Buchan Offshore Wind

Chapter 16 Marine Archaeology and Cultural Heritage

QMS Review

Name	Company	Date	Reviewed	Approved
Wessex Archaeology	Natural Power	16/06/2025	LJN	SMM
RML	Buchan Offshore Wind	30/06/2025	RML	ISS

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16.1 INTRODUCTION

16-1. This chapter forms part of the Environmental Impact Assessment Report (EIAR) for the Proposed Offshore Development. The purpose of the EIAR is to provide the decision-maker, stakeholders and all interested parties with the environmental information required to develop an informed view of any likely significant effects resulting from the Proposed Offshore Development, as required by the Environment Impact Assessment (EIA) Regulations.

16-2. This EIAR chapter describes the potential impacts of the Proposed Offshore Development on marine archaeology and cultural heritage receptors during the construction, operation and maintenance and decommissioning phases and discusses appropriate mitigation and monitoring as required to address any likely significant effects.

16-3. **Section 16.11** of this EIAR chapter provides a summary of the impact assessment and confirms the likely significance of residual effects on marine archaeology and cultural heritage receptors after mitigation and/or monitoring measures have been considered.

16-4. The assessment should be read in conjunction with following linked and supporting chapters:

- **Volume 1, Chapter 5: EIA Methodology** – provides further details of the general framework and approach to the EIA; and
- **Volume 2, Chapter 6: Marine Physical and Coastal Processes** – considers the impacts on physical processes such as sedimentation and suspended sediment transfer which are linked to potential indirect impacts on marine archaeology effected by the Proposed Offshore Development.

16-5. Additional information to support the assessment includes:

- **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**; and
- **Proposed Management Plan (PMP) 8: Proposed Offshore Written Scheme of Investigations (WSI) (Buchan Offshore Wind Ltd, 2025)**

16.2 PURPOSE OF THIS CHAPTER

16-6. The primary purpose of the EIAR is defined in **Volume 1, Chapter 1: Introduction**.

16-7. It is intended that the EIAR will provide Scottish Ministers and statutory and non-statutory stakeholders with sufficient information to form a reasoned conclusion on the assessment of likely significant effects of the Proposed Offshore Development associated with the construction, operation and maintenance and decommissioning phases on marine archaeology and cultural heritage receptors.

16-8. The objectives of this chapter are to:

- Define legislation, guidance, and policy documents relevant to the assessment of likely significant effects on marine archaeology and cultural heritage receptors;
- Provide an overview of consultation activities and present the responses relevant to the assessment of likely significant effects on marine archaeology and cultural heritage;

- Present the methodology and assessment criteria used in the impact assessment and provide definitions of the scope of the Study Area;
- Define the marine archaeology and cultural heritage existing baseline environment;
- Assess the potential impacts and likely significant effects that activities associated with any stage of the Proposed Offshore Development may have on marine archaeology and cultural heritage receptors from direct, indirect, and cumulative sources; and
- Describe any potential transboundary impacts and inter-relationships on marine archaeology and cultural heritage receptors.

16-9. A marine archaeology and cultural heritage Technical Report in support of this chapter has been presented in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report** of the EIAR. A proposed Offshore WSI setting out the mitigation strategy resulting for this chapter has been presented in **PMP 8: Proposed Offshore WSI** submitted alongside the EIAR (Buchan Offshore Wind Ltd, 2025).

16.3 LEGISLATION, POLICY AND GUIDANCE

16-10. A summary of legislation, policy, and guidance documents directly relevant to marine archaeology and cultural heritage is presented in the following sections and these have been referred to as appropriate in the characterisation of the baseline and impact assessment. Overarching information in relation to the legal framework for the Proposed Offshore Development is provided in **Volume 1, Chapter 2: Legislation and Policy** of the EIAR.

16.3.1 Legislation

16-11. All legislation directly applicable to marine archaeology and cultural heritage is illustrated in **Table 16-1**.

Table 16-1 Legislation Relevant to Marine Archaeology and Cultural Heritage

Legislation	Summary	Relevance to this Chapter
The World Heritage Convention 1972	The Convention provides for the identification, protection, conservation and presentation of cultural and natural sites of 'outstanding universal value' for inscription on the World Heritage List. The Convention sets out the duties of States Parties in identifying potential sites and their role in protecting and preserving them. By signing the Convention, each country pledges to conserve not only the World Heritage sites situated on its territory, but also to protect its national heritage. The 1972 United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Convention was ratified	The significance of offshore heritage assets has been discussed in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**. This is relevant to the topic assessment as the EIA demonstrates that potential harm to heritage assets will be avoided, minimised or mitigated.

Legislation	Summary	Relevance to this Chapter
	by the United Kingdom (UK) in 1984, and the UK currently has 29 World Heritage Sites.	
The United Nations Convention on the Law of the Sea (UNCLOS)1982	UNCLOS 1982 was ratified by the UK in 1997. Article 149 applies only to those archaeological and historical objects that lie outside national jurisdiction and stipulates that 'all objects of an archaeological and historical nature found in the Area shall be preserved or disposed of for the benefit of mankind as a whole, particular regard being paid to the preferential rights of the State or country of origin, or the State of cultural origin, or the State of historical and archaeological origin'. Article 303 stipulates that 'states have the duty to protect objects of archaeological and historical nature found at sea and shall co-operate for this purpose'. Article 303 also provides for coastal states to exert a degree of control over the archaeological heritage to 24 nm, though the UK has not introduced any measures to implement this right.	The significance of offshore heritage assets has been discussed in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**. This is relevant to the topic assessment as the EIA demonstrates that potential harm to heritage assets will be avoided, minimised or mitigated.
The European Convention on the Protection of the Archaeological Heritage (Revised) 1992 (the Valletta Convention)	The Articles of the Valletta Convention tackle various aspects. Article 1 deals with the inventorying and protection of sites and areas; Article 2 deals with the mandatory reporting of chance finds and providing for 'archaeological reserves' on land or underwater; Article 3 promotes high standards for all archaeological work undertaken by suitably qualified people; Article 4 requires the conservation of excavated sites and the safe-keeping of finds; and Article 5 is concerned with consultation that should take place between planning authorities and developers to	The significance of offshore heritage assets has been discussed in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**. This is relevant to the topic assessment as the EIA demonstrates that potential harm to heritage assets will be avoided, minimised or mitigated.

Legislation	Summary	Relevance to this Chapter
	avoid damage to archaeological remains.	
International Council of Monuments Sites Charter on the Protection and Management of Underwater Cultural Heritage 1996 (the Sofia Charter)	The Charter upon which the Annex of the UNESCO Convention is largely based includes a series of statements regarding best practice, intending 'to ensure that all investigations are explicit in their aims, methodology and anticipated results so that the intention of each project is transparent to all'. The UK is a member of the International Council of Monuments and Sites.	Relevant best practice guidance applicable to the Proposed Offshore Development is provided in **Section 16.3.3**
The European Landscape Convention 2000	The European Landscape Convention became binding on the UK from 1 March 2007. Its principal clauses require the Government to protect and manage landscapes and to integrate landscape into regional and town planning policies including its cultural, environmental, agricultural, social and economic policies. The Convention applies to the entire territory of the UK and includes land, inland water and marine areas. It is not regarded as applying to sea areas regulated by the UK that lie beyond territorial waters.	The approach to the assessment of impacts upon the historic environment is in line with the Convention.
UNESCO Convention on the Protection of the Underwater Cultural Heritage 2001	The UNESCO Convention was concluded in 2001 and is a comprehensive attempt to codify the law internationally with regards to underwater archaeological heritage. The UK abstained in the vote on the final draft of the Convention, however, it has stated that it has adopted the Annex of the Convention (Hansard 2017), which governs the conduct of archaeological investigations, as best practice for archaeology. Although the UK is not a signatory, the convention entered into force on 2nd	The approach to the assessment of impacts upon the historic environment is in line with the Annex of the Convention.

Legislation	Summary	Relevance to this Chapter
	January 2009 having been signed or ratified by 20 member states. It has since been ratified or accepted by an additional 40 states.	
Marine and Coastal Access Act 2009	The Marine and Coastal Access Act 2009 provides devolved authority to Scottish Ministers for marine planning and conservation powers in the Scottish Offshore Region (from 12 to 200 nm). Under section 66 of the Marine and Coastal Access Act 2009 (in the context of the Scottish Offshore Region), the Proposed Offshore Development requires a Marine Licence for the marine licensable activities beyond 12 nm.	Marine Directorate – Licensing Operations Team (MD-LOT) are the governing body responsible for licensing, regulating and planning marine activities in Scotland (see **Volume 3, Appendix 16.1 (Marine Archaeology Technical Report**). An assessment of Proposed Offshore Development activities during the construction, operation and maintenance, and decommissioning phases which have the potential to result in a likely significant effect on historic environment receptors (and which therefore require consideration as part of the Marine Licence application) are considered in **Section 16.9**.
Marine (Scotland) Act 2010	The Marine (Scotland) Act 2010 provides the legislative and management framework for the marine environment within Scottish Territorial Waters (from MHWS out to 12 nm). Under this legislation, Scottish Ministers along with public authorities have the responsibility to act to protect and enhance the marine biodiversity and the preservation of marine historic assets of national importance. Marine historic assets of national importance which are located within Scottish Territorial Waters, can be designated as Historic Marine Protected Areas (HMPAs).	Marine Directorate – Licensing Operations Team (MD-LOT) are the governing body responsible for licensing, regulating and planning marine activities in Scotland (see **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**). An assessment of Proposed Offshore Development activities during the construction, operation and maintenance, and decommissioning phases which have the potential to result in a likely significant effect on historic environment receptors (and which

Legislation	Summary	Relevance to this Chapter
	In Scotland, HMPAs have replaced Section 1 of the Protection of Wrecks Act 1973, which provides protection for designated shipwrecks in the UK. Military wrecks and aircraft are further addressed through the Protection of Military Remains Act 1986.	therefore require consideration as part of the Marine Licence application) are considered in **Section 16.9**. There are no known marine historic assets designated as HMPAs within the Study Area.
Historic Environment Scotland Act 2014	Section 1 of this Act provides for the creation of a new body to be known as Historic Environment Scotland (HES), with the functions conferred on it by this Act and any other enactment. HES's general function is to investigate, care for and promote Scotland's historic environment. HES is responsible for the archaeological resource within Scotland's Territorial Waters (up to 12 nm) and acts as consultee for the resource in the Scottish Exclusive Economic Zone (EEZ).	HES were consulted with regards to marine archaeology and cultural heritage chapter presented in the Offshore Scoping Report. Feedback from the responses to the Scoping Report were incorporated in this Chapter as presented in **Section 16.4**.
Protection of Wrecks Act 1973	Wrecks and wreckage of historical, archaeological or artistic importance can be protected by way of designation. It is an offence to carry out certain activities in a defined area surrounding a wreck that has been designated, unless a license for those activities has been obtained from the Government. Section 2 provides protection for wrecks that are designated as dangerous due to their contents and is administered by the Maritime and Coastguard Agency through the Receiver of Wreck. There are no protected wrecks under this legislation within the footprint of the Proposed Offshore Development.	There are no known protected wrecks within the Study Area. The embedded commitments for the Proposed Offshore Development have been designed to protect any marine archaeological receptors of interest.
Ancient Monuments and Archaeological Areas Act 1979 (as amended)	This Act is primarily land based, but in recent years it has also been used to provide some level of protection for underwater sites. Scheduled Monuments and Areas of Archaeological	There are no Scheduled Monuments or designated Areas of Archaeological Importance within the Marine Archaeology Study Area.

Legislation	Summary	Relevance to this Chapter
	Importance are afforded statutory protection by the Secretary of State, and consent is required for any major works. It is a criminal offence to carry out any works on, or near to, a Scheduled Monument without Scheduled Monument Consent. Both terrestrial and maritime sites, including wrecks, may be designated under this Act. There are no Scheduled Monuments within the footprint (offshore or intertidal) of the Proposed Offshore Development.	The embedded commitments for the Proposed Offshore Development have been designed to protect any marine archaeological receptors of interest.
Protection of Military Remains Act 1986	Under this Act, all aircraft that have crashed in military service are automatically protected. Maritime vessels lost during military service are not automatically protected although the Ministry of Defence (MOD) has powers to protect any vessel that was in military service when lost. The MOD can designate 'controlled sites' around wrecks whose position is known and can designate named vessels as 'protected places' even if the position of the wreck is not known. It is not necessary to demonstrate the presence of human remains at either 'controlled sites' or 'protected places'. Beyond the 12 nm limit the Merchant Shipping Act 1995 covers wrecks found or taken into possession outside UK waters and stipulates that, if brought into UK waters, finds must be reported to the Receiver of Wreck. The provisions of the Protection of Military Remains Act 1986 regarding Controlled Sites are applicable in international waters, though they are only enforceable with respect to British-controlled ships, British citizens and British companies.	There are no known aircraft crash sites, controlled sites or protected places within the Study Area. However, there is potential for discovery of currently unidentified aircraft crash sites within the Study Area. The embedded commitments for the Proposed Offshore Development have been designed to protect any marine archaeological receptors identified during the project lifecycle which may be covered by this Act.

Legislation	Summary	Relevance to this Chapter
Merchant Shipping Act 1995	This Act sets out the procedures for determining the ownership of underwater finds that turn out to be 'wreck', defined as any flotsam, jetsam, derelict and lagan found in or on the shores of the sea or any tidal water. It includes ships, aircraft, hovercraft, parts of these, their cargo or equipment. If any such finds are recovered and brought into UK territorial waters, the salvor is required to give notice to the Receiver of Wreck that he/she has found or taken possession of them and as directed by the Receiver, either hold them pending the Receiver's order or deliver them to the Receiver. The act is administered by the Maritime and Coastguard Agency.	The mitigation measures for the Proposed Offshore Development have been designed to protect any marine archaeological receptors of interest. Archaeological Exclusion Zones (AEZs) are proposed around relevant historic records of archaeological material and their locations/extent are set out in **PMP 8: proposed Offshore WSI** submitted alongside the EIAR (Buchan Offshore Wind Ltd, 2025). A Protocol for Archaeological Discoveries (PAD) is proposed to report any discoveries of unexpected archaeological material and is set out in **PMP 8: Proposed Offshore WSI** (Buchan Offshore Wind Ltd, 2025).

16.3.2 Policy

16-12. Relevant policies directly applicable to marine archaeology and cultural heritage are illustrated in **Table 16-2**

Table 16-2 Policy Relevant to Marine Archaeology and Cultural Heritage

Policy	Summary	Relevance to this Chapter
United Kingdom (UK) Marine Policy Statement, (HM Government, 2011)	This statement was intended to facilitate and support the formulation of Marine Plans, ensuring that marine resources are used in a sustainable way in line with high level marine objectives. The MPS also states that Marine Plans must ensure a sustainable marine environment that will protect heritage assets.	This chapter outlines the mitigation measures needed to preserve any archaeological or historical assets. Avoidance of impacts on known marine archaeology will initially be achieved through the use of AEZs. The AEZs have been designed to protect any known marine archaeological receptors of interest.

Policy	Summary	Relevance to this Chapter
		The reduction and mitigation of impacts have been assessed for the construction, operation and maintenance and decommissioning phase.
Scotland's National Marine Plan (NMP), (Scottish Government, 2015)	This sets out a single framework for sustainable development within Scotland's marine area. GEN 6 for Historic Environment states "development and use of the marine environment should protect and where appropriate, enhance heritage assets in a manner proportionate to their significance".	This is relevant to the topic assessment as the EIA demonstrates that potential harm to heritage assets will be avoided, reduced or mitigated.
National Planning Framework for Scotland 4 (NPF4), (Scottish Government, 2023)	Long term spatial strategy for Scotland's development including the protection of the environment, with a focus on the conservation and enhancement of Scotland's distinctive natural and cultural heritage and a commitment to protect, promote and support the sustainable management of these assets. Policy 7 protects the embodied carbon in the historic built environment. The Policy intent is to protect and enhance historic environment assets and places, and to enable positive change as a catalyst for the regeneration of places.	The significance of offshore heritage assets has been discussed in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**. This is relevant to the topic assessment as the EIA demonstrates that potential harm to heritage assets will be avoided, reduced or mitigated
Historic Environment Policy Statement (HEPS), (HES 2019a)	Includes policies that decisions affecting any part of the historic environment require understanding of its significance and consideration of avoiding or minimising impacts.	The significance of offshore heritage assets has been discussed in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**. This is relevant to the topic assessment as the EIA demonstrates that potential harm to heritage assets will be avoided, reduced or otherwise mitigated.
Historic Environment Scotland Designation Policy and	Includes the policy setting out requirements and strategy for	The significance of offshore heritage assets has been

Policy	Summary	Relevance to this Chapter
Selection Guidance (Historic Environment Scotland (HES), 2019b)	designations relevant to Scotland's historic environment and the guidance used by HES for selecting sites for designation.	discussed in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**. This is relevant to the topic assessment as the EIA demonstrates that potential harm to heritage assets will be avoided, reduced or mitigated.

16.3.3 Guidance

16-13. All guidance directly applicable to marine archaeology and cultural heritage is illustrated below.

- Military Aircraft Crash Sites: Archaeological Guidance on their significance and future management (English Heritage (now Historic England), 2002);
- The Code of Practice for Seabed Developers (Joint Nautical Archaeology Policy Committee and The Crown Estate, 2006);
- Historic Environment Guidance for the Offshore Renewable Energy Sector (Wessex Archaeology, 2007);
- Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (English Heritage (now Historic England), 2008);
- Guidance for Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy (Oxford Archaeology and George Lambrick Archaeology and Heritage, 2008);
- Our Seas – A shared resource: High level marine objectives (HM Government, 2009);
- Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Gribble and Leather, 2011);
- Characterising Scotland's Marine Archaeological Resource (Wessex Archaeology, 2012);
- Ships and Boats: Prehistory to Present – Designation Selection Guide (English Heritage (now Historic England), 2012);
- Marine Geophysics Data Acquisition, Processing and Interpretation Guidance Notes (English Heritage (now Historic England), 2013);
- Protocol for Archaeological Discoveries: Offshore Renewables Projects (The Crown Estate, 2014);
- Our Place in Time – the Historic Environment Strategy for Scotland (The Scottish Government, 2014);
- Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record (Historic England, 2015);
- Managing Change in the Historic Environment: Setting (HES, 2016);

- Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland (HES and Scottish Natural Heritage, 2018);
- Marine Protected Areas (MPA) in the Seas around Scotland – Guidelines on the selection, designation and management of Historic Marine Protected Areas (HES, 2019c);
- Standard and Guidance for Historic Environment Desk-based Assessment (Chartered Institute for Archaeologists, 2020a);
- Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (The Crown Estate, 2021); and
- Curating the Palaeolithic (Historic England, 2023).

16.4 CONSULTATION

16-14. Buchan Offshore Wind Ltd ('The Applicant') has sought opinion and advice from key stakeholders through scoping and consultation regarding the EIA Scoping Report for the Proposed Offshore Development (Buchan Offshore Wind 2023) (which was submitted to MD-LOT in October 2023).

16-15. **Table 16-3** provides a summary of the key issues raised during the consultation process relevant to marine archaeology and cultural heritage and details how these issues have been considered in the production of this EIAR chapter.

16-16. Further detail on the Proposed Offshore Development's overall EIA stakeholder consultation process is presented in **Volume 1, Chapter 5 :EIA Methodology** of the EIAR.

Table 16-3 Consultation Relevant to Marine Archaeology and Cultural Heritage

Consultee	Date/Document	Summary	Relevance to this Chapter
Scoping Opinion (Marine Directorate, 2023)			
Marine Directorate	Scoping Opinion for Buchan Offshore Wind Farm, December 2023	The Scottish Ministers are broadly content with the study area as defined in Section 14.4 of the Offshore Scoping Report and that the baseline data gathered for the assessment is appropriate. This view is supported by Aberdeenshire Council and HES.	The Offshore Scoping Report study area was a 3km buffer to enable a general context to be established prior to any project specific surveys relating to marine archaeology. It did not specify a buffer for the EIAR. As the EIAR utilises archaeologically assessed datasets from the project specific marine geophysical surveys there is a greater level of understanding of the known and potential marine archaeology within the proposed offshore development area, and so the cultural heritage baseline is presented with a 1km buffer in line with wider professional practice for similar developments (Wessex Archaeology, 2007; Chartered Institute for Archaeologists (CIfA), 2014a). Additional data sources such as nautical charts and site-specific surveys as described in **Section 16.6** have been utilised for this assessment. The site surveys have been undertaken in part to determine the presence or absence of submerged or semi-submerged palaeolandscapes.
	Scoping Opinion for Buchan Offshore Wind Farm, December 2023	In line with advice from HES and Aberdeenshire Council, the Scottish Ministers are broadly content with the impact pathways scoped into the EIA as outlined in Table 14-5 of the Scoping Report. However, the Scottish Ministers recommend that the Written Scheme of Investigation and Protocol for Archaeological Discoveries are developed as part of the EIA process as represented by HES.	A proposed offshore WSI including a PAD will be included as part of the supporting documentation of the EIAR, providing details of the outline mitigation strategies and programme, which may be updated as a live document if required in accordance with any relevant S36 consent or marine licence condition.

Consultee	Date/Document	Summary	Relevance to this Chapter
	Scoping Opinion for Buchan Offshore Wind Farm, December 2023	The methodology, as outlined in Section 14.10.2, is acceptable to the Scottish Ministers which is in agreement with the HES representation.	Methodology for Impact Assessment is further outlined and confirmed in **Section 16.8**.
	Scoping Opinion for Buchan Offshore Wind Farm, December 2023	The Scottish Ministers are content that the mitigation measures outlined in Section 14.6 of the Scoping Report are sufficient to manage and mitigate impacts on the marine historic environment in line with the HES representation.	Embedded mitigation measures are outlined in **Section 16.10**.
Historic Environment Scotland	Scoping Opinion for Buchan Offshore Wind Farm, December 2023	We note that the current Scoping consultation relates only to the marine element of the Proposed Offshore Development and does not cover the onshore impacts such as grid connections which will be covered by a separate consent process. We also note that potential setting impacts on terrestrial assets are not included in the Scoping report. It is not clear if this is because they will be addressed in the terrestrial EIA process or if they have been omitted because the applicants propose to scope out landscape and visual impacts from further assessment (Chapter 16). While we would have wished to see this issue addressed in the Scoping report, we can confirm that given the distance between the proposed development and any terrestrial cultural heritage assets we are content for potential setting impacts from the turbine array to be scoped out of further assessment.	Onshore heritage assets are considered in the onshore consent application for the Project within the Onshore Archaeology & Cultural Heritage chapter. This EIAR chapter covers seaward of MHWS, including landfall (intertidal) heritage receptors and is in accordance with the relevant feedback received on Marine Archaeology from the Scoping Opinion.
	Scoping Opinion for Buchan Offshore	We welcome that impacts on the marine archaeological baseline will be scoped in to the assessment and have the following comments on	The Offshore Scoping Report study area was a 3km buffer to enable a general context to be established prior to any project specific surveys relating to marine

Consultee	Date/Document	Summary	Relevance to this Chapter
	Wind Farm, December 2023	the Report. We are content with the study areas defined for marine archaeology, and with the baseline data sources listed in section 14.5.1. We note and welcome the proposals outlined in section 14.10.1 to use project-specific survey outputs to enhance the understanding of marine archaeology within the study area. Any such survey work should be undertaken in a manner that facilitates its archaeological analysis and use.	archaeology. It did not specify a buffer for the EIAR. As the EIAR utilises archaeologically assessed datasets from the project specific marine geophysical surveys there is a greater level of understanding of the known and potential marine archaeology within the proposed offshore development area, and so the cultural heritage baseline is presented with a 1km buffer in line with wider professional practice for similar developments. Additional data sources such as nautical charts and site-specific surveys as described in **Section 16.6** have been utilised for this assessment. The site surveys have been undertaken in part to determine the presence or absence of submerged or semi-submerged palaeolandscapes.
	Scoping Opinion for Buchan Offshore Wind Farm, December 2023	We are content that the potential impacts on marine archaeology and cultural heritage have been identified adequately within the Scoping Report. We welcome the proposals to use embedded mitigation strategies to manage and mitigate impacts on the marine historic environment. We are content that the proposals to undertake desk-based assessments and reviews of marine geophysical surveys and geotechnical datasets will help to identify marine and intertidal historic assets and ensure appropriate mitigation can be implemented. We support the use of this information to avoid archaeological seabed features and to create appropriately sized	Embedded mitigation measures are fully outlined in **Section 16.10** and confirmed within the WSI in **Volume 4, PMP 8: proposed WSI** of this EIAR (Buchan Offshore Wind Ltd, 2025).

Consultee	Date/Document	Summary	Relevance to this Chapter
		Archaeological Exclusion Zones around marine archaeological assets.	
	Scoping Opinion for Buchan Offshore Wind Farm, December 2023	While we welcome the proposed development of a marine archaeological Written Scheme of Investigation (WSI) and a Protocol for Archaeological Discoveries (PAD), we recommend that these documents are developed as part of the EIA Reporting process rather than post-consent as proposed in the Scoping report. The Crown Estate's guidance for WSI's for offshore wind farm projects states that an outline WSI should be developed during the EIA process with the final version agreed during post consent works, which we encourage. The mitigation measures laid out in the WSI and PAD are fundamental to the EIA process as they set out the proposed mitigation strategies to be used during the proposed offshore development works. They should demonstrate that any anticipated significant effects have been mitigated to an acceptable level, allowing the Marine Directorate to make a fully informed consenting decision.	A proposed WSI including a Protocol for Archaeological Discoveries will be included as in **Volume 4, PMP 8: proposed WSI** (Buchan Offshore Wind Ltd, 2025), providing details of the outline mitigation strategies and programme, which will then be updated as a live document as recommended in the HES scoping response, and if required in accordance with any relevant S36 consent or marine licence condition.
	Scoping Opinion for Buchan Offshore Wind Farm, December 2023	We are content with the proposed methodology for assessment of impacts on marine heritage assets and sites.	Methodology for Impact Assessment is further outlined and confirmed in **Section 16.8**.
Other Relevant Consultation To Date			
Historic Environment Scotland	Response to stakeholder	We note that the data gathering process for the magnetometry survey has left gaps in the coverage but you consider this can be addressed with follow-	Datasets for the geophysical surveys have been discussed and assessed in **Section 16.6**, with the results summarised in **Section 16.7**. A full discussion

Consultee	Date/Document	Summary	Relevance to this Chapter
	engagement letter ref. BOW-L-0294	up work at the post-consent stage. We expect this matter to be fully described in the EIA report and its supporting data, along with a mitigation strategy forming part of the Written Scheme of Investigation, as outlined in your letter. Your client bears the risk if the nature of the survey work results in assets not being identified until the post-consent phase.	of data quality and suitability is present within the Marine Archaeology Technical Report in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report** of this ES. Additional outline standards and information for the planning of further geophysical surveys to be completed in the post-consent stage are outlined in the proposed WSI in **Volume 4, PMP 8: proposed WSI** of this EIAR.
Aberdeenshire Council Archaeology Service (ACAS)		Phone call with the County Archaeologist for Aberdeenshire (14th November 2024) requesting up to date information on early prehistoric sites in the area which might not be in the public domain as yet, to ensure that the baseline is as up to date as possible. Reports received that day.	The resulting additional datasets/reports provided by ACAS have been included into the submerged prehistory baseline section to make it as accurate as possible.

16.5 STUDY AREA

16-17. The spatial scale of the Study Area for marine archaeology and cultural heritage includes the following, within the outer Moray Firth:

- Array Area;
- Offshore Export Cable Corridor (ECC) and Landfall from MHWS seaward to the Array Area; and
- A 1 km buffer around the above areas, clipped to MHWS for documentary source data searches.

16-18. The marine archaeology and cultural heritage Study Area is shown in **Figure 16-1**. This has been used to capture relevant data on designated and non-designated marine archaeological assets from the documentary sources outlined in the technical report, and to provide the additional spatial context for understanding archaeological potential and heritage significance of receptors that may be affected by the Proposed Offshore Development. Assessment of geophysical survey data has been completed within the bounds of the Array Area and the ECC and does not cover the 1km buffer of the Study Area beyond the extent of the Proposed Offshore Development.

16.6 METHODOLOGY TO INFORM BASELINE ENVIRONMENT

16-19. Baseline data to inform the marine archaeology and cultural heritage assessment includes known wrecks and obstructions, geophysical anomalies of archaeological interest, and examines the potential for encountering further maritime and aviation archaeological receptors. Full details are presented in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**. The methodology follows the best practice professional guidance outlined by CIfA's Standard and Guidance for Historic Environment Desk Based Assessment (CIfA, 2020a) and other appropriate guidance (CIfA, 2020b).

16-20. The marine themes relevant to marine archaeological baseline as assessed in this report are:

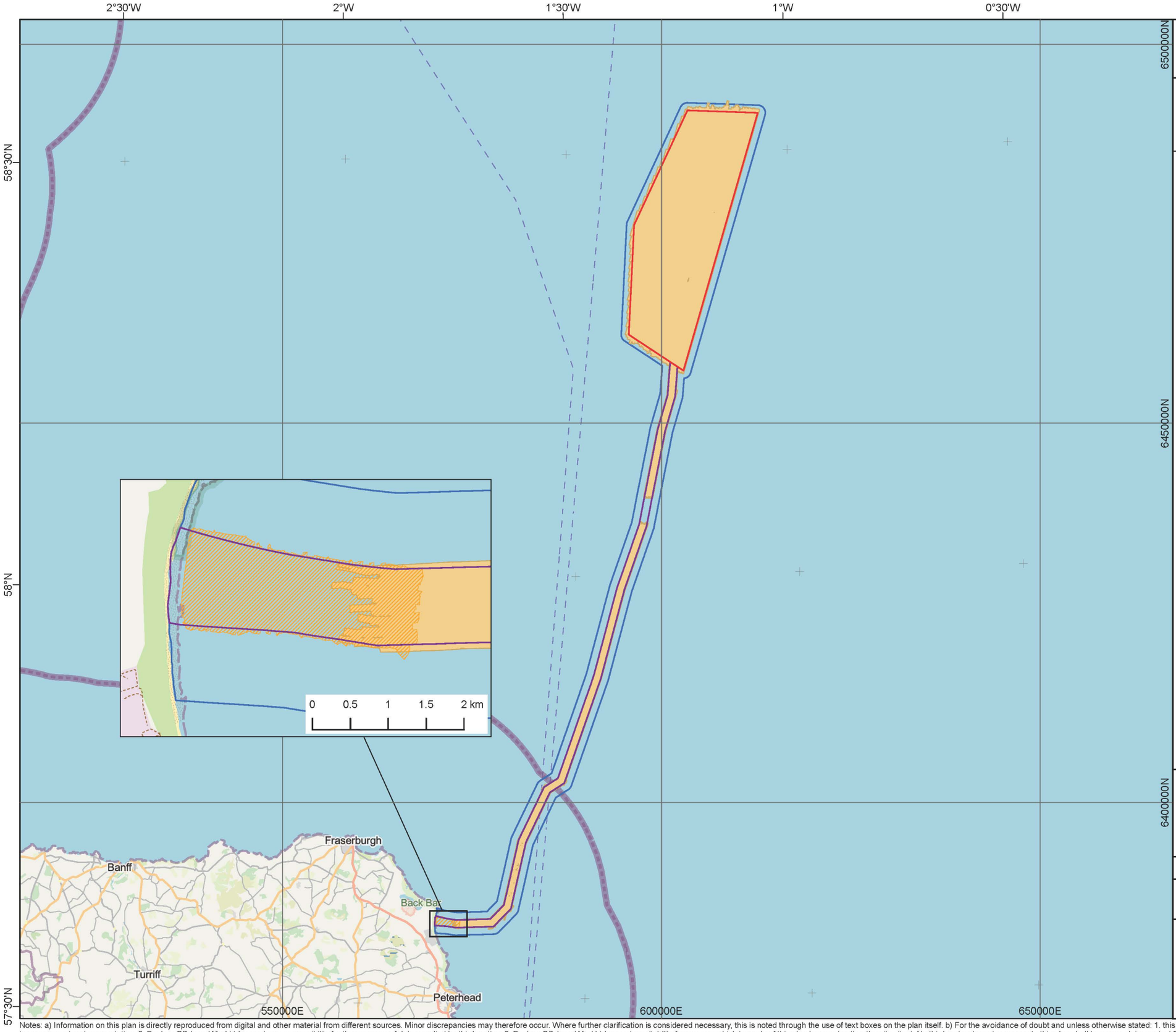
- seabed prehistory (for example, palaeochannels and other features that contain Quaternary sediments, and derived early prehistoric artefacts such as lithic blades and tools);
- seabed features, including maritime sites (such as shipwrecks and associated material including cargo, or records of obstructions and fisherman's fasteners) and aviation sites (aircraft crash sites and associated debris); and
- landfall heritage assets.

16-21. The types of archaeology listed above relate to the known marine resource and also the potential, but currently, unknown resource which may be found within the Outer Moray Firth and wider North Sea. There is potential for archaeological and palaeolandscape features dating from the Later Upper Palaeolithic onwards (see **Section 16.7.2**).

16-22. Post-medieval and modern wrecks, as they were generally made of more substantial material, are more likely to have been discovered through surveys undertaken by the United Kingdom Hydrographic Office (UKHO) and others, and thus recorded in the archaeological record (see **Section 16.7.3**). However, there is still potential for the discovery of previously

unrecorded wreck sites, particularly of wooden wrecks, broken up wrecks or partially buried wrecks that are more difficult to detect through geophysical survey.

16-23. There is also potential for 20th century aircraft, particularly in relation to the Second World War (Wessex Archaeology, 2008). Aircraft crash sites are also difficult to identify through archaeological assessments of geophysical survey data, although experience indicates material from the site, such as engines or other material may be recorded as small obstructions or anomalies.



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-1: Site Location, Study Area and Extent of Geophysical Survey Datasets

Key

- Study Area
- Array Area
- Export Cable Corridor (EEC)
- Ocean Infinity MBES coverage
- SEP Hydrographic MBES coverage

Scale @ A3: 1:500,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

0 6.25 12.5 18.75 25 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0094
Map Ref: 259970_Fig.01

BUCHAN OFFSHORE WIND

16.6.1 Desktop Study

16-24. Information to inform the marine archaeology and cultural heritage assessment within the Study Area was collated through a detailed desk-based review of existing studies and datasets which are summarised in **Table 16-4**.

Table 16-4 Key Sources of Marine Archaeology and Cultural Heritage Literature and Data

Literature/Data	Source	Year	Author
Charted wrecks and obstruction database.	Wreck Database	2024	UKHO
Database of recorded archaeological sites, find spots and archaeological events, including buildings, industry and maritime heritage.	Canmore, The National Record of the Historic Environment of Scotland	2024	HES
Records of sites of archaeological and historical interest.	Aberdeenshire Historic Environment Record (HER)	2024	ACAS
Marine Environmental Data and Information Network (MEDIN) data archive centre for geology, geophysics and backscatter	BGS GeoIndex Offshore	2024	British Geological Survey (BGS)
Scheduled Monuments (including protected wrecks)	HES databases	2024	HES
Scottish Government historic Marine Protected Areas (protected wrecks)	Marine Directorate databases	2024	Marine Directorate
Admiralty charts 0213 (Peterhead to Fraserburgh) and 0115 (Moray Firth)	UKHO	2024	UKHO
Grey literature/previous archaeological reports	Various (see **Section 16.7** and references)	Various	Various

16-25. Due to the significant distance offshore, particularly of the Array Area, the UKHO wreck database is the primary source of data for the majority of the Study Area as HERs tend to be concentrated nearshore within the 12 nm limit while the UKHO records are global and extend much further offshore. Entries from the UKHO dataset were cross-checked with any entries in the National Record of the Historic Environment (Canmore database: HES, 2024) and the adjacent Aberdeenshire HER to assess known and potential marine cultural Heritage Assets within the Marine Archaeology Study Area.

16-26. All data for Heritage Assets located within this Study Area are stored on the Wessex Archaeology (WA) archive network.

16.6.2 Baseline Surveys

16-27. Site specific surveys were carried out to collect data to inform the marine archaeology and cultural heritage EIA Report chapter. A summary of the surveys undertaken to aid in establishing the marine archaeology and cultural heritage baseline are outline in **Table 16-5**.

16-28. The geophysical survey scope included the acquisition of Multibeam Echo Sounder (MBES), sidescan sonar (SSS), magnetometer (Mag.) and sub-bottom profiler (SBP) data. The outputs of the site-specific survey are summarised, contextualised and assessed in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**, and this was used to directly inform the baseline characterisation and impact assessment presented within this EIAR. **Figure 16-1**

shows the extents of the relevant geophysical surveys, which were considered sufficient to inform the archaeological baseline at this stage of the project, as outlined in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**.

Table 16-5 Site Specific Surveys Undertaken to Inform Marine Archaeology and Cultural Heritage

Survey, Survey Contractor and Year	Summary	Coverage of Proposed Offshore Development study area
Nearshore ECC, SEP Hydrographic, 2023	Archaeological assessment of geophysical survey data, including MBES, SSS, Mag. and SBP data. Results reported in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report.**	Nearshore section of the ECC from circa 150 m to up to circa 3 km from coastline
Offshore ECC, Ocean Infinity, 2023	Archaeological assessment of geophysical survey data, including MBES, SSS, Mag. and SBP data. Results reported in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**.	Offshore section of the ECC beyond circa 2.5 km from coastline excluding exclusion zone around Ross Pipeline.
Array Area, Ocean Infinity, 2023	Archaeological assessment of geophysical survey data, including MBES, SSS, Mag. and SBP data. Results reported in Volume 3, Appendix 16.1: (marine archaeology and cultural heritage Technical Report)	Array Area
Landfall Walkover Survey, Wessex Archaeology, 2024	Walkover of Landfall during low tide by marine archaeologists to check for extant archaeological receptors. Confirmation of three previously identified receptors (one standing building, two shipwreck sites) and visual survey for additional receptors. Full results of the landfall walkover survey are reported on in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**.	Landfall and 1 km buffer

16.6.3 Identification of Designated Sites

16-29. All database of sites designated under the legislation outlined in **Section 16.3.1** that were of international, national or local importance or were qualifying interest features within the Study Area that could be affected by any phase of the Proposed Offshore Development were

inspected through the desk-based sources outlined in **Table 16-4**. Information was then compiled on the relevant environmental features of these sites.

16-30. Designated sites are included for further consideration in assessment if:

- The designated site or any associated protection area directly overlaps with the Proposed Offshore Development; and/or
- Designated sites and associated features are located within the topic-specific potential 10 km buffer Zone of Influence (ZoI) for indirect impacts associated with the Proposed Offshore Development for cumulative impact assessment.

The maximum distance from the boundaries of the Proposed Offshore Development Area that indirect impacts may have an influence on marine heritage receptors. Based on the results of **Volume 2 Chapter 6 Marine Coastal & Physical Processes** this is judged to be 10km.

16.7 BASELINE ENVIRONMENT

16-31. A summary of the marine archaeology and cultural heritage baseline environment is provided in the following sections. Full details of the analysis undertaken to develop the marine archaeology and cultural heritage baseline are provided in the technical report in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**.

16.7.1 Designated Sites

16-32. There are no known sites located within the Study Area that have statutory designations under the Protection of Military Remains Act 1986, Protection of Wrecks Act 1973; Section 2, Marine (Scotland) Act 2010, or the Ancient Monuments and Archaeological Areas Act (1979).

16-33. If there were any material from crashed military aircraft identified within the Study Area, it would automatically be protected under the Protection of Military Remains Act (1986). Further details on potential aircraft material elsewhere in the Study Area are discussed in the **Section 16.7.4**.

16.7.2 Palaeolandscapes

16.7.2.1 Palaeolandscapes background

16-34. Hominids and humans have occupied the British Isles at various times, with the earliest occupation extending back to around one million years ago (Parfitt et al., 2010), with coastal areas clearly attracting human populations, including landscapes that are now submerged (Bailey et al., 2020).

16-35. The earliest archaeological evidence for Scotland comprises around the last 15,000 years and reflects Later Upper Palaeolithic and Early Mesolithic human activity at various locations across Scotland (Saville et al., 2012), in periods when (now-inundated) coastal land was more extensive than today, due to lower global sea-levels following the end of the last ice age (Fitch, 2022).

16-36. Nearshore areas around Scotland's coasts retain higher potential for encountering Late Pleistocene and Early Holocene submerged palaeolandscapes than those further offshore. For example, within the ECC and Landfall area there is potential for the presence of as yet undiscovered *in situ* palaeolandscape deposits (such as peats, estuarine and low-energy coastal sediments of archaeological interest), and prehistoric sites and finds located within

the inundated nearshore palaeolandscapes. Therefore, the potential for submerged palaeolandscape features and prehistoric archaeological evidence is highest between present-day sea level and the -20 m bathymetric contour. Any in-situ prehistoric discoveries will be regarded of either regional or national importance, above or below sea level.

Palaeolandscape results and potential

16-37. Within the Study Area, the archaeological assessment of SBP data within the nearshore section of the ECC identified one distinct palaeolandscape feature of archaeological potential, measuring circa 780 m in length and 200 – 250 m in width running roughly parallel to the modern coastline (**Figure 16-2** and **Figure 16-3**). The inshore edge of it is circa 700 m eastward of the landfall, with the offshore edge being circa 900 – 950 m eastward of the landfall. The area identified is interpreted as a relic coastal barrier feature (potentially an area of preserved sand dunes) which may represent a relict coastline dating to circa 8 – 9,000 year BP. This feature has potential for encountering early Holocene palaeolandscapes and archaeological material in very nearshore locations (if preserving sediments and landforms survive). The feature is also potentially of palaeoenvironmental interest and may aid in determining the Holocene sea level history of the wider Outer Moray Firth/eastern coast of Aberdeenshire, making it of regional importance.

16-38. The assessment of SBP data shows that the geology within the Array Area and much of the offshore sections of the ECC in water depths over 50 m either pre-date the earliest occupation of humans or consists of subglacial units and are therefore not considered to be of palaeolandscape archaeological potential. However, modern seabed sediments covering the Study Area have the potential to contain *in situ* and derived archaeological material such as shipwrecks.

Project:

Buchan Offshore Wind EIA

Title:

Figure 16-2: Palaeolandscape Feature of Archaeological Potential 75000

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Bank
- Data example location

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

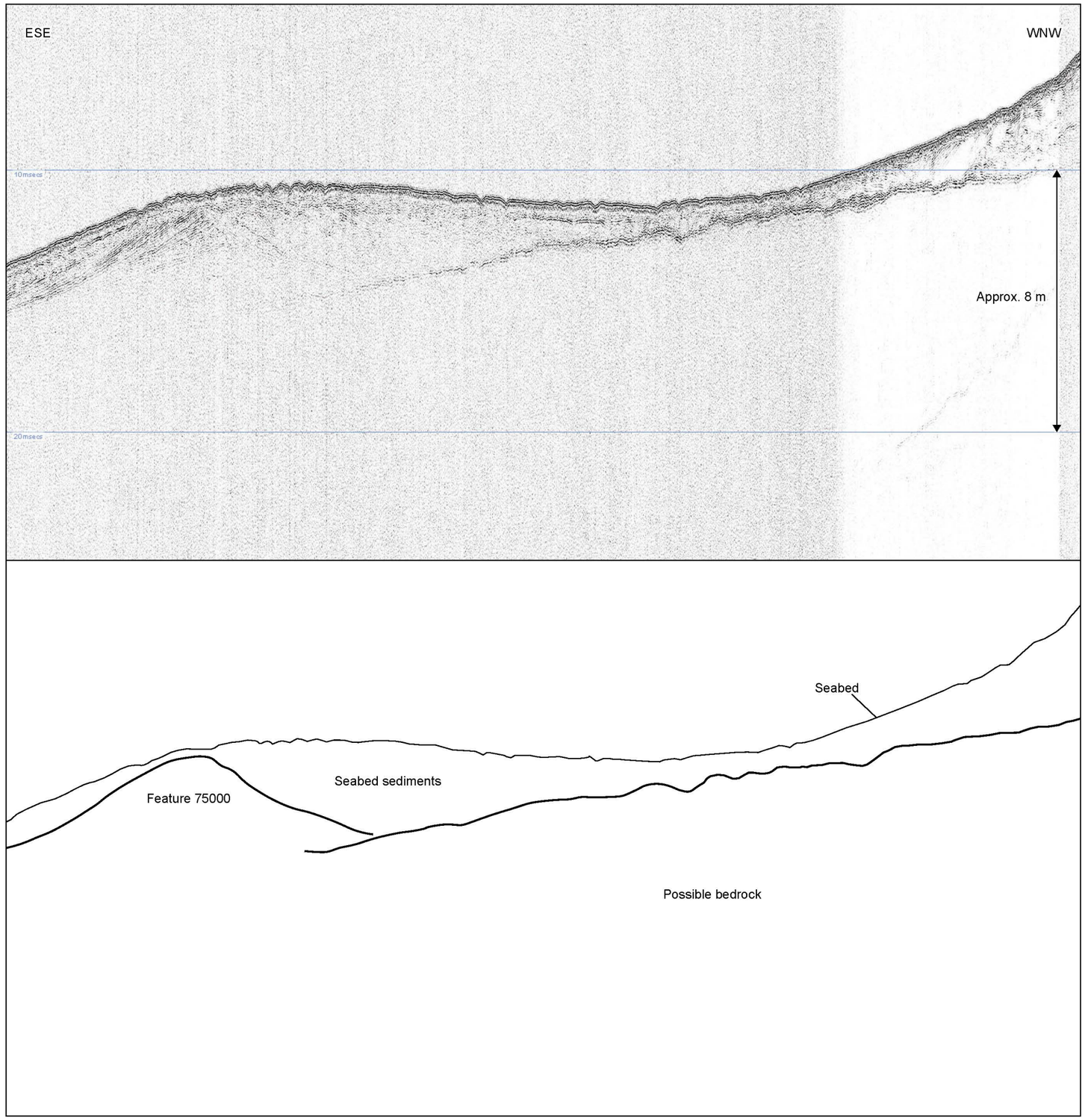
N

0 0.25 0.5 0.75 1 km

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0095
Map Ref: 259970_Fig.02

BUCHAN OFFSHORE WIND



Project:
Buchan Offshore Wind EIA

Title:
Figure 16-3: SBP data example – feature 75000

Scale @ A3: Not to scale

Date: 05-02-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0096
Map Ref: Fig03

BUCHAN OFFSHORE WIND

16.7.3 Seabed Features: Maritime and Aviation

16.7.3.1 ECC

16-39. The assessment of the geophysical survey data and documented sources within the ECC and associated Study Area resulted in a total of 152 anomalies identified as being of possible archaeological interest.

16-40. A total of six receptors identified in documented sources were present within the Study Area. These have been compiled from the UKHO, Canmore, and HER datasets and where possible enhanced following the archaeological assessment of geophysical survey data into gazetteers, with each feature allotted a unique ID number (see **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**). Of the six receptors, four receptors were not identified in the geophysical survey data due to being outwith the extents of the geophysical survey dataset within the wider Study Area. These have been allotted a 2000s gazetteer number and an O1 classification (outside horizontal footprint of geophysical survey dataset). They include:

- Canmore record of an unknown wreck site (**2000**) recorded in Dive Scotland at a depth of 45 m;
- the previously identified wreck of the steamship *St Fergus* (**2001**) sunk in 1940 following a collision while carrying a cargo of mixed goods;
- one record of an unknown wreck (**2002**) which has been amended to 'dead' by the UKHO (i.e. not identified on multiple previous surveys); and
- the previously identified wreck of the fishing trawler *Trinity* (**2003**) sunk in 1939 by German bombers while in ballast heading from Granton in the Firth of Forth to the fishing grounds.

16-41. A further 148 anomalies with archaeological potential were identified in the archaeological assessment of the geophysical survey data within the ECC, two of which related to receptors previously identified in documented sources. These were allotted a 7000s gazetteer number and categorised as follows:

- five A1 anomalies (anthropogenic origin of archaeological interest);
- 18 A2_h anomalies (anomaly of likely anthropogenic origin but of unknown date; may be of archaeological interest of a modern feature);
- 124 A2_l anomalies (anomaly of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature) including one linear trend that extends into the Array Area (**7144**); and
- one A3 record (historic record of possible archaeological interest with no corresponding geophysical anomaly).

16-42. The five A1 records include the identified extents of two wrecks: one (**7102**) of which had been identified in the UKHO records as the wreck of the *Procyon,* a British steam trawler that sank in 1927 in ballast after a collision with an Icelandic trawler. This had two associated pieces of debris (**7103** and **7147**) assigned as A1 and two further A2_l anomalies classified as

dark reflectors (**7146** and **7148**). This group of anomalies were outwith the ECC boundary, circa40 – 50m east of it within the Study Area.

16-43. The other wreck (**7081**) has not previously been identified in documentary sources at the surveyed location and was identified in all sensors, with a very large magnetic anomaly of 2,880 nT. It is possible that this may be the correct position for the wreck of the *Alcora* which is the A3 anomaly **7145** which had no corresponding geophysical anomaly located 1,300 m west-south-west. This iron steamship was driven ashore in October 1940 in a storm with no casualties but the wreck had not been identified at its recorded position in surveys in 2010.

16-44. The final A1 anomaly was a substantial magnetic anomaly (**7039**) of 1,834 nT that was located within the ECC 1,500 m east of the Landfall area.

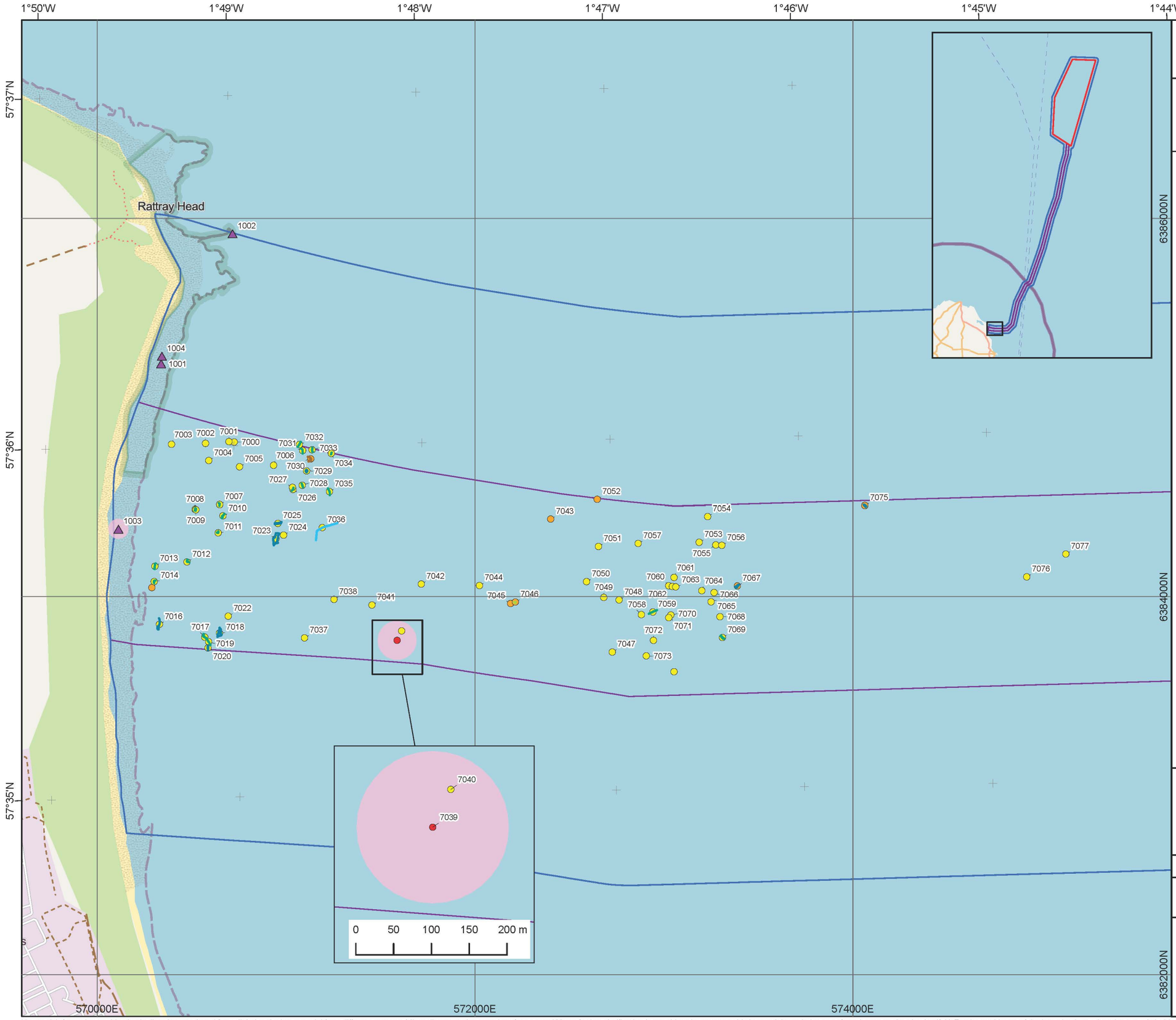
16-45. The A2_h and A2_l categories are further classified by interpreted type, which further aids in assigning archaeological potential and importance, with differentiations done on professional experience and judgement. Further explanation of these classifications and information is presented within the Marine Archaeology and Cultura Heritage Technical Report (see **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**). **Table 16-6** shows the breakdown of these classifications.

Table 16-6: Classifications of A2_h and A2_l anomalies within the Buchan ECC

Classification	Archaeological Category	Buchan ECC
Bright reflector	A2_l	1
Dark reflector	A2_l	41
Debris	A2_h	4
Debris Field	A2_h	2
Linear Debris	A2_h	5
Linear trend	A2_l	1
Magnetic	A2_h	4
Magnetic	A2_l	63
Magnetic Trend	A2_h	1
Magnetic Trend	A2_l	2
Mound	A2_l	2
Seabed disturbance	A2_h	2
Seabed disturbance	A2_l	14

16-46. The A3 category reflects a documented feature which was covered by the geophysical survey dataset but had no corresponding geophysical anomaly. This does not mean that there is necessarily no archaeological material there, as it may be buried in seabed sediments and so not picked up by the surveys.

16-47. Seabed features identified within the Buchan ECC are presented in **Figure 16-4a-m** below. Features designated as A1 (being either defined shipwrecks or anomalies judged to be of anthropological origin and of archaeological interest) and A3 (being the location of a historic record of a shipwreck, aircraft crash or other archaeological record) have been assigned a 100 m diameter Archaeological Exclusion Zone (AEZ) as a precautionary measure of embedded mitigation to ensure that there is no potential for any direct impact from the Proposed Offshore Development. Further information on the AEZs is in **Section 16.10.1** and more details on their operation is provided within **PMP 8: Proposed Offshore WSI** (Buchan Offshore Wind Ltd, 2025).



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4a: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ
- Landfall Area heritage receptors

Anomalies of archaeological potential

- A1 - Anthropogenic origin of archaeological interest
- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Seabed feature boundaries

- Debris field
- Dark reflector
- Seabed disturbance

Linear seabed features

- Dark reflector
- Linear debris
- Magnetic trend

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N

Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

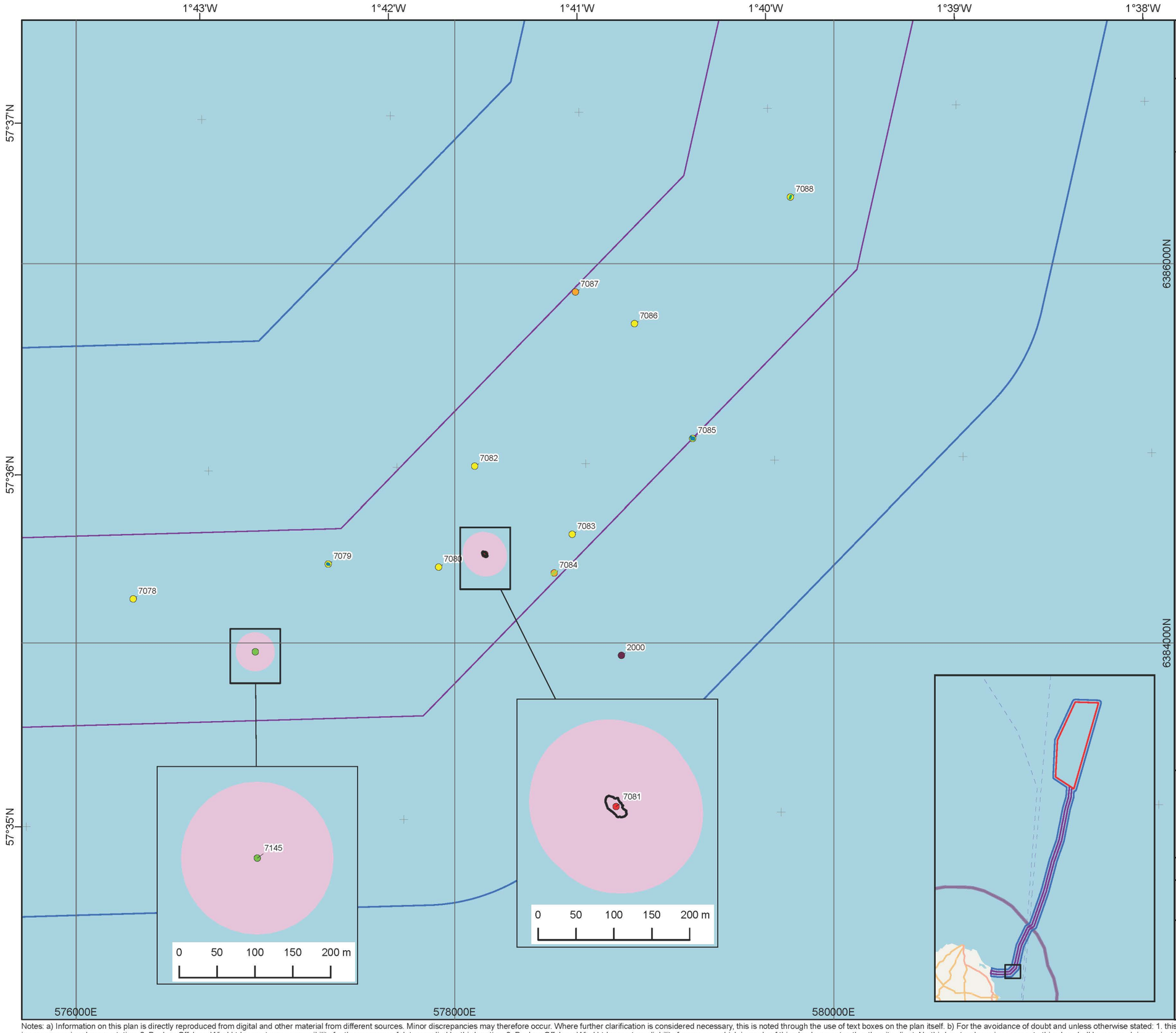
N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097a

Map Ref: 259970_Fig.04a

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4b: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A1 - Anthropogenic origin of archaeological interest
- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain
- A3 – Historic record of possible archaeological interest with no corresponding geophysical anomaly
- O1 – Outside horizontal footprint of geophysical survey dataset

Seabed feature boundaries

- Wreck
- Seabed disturbance

Linear seabed features

- Dark reflector
- Linear debris

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

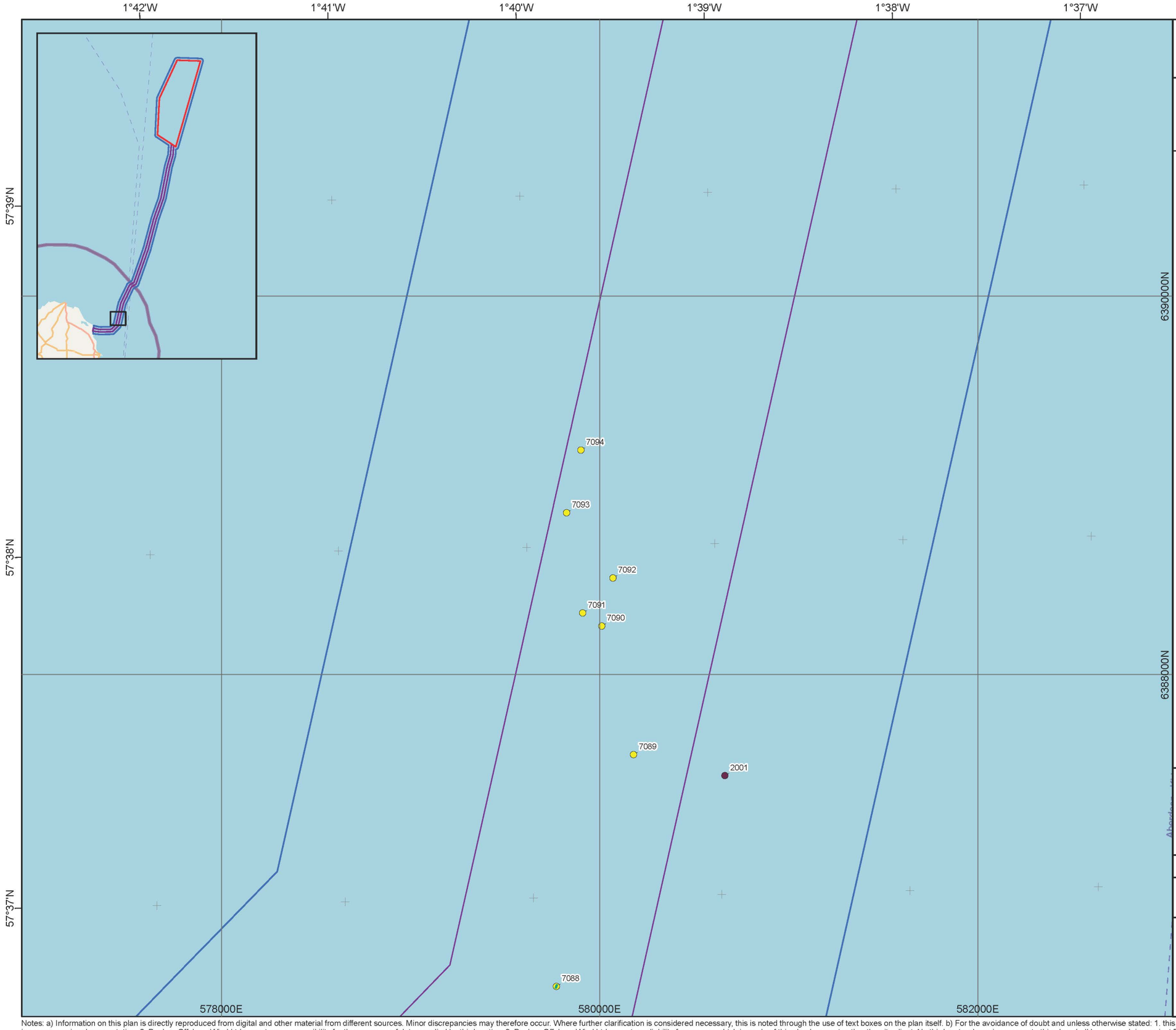
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097b
Map Ref: 259970_Fig.04b

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4c: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain
- O1 – Outside horizontal footprint of geophysical survey dataset

Linear seabed features

- Dark reflector

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097c
Map Ref: 259970_Fig.04c

BUCHAN OFFSHORE WIND

1°41'W 1°40'W 1°39'W 1°38'W 1°37'W 1°36'W 1°35'W

57°42'N 57°41'N 57°40'N

6396000N 6394000N

580000E 582000E 584000E

Aberdeen - Kirkwall - Lerwick

Aberdeen-Lerwick

7106 7105 7104 7101 7100 7099 7098 7097 7096 7095 2002

7148 7103 7102 7147 7146

0 50 100 150 200 m

Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4d: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A1 - Anthropogenic origin of archaeological interest
- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain
- O1 – Outside horizontal footprint of geophysical survey dataset

Seabed feature boundaries

- Wreck
- Debris field

Linear seabed features

- Dark reflector

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N

Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

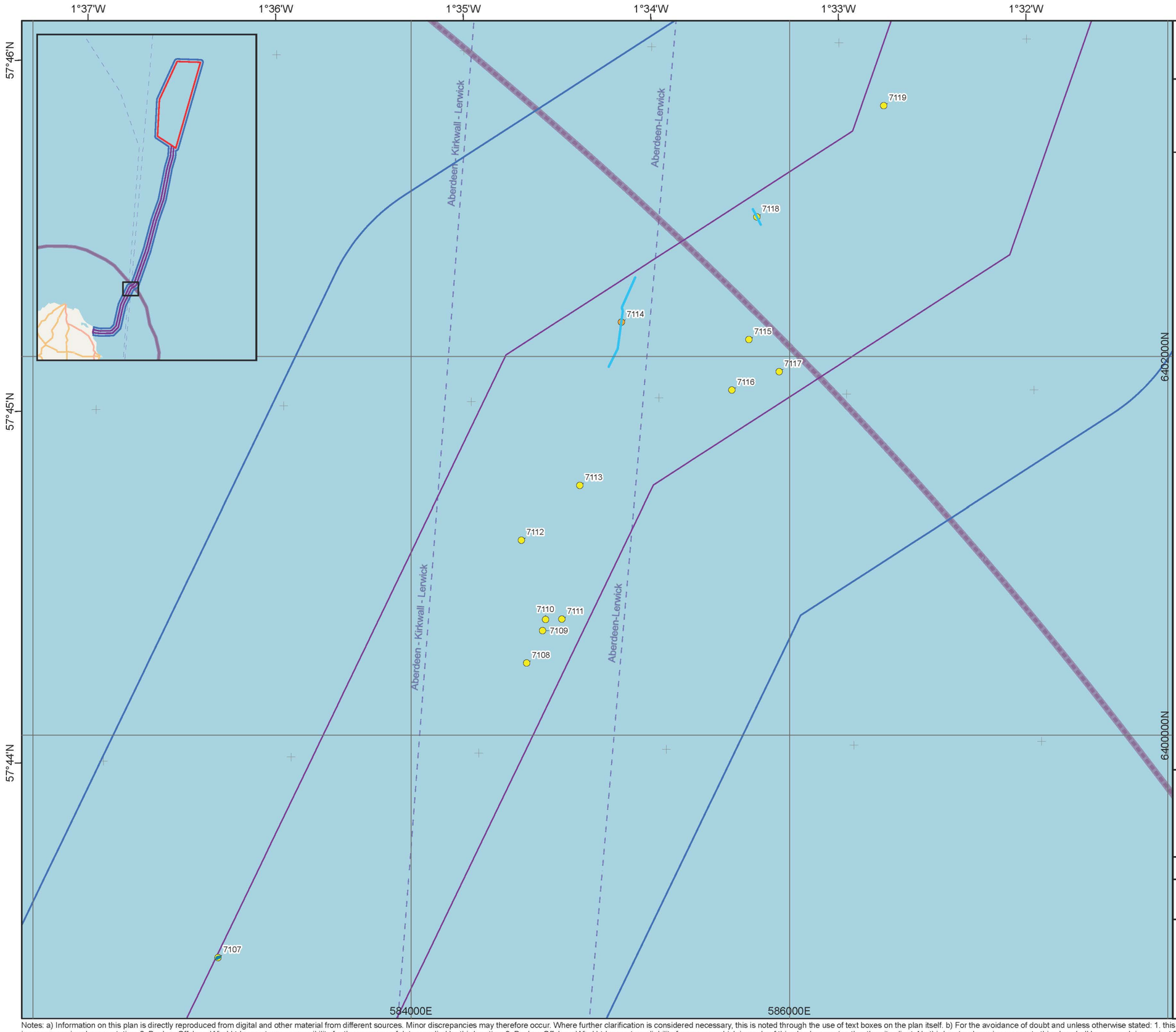
N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097d

Map Ref: 259970_Fig.04d

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4e: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Seabed feature boundaries

- Seabed disturbance

Linear seabed features

- Magnetic trend

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

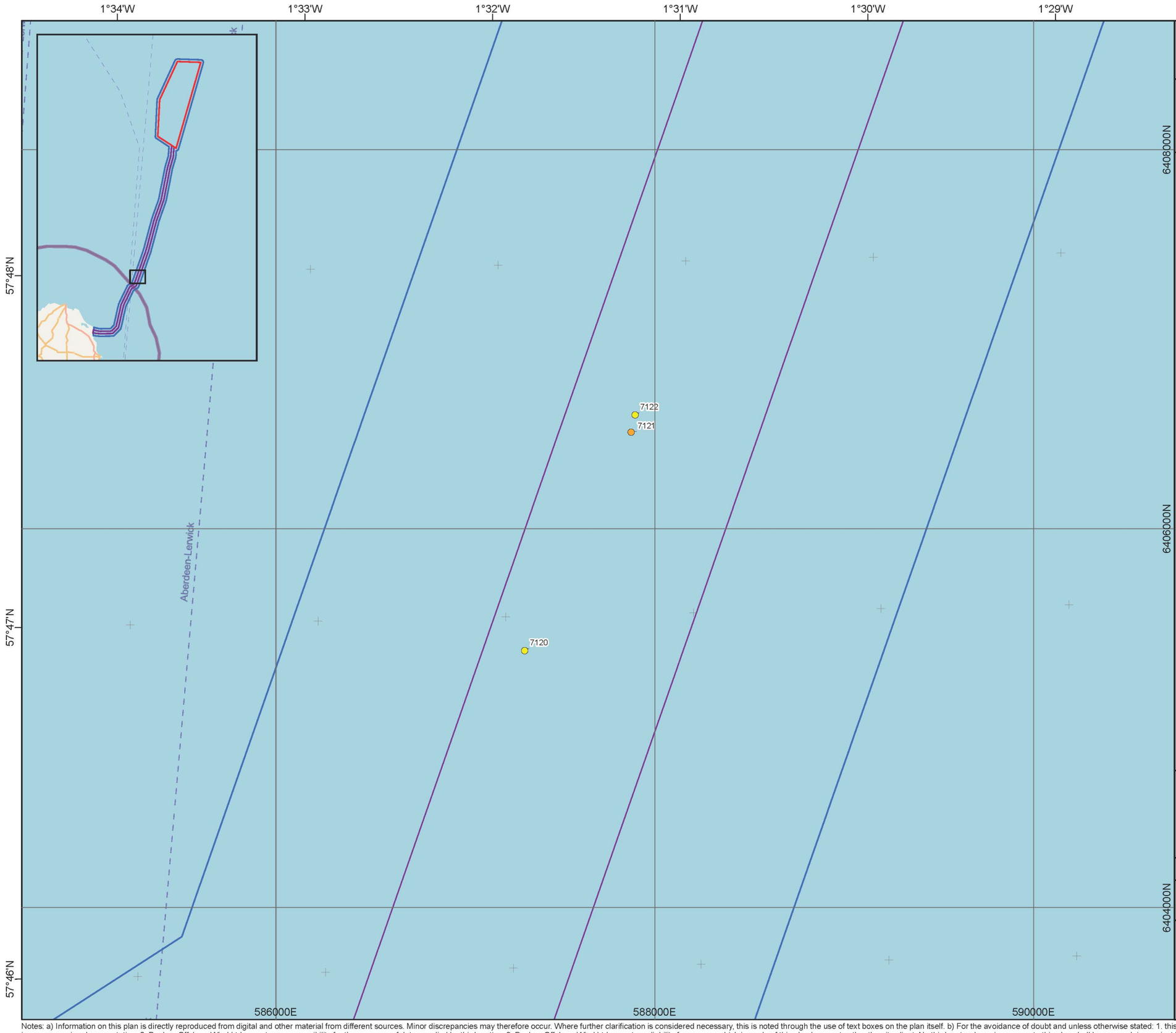
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097e
Map Ref: 259970_Fig.04e

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4f: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

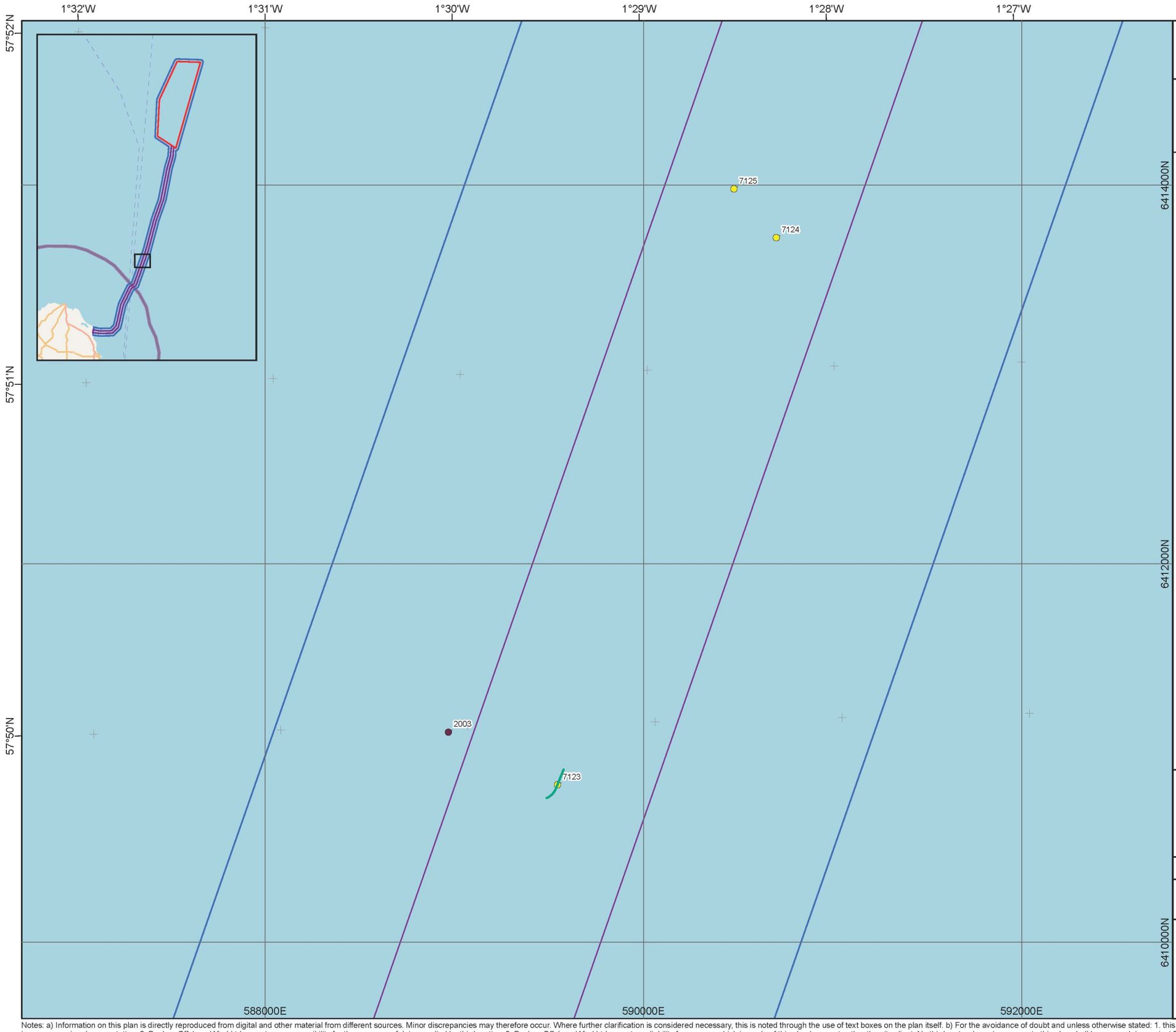
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097f
Map Ref: 259970_Fig.04f

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4g: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_I – Anomaly of possible anthropogenic origin but the interpretation is uncertain
- O1 – Outside horizontal footprint of geophysical survey dataset

Linear seabed features

- Dark reflector

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

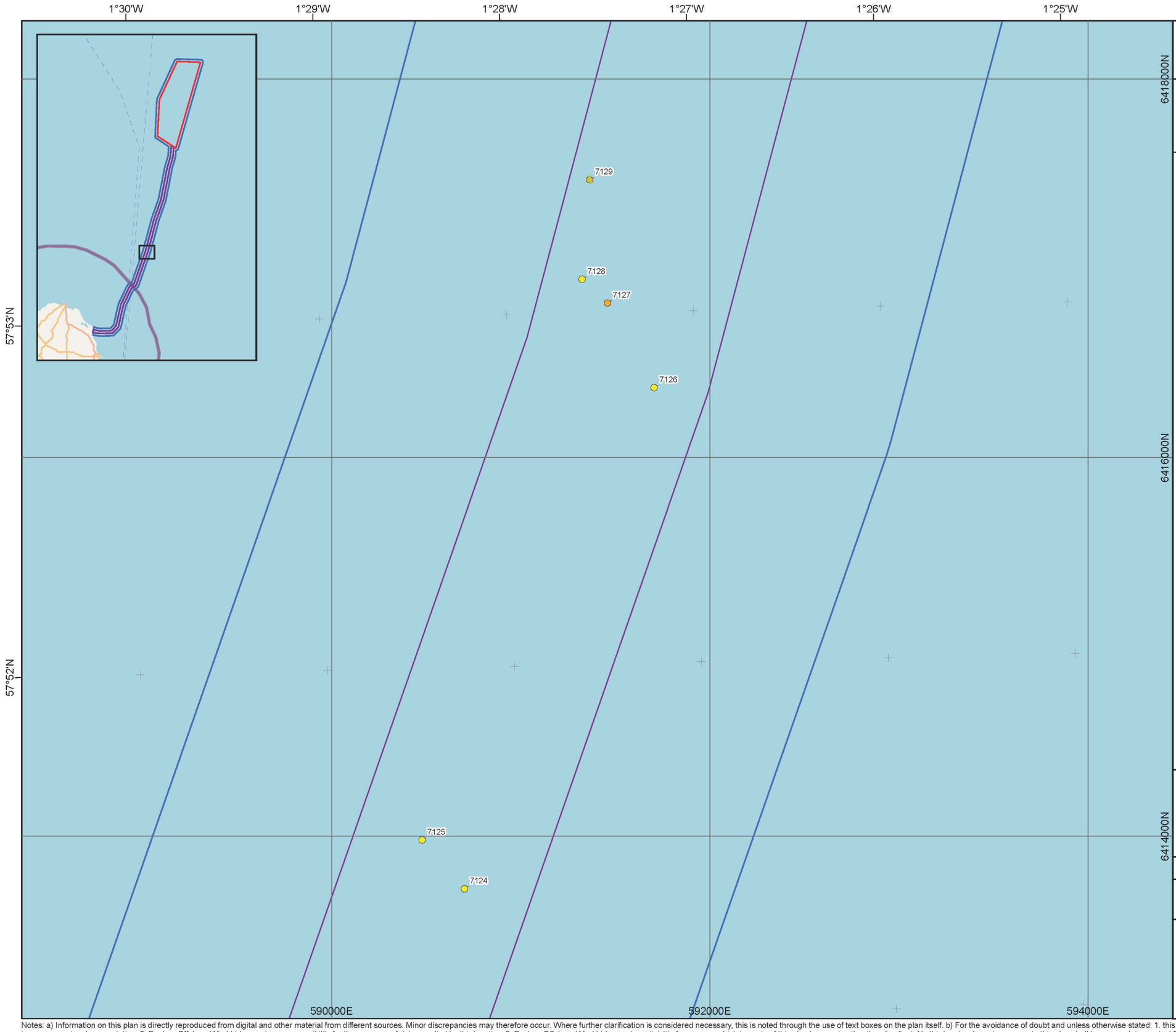
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097g
Map Ref: 259970_Fig.04g

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4h: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Linear seabed features

- Linear debris

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

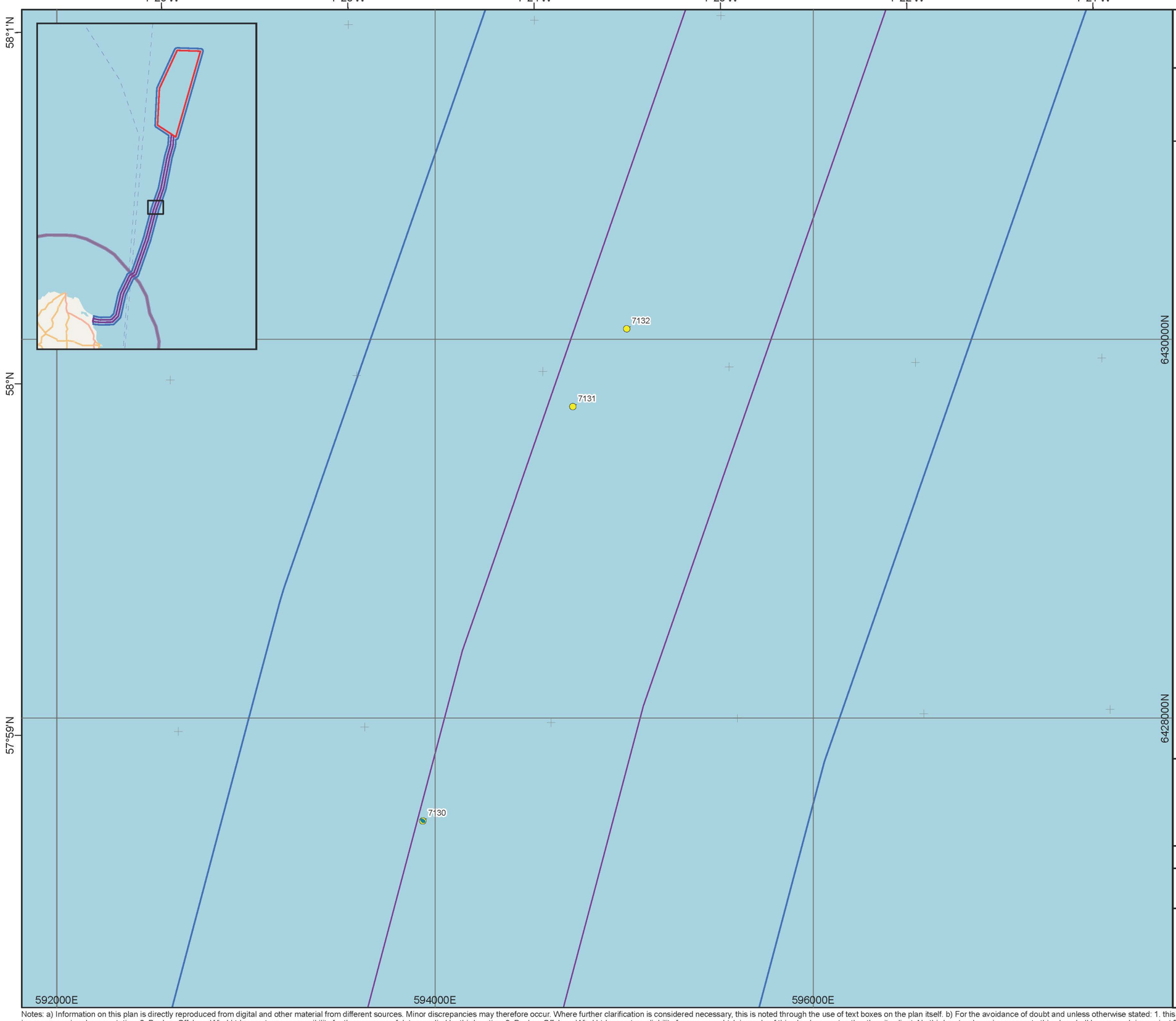
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097h
Map Ref: 259970_Fig.04h

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4i: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_I – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Seabed feature boundaries

- Seabed disturbance

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

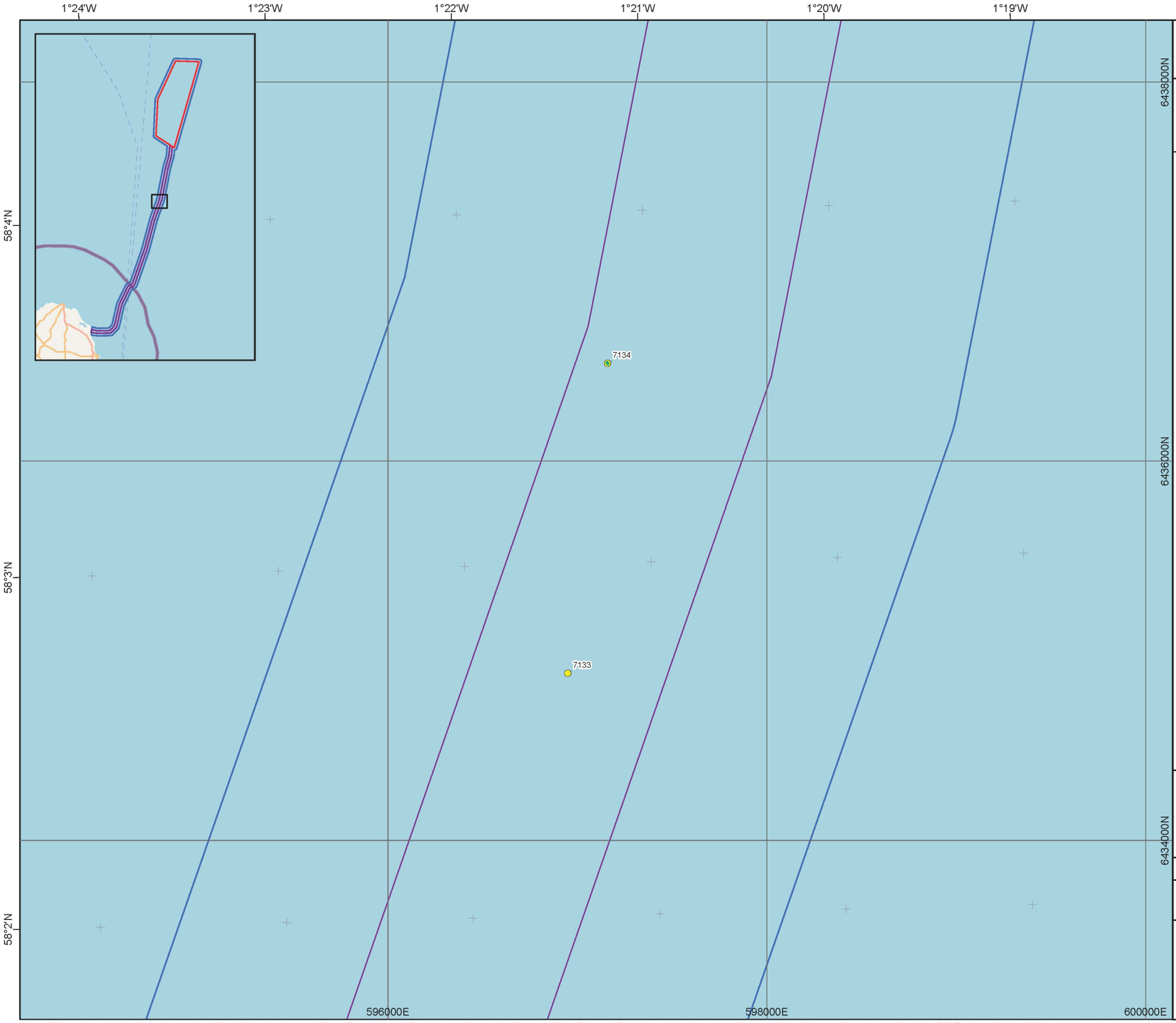
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097i
Map Ref: 259970_Fig.04i

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4j: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Seabed feature boundaries

- Dark reflector

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

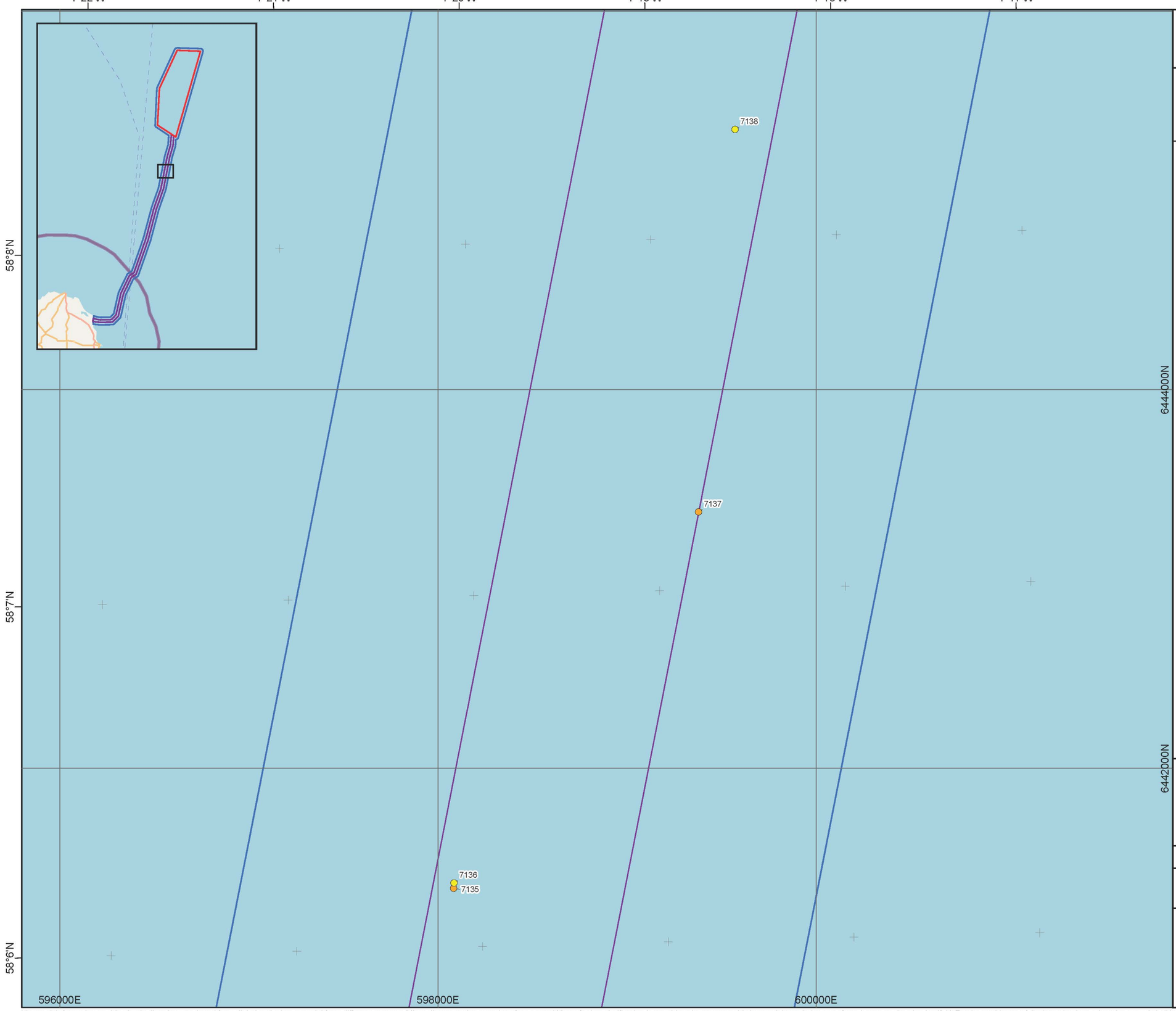
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097j
Map Ref: 259970_Fig.04j

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4k: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

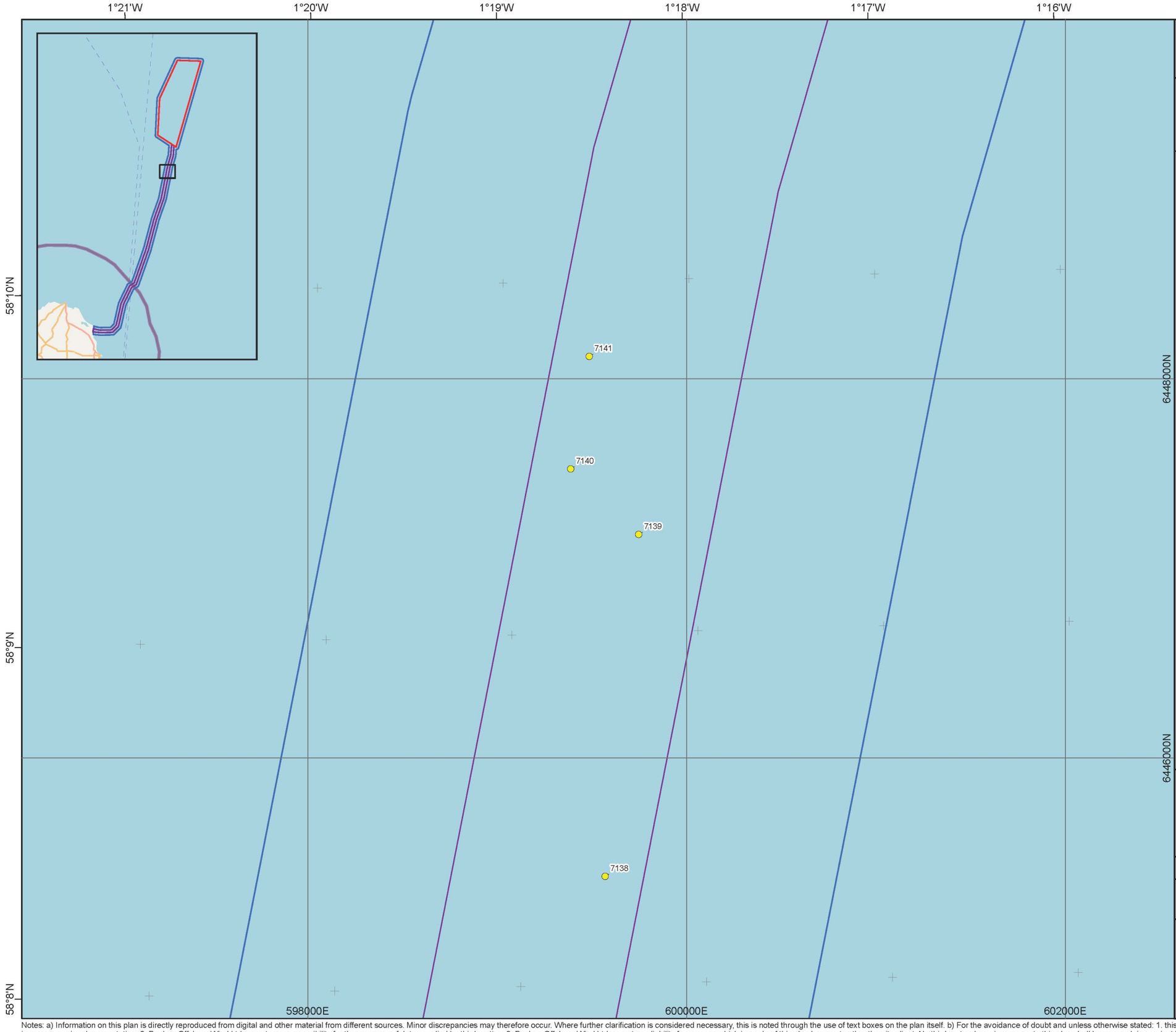
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097k
Map Ref: 259970_Fig.04k

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4l: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

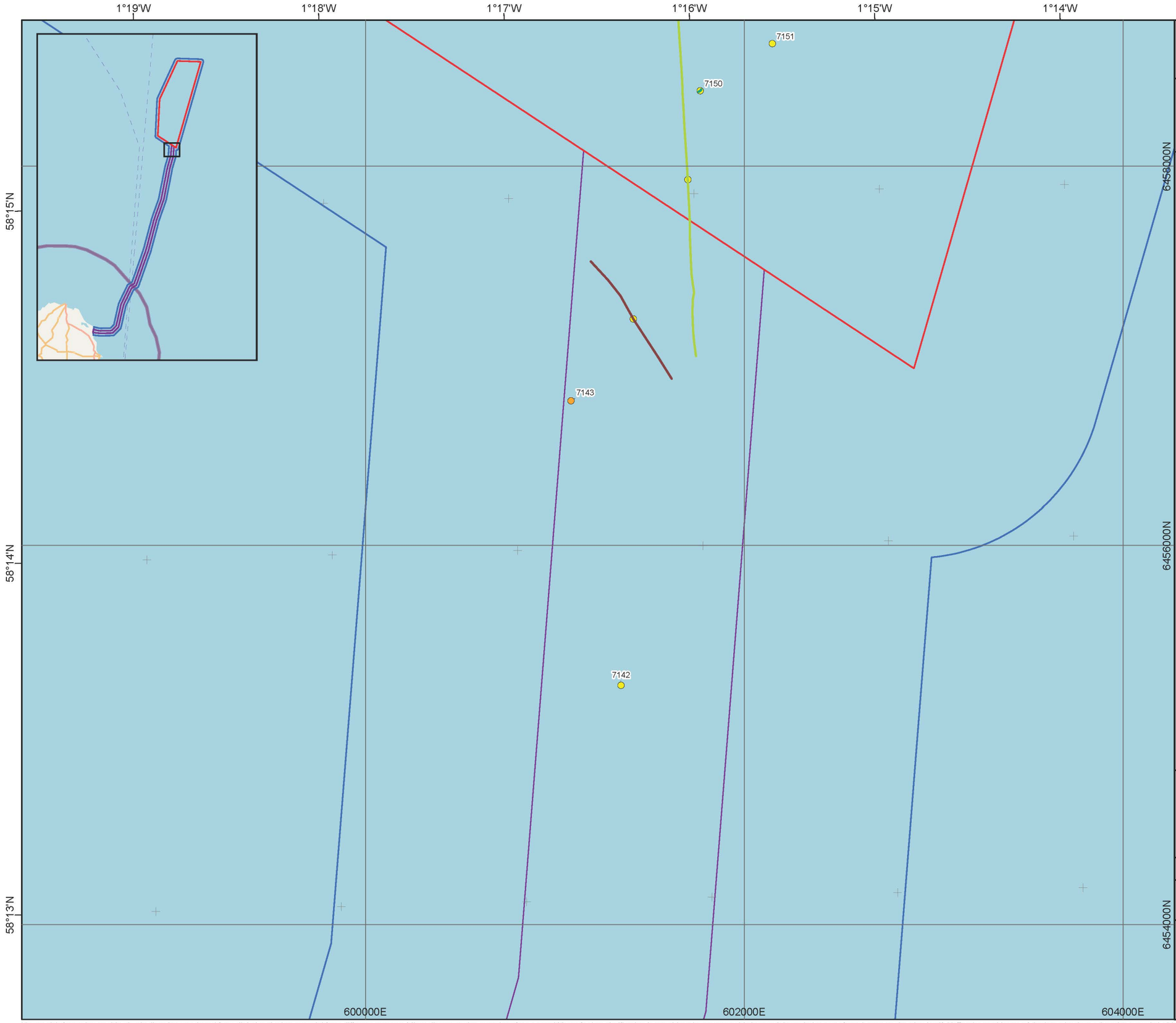
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097l
Map Ref: 259970_Fig.04l

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-4m: Anomalies of Archaeological Potential – Buchan ECC

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Linear seabed features

- Linear trend

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0097m
Map Ref: 259970_Fig.04m

BUCHAN OFFSHORE WIND

16.7.3.2 Array Area

16-48. The assessment of the geophysical data and documented sources within the Array Area and wider Study Area resulted in a total of 145 anomalies identified as being of possible archaeological interest.

16-49. Ten receptors identified in documented sources were present within the Study Area covering the Buchan Offshore Wind Farm (OWF) Array Area and a 1 km buffer. These have been compiled from the UKHO, Canmore and HER datasets and where possible enhanced following the archaeological assessment of marine geophysical data into gazetteers, with each feature allotted a unique ID number (see **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**). Of the ten receptors, four receptors were not identified in the geophysical survey data due to being outwith the extents of the geophysical survey area within the wider Study Area. These have been allotted a 2000s gazetteer number and an O1 category (see below). They include:

- a previously identified obstruction (**2004**) listed as a fisherman's fastener or foul ground at 100 m depth; and
- the previously identified wreck of the Norwegian steamship *Fredville* sunk in 1940 after it struck a mine while in ballast from Drammen to Methil (**2005**).

16-50. A wreck identified as modern and one fishing vessel wreck (UKHO 61436, **7221**) dating to the early 21st century was identified in the geophysical assessment. The reported location of this loss from the documented sources was at a position circa 500 m from the anomaly for the wreck, and so this reported position has been removed from the baseline in preference for the assessed anomaly location.

16-51. In total 143 anomalies with archaeological potential were identified in the archaeological assessment of the geophysical survey data within the Buchan OWF Array Area, some of which related to the individual documented source features. These were allotted a 7000s gazetteer number continuing on from the northernmost in the ECC gazetteer and categorised as follows:

- seven A1 anomalies (anthropogenic origin of archaeological interest);
- 16 A2_h anomalies (anomaly of likely anthropogenic origin but of unknown date; may be of archaeological interest of a modern feature);
- 114 A2_l anomalies (anomaly of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature);
- five A3 records (historic record of possible archaeological interest with no corresponding geophysical anomaly); and
- one U2 anomaly (known non-archaeological feature / feature of non-archaeological interest).

16-52. The seven A1 records include the identified extents of one wreck (**7176**): which had been identified in the UKHO record (UKHO 1375) as an unknown steamship wreck previously recorded on sonar surveys as being 80.4 x 22.6 x 6.6 m in size. This had five associated pieces of debris (**7175, 7177, 7178, 7179, 7180**) which were also assigned as A1. This group of anomalies were within the southern part of the Array Area.

16-53. The final A1 (**7197**) had not previously been identified in documentary sources at the surveyed location and was identified as a very large magnetic anomaly of 552 nT.

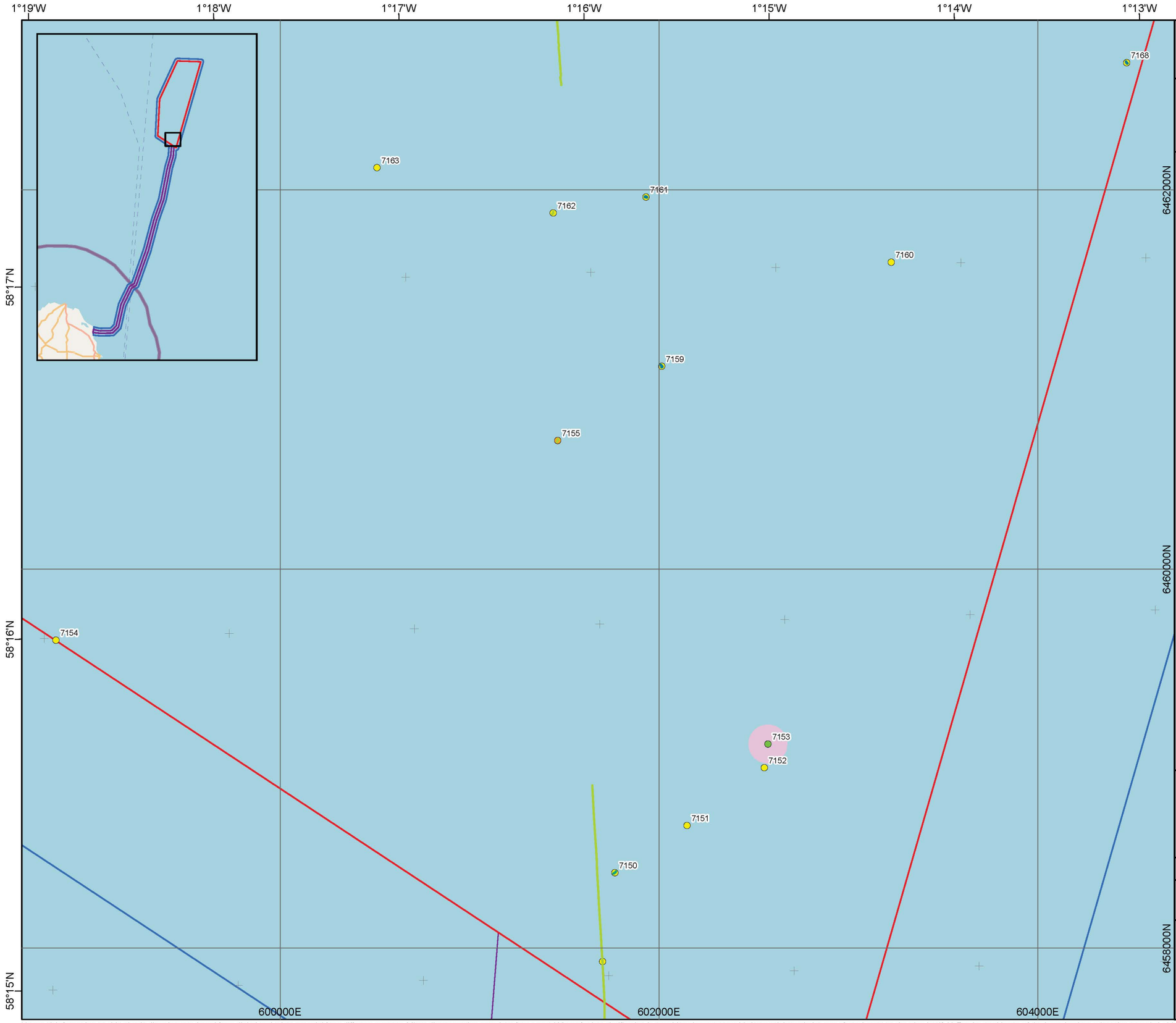
16-54. The 130 A2_h and A2_l categories are further classified by interpreted type, which further aids in assigning archaeological potential and importance, with differentiations done on professional experience and judgement. Some of the A2_l linear trends may relate to minelaying activities during the First World War, associated with both U-boats and surface minelayers such as the SMS *Meteor.* Further explanation of these classifications and information is presented within the marine archaeology and cultural heritage Technical Report (see **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**). **Table 16-7** shows the breakdown of these classifications.

Table 16-7: Classifications of A2_h and A2_l anomalies within the Buchan OWF array area

Classification	Archaeological Category	Buchan OWF Array Area
Bright reflector	A2_l	2
Dark reflector	A2_l	50
Debris	A2_h	2
Debris Field	A2_h	3
Linear Debris	A2_h	10
Linear Debris	A2_l	12
Linear Trend	A2_l	12
Magnetic	A2_h	1
Magnetic	A2_l	11
Mound	A2_l	3
Seabed disturbance	A2_l	24

16-55. The A3 category reflects a documented feature which was covered by the geophysical survey dataset but had no corresponding geophysical anomaly. This does not mean that there is necessarily no archaeological material there, as it may be buried in seabed sediments and so not picked up by the surveys.

16-56. Seabed features identified within the Buchan OWF array area are presented in **Figure 16-5a-m** below. AEZs have been included for the A1 and A3 receptors, further details are in **Section 16.10.1**.



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5a: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain
- A3 – Historic record of possible archaeological interest with no corresponding geophysical anomaly

Seabed feature boundaries

- Seabed disturbance

Linear seabed features

- Dark reflector
- Linear debris

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

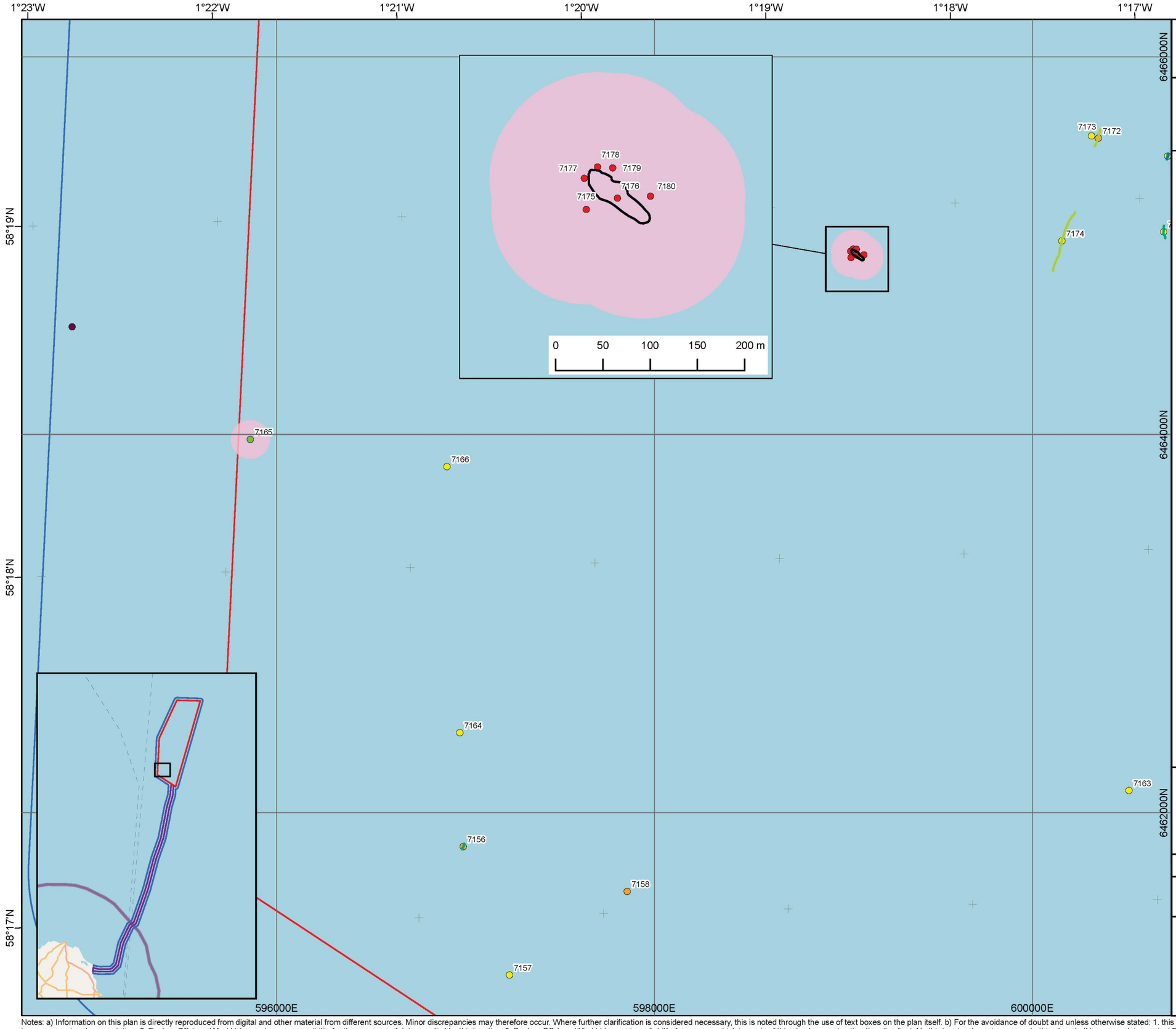
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098a
Map Ref: 259970_Fig.05a

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5b: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A1 - Anthropogenic origin of archaeological interest
- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain
- A3 – Historic record of possible archaeological interest with no corresponding geophysical anomaly
- O1 – Outside horizontal footprint of geophysical survey dataset

Seabed feature boundaries

- Wreck
- Seabed disturbance

Linear seabed features

- Dark reflector
- Linear debris

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N

Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098b

Map Ref: 259970_Fig.05b

BUCHAN OFFSHORE WIND

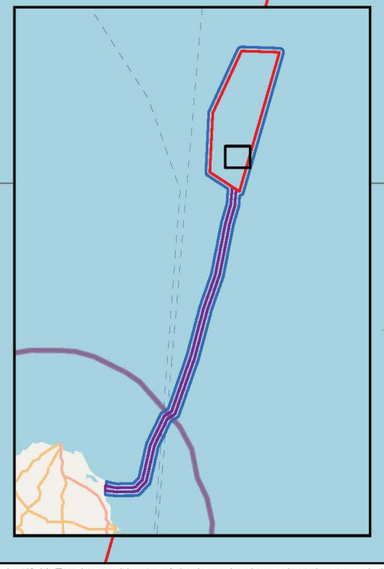
1°18'W 1°17'W 1°16'W 1°15'W 1°14'W 1°13'W 1°12'W

58°20'N 58°19'N 58°18'N

600000E 602000E 604000E

6466000N 6464000N

7186 7187 7190 7183 7184 7185 7173 7172 7170 7169 7171 7174 7167



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5c: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Seabed feature boundaries

- Seabed disturbance

Linear seabed features

- Dark reflector
- Linear debris

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098c
Map Ref: 259970_Fig.05c

BUCHAN OFFSHORE WIND

1°21'W 1°20'W 1°19'W 1°18'W 1°17'W 1°16'W

58°22'N

58°21'N

58°20'N

6470000N

6468000N

6466000N

596000E 598000E 600000E

7193 7192 7188 7191 7189 7186 7187 7190 7181 7183 7182

Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5d: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain
- A3 – Historic record of possible archaeological interest with no corresponding geophysical anomaly

Seabed feature boundaries

- Debris field

Linear seabed features

- Linear debris
- Linear trend

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N

Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

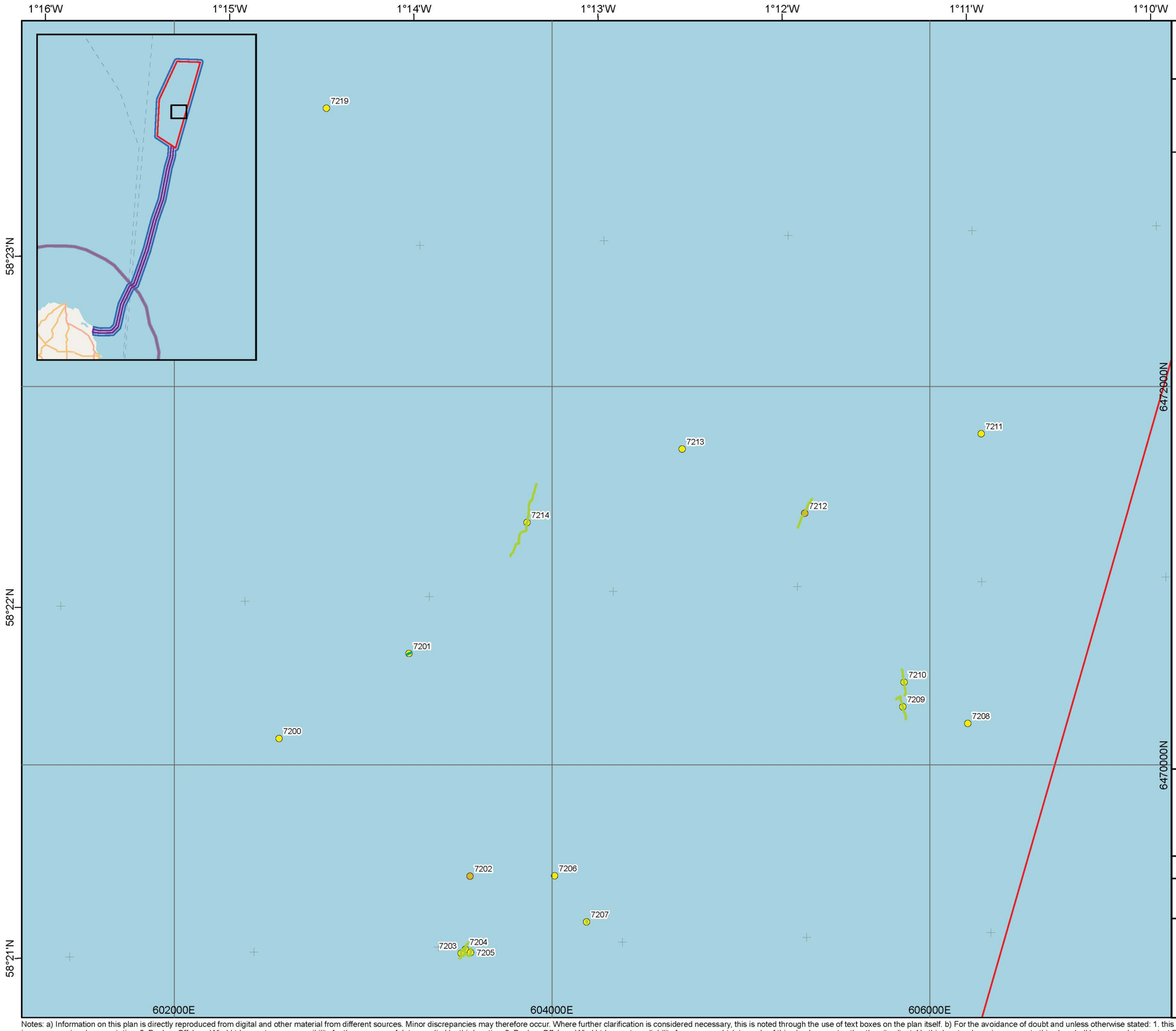
N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098d

Map Ref: 259970_Fig.05d

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5e: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Linear seabed features

- Dark reflector
- Linear debris

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098e

Map Ref: 259970_Fig.05e

BUCHAN OFFSHORE WIND

1°22'W
1°21'W
1°20'W
1°19'W
1°18'W
1°17'W
58°24'N
58°23'N
6474000N
6472000N
596000E
598000E
600000E
7215
7216
7217
7218
7195
7194
7196
7197
7198
7199

Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5f: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A1 - Anthropogenic origin of archaeological interest
- A2_I – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Linear seabed features

- Bright reflector
- Linear trend

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

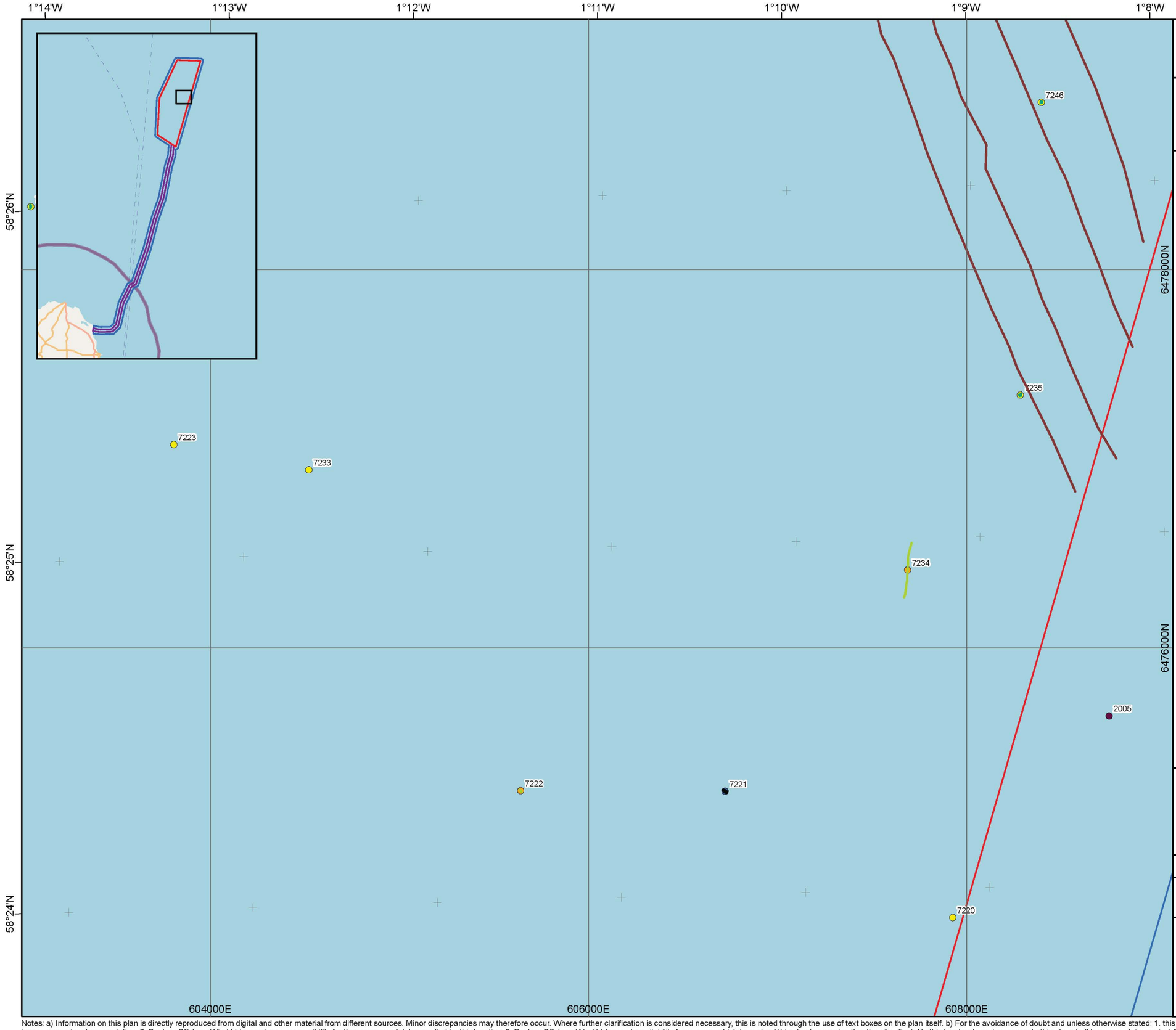
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098f
Map Ref: 259970_Fig.05f

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5g: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain
- O1 – Outside horizontal footprint of geophysical survey dataset
- U2 – Known non-archaeological feature

Seabed feature boundaries

- Wreck
- Dark reflector

Linear seabed features

- Linear debris
- Linear trend

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098g
Map Ref: 259970_Fig.05g

BUCHAN OFFSHORE WIND

1°19'W 1°18'W 1°17'W 1°16'W 1°15'W 1°14'W

58°27'N 58°26'N 58°25'N

6480000N 6478000N 6476000N

598000E 600000E 602000E

7243 7239 7241 7238 7236 7237 7232 7230 7231 7229 7224 7228 7225 7226 7227

Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5h: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Seabed feature boundaries

- Dark reflector
- Seabed disturbance

Linear seabed features

- Bright reflector
- Dark reflector
- Linear trend

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

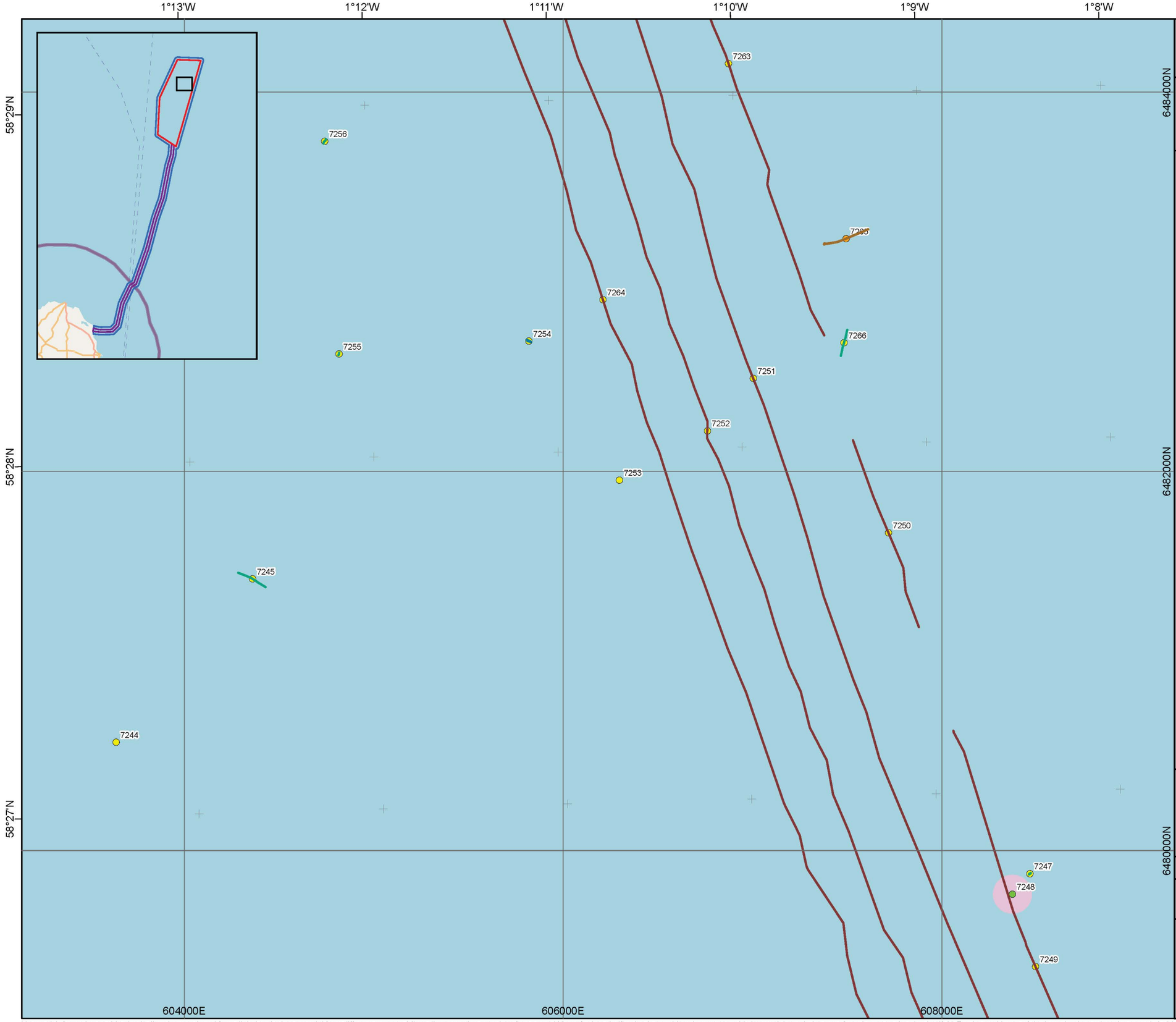
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098h
Map Ref: 259970_Fig.05h

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5i: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain
- A3 – Historic record of possible archaeological interest with no corresponding geophysical anomaly

Seabed feature boundaries

- Debris field
- Dark reflector
- Seabed disturbance

Linear seabed features

- Dark reflector
- Linear trend

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

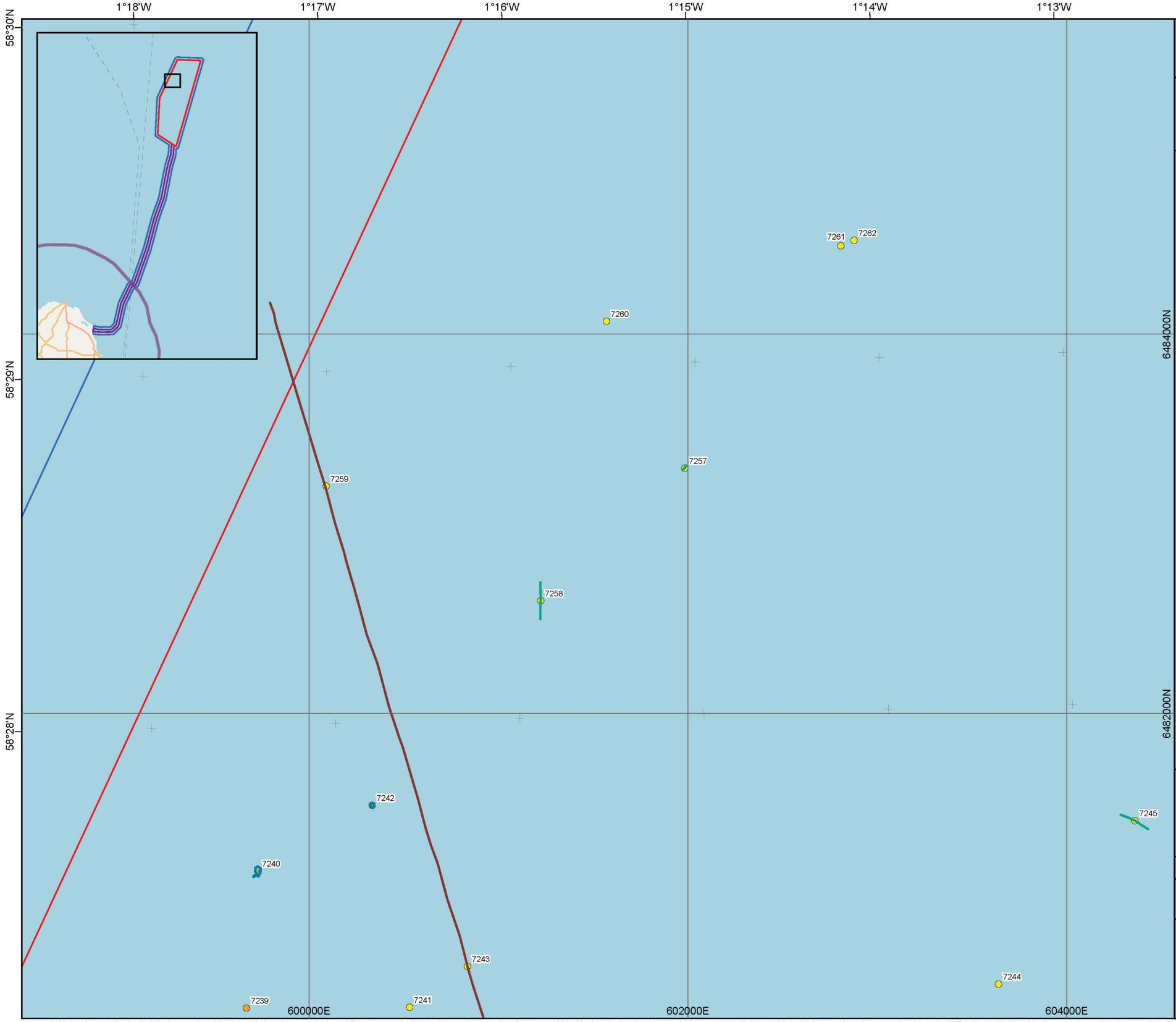
0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098i
Map Ref: 259970_Fig.05i

BUCHAN OFFSHORE WIND



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5j: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Seabed feature boundaries

- Seabed disturbance

Linear seabed features

- Dark reflector
- Linear trend

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098j
Map Ref: 259970_Fig.05j

BUCHAN OFFSHORE WIND

1°11'W
1°10'W
1°9'W
1°8'W
1°7'W
1°6'W
58°31'N
58°30'N
58°29'N
606000E
608000E
610000E
6486000N
6484000N
7280
7274
7273
7278
7275
7277
7276
7271
7270
7269
7268
7272
7267
7263
7265
7264
7254
7266
7251

Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5k: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_h – Anomaly of likely anthropogenic origin but of unknown date
- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain
- A3 – Historic record of possible archaeological interest with no corresponding geophysical anomaly

Seabed feature boundaries

- Debris field
- Seabed disturbance

Linear seabed features

- Dark reflector
- Linear trend

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098k
Map Ref: 259970_Fig.05k

BUCHAN OFFSHORE WIND

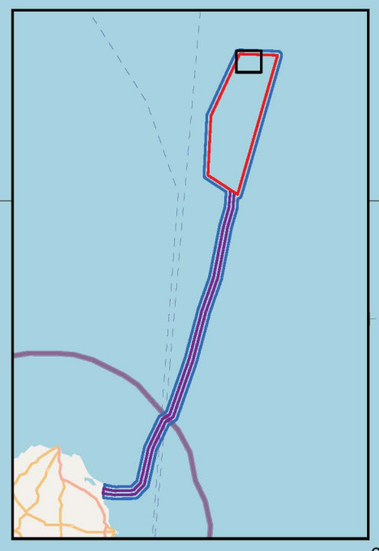
1°14'W 1°13'W 1°12'W 1°11'W 1°10'W 1°9'W 1°8'W

58°33'N
58°32'N
58°31'N

6490000N
6488000N

604000E 606000E 608000E

7285 7284 7287 7286 7289 7281 7282 7279 7280 7274 7273



Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5l: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Seabed feature boundaries

- Seabed disturbance

Linear seabed features

- Dark reflector
- Linear debris
- Linear trend

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098l
Map Ref: 259970_Fig.05l

BUCHAN OFFSHORE WIND

1°9'W
1°8'W
1°7'W
1°6'W
1°5'W
1°4'W
58°32'N
58°31'N
6490000N
6488000N
608000E
610000E
612000E
7289
7290
7283
7274
7273
7275

Project:

Buchan Offshore Wind EIA

Title:

Figure 16-5m: Anomalies of Archaeological Potential – Buchan Array Area

Key

- Study Area
- Array Area
- Export Cable Corridor (ECC)
- Recommended AEZ

Anomalies of archaeological potential

- A2_l – Anomaly of possible anthropogenic origin but the interpretation is uncertain

Seabed feature boundaries

- Seabed disturbance

Linear seabed features

- Linear debris

Scale @ A3: 1:20,000

Coordinate system: WGS 1984 UTM Zone 30N
Graticules: WGS 1984

0 0.25 0.5 0.75 1 km

N

Date: 19-06-25	Prepared by: KJF	Checked by: BS

EIA Ref No: BUC-C-MP-NP-0098m
Map Ref: 259970_Fig.05m

BUCHAN OFFSHORE WIND

16.7.4 Seabed Features: Potential

16-57. In addition, there is potential for encountering the following:

- unknown shipwreck material; and
- 20th century aircraft material, particularly from the Second World War.

16-58. A total of 65 recorded losses for various types of ship, craft or aircraft were recorded within the Study Area, all of which were recorded within the ECC, largely concentrated around the area immediately north of the Aberdeenshire coastline. The vast majority of these were from the 19th and 20th centuries, with only one wrecked prior to 1800. Further details can be found in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**.

16.7.5 Landfall Heritage Receptors

Four receptors within the Landfall Area between MHWS and MLWS were identified through both the documentary sources and the walkover survey, one of which was within the ECC and three within the vicinity of the ECC within the wider Study Area. These are shown on **Figure 16-4a-m**.

16-59. The lower parts of the Norwegian wooden barque *Excelsior* (**1003**)*,* stranded close to Rattray Head in 1881 with a cargo of phosphate rock, are present within the Landfall zone of the ECC. The wreck remains measure 40 x 8.5 m with multiple timber framing elements of the hull present above the beach material. The buried extent of the wreck is currently unknown, as is the extent of any buried debris around it.

16-60. Two of the receptors to the north of the ECC (**1001** and **1004**) relate to parts of the iron wreck of HMS *Erne,* a Royal Navy destroyer that stranded at Rattray Head in 1915 with no casualties and was extensively broken up during the following years. The remains largely relate to the lower hull plating and some fittings.

16-61. The final Landfall Area receptor is the Rattray Head lighthouse (**1002**) to the north of the Landfall which was designed by David Alan Stevenson for the Northern Lighthouse Board and built in 1885. It is still in use.

16-62. There is the potential for further unknown heritage sites to be located within the Landfall Area and the wider study area that were not visible on the intertidal sediment surface during the walkover of previously identified within the documentary sources. These assets may be of a maritime nature, relating to coastal infrastructure, or may represent individual artefactual finds.

16.7.6 Future Changes

16-63. The EIA Regulations require that a "*description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort, on the basis of the availability of environmental information and scientific knowledge"* is included within the EIAR. This reflects how the baseline relevant to marine archaeology and cultural heritage is expected to evolve without the Proposed Offshore Development.

16-64. If undisturbed by the Proposed Offshore Development, there would be no change to the baseline conditions discussed above beyond those caused by natural physical processes,

natural deterioration, as well as those associated with potential changes to the coastline or sediment processes caused by climate change (as outlined in HES's Climate Action Plan – HES 2020). Discussion of potential impacts from other developments are discussed within **Section 16.12** as part of the Cumulative Effects Assessment.

16-65. **Volume 2, Chapter 6: Marine Physical and Coastal Processes** concludes that based on current projections (based on UK Climate Projections -Met Office, 2018), soft and erodible shorelines across Scotland are at greater risk of erosion. This will be exacerbated by climate change and future sea level rise.

16.7.6.1 Climate Change Effects

16-66. Impacts of climate change on marine archaeology and cultural heritage could result from a number of inter-related factors, including wind, waves and storms, relative sea level rise and coastal flooding, increased seawater temperatures, changes in salinity and dissolved oxygen, ocean acidification and changes in ocean circulation. The considered climate variables on marine archaeology and cultural heritage include storm surges, wave height and frequency and sea level rise. Based on the UK Climate Projections (UKPC) 2018 data, there is potential for changes in the severity of future storm surge events (Met Office, 2018). Similarly, model predictions for wave height and frequency are variable along coastal locations and simulations suggest an overall decrease in mean significant wave height around most of the UK coastline. The baseline annual time-mean sea level is projected to increase over time (Met Office, 2018). Direct impact pathways from the above factors could lead to exposure and / or damage to coastal features, if they were present.

16-67. Other factors that could lead to indirect impact pathways are biologically related aspects of acidity, dissolved oxygen and changes to sea temperature. Based on Gregory et al. (2022), it was noted that a general trend of increasing water temperatures and ocean acidity may lead to a small increase in corrosion rates for metal elements of wreck sites; however this trend was on centennial timescales. Warmer seas, in conjunction with complex interactions of environment, physical, chemical and human factors may indirectly influence the expansion of species which degrade wooden wreck material (e.g. wood-boring organisms). However, it was noted that a decrease in dissolved oxygen is likely to decrease corrosion rates affecting metal elements of wreck sites and limit wood-degrading organisms.

16-68. As part of the Climate Change (Scotland) Act 2009, Historic Environment Scotland collated a Climate Action Plan detailing climate action ambitions for the historic environment for 2020-2025. This Plan sets out seven key areas of climate action including climate mitigation and climate adaptation. Due to projected increases in sea levels and storm surge which could result in increased frequency of coastal flooding and erosion, there could be significant impacts for coastal and heritage sites situated in proximity to the coast and on estuaries (discussed more extensively in **Volume 2, Chapter 18: Climate Change**).

16.7.7 Data Limitations and Assumptions

16.7.7.1 Historic Environment Records and Archives

16-69. The information used to compile this chapter derives from a variety of sources. With regards to the documentary sources, it is assumed that the HER data, as well as that derived from other secondary sources, are reasonably accurate.

16-70. The records held by the UKHO, Canmore, HER, and the other sources used in this assessment are not a record of all surviving cultural Heritage Assets, rather a record of the discovery of a wide range of archaeological and historical components of the marine historic environment. The information held within these datasets is not complete and does not preclude the subsequent discovery of further elements of the historic environment that are, at present, unknown. In particular, this relates to buried archaeological features.

16-71. The data supplied by the UKHO, Canmore and HER were initially obtained in March 2023, with updated searches obtained in August 2024 and at time of writing, are considered current for the purposes of this baseline assessment and EIA process.

16.7.7.2 Geophysical Data

16-72. For an archaeological assessment of the acquired geophysical data the high frequency SSS data is considered best for purpose. The majority of this assessment was undertaken using SSS mosaics, provided as part of the geophysical dataset. High frequency mosaics were available and utilised where quality was appropriate. Where lower quality high frequency (HF) mosaics were identified the low frequency (LF) were used. Further confidence in the assessment was provided by utilising the geophysical contact lists from the survey company alongside these SSS datasets. Additionally, anomalies of high potential were checked in the raw SSS data, for which high frequency data was available.

16-73. As overlap between the spatial extents of the geophysical survey datasets (Array Area, ECC and Nearshore section of the ECC) was generally considered good, there were no identified gaps between the survey areas (**Figure 16-1**). No geophysical survey was completed within the circa 1.5 km exclusion zone either side of the Ross pipeline that crosses the ECC circa 19 km south of where it joins the Array Area.

16-74. The presence of small ferrous material, more likely to be anthropogenic in origin, cannot be determined due to the relatively large line spacings of the Mag. survey acquired over the survey areas. Therefore, only significant ferrous objects (e.g. steel hulled wrecks) will be identified between lines of surveys, and smaller individual pieces of ferrous debris will not be detected. This means that there is potential for any ferrous debris to be buried or have little surface expression across the Proposed Offshore Development. Further geophysical surveys specifically for Unexploded Ordnance (UXO) clearance works within the construction footprint of the Proposed Offshore Development are expected to provide infilling of these areas during the post-consent stage and archaeological input into this has been outlined in the **PMP 8: Proposed Offshore WSI** (Buchan Offshore Wind Ltd, 2025).

16-75. Overall geophysical data quality is summarised in **Table 16-8** and further details, including the criteria for data quality can be found in **Volume 3, Appendix 16.1: Marine Archaeology Technical Report**. Average data quality allows for the confident identification of upstanding and partially buried wrecks, larger elements of debris/dispersed sites and larger individual anomalies, and is considered suitable for EIA-level assessment.

Table 16-8: Data quality summary for Buchan OWF datasets

Survey Details	Data Quality				
Area	**SBP**	**MBES**	**SSS Raw**	**SSS Mosaic**	**Mag.**
Nearshore ECC	N/A	Average	Average	HF* – Below Average LF**- Average	Average
Offshore ECC	Variable	Average	Average	HF – Average	Average
Array Area	Average	Average	Average	HF – Average LF – Average	Average

*HF: High Frequency. **LF: Low Frequency

16.8 METHOD FOR ASSESSMENT

16.8.1 Overview

16-76. Assessment of effects in this Chapter will follow the general approach outlined **in Volume 1, Chapter 5: EIA Methodology** of the EIAR. In addition, guidance, policy and legislation relevant to marine archaeology and cultural heritage as detailed in **Section 16.3** has been considered in the assessment of effects, in particular the following documents:

- Designation Policy and Selection Guidance (HES, 2019b);
- Characterising Scotland's Marine Archaeological Resource (Wessex Archaeology, 2012); and
- Ships and Boats: Prehistory to Present - Designation Selection Guide (English Heritage (now Historic England), 2012).

16.8.2 Criteria for Assessment

16-77. Determining the likely significance of effects is a two-stage process that involves defining the magnitude of the potential impacts and the sensitivity of the receptors. This section describes the criteria applied in this Chapter to assign values to the magnitude of potential impacts and the sensitivity of the receptors.

16-78. The terms used to define impact magnitude and receptor sensitivity for marine archaeology and cultural heritage are based on those described in further detail in **Volume 1, Chapter 5: EIA Methodology** of the EIAR.

16.8.2.1 Magnitude

16-79. The magnitude criteria for marine archaeology and cultural heritage are provided in **Table 16-9**. In determining magnitude, each assessment considered the spatial extent, duration, frequency, and reversibility of impact and these are outlined within the magnitude section of each assessment of impact (e.g., a duration of hours or days would be considered for most receptors to be of short-term duration, which is likely to result in a low magnitude of

impact). These terms are applicable for either negative or beneficial magnitude as laid out in **Table 16-11**.

Table 16-9: Impact Magnitude Criteria for Marine Archaeology and Cultural Heritage

Magnitude	Description
Negligible	Impact is highly localised and short term (days to weeks) with full rapid recovery expected to result in very slight or imperceptible changes to baseline conditions or the receptor. The impact is very unlikely to occur and if it does, will occur at very low frequency or intensity.
Low	Impact is localised and temporary or short term (days to weeks), leading to detectable change in baseline conditions or noticeable effect on small proportion of the receptor. The impact is unlikely to occur or may occur but at low frequency or intensity.
Medium	Impact occurs over a local to medium extent, with short to medium term (days to months) change to baseline conditions or affecting a moderate proportion of the receptor. The impact is likely to occur and/or will occur at a moderate frequency or intensity.
High	Impact occurs over a large spatial extent resulting in widespread, long term (years) or permanent changes in baseline conditions or affecting a large proportion of the receptor. The impact is very likely to occur and/or will occur at a high frequency or intensity.

16.8.2.2 Sensitivity

16-80. Receptor sensitivity is determined by considering a combination of value, tolerance, adaptability and recoverability. Marine archaeology and cultural heritage receptors cannot typically adapt, tolerate, or recover from physical impacts resulting in material damage or loss caused by development activities. Consequently, the sensitivity of each receptor is predominantly quantified only by its value. Within this EIAR, value is weighed by consideration of the potential for the receptor to demonstrate the following value criteria:

- Evidential value - deriving from the potential of a place to yield evidence about past human activity;
- Historical value - deriving from the ways in which past people, events and aspects of life can be connected through a place to the present. It tends to be illustrative or associative;
- Aesthetic value - deriving from the ways in which people draw sensory and intellectual stimulation from a place; and
- Communal value - deriving from the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory. Communal values are closely bound up with historical (particularly associative) and aesthetic values but tend to have additional and specific aspects.

16-81. With regards to assessing the value of shipwrecks, the following criteria were also used to assess a receptor in terms of its value (English Heritage (now Historic England), 2012):

- Period;
- Rarity;
- Documentation;
- Group value;
- Survival/condition; and
- Potential.

16-82. The sensitivity criteria for marine archaeology and cultural heritage receptors are provided in **Table 16-10**.

Table 16-10: Receptor Sensitivity Criteria for Marine Archaeology and Cultural Heritage

Sensitivity	Description
Very Low	Poor example and/or little or no potential to contribute to knowledge and understanding and/or outreach. Assets with little or no surviving archaeological interest.
Low	Below average example and/or low potential to contribute to knowledge and understanding and/or outreach including: • wrecks of ships and aircraft that do not have statutory protection or equivalent significance, but have low potential based on a formal assessment of their importance in terms of build, use, loss, survival and investigation; and • prehistoric deposits with low potential to contribute to an understanding of the palaeoenvironment.
Medium	Average example and/or moderate potential to contribute to knowledge and understanding and/or outreach including: • wrecks of ships and aircraft that do not have statutory protection or equivalent significance, but have moderate potential based on a formal assessment of their importance in terms of build, use, loss, survival and investigation; and • Prehistoric deposits with moderate potential to contribute to an understanding of the palaeoenvironment.
High	Best known, only example or above average example and or significant or high potential to contribute to knowledge and understanding and/or outreach. Receptors with a demonstrable international or national dimension to their importance are likely to fall within this category including: • wrecked ships and aircraft that are protected under the Marine (Scotland) Act 2010, Protection of Wrecks Act 1973, Ancient Monuments and Archaeological Areas Act 1979, and Protection of Military Remains Act 1986 with an international dimension to their importance, plus as-yet undesignated sites that are demonstrably of equivalent archaeological value; and • known submerged prehistoric sites and landscapes with the confirmed presence of largely in situ artefactual material or palaeogeographic features with demonstrable potential to include artefactual and/or palaeoenvironmental material, possibly as part of a prehistoric site or landscape.

16.8.2.3 Significance of Effect

16-83. By assigning and combining magnitude and sensitivity criteria, overall effect significance upon marine archaeology and cultural heritage receptors can be determined (**Table 16-11**).

Table 16-11: Effect Significance Matrix

		Negative Magnitude				Beneficial Magnitude			
		High	**Medium**	**Low**	**Negligible**	**Negligible**	**Low**	**Medium**	**High**
Sensitivity	**High**	Major	Major	Moderate	Minor	Minor	Moderate	Major	Major
	Medium	Major	Moderate	Minor	Negligible	Negligible	Minor	Moderate	Major
	Low	Moderate	Minor	Minor	Negligible	Negligible	Minor	Minor	Moderate
	Very Low	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

16-84. In cases where a range is suggested for the significance of effect, there remains the possibility that this may span the significance threshold (i.e. the range is given as minor to moderate). In such cases the final significance conclusion is based upon the technical experts' professional judgement as to which outcome delineates the most likely effect. Where professional judgement is applied to quantify final significance from a range, the assessment will set out the factors that result in the final assessment of significance. These factors may include the likelihood that an effect will occur, data certainty and relevant information about the wider environmental context.

16-85. For the purposes of this assessment the following assessment will be used:

- a level of residual effect of moderate or more will be considered a 'significant' effect in terms of the EIA Regulations; and
- a level of residual effect of minor or less will be considered 'not significant' in terms of the EIA Regulations.

16-86. Significant effects are therefore considered important in the decision-making process, whilst effects deemed as not significant warrant little, if any, weight in the decision-making process. Effects significance is defined in **Table 16-12**.

Table 16-12 Effect Significance Definitions

Effect Significance	Definition
Major	Very large or large changes in receptor condition, both negative or beneficial, which are likely to be important considerations at a regional or district level as they contribute to achieving national, regional or local objectives, or could result in exceedance of statutory objectives and/or breaches of legislation.
Moderate	Intermediate changes in receptor condition, which are likely to be important considerations at a local level.
Minor	Small changes in receptor condition, which may be raised as local issues but are unlikely to be important in the decision-making process.
Negligible	No discernible change in receptor condition.

16.9 MAXIMUM DESIGN SCENARIO

16-87. Details of the Proposed Offshore Development activities and key Project components is provided in **Volume 1, Chapter 4: Project Description**. As this assessment is using the Design Envelope approach, a maximum design scenario has been selected for each impact which would lead to the greatest impact for all receptors or receptor groups, when selected from a range of values.

16-88. **Table 16-13** presents the maximum design scenario for each impact associated with likely significant effects assessment on marine archaeology and cultural heritage, along with justification.

Table 16-13 Maximum Design Scenarios Considered for Impacts for Assessment of Likely Significant Effects on Marine Archaeology and Cultural Heritage

Likely Significant Impact Pathway	Phase[1]			Maximum Design Scenario	Justification
	C	O	D		
Loss or damage to known and unknown marine and Landfall Area historic environment and submerged prehistoric landscapes from direct impacts	x			Seabed Preparation: • Geophysical surveys; • UXO clearance; • Pre-lay grapnel run; • Boulder clearance; • Sandwave clearance. Construction/installation of: • Up to 70 floating Wind Turbine Generators (WTGs). Each WTG location requires maximum seabed area of 6,840m^2 for anchors and associated scour protection, so a total area of 478,800m^2; • Up to three Offshore Substation Platforms (OSPs) (fixed foundation). Each OSP location requires maximum seabed area of 20,600m^2 for fixed foundations and scour protection, so a total area of 61,800m^2. • 1 Intermediate Reactive Compensation (IRC) platform. The one IRC location requires maximum seabed area of 20,600m^2 for fixed foundations and scour protection. • inter-array cables totalling 210km within the Array Area with a seabed impact	Design scenario representing the maximum spatial area of impact associated with seabed activities including installation of the seabed anchors and substructure mooring lines, inter-array cables, pre-installation and installation of export cables and any required cable and scour protection measures. Any of the device designs, transmission cables and other infrastructure that impact the seabed have the potential to result in the damage/loss of known archaeological features and to unknown archaeological features, which may lie undiscovered on or below the surface or the seabed, if any are present. Similar effects may be expected from vessel anchoring systems that impact the seabed, or the removal of devices and other infrastructure in ways that disturb the seabed during decommissioning activities. The total for seabed impact area does not include areas of anchor line sweep above the seabed within the water column, which have the potential to impact archaeological material standing proud of the seabed as these have not been modelled. Effects are considered to be permanent. At Landfall the application of HDD will result in a lower level of disturbance.

[1] [1] C = Construction, O = Operation and Maintenance, D = Decommissioning

Likely Significant Impact Pathway	Phase[1]			Maximum Design Scenario	Justification
	C	O	D		
				width of up to 10m including cable protection, giving a total area of 2,100,000m^2; and • 3 export cables (within Array area and from Array area to landfall) totalling 364.5km with a seabed impact width of up to 10m including cable protection, giving a total area of 3,645,000m^2. • EC joint pit area is 1,400 m^2 • 2 pipeline crossings (Captain and Ross Gas Export Lines) by installed rock berm up to 21.4m wide.	
Indirect disturbance to marine historic environment assets caused by seabed preparation or installation of foundation anchors and mooring systems for floating WTGs, fixed foundations of OSPs/IRC, cable burial installation methods and/or cable protection	x			Seabed Preparation: • Pre-lay grapnel run; • Sandwave clearance. Construction/installation as detailed for Direct Impact above:	Design scenario representing the maximum spatial area of impact associated with seabed activities including all installation and pre-installation works. Indirect impacts to receptors could be caused by changes to the hydrodynamic and sedimentary regimes due to sediment redistribution during installation and application of protective measures resulting in changes to sediment transport regimes.
Loss or damage to known and unknown marine and Landfall Area historic environment and submerged prehistoric landscapes from direct impacts		x		Routine, Preventative and Corrective maintenance as detailed in **Volume 1, Chapter 4: Project Description**.	Design scenario representing the maximum spatial area of impact associated with Operation and Maintenance (O&M) activities including repair/replacement of foundation anchors, mooring lines, cables and cable/scour protection and the anchoring of vessels completing this work have the potential to result in the damage/loss of any archaeological features lying on the seabed. The numbers do not include areas of anchor line sweep above the seabed within the water column,

Likely Significant Impact Pathway	Phase[1]			Maximum Design Scenario	Justification
	C	O	D		
					which have the potential to impact archaeological material standing proud of the seabed as these have not been modelled. These would only be included in the impact areas for semi-submersible foundations Effects are considered to be permanent.
Indirect disturbance to marine historic environment assets caused by replacement and/or repair of installed infrastructure and/or additional cable or scour protection		x		Routine, Preventative and Corrective maintenance as detailed in **Volume 1, Chapter 4: Project Description**.	Indirect impact to known and potential maritime and aviation receptors could also be caused by potential seabed level changes (such as scour) and plume effects resulting in increased protection to, or deterioration through erosion.
Loss or damage to known and unknown marine and Landfall Area historic environment and submerged prehistoric landscapes from direct impacts			x	As Construction Phase	As with the construction phase, decommissioning activities have the potential to affect archaeological features either directly or indirectly. Impacts from decommissioning activities are predicted to be of similar nature to construction activities and would be no worse than those at Construction Phase, with floating WTGs towed to shore-based facilities for demolition and mooring lines and cables recovered by vessel. From this information, the Maximum Design Scenario for decommissioning would be the same or less than during construction, assuming the impact footprint is the same.

16.10 EMBEDDED MITIGATION AS PART OF THE PROPOSED OFFSHORE DEVELOPMENT

16-89. As part of the Proposed Offshore Development design process, embedded mitigation measures have been proposed to reduce the potential for impacts on environmental receptors. As there is a commitment to implementing these measures, they are inherently part of the design of the Proposed Offshore Development and have therefore been considered to be in place for the entirety of the impact assessment in **Section 16.11** (i.e., the determination of magnitude and therefore significance assumes implementation of these measures). These measures are considered standard industry practice for this type and scale of development. The embedded commitments relevant to marine archaeology and cultural heritage are presented in **Table 16-14** and **Volume 3, Appendix 1.3: Commitments Mitigation and Monitoring Register** which provides additional information on how these commitments are secured.

16-90. It should be noted that in some cases, the application of appropriate mitigation, such as an archaeological investigation of seabed anomalies prior to impact could lead to beneficial effects. For example, undertaking further geoarchaeological assessment of geotechnical samples and enhancing knowledge of the wider prehistoric landscape or discovery of a wreck of interest through assessment of geophysical data, and being able to share information (via publications/outreach events etc.) with the wider public could be of major beneficial significance. EM40 in the table below (development of **PMP 8: Proposed Offshore WSI** (Buchan Offshore Wind Ltd, 2025)) covers these future investigations.

Table 16-14 Embedded Mitigation Measures of Relevance to Marine Archaeology and Cultural Heritage

Reference	Embedded Mitigation Measure	Justification
EM9	Development of and adherence to a CaP (Cable Plan). The CaP will confirm planned cable routing, burial and any additional protection and will set out methods for post-installation cable monitoring. The CaP will be informed by a Cable Burial Risk Assessment (CBRA).	The CaP will confirm planned cable routing, burial and any additional cable protection at pre-construction design phase and will set out methods for post-installation cable monitoring as part of conditions of a Marine Licence.
EM45	Development of, and adherence to, a Design Specification and Layout Plan (DSLP).	The DSLP will confirm the layout and design parameters of the Proposed Offshore Development at pre-construction design phase as part of conditions of a Marine Licence.
EM1	Scour protection measures will be carefully designed to reduce impacts on the prevailing hydrodynamic, wave and sediment regimes. The use of non-burial cable protection measures will be minimised where reasonably practicable as it is the intention that cables will be buried where appropriate and reasonably practicable to do so.	Scour protection prevents scour of seabed sediments and exposure/damage to currently unknown or unidentified archaeological material. The extent of scour protection will be laid out in the CaP (EM9) as part of the pre-construction design phase.
EM8	Requirement for a Decommissioning Plan to be developed.	The DP will detail the measures for the decommissioning of the Proposed Offshore Development for the

Reference	Embedded Mitigation Measure	Justification
		decommissioning phase as part of the conditions of a Marine Licence relating to the decommissioning works..
EM40	Marine archaeological Written Scheme of Investigation (WSI) and a Protocol for Archaeological Discoveries (PAD) for items of archaeological interest would be agreed post-consent to manage potential impacts and recommend appropriate mitigation strategies for unexpected discoveries.	A proposed WSI inclusive of a PAD (**PMP 8: Proposed Offshore WSI** (Buchan Offshore Wind Ltd, 2025)) will be in place for the pre-construction design phase, construction phase and O&M phases, related to the conditions of the relevant Marine Licences for these works. This will include any recommended AEZs (for example in relation to seabed preparation, installation activities and installed infrastructure) and a PAD for reporting and investigating unexpected archaeological discoveries encountered during installation activities, with a Retained Archaeologist providing guidance and advising industry staff on the implementation of the PAD. The PAD provides a mechanism to comply with the Merchant Shipping Act 1995, including notification of the Receiver of Wreck, and accords with the Code of Practice for Seabed Developers, Joint Nautical Archaeology Policy Committee (JNAPC, 2006). The PAD also makes provision for the implementation of Temporary Exclusion Zones (TEZs) around areas of possible archaeological interest, for prompt archaeological advice, and, if necessary, for archaeological inspection of important features prior to further activities in the vicinity.
Included in EM1-3, EM9	Seabed preparation, installation activities and installed infrastructure will avoid any identified seabed heritage assets and anthropogenic geophysical anomalies identified as AEZs and described in the WSI.	A proposed WSI inclusive of a PAD will be in place for the pre-construction design phase and construction phases, and provide constraints mapping for the CaP and scour protection design. This will include any recommended AEZs (for example in relation to seabed preparation, installation activities and installed infrastructure) and a PAD for reporting and investigating unexpected archaeological discoveries encountered during installation activities, with a Retained Archaeologist providing guidance and advising industry staff on the implementation of the PAD.

16.10.1 Archaeological Exclusion Zones

16-91. 12 AEZs have been proposed as part of the assessment of the marine archaeology and cultural heritage baseline. They are detailed in **Table 16-15**.

Table 16-15: AEZs for the Proposed Offshore Development

ID	Name of Wreck	Archaeological Discrimination	Easting	Northing	AEZ Extent
1003	*Excelsior*	Wreck identified at landfall within intertidal zone	570112	6384360	50 m around location point
7039	Ferrous debris	A1	571587	6383769	100 m around location point
7081	Unknown wreck	A1	578158	6384468	100 m around wreck extents
7102, 7103, 7147	*Procyon*	A1	581982	6393974	100 m around wreck extents
7145	*Alcora* (Recorded wreck location)	A3	576946	6383953	100 m around location point
7153	*Bergensgut* (Recorded wreck location)	A3	602575	6459077	100 m around location point
7165	Recorded Obstruction	A3	595860	6463974	100 m around location point
7175, 7176, 7177, 7178, 7179, 7180	Unknown wreck and associated debris	A1s	599073	6464949	100 m around wreck extents and debris locations
7193	Unknown wreck (Recorded wreck location)	A3	596963	6468797	100 m around location point
7197	Ferrous debris	A1	598635	6471159	100 m around location point
7248	Unknown wreck (Recorded wreck location)	A3	608372	6479770	100 m around location point
7276	*Marna* (Recorded wreck location)	A3	606738	6485795	100 m around location point

16.11 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

16-92. The potential impacts arising from the construction, operation and maintenance, and decommissioning phases of the Proposed Offshore Development are listed in **Table 16-13** along with the maximum design scenario against which each impact has been assessed. An assessment of the likely significance of the effects of the Proposed Offshore Development on

the marine archaeology and cultural heritage receptors caused by each identified impact is given below.

16.11.1 Construction Phase

16.11.1.1 Loss or damage to known and unknown marine and Landfall Area historic environment and submerged prehistoric landscapes from direct impacts

16-93. Direct impacts to the marine archaeology and cultural heritage receptors identified in **Section 16.7** of this EIAR chapter and any potential archaeology within the study area are most likely to occur during the construction phase of the Proposed Offshore Development, due to the majority of new seabed impact being during this phase. Impacts resulting in negative effects upon archaeological assets as part of the construction phase are largely those involving contact with the seabed and/or the removal of seabed sediments.

16-94. In addition to the impacts on the seabed and seabed sediments, marine archaeological receptors with height above the seabed surface, such as shipwrecks, may be impacted by activities that occur within the water column, including pre-installation activities and mooring/anchor/cable installation activities.

16-95. Installation activities that may lead to direct physical impacts could include:

- Seabed preparation activities (pre-sweeping along export cable e.g. grapnel runs, sandwave clearance);
- Installation of floating lidar buoy, wave rider buoy and wave radar;
- Placement of moorings for floating WTG, including catenary, semi-taut and taut, and their potential movement on the seabed and water column close to the seabed for anomalies with height above the seabed;
- Foundation anchor installation and presence;
- Placement of scour protection;
- Installation of OSPs with fixed foundations;
- Installation of inter-array cables and associated cable protection;
- Installation of export cable and associated cable protection;
- Preparation and installation of HDD route inclusive of exit pits and installation equipment e.g. Jack Up Vessels (JUVs); and
- Vessel related impacts such as vessel anchoring.

16-96. The application of the embedded mitigation outlined in **Table 16-14** consisting of the implementation of AEZs around high value anomalies and avoidance of identified heritage assets by infrastructure will mean that direct impacts to known archaeological receptors would not occur.

16-97. Direct impacts to any as yet unidentified and unlocated potential archaeological receptors may occur at any point where development and related activities disturb the seafloor.

Magnitude of Impact

16-98. All direct impacts to marine cultural heritage are permanent. Once archaeological deposits and material, and/or the relationships between them and their wider surroundings, have been damaged or disturbed it is not possible to reinstate or reverse those changes.

16-99. For the cable burial along the ECC this is anticipated to be down to a maximum burial depth of 2.4 m (see **Volume 1, Chapter 4: Project Description**, with HDD anticipated at Landfall, which will be deeper than 2.4 m. Additionally the vast majority of the ECC lies beyond the 50 m contour beyond which no relevant palaeogeography receptors are expected. Therefore, should potential palaeogeographic features be impacted the footprint will be limited to the trench width and depth or the HDD cross-sections within the nearshore section of the ECC above the 50 m contour. Impacts on palaeogeography receptors, such as known and potential submerged landscape features, could result in impacts of medium magnitude before the application of embedded mitigation related to geoarchaeological surveys and assessments on this known feature and potential others as set out in **PMP8: Proposed Offshore WSI.** With the application of this mitigation the magnitude of such direct impacts on a landscape scale resource is considered to be low..

16-100. The magnitude of direct impacts as part of construction activities on known maritime and aviation receptors, if they were to occur, would be high. This applies to all known sites identified in **Section 16.7**. For potential intact aircraft wrecks and large shipwrecks it is considered likely that the presence of an engine or other iron objects would lead to a recognisable magnetic anomaly and so while any intact aircraft wreck may not have been identified as such it would have been identified as an anomaly (either an A2_h or A2_l). Through the application of embedded mitigation, including the implementation of AEZs, avoidance of identified maritime and aviation receptors, and additional investigation of anomalies that are not avoided , described in **Table 16-15** the magnitude of impacts is considered to be negligible.

16-101. The magnitude of direct impacts as part of construction activities on potential (currently unknown) maritime and aviation receptors excluding potential intact aircraft wrecks and large shipwrecks described above, if they were to occur, would be high. As above, the application of embedded mitigation as set out in **Table 16-14** (specifically the implementation of mitigation measures within the **PMP 8 Proposed Offshore WSI** (Buchan Offshore Wind Ltd, 2025) inclusive of a PAD covering the response to an unexpected archaeological discovery, its assessment and further actions to be taken to reduce impact on it) would mean that the magnitude of direct impacts on potential maritime and aviation receptors, and potential other seabed features which might be impacted as part of construction activities, if they were to occur, would be Negligible.

Sensitivity of Receptor

16-102. All seabed assets have the potential to be damaged or destroyed if they are directly impacted during the construction phase of the Proposed Offshore Development. Furthermore, all damage to archaeological sites or material is permanent and any recovery is limited to the stabilisation of surrounding sediments or re-burial of any surviving material so as to limit further impact. There is no potential for the recoverability of damaged or destroyed seabed assets if they are affected following a direct impact. As such, all wrecks,

aircraft, associated material and debris, and other maritime receptors are considered as having High sensitivity.

16-103. As the value of potential shipwrecks cannot be evaluated until they are discovered, potential wrecks of all periods should be expected to be of high value, in accordance with the precautionary approach. Aircraft wrecks are considered to have significance for remembrance and commemoration, but also have an implicit heritage value as historic artefacts, providing information on the aircraft itself and also the circumstances of its use and loss (English Heritage (now Historic England), 2002, p. 2). In addition, all UK aircraft that crash while in military service are protected under the Protection of Military Remains Act 1986, and therefore should be considered as designated sites until proven to be non-military. On this basis, all potential aircraft sites are of High sensitivity.

16-104. Derived artefacts and other isolated finds are likely to be of limited archaeological value as individual discoveries. However, the occurrence of a number of seemingly isolated objects within a particular area has the potential to indicate shipping routes or maritime battlegrounds, or possibly even indicate the presence of a hitherto unknown ship or aircraft wreck site. Isolated maritime finds are, therefore, regarded as being of Medium archaeological sensitivity. Isolated aircraft finds are considered as being of medium archaeological sensitivity as they may provide insight into patterns of historical aviation across the study area or indicate the presence of uncharted aircraft crash sites.

16-105. Based on the available assessed datasets, one feature of palaeogeographic interest was identified (see **Section 16.7.2**) within the Proposed Offshore Development, and it has been assessed as being of Medium sensitivity. Potential palaeogeographical features may be up to Medium sensitivity.

16-106. All A1 receptors, A3 receptors and currently unknown archaeological sites are considered as High sensitivity receptors.

16-107. For all A2_hand A2_l anomalies, there is insufficient data to assess the value of each individual anomaly at this point. As such, all A2 anomalies must be considered to potentially have archaeological value, to a greater or lesser degree and, in accordance with the precautionary principle are considered as High sensitivity assets.

Significance of Effect

16-108. Significant impacts have been evaluated according to defined parameters presented in the matrix in **Table 16-11**.

16-109. As the known maritime and aviation receptors and potential intact wrecks are considered to have high sensitivity, while the magnitude of impact is considered to be negligible, the effect of direct impacts through construction activities is considered to be Minor and Not Significant in EIA terms.

16-110. The medium sensitivity of known palaeogeographic receptors and the low magnitude of impact results in Minor effects which is Not Significant in EIA terms.

16-111. The medium sensitivity of potential maritime and aviation receptors excluding intact wrecks and the negligible magnitude of impact results in Negligible effects which is Not Significant in EIA terms.

16-112. The medium sensitivity of potential palaeogeographic receptors and the low magnitude of impact results in Minor effects which is Not Significant in EIA terms.

Table 16-16: Significance of effect from Construction phase direct impacts

Receptor	Sensitivity	Magnitude of Impact	Significance of effect
Known and potential maritime and aviation receptors (A1, A2 and A3 receptors)	High	Negligible	Minor
Known palaeogeographic receptors	Medium	Low	Minor
Potential maritime and aviation receptors excluding intact wrecks	Medium	Negligible	Negligible
Potential palaeogeographic receptors	Medium	Low	–Minor

Secondary Mitigation and Residual Effect

16-113. No secondary mitigation is required for this impact, as the impact is already Not Significant.

16.11.1.2 Indirect disturbance to marine historic environment assets caused by seabed preparation or installation of foundation anchors and mooring systems for floating WTGs, fixed foundations of OSPs/IRC, cable burial installation methods and/or cable protection

16-114. The indirect impacts upon the known and potential marine archaeological assets considered here are those which occur as a result of changes to hydrodynamic and/or sediment transport regimes, where these changes have occurred as a consequence of activities and installations associated with the construction activities. The impacts would lead to either the removal or addition of covering or supporting sediment around a receptor, leading to it either being more exposed to physical processes which could lead to its partial or complete loss over time, or leading to it becoming more extensively covered or buried, reducing the potential for physical processes to break down the material. These impacts may occur during or subsequent to the clearance of areas of seabed as part of the preparation works for foundation anchors for floating WTGs, fixed foundations for OSPs/IRC and cable routes but may also occur through sediment dispersal/deposition or the placement of non-burial scour and/or cable protection on the seabed. Construction activities that could potentially create indirect physical impacts include:

- Changes to the sediment transport regime due to seabed preparation activities for foundation anchors for floating WTGs, OSP and IRC fixed foundations and scour protection installation leading to changes in seabed sediment levels;
- Changes to the sediment transport regime due to seabed preparation for inter array cables, installation of inter array cables and associated cable protection leading to changes in seabed sediment levels;
- Changes to the sediment transport regime due to seabed preparation for export cables, installation of export cables, associated cable protection, and HDD exit pits leading to changes in seabed sediment levels; and

- Dispersal of increased suspended sediment from arisings/plumes from construction activities potentially resulting in changes in seabed sediment levels.

Magnitude of Impact

16-115. The following details on magnitude of impact are summarised from **Volume 2, Chapter 6: Marine Physical and Coastal Processes** as their magnitude is directly linked to the magnitude of impact on marine archaeology receptors.

16-116. Changes to Suspended Sediment Concentration (SSC) which would in turn lead to changes to seabed level are noted to be associated with the construction activities interacting with the seabed. These would include seabed preparation, OSP and IRC foundation installation and foundation anchor installation for floating WTGs. Seabed preparation is largely expected to be related to, boulder clearance, pre-lay grapnel run (both of which may result in a highly localised and transient increase in SSC) and potential pre-sweeping for sandwave clearance. The maximum distance of suspended sediment transport was identified as being related to pre-sweeping of sandwaves. The stronger tidal currents identified up to 1 km offshore were noted to be capable of transporting suspended sediments up to 10 km from potential dredging activities (for further detail please see **Volume 2, Chapter 6: Marine Physical and Coastal Processes)**, although the vast majority of sediments were not transported this distance (due to a substantial proportion being heavier material). The other activities were noted to have changes to SSC either within the immediate vicinity of the area of direct impact, or within the locale of disposal.

16-117. Changes to seabed level are noted to be a temporary increase of up to 12 cm related directly to the construction activities around jet trenching for cable installation. The other seabed sediment impact pathways (seabed preparation including sandwave clearance/pre-sweeping and foundation/anchor installation) had a maximum increase of up to 11 cm, which was again temporary and highly localised to the immediate area of the works. Beyond this the amount of sediment deposited reduces rapidly. As discussed above increases in seabed sediment and thereby increased burial have positive effects on seabed features as they afford higher levels of preservation. The chapter does not identify any significant effect which would lead to the lowering of seabed sediment levels, which would be the pathway for any negative indirect impacts.

16-118. All the magnitude of impacts identified related to the sediment transport regimes within **Volume 2, Chapter 6: Marine Physical and Coastal Processes** are negligible. They are described as temporary and localised. As the magnitude of impact of these regimes is directly linked to the magnitude of impact of such changes on known and potential marine archaeology receptors, even without the application of embedded mitigation to further reduce the magnitude of the impacts by removing them from the location of the receptors, the magnitude of impact on for all marine archaeology receptors from indirect impacts during construction are considered to be Negligible

Sensitivity of Receptor

16-119. Indirect impacts may affect marine archaeological baseline conditions where they result in the increased exposure or burial of marine archaeological assets. The increased exposure of marine archaeological assets has the potential to cause erosion and deterioration to the assets. Conversely, should assets be subject to increased sedimentation and burial, they may, in turn, benefit from conditions which afford higher levels of preservation.

16-120. Known and potential marine archaeology receptors may experience partial or total exposure, or covering by additional sediments as a result of changes to sediment transport regimes or hydrodynamic processes. These changes are noted to be local and temporary during the construction phase. The sensitivity of known and potential maritime or aviation archaeology receptors on or within the seabed to a temporary, local change prior to any embedded mitigation would be medium, as the change would either cause a temporary exposure of the receptor to additional erosion/chemical breakdown or would cause increase burial/coverage of sediments leading to a reduction in erosion and material loss.

16-121. Known and potential palaeogeographic features occur at a scale such that any local changes to them are likely to have minimal impact on the whole feature, meaning that their overall sensitivity to indirect impacts is very low, particularly as they are already buried beyond the identified magnitude of maximum removal. Similarly they would have a very Low sensitivity to any increase in sediment leading to additional burial as they are already buried.

Significance of Effect

16-122. Impacts have been evaluated according to defined parameters expressed as a matrix in **Table 16-11**.

16-123. Taking the medium sensitivity of known and potential maritime and aviation receptors to the identified potential for changes in sediment transport regimes and the negligible magnitude of impact, the effect of indirect impacts through construction activities is considered to be Negligible and Not Significant in EIA terms.

16-124. With a very low sensitivity to impacts and a negligible magnitude of impact to known and potential palaeogeographic receptors, the effect of indirect impacts through construction activities is considered to be Negligible and Not Significant in EIA terms.

16-125. All negligible or minor effects above are noted to be likely to be beneficial rather than negative due to the predicted increase in deposited sediments leading to increased burial of archaeological receptors.

Table 16-17: Significance of effect from Construction phase indirect impacts

Receptor	Sensitivity	Magnitude of Impact	Significance of effect
Known maritime and aviation receptors (A1, A2and A3 receptors)	Medium	Negligible	Negligible
Potential maritime and aviation receptors	Medium	Negligible	Negligible
Known and potential palaeogeographic receptors	Very Low	Negligible	Negligible

Secondary Mitigation and Residual Effect

16-126. No secondary mitigation is required for this impact, as the impact is already Not Significant.

16.11.2 Operation and Maintenance Phase

16.11.2.1 Loss or damage to known and unknown marine and Landfall Area historic environment and submerged prehistoric landscapes from direct impacts

16-127. Activities undertaken as part of the O&M phase have the potential to directly impact marine archaeology ,located on or under the seabed, resulting in their loss or the disruption of relationships between receptors and their wider surroundings.

16-128. Potential direct impacts on marine archaeology during O & M may arise from:

- Repair or replacement of foundation anchors and/or mooring lines for floating WTGs;
- Re-burial of cables;
- Repair/replacement of cables;
- Placement of additional cable protection; and
- Vessel related impacts such as vessel anchoring during any maintenance activities.

Magnitude of Impact

16-129. The magnitude for direct impacts due to O & M activities on known marine archaeology receptors, if they were to occur, would be high, similarly to the construction phase. However, as a result of the embedded mitigation, which remain applicable during O&M phase (see **Table 16-14**), avoidance through AEZs and the application of any further mitigation on receptors without AEZs in line with **PMP 8: Proposed Offshore WSI** (Buchan Offshore Wind Ltd, 2025), the magnitude of direct impacts to known archaeological receptors is considered to be negligible.

16-130. The magnitude of direct impacts on potential maritime and aviation receptors, and potential palaeogeographic features as part of operation activities, if they were to occur, would be high. Any impact upon marine archaeology, including any unknown archaeology would be permanent and irreversible. However, with the implementation of embedded mitigation and measures within **PMP 8: Proposed Offshore WSI** (Buchan Offshore Wind Ltd, 2025) including the ongoing use of AEZs around known archaeological receptors, archaeological input in any future surveys and a PAD to report on and record any unexpected archaeological discoveries, the magnitude of impacts is considered to be Negligible

Sensitivity of Receptor

16-131. Although the operation of the Proposed Offshore Development and associated maintenance works is anticipated to occur within areas already disturbed during the construction phase, seabed assets have the potential to be damaged or destroyed if they are directly impacted during the O&M phase without a continuation of the embedded mitigation. Furthermore, as noted above, all damage to archaeological sites or material is permanent and recovery is limited to stabilisation of surrounding sediments or re-burial of surviving material to limit further impact. There is no potential for the recoverability of any seabed assets if they are affected following a direct impact. As such, all wrecks, aircraft, and associated material and debris should be regarded as having high sensitivity.

16-132. Derived artefacts and other isolated finds are likely to be of limited archaeological value as individual discoveries. There is however the potential for the occurrence of a number of seemingly isolated objects within a particular area to indicate shipping routes or maritime battlegrounds, or possibly even indicate the presence of a hitherto unknown wreck site. Isolated maritime finds are therefore regarded as being of medium archaeological value. Isolated aircraft finds are considered as being of medium archaeological value as they may

provide insight into patterns of historical aviation across the study area or indicate the presence of uncharted aircraft crash sites, which as noted above may be protected sites under the Protection of Military Remains Act 1986. All isolated finds and derived artefacts are therefore considered to have a medium sensitivity.

16-133. Based on the available assessed datasets, one feature of palaeogeographic interest was identified within the nearshore section of the ECC (see **Section 16.7.2**). This feature, assessed as a submerged relic coastline of sand dunes, has potential for containing intact palaeolandscape features and in-situ sediments with archaeological potential to provide information on the regional coastline changes and is therefore considered to be of Medium sensitivity.

Significance of Effect

16-134. Significant impacts have been evaluated according to defined parameters expressed as a matrix in **Table 16-11**.

16-135. In areas where the impact has already occurred during the construction phase, there is unlikely to be further impact.

16-136. In areas that have not yet been impacted, the magnitude of impact on marine archaeology are anticipated to be negligible , on the basis that embedded mitigation and proposed WSI measures are implemented.

16-137. Taking the high sensitivity of known and potential maritime and aviation archaeology receptors and the negligible magnitude of impact, the effect of direct impacts through O&M activities is considered to be Minor and Not Significant in EIA terms.

16-138. Taking the medium sensitivity of potential maritime and aviation receptors excluding intact wrecks, and known and potential palaeogeographic receptors and the negligible magnitude of impact on these receptors, the effect of direct impacts through O&M activities is considered to be Negligible and Not Significant in EIA terms.

Table 16-18: Significance of effect from Operation and Maintenance phase direct impacts

Receptor	Sensitivity	Magnitude of Impact	Significance of effect
Known and potential maritime and aviation receptors (A1, A2 and A3 receptors)	High	Negligible	Minor
Potential maritime and aviation receptors excluding intact wrecks	Medium	Negligible	Negligible
Known and potential palaeogeographic receptors	Medium	Negligible	Negligible

Secondary Mitigation and Residual Effect

16-139. No secondary mitigation is required for this impact, as the impact is already not significant.

16.11.2.2 Indirect disturbance to marine historic environment assets caused by replacement and/or repair of installed infrastructure and/or additional cable or scour protection

16-140. The impacts upon known and potential offshore archaeological assets considered here are those which occur as a result of changes to hydrodynamic and sediment transport regimes leading to changes in seabed sediment levels (such as localised scour), where these changes have occurred as a result of the presence of the anchors for floating WTGs, fixed foundations for OSPs and IRC, inter-array cables and export cables, and the associated cable and scour protection measures. The impacts would lead to either the removal or addition of covering or supporting sediment around a receptor, leading to it either being more exposed to physical processes which could lead to its partial or complete loss over time, or leading to it becoming more extensively covered or buried, reducing the potential for physical processes to break down the material. Such impacts would therefore lead to increased protection to, or deterioration of, archaeological receptors. These include:

- Changes to the sediment transport regime due to the presence of structures on the seabed (anchors for floating WTGs and OSP/IRC fixed foundations) leading to changes in seabed sediment levels; and
- Changes to the sediment transport regime associated with inter array/export cable reburial, repair/replacement and additional cable protection leading to changes in seabed sediment levels.

Magnitude of Impact

16-141. **Volume 2, Chapter 6: Marine Physical and Coastal Processes** identifies impacts on seabed morphology by structures on or close to the seabed as having the potential for an increase in sediment accumulation around areas of cable protection, and the potential for scour around installed seabed infrastructure. Both of these changes are predicted to be restricted to the local area around installed infrastructure and to a short period after installation until the sediment levels stabilise. The use of scour protection material within the embedded mitigation will mitigate the potential for negative impacts from scour. Therefore the main sediment change would be a slight increase in sediment deposition around cable protection until an equilibrium is reached, which is considered to be beneficial, as it is in effect protecting receptors as presently or afford protection to a greater extent.

16-142. Overall therefore, the magnitude of indirect impacts to marine archaeological receptors, inclusive of known and potential maritime and aviation receptors and known and potential palaeogeographic features, during operation and maintenance is expected to be low without the application of embedded mitigation, as all the magnitudes of impacts identified related to the sediment transport regimes within **Volume 2, Chapter 6: Marine Physical and Coastal Processes** are low due to slow tidal currents for the majority of the Proposed Offshore Development, which are the main drivers of scour formation. From this the significance of effect of these in **Volume 2, Chapter 6 Marine Physical and Coastal Processes** has been assessed as minor and not significant. With the application of the embedded mitigation of scour protection and AEZs the impact is expected to be negligible as these methodologies either prevent the impact or keep it remote from the location of receptors. As discussed above, the impact is expected to be Beneficial due to a slight increase in sedimentation.

Sensitivity of Receptor

16-143. Indirect impacts may affect marine archaeological baseline conditions where they result in the increased exposure or burial of marine archaeological assets. The increased exposure of marine archaeological assets has the potential to cause erosion and deterioration to the

assets. Conversely, should assets be subject to increased sedimentation and burial, they may benefit from conditions which afford higher levels of preservation.

16-144. The sensitivity of known and potential maritime or aviation archaeology receptors on or within the seabed to the removal of supporting sediments through increased scour prior to any embedded mitigation would be medium, as the change would be local in extent to the immediate surroundings of scour protection or either cause partial or total exposure of the receptor to additional erosion/chemical breakdown or would cause increase burial/coverage of sediments leading to a reduction in erosion and material loss.

16-145. Known and potential palaeogeographic features occur at a scale such that any local changes to them are likely to have minimal impact on the whole feature, meaning that their overall sensitivity to indirect impacts is very low, particularly as they are already buried beyond the identified magnitude of maximum removal. Similarly they would have a very low sensitivity to any increase in sediment leading to additional burial as they are already buried.

Significance of Effect

16-146. Significant impacts have been evaluated according to defined parameters expressed as a matrix in **Table 16-11**.

16-147. Taking the medium sensitivity of maritime and aviation receptors to continued sediment deposition and the negligible magnitude of impact, the effect of indirect impacts through O&M activities is considered to be Negligible and Not Significant in EIA terms.

16-148. With a very low sensitivity to impacts and a negligible magnitude of impact to known and potential palaeogeographic receptors, the effect of indirect impacts through O&M activities is considered to be Negligible and Not Significant in EIA terms.

Table 16-19: Significance of effect from Operation and Maintenance phase indirect impacts

Receptor	Sensitivity	Magnitude of Impact	Significance of effect
Known maritime and aviation receptors (A1, A2 and A3 receptors)	Medium	Negligible	Negligible
Potential maritime and aviation receptors	Medium	Negligible	Negligible
Known and potential palaeogeographic receptors	Very Low	Negligible	Negligible

Secondary Mitigation and Residual Effect

No secondary mitigation is required for this impact, as the impact is already Not Significant.

16.11.3 Decommissioning

16.11.3.1 Loss or damage to known and unknown marine historic environment and submerged prehistoric landscapes from direct impacts

a. As with the construction phase (see **Section 16.11.1**), decommissioning activities have the potential to affect archaeological assets directly within the footprint of the installed infrastructure. The footprint of direct impact for decommissioning is expected to be the same as for construction and so there is not predicted to be any additional direct impact outside areas already impacted during the construction phase. The

operational lifetime of the Proposed Offshore Development is expected to be 35 years. All infrastructure above the seabed within the Proposed Offshore Development Area is anticipated to be removed during decommissioning. The methodology for doing so will be based upon regulations/practices and available technology at the time (See **Volume 1, Chapter 4: Project Description)**.

Magnitude of impact

16-149. The magnitude of impact for decommissioning on all known and potential marine archaeology receptors is expected to be no worse or less than that of the construction phase. With the continuation of embedded mitigation the magnitude of impact on known and potential maritime and aviation archaeology receptors would be negligible, while the maximum magnitude of impact on known and potential palaeogeographic receptors would be Low.

Sensitivity of Receptor

16-150. As impacts from decommissioning would be no worse than those in construction the sensitivity of receptors to these impacts would be the same as construction: High for known maritime and aviation archaeology receptors; Medium for known and potential palaeogeographic receptors and Medium for potential maritime and aviation archaeology receptors.

Significance of Effect

16-151. The significance of effect for direct impacts during the decommissioning phase will be no worse than those in the construction phase considering embedded and secondary mitigation proposals set out in PMP 8 Proposed Offshore WSI, discussed in **Section 16.11.1**, all of which were Not Significant in EIA terms.

16-152. If any of the Proposed Offshore Development structures are left in-situ any likely significant effects from decommissioning them will be avoided.

16.11.3.2 Indirect disturbance to marine historic environment assets caused by decommissioning activities

16-153. Similar to those impacts assessed during the construction phase (see **Section 16.11.2**), during decommissioning impacts may occur as a result of changes to hydrodynamic and sediment transport regimes, where these changes have occurred as a consequence of activities and removal of structures associated with decommissioning activities. The complete removal of project infrastructure would have the greatest potential for impact, while the partial removal (all infrastructure proud of the seabed) would have a lesser impact.

Magnitude of impact

16-154. The magnitude of impact for indirect impacts at decommissioning on all known and potential marine archaeology receptors is expected to be no worse or less than that of the construction phase, with the hydrodynamic and sediment transport regimes either remaining static or returning to their characteristics before the construction phase. The magnitude of impact on all known and potential maritime and aviation archaeology receptors and palaeogeographic receptors would be Negligible.

Sensitivity of Receptor

16-155. As impacts from indirect impacts at decommissioning would be no worse than those in construction the sensitivity of receptors to these impacts would be the same as construction: Medium for known and potential maritime and aviation archaeology receptors and Very Low for known and potential palaeogeographic receptors.

Significance of Effect

16-156. The significance of effect for indirect impacts during the decommissioning phase will be no worse than those in the construction phase outlined in **Section 16.11.1**, all of which were Not Significant in EIA terms.

16.11.4 Proposed Monitoring

16-157. No monitoring is proposed on these impacts other than any present within the embedded mitigation (such as monitoring of construction envelope, ship movements, anchoring locations) as the embedded mitigation will have reduced the impacts to non-significant already.

16.12 CUMULATIVE EFFECTS ASSESSMENT

16.12.1 Methodology

16-158. **Volume 1, Chapter 5: EIA Methodology** details how cumulative likely significant effects will be assessed for the Proposed Offshore Development together with other relevant plans, projects and activities through a Cumulative Effects Assessment (CEA). Those plans/projects relevant to the CEA for marine archaeology and cultural heritage are based upon the results of a screening exercise, **Volume 3, Appendix 1.4**

16-159. Each project or plan has been considered on a case-by-case basis for screening in or out of the CEA based upon data confidence, effect receptor pathways and the spatial or temporal scales involved.

16-160. These plans or projects may present different levels of cumulative effect when combined with the Proposed Offshore Development, informed by the plan/project's readiness and likelihood for actual operation. A tiered approach to the CEA is therefore applied here, allowing weighted assessment of likely cumulative effects. A tiered approach provides a framework for placing relative weight on the potential for each project or plan to be included in the CEA to be realised taking into account the Proposed Offshore Development or plans current stage of maturity and certainty in the projects' parameters. The following tiers are employed in the marine archaeology and cultural heritage CEA, as set out below.

- Tier 1 – The Proposed Offshore Development, combined with onshore elements of the project;
- Tier 2 – All projects or plans assessed under Tier 1, plus those plans/projects which have become operational since the baseline characterisation of the Proposed Offshore Development, plus those under construction, those with consent, and those pending determination following a submitted application;
- Tier 3 – All projects or plans assessed under Tier 2, plus those projects that have submitted a Scoping Report to MD-LOT; and

- Tier 4 - All projects or plans assessed under Tier 3, projects that are considered reasonably foreseeable, plus those with a granted Agreement for Lease (AfL) or equivalent where information is available to inform the cumulative assessment and there is sufficient data confidence.

16-161. Information on each Tiered project considered as part of the marine archaeology and cultural heritage CEA is given in **Table 16-20**.

16-162. The assessment for marine archaeology specifically considers whether any of the approved developments within the ZoI of 10 km have the potential to alter the significance of effects associated with the Proposed Offshore Development based on best scientific knowledge. Developments which are already built and operating have already therefore been considered as part of the baseline environment assessed above and so have been screened out as there is no potential to alter the significance of effects identified within the remit of this chapter.

16-163. The CEA long list contained no developments that were not already built that had a direct physical overlap with the Proposed Offshore Development Area. As the identified direct impacts to marine archaeology and cultural heritage would only occur within the Proposed Offshore Development there is therefore no potential for cumulative direct impacts through the identified impact pathways in the Construction, Operation & Maintenance or Decommissioning phases from developments in Tiers 1 – 4.

16-164. The potential for cumulative impacts between the Proposed Offshore Development and other proposed, planned and/or consented developments is therefore limited to the indirect impacts of sediment transport regimes during construction, as the indirect impacts of changes to scour and sedimentation during O&M have been identified as being highly localised and largely mitigated by the embedded mitigation. As **Volume 2, Chapter 6 Marine Physical and Coastal Processes** identifies a maximum extent of potential suspended seabed sediment from dredging during construction of 10 km, as a precautionary approach the Marine Archaeology CEA will assess the potential for cumulative effects from all proposed, planned and/or consented marine projects within the 10 km ZoI around the Proposed Offshore Development Area, clipped to MHWS to avoid including any onshore developments which wouldn't have a cumulative impact on marine processes.

16-165. This CEA for marine archaeology and cultural heritage will consider the maximum design scenario for each of the Proposed Offshore Developments , plans and activities in line with the methodology outlined in **Volume 1, Chapter 5 EIA Methodology**.

Table 16-20 List of Other Developments Considered Within the CEA for Marine Archaeology and Cultural Heritage

Plan/Project	Summary	Status	Distance from Array Area (km)	Distance from ECC (km)	Construction Dates	Operational by (if relevant)	Summary of Interaction with Proposed Offshore Development
Tier 1							
Buchan	Proposed offshore development considered with onshore infrastructure	Planned	75.1	0.1	2030 – 2034	2034	No cumulative effect for identified impacts on marine archaeology from BOW Proposed Onshore Infrastructure
Tier 2							
Green Volt	490-560MW OWF Float, 35T, INTOG	Consented April 2024	43.8	6.6	2025 – 2029	2029	No direct overlap with Buchan, within 10 km potential zone of impact for cumulative indirect impacts from SSC and sedimentation changes
Salamander	100MW OWF Float, 5-7T, INTOG	Planned, application submitted April 2024	66.3	4.7	2026 – 2029	2029	No direct overlap with Buchan, within 10 km potential zone of impact for cumulative indirect impacts from SSC and sedimentation changes
Muir Mhòr	798MW OWF Float, 40T, ScotWind	Planned, Application submitted Jan 2025	84.8	5.0	2028 – 2033	2034	No direct overlap with Buchan, within 10 km potential zone of impact for cumulative indirect impacts from SSC and sedimentation changes
Tier 3							
MarramWind	3000MW OWF Float, 126-225T, ScotWind	Planned, scoping submitted Feb 2023	24.2	2.5	2026 – 2030	2030	No direct overlap with Buchan, within 10 km potential zone of impact for cumulative indirect impacts from SSC and sedimentation changes

Plan/Project	Summary	Status	Distance from Array Area (km)	Distance from ECC (km)	Construction Dates	Operational by (if relevant)	Summary of Interaction with Proposed Offshore Development
Spittal to Peterhead HVDC cable[2]	HVDC cable route	Planned, application submitted Jan 2025	-	-	-	-	No confirmed spatial overlap with Buchan, but considered likely to be within 10 km potential zone of impact for cumulative indirect impacts from SSC and sedimentation changes. Due to lack of project timeline information, precautionary assumption of temporal overlap with activities related to the Proposed Offshore Development

[2] It is understood that the Marine Licence Application for this project was submitted in January 2025. Details have been requested from MD-LOT and the Applicant, but have not been able to be provided to allow a more detailed consideration of the assessment of cumulative effects at the time of finalising this assessment, and this therefore remains as Tier 3 for assessment purposes.

16.12.2 Maximum Design Scenario

16-166. Details of the Project activities and key Project components is provided in **Volume 1, Chapter 4: Project Description**. As this assessment is using the Design Envelope approach, a maximum design scenario has been selected for each cumulative impact which would lead to the greatest impact for all receptors or receptor groups, when selected from a range of values. As there is no combined spatial/temporal overlap between the Project and the other projects selected for cumulative impact assessment the key metric is that of changes to SSC and scour which **Volume 2 Chapter 6 Marine Physical and Coastal Processes** has assessed as having a maximum range within the project area of 10km. Given that the selected projects are all similar types of projects (either Offshore Wind developments or interconnectors) with similar installation methodologies to those set out in the Design Envelope being completed within the same hydrodynamic system and sediments as the Project this maximum range is considered suitable.

16-167. **Table 16-21** presents the maximum design scenario for each cumulative impact associated with the CEA for marine archaeology and cultural heritage, along with justification.

Table 16-21 Maximum Design Scenarios Considered for Assessment of Likely Significant Cumulative Effects on Marine Archaeology and Cultural Heritage

Potential Impact	Phase[3]			Tier	Maximum Design Scenario
	C	O	D		
Loss or damage to known and unknown marine historic environment from direct impacts. Loss or damage to submerged prehistoric landscapes from direct impacts.	x	x	x	Tier 1: Proposed Offshore Development alongside onshore elements of Buchan OWF Tier 2: Developments either under construction, permitted under the Planning Act or refusals subject to appeals Tier 3: Projects that have submitted a Scoping Report and/or have received a Scoping Opinion Tier 4: Other reasonably foreseeable projects	Buchan MDS as set out in **Table 16-13** As there will be no spatial interaction between the Proposed Offshore Development and either the onshore elements of the Buchan OWF or any Tier 2 developments there will be no direct disturbance or damage to offshore archaeology. For the Tier 3 and 4 developments there is either no spatial overlap or the Tier 3 and 4 developments have already been constructed and so form part of the currently assessed baseline. As a result, no cumulative effects for direct impacts are anticipated and this impact has been **scoped out** of CEA.
Indirect disturbance to marine historic environment assets caused by seabed preparation, foundations, cable burial methods and/or cable protection.	x			Tier 1: Proposed Offshore Development alongside onshore elements of Buchan OWF Tier 2: Developments either under construction, permitted under the Planning Act or refusals subject to appeals Tier 3: Projects that have submitted a Scoping Report and/or have received a Scoping Opinion Tier 4: Other reasonably foreseeable projects	Buchan MDS as set out in **Table 16-13** The indirect impacts of changes in local sediment patterns through either changes in SSC or seabed scour may lead to increased exposure or burial of offshore archaeology receptors. The maximum range of this has been assessed as 10 km (**Volume 2 Chapter 6 Marine Physical and Coastal Processes**), clipped to MHWS as it is only a marine impact. The majority of the increase to SSC with be temporary and local to the works. This potential impact has been assessed to be negligible for the Proposed Offshore Development alone, which is Not Significant.

[3] C = Construction, O = Operation and Maintenance, D = Decommissioning

16.12.3 Cumulative Effects Assessment

16-168. An assessment of the likely significance of the cumulative effects of the Proposed Offshore Development cumulative effects with the tier 2, 3 and 4 projects upon marine archaeology and cultural heritage receptors arising from each identified impact is given in the following sections.

16.12.3.1 Construction Phase

16-169. As noted above direct impacts during the Construction Phase have no potential for cumulative effects as there are no confirmed spatial overlaps between the Proposed Offshore Development and short-listed developments. Therefore, the only Construction Phase impact brought through to CEA is the indirect impact.

16-170. Indirect disturbance to marine historic environment assets caused or installation of foundation anchors and mooring systems for floating WTGs, fixed foundations of OSPs/IRC, cable burial installation and/or cable protection

16-171. The indirect impacts upon the known and potential marine archaeological assets considered here are those which occur as a result of changes to hydrodynamic and sediment transport regimes, where these changes have occurred as a consequence of activities and structures associated with the construction activities of the Proposed Offshore Development and the short-list of other developments. These impacts may occur subsequent to the clearance of areas of seabed during floating foundation anchor, fixed foundation for IRC and OSP and/or cable route preparation but may also occur through sediment dispersal/deposition or the placement of non-burial scour and/or cable protection on the seabed.

16-172. Construction activities from all developments that could potentially create indirect physical impacts include:

- Changes to the sediment transport regime due to seabed preparation activities for foundation anchors for floating WTGs, fixed foundations for OSPs and IRC and scour protection installation leading to changes in seabed sediment levels;
- Changes to the sediment transport regime due to seabed preparation for inter array cables, installation of inter array cables and associated cable protection leading to changes in seabed sediment levels;
- Changes to the sediment transport regime due to seabed preparation for export cables, installation of export cables and associated cable protection leading to changes in seabed sediment levels; and
- Dispersal of increased suspended sediment from arisings/plumes from construction activities potentially resulting in changes in seabed sediment levels.

Magnitude of Impact

16-173. The magnitude of impact assessed above for Buchan has been assessed as Low due to the localized and temporary nature of it. Given that this assessment is for the marine and coastal physical processes related to the seabed sediments within the vicinity of the Proposed Offshore Development and the techniques for installation/construction of offshore wind cabling/interconnector cabling infrastructure, it is reasonable that the five schemes identified in the short list, which are all offshore wind projects (with the overlap in ZoIs

exclusively relating to their export cabling infrastructure rather than the Array Areas with their more extensive installed infrastructure including inter-array cabling, WTGs and OSPs) or interconnector cabling would have a similar magnitude of impact. Their infrastructure would be being installed in the same area and types of sediment as those of the Proposed Offshore Development, utilising similar methodologies of cable laying and protection within the similar seabed conditions of the various nearby projects. The overall magnitude of impact is therefore assessed as being Negligible for all developments, being temporary and localised and further mitigated through the embedded mitigations standard across the industries as outlined in The Crown Estate 2021. Current construction programmes for these developments only overlap with the Proposed Offshore Development for 2029, reducing the potential further.

Sensitivity of Receptor

16-174. As noted above the sensitivity of receptors to changes from indirect impacts remains Very Low.

Significance of Effect

16-175. Taking the very low sensitivity of marine archaeological assets to continued sediment deposition and the low magnitude of impact, the cumulative effect of indirect impacts through construction activities is considered to be Negligible and Not Significant in EIA terms.

Secondary Mitigation and Residual Effect

16-176. No secondary mitigation is required for this impact, as the impact is already not significant.

16.12.3.2 Operation and Maintenance Phase

16-177. As noted above direct impacts during the O&M phase have no potential for cumulative effects as there are no spatial overlaps between the Proposed Offshore Development and project boundaries of the five short-listed developments. The indirect impacts for the O&M phase were identified as being highly localised and temporary and so similarly to the direct impacts for this phase have no potential for cumulative effects, as there is no spatial overlap between their extent within the Proposed Offshore Development and the five short-listed developments.

16.12.3.3 Decommissioning Phase

16-178. The decommissioning schedule for the additional five developments is not confirmed, but the greatest cumulative impact would be if decommissioning of all was to be simultaneous. This assessment assumes that cumulative impacts from decommissioning activities would be of similar nature and magnitude to construction activities and their overall effect would be no worse than that of the construction phase. As above the overall magnitude of the cumulative impact at Decommissioning is considered to be negligible for all receptors, while the sensitivity of receptors to changes from the impact would be medium for known and potential maritime and aviation archaeology receptors and very low for known and potential palaeogeographic receptors Therefore it is predicted that cumulative decommissioning effects will be Not Significant in EIA terms.

16.13 TRANSBOUNDARY EFFECTS

16-179. A transboundary effect assessment is used to identify the potential marine archaeology and cultural heritage effects from the Proposed Offshore Development on the interests of European Economic Areas (EEA States).

16-180. There is no direct impact on marine archaeology and cultural heritage receptors beyond the footprint of the Proposed Offshore Development, which is entirely within Scottish waters. The indirect impacts identified above have all been evaluated as having negligible effects which is not significant in EIA terms. Therefore, there are no transboundary impacts with regard to marine archaeology and cultural heritage and this is not considered further.

16.14 INTER-RELATED EFFECTS

16-181. Effects on marine archaeology and cultural heritage do not have the potential to have secondary effects on other receptors.

16.15 SUMMARY

16-182. The construction, operation/ maintenance and decommissioning phases of the Proposed Offshore Development would have a range of impacts on marine archaeology and cultural heritage. The significance of these effects has been assessed using expert analysis, drawing from a wide science base that includes project-specific surveys and previous numerical modelling activities. A summary of the residual effects of the Proposed Offshore Development on marine archaeology and cultural heritage is listed in **Table 16-22**.

16-183. With the adoption of the additional mitigation measures, primarily by avoidance of known receptors by AEZs, the magnitude of any identified impacts (Impacts 1 and 3 above) will be reduced to negligible. Additionally, **PMP 8: Proposed Offshore WSI** (Buchan Offshore Wind Ltd, 2025) will be in operation during the phases of the Proposed Offshore Development.

Table 16-22 Summary of the Likely Significant Environmental Effects, Mitigation, Monitoring and Residual Effects for Marine Archaeology and Cultural Heritage

Description of Impact	Phase			Magnitude of Impact	Sensitivity of Receptor	Embeded Mitigation Measure	Significance of Effect	Secondary Mitigation Measure	Residual Effect	Proposed Monitoring
	C	O	D							
Project Alone Summary										
Loss or damage to known and unknown marine and Landfall Area historic environment and submerged prehistoric landscapes from direct impacts (**Sections 16.11.1.1, 16.11.2.1 and 16.11.3**)	x	X	x	Negligible to Low	Medium to High	EM1, EM2-3, EM8, EM9, EM40, EM45	Negligible to Minor	No mitigation required above and beyond embedded mitigation measures outlined in **Table 16-14**	Negligible to Minor	None
Indirect disturbance to marine historic environment assets caused by seabed preparation or installation of foundation anchors and mooring systems for floating WTGs, fixed foundations of OSPs/IRC, cable burial installation methods and/or cable protection (**Section 16.11.1.2**)	x			Negligible	Very Low to Medium	EM1, EM2-3, EM9, EM40, EM45	Negligible	No mitigation required above and beyond embedded mitigation measures outlined in **Table 16-14**	Negligible	None
Indirect disturbance to marine historic environment assets caused by replacement and/or repair of installed infrastructure and/or additional cable or scour protection (**Section 16.11.2.2**)		x		Negligible	Very Low to Medium	EM1, EM2-3, EM9, EM40, EM45	Negligible	No mitigation required above and beyond embedded mitigation measures outlined in **Table 16-14**	Negligible	None
Cumulative Summary										
Indirect disturbance to marine historic environment assets caused by seabed preparation or installation of foundation anchors and mooring systems for floating WTGs, fixed foundations of OSPs/IRC, cable burial installation methods and/or cable protection (**Section 16.12.3.1**)	x			Negligible	Very Low to Medium	EM1, EM2-3, EM9, EM40, EM45	Negligible	No mitigation required above and beyond embedded mitigation measures outlined in **Table 16-14**	Negligible	None

16.16 REFERENCES

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