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MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Annex 3.1 to the Applicant's response to Written Submissions from MMO at Deadline 2

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Image of an offshore wind farm

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Glossary

Term	Meaning
Applicant	Morgan Offshore Wind Limited.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Morgan Array Area	The area within which the wind turbines, foundations, inter-array cables, interconnector cables, scour protection, cable protection and offshore substation platforms (OSPs) forming part of the Morgan Offshore Wind Project: Generation Assets will be located.
Morgan Offshore Wind Project: Generation Assets	This is the name given to the Morgan Generation Assets project as a whole (includes all infrastructure and activities associated with the project construction, operations and maintenance, and decommissioning).
Sound exposure level	Metric uses to measure the cumulative sound energy to which a receiver is exposed.
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Spawning grounds	Areas of water or seabed where fish spawn or produced their eggs.
Temporary Threshold Shift	Change (deterioration) in hearing of an animal which recovers after some time.
The Planning Inspectorate	The agency responsible for operating the planning process for applications for development consent under the Planning Act 2008.

Acronyms

Acronym	Description
MMO	Marine Management Organisation
TTS	Temporary Threshold Shift
UWN	Underwater Noise
UWSMS	Underwater Sound Management Strategy
WR	Written Representations

Units

Unit	Description
SELcum	Cumulative Sound Exposure Level

1 ANNEX A TO THE APPLICANT'S RESPONSE TO WRITTEN REPRESENTATIONS FROM MMO AT DEADLINE 2

1.1 Introduction

1.1.1.1 This document has been prepared in response to the Comments on Written Representations from MMO (REP2-029) submitted to the Examining Authority at Deadline 2. The comments are as follows:

1.1.2.1 [Paragraph 1.1.6] The MMO requests that the range of impact from UWN based on the thresholds for Group 3 fish with high hearing sensitivity for mortality and potential mortal injury (207 cumulative sound exposure level (SELcum)), recoverable injury (203 SELcum), and Temporary Threshold Shift (TTS) (186 SELcum), as per the pile driving threshold guidelines described by Popper *et al*. (2014), are presented so that the physiological risks to cod can be assessed.

1.1.3.1 [Paragraph 1.1.8] As per the MMO comments in RR-020.55 of Table 1, the MMO requests that the Applicant presents the range of impact from UWN based on the thresholds for Group 3 fish with high hearing sensitivity for mortality and potential mortal injury (207 cumulative sound exposure level (SELcum)), recoverable injury (203 SELcum), and TTS (186 SELcum) so that the risk to adult cod which may be spawning in the vicinity of the array can be appropriately assessed.

1.2 Response

2.1.1.1 This request was discussed during a meeting between the Applicant and the MMO on 24 October 2024 where it was agreed that the Applicant would provide updated maps showing the requested noise contours.

2.1.2.1 The Applicant has mapped the cumulative sound exposure level thresholds for mortality (207 cumulative sound exposure level (SELcum)), recoverable injury (203 SELcum), and TTS (186 SELcum) as described by Popper *et al*. (2014) in relation to herring and cod spawning grounds, with fish modelled as static receptors in both cases. This involved replicating Figure 3.10 and Figure 3.11 respectively from Volume 2, Chapter 3: Fish and Shellfish Ecology (APP-021) to display these thresholds as requested by the MMO. This is shown below in Figure 1.1 for herring spawning grounds and Figure 1.3 for cod spawning grounds for comparative purposes with the original figures. The MMO suggested that Figures 3.8-3.11 to be updated but the Figures 3.8 and 3.9 in Volume 2, Chapter 3: Fish and Shellfish Ecology (APP-021) show fleeing receptor ranges, and so these have not been presented due to the MMO not considering fleeing receptor modelling appropriate for the assessment of underwater sound impacts e.g. as detailed in their Statement of Common Ground (REP1-035, MMO.FSF.14).

2.1.3.1 The updated figure for herring spawning broadly shows a slight reduction in the overlap of both low and high intensity spawning grounds for herring in Figure 1.1 when compared to Figure 3.10 of Volume 2, Chapter 3: Fish and Shellfish Ecology (APP-021; which is reproduced in Figure 1.2 below for comparison purposes). A slight reduction in the overlap with both low and high intensity spawning grounds for cod is also noted in Figure 1.3 when compared to Figure 3.11 of Volume 2, Chapter 3: Fish and Shellfish Ecology (APP-021; reproduced in Figure 1.4 below for comparison purposes).

2.1.4.1 The changes in threshold contour represent a reduction in overlap with areas of herring and cod low and high intensity spawning grounds, but do not represent a meaningful

change in the assessment of the impact of underwater sound from piling activities. As the updated thresholds represent a smaller overlap with these spawning grounds, the previous approach was more precautionary, and the overall assessment conclusions remain the same as presented in Volume 2, Chapter 3: Fish and Shellfish Ecology (APP-021). This lack of significant difference can be seen visually when compared to the original Figures 3.10 and 3.11 from Volume 2, Chapter 3: Fish and Shellfish Ecology (APP-021) which are included in Figure 1.2 and Figure 1.4 below.

2.1.5.1 The Applicant welcomes the MMO's support for the ongoing development of the Underwater Sound Management Strategy (UWSMS). The MMO required the clarifications set out in this note in order to inform the conclusions of the impact assessment and ultimately the measures set out in the UWSMS. The Applicant therefore considers this clarification is resolved.

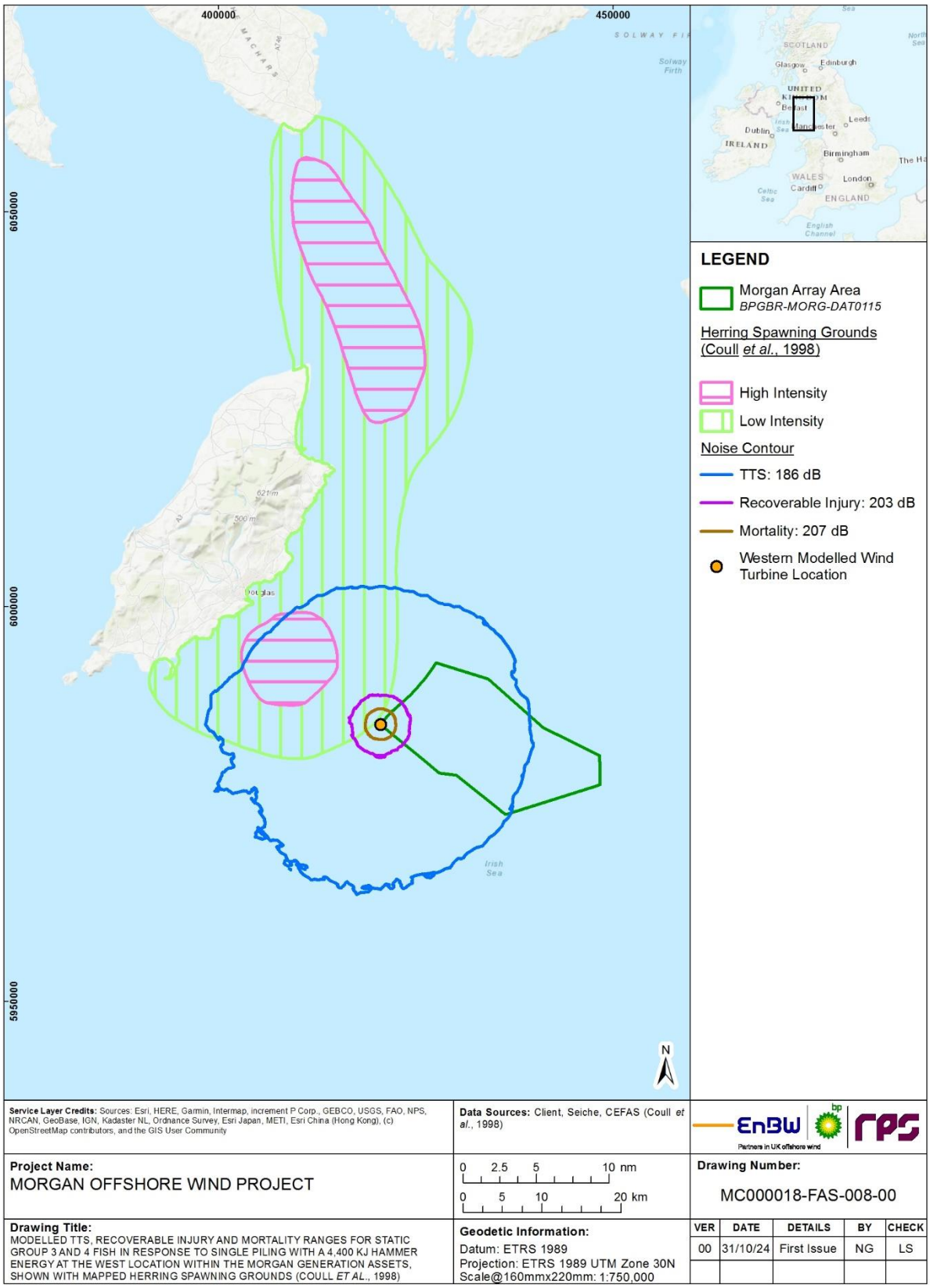

Figure 1.1: Modelled TTS, recoverable injury and mortality ranges for static group 3 and 4 fish in response to single piling with a 4,400 kJ hammer energy at the west location within the Morgan Array Area, shown with mapped herring spawning grounds (Coull *et al*., 1998). Updated from Figure 3.10 (see Figure 1.2 for comparison).

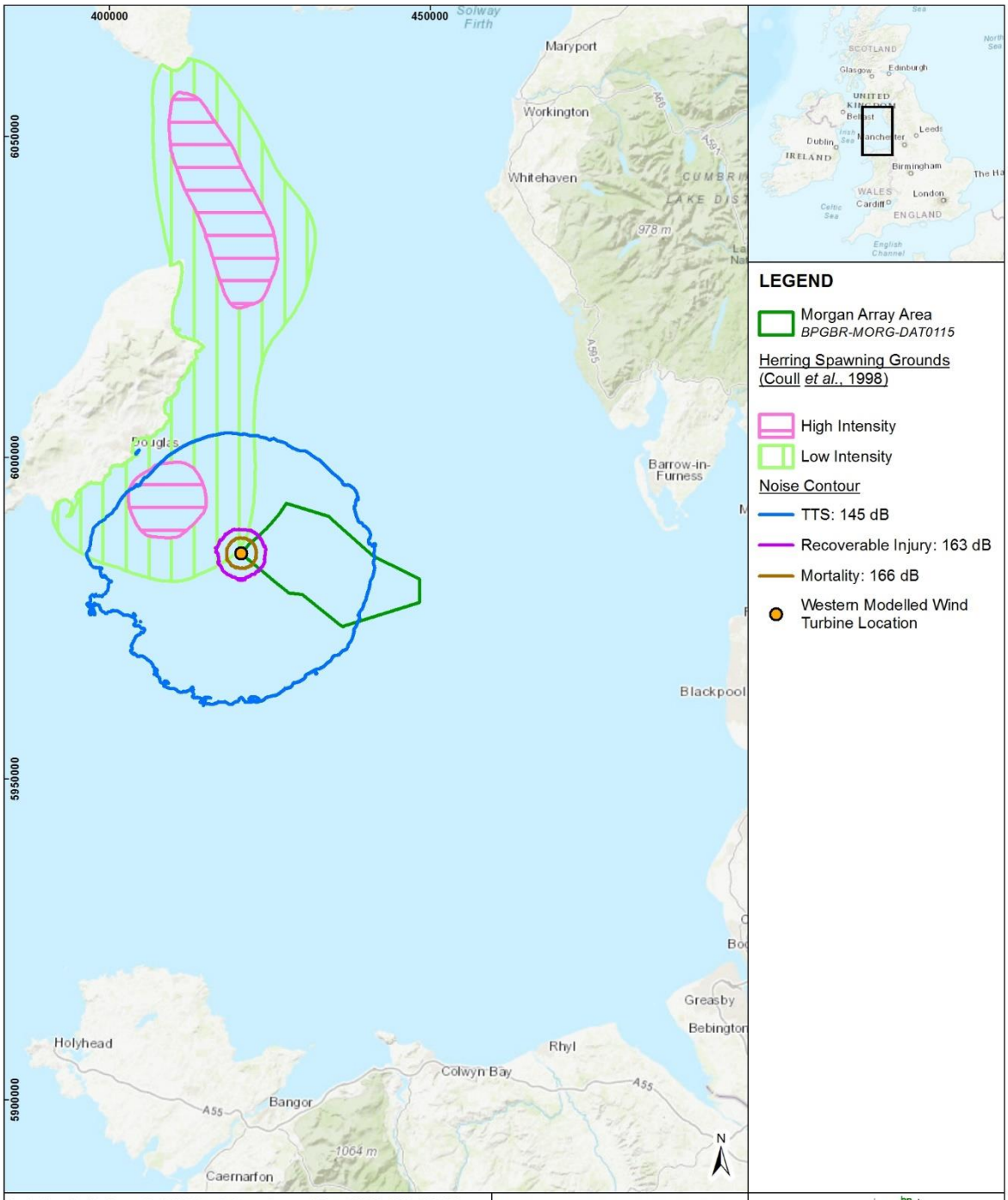

Figure 1.2: Modelled TTS, recoverable injury and mortality ranges for static group 3 and 4 fish in response to single piling with a 4,400kJ hammer energy at the west location within the Morgan Array Area, shown with mapped herring spawning grounds (Coull *et al*., 1998). Note: Reproduction of Figure 3.10 of Volume 2, Chapter 3: Fish and Shellfish Ecology (APP-021) for comparison purposes only.

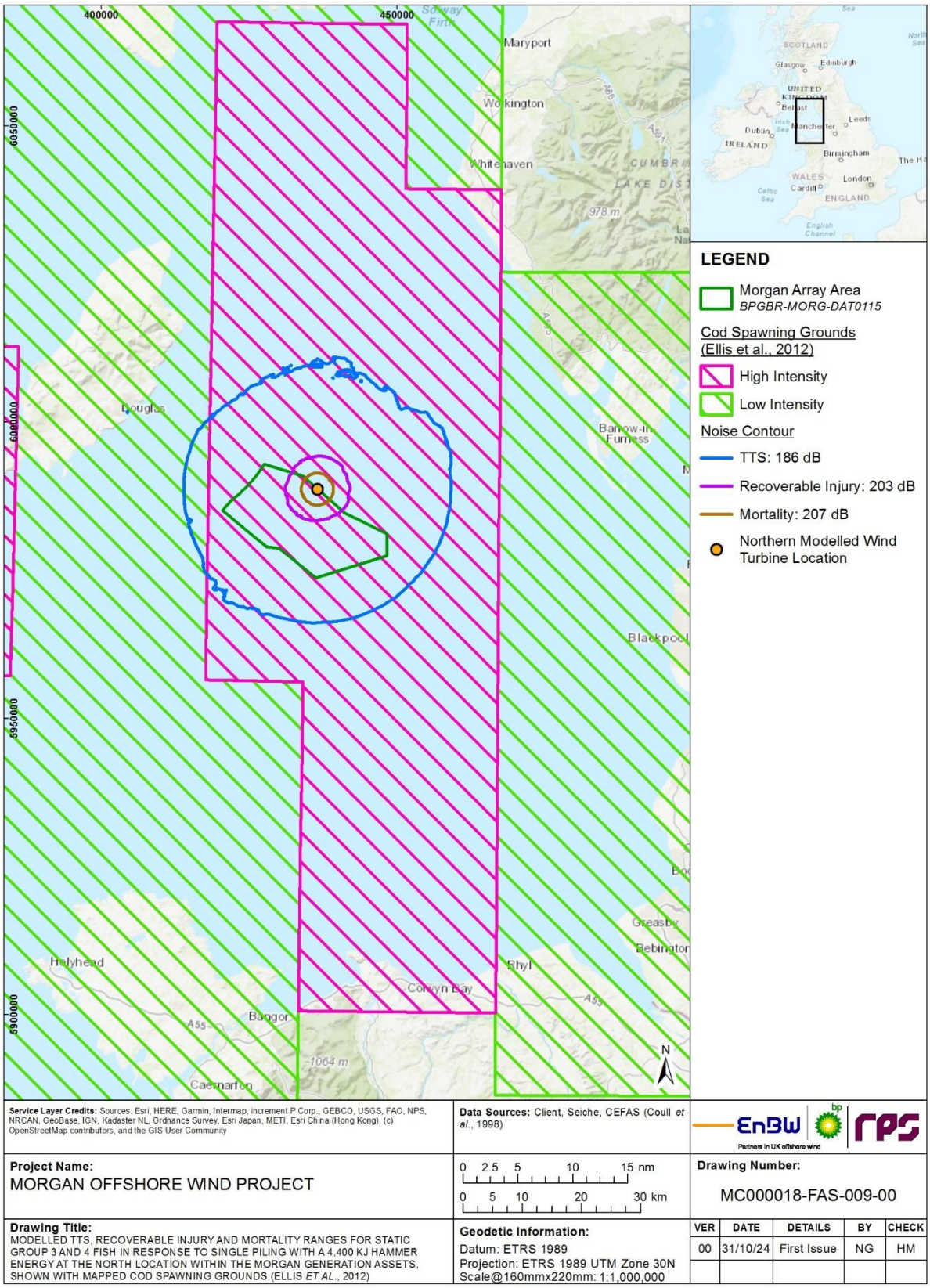

Figure 1.3: Modelled TTS, recoverable injury and mortality ranges for static group 3 and 4 fish in response to single piling with a 4,400 kJ hammer energy at the north location within the Morgan Array Area, shown with mapped cod spawning grounds (Ellis *et al*., 2012). Updated from Figure 3.11 (see Figure 1.4 for comparison).

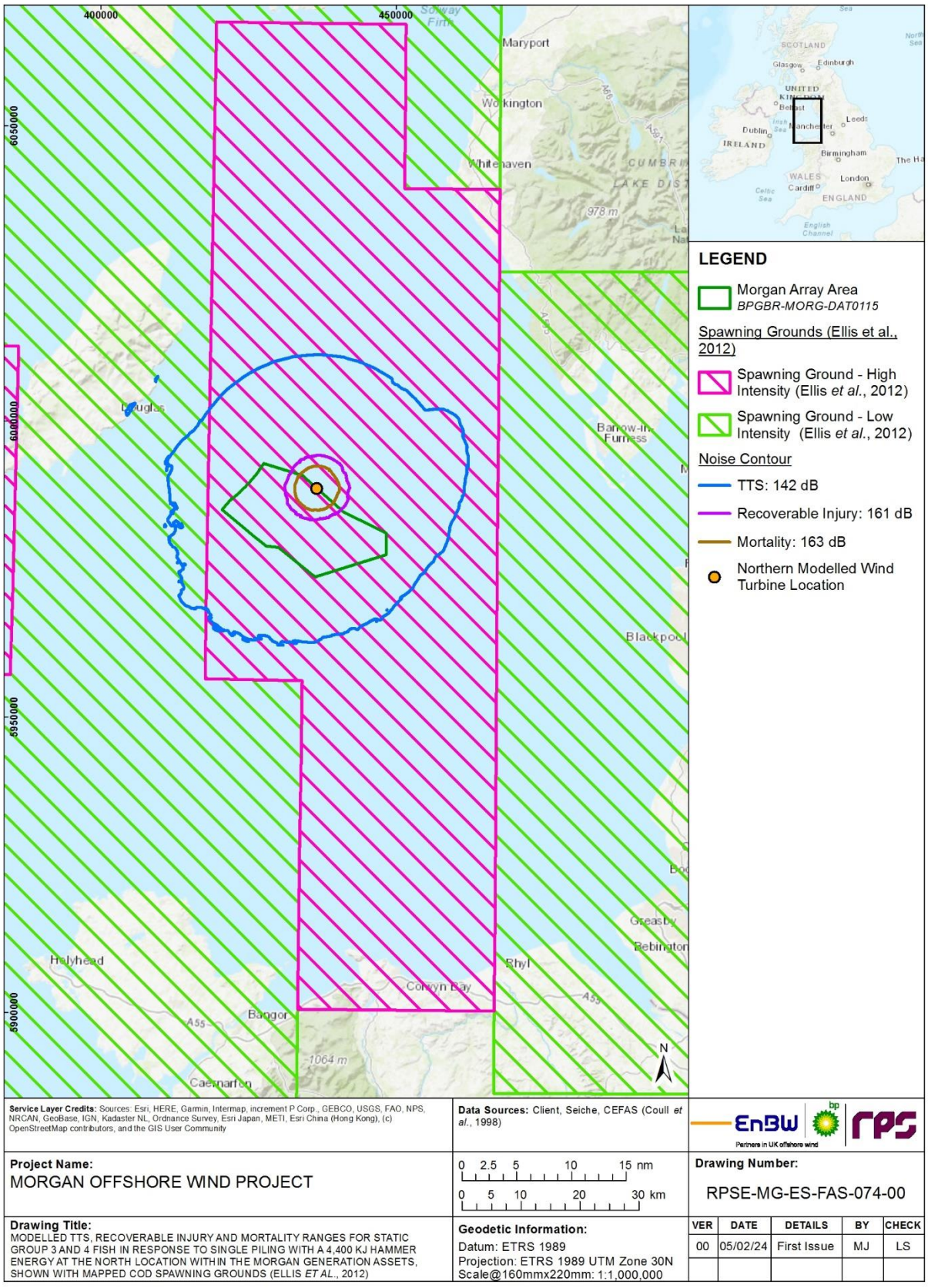

Figure 1.4: Modelled TTS, recoverable injury and mortality ranges for static group 3 and 4 fish in response to single piling with a 4,400kJ hammer energy at the north location within the Morgan Array Area, shown with mapped cod spawning grounds (Ellis *et al.* 2012). Note: Reproduction of Figure 3.11 as presented in Volume 2, Chapter 3: Fish and Shellfish Ecology (APP-021) for comparison purposes only.