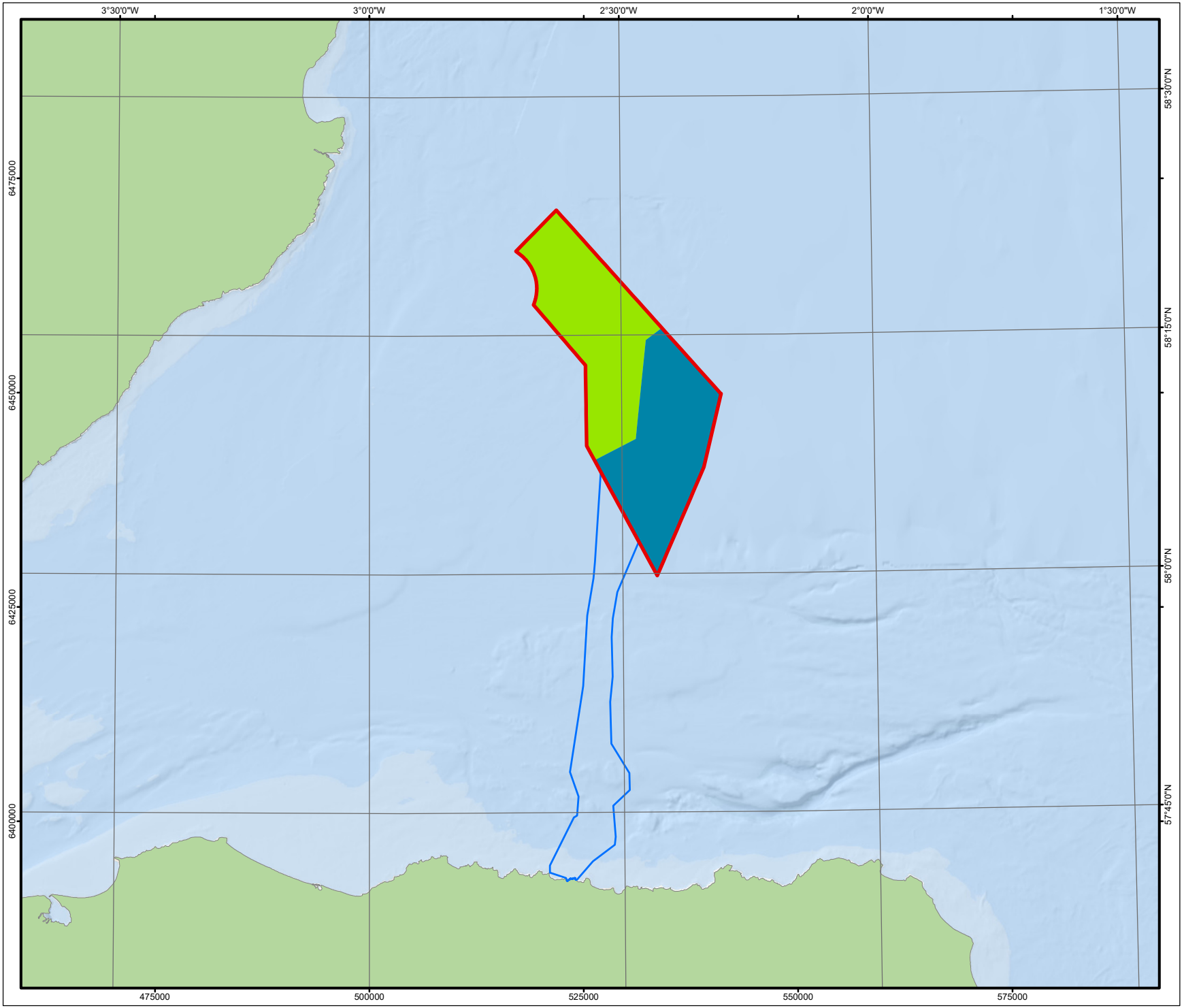
1.3.1 Radar Data

1.3.1.1 All radar parameters used in the assessment are extrapolated from specific industry knowledge of how specific radars operate and through review of various data sources held both public and held internally by Cyrrus. Radar data sources include:

- Allanshill PSR location and height (Ofcom, 2023[1]);
- Perwinnes PSR location and height (NATS, 2010[2]);
- Inverness PSR location and height (HIAL, 2018[3]);
- Lossiemouth Watchman PSR location and height (sourced from an MoD email dated 9th May 2008);
- Lossiemouth Star NG PSR location and height (Ofcom, 2023[1]); and
- Buchan AD PSR location and height (sourced from an MoD email dated 5th June 2018).

1.3.2 Proposed Development (Offshore)

1.3.2.1 The location of the Proposed Development (Offshore) is shown in Figure 1-1.



Caledonia OWF

Caledonia North Site

Caledonia South Site

Offshore Export Cable Corridor

Note: For the Caledonia North Site the Offshore Export Cable Corridor extends further to also include the Caledonia South Site.

0 5 10 15 20 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
01	09/09/2024	Approved	EV	BB	DH

CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00188
CONTRACTOR REV: 01

GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)

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Figure 1-1: The Proposed Development (Offshore)

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SCALE: 1:600,000
DRAWING NUMBER: N/A
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REV: N/A

1.3.3 Wind Turbine Generators

1.3.3.1 Up to 140 WTGs with a maximum blade tip height of between 297 metres (m) to 355m Above Mean Sea Level (AMSL) will be installed in Caledonia OWF. The WTG parameters for the Caledonia OWF are shown in Table 1-1.

1.3.3.2 Up to 77 WTGs with a maximum blade tip height of between 297m to 355m AMSL could be installed in the Caledonia North Site. The WTG parameters for the Caledonia North Site are shown in Table 1-1.

1.3.3.3 Up to 78 WTGs with a maximum tip height of between 297m to 355m AMSL could be installed in Caledonia South. The WTG parameters for Caledonia South are shown in Table 1-1.

1.3.3.4 If constructed first, the number of WTGs in Caledonia North will not exceed 77. If Caledonia South is constructed first, the number of WTGs in Caledonia South will not exceed 78. In both instances, the number of WTGs in the following phase will be such that the total number of WTGs across the Proposed Development (Offshore) will not exceed 140.

Table 1-1: WTG design parameters.

Parameter	Smallest WTG	Largest WTG
Caledonia OWF		
Maximum blade tip height	297m AMSL	355m AMSL
Rotor diameter	236m	310m
Approximate hub height	153m AMSL	190m AMSL
Maximum number of WTG	140 (Up to 39 floating foundations, remaining composition bottom-fixed up to a total of 140)	84 (Up to 29 floating foundations, remaining composition bottom-fixed up to a total of 84)*
Caledonia North Site		
Maximum blade tip height	297m AMSL	355m AMSL
Rotor diameter	236m	310m
Approximate hub height	153m AMSL	190m AMSL
Maximum number of WTG	77 (bottom-fixed only)	47 (bottom-fixed only)
Caledonia South Site		
Maximum blade tip height	297m AMSL	355m AMSL
Rotor diameter	236m	310m

Parameter	Smallest WTG	Largest WTG
Approximate hub height	153m AMSL	190m AMSL
Maximum number of WTG	78 (Up to 39 floating foundations, remaining composition bottom-fixed up to a total of 78)	47 (all bottom-fixed) or 53 (if bottom-fixed and floating -up to 29 floating foundations, remaining composition bottom-fixed up to a total of 53)
*Note these parameters do not influence the outcome of the Military and Civil Aviation EIA. The final worst-case scenario taken through to the EIAR is presented in Section 11.6 of Volumes 2, 3 and 4, Chapter 11: Military and Civil Aviation		

1.3.4 Terrain Data

1.3.4.1 The following terrain data was used to inform modelling:

- United Kingdom (UK) 25m Digital Terrain Model (DTM).

1.3.5 Analysis Tools

1.3.5.1 The following analysis tools were used to inform modelling:

- ATDI HTZ communications V2024.3 release 1500 radio planning tool; and
- Blue Marble Global Mapper V25.1 Geographic Information System (GIS).

1.3.6 Mapping Datum

1.3.6.1 UTM zone 30N (WGS84 datum) is used as a common working datum for all mapping and geodetic references.

1.3.6.2 Where necessary, mapping datum transformations are made using Global Mapper or Grid Inquest II Coordinate Transformation Program.

1.3.6.3 All heights stated in this document are AMSL (Newlyn datum) unless otherwise stated.

2 Airspace Analysis

2.1 Introduction

2.1.1.1 This assessment is a review of potential impacts on aviation arising from the presence of WTGs located in the Caledonia OWF. For the purposes of this assessment a maximum blade tip height of 1,165 feet (ft) AMSL for the WTGs has been assumed, the equivalent of 355m rounded up to the nearest 1ft.

2.1.1.2 All airspace data has been referenced from the UK Aeronautical Information Publication (AIP) available online from source and is therefore the latest information available (AIP, 2024[4]). Additional information regarding offshore infrastructure has been sourced from the North Sea Transition Authority (NSTA) Open Data website (NSTA, 2024[5]).

2.1.1.3 The purpose of this assessment is to identify areas of potential impact, and it does not draw any conclusions.

2.2 Scope

2.2.1.1 The scope of the assessment includes the Caledonia OWF and the surrounding airspace relating to aviation, its use and potential impact. The types of airspace and limitations on its use are identified.

2.3 Airspace Classification

2.3.1.1 In general, airspace can be characterised as either controlled or uncontrolled airspace. Aircraft in controlled airspace are being positively managed by ATC the entire time they are within that designated area (e.g. ATC are controlling the aircraft as opposed to providing advice / information on other traffic). This type of airspace is generally used by airlines and corporate aviation. Aircraft in uncontrolled airspace are operating within a framework of rules but are not being controlled by ATC, although many pilots flying in this environment may choose to report their position, altitude, and intentions to ATC to benefit from the enhanced situational awareness that brings. Users of this airspace tend to be small aircraft engaged in training or private (social) flying.

2.3.1.2 In addition, Special Use Airspace (SUA) is airspace designated for specific activities such that limitations on airspace access may be imposed on other non-participatory aircraft. An example of such airspace would be a Danger Area (DA) established for military flight training.

2.3.1.3 There are five classes of airspace in the UK, namely classes A, C, D, E and G. Classes A to E are types of controlled airspace, while class G is uncontrolled airspace. Class A is the most strictly regulated controlled airspace whereby aircraft are positively controlled by ATC, compliance with ATC clearance is mandatory, and aircraft are flown and navigated solely with reference to

aircraft instruments. Certain onboard equipment is also a prerequisite. Flight in class G airspace is generally visual, meaning pilots fly and navigate with reference to the natural horizon and terrain features they see outside. Pilots are required to maintain minimum distances from notified obstacles, including WTGs, and may only fly within the minimum weather and visibility criteria.

2.4 Aircraft Vertical Reference

2.4.1.1 An aircraft's vertical reference above the ground or sea can either be an altitude AMSL or, above a designated altitude, a Flight Level (FL). An aircraft's altitude, expressed in feet, is based on the last known verified local barometric pressure while a FL, expressed in 100ft increments, is based on a common international barometric pressure setting of 1013.2 hectopascals. With aircraft using a common vertical datum, safe separation can be achieved by either ATC or between pilots of different aircraft.

2.4.1.2 The airspace where vertical reference changes from altitude to FL and vice versa is known as the Transition Layer and consists of a (lower) Transition Altitude and (higher) Transition Level. In UK airspace the Transition Altitude is set at 3,000ft AMSL except in certain specified airspace where it is higher.

2.4.1.3 The vertical limits of airspace are defined in terms of either altitudes or FLs, with airspace commonly having a lower limit expressed as an altitude and an upper limit expressed as a FL.

2.5 Current Airspace Baseline

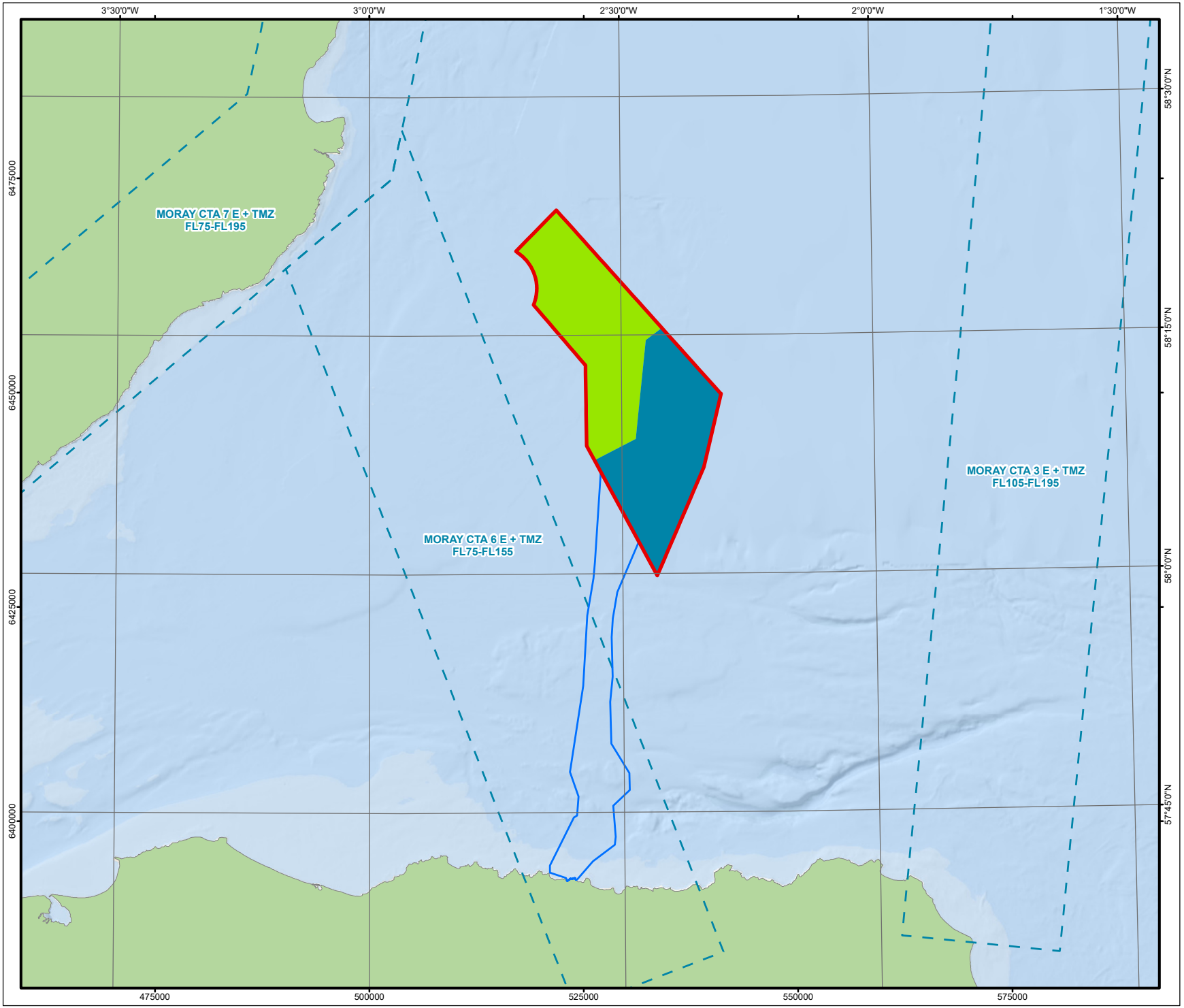
2.5.1.1 The Caledonia OWF lies within the Scottish Flight Information Region (FIR), which is airspace that is regulated by the UK Civil Aviation Authority (CAA). NATS provides enroute civil ATS within the Scottish FIR and operates a network of radar facilities which provide enroute information on airborne traffic for both civil and military ATC. Approximately 235 kilometres (km) to the north-east of the Caledonia OWF is the boundary between the Scottish FIR and the adjacent Polaris FIR, regulated by CAA Norway.

2.5.1.2 Immediately surrounding the Caledonia OWF is uncontrolled class G airspace, extending from sea level to FL195, approximately 19,500ft AMSL. This airspace is used by both civil and military aircraft, predominantly for low-level flight operations and generally by aircraft flying under Visual Flight Rules (VFR). Aircraft operate under one of two flight rules: VFR or Instrument Flight Rules (IFR). VFR flight is conducted with visual reference to the natural horizon while IFR flight requires reference solely to aircraft instrumentation. Under VFR flight the pilot is responsible for maintaining a safe distance from terrain, obstacles, and other aircraft.

2.5.1.3 Above FL195 is class C controlled airspace in the form of a Temporary Reserved Area (TRA). This airspace, specifically TRA 008B, has an upper vertical limit of FL245, approximately 24,500ft AMSL, and is available for use

by both military and civil aircraft, though its main use is to accommodate VFR military flying activity.

2.5.1.4 The Moray Control Area (Moray CTA) is the closest controlled airspace (class E) to the Caledonia OWF and comprises CTAs 1 to 17. CTA 6 lies approximately 6.5km to the west of the Caledonia OWF, as shown in Figure 2-1, and extends from a lower vertical limit of FL75, approximately 7,500ft AMSL, to an upper limit of FL155, approximately 15,500ft AMSL. This element of the Moray CTA facilitates air traffic transiting between Aberdeen and Wick.



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Moray Control Area (CTA)

0 5 10 15 20 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
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CALEDONIA Offshore Wind Farm

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CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00189_
CONTRACTOR REV: 01

GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)

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Figure 2-1: The Moray CTA

STATUS: Approved
SCALE: 1:600,000
DRAWING NUMBER: N/A
SHEET NO: 01 of 01
REV: N/A

2.6 Special Use Airspace

2.6.1.1 The Caledonia OWF and a portion of the Caledonia OECC lies within the Moray Firth (South) Danger Area (DA) EGD809S. When active the DA has vertical limits from the sea surface up to 55,000ft AMSL. Ordnance, munitions and explosives, unmanned aircraft system, and high energy manoeuvre activities take place within this DA and the MoD need to know of any new obstacles or vessels that could affect these operations.

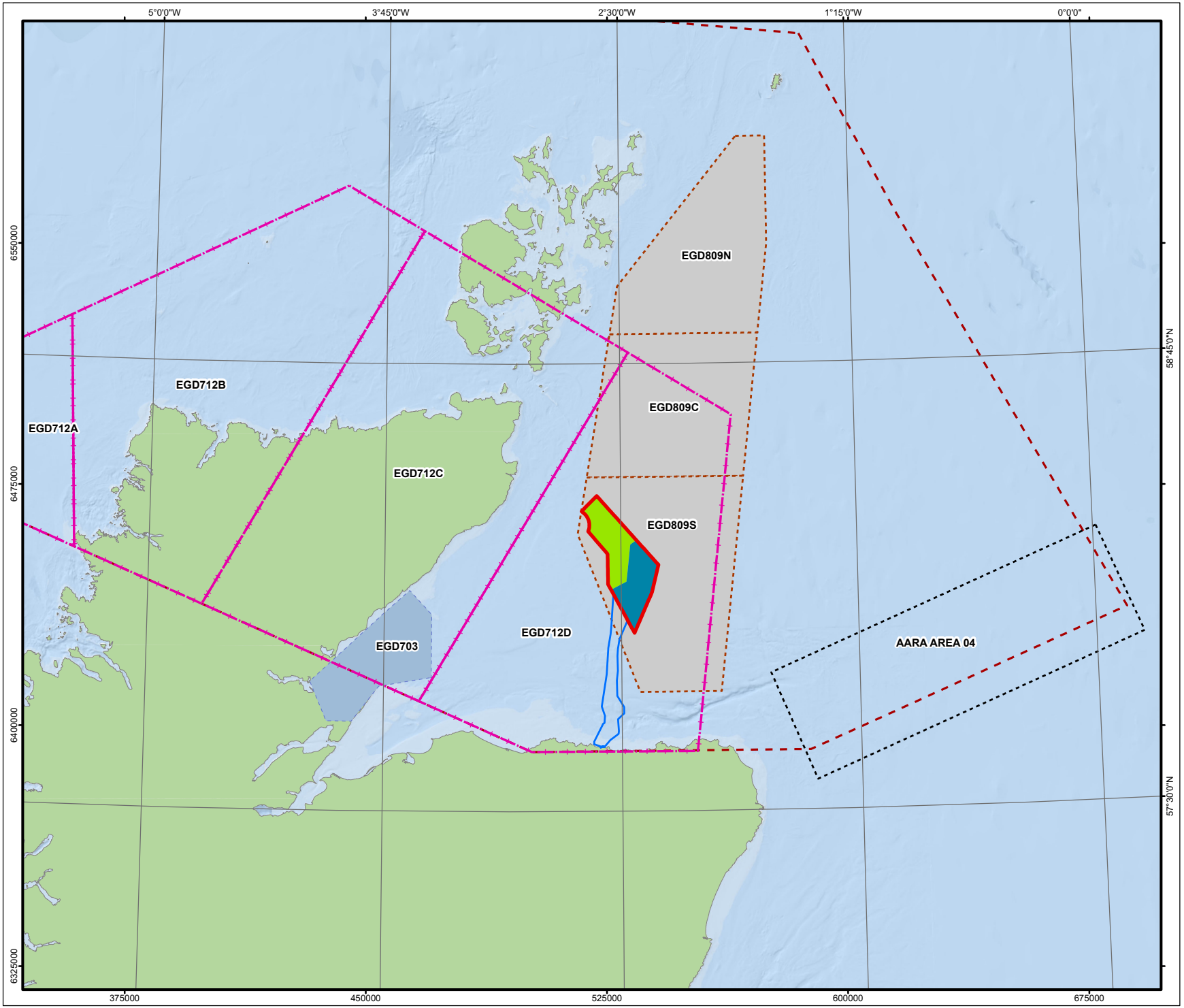
2.6.1.2 Approximately 55km south-west of the Caledonia OWF is the Tain DA, EGD703, which when active has vertical limits from the surface up to 15,000ft AMSL. Similar activities to those within Moray Firth (South) DA take place within Tain DA, with the addition of para dropping, electronic and optical hazard activities.

2.6.1.3 The Caledonia OWF also lies beneath the Northern Complex DA, one of four DA complexes in UK airspace that provide segregated airspace for military flying training involving high energy manoeuvres. Specifically, the Caledonia OWF is beneath DA EGD712D which, when activated, has vertical limits from FL245 to FL660 (approximately 66,000ft AMSL).

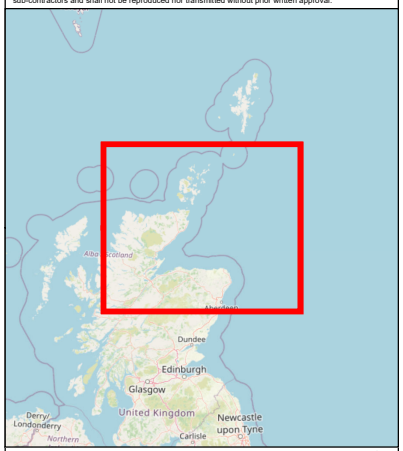
2.6.1.4 Also above the Caledonia OWF is a further DA, EGD901, known as Fast Jet Area North. This DA has vertical limits from FL245 to FL550 (approximately 55,000ft AMSL). This DA is solely in support of Exercise Joint Warrior, a biannual multinational conduct readiness military training exercise that takes place in the spring and autumn. High energy manoeuvres, ordnance, munitions and explosives activities take place within EGD901.

2.6.1.5 Approximately 44km south-east of the Caledonia OWF is Air to Air Refuelling Area (AARA) Area 04. AARA Area 04 is permanently available to military traffic and has vertical limits from FL70 (approximately 7,000ft AMSL) to FL240 (approximately 24,000ft AMSL). Within AARA airspace, fuel is transferred from tanker aircraft to receiver aircraft under a radar service provided by military controllers based at Swanwick.

2.6.1.6 The DAs and AARA in the vicinity of the Caledonia OWF are shown in Figure 2-2.



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Air To Air Refuelling Area (AARA) Area 04
Fast Jet Area North
Northern Complex
Moray Firth Danger Area
Tain Danger Area



0 20 40 60 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
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CALEDONIA Offshore Wind Farm

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DRAWING TITLE

Figure 2-2: Danger Areas and Air-to-Air Refuelling Area

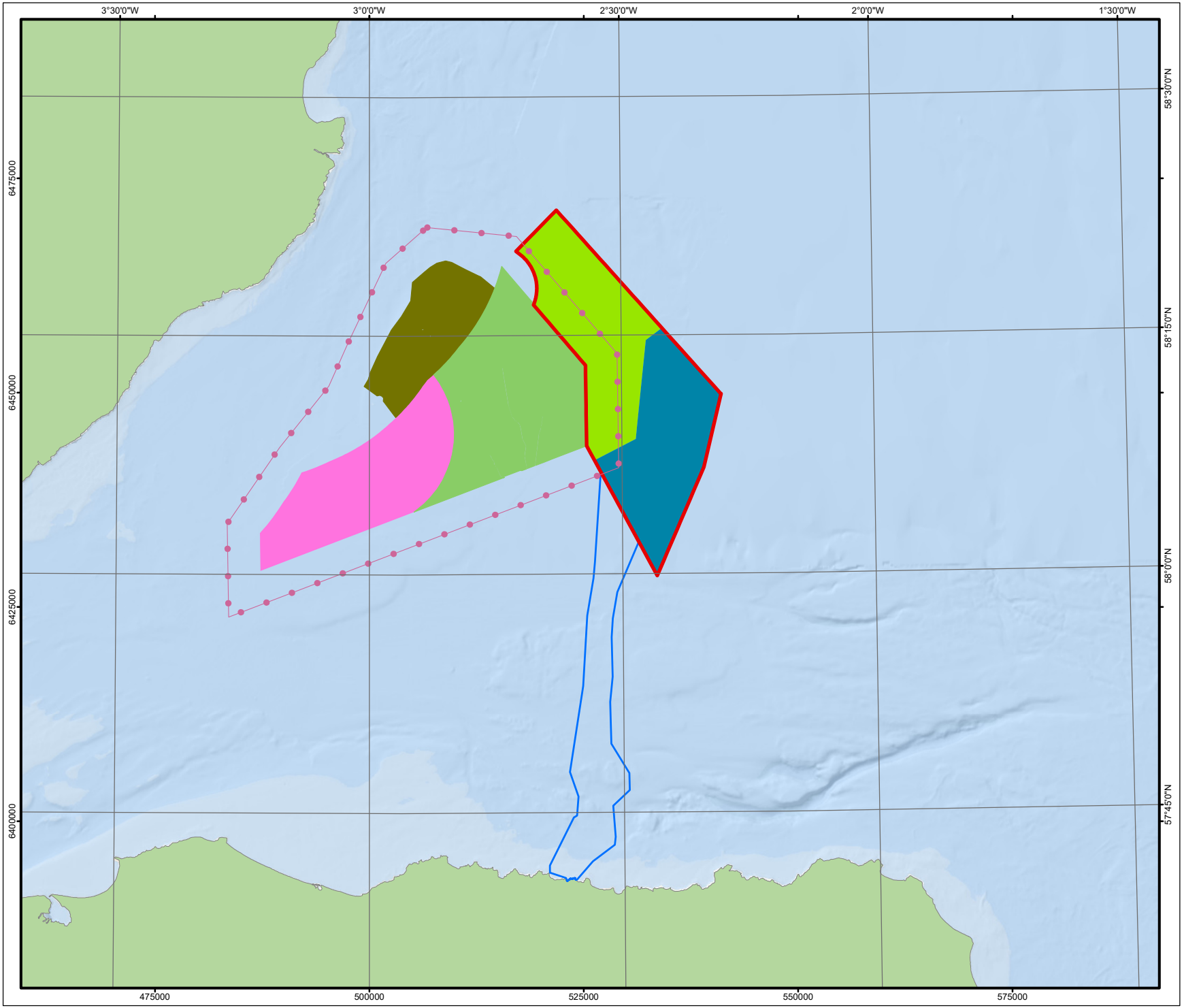
STATUS: Approved	SCALE: 1:1,600,000	
DRAWING NUMBER: N/A	SHEET NO: 01 of 01	REV: N/A

2.7 Transponder Mandatory Zones

2.7.1.1 The western extent of the Caledonia OWF lies partially within the Moray Firth Transponder Mandatory Zone (TMZ), as shown in Figure 2-3, which extends from the sea surface to an upper vertical limit of FL100 (approximately 10,000ft AMSL). Within a TMZ the carriage and operation of aircraft transponder equipment is mandatory. This enables such aircraft to be detected and tracked by SSR systems.

2.7.1.2 The Moray Firth TMZ encompasses the Beatrice, Moray West and Moray East OWFs and is used to mitigate the impact the associated WTGs have on PSR. The establishment of a TMZ over the Caledonia OWF is one of the potential mitigation measures to be considered during the design process.

2.7.1.3 The Moray CTA, described in Paragraph 2.5.1.4, is also a TMZ.



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Beatrice OWF
Moray East OWF
Moray West OWF
Moray Firth Transponder Mandatory Zone (TMZ)

0 5 10 15 20 km

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CALEDONIA Offshore Wind Farm

GoBe APEM Group

CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00191_
CONTRACTOR REV: 01

GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)

DRAWING TITLE

Figure 2-3: The Moray Firth TMZ

STATUS: Approved
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REV: N/A

2.8 Helicopter Main Routing Indicators

2.8.1.1 A network of low level offshore routes over the northern North Sea are flown by civilian helicopters in support of offshore oil and gas installations. The routes typically and routinely flown are published on charts as Helicopter Main Routing Indicators (HMRIs) to alert other airspace users to concentrations of frequent low-level helicopter traffic.

2.8.1.2 These routes have no lateral dimensions and assume the background airspace classification within which they lie (in this case class G). HMRIs over the northern North Sea generally extend vertically from 1,500ft AMSL to FL85 (approximately 8,500ft AMSL), although icing conditions or other flight safety considerations may require helicopters to operate below 1,500ft AMSL.

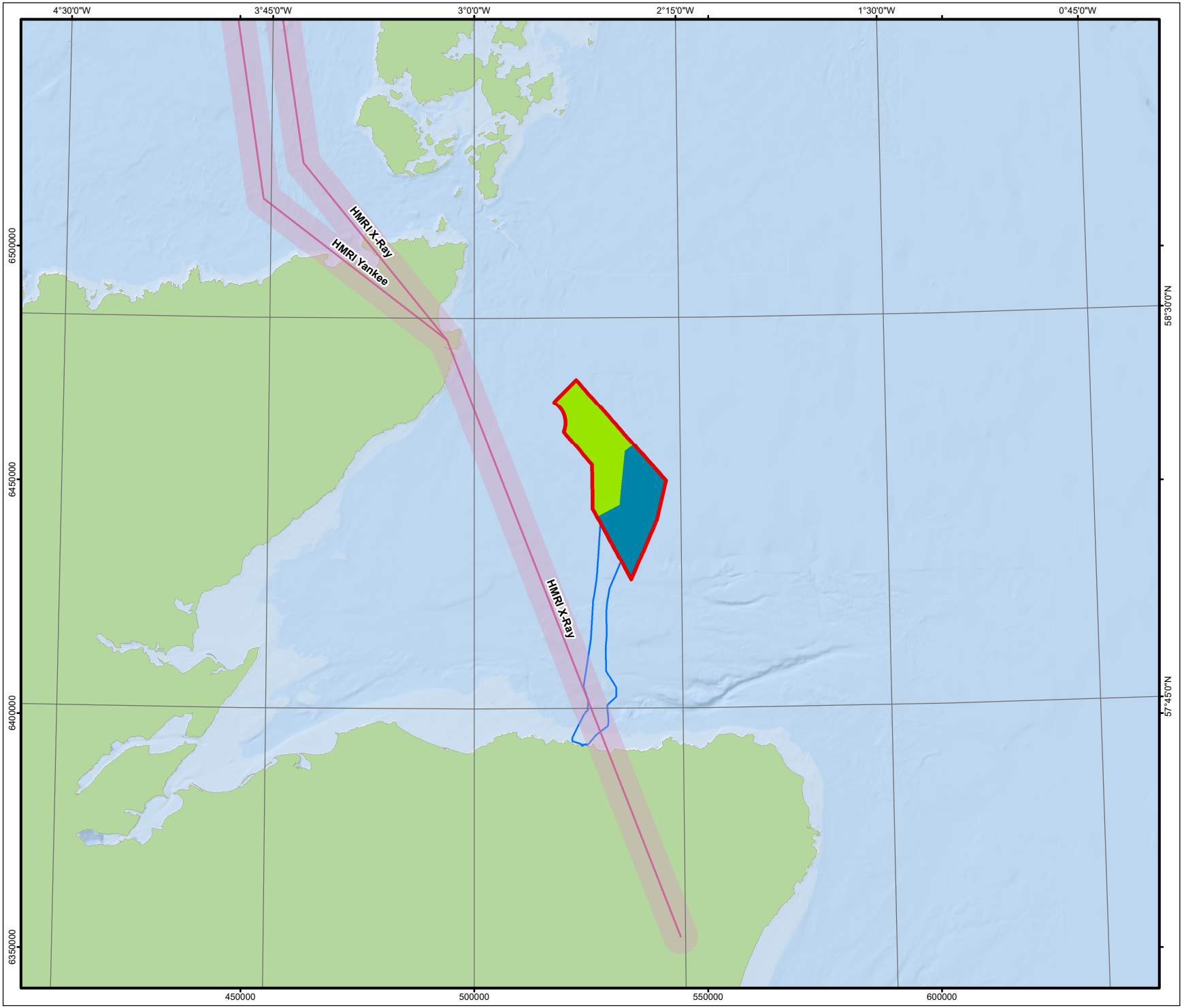
2.8.1.3 The CAA publication Civil Aviation Publication (CAP) 764 Policy and Guidelines on Wind Turbines (CAA, 2016[6]) advises that planned obstacles within 2nm of an HMRI route centreline should be consulted upon with helicopter operators and the Air Navigation Service Provider (Aberdeen Radar).

2.8.1.4 The closest HMRI to the Caledonia OWF is HMRI X-Ray which tracks between Aberdeen and the Atlantic Rim and passes the Caledonia OWF by 8.7nm (16.1km) to the west. This HMRI is depicted in Figure 2-4 with a 2nm buffer established around the HMRI centreline.

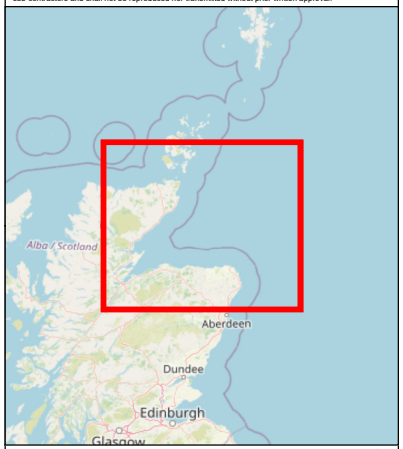
2.9 Offshore Helidecks

2.9.1.1 To help achieve a safe operating environment, a 9nm consultation zone for planned obstacles exists around offshore helicopter destinations. Within 9nm, obstacles such as WTGs can potentially impact upon the feasibility of helicopters to safely fly low visibility or missed approach procedures at the associated helideck site.

2.9.1.2 The closest helidecks to the Caledonia OWF are associated with the five platform structures within the Beatrice oil field, as depicted in Figure 2-5; however, at a minimum range of more than 13nm (25.4km) to the west, the platforms are beyond the 9nm consultation zone. The Beatrice oil field has now ceased production and plans are underway for the decommissioning of the platform complex. Decommissioning plans were approved by the UK government in 2019 (Repsol Sinopec, 2018[7])



- Caledonia OWF
- Caledonia North Site
- Caledonia South Site
- Offshore Export Cable Corridor
- Helicopter Main Routing Indicators (HMRIs)
- HMRI 2nm Consultation Buffer



0 10 20 30 40 km

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CALEDONIA Offshore Wind Farm

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GEODETIC PARAMETERS
WGS 84 / UTM zone 30N (EPSG: 32630)

DRAWING TITLE

Figure 2-4: Helicopter Main Routing Indicators

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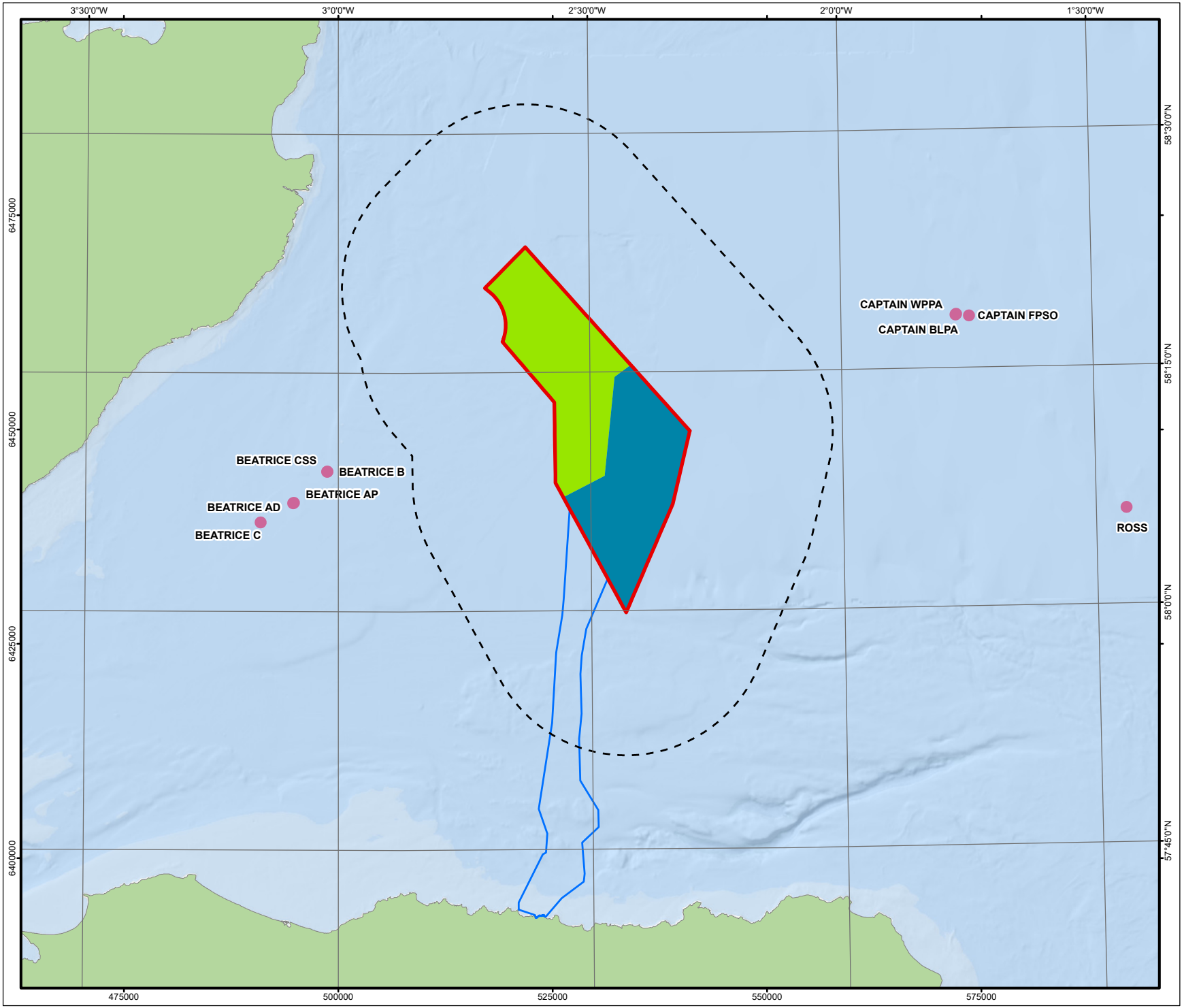

Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Caledonia OWF 9nm Buffer
Oil and Gas Platforms

0 5 10 15 20 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
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CALEDONIA Offshore Wind Farm

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CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00193
CONTRACTOR REV: 01

GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)

DRAWING TITLE

Figure 2-5: Oil and Gas Platforms in the Vicinity of the Caledonia OWF

STATUS: Approved
SCALE: 1:600,000
DRAWING NUMBER: N/A
SHEET NO: 01 of 01
REV: N/A

2.10 Search and Rescue

2.10.1.1 SAR operations are a highly specialised undertaking involving not only aviation assets, but also small boats, ships, and shore-based personnel. SAR operations are generally carried out in extremely challenging conditions and at all times of the day and night. There are ten helicopter SAR bases, incorporating 22 aircraft, around the UK with Bristow Helicopters currently providing helicopters and aircrew on behalf of the Maritime and Coastguard Agency.

2.10.1.2 The nearest SAR base is at Inverness Airport, approximately 110km south-west of the Caledonia OWF. Its helicopters provide rescue services for both offshore and land-based incidents up to approximately 460km from their base.

2.10.1.3 The random nature of people, watercraft or aircraft in distress makes it very difficult to determine the routes taken by SAR aircraft. Fixed wing SAR aircraft tend to stay at higher altitudes in a command-and-control role during major incidents, whilst helicopters tend to be used in a low-level role, sometimes in support of small rescue boats.

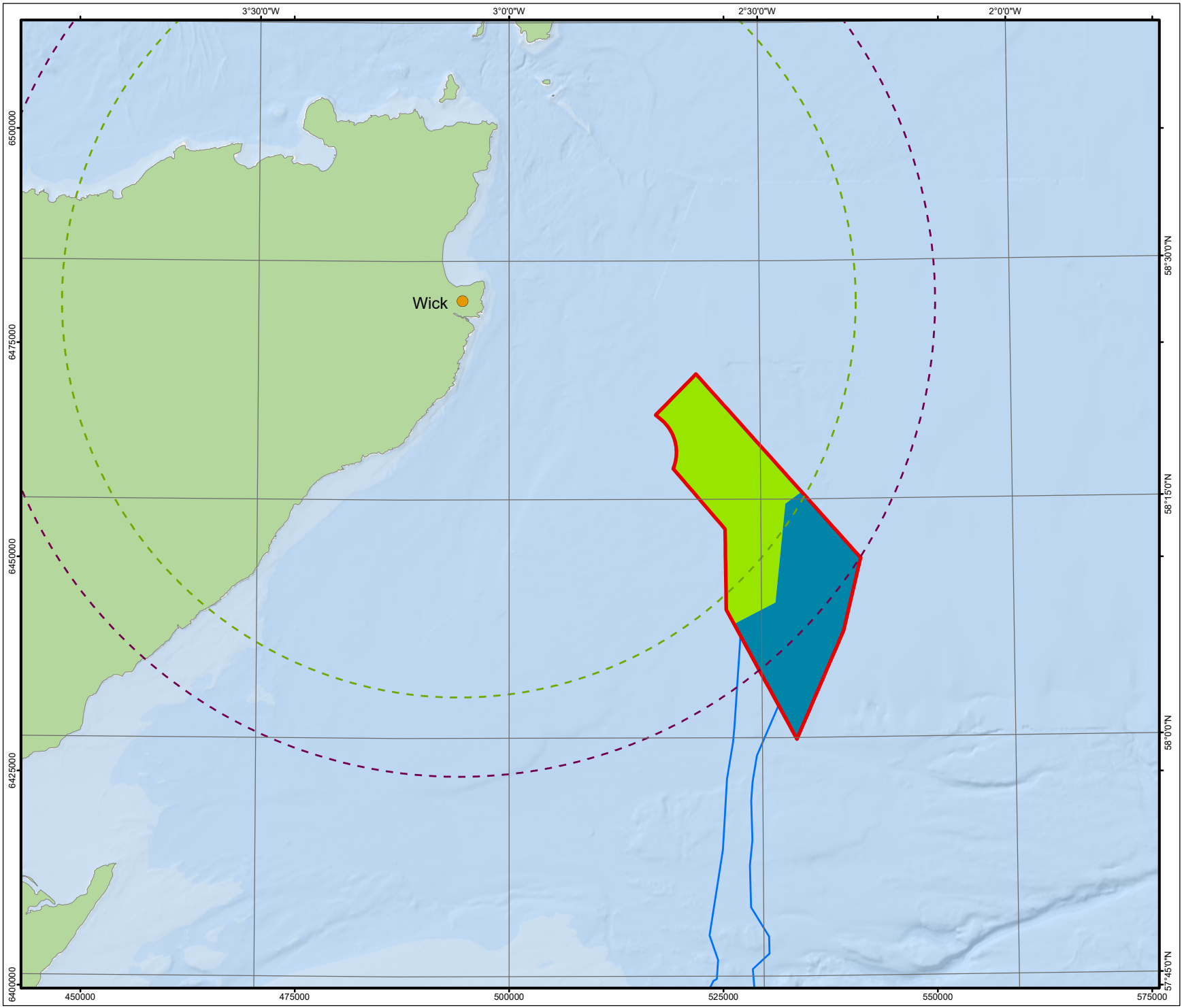
2.11 Obstacle Clearance

2.11.1.1 Airports with Instrument Flight Procedures (IFPs) published on Instrument Approach Charts (IACs) have associated Minimum Sector Altitudes (MSAs). An MSA defines the minimum safe altitude an aircraft can descend to within a sector of radius 25nm, approximately 46km. These sectors provide obstacle clearance protection of at least 300m (approximately 1,000ft) to aircraft within that area. This allows pilots of aircraft flying under IFR the reassurance of properly designated obstacle and terrain clearance protection whilst making an approach and landing at an airport in poor weather.

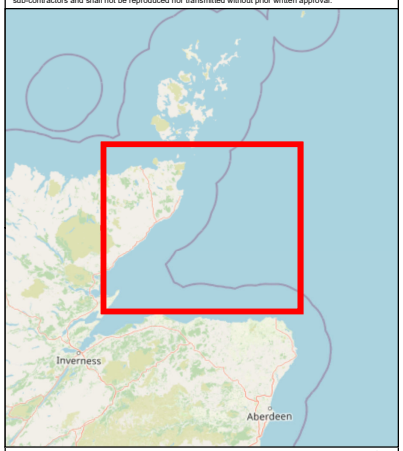
2.12 Wick Airport

2.12.1.1 Wick Airport is the nearest UK civil airport to the Caledonia OWF, 26km to the north-west. Wick Airport provides daily scheduled flights to Aberdeen Airport and is regularly used by helicopters operating offshore. The MSA 25nm radius associated with IFPs published for Wick Airport in the AIP extends over the Caledonia OWF, as shown in Figure 2-6, with a minimum safe altitude of 1,800ft AMSL.

2.12.1.2 Also shown in Figure 2-6 is a 5nm buffer which is applied when validating the MSA against the highest known obstacles. WTGs with a maximum tip height that exceeds 248.6m AMSL within the Caledonia North Site and most of the Caledonia South Site will require the published minimum safe altitude to be increased to maintain the necessary 300m obstacle clearance protection.



- Caledonia OWF
- Caledonia North Site
- Caledonia South Site
- Offshore Export Cable Corridor
- Wick Minimum Sector Altitude (MSA) 25nm Buffer
- Wick Minimum Sector Altitude (MSA) 5nm Buffer
- Civil Airports



0 5 10 15 20 km

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CALEDONIA Offshore Wind Farm

GoBe APEM Group

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GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)	

DRAWING TITLE

Figure 2-6: Wick Airport MSA 25nm Buffer

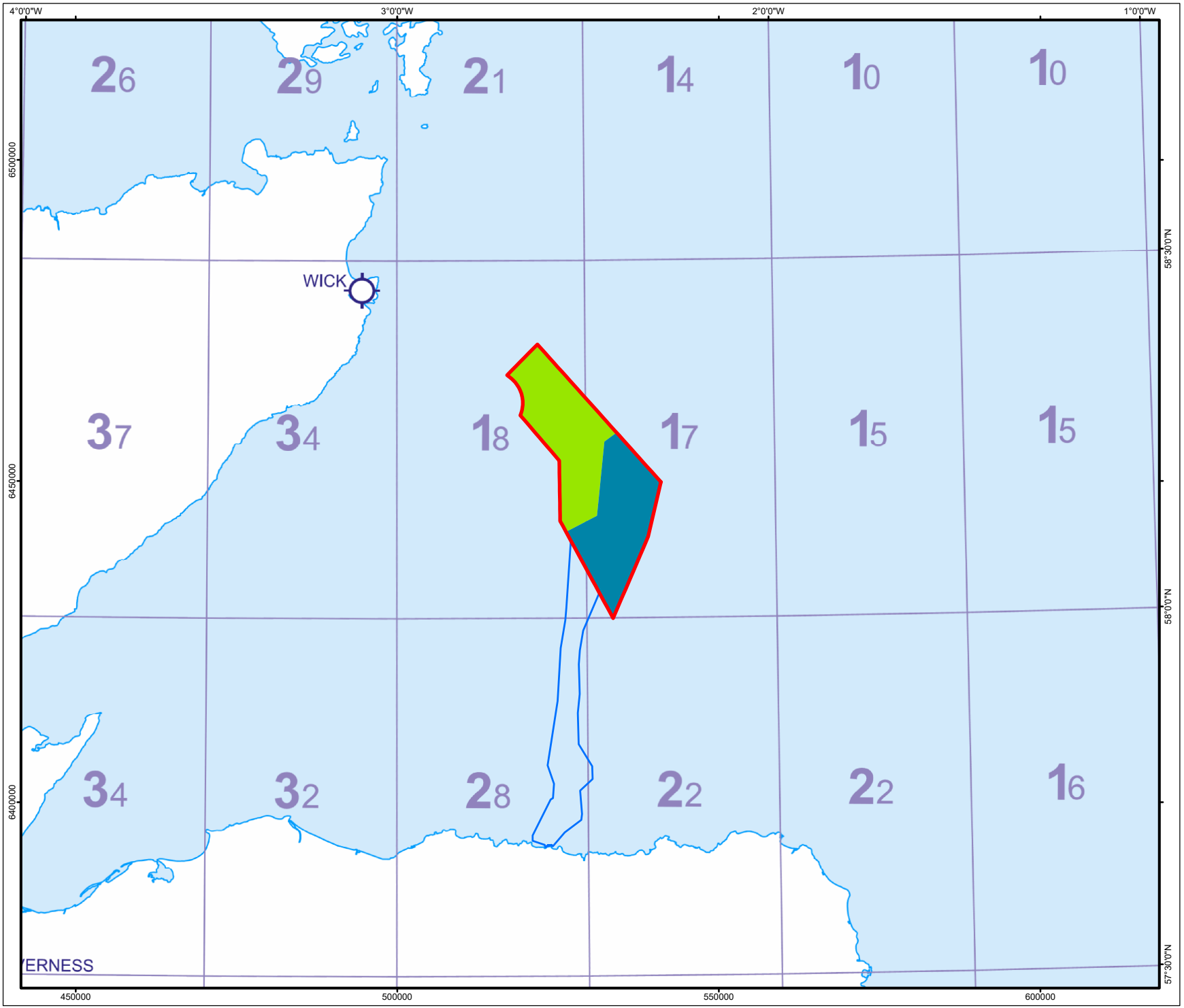
STATUS: Approved	SCALE: 1:600,000	
DRAWING NUMBER: N/A	SHEET NO: 01 of 01	REV: N/A

2.13 Area Minimum Altitudes

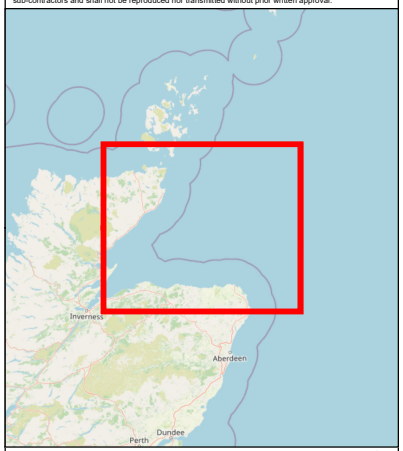
2.13.1.1 A chart of Area Minimum Altitudes (AMAs) across the London and Scottish FIRs is published in the AIP. An AMA provides a minimum obstacle clearance of 300m within a specified area in the same way as an MSA. The specified areas are formed by lines of latitude and longitude in half degree steps.

2.13.1.2 The Caledonia OWF is within two AMA areas of 1,700ft AMSL and 1,800ft AMSL, as shown in Figure 2-7. Note that the AMA altitudes are marked as two digits, the larger digit representing thousands of feet and the smaller one representing hundreds. For example, 1,800ft is shown as '18'.

2.13.1.3 WTGs with a maximum tip height exceeding 218.2m AMSL will require the 1,700ft AMA to be increased to maintain the necessary 300m obstacle clearance protection. WTGs with a maximum tip height exceeding 248.6m AMSL will require the 1,800ft AMA to be increased to maintain the necessary 300m obstacle clearance protection.



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor



0 10 20 30 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
01	09/09/2024	Approved	EV	BB	DH

CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00195_
CONTRACTOR REV: 01
GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)
DRAWING TITLE: Figure 2-7: AMAs Over the Caledonia OWF
STATUS: Approved
SCALE: 1:800,000
DRAWING NUMBER: N/A
SHEET NO: 01 of 01
REV: N/A

3 Radar Line of Sight Assessment

3.1 Methodology

3.1.1.1 RLoS is determined by use of a radar propagation model (ATDI HTZ communications) using 3D DTM data with 25m horizontal resolution (Figure 3-1). Radar data is entered into the model and RLoS to the WTGs from the radar is calculated. Note that by using a DTM, no account is taken of possible further shielding of the WTGs due to the presence of structures or vegetation that may lie between the radar and the WTGs. Thus, the RLoS assessment presents a worst-case result.

3.1.1.2 For PSR, the principal source of adverse wind farm effects are the WTG blades, so RLoS is calculated for the maximum blade tip heights of the WTGs, such as 297m and 355m AMSL.

3.2 Licensed Airfields With Surveillance Radar

3.2.1 Closest Civil Airfields

3.2.1.1 The closest radar equipped airfields to the Caledonia OWF are Aberdeen, 90km (48nm) to the south, and Inverness, 110km (59nm) to the south-west. CAP 764 (2016[6]) recommends consultation with any aerodromes with a surveillance radar facility that are within 30km of WTGs, however this distance can be greater depending on the type and coverage of the radar and the particular operation at the aerodrome.

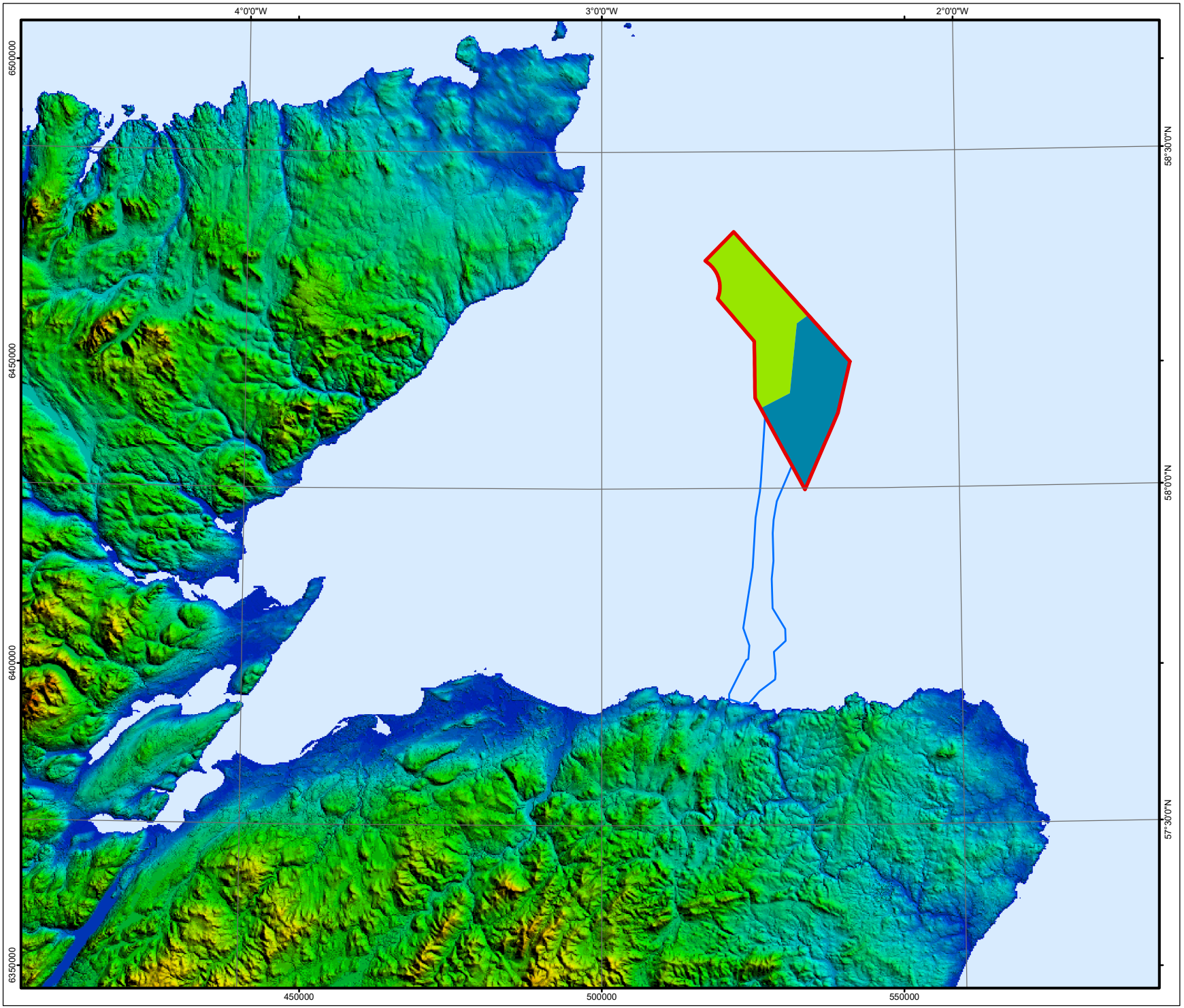
3.2.2 Inverness

3.2.2.1 Inverness Airport is equipped with a combined PSR/SSR facility. Inverness RLoS coverage for the maximum blade tip height of 355m AMSL is shown in Figure 3-2. At a maximum blade tip height of 355m AMSL, none of the Proposed Development (Offshore)'s WTGs are in RLoS of the Inverness Star 2000 PSR. It is highly unlikely that any WTGs within the Caledonia OWF will be detected by the Inverness PSR.

3.2.2.2 The Designated Operational Coverage (DOC) for Inverness's ATC radar service is 40nm and, at a minimum range of 59nm, it is considered unlikely that Inverness ATC will provide a radar control service for aircraft in the vicinity of the Caledonia OWF.

3.2.3 Aberdeen

3.2.3.1 Aberdeen Airport utilises the NATS radar facilities located at Perwinnes and Allanshill. NATS radars are assessed in the following section.



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor

0 10 20 30 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
01	09/09/2024	Approved	EV	BB	DH

CALEDONIA Offshore Wind Farm

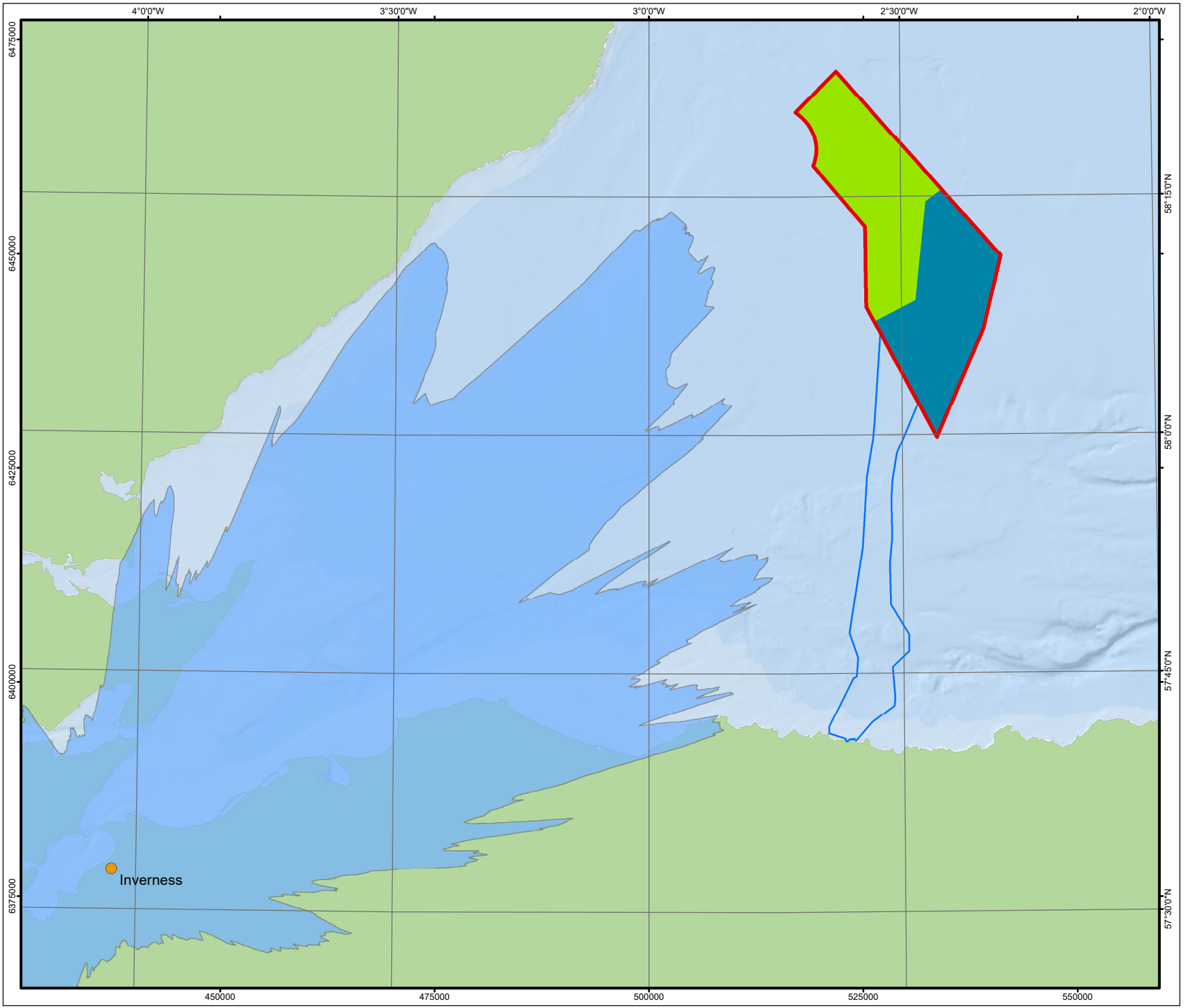
GoBe APEM Group

CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00196	CONTRACTOR REV: 01
GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)	

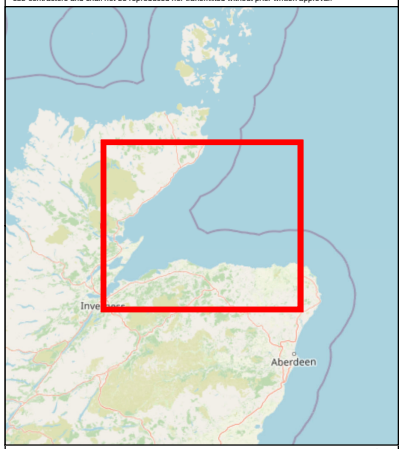
DRAWING TITLE

Figure 3-1: 25m Resolution DTM Used for RLoS Modelling

STATUS: Approved	SCALE: 1:850,000	
DRAWING NUMBER: N/A	SHEET NO: 01 of 01	REV: N/A



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Inverness RLoS 355m AMSL
Civil Airports



0 10 20 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
01	09/09/2024	Approved	EV	BB	DH

CALEDONIA Offshore Wind Farm

GoBe APEM Group

CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00197_
CONTRACTOR REV: 01

GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)

DRAWING TITLE

Figure 3-2: Inverness RLoS 355m AMSL

STATUS: Approved
SCALE: 1:600,000
DRAWING NUMBER: N/A
SHEET NO: 01 of 01
REV: N/A

3.3 NATS Radars

3.3.1 Closest NATS Radars

3.3.1.1 The closest NATS radars to the Caledonia OWF are at Allanshill, 43km (23nm) to the south, and Perwinnes, 89km (48nm) to the south. NATS radar facilities are combined PSR and SSR systems. NATS only consider the impact of WTGs on their SSR facilities when they are within 15nm, approximately 28km.

3.3.2 Allanshill

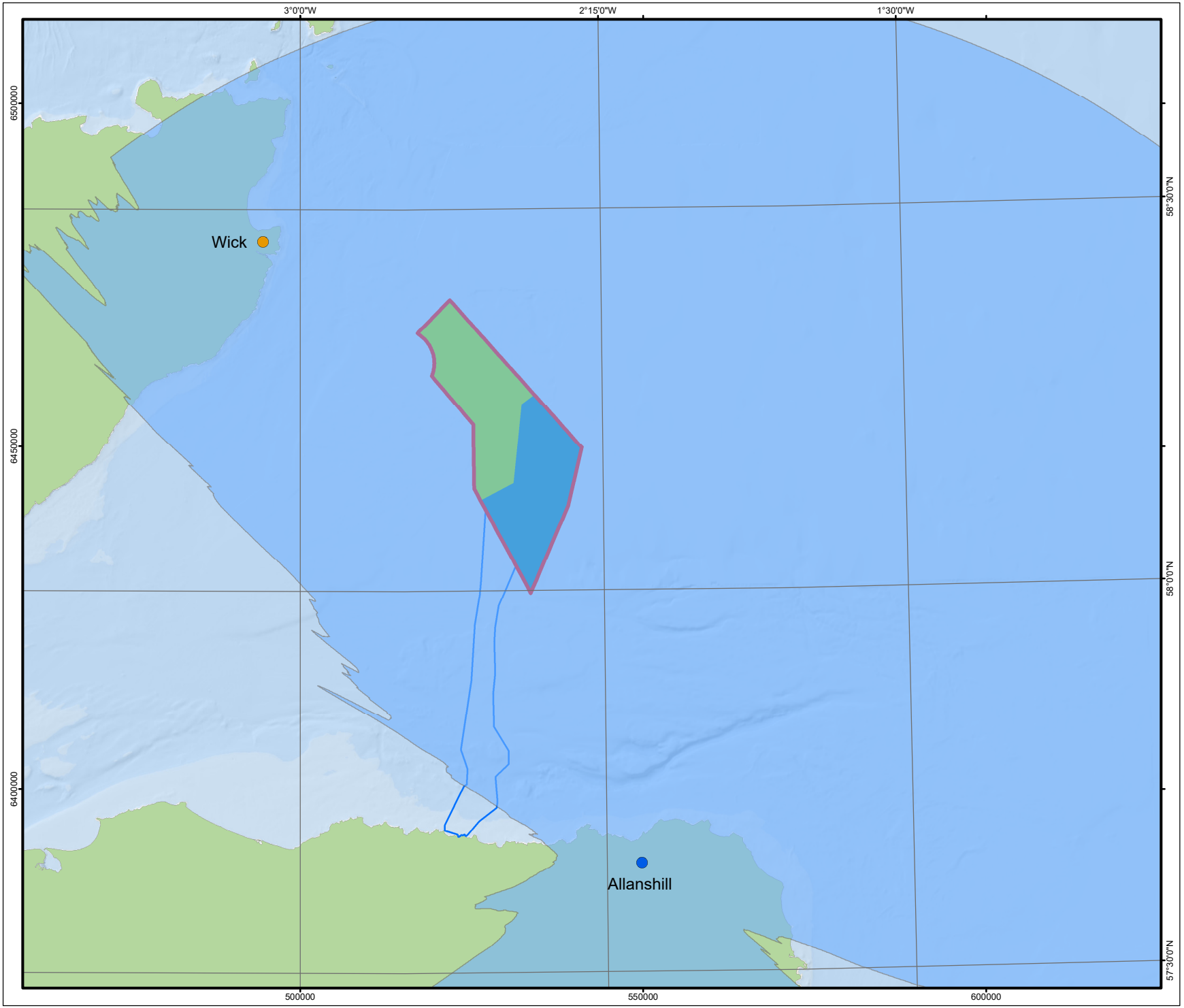
3.3.2.1 Allanshill RLoS coverages for blade tip heights of 355m and 297m AMSL are shown in Figure 3-3 and Figure 3-4 respectively.

3.3.2.2 All WTGs within the Caledonia OWF, irrespective of blade tip height, are in the RLoS of the Allanshill ASR-10SS PSR and are highly likely to be detected. The impact on Allanshill PSR is likely to be operationally significant, and a mitigation solution will be required to be agreed in consultation with NATS.

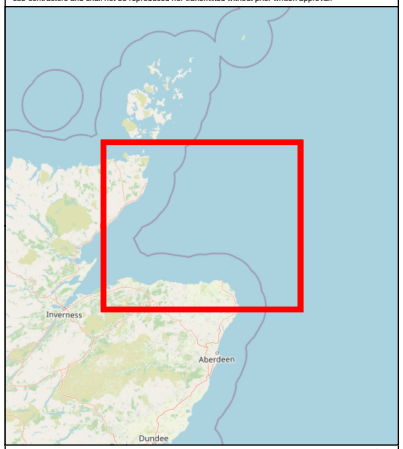
3.3.3 Perwinnes

3.3.3.1 Perwinnes RLoS coverage for a blade tip height of 355m AMSL is shown in Figure 3-5.

3.3.3.2 No WTGs within the Caledonia OWF, irrespective of blade tip height, are the in RLoS of the Perwinnes ASR-23SS PSR. It is highly unlikely that WTGs with the maximum blade tip height of 355m AMSL will be detected by the Perwinnes PSR.



- Caledonia OWF
- Caledonia North Site
- Caledonia South Site
- Offshore Export Cable Corridor
- Allanshill RLoS 355m AMSL
- Civil Airports
- NATS Radars



0 10 20 30 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
01	09/09/2024	Approved	EV	BB	DH

CALEDONIA Offshore Wind Farm

GoBe APEM Group

CONTRACTOR DRAWING NO	CONTRACTOR REV
UKCAL1_GO_WNF_MAV_MAP_00198	01

GEODETIC PARAMETERS
WGS 84 / UTM zone 30N (EPSG: 32630)

DRAWING TITLE

Figure 3-3: Allanshill RLoS 355m AMSL

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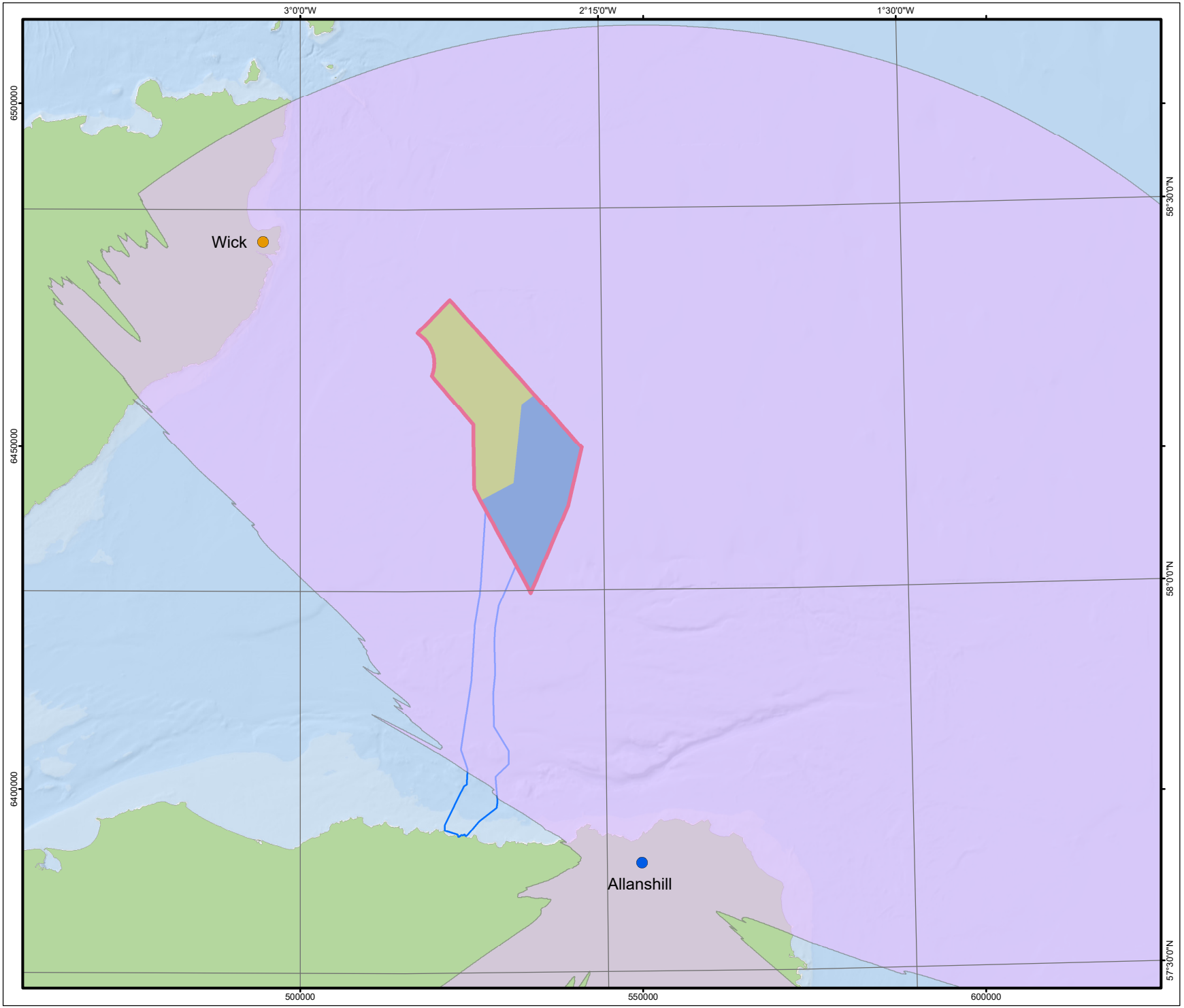
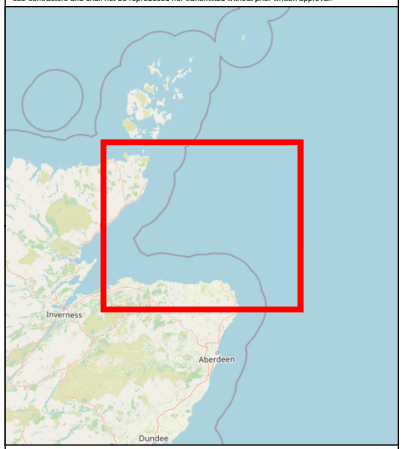
Approved	1:750,000	
DRAWING NUMBER	SHEET NO	REV
N/A	01 of 01	N/A



- Caledonia OWF
- Caledonia North Site
- Caledonia South Site
- Offshore Export Cable Corridor
- Allanshill RLoS 297m AMSL
- Civil Airports
- NATS Radars



0 10 20 30 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
01	09/09/2024	Approved	EV	BB	DH

CALEDONIA Offshore Wind Farm

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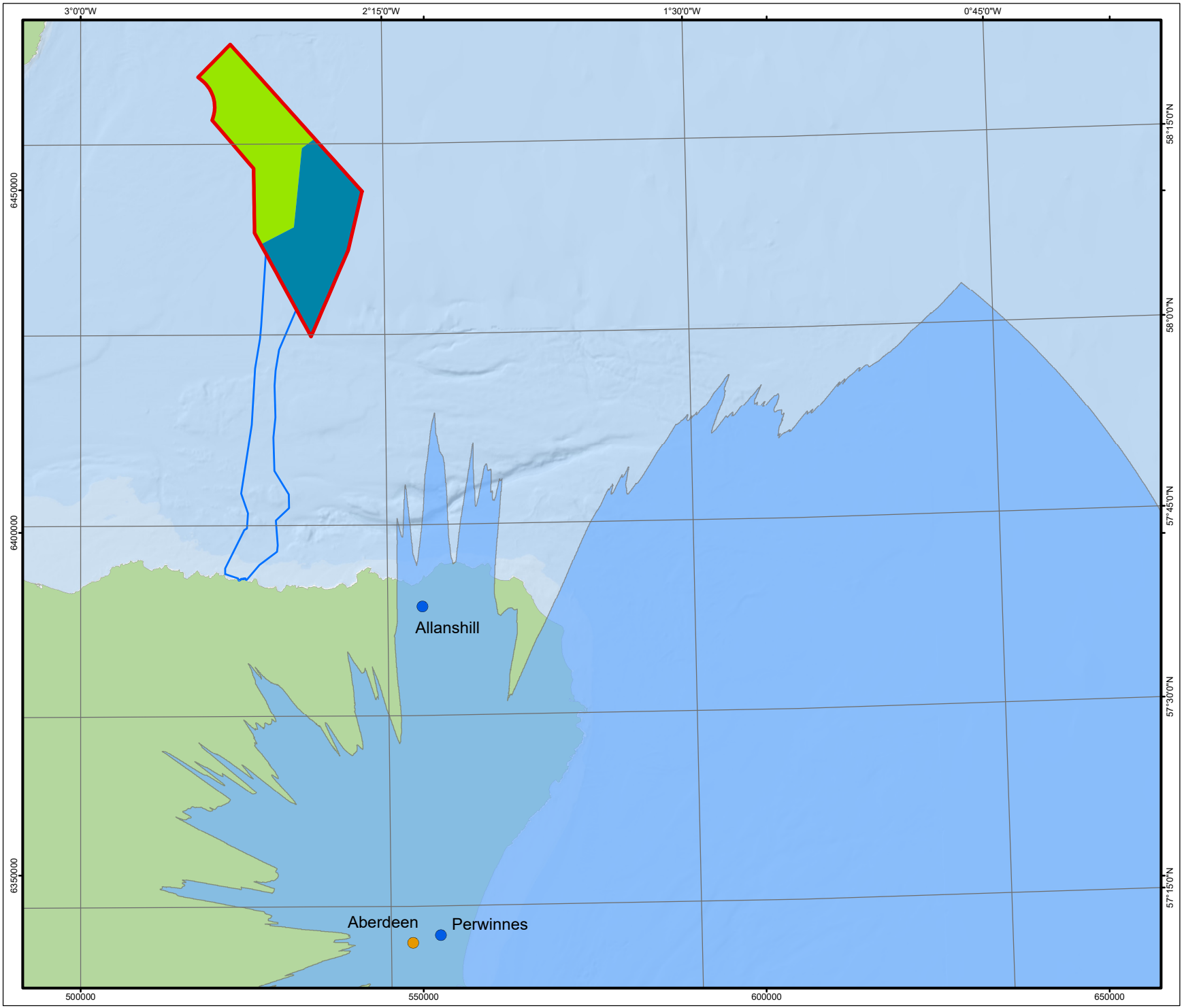
CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00199	CONTRACTOR REV: 01
GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)	

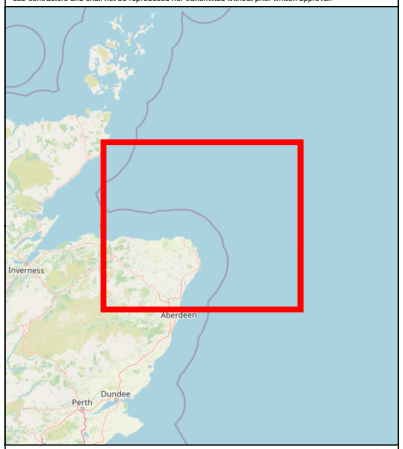
DRAWING TITLE

Figure 3-4: Allanshill RLoS 297m AMSL

STATUS: Approved	SCALE: 1:750,000	
DRAWING NUMBER: N/A	SHEET NO: 01 of 01	REV: N/A



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Perwinnes RLoS 355m AMSL
Civil Airports
NATS Radars



0 10 20 30 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
01	09/09/2024	Approved	EV	BB	DH

CALEDONIA Offshore Wind Farm

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CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00200	CONTRACTOR REV: 01
GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)	

DRAWING TITLE

Figure 3-5: Perwinnes RLoS 355m AMSL

STATUS: Approved	SCALE: 1:750,000	
DRAWING NUMBER: N/A	SHEET NO: 01 of 01	REV: N/A

3.4 Military Airfields with Surveillance Radar

3.4.1 Closest Military Airfields

3.4.1.1 The closest radar equipped military airfield to the Caledonia OWF is RAF Lossiemouth, 63km (34nm) to the south-west. Controllers at this station may provide a Lower Airspace Radar Service (LARS) to aircraft operating outside controlled airspace at a maximum range of 40nm (74km) from its facility.

3.4.2 Lossiemouth

3.4.2.1 RAF Lossiemouth currently has two PSR facilities: a Watchman PSR, and a newly installed Thales STAR NG PSR which is intended to replace the legacy Watchman facility.

3.4.2.2 Lossiemouth Watchman PSR RLoS coverages for blade tip heights of 355m and 297m AMSL are shown in Figure 3-6 and Figure 3-7 respectively.

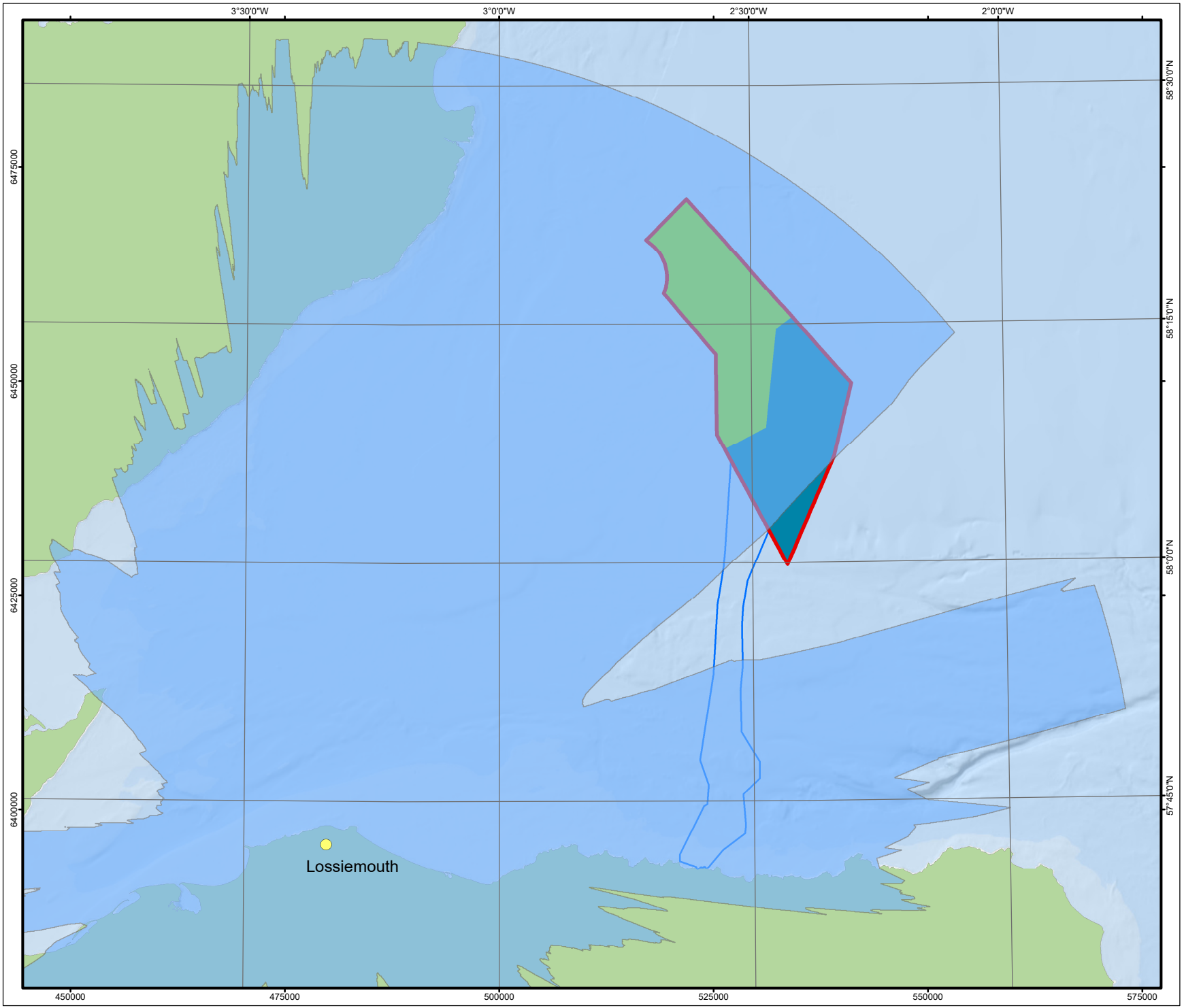
3.4.2.3 All WTGs within the Caledonia North Site and most of the Caledonia South Site, irrespective of blade tip height, are in the RLoS of the Lossiemouth Watchman PSR and are highly likely to be detected. The operational significance of the Watchman PSR impact will be required to be confirmed through consultation with the MoD.

3.4.2.4 Lossiemouth STAR NG RLoS coverages for blade tip heights of 355m and 297m AMSL are shown in Figure 3-8 and Figure 3-9 respectively.

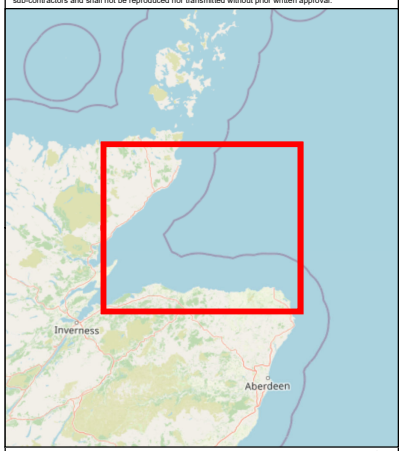
3.4.2.5 All WTGs within the Caledonia OWF, irrespective of blade tip height, are in the RLoS of the Lossiemouth STAR NG PSR and highly likely to be detected. The operational impact of the Proposed Development (Offshore) on civil and military PSR systems (including the PSR at RAF Lossiemouth) have been assessed in:

- Volume 2, Chapter 11: Military and Civil Aviation;
- Volume 3, Chapter 11: Military and Civil Aviation; and
- Volume 4, Chapter 11: Military and Civil Aviation.

3.4.2.6 The operational significance of the PSR impact will require to be confirmed through current ongoing consultation and anticipated post-submission consultation with the MoD.



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Lossiemouth RLoS 355m AMSL
Military Airfields



0 10 20 km

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01	09/09/2024	Approved	EV	BB	DH

CALEDONIA Offshore Wind Farm

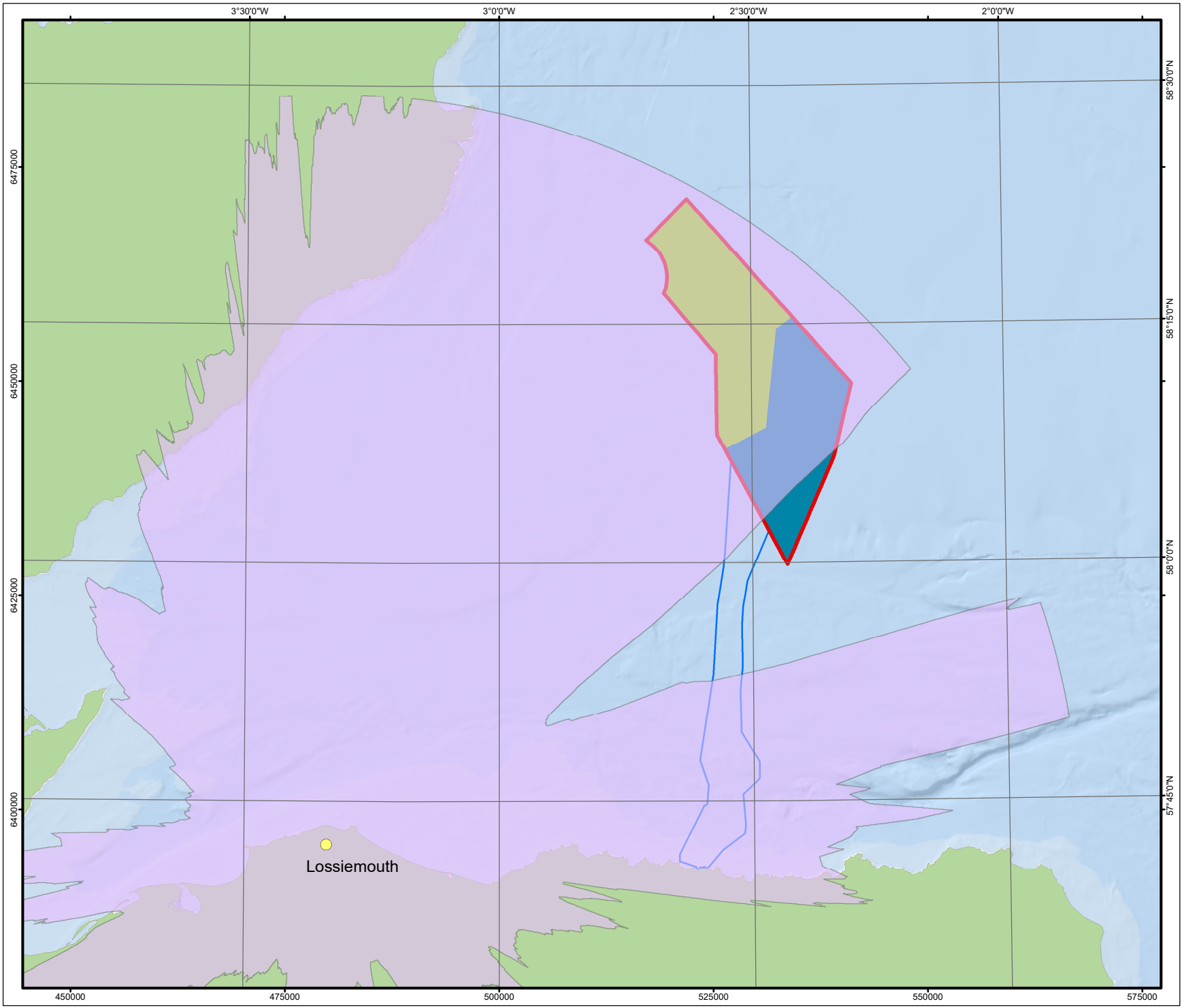
GoBe APEM Group

CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00201_	CONTRACTOR REV: 01
GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)	

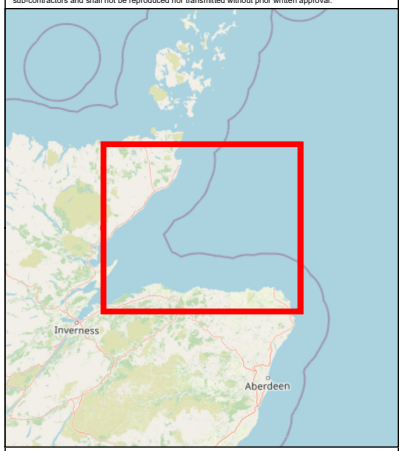
DRAWING TITLE

Figure 3-6: Lossiemouth Watchman RLoS 355m AMSL

STATUS: Approved	SCALE: 1:600,000	
DRAWING NUMBER: N/A	SHEET NO: 01 of 01	REV: N/A



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Lossiemouth RLoS 297m AMSL
Military Airfields



0 10 20 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
01	09/09/2024	Approved	EV	BB	DH

CALEDONIA Offshore Wind Farm

GoBe APEM Group

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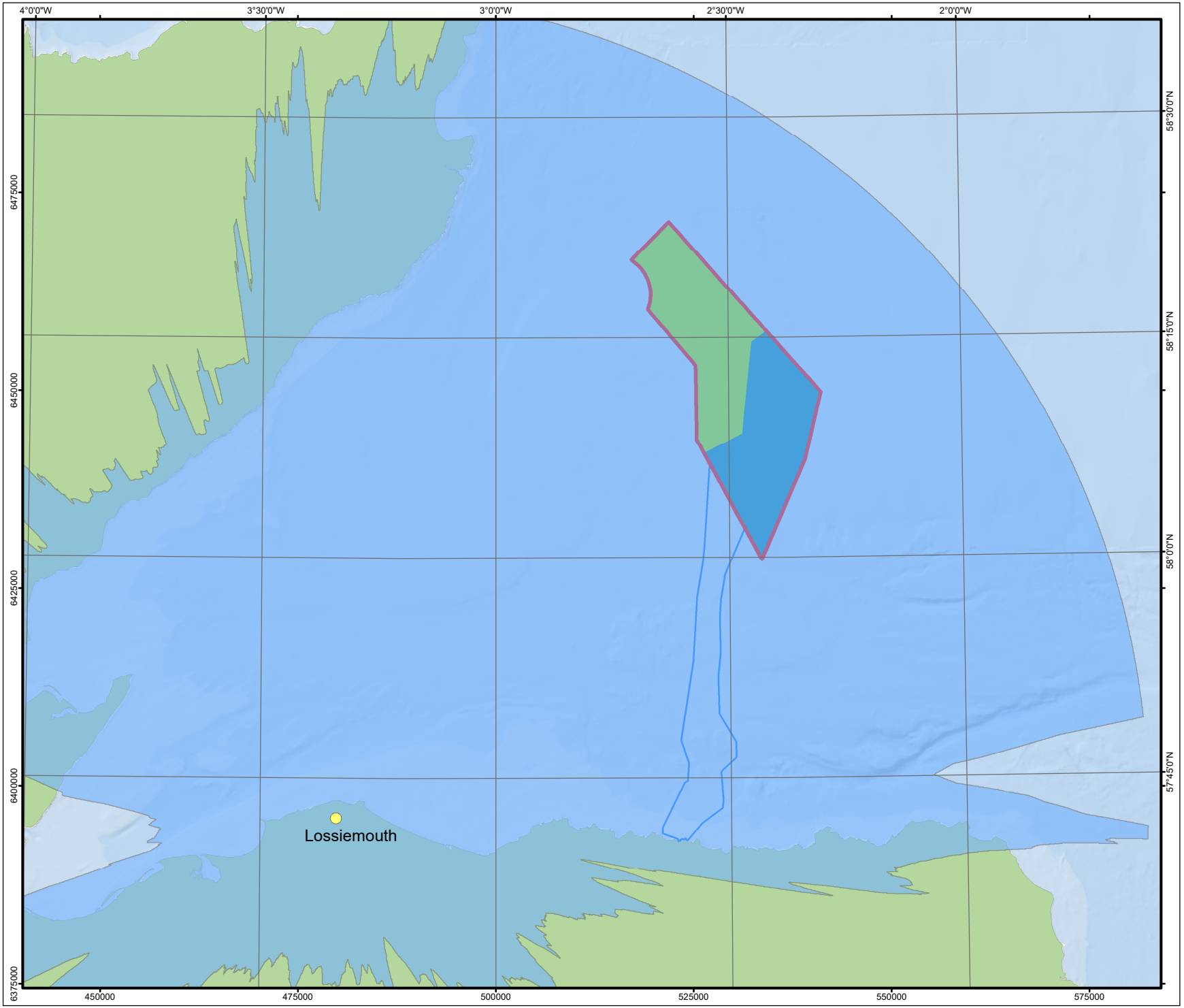
CONTRACTOR REV: 01

GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)

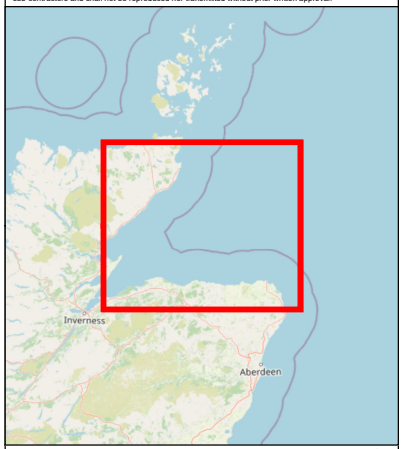
DRAWING TITLE

Figure 3-7: Lossiemouth Watchman RLoS 297m AMSL

STATUS: Approved
SCALE: 1:600,000
DRAWING NUMBER: N/A
SHEET NO: 01 of 01
REV: N/A



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Lossiemouth Star NG RLoS 355m AMSL
Military Airfields



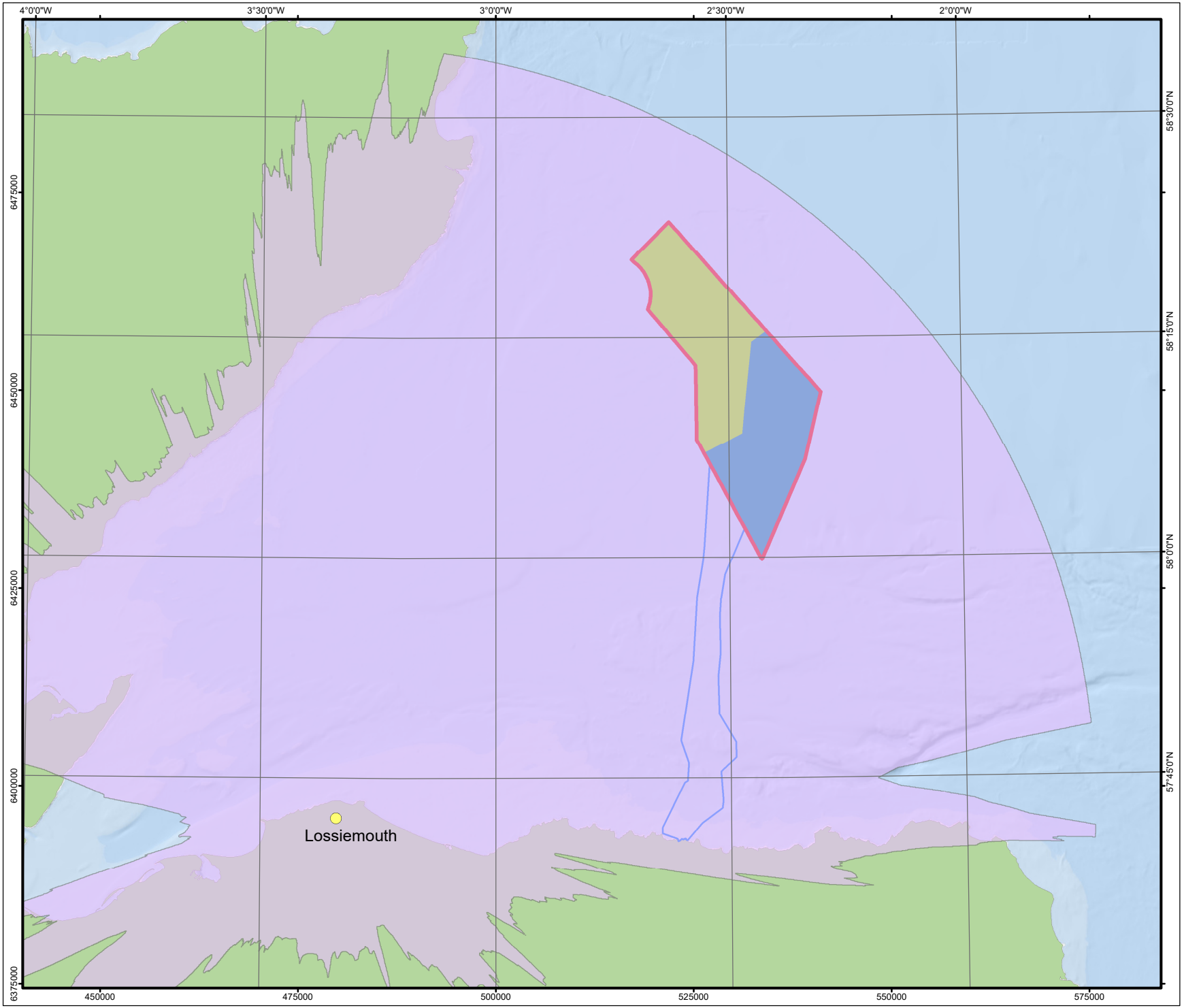
0 10 20 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
01	09/09/2024	Approved	EV	BB	DH

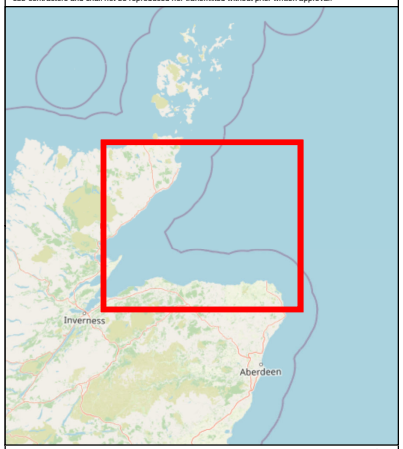
CALEDONIA Offshore Wind Farm

GoBe APEM Group

CONTRACTOR DRAWING NO UKCAL1_GO_WNF_MAV_MAP_00203	CONTRACTOR REV 01
GEODETIC PARAMETERS WGS 84 / UTM zone 30N (EPSG: 32630)	
DRAWING TITLE Figure 3-8: Lossiemouth STAR NG RLoS 355m AMSL	
STATUS Approved	SCALE 1:650,000
DRAWING NUMBER N/A	SHEET NO 01 of 01 / REV N/A



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Lossiemouth Star NG RLoS 297m AMSL
Military Airfields



0 10 20 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
01	09/09/2024	Approved	EV	BB	DH

CALEDONIA Offshore Wind Farm

GoBe APEM Group

CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00204	CONTRACTOR REV: 01
GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)	

DRAWING TITLE

Figure 3-9: Lossiemouth STAR NG RLoS 297m AMSL

STATUS: Approved	SCALE: 1:650,000	
DRAWING NUMBER: N/A	SHEET NO: 01 of 01	REV: N/A

3.5 MoD Air Defence Radars

3.5.1 Closest AD Radars

3.5.1.1 The closest AD radar to the Caledonia OWF is at Remote Radar Head (RRH) Buchan, 71km (38nm) to the south-east.

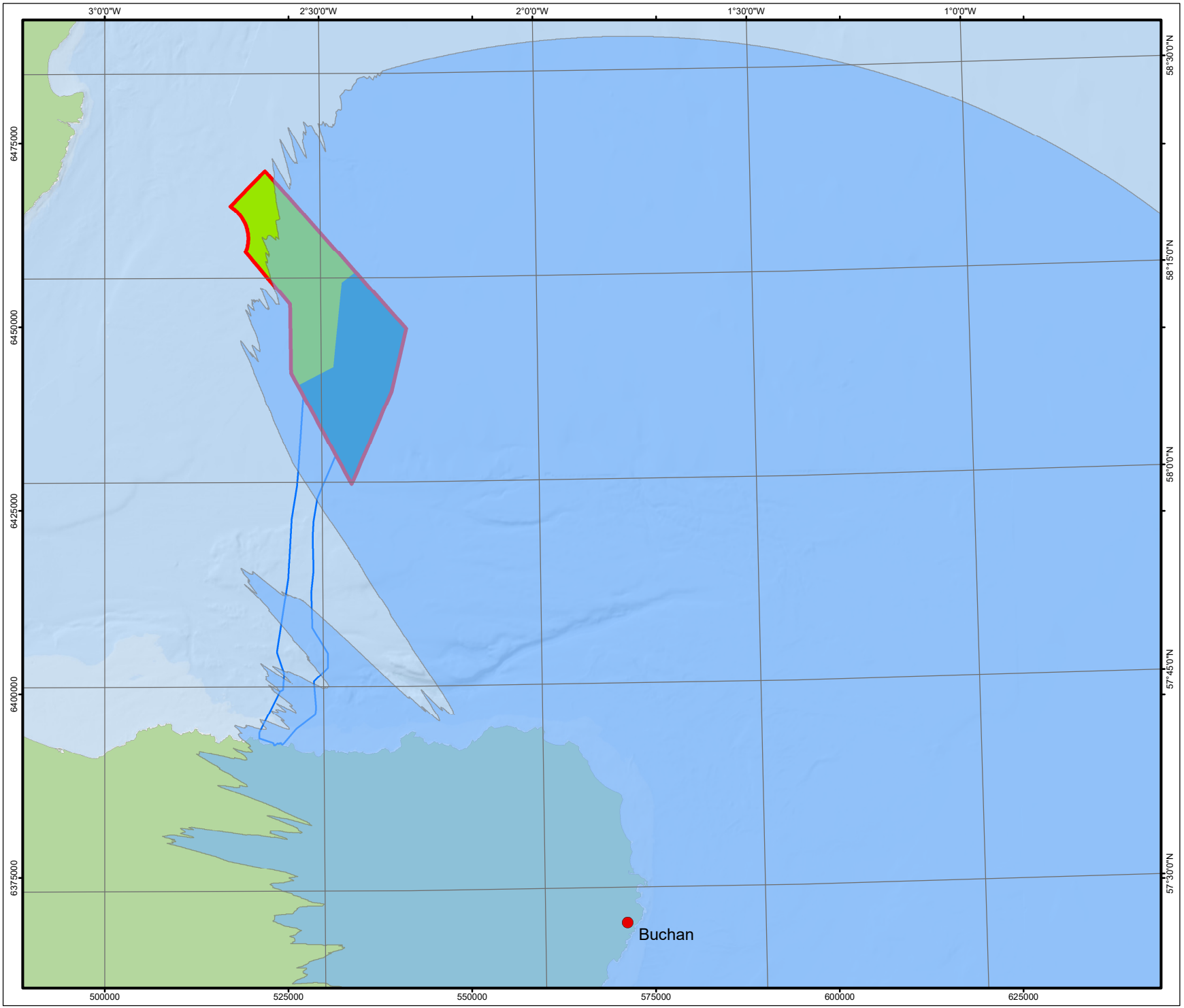
3.5.2 Buchan

3.5.2.1 The Buchan AD PSR is a Lockheed Martin TPS-77 system. Buchan RLoS coverage for blade tip heights of 355m and 297m AMSL are shown in Figure 3-10 and Figure 3-11 respectively.

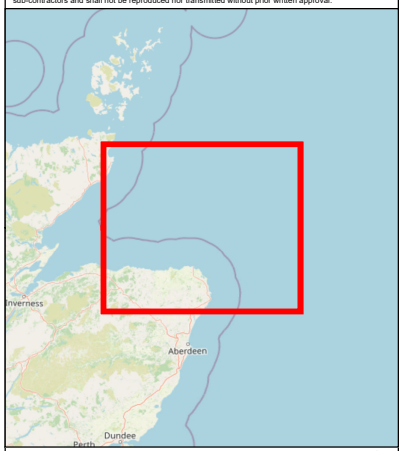
3.5.2.2 All WTGs within the Caledonia South Site and most of the Caledonia North Site, irrespective of blade tip height, are in RLoS of the Buchan AD PSR and are highly likely to be detected. The operational impact of the Proposed Development (Offshore) on civil and military PSR systems (including the PSR at RRH Buchan) have been assessed in:

- Volume 2, Chapter 11: Military and Civil Aviation;
- Volume 3, Chapter 11: Military and Civil Aviation; and
- Volume 4, Chapter 11: Military and Civil Aviation.

3.5.2.3 A mitigation solution will need to be agreed through current ongoing consultation and anticipated post-submission consultation with the MoD.



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Buchan RLoS 355m AMSL
Air Defence Radars



0 10 20 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
01	09/09/2024	Approved	EV	BB	DH

CALEDONIA Offshore Wind Farm

GoBe APEM Group

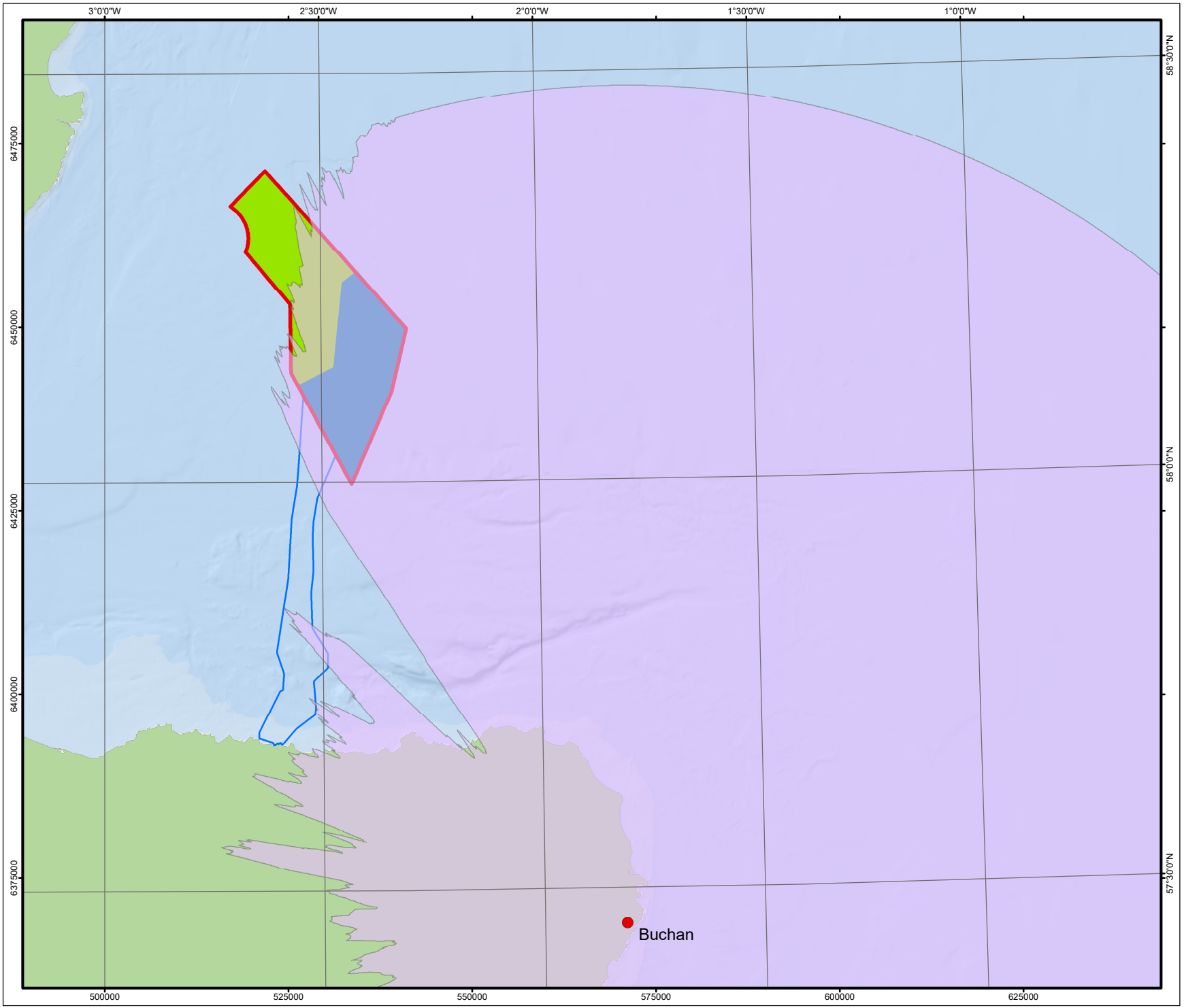
CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00205
CONTRACTOR REV: 01

GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)

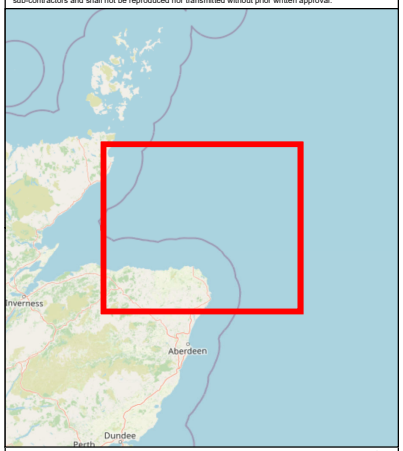
DRAWING TITLE

Figure 3-10: Buchan RLoS 355m AMSL

STATUS: Approved
SCALE: 1:700,000
DRAWING NUMBER: N/A
SHEET NO: 01 of 01
REV: N/A



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Buchan RLoS 297m AMSL
Air Defence Radars



0 10 20 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
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CALEDONIA Offshore Wind Farm

GoBe APEMGroup

CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00206	CONTRACTOR REV: 01
GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)	
DRAWING TITLE: Figure 3-11: Buchan RLoS 297m AMSL	
STATUS: Approved	SCALE: 1:700,000
DRAWING NUMBER: N/A	SHEET NO: 01 of 01 / REV: N/A

3.6 Radar Mitigation

3.6.1 NATS Allanshill

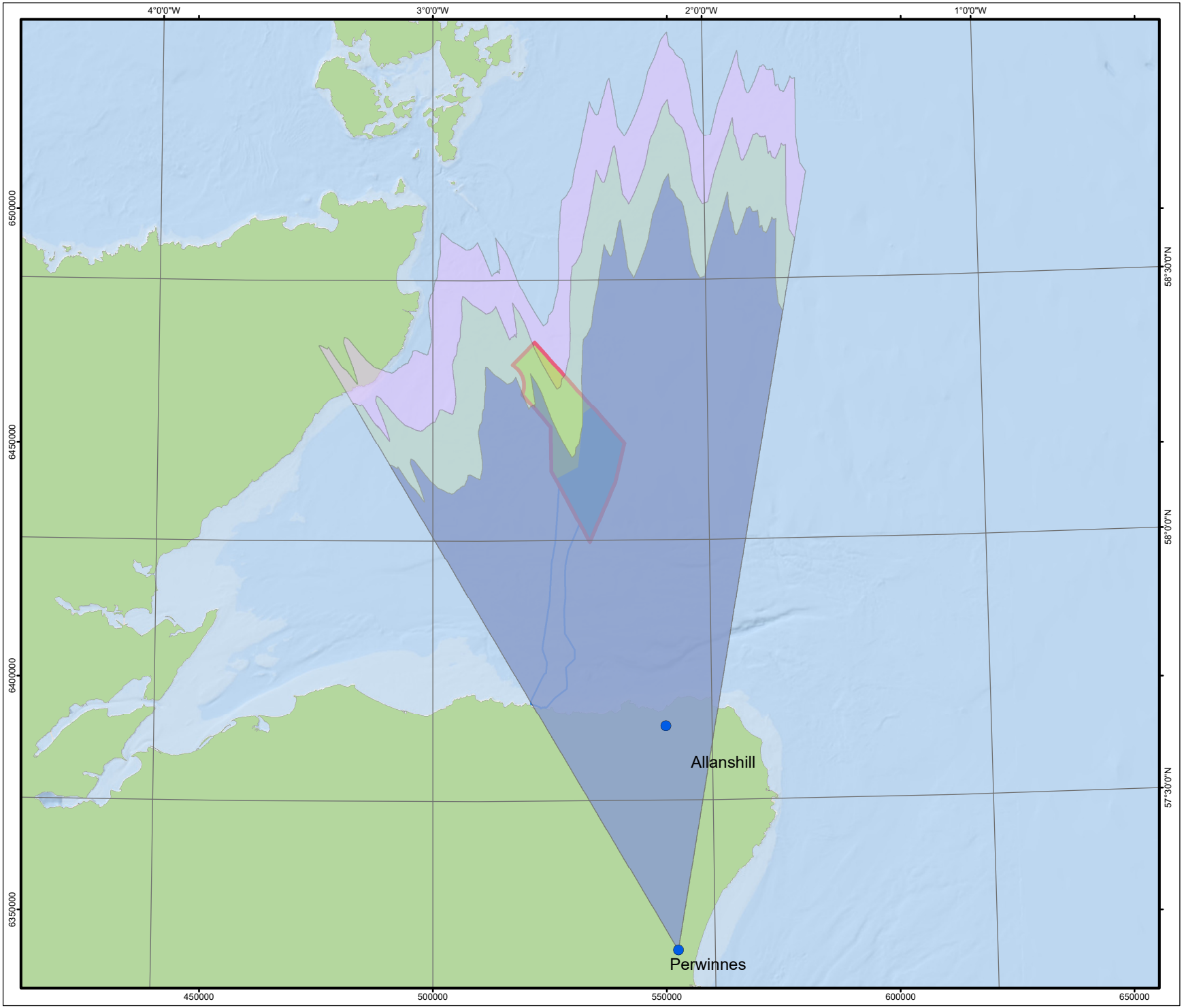
3.6.1.1 Possible mitigation options for WTGs that are detected by NATS Allanshill PSR include blanking of the radar in the impacted area. This removes the unwanted WTG generated clutter from the controller's radar display, but also means that wanted aircraft returns are not displayed within the blanked area. Therefore, blanking is usually used in combination with infill data from an alternative radar feed that is not impacted by the WTGs or combined with the imposition of a TMZ.

3.6.1.2 A TMZ allows ATC to track an aircraft target using solely SSR within an area in which PSR clutter may otherwise have obscured the target. Existing TMZs that have been established to mitigate the impacts of OWFs include Moray Firth TMZ, Neart na Gaoithe TMZ and Seagreen TMZ.

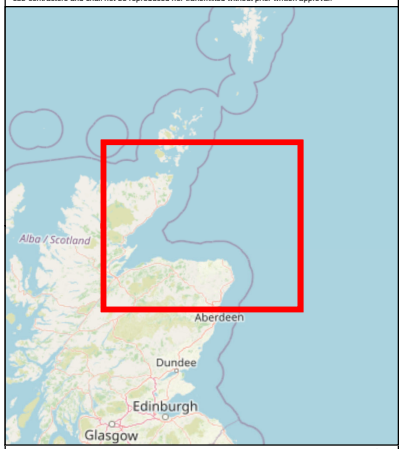
3.6.1.3 NATS' network of radars feed their overlapping coverage data into a Multi Radar Tracking (MRT) system to produce an integrated radar picture for users at its control centres at Swanwick and Prestwick. After NATS Allanshill PSR, the next nearest en route NATS radar to the Caledonia OWF is at Perwinnes. Section 3.3.3 shows that WTGs in the Caledonia OWF are not in the RLoS of Perwinnes PSR. Perwinnes minimum RLoS coverage in a sector encompassing the Caledonia OWF is depicted in Figure 3-12.

3.6.1.4 Perwinnes PSR has RLoS coverage down to 5,000ft AMSL over the Caledonia South Site, and coverage down to between 6,000ft and 7,000ft AMSL over the Caledonia North Site. The minimum RLoS coverage from Perwinnes is not sufficient to detect low-level helicopter traffic in the vicinity of the Caledonia OWF.

3.6.1.5 The most likely mitigation option for the impact on Allanshill PSR will be to blank the PSR and establish a TMZ around the Caledonia OWF. This may take the form of an extension to the existing Moray Firth TMZ which lies to the west of the Caledonia OWF. To implement a new TMZ or extend an existing TMZ requires the submission of a formal airspace change proposal to the CAA. This process has recently been revised to make it more efficient, and specific guidance for TMZs is detailed in CAP 1616H: Guidance on Airspace Change Process for Level 3 and Pre-Scaled Airspace Change Proposals (CAA, 2023[8]).



Caledonia OWF
Caledonia North Site
Caledonia South Site
Offshore Export Cable Corridor
Perwinnes RLoS 5,000ft AMSL
Perwinnes RLoS 6,000ft AMSL
Perwinnes RLoS 7,000ft AMSL
NATS Radars



0 10 20 30 40 km

REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
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CALEDONIA Offshore Wind Farm

GoBe APEM Group

CONTRACTOR DRAWING NO: UKCAL1_GO_WNF_MAV_MAP_00207	CONTRACTOR REV: 01
GEODETIC PARAMETERS: WGS 84 / UTM zone 30N (EPSG: 32630)	

DRAWING TITLE

Figure 3-12: Perwinnes RLoS coverage at 5,000ft, 6,000ft and 7,000ft AMSL

STATUS: Approved	SCALE: 1:1,100,000	
DRAWING NUMBER: N/A	SHEET NO: 01 of 01	REV: N/A

3.6.2 RAF Lossiemouth

3.6.2.1 The Lossiemouth Watchman PSR is expected to be removed pending the successful commissioning into service of the Thales STAR NG PSR. The STAR NG system is known to have enhanced capability for filtering out clutter from WTGs; a software-based solution known as the STAR NG Wind Farm Filter (WFF). The WFF can potentially be configured to mitigate the impact of WTGs should this be required to safeguard ATC operations.

3.6.2.2 The MoD has previously accepted a TMZ as an interim mitigation solution for the Beatrice, Moray East and Moray West OWFs (Moray Firth TMZ) pending the development of an enduring radar solution.

3.6.3 RRH Buchan

3.6.3.1 In respect of the TPS-77 PSR at Buchan, the most common WTG mitigation technique applied for previous OWF developments is the application of a Non-Auto Initiation Zone (NAIZ) in the TPS-77's lowest beam over the footprint of any detectable WTGs. A NAIZ is a pre-defined geographical area where spurious radar returns from turbines will not initiate a track that could be interpreted as an aircraft. However, on 24 August 2018 the MoD issued a statement indicating that the TPS-77 NAIZ mitigation had not performed to expectations at flight trials over two OWFs and as a result immediately paused the receipt and assessment of any technical mitigation reports or submissions relating to TPS-77 radars and multi-turbine wind farms (MoD, 2018[9]).

3.6.3.2 More recently the MoD has softened its stance regarding the acceptability of NAIZ mitigation, albeit mainly for smaller, and generally onshore, wind farm developments. The MoD may still consider the use of a NAIZ as an interim solution for the Caledonia OWF, pending the outcome of the initiatives described in the following paragraphs.

3.6.3.3 In August 2019 an Air Defence and Offshore Wind (AD&OW) Windfarm Mitigation Task Force was formed as a collaborative initiative between the MoD, the Department for Business, Energy and Industrial Strategy (BEIS) (which is now the Department for Energy Security and Net Zero [DESNZ]), the Offshore Wind Industry Council (OWIC) and The Crown Estate. The Scottish Government and Crown Estate Scotland joined the Task Force in March 2022. The aim of the Task Force is to enable the co-existence of UK Air Defence and offshore wind by identifying potential mitigations and supporting processes, allowing offshore wind to contribute towards meeting the UK Government's Net Zero target without degrading the nation's AD surveillance capability.

3.6.3.4 In parallel with the work of the Task Force, the MoD, through programme NJORD, is currently working on deploying mitigations as quickly as possible for the current Air Defence system using existing technologies, to enable

OWFs to be built that will become operational from 2025 onwards (MoD, 2021[10]).

3.7 Consultation on Mitigation

3.7.1.1 Potential mitigation measures have been consulted upon with stakeholders throughout the development of the Proposed Development (Offshore) design and reflect appropriate measures that are being discussed at an industry level.

3.7.1.2 Details of stakeholder engagement are provided in the following chapters:

- Volume 2, Chapter 11: Military and Civil Aviation;
- Volume 3, Chapter 11: Military and Civil Aviation; and
- Volume 4, Chapter 11: Military and Civil Aviation.

4 References

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[10] MoD *et al.* (2021) 'Air defence and offshore wind – working together towards Net Zero'. Available at: https://www.gov.uk/government/publications/air-defence-and-offshore-wind-working-together-towards-net-zero/air-defence-and-offshore-wind-working-together-towards-net-zero (Accessed 24/05/2024)

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