

List of Figures

| | |
|--|----|
| Figure 1.1: Location of Inch Cape Wind Farm | 1 |
| Figure 1.2: Development Area and Offshore Export Cable Corridor | 2 |
| Figure 6.1 Constraints Mapping and Offshore Export Cable Corridor Routing | 7 |
| Figure 7.1: Location of Development Area, Offshore Export Cable Corridor and Grid Connection | 8 |
| Figure 7.3: Development Area | 9 |
| Figure 7.4: Development Area Bathymetry | 10 |
| Figure 7.6: Cable Landfall | 11 |
| Figure 7.7: Offshore Export Cable Corridor | 12 |
| Figure 9.1 Study area | 14 |
| Figure 9.2 Herring spawning areas | 15 |
| Figure 9.3 Herring nursery areas..... | 16 |
| Figure 9.4 Cod nursery and spawning Areas..... | 17 |
| Figure 9.5 Sprat nursery and spawning areas..... | 18 |
| Figure 9.6 SEL interaction with herring spawning grounds – pin piles | 19 |
| Figure 9.7 SEL interaction with herring spawning grounds – monopiles..... | 20 |
| Figure 9.8 Variation in SEL Impact Areas with Changing Conversion Factor | 21 |
| Figure 9.9 Cumulative SEL interaction with herring spawning grounds – pin piles..... | 22 |
| Figure 9.10 Cumulative SEL interaction with herring spawning grounds – monopiles | 23 |
| Figure 10.1 Cumulative PTS effect zones for minke whale exposed to piling of a single monopile foundation with a maximum hammer energy of 4,500 kJ at noise modelling location 3 (F3), NOAA criteria..... | 24 |
| Figure 10.2 Cumulative PTS effect zones for grey and harbour seal exposed to piling of a single monopile foundation with a maximum hammer energy of 4,500 kJ at location noise modelling location 4 (F4), Southall criteria..... | 25 |
| Figure 10.3 Modelled received noise levels (dB re 1 μ Pa2s) for PTS from pile driving under Scenario 4 for low frequency cetaceans for pin piles with and without use of an ADD | 26 |
| Figure 10.4 Modelled received noise levels (dB re 1 μ Pa2s) for PTS from pile driving under Scenario 4 for low frequency cetaceans for monopiles with and without use of an ADD..... | 27 |
| Figure 10.5 Minke whale density..... | 28 |
| Figure 10.6 Bottlenose dolphin density | 29 |
| Figure 10.7 White-beaked dolphin density..... | 30 |
| Figure 10.8 Harbour porpoise density | 31 |
| Figure 10.9 Grey seal density | 32 |
| Figure 10.10 Harbour seal density | 33 |
| Figure 10.13 Noise modelling locations..... | 34 |
| Figure 10.15 Modelled received noise levels (dB re 1 μ Pa2s) for PTS from pile driving under Scenario 1a for low frequency cetaceans..... | 35 |
| Figure 10.16 Modelled received noise levels (dB re 1 μ Pa2s) for PTS from pile driving under Scenario 2a for low frequency cetaceans..... | 36 |
| Figure 10.17 Modelled received noise levels (dB re 1 μ Pa2s) for PTS from pile driving under Scenario 3 for low frequency cetaceans..... | 37 |
| Figure 10.18 Modelled received noise levels (dB re 1 μ Pa2s) for PTS from pile driving under Scenario 4 for low frequency cetaceans..... | 38 |

| | |
|---|----|
| Figure 10.19 Modelled received noise levels (dB re 1 μ Pa2s) for PTS from pile driving under Scenario 4 for high frequency cetaceans..... | 39 |
| Figure 10.20 Modelled received noise levels (dB re 1 μ Pa2s) for PTS from pile driving under Scenario 2b for phocid seals in water | 40 |
| Figure 10.21 Modelled received noise levels (dB re 1 μ Pa2s) for PTS from pile driving under Scenario 3 for phocid seals in water | 41 |
| Figure 10.22 Modelled received noise levels (dB re 1 μ Pa2s) for PTS from pile driving under Scenario 4 for phocid seals in water | 42 |
| Figure 10.23 Modelled received noise levels (dB re 1 μ Pa2s) for displacement from pin pile driving under Scenario 1a | 43 |
| Figure 10.24 Modelled received noise levels (dB re 1 μ Pa2s) for displacement from pin pile driving under Scenario 1b | 44 |
| Figure 10.25 Modelled received noise levels (dB re 1 μ Pa2s) for displacement from pin pile driving under Scenario 2a | 45 |
| Figure 10.26 Modelled received noise levels (dB re 1 μ Pa2s) for displacement from pin pile driving under Scenario 2b | 46 |
| Figure 10.27 Modelled received noise levels (dB re 1 μ Pa2s) for displacement from pin pile driving under Scenario 3 | 47 |
| Figure 10.28 Modelled received noise levels (dB re 1 μ Pa2s) for displacement from pin pile driving under Scenario 4 | 48 |
| Figure 10.29 Modelled received noise levels (dB re 1 μ Pa2s) for displacement from monopile driving under Scenario 1a | 49 |
| Figure 10.30 Modelled received noise levels (dB re 1 μ Pa2s) for displacement from monopile driving under Scenario 1b | 50 |
| Figure 10.31 Modelled received noise levels (dB re 1 μ Pa2s) for displacement from monopile driving under Scenario 2a | 51 |
| Figure 10.32 Modelled received noise levels (dB re 1 μ Pa2s) for displacement from monopile driving under Scenario 2b | 52 |
| Figure 10.33 Modelled received noise levels (dB re 1 μ Pa2s) for displacement from monopile driving under Scenario 3 | 53 |
| Figure 10.34 Modelled received noise levels (dB re 1 μ Pa2s) for displacement from monopile driving under Scenario 4 | 54 |
| Figure 11.1 Development Area and Offshore Export Cable Corridor with Survey Area..... | 55 |
| Figure 11.2 Special Protection Areas for Gannet within Mean Maximum Foraging Range of the Development Area and Two Kilometre Buffer | 56 |
| Figure 11.6 Special Protection Areas for Razorbill within Mean Maximum Foraging Range of the Development Area and Two Kilometre Buffer | 60 |
| Figure 11.7 Special Protection Areas for Puffin within Mean Maximum Foraging Range of the Development Area and Two Kilometre Buffer | 61 |
| Figure 13.1 Wireline models for Bell Rock Lighthouse (HB no. 45197) | 63 |
| Figure 13.2 Setting Impact Assessment Receptors..... | 64 |
| Figure 14.1 Study Area..... | 65 |
| Figure 14.2 Annual landings values by species (average 2011 to 2016) in National Study Area (MMO) | 66 |

| | |
|---|----|
| Figure 14.3 Annual landings values by vessel category (Average 2011 to 2016) in Regional Study Area (MMO)..... | 67 |
| Figure 14.5 Distribution of scallops by intensity (Average 2007-2011) in Regional Study Area (MS; Kafas et al., 2012)..... | 68 |
| Figure 14.6 Distribution of scallops by intensity (Average 2009-2013) in Regional Study Area (MS; Kafas et al., 2013)..... | 69 |
| Figure 14.7 VMS density by fishing intensity for dredge (2011-2015) (MMO)..... | 70 |
| Figure 14.8 VMS density by fishing intensity for dredge (over 12 m vessels) in 2016 (ICES) | 71 |
| Figure 14.9 Scallop annual landings values (Average 2011 to 2016) in the UK (MMO) | 72 |
| Figure 14.10 Relative annual landings values by species, shellfish only (Average 2011 to 2016) in the National Study Area (MMO) | 73 |
| Figure 14.11 Average number of crab/lobster hauls per day per cell (4 km ²) (MS, 2017) | 74 |
| Figure 14.12 Scotmap pots crab/lobster Monetary value (MS, 2012) | 75 |
| Figure 14.13 Relative annual landings values by species, squid only (Average 2011 to 2016), in the National Study Area (MMO) | 76 |
| Figure 14.14 Distribution of squid by intensity (Average 2009 to 2013) in the Regional Study Area (MS; Kafas et al., 2013) | 77 |
| Figure 14.15 Scotmap ‘not Nephrops trawls’ No. of vessels (MS, 2012)..... | 78 |
| Figure 14.16 Relative annual landings values by species, Nephrops only (Average 2011 to 2016), in the National Study area (MMO) | 79 |
| Figure 14.17 VMS density by value for demersal gears (Average 2011 – 2015) (MMO)..... | 80 |
| Figure 14.18 Scotmap Nephrops trawls Monetary value (MS, 2012)..... | 81 |
| Figure 14.19 VMS density by fishing intensity for Nephrops for vessels of over 12 m (2016) (ICES)... | 82 |
| Figure 14.20 Scallop dredging VMS intensity (2007-2016) in relation to the Forth and Tay Projects . | 83 |
| Figure 15.1 Worst case indicative layout | 84 |
| Figure 15.2 Development Area and Offshore Export Cable Corridor Study Areas | 85 |
| Figure 15.3 AIS data excluding temporary traffic within Development Area Study Area colour-coded by vessel type (28 Days – June and December 2016)..... | 86 |
| Figure 15.4 Main commercial vessel routes within Development Area Study Area | 87 |
| Figure 15.5 AIS fishing vessel data within Development Area Study Area colour-coded by gear type (28 Days – June and December 2016) | 88 |
| Figure 15.6 AIS recreational vessel data within Development Area Study Area (28 Days – June and December 2016) | 89 |
| Figure 15.7 RYA dataset in vicinity of Development Area and Offshore Export Cable Corridor | 90 |
| Figure 15.8 MAIB incidents within Development Area and Offshore Export Cable Corridor Study Areas colour-coded by incident type (2005 to 2014) | 91 |
| Figure 15.9 RNLI incidents within Development Area and Offshore Export Cable Corridor Study Areas colour-coded by casualty type (2005 to 2014) | 92 |
| Figure 15.10 AIS data excluding temporary traffic within Offshore Export Cable Corridor Study Area colour coded by vessel type (56 Days – January February 2011 and May 2012) | 93 |
| Figure 15.11 AIS fishing and recreational vessel data within Offshore Export Cable Corridor Study Area (28 Days – June and December 2016)..... | 94 |
| Figure 15.12 Firth of Forth Wind Farms..... | 95 |
| Figure 16.1 Illustration of Economic Study Area..... | 96 |
| Figure 16.2 Labour market catchment areas..... | 97 |

| | |
|---|-----|
| Figure 16.3 Labour market catchment areas..... | 98 |
| Figure 17.2 Position of UP18 and UP59 relative to the Development Area © <i>Reproduced by permission of the CAA, NATS and OS 2018</i> | 100 |
| Figure 17.3 Position of TRA 007A relative to the Development Area © <i>Reproduced by permission of the CAA, NATS and OS 2018</i> | 101 |

Figure 1.1: Location of Inch Cape Wind Farm

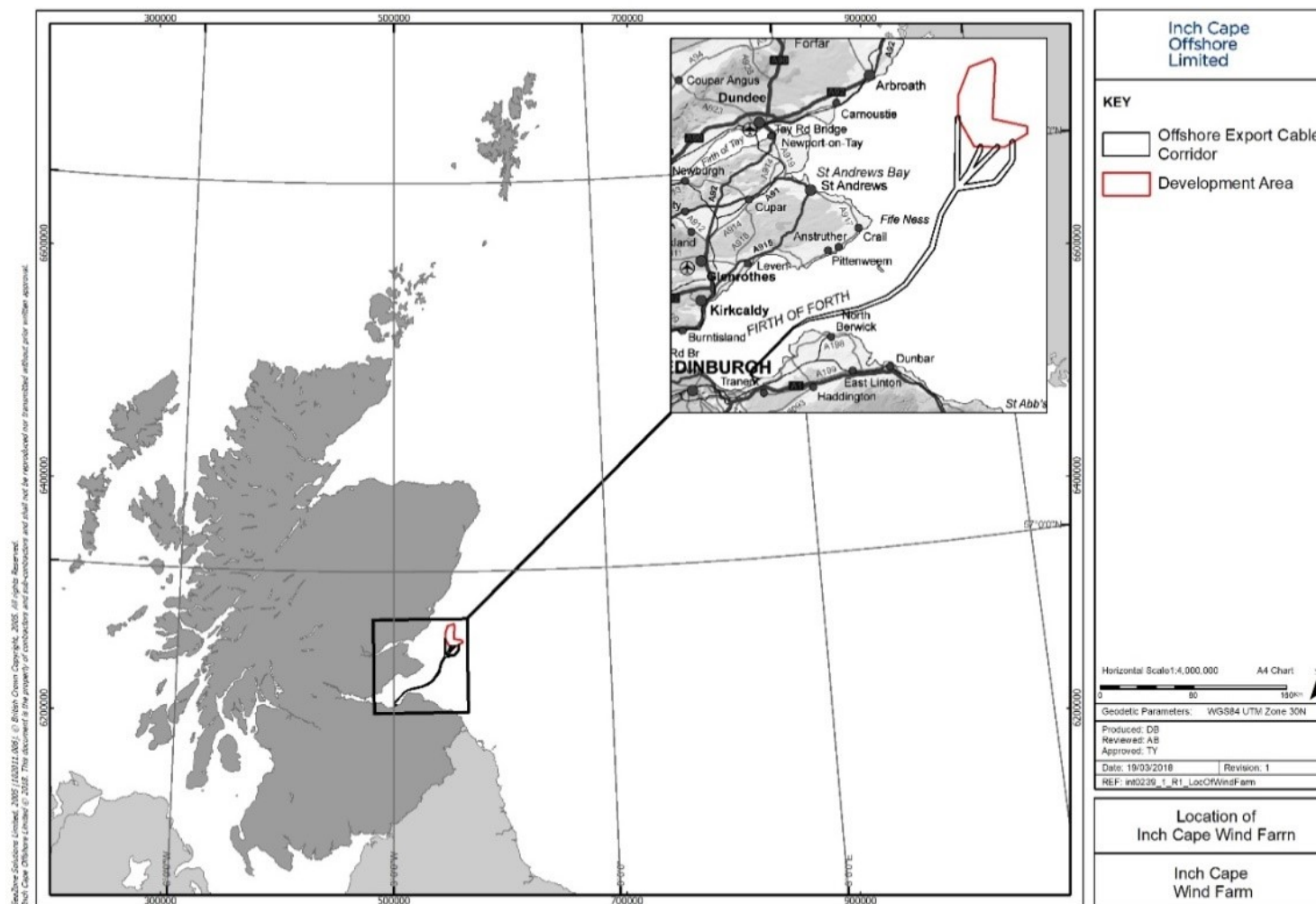
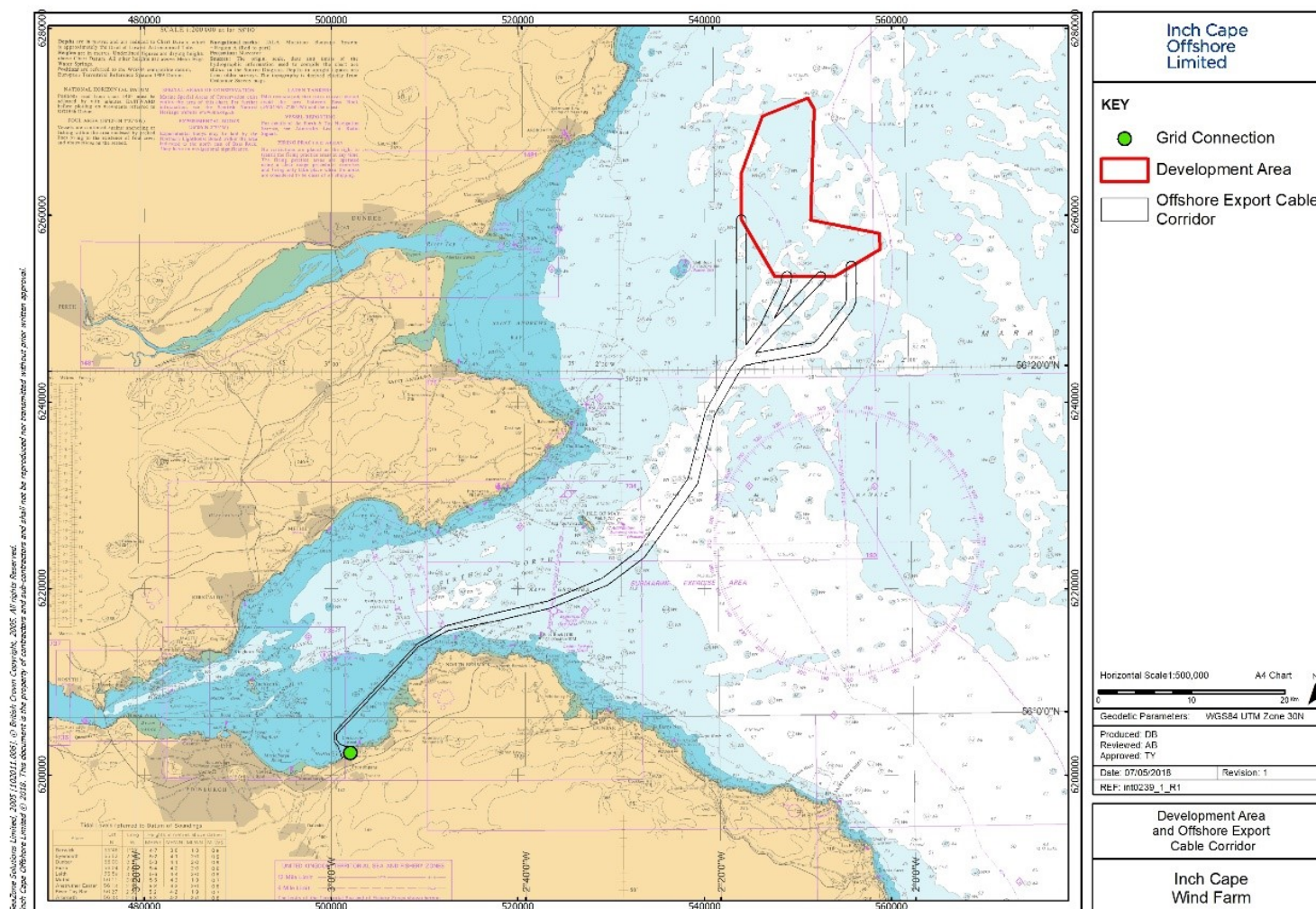


Figure 1.2: Development Area and Offshore Export Cable Corridor



NO FIGURES WERE PRESENTED IN CHAPTER 2

NO FIGURES WERE PRESENTED IN CHAPTER 3

NO FIGURES WERE PRESENTED IN CHAPTER 4

NO FIGURES WERE PRESENTED IN CHAPTER 5

Figure 6.1 Constraints Mapping and Offshore Export Cable Corridor Routing

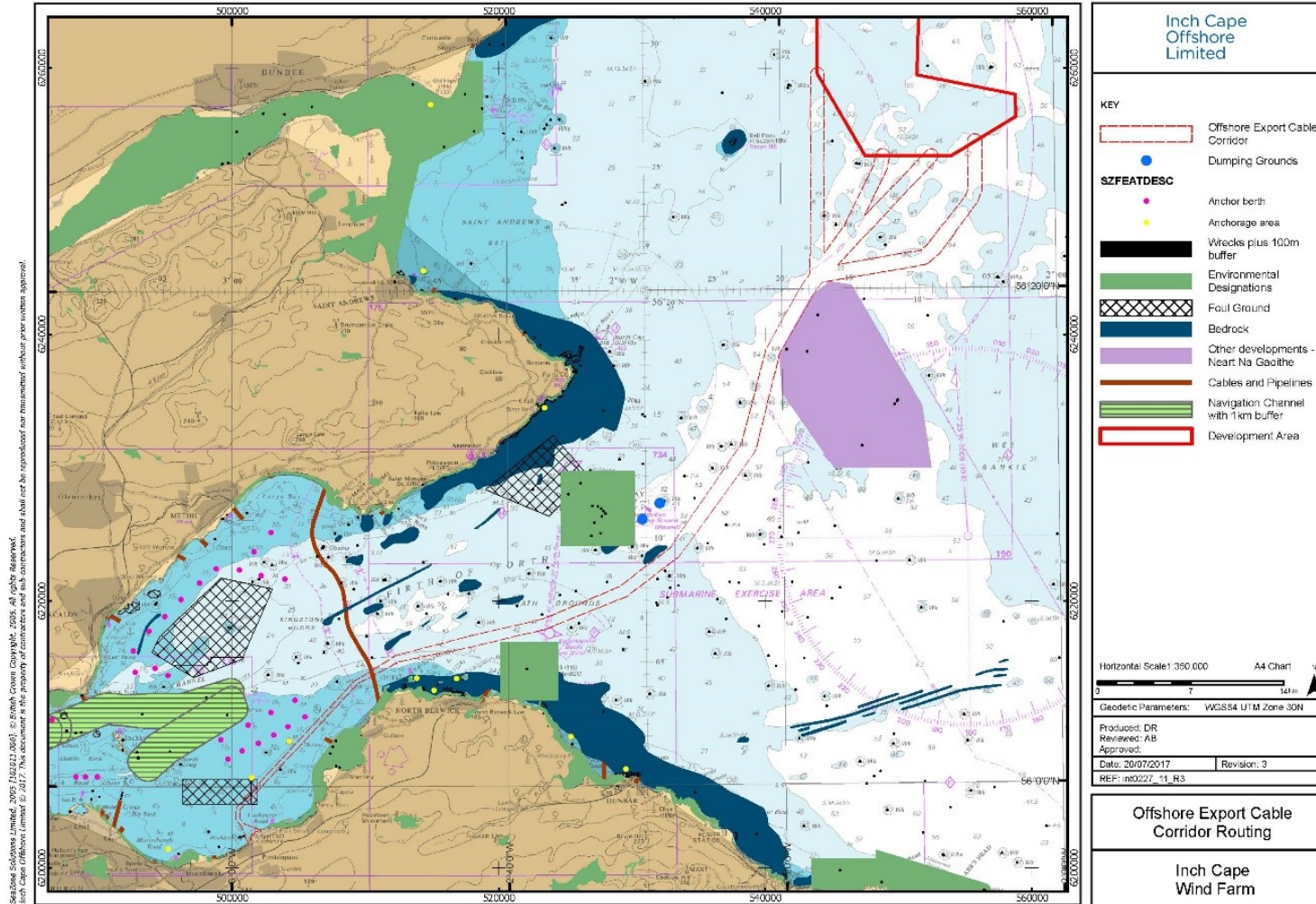


Figure 7.1: Location of Development Area, Offshore Export Cable Corridor and Grid Connection

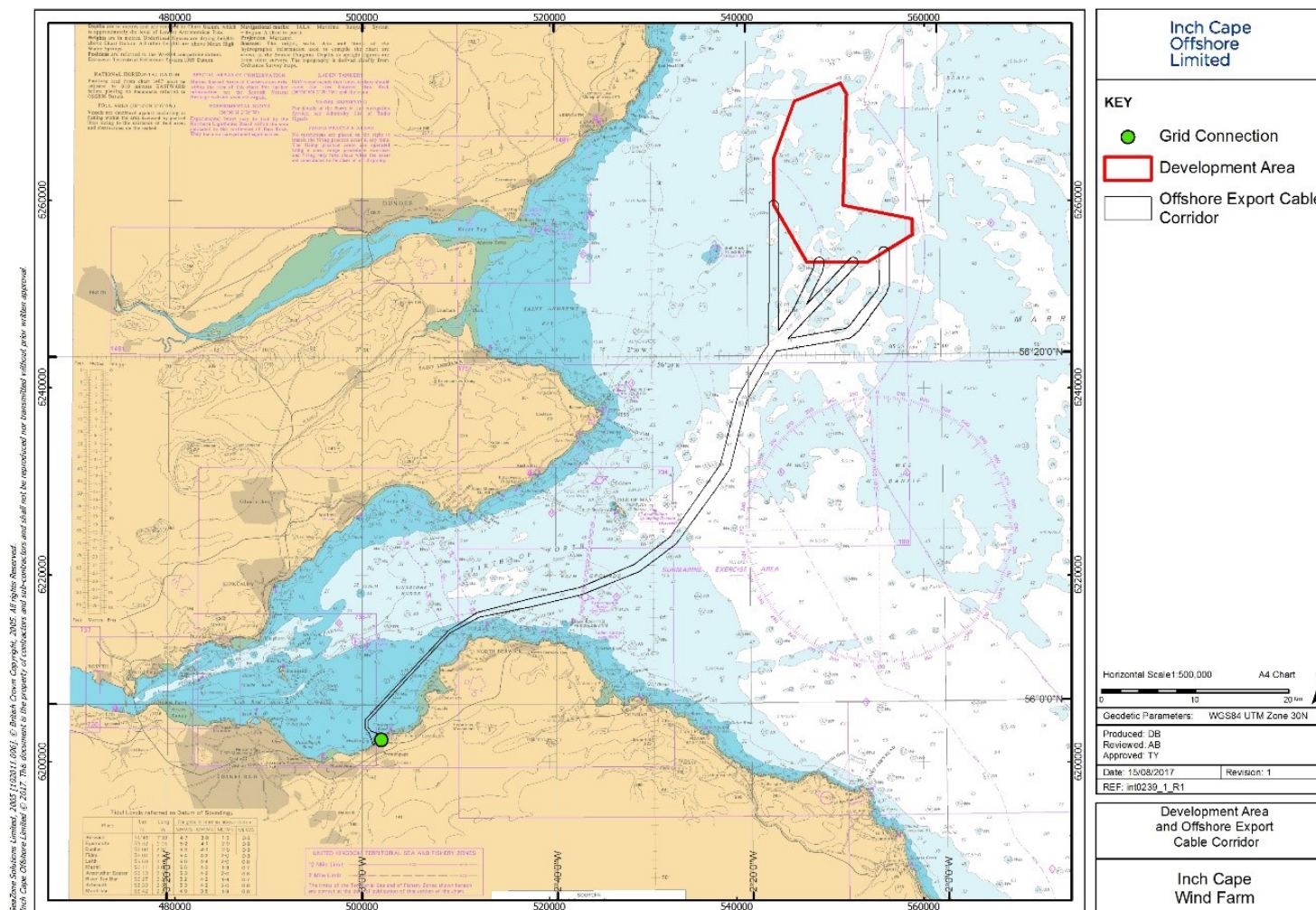


Figure 7.3: Development Area

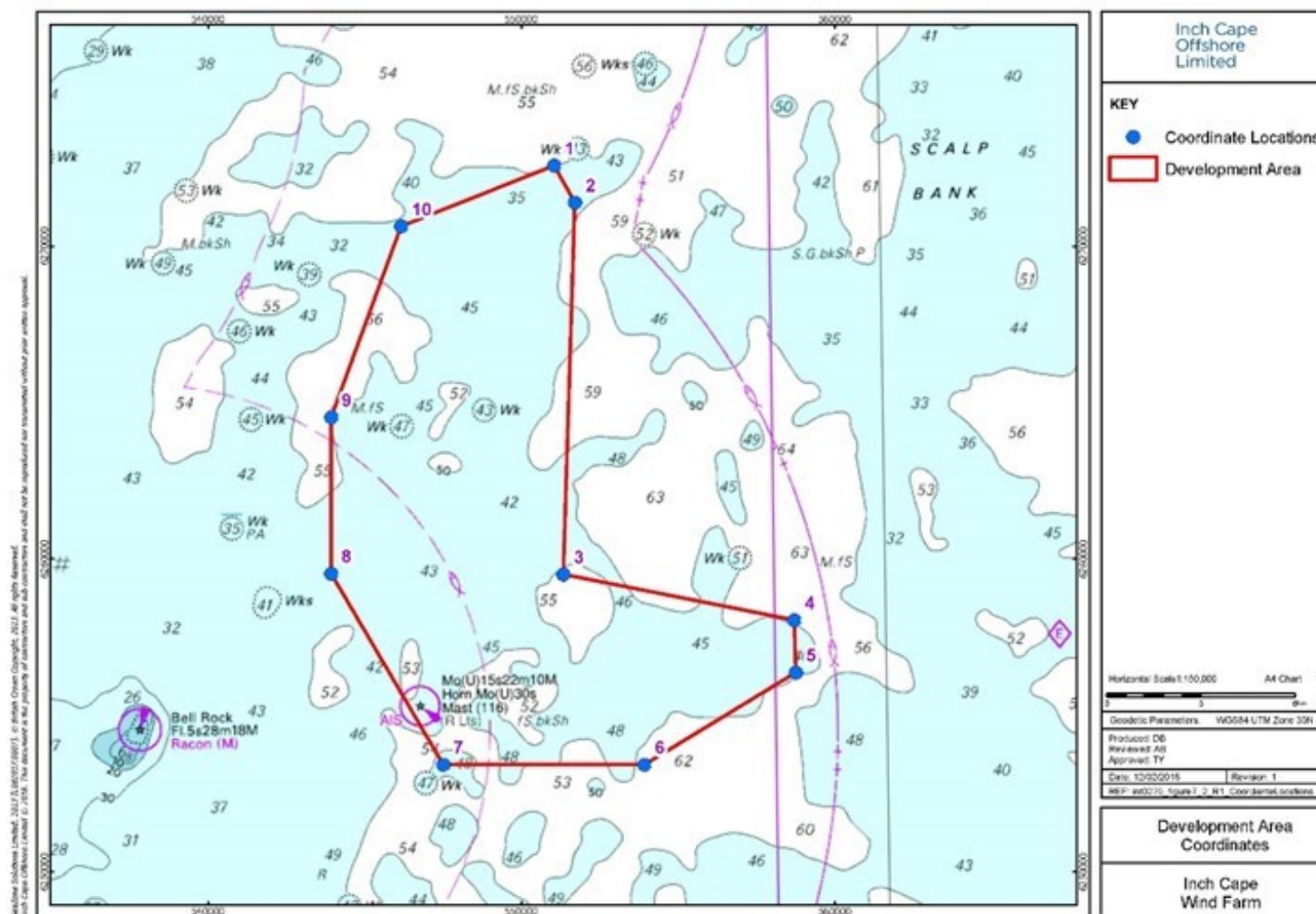


Figure 7.4: Development Area Bathymetry

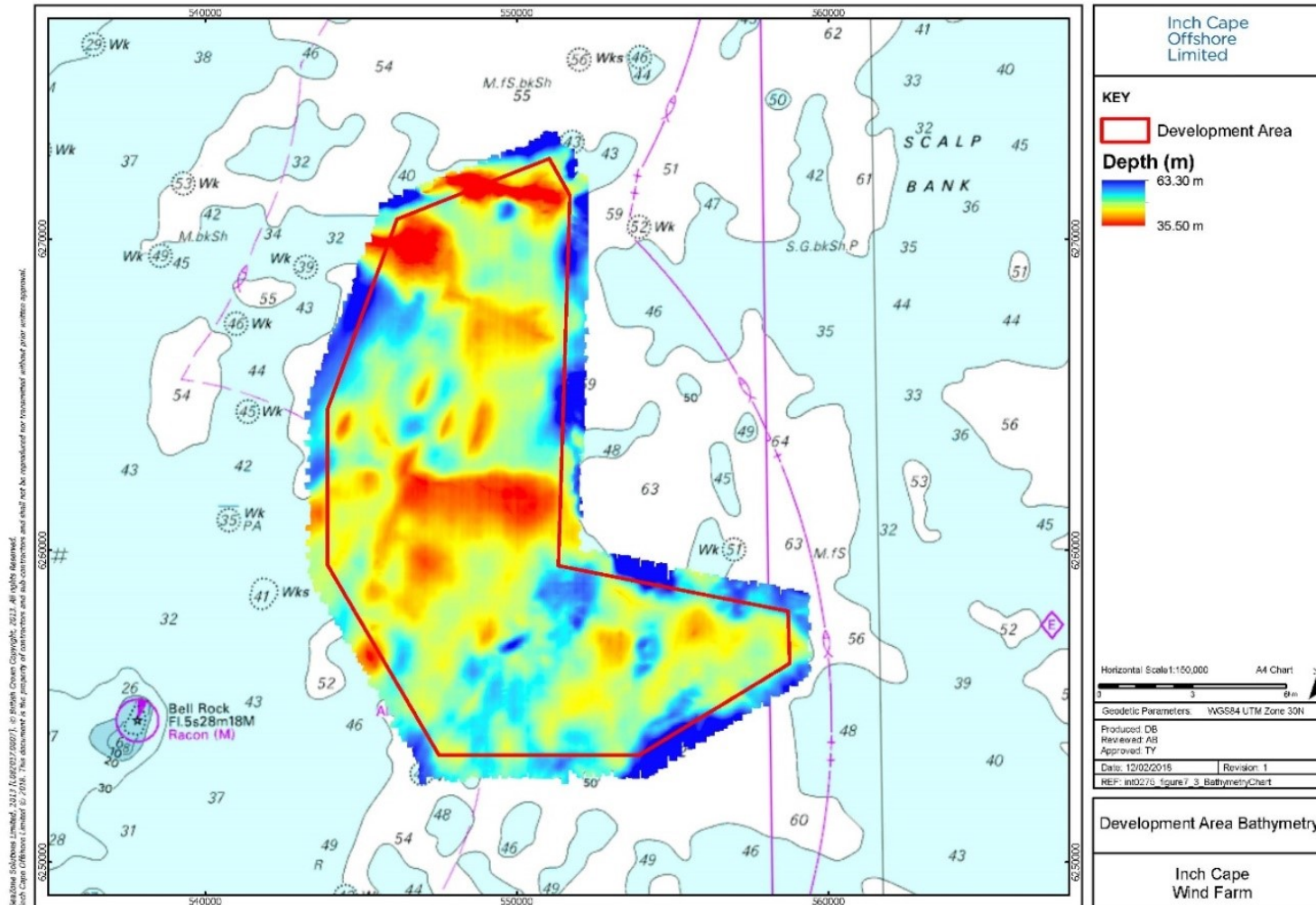


Figure 7.6: Cable Landfall

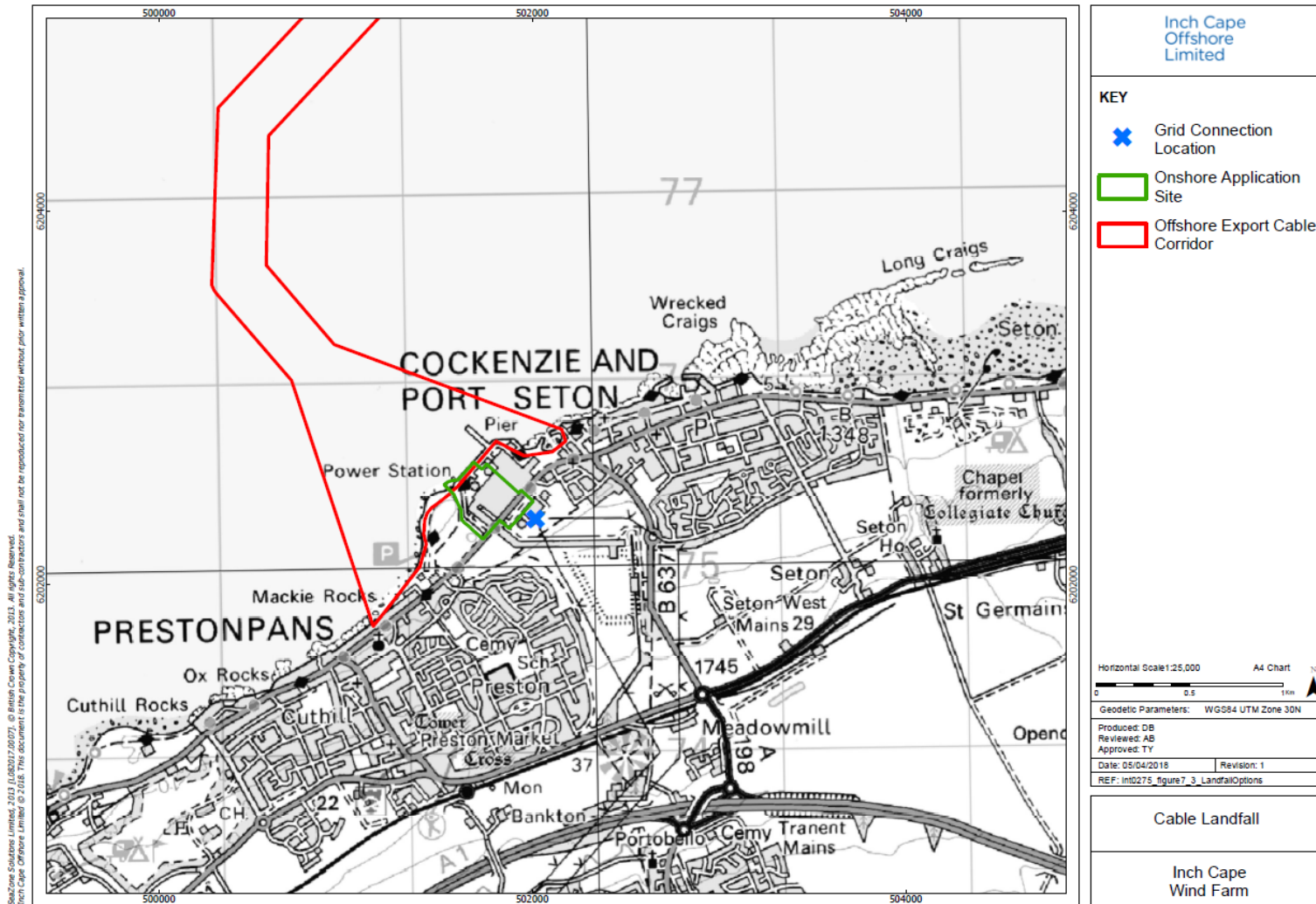
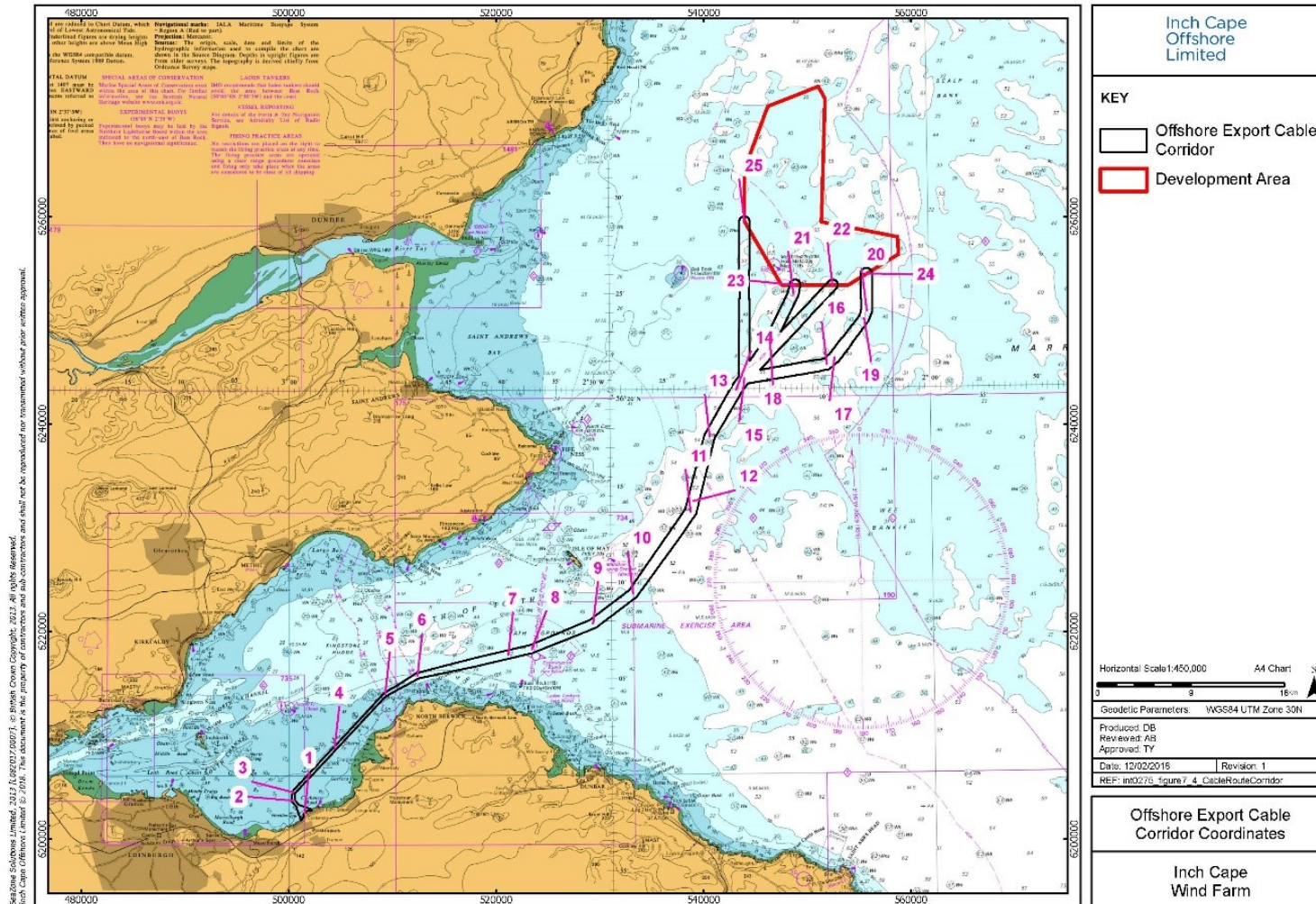


Figure 7.7: Offshore Export Cable Corridor



NO FIGURES WERE PRESENTED IN CHAPTER 8

Figure 9.1 Study area

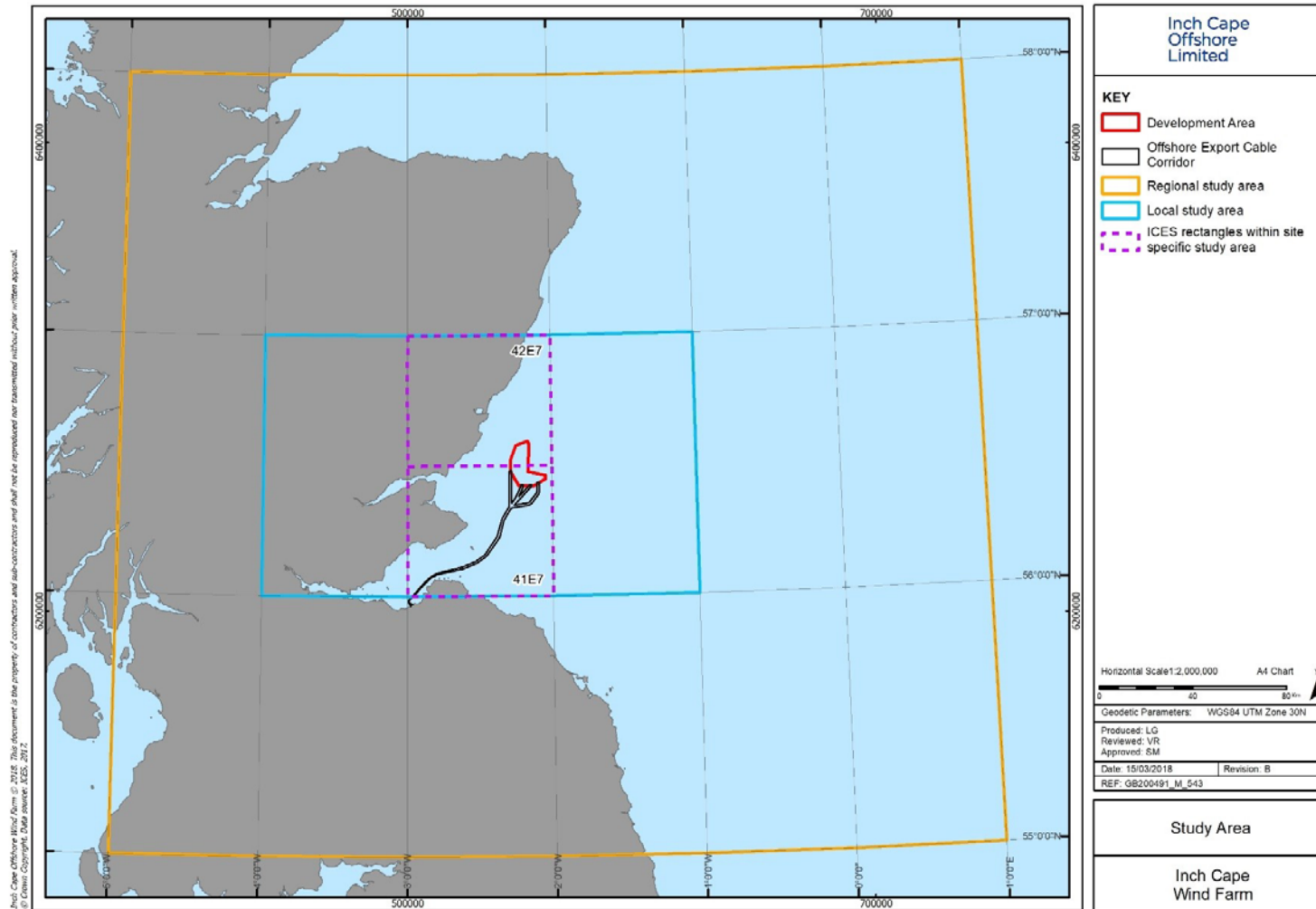


Figure 9.2 Herring spawning areas

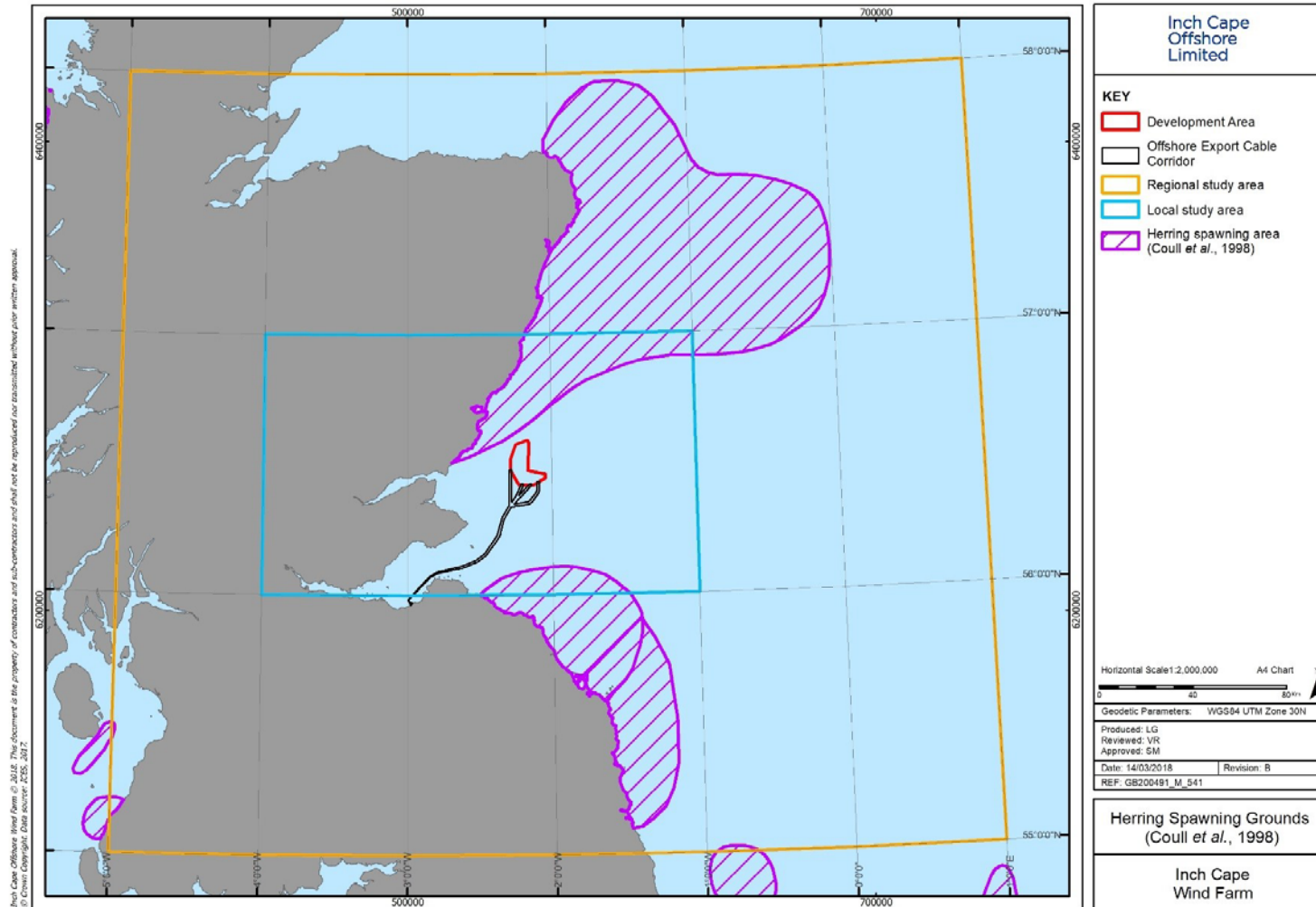


Figure 9.3 Herring nursery areas

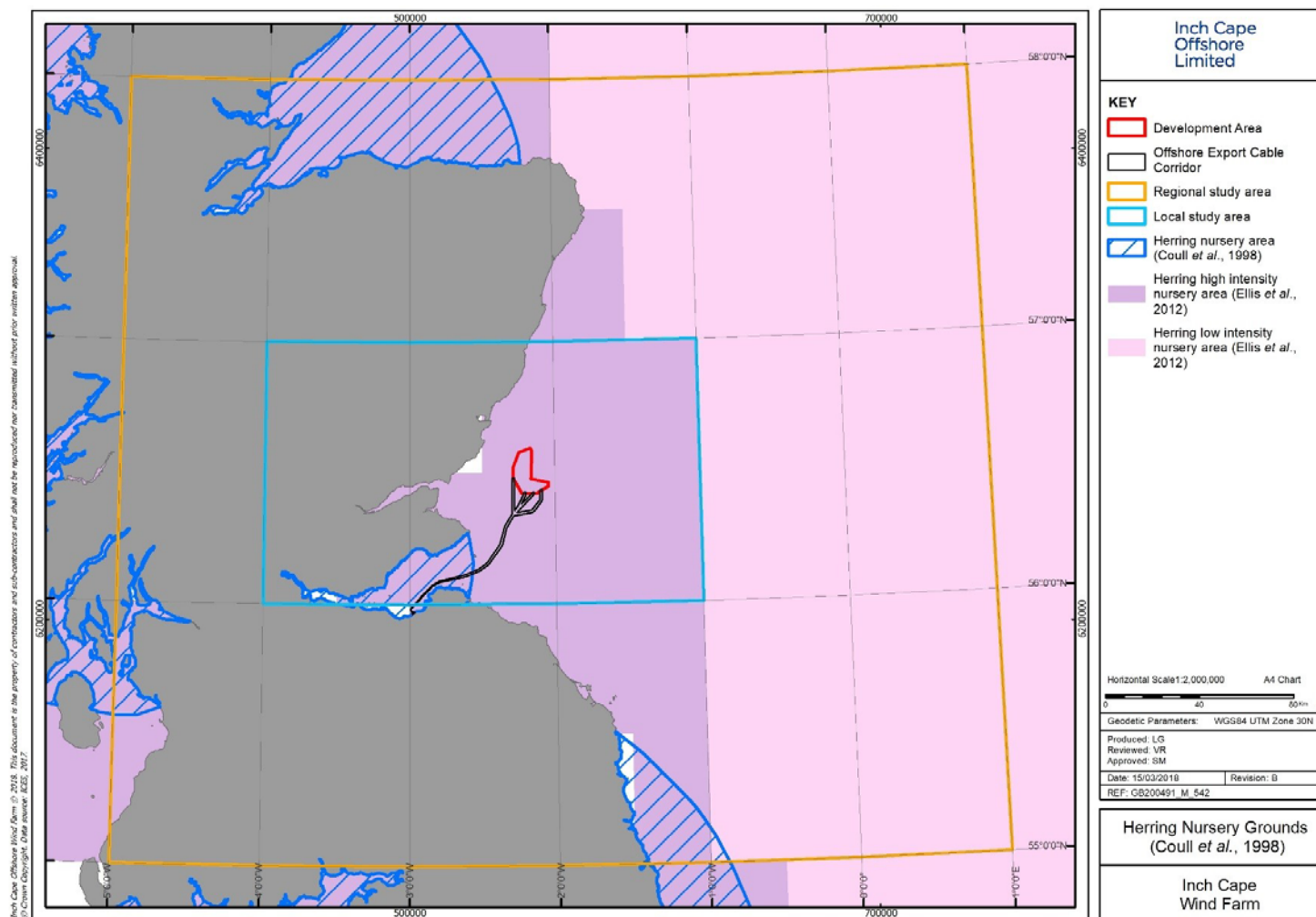


Figure 9.4 Cod nursery and spawning Areas

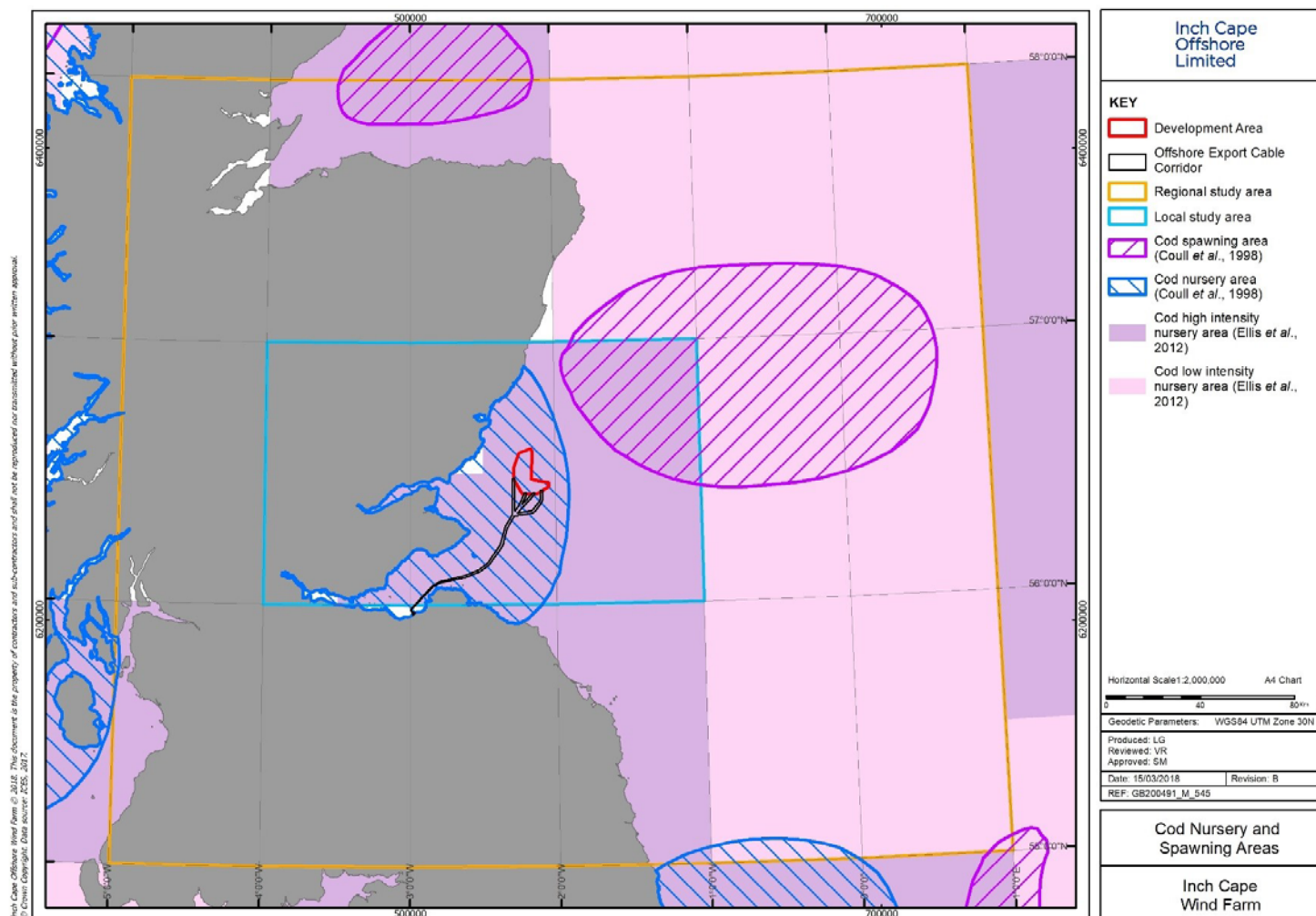


Figure 9.5 Sprat nursery and spawning areas

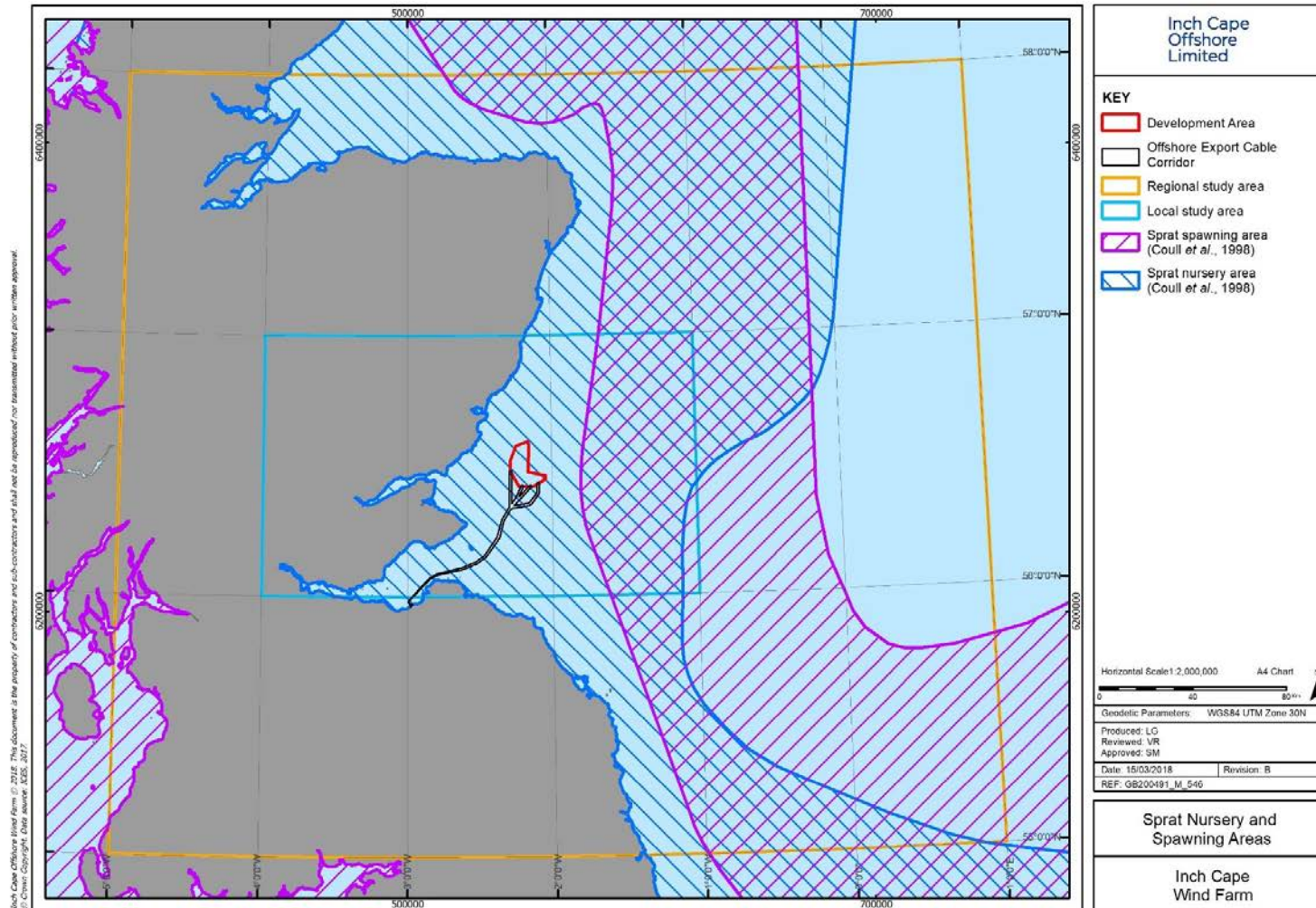


Figure 9.6 SEL interaction with herring spawning grounds – pin piles

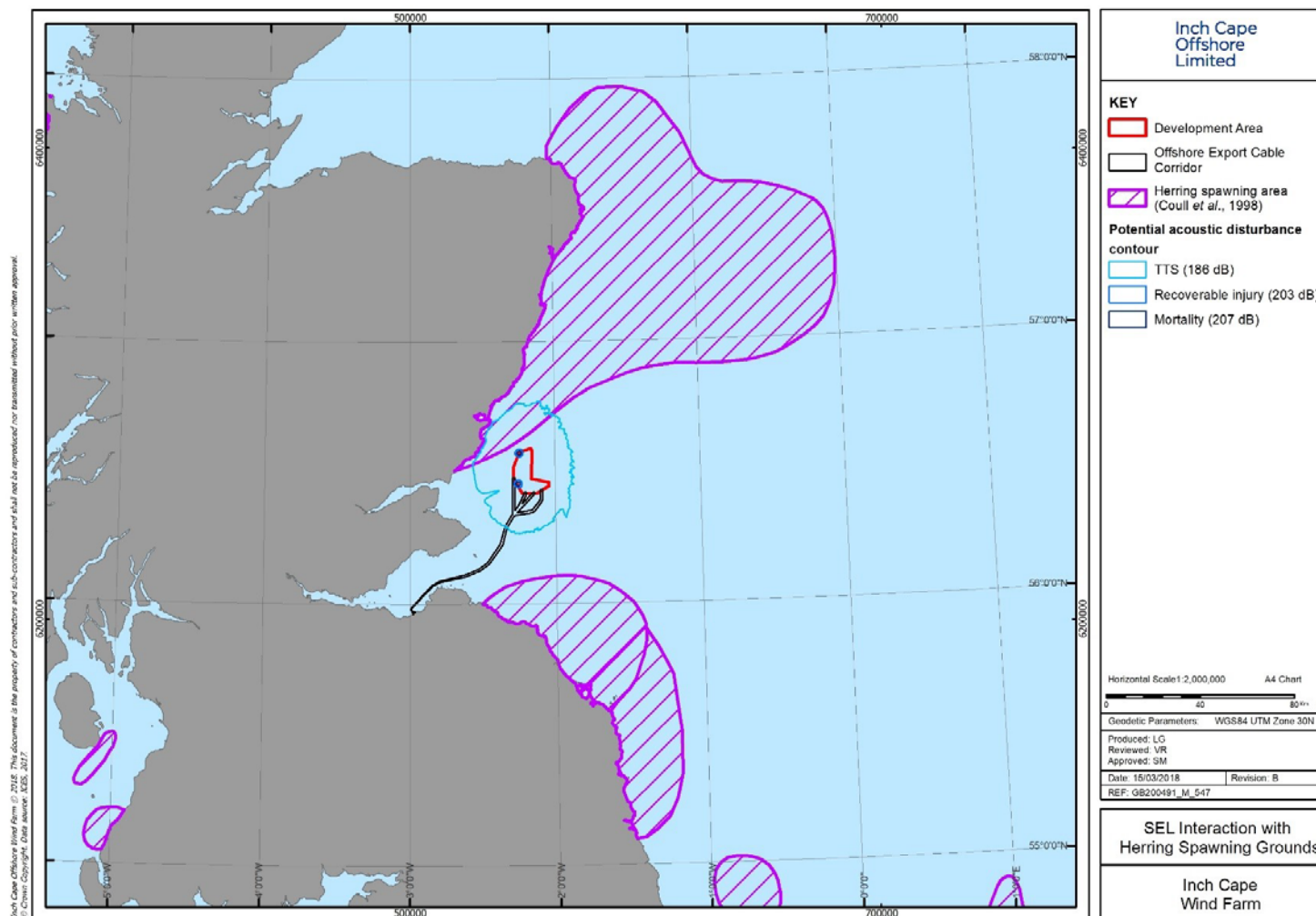


Figure 9.7 SEL interaction with herring spawning grounds – monopiles

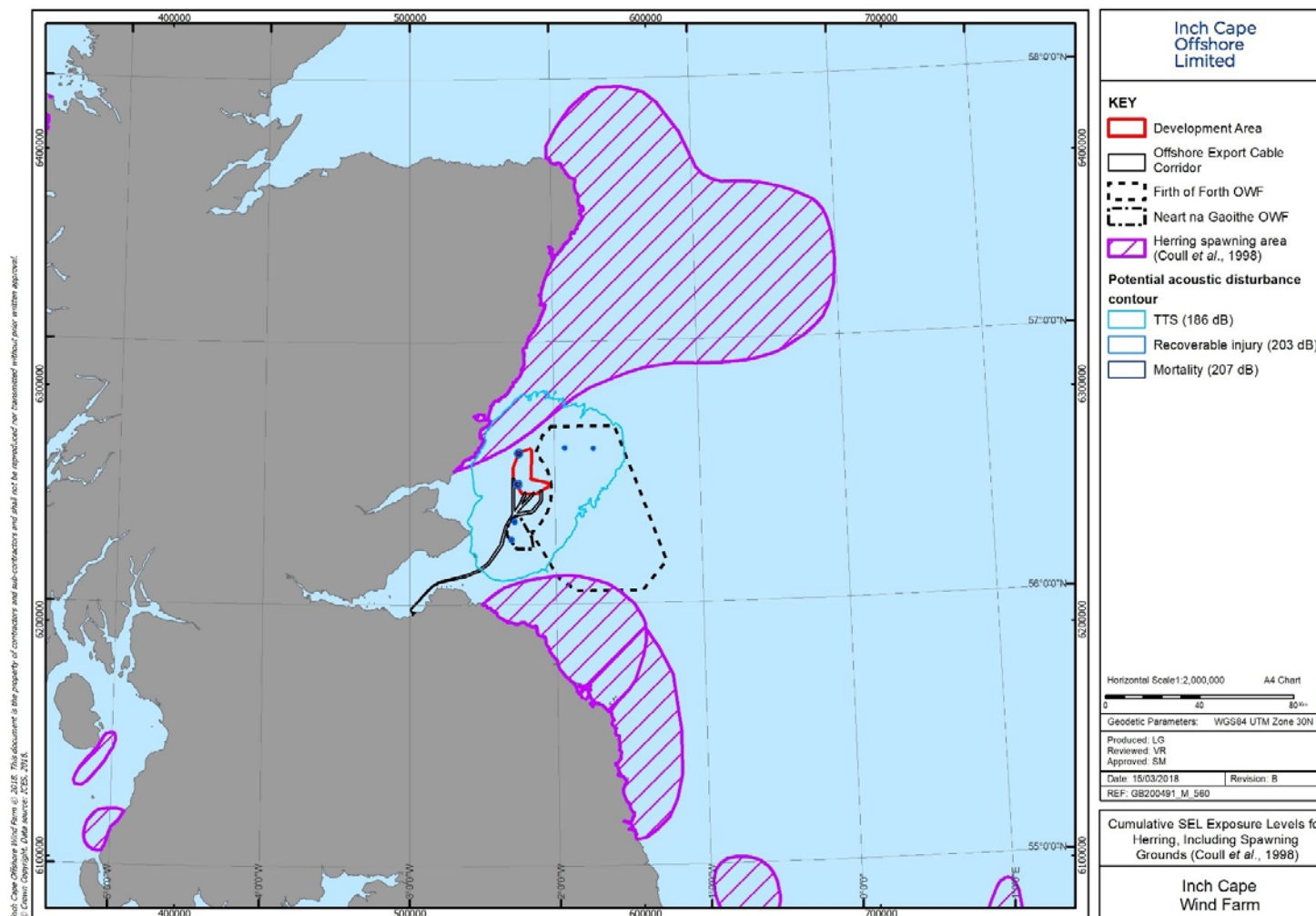


Figure 9.8 Variation in SEL Impact Areas with Changing Conversion Factor

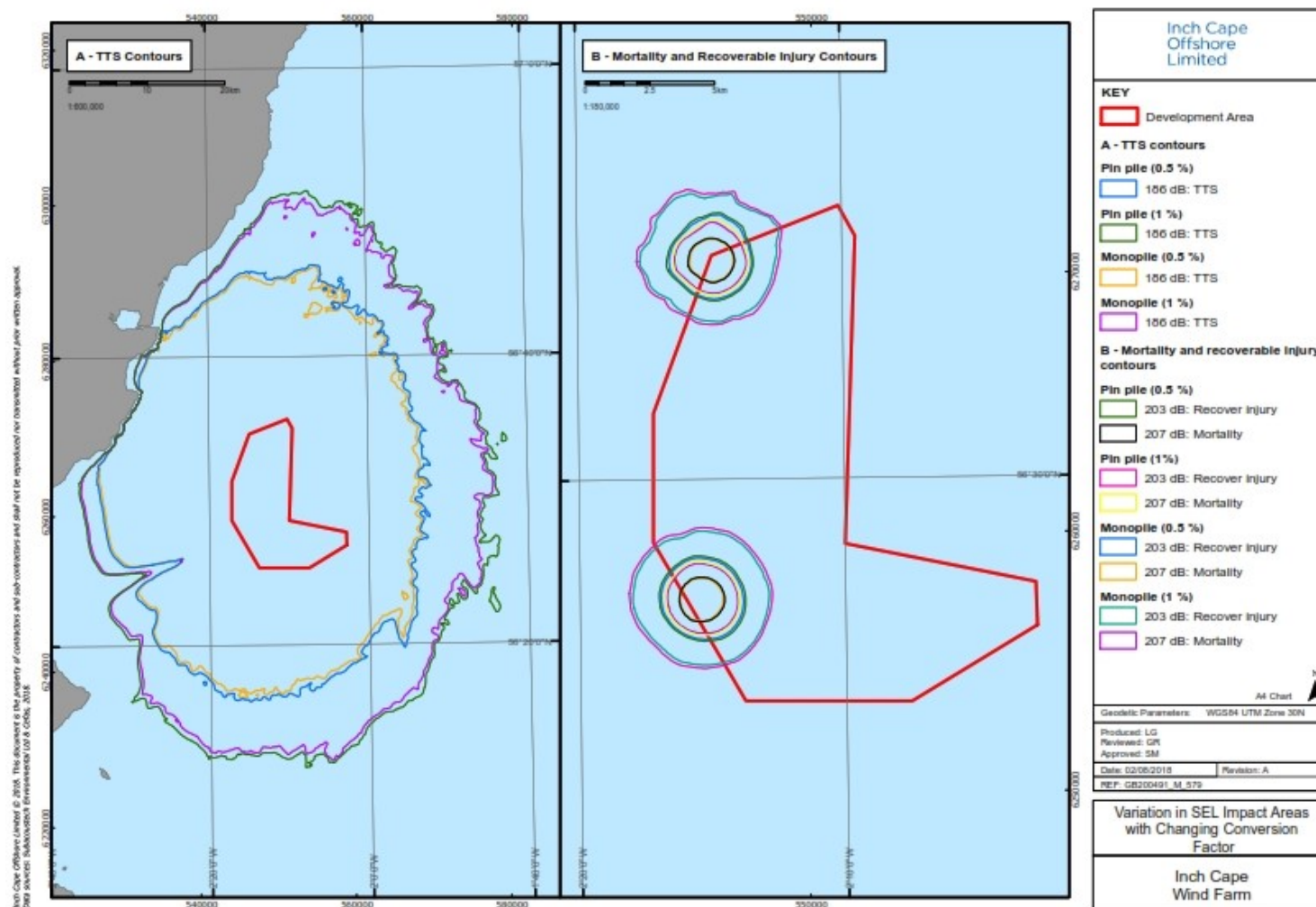


Figure 9.9 Cumulative SEL interaction with herring spawning grounds – pin piles

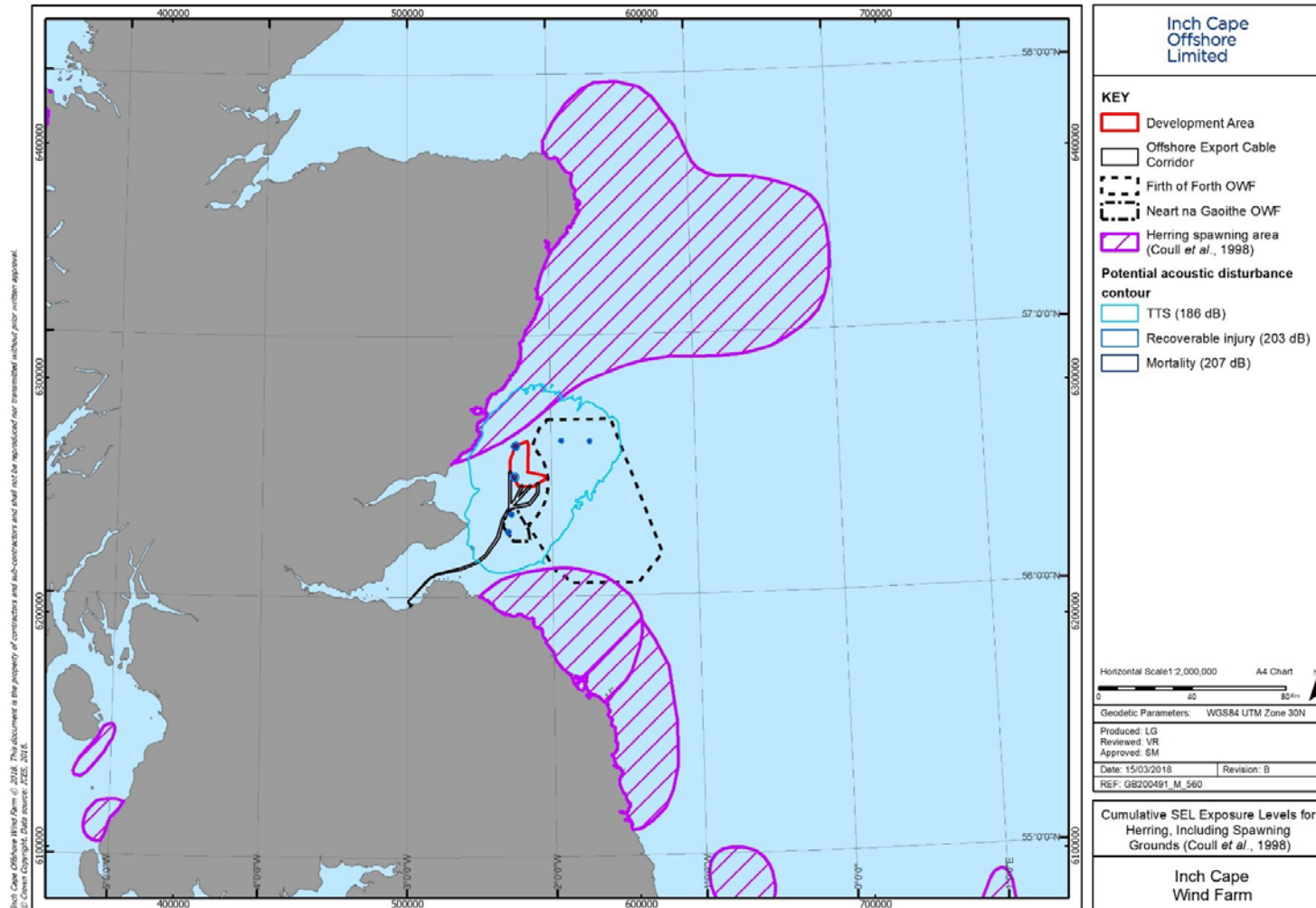


Figure 9.10 Cumulative SEL interaction with herring spawning grounds – monopiles

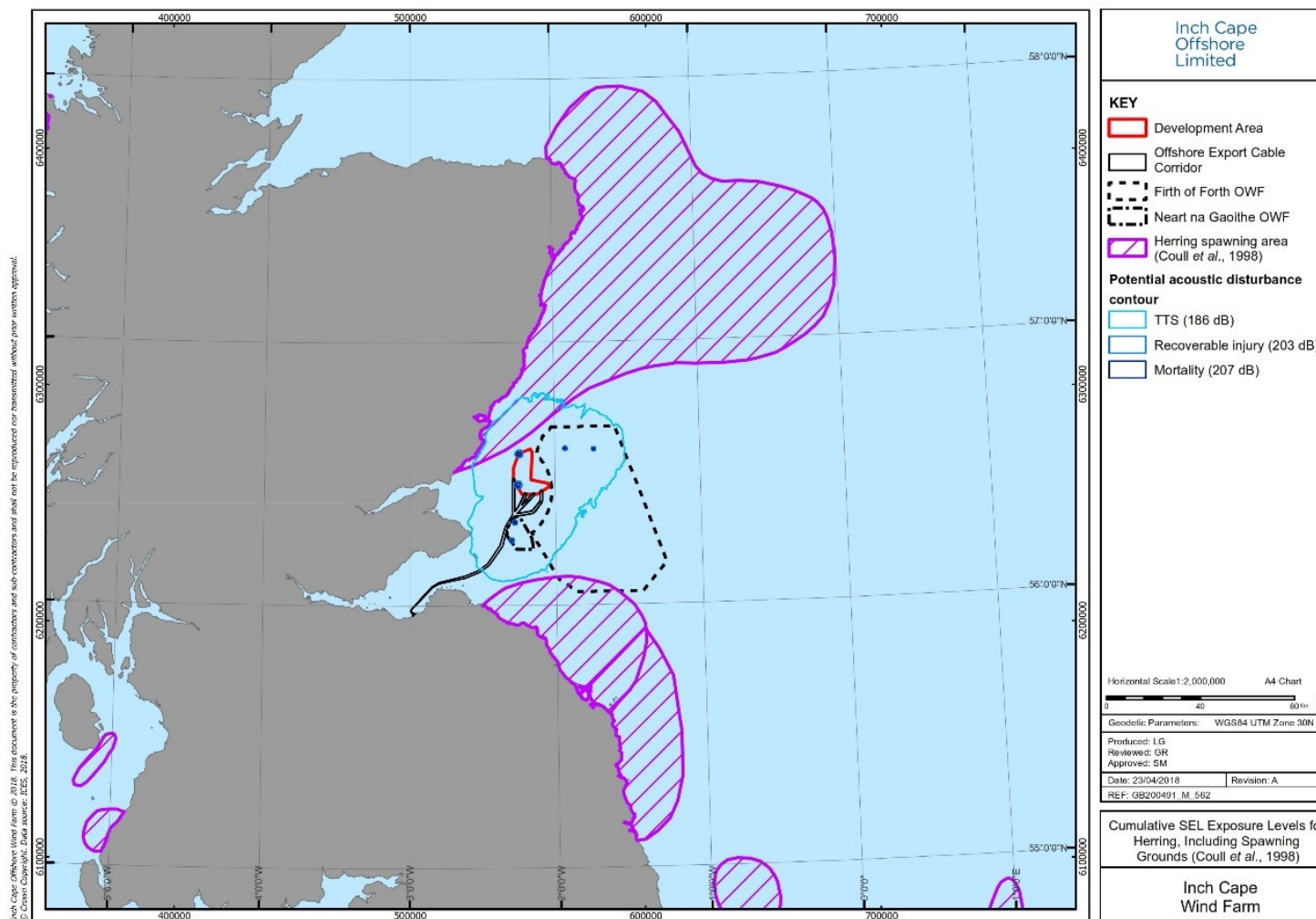


Figure 10.1 Cumulative PTS effect zones for minke whale exposed to piling of a single monopile foundation with a maximum hammer energy of 4,500 kJ at noise modelling location 3 (F3), NOAA criteria

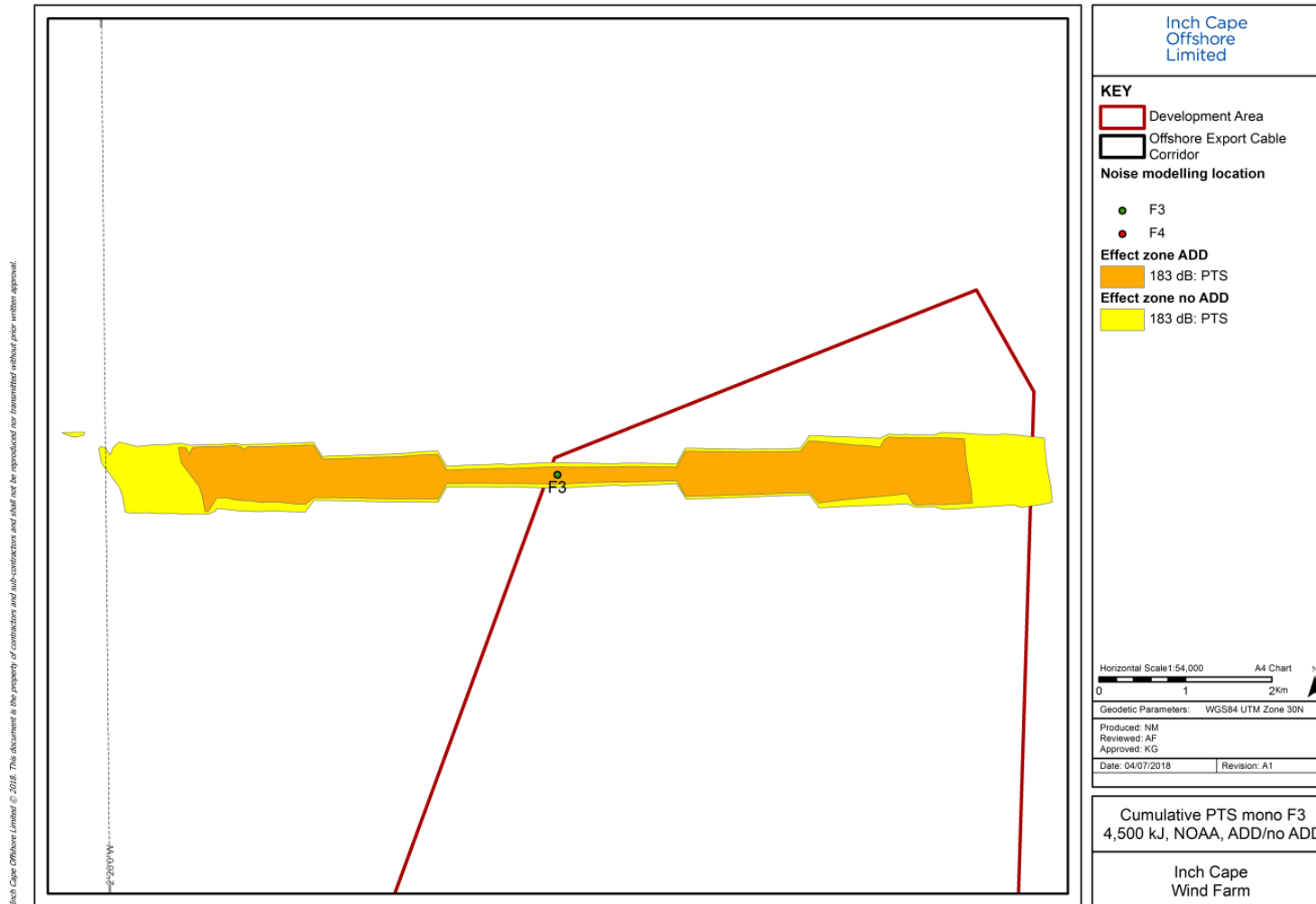


Figure 10.2 Cumulative PTS effect zones for grey and harbour seal exposed to piling of a single monopile foundation with a maximum hammer energy of 4,500 kJ at location noise modelling location 4 (F4), Southall criteria

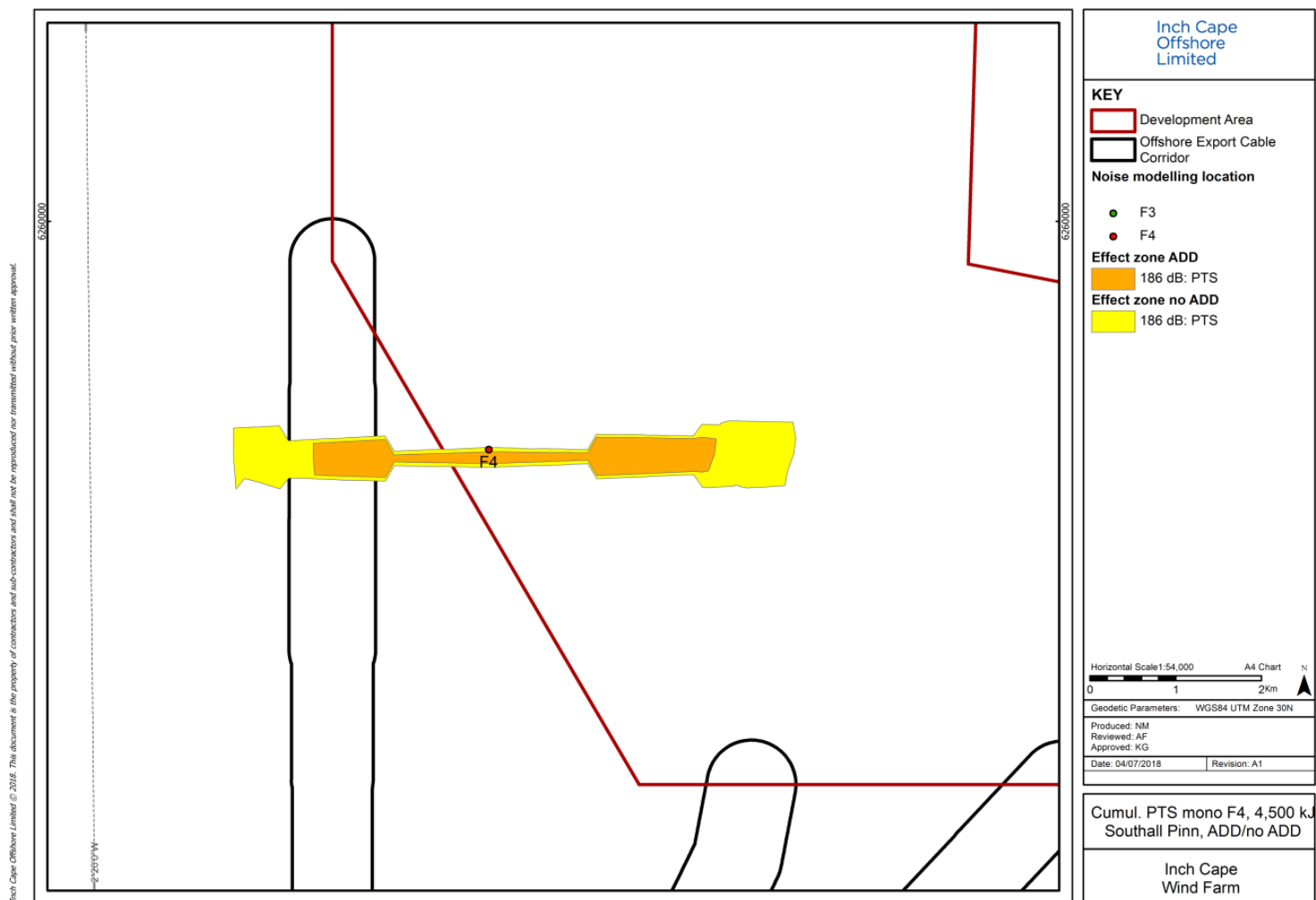


Figure 10.3 Modelled received noise levels (dB re 1 μ Pa²s) for PTS from pile driving under Scenario 4 for low frequency cetaceans for pin piles with and without use of an ADD

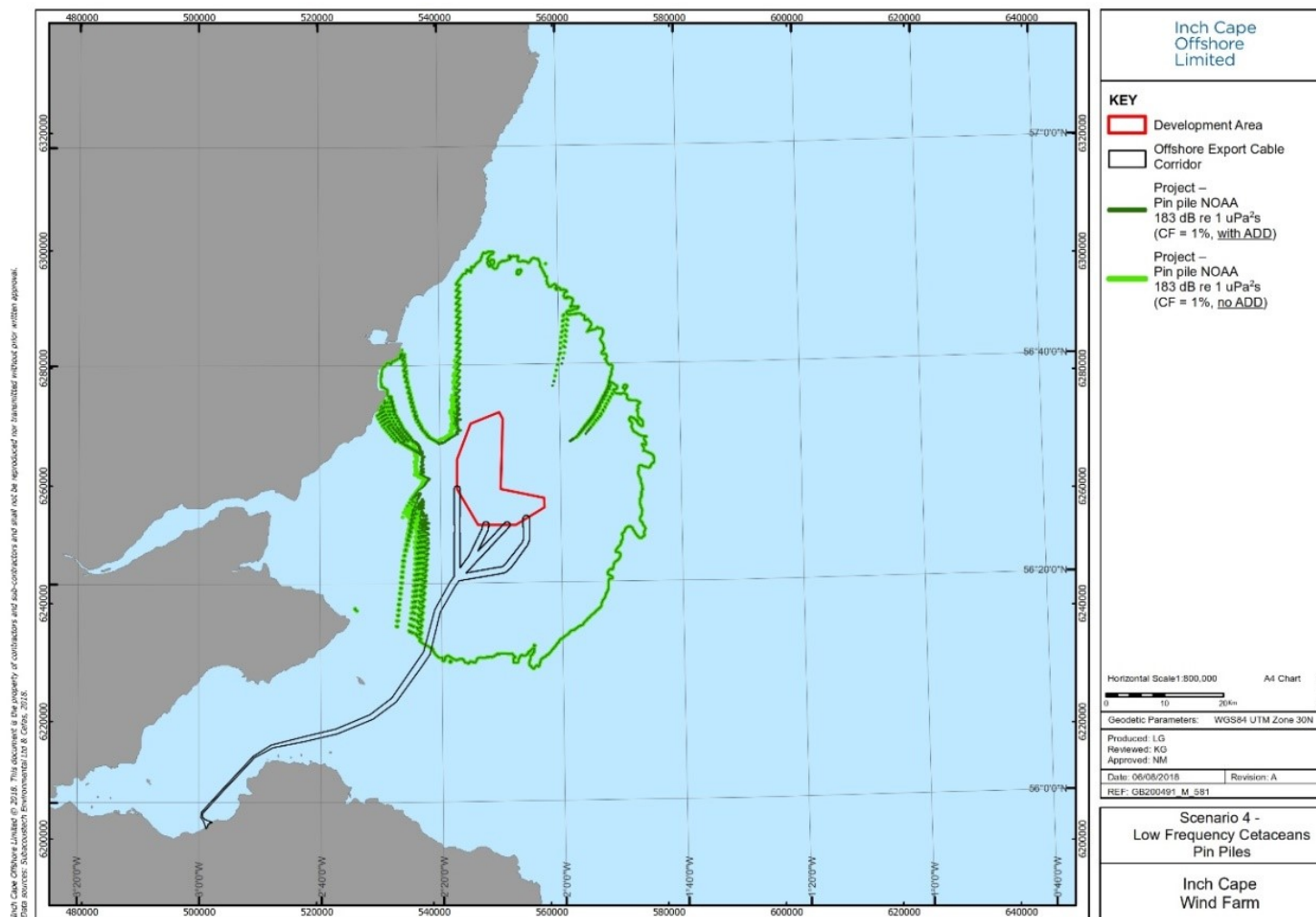


Figure 10.4 Modelled received noise levels (dB re 1 μ Pa²s) for PTS from pile driving under Scenario 4 for low frequency cetaceans for monopiles with and without use of an ADD

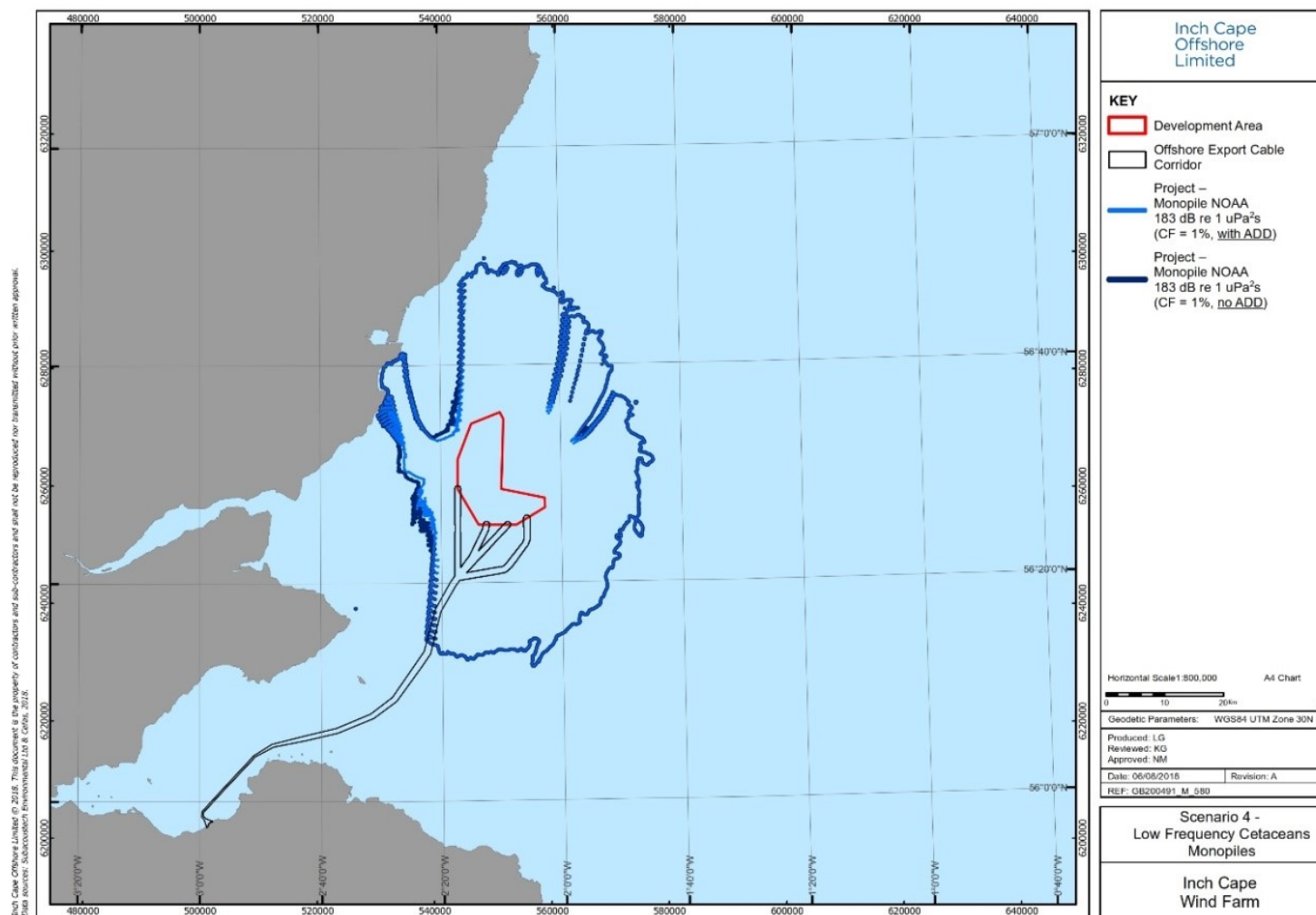


Figure 10.5 Minke whale density

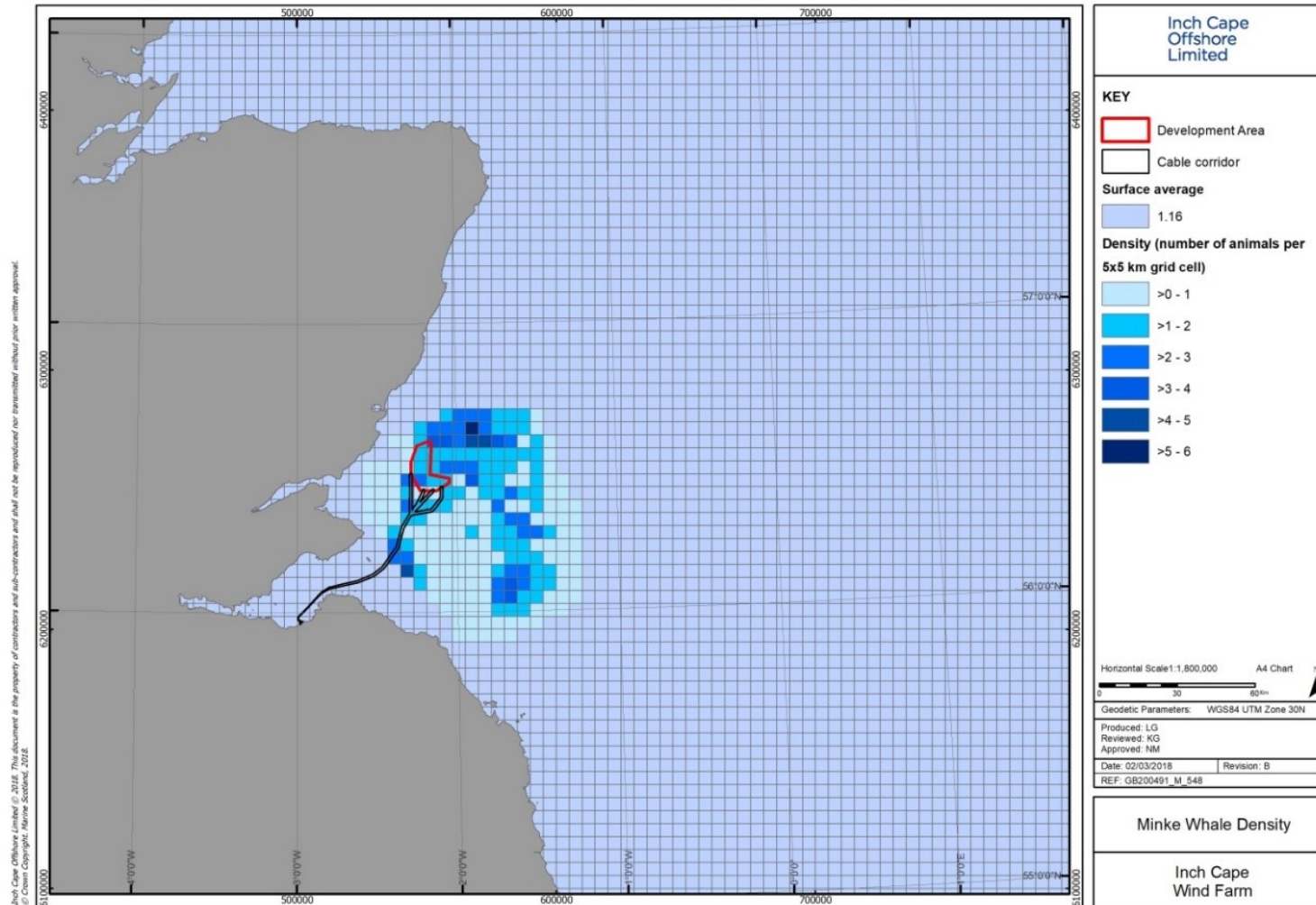


Figure 10.6 Bottlenose dolphin density

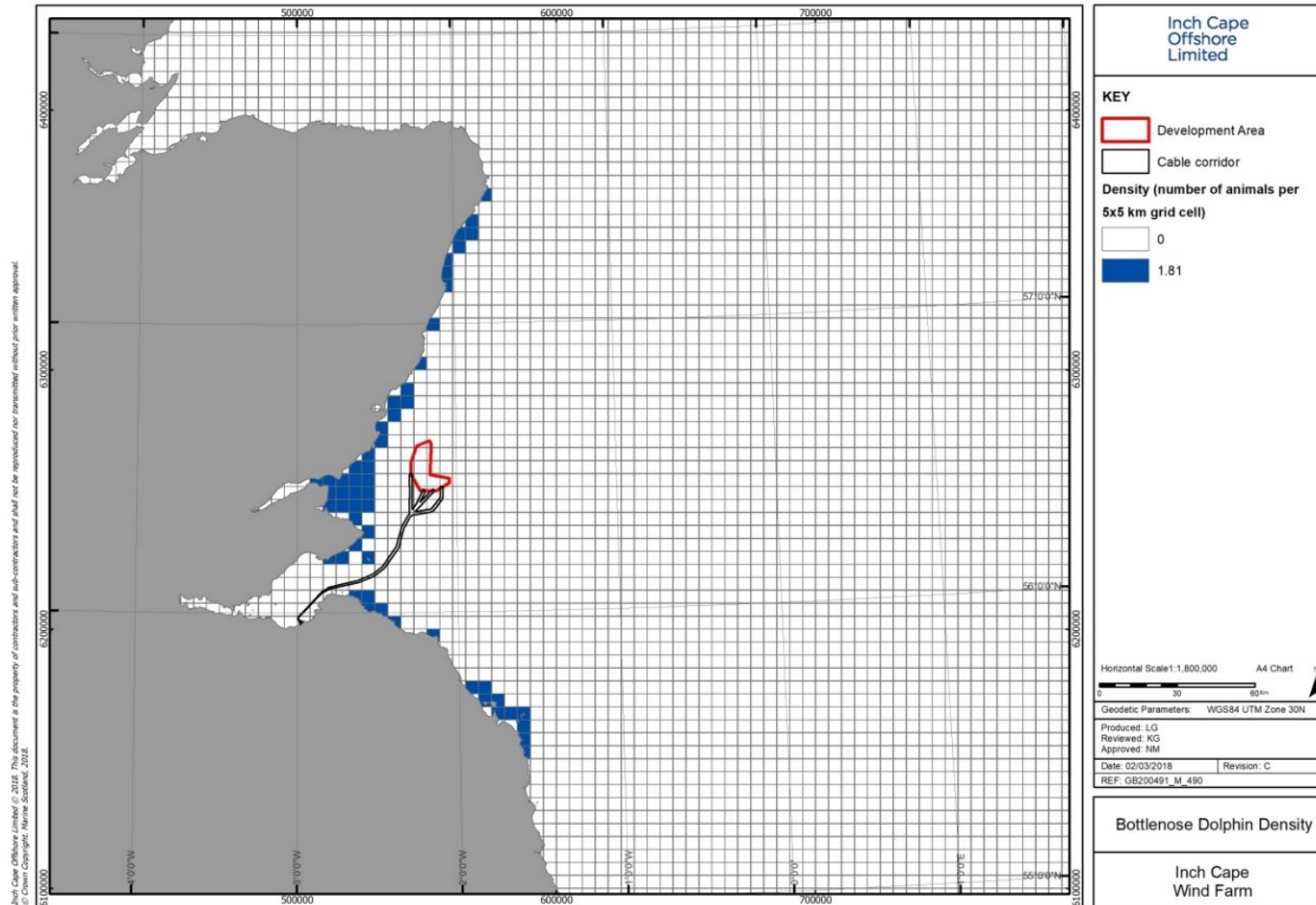


Figure 10.7 White-beaked dolphin density

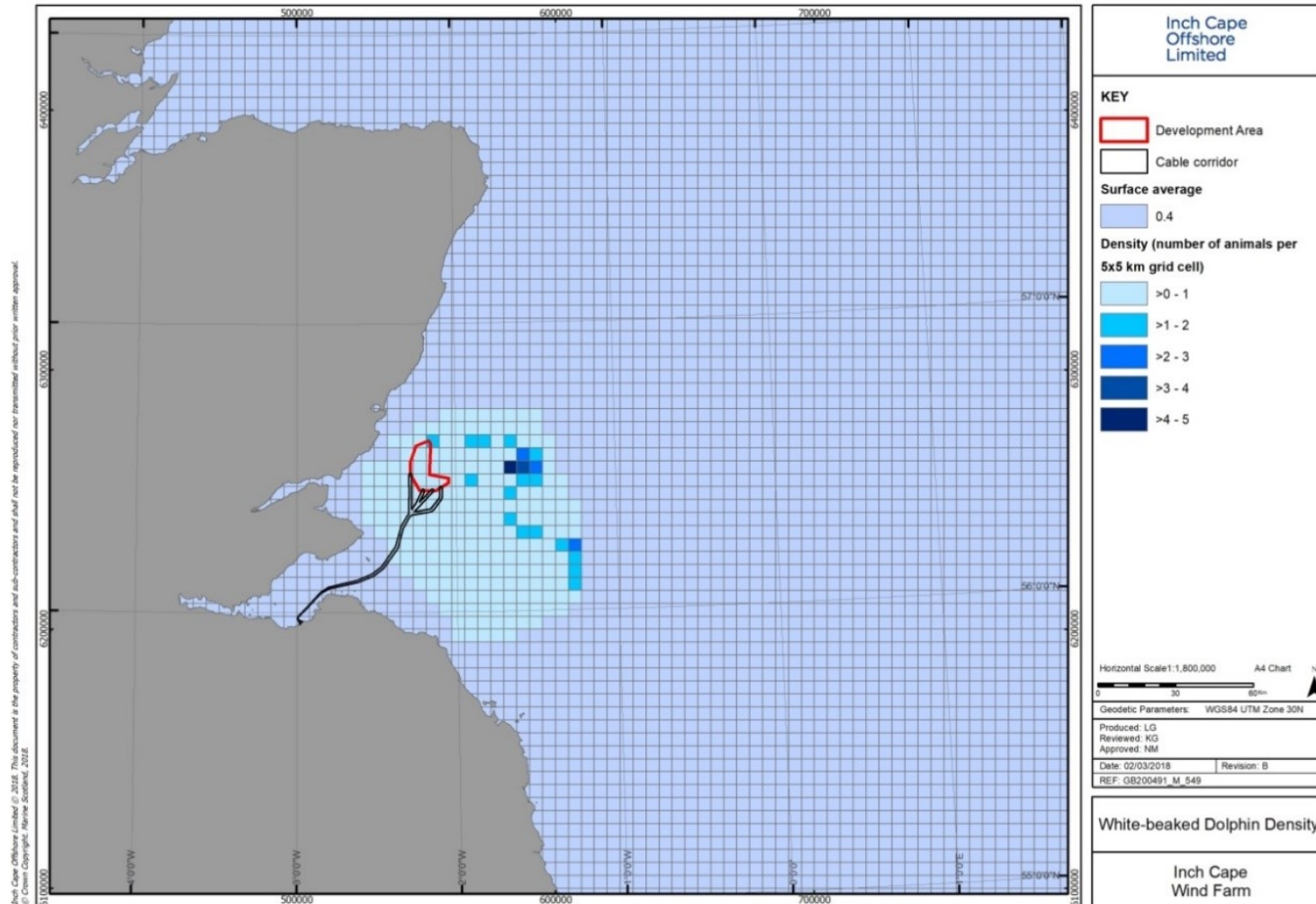


Figure 10.8 Harbour porpoise density

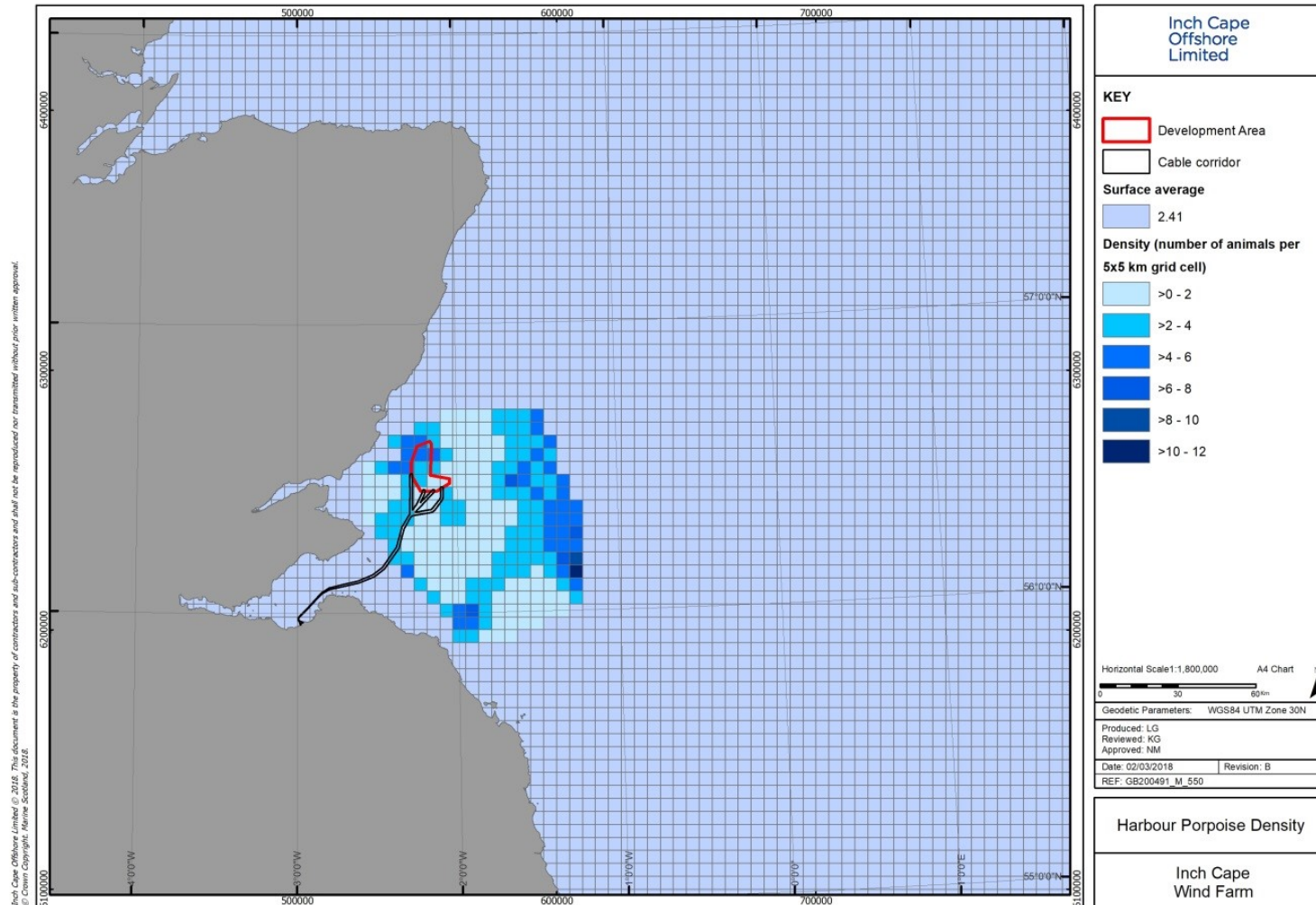


Figure 10.9 Grey seal density

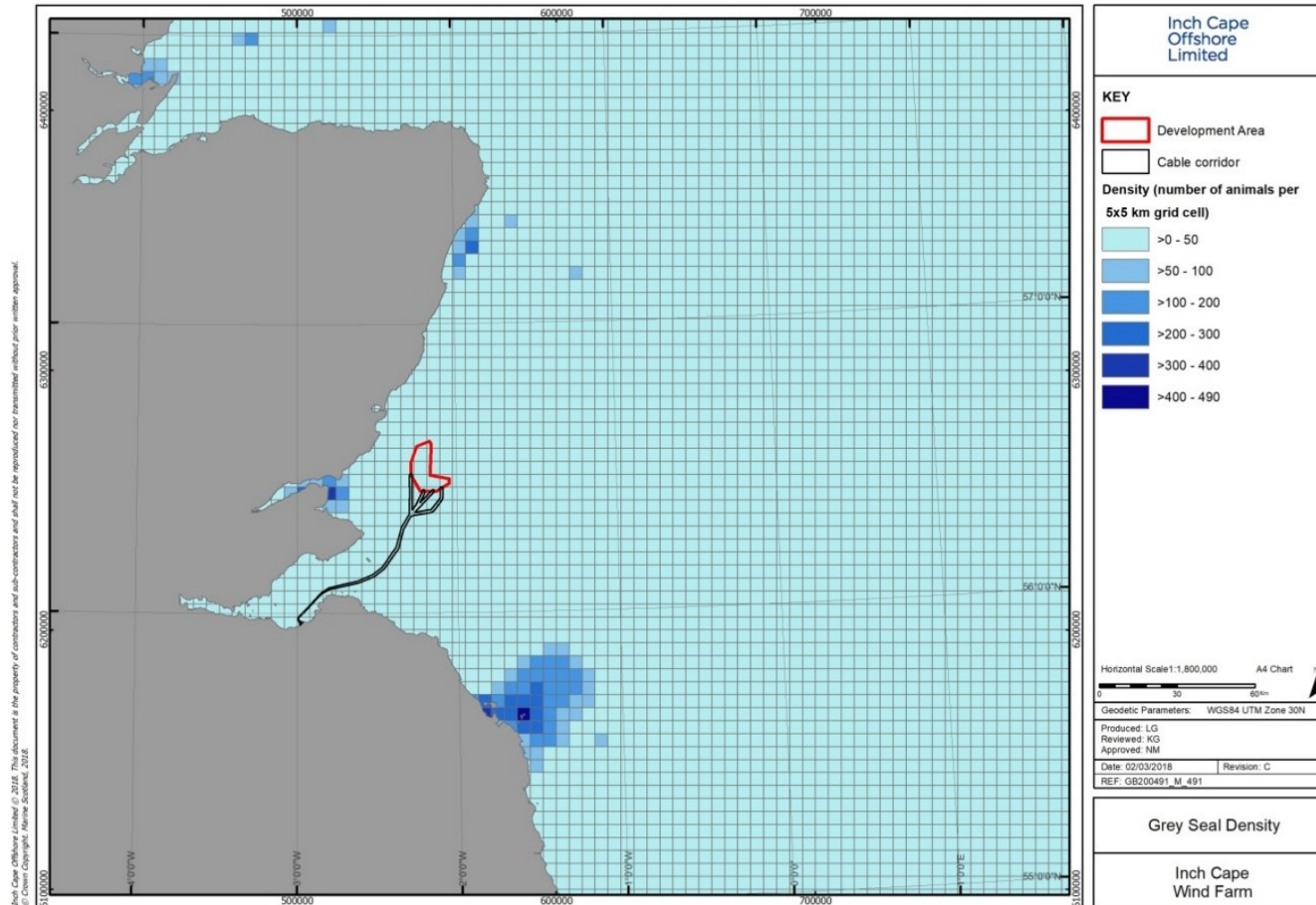


Figure 10.10 Harbour seal density

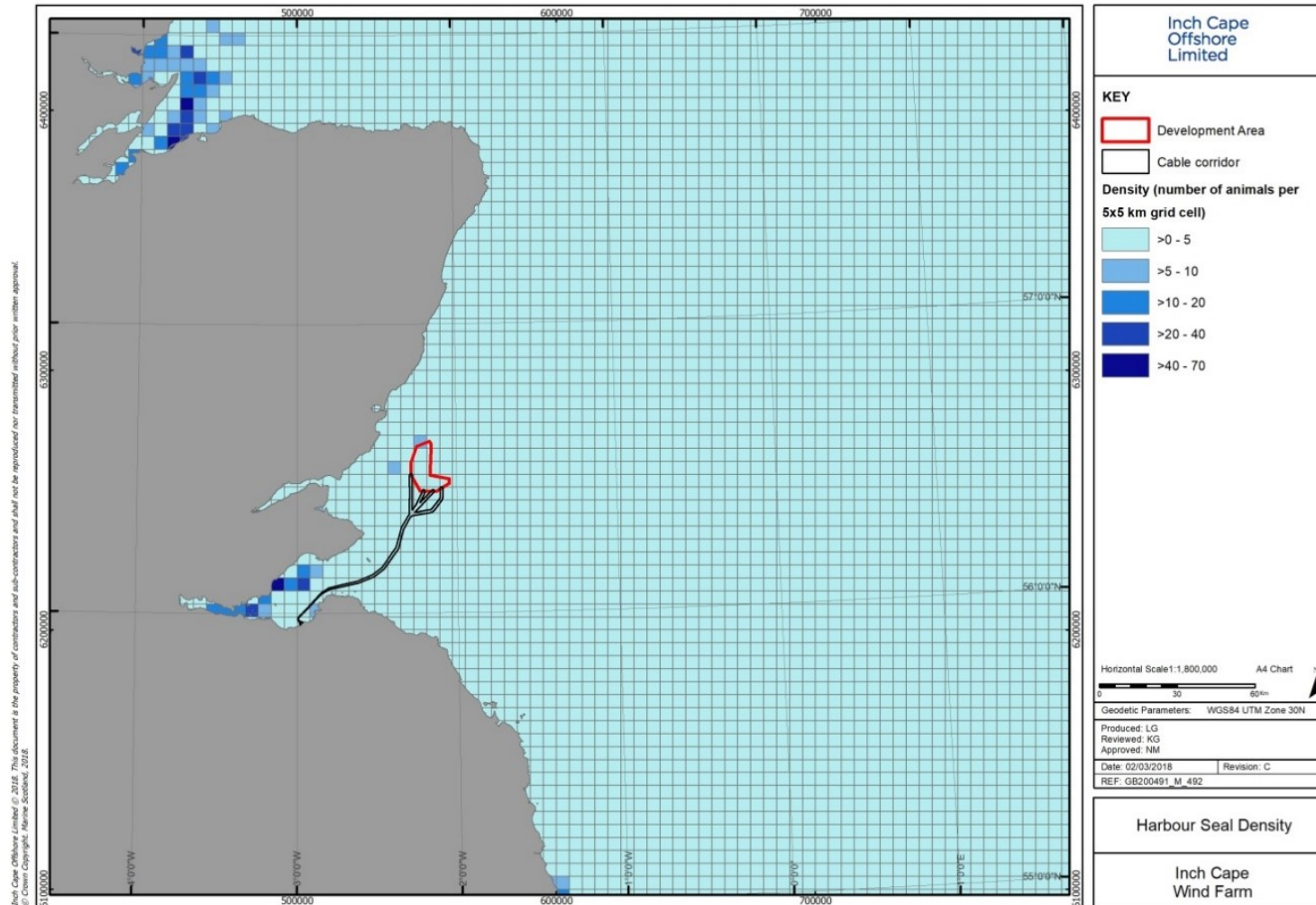


Figure 10.13 Noise modelling locations

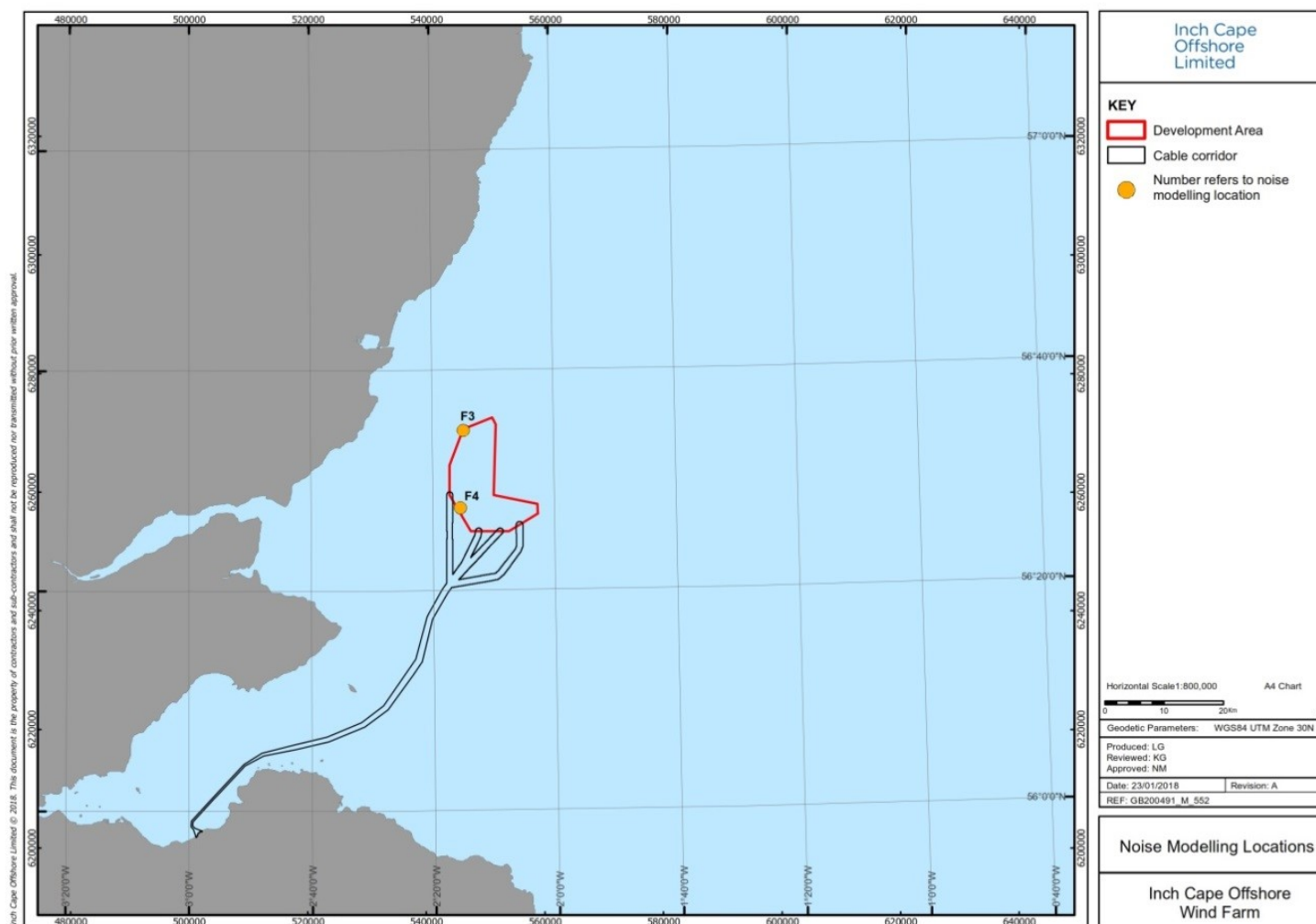


Figure 10.15 Modelled received noise levels (dB re 1 μ Pa²s) for PTS from pile driving under Scenario 1a for low frequency cetaceans

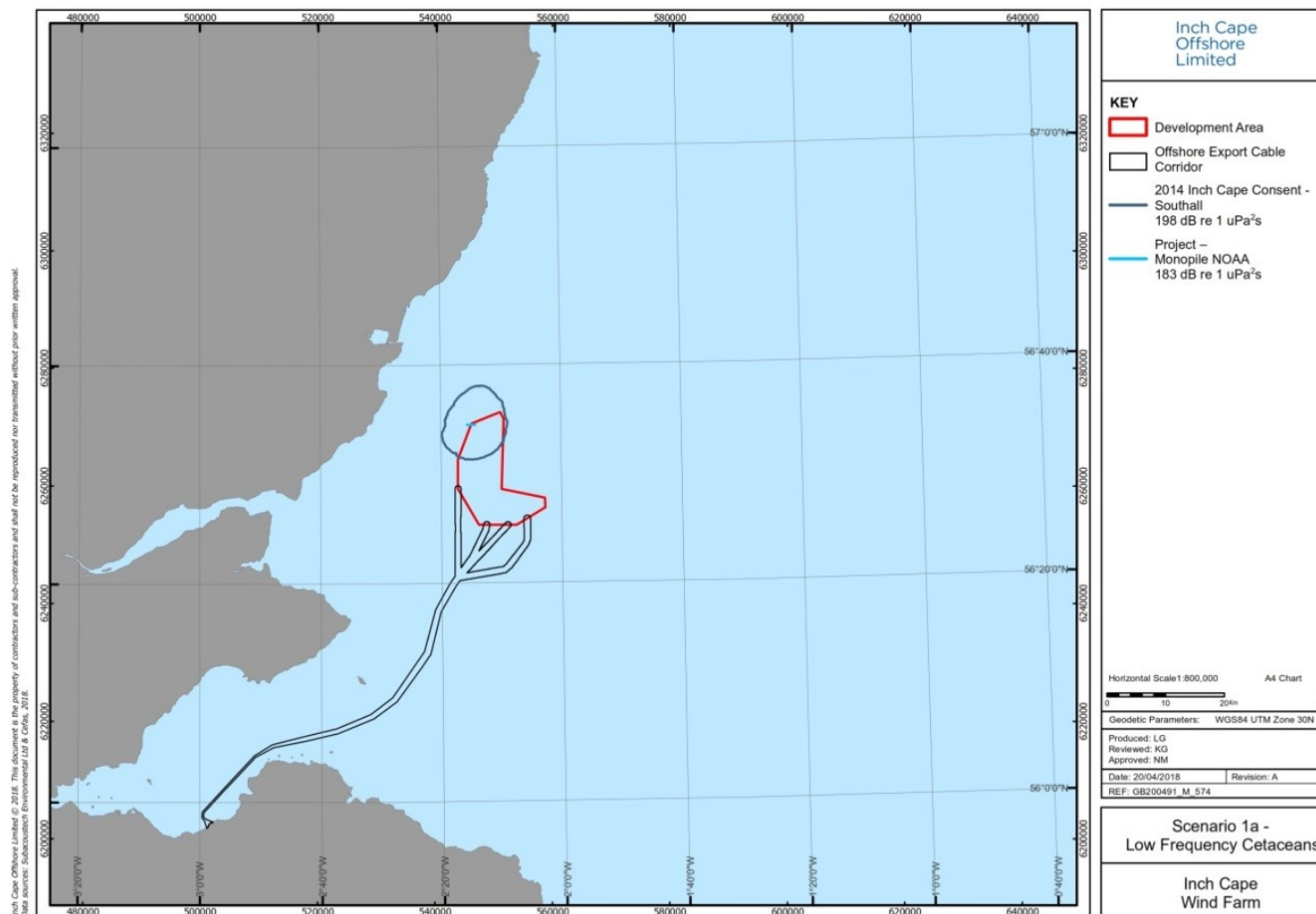


Figure 10.16 Modelled received noise levels (dB re 1 $\mu\text{Pa}^2\text{s}$) for PTS from pile driving under Scenario 2a for low frequency cetaceans

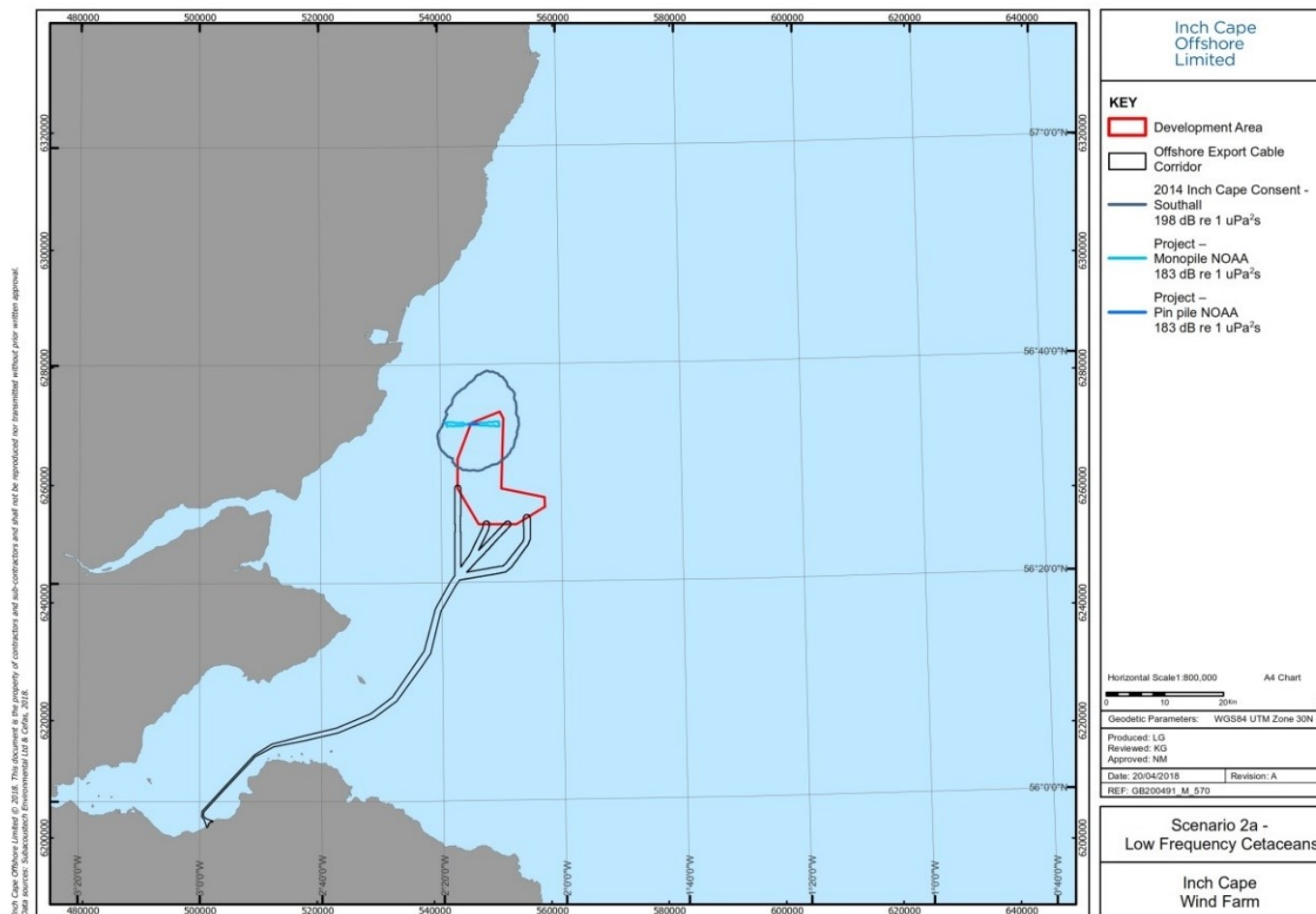


Figure 10.17 Modelled received noise levels (dB re 1 $\mu\text{Pa}^2\text{s}$) for PTS from pile driving under Scenario 3 for low frequency cetaceans

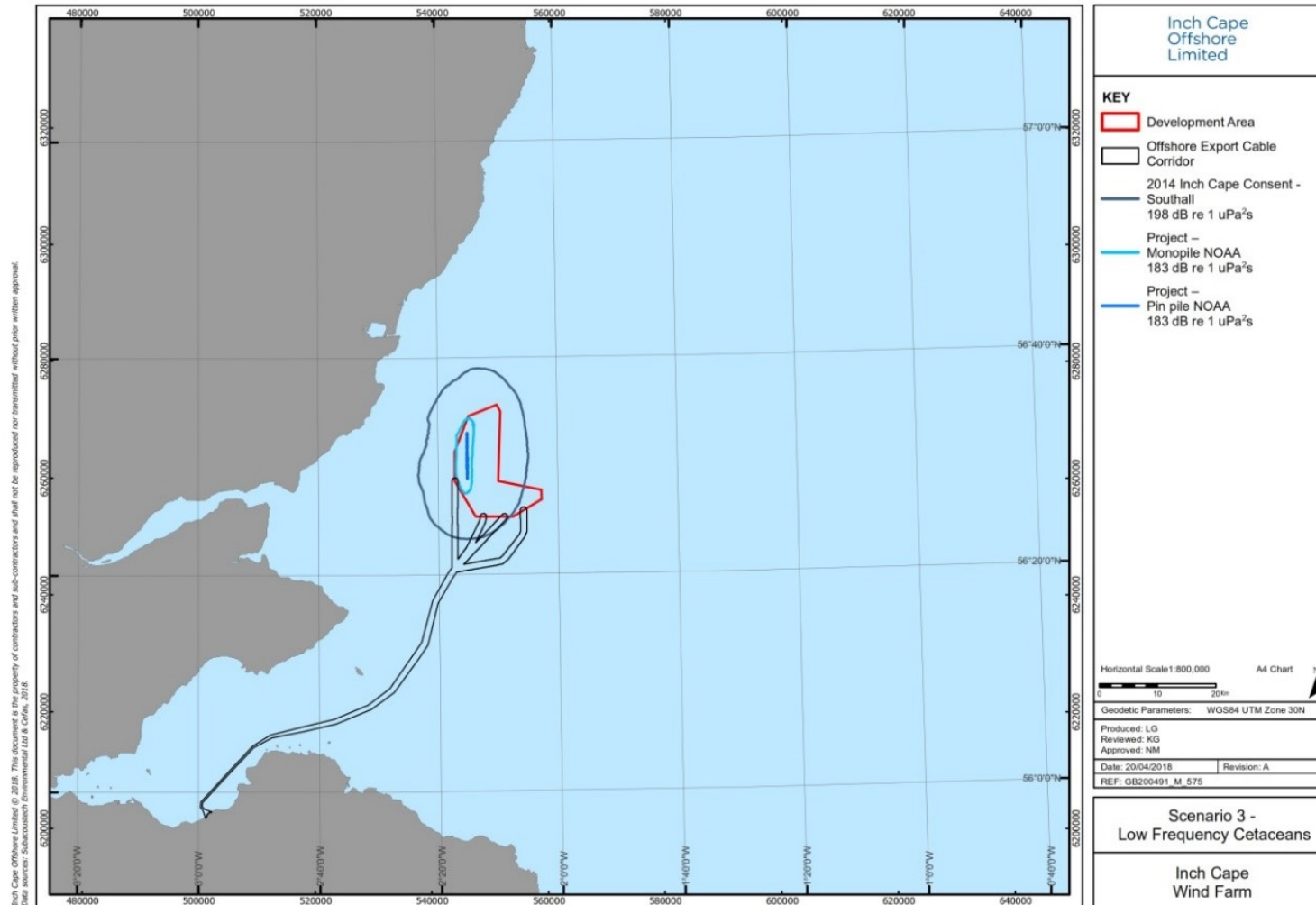


Figure 10.18 Modelled received noise levels (dB re 1 $\mu\text{Pa}^2\text{s}$) for PTS from pile driving under Scenario 4 for low frequency cetaceans

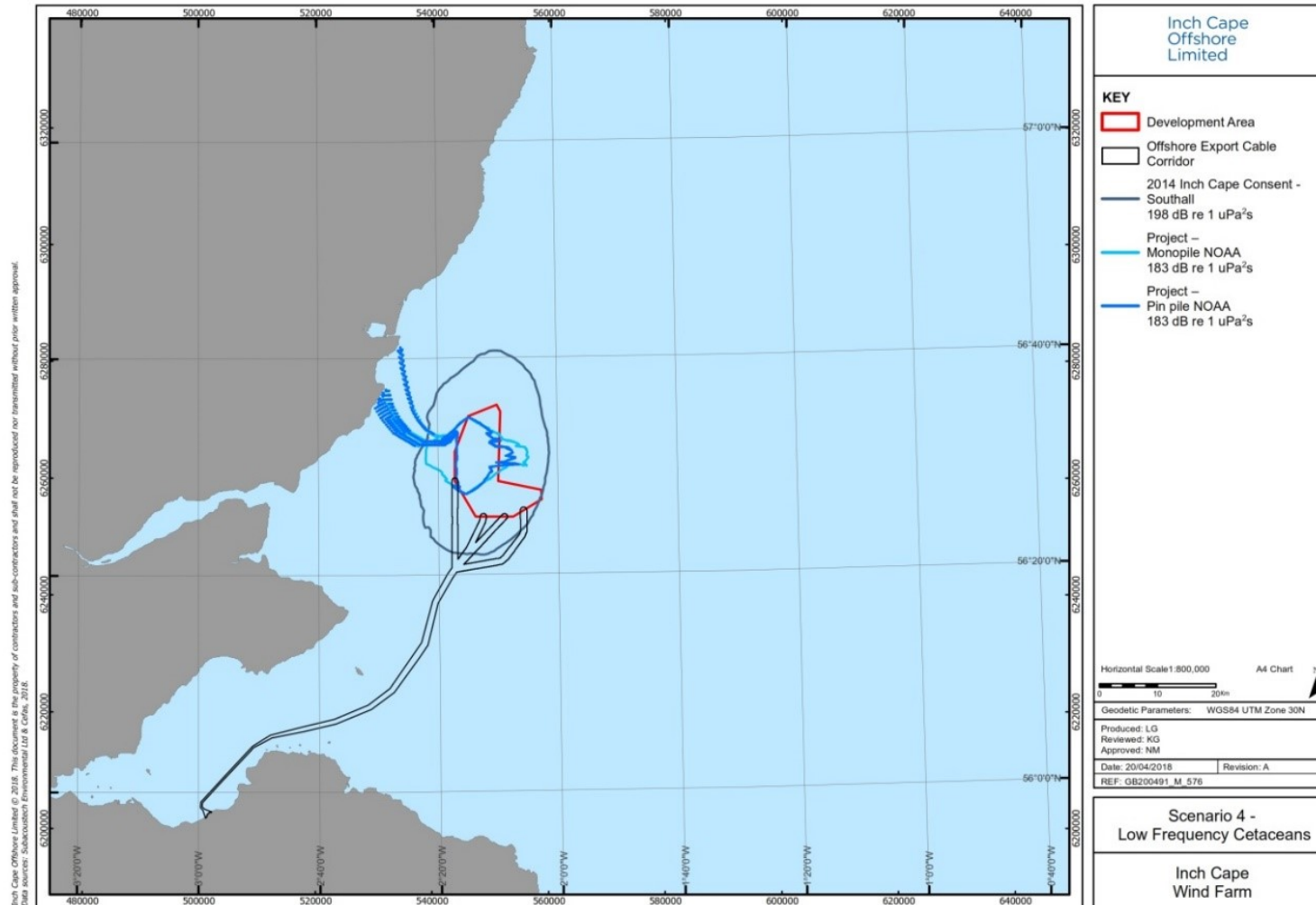


Figure 10.19 Modelled received noise levels (dB re 1 $\mu\text{Pa}^2\text{s}$) for PTS from pile driving under Scenario 4 for high frequency cetaceans

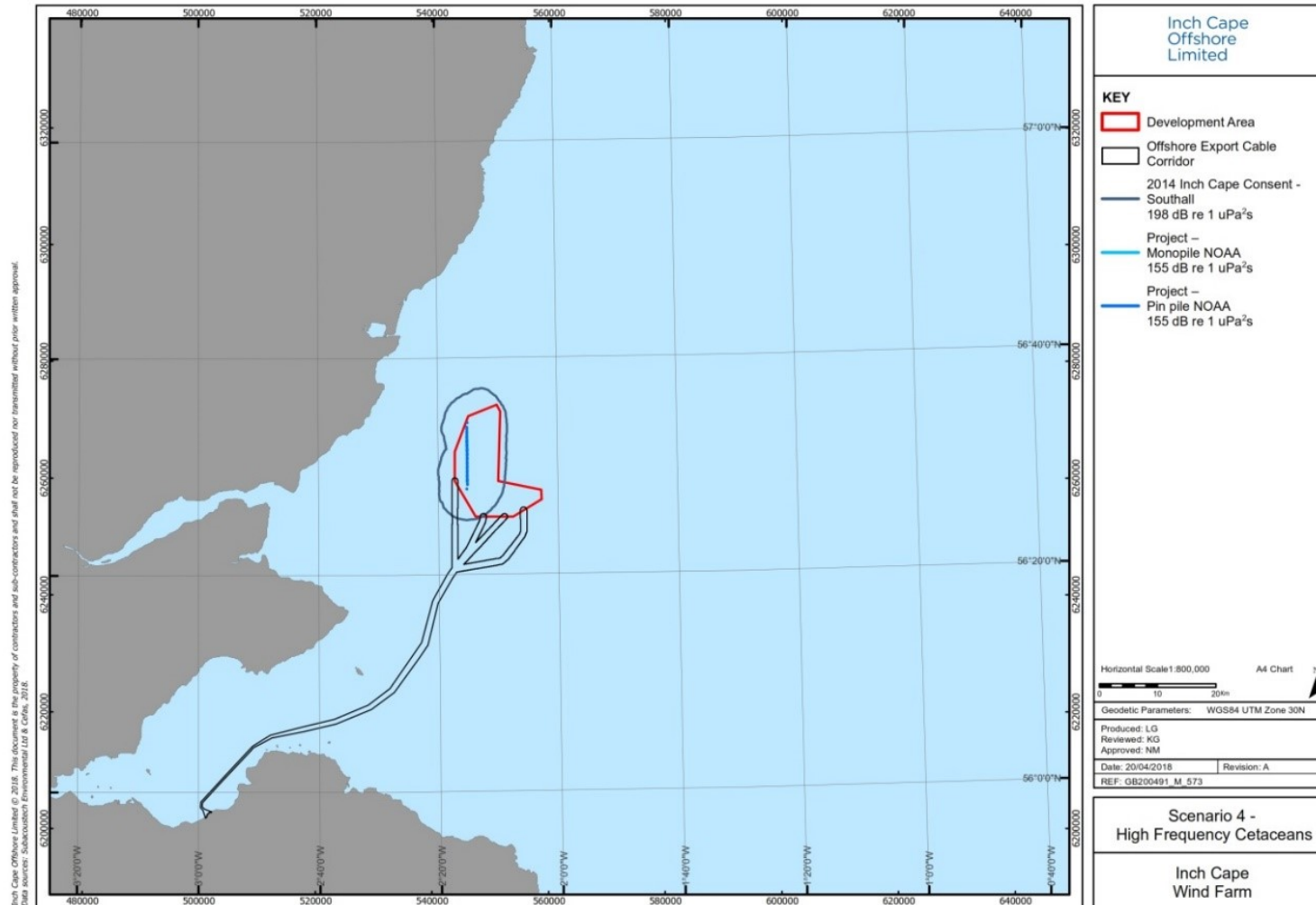


Figure 10.20 Modelled received noise levels (dB re 1 $\mu\text{Pa}^2\text{s}$) for PTS from pile driving under Scenario 2b for phocid seals in water

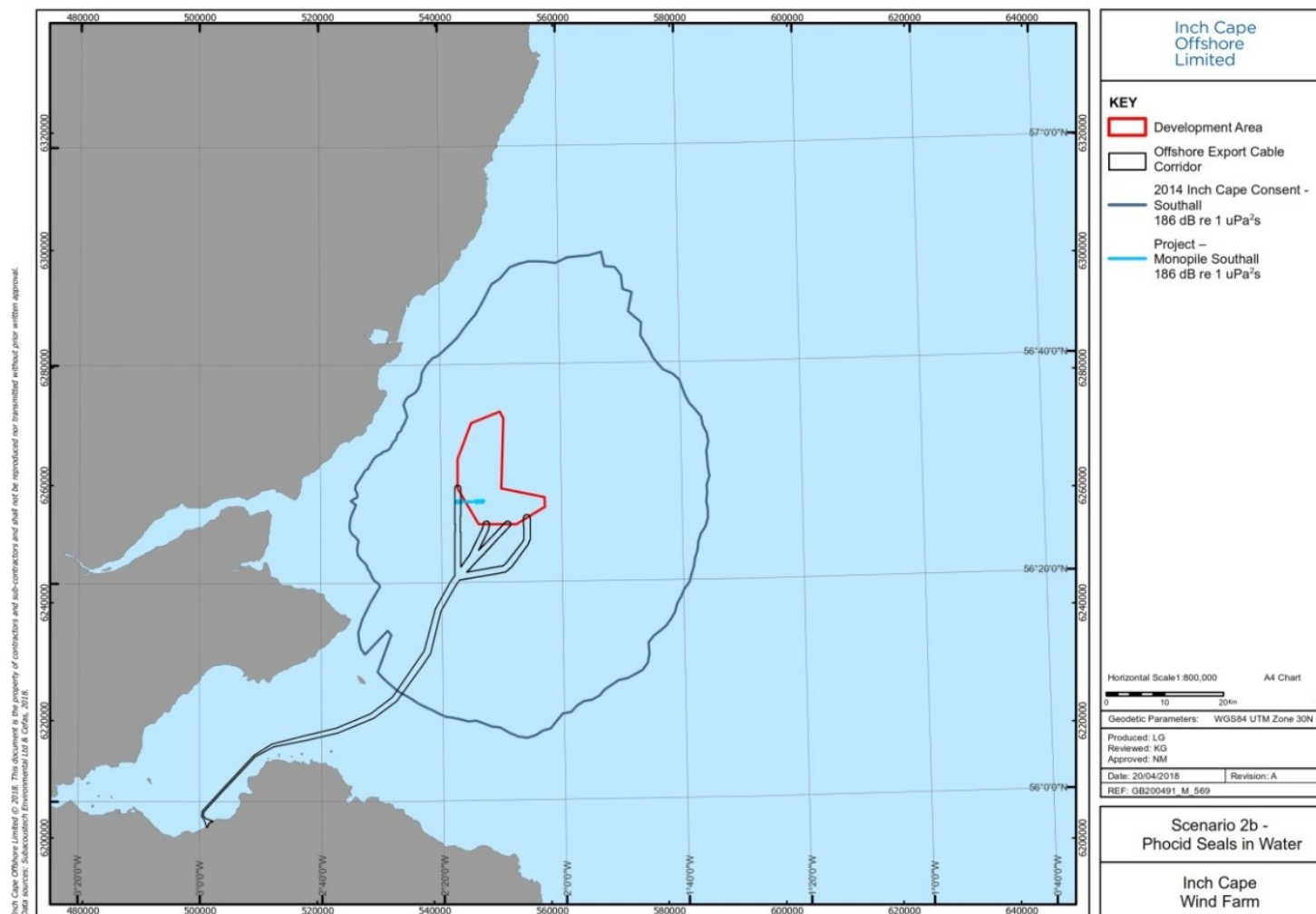


Figure 10.21 Modelled received noise levels (dB re 1 $\mu\text{Pa}^2\text{s}$) for PTS from pile driving under Scenario 3 for phocid seals in water

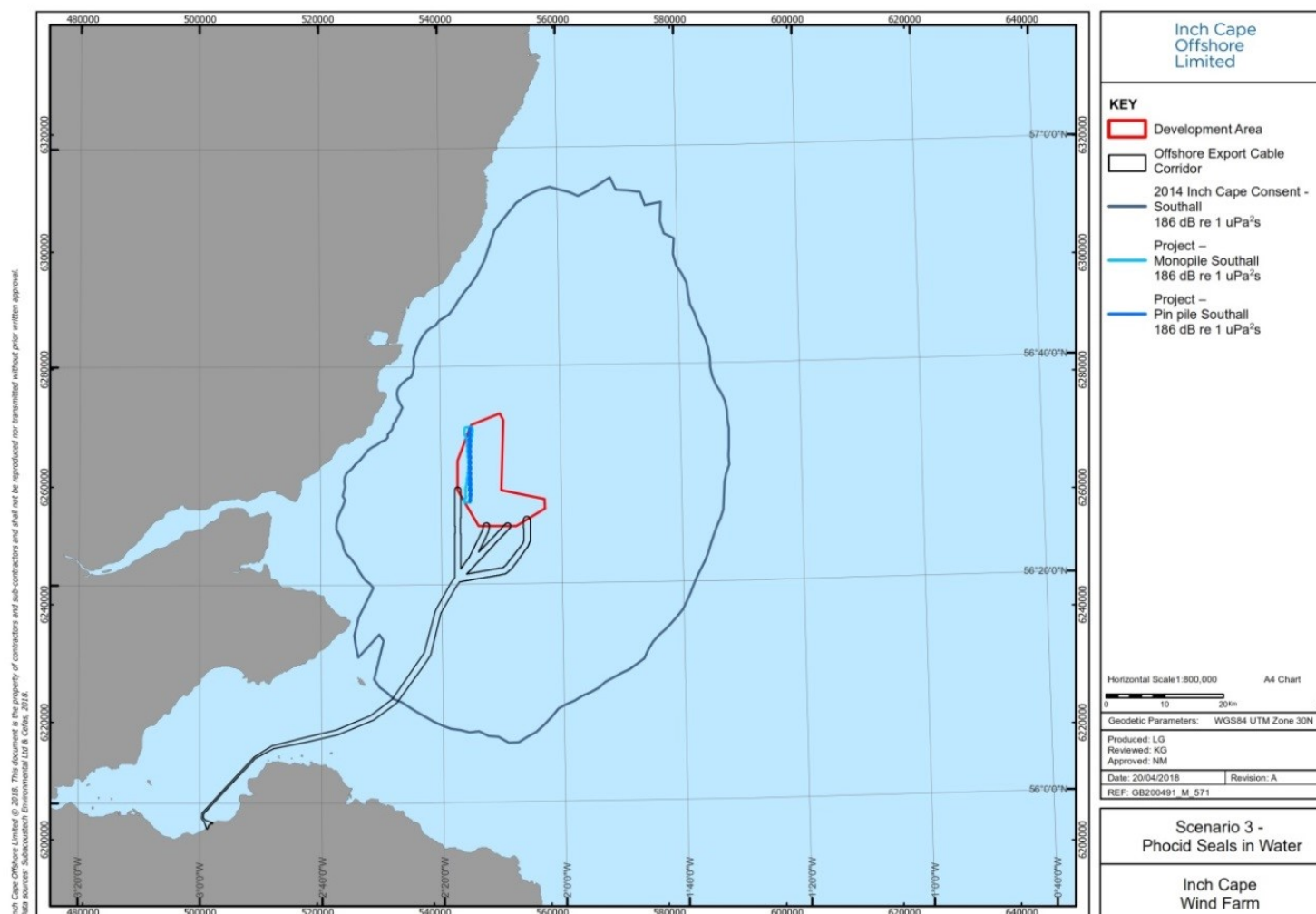


Figure 10.22 Modelled received noise levels (dB re 1 $\mu\text{Pa}^2\text{s}$) for PTS from pile driving under Scenario 4 for phocid seals in water

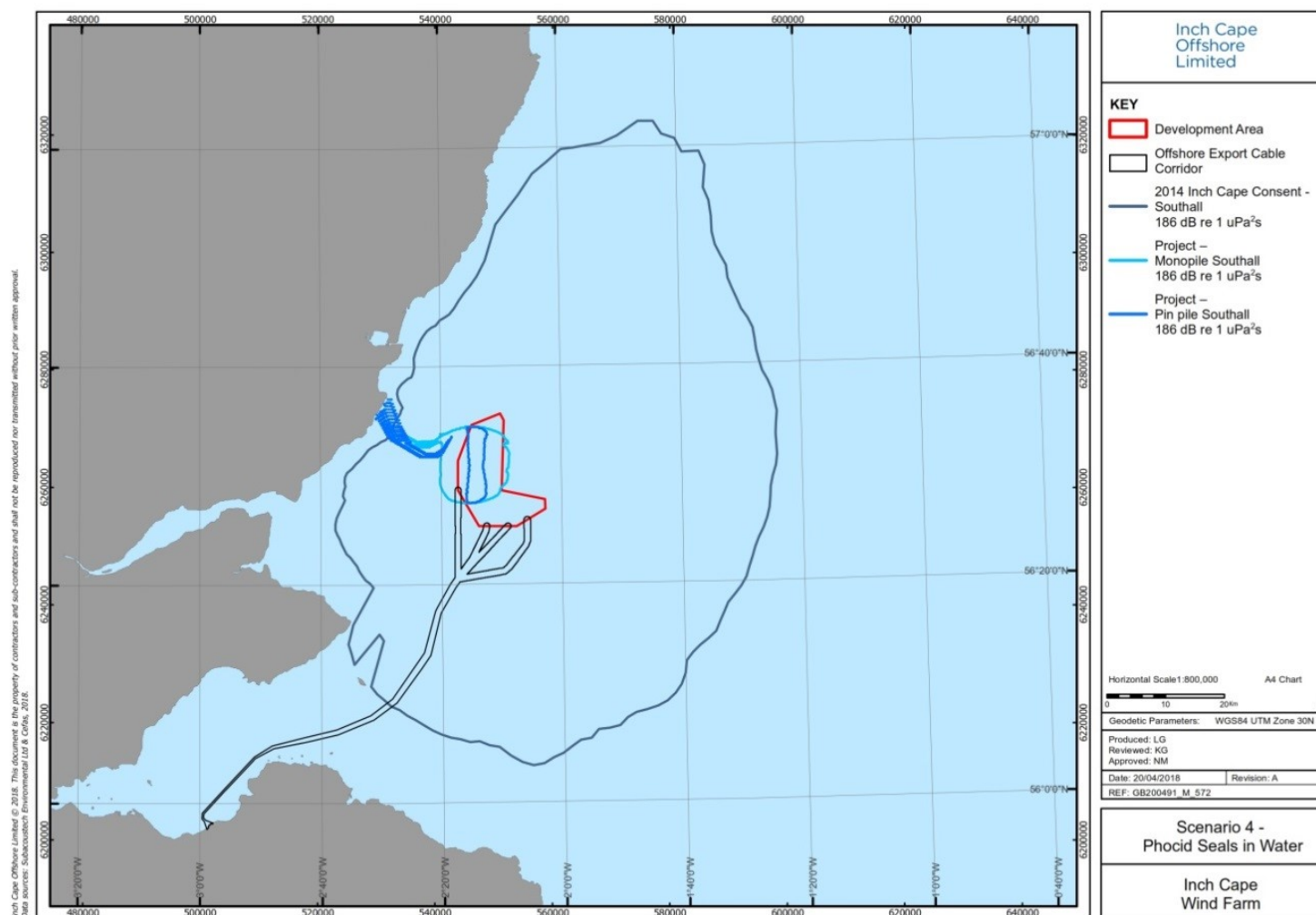


Figure 10.23 Modelled received noise levels (dB re 1 μ Pa²s) for displacement from pin pile driving under Scenario 1a

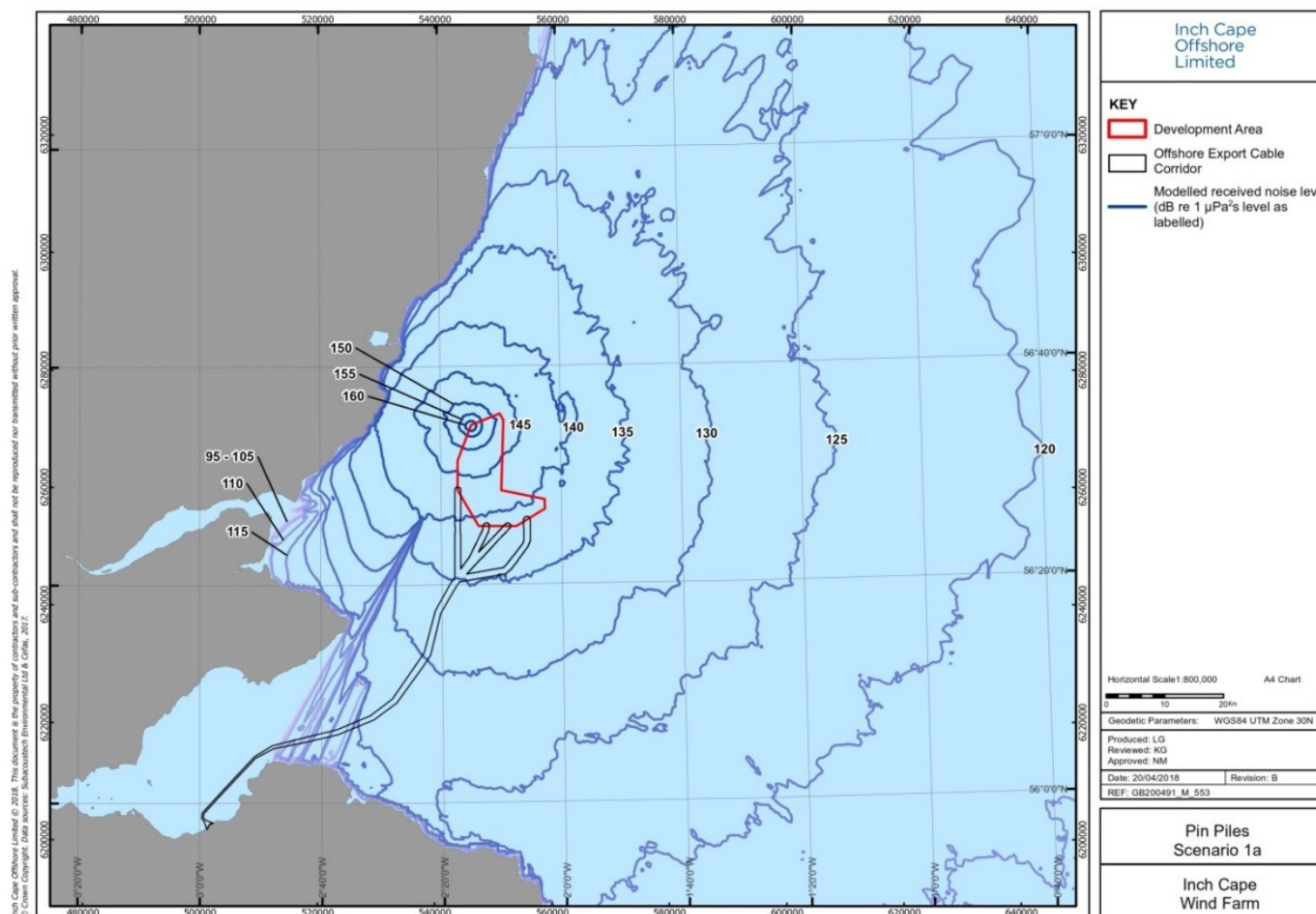


Figure 10.24 Modelled received noise levels (dB re 1 μ Pa²s) for displacement from pin pile driving under Scenario 1b

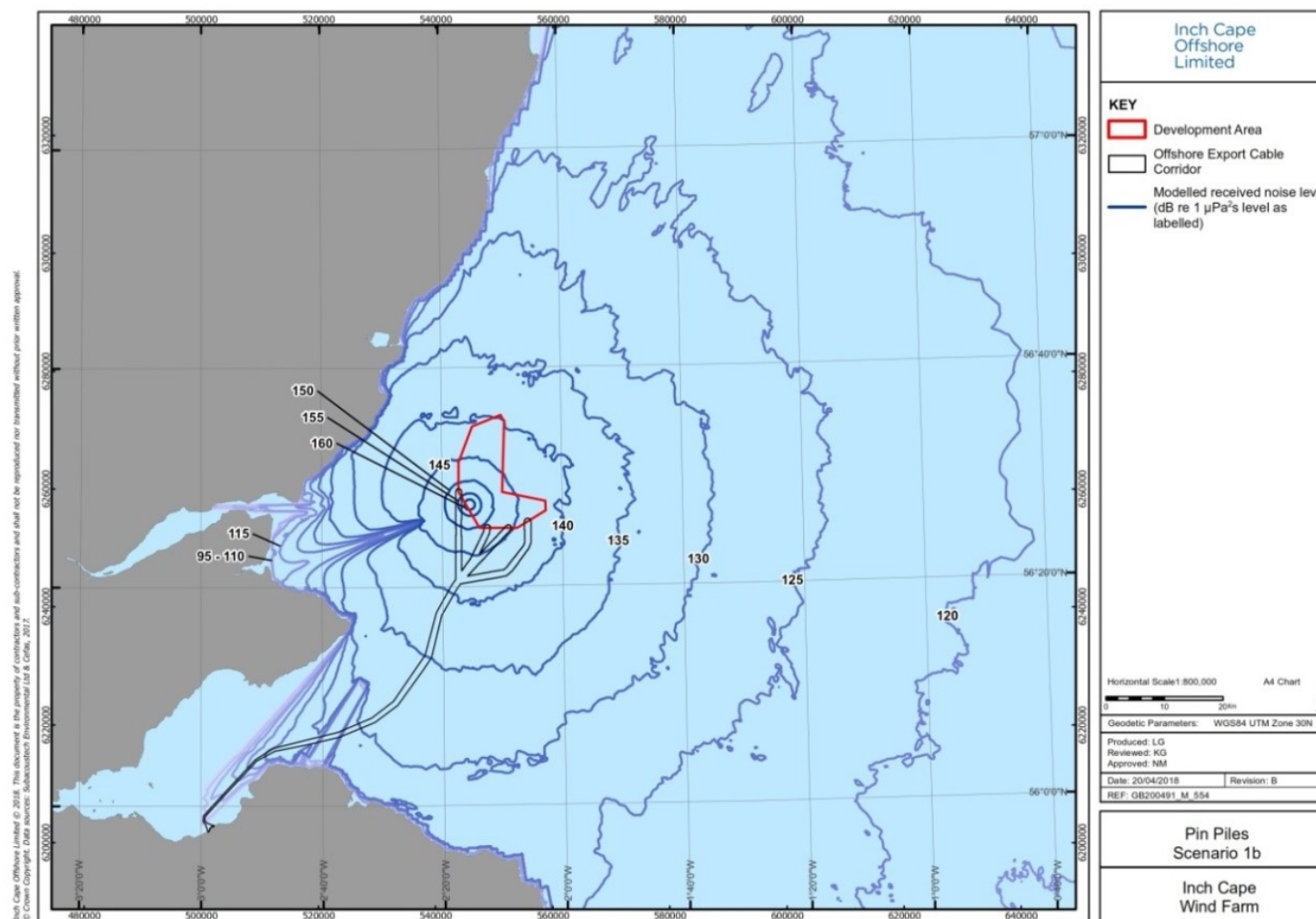


Figure 10.25 Modelled received noise levels (dB re 1 μ Pa²s) for displacement from pin pile driving under Scenario 2a

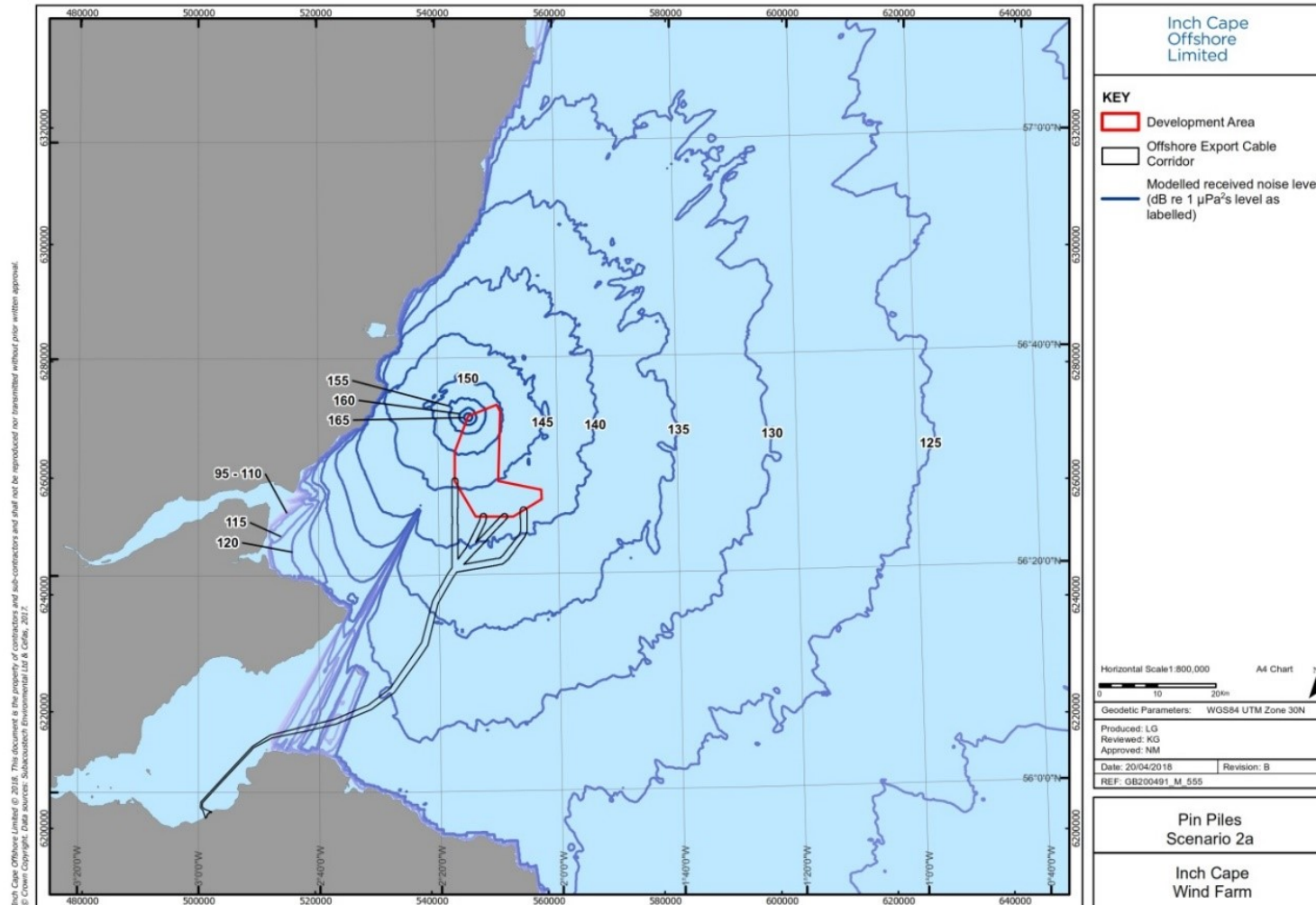


Figure 10.26 Modelled received noise levels (dB re 1 μ Pa²s) for displacement from pin pile driving under Scenario 2b

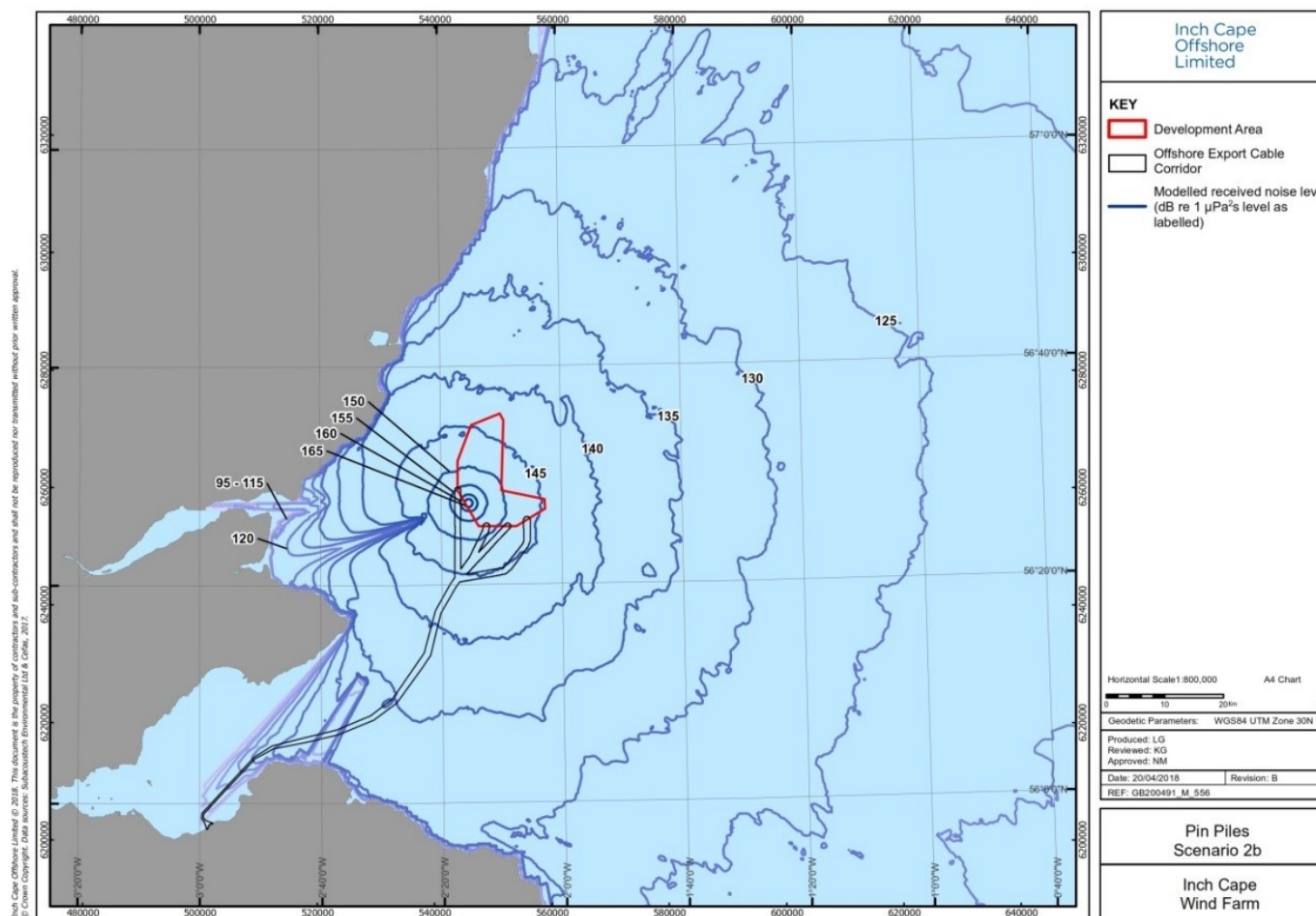


Figure 10.27 Modelled received noise levels (dB re 1 μ Pa²s) for displacement from pin pile driving under Scenario 3

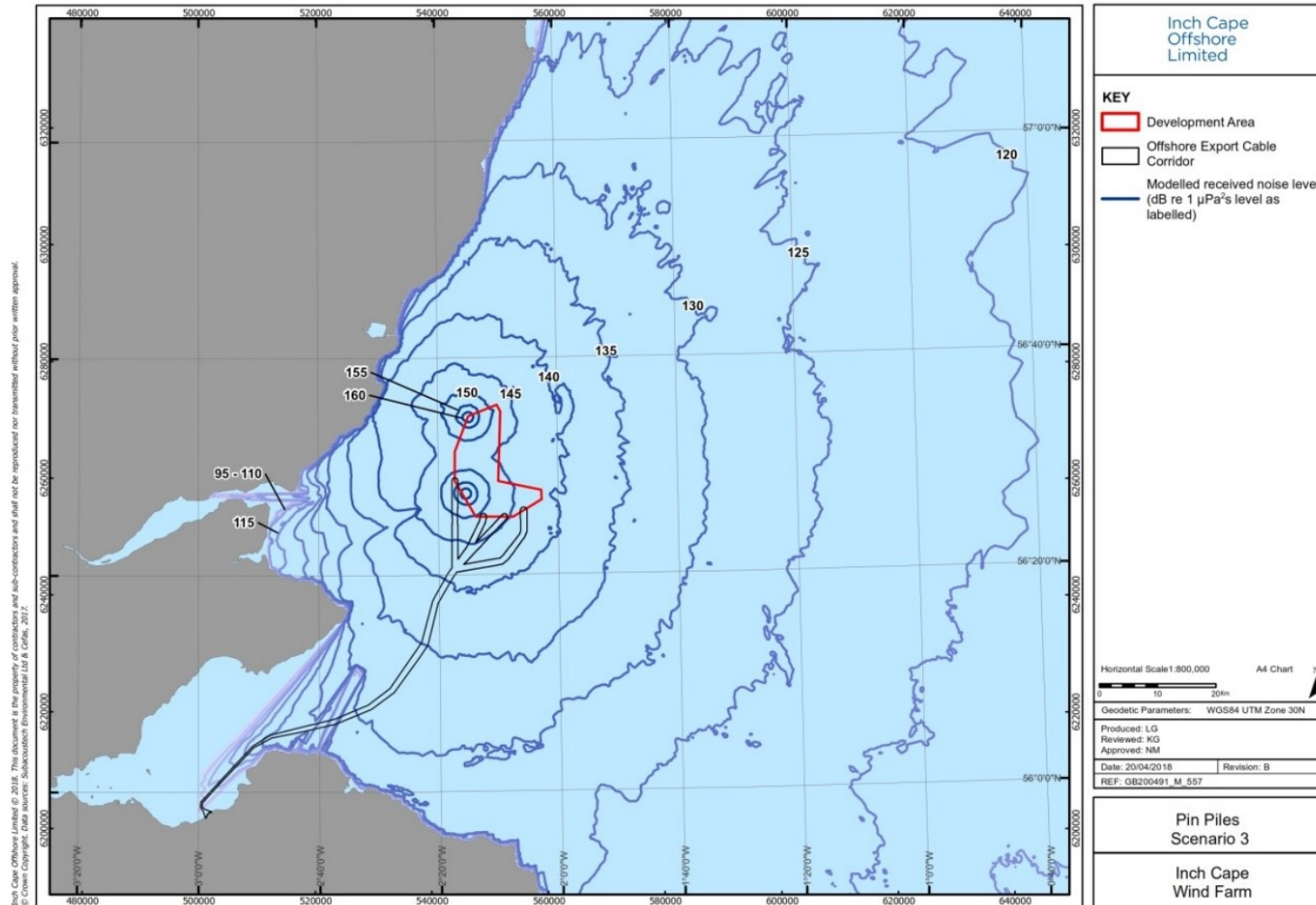


Figure 10.28 Modelled received noise levels (dB re 1 μ Pa²s) for displacement from pin pile driving under Scenario 4

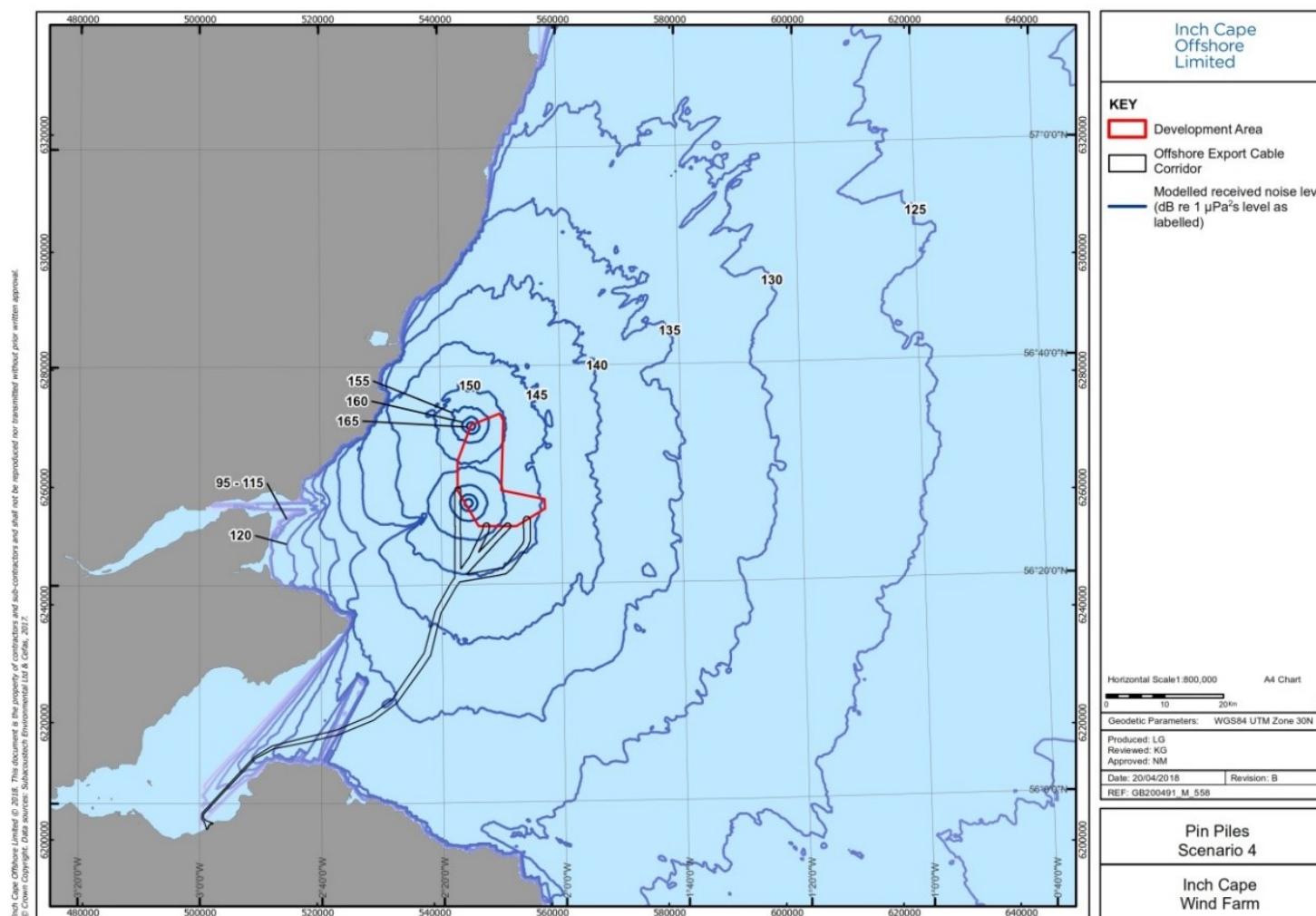


Figure 10.29 Modelled received noise levels (dB re 1 μ Pa²s) for displacement from monopile driving under Scenario 1a

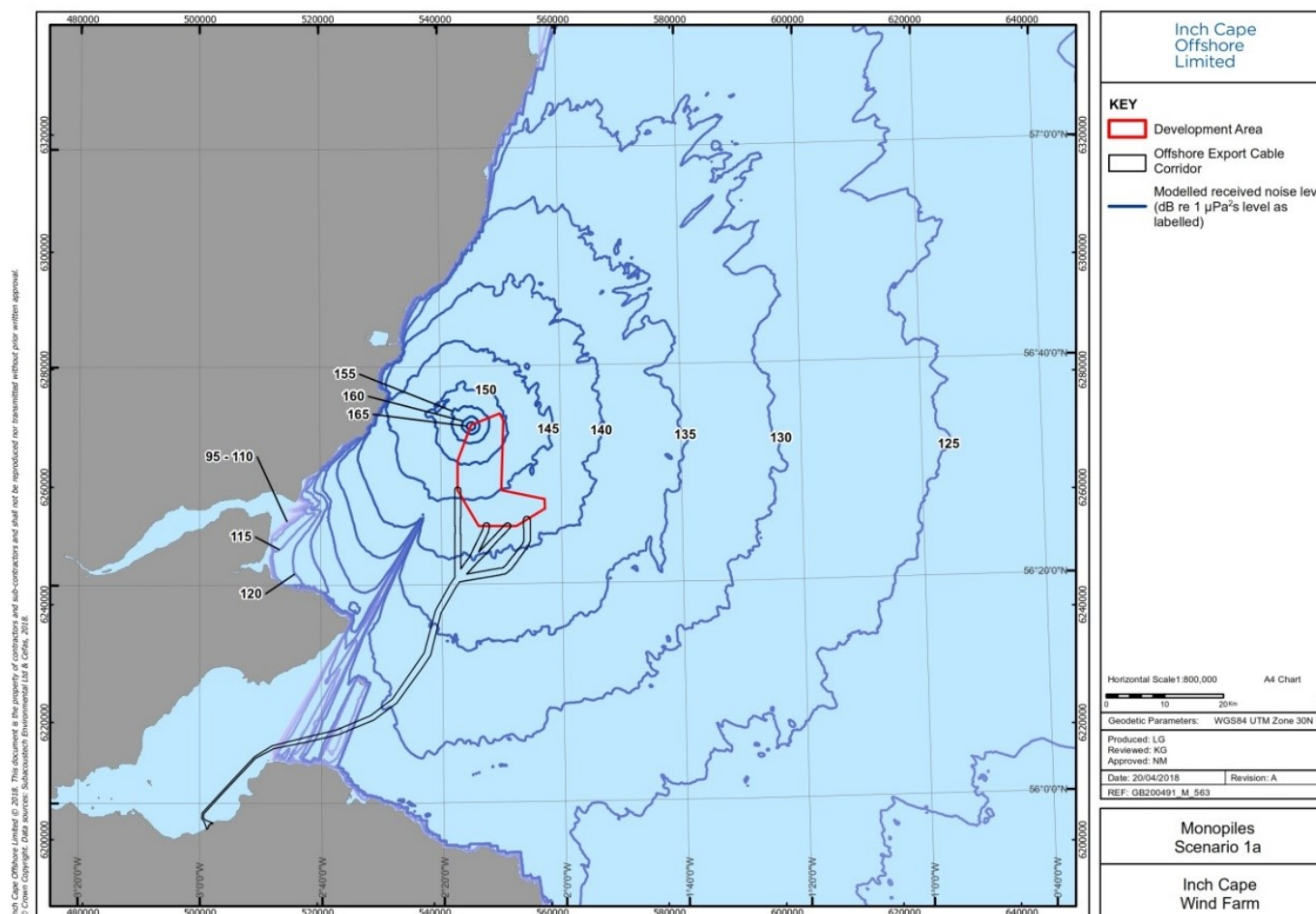


Figure 10.30 Modelled received noise levels (dB re 1 μ Pa²s) for displacement from monopile driving under Scenario 1b

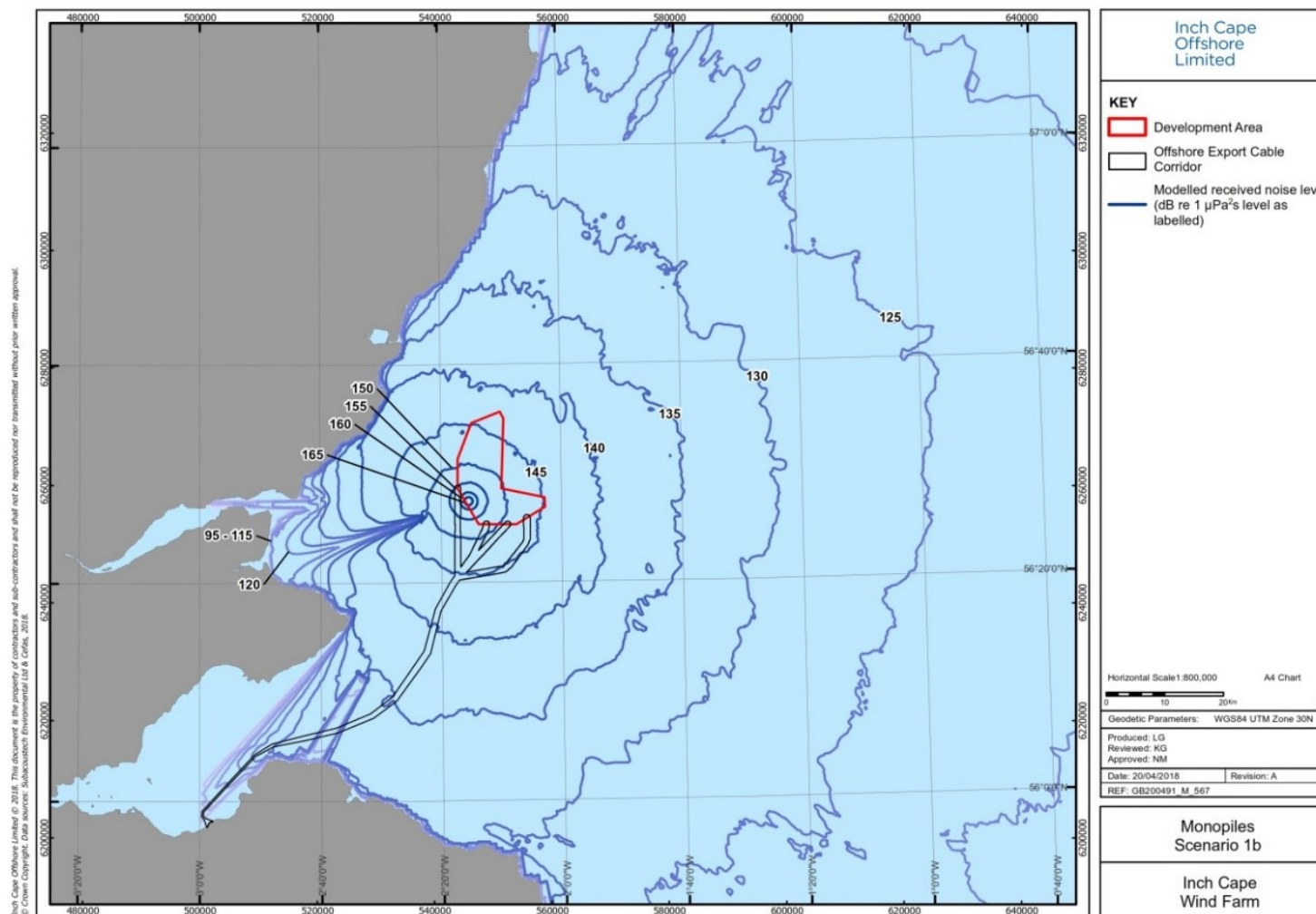


Figure 10.31 Modelled received noise levels (dB re 1 μ Pa²s) for displacement from monopile driving under Scenario 2a

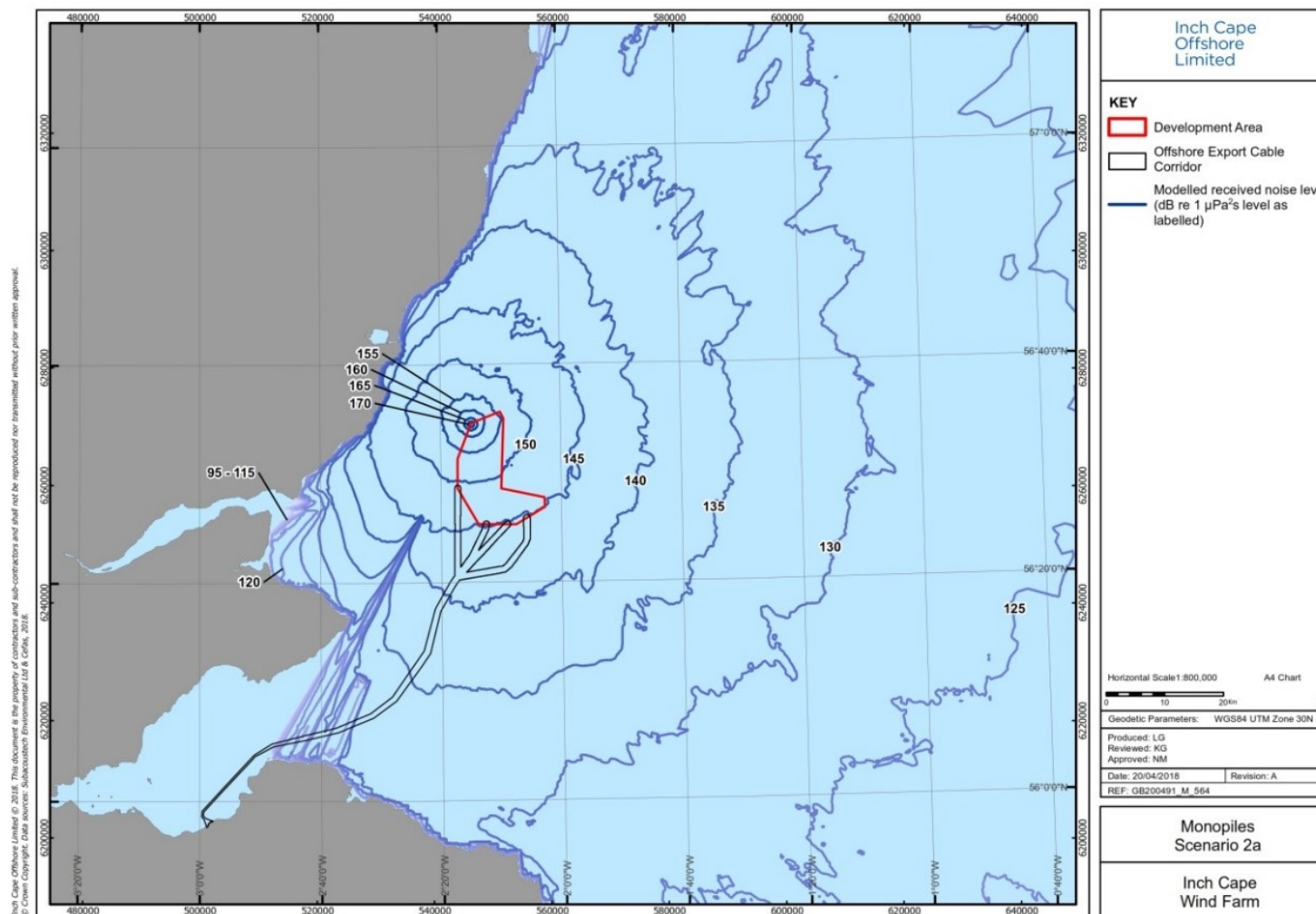


Figure 10.32 Modelled received noise levels (dB re 1 μ Pa²s) for displacement from monopile driving under Scenario 2b

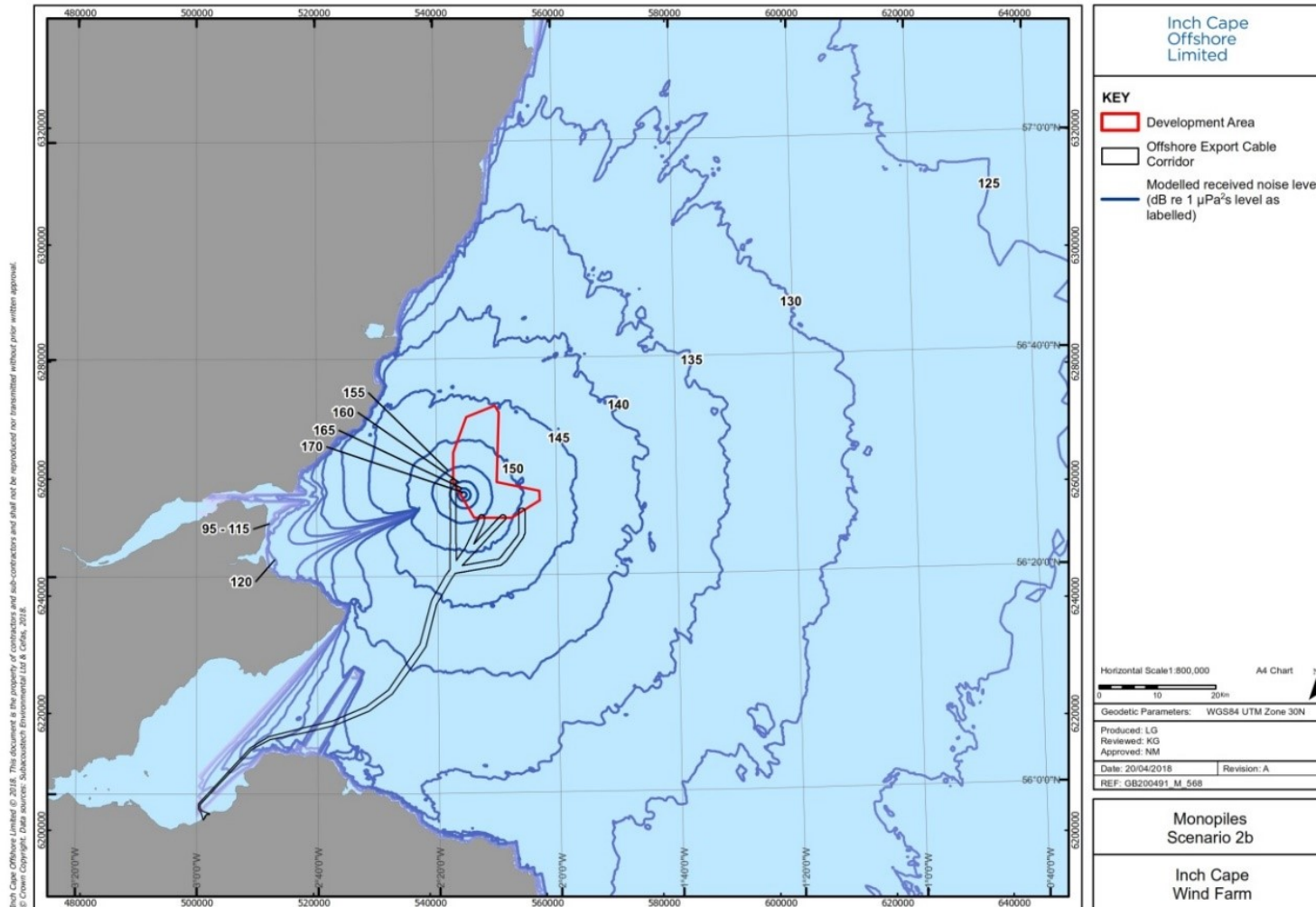


Figure 10.33 Modelled received noise levels (dB re 1 μ Pa²s) for displacement from monopile driving under Scenario 3

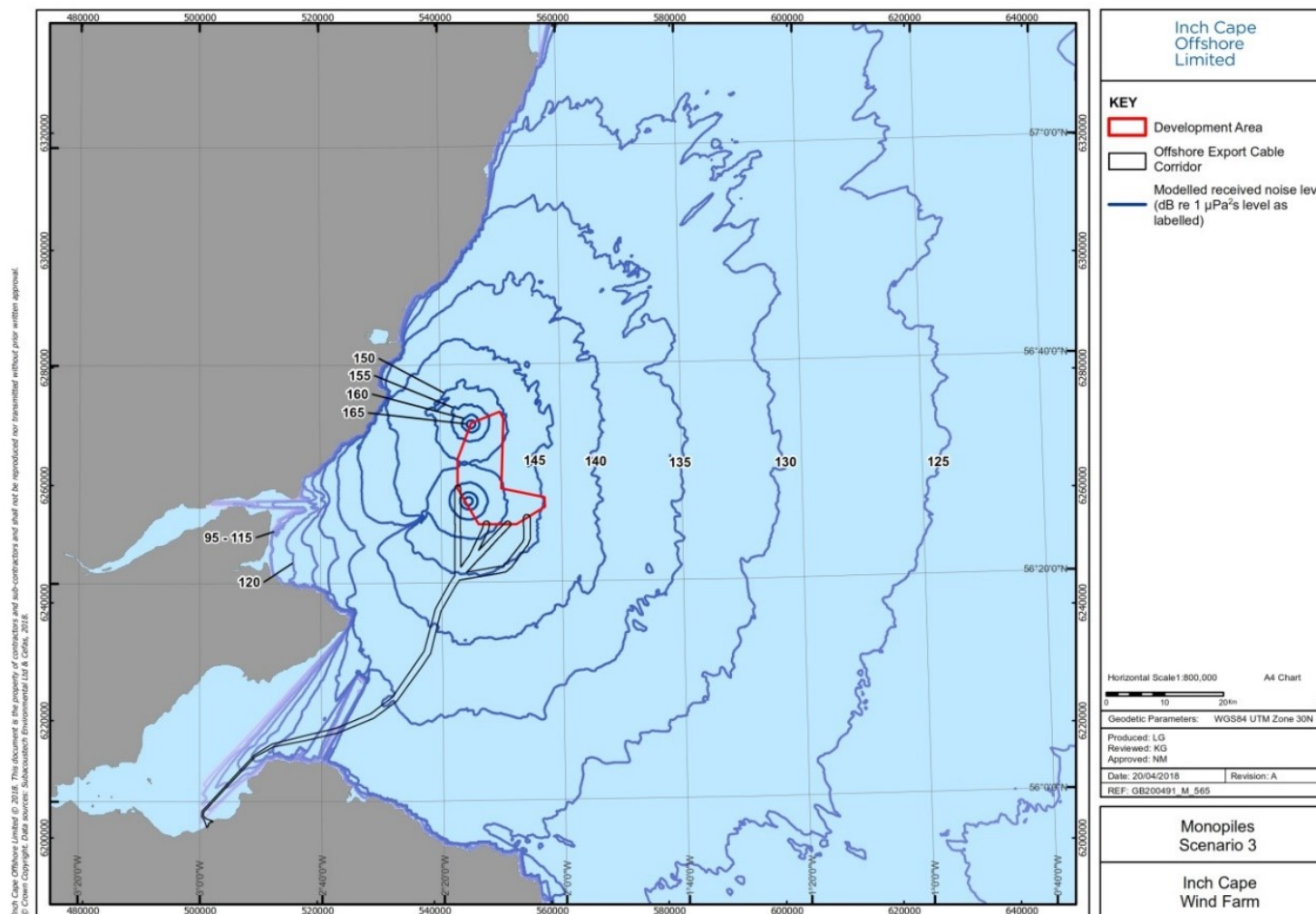


Figure 10.34 Modelled received noise levels (dB re 1 μ Pa²s) for displacement from monopile driving under Scenario 4

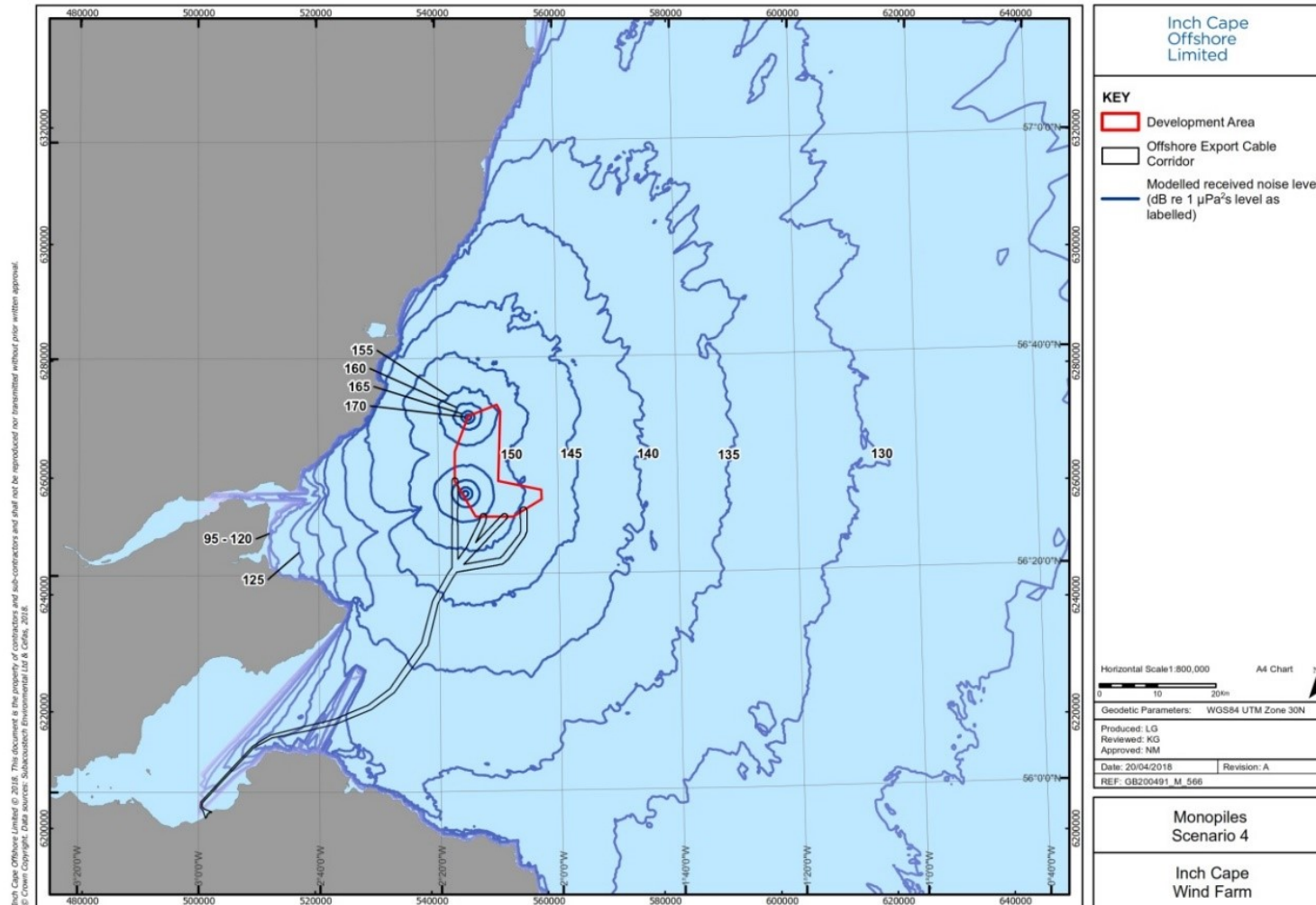


Figure 11.1 Development Area and Offshore Export Cable Corridor with Survey Area

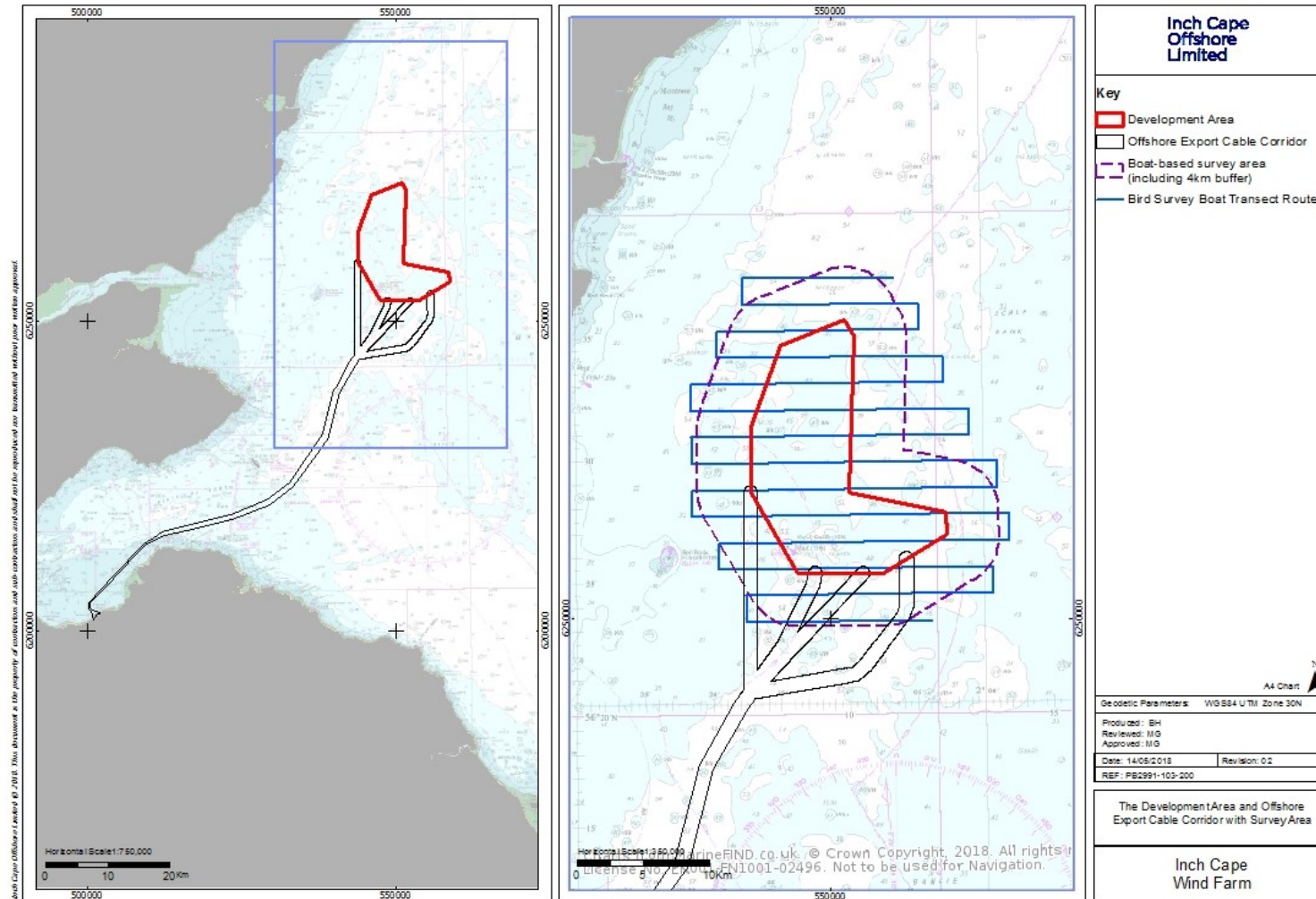


Figure 11.2 Special Protection Areas for Gannet within Mean Maximum Foraging Range of the Development Area and Two Kilometre Buffer

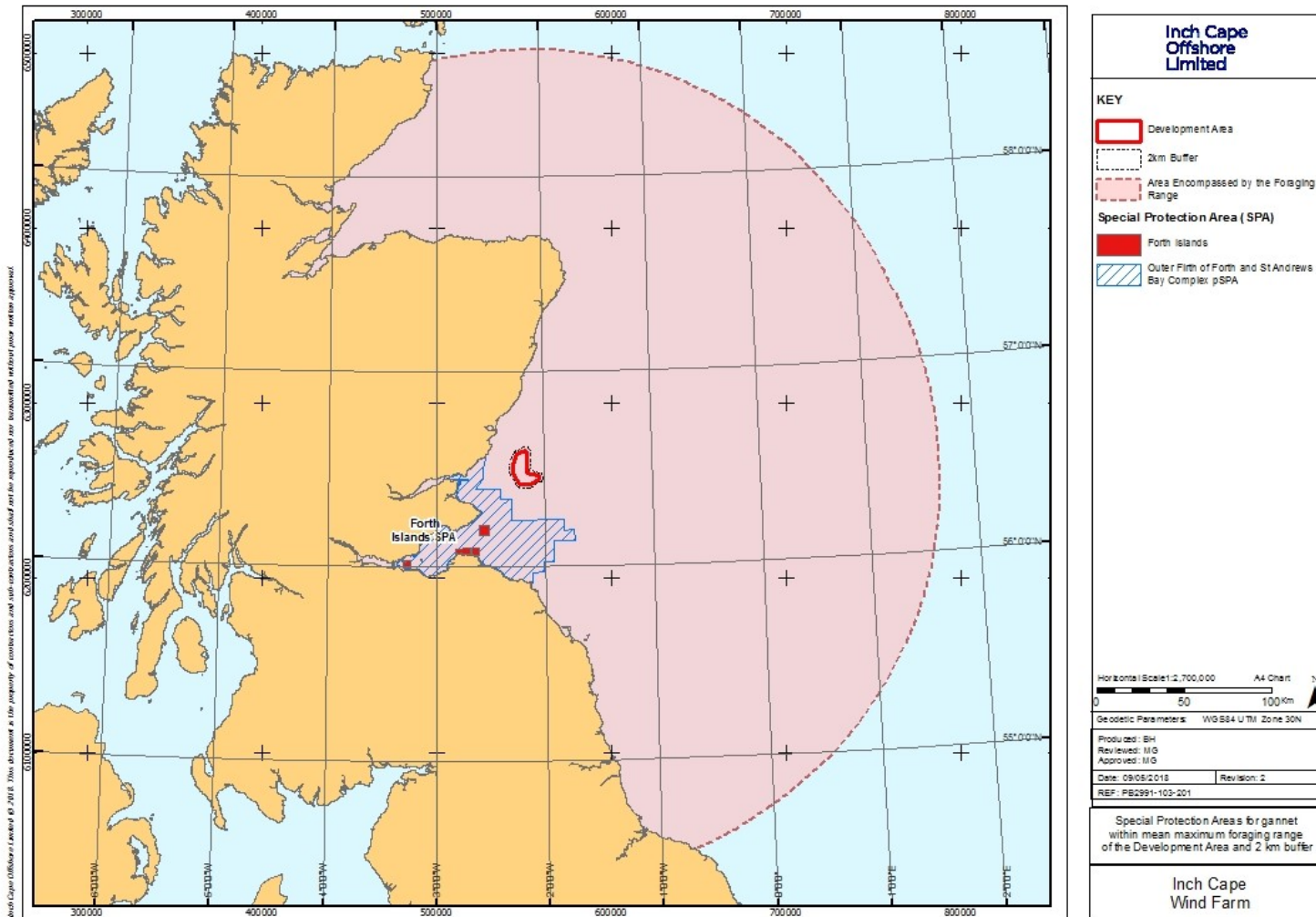


Figure 11.3 Special Protection Areas for Kittiwake within Mean Maximum Foraging Range of the Development Area and Two Kilometre Buffer

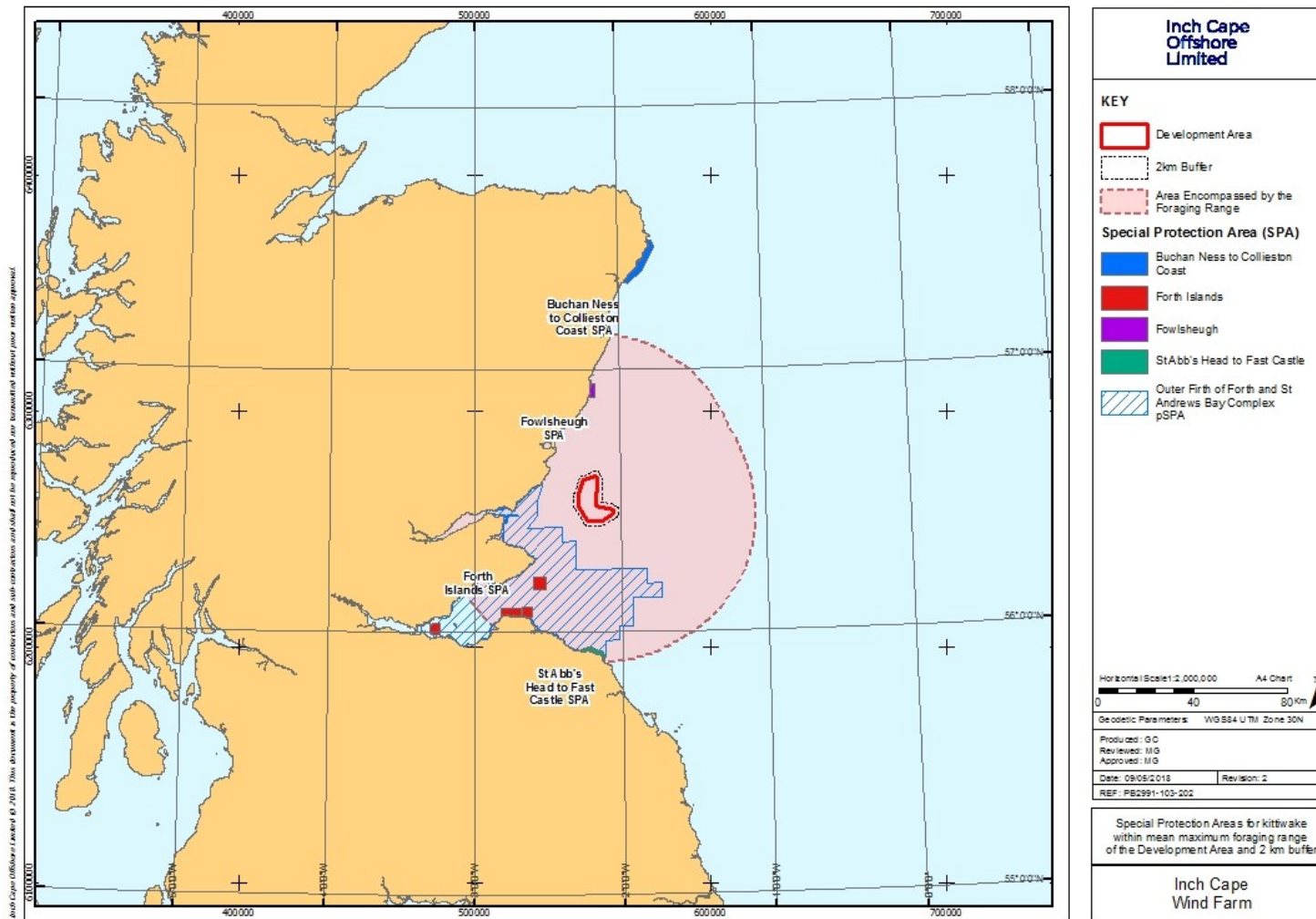


Figure 11.4 Special Protection Areas for Herring Gull within Mean Maximum Foraging Range of the Development Area and Two Kilometre Buffer

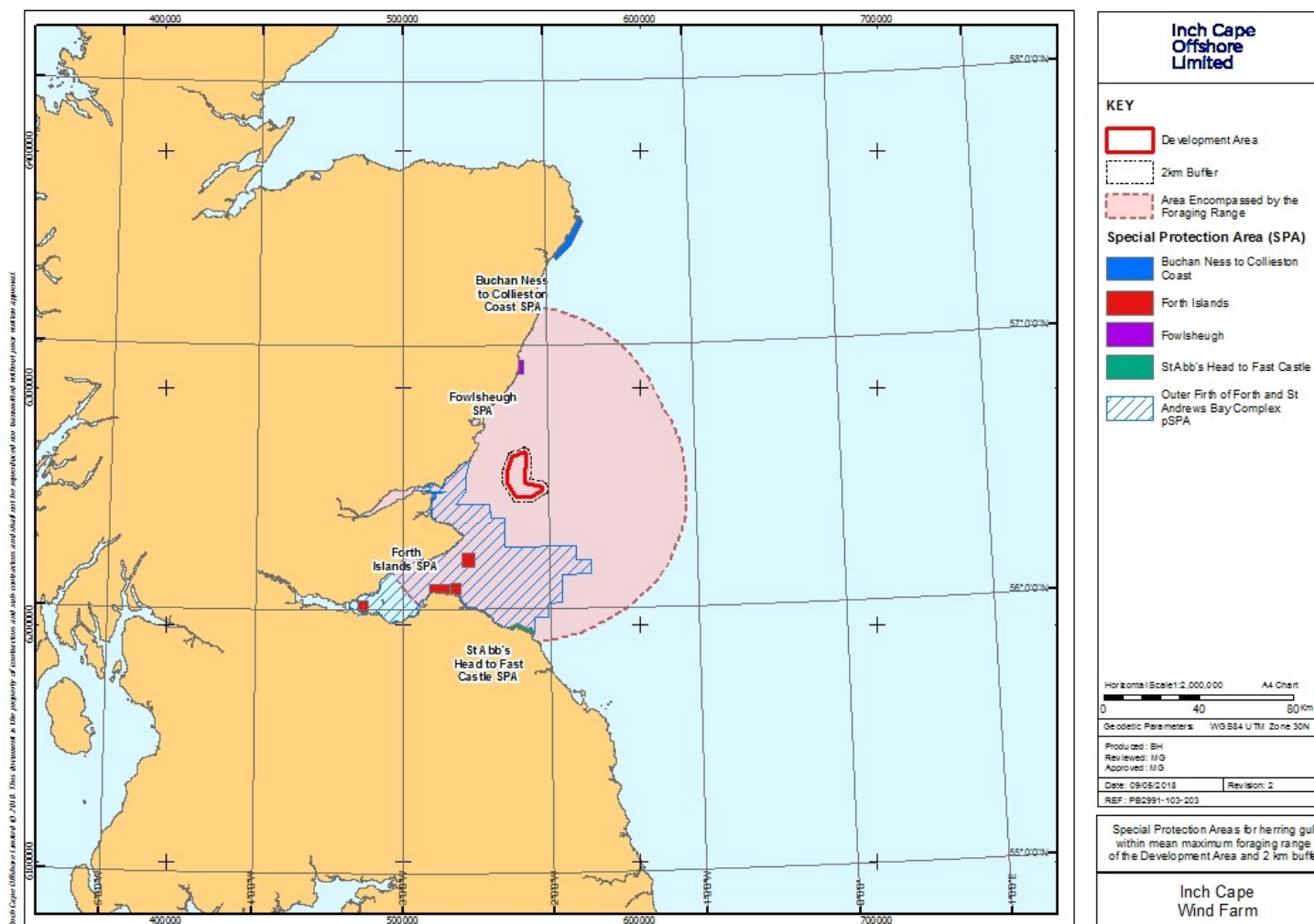


Figure 11.5 Special Protection Areas for Guillemot within Mean Maximum Foraging Range of the Development Area and Two Kilometre Buffer

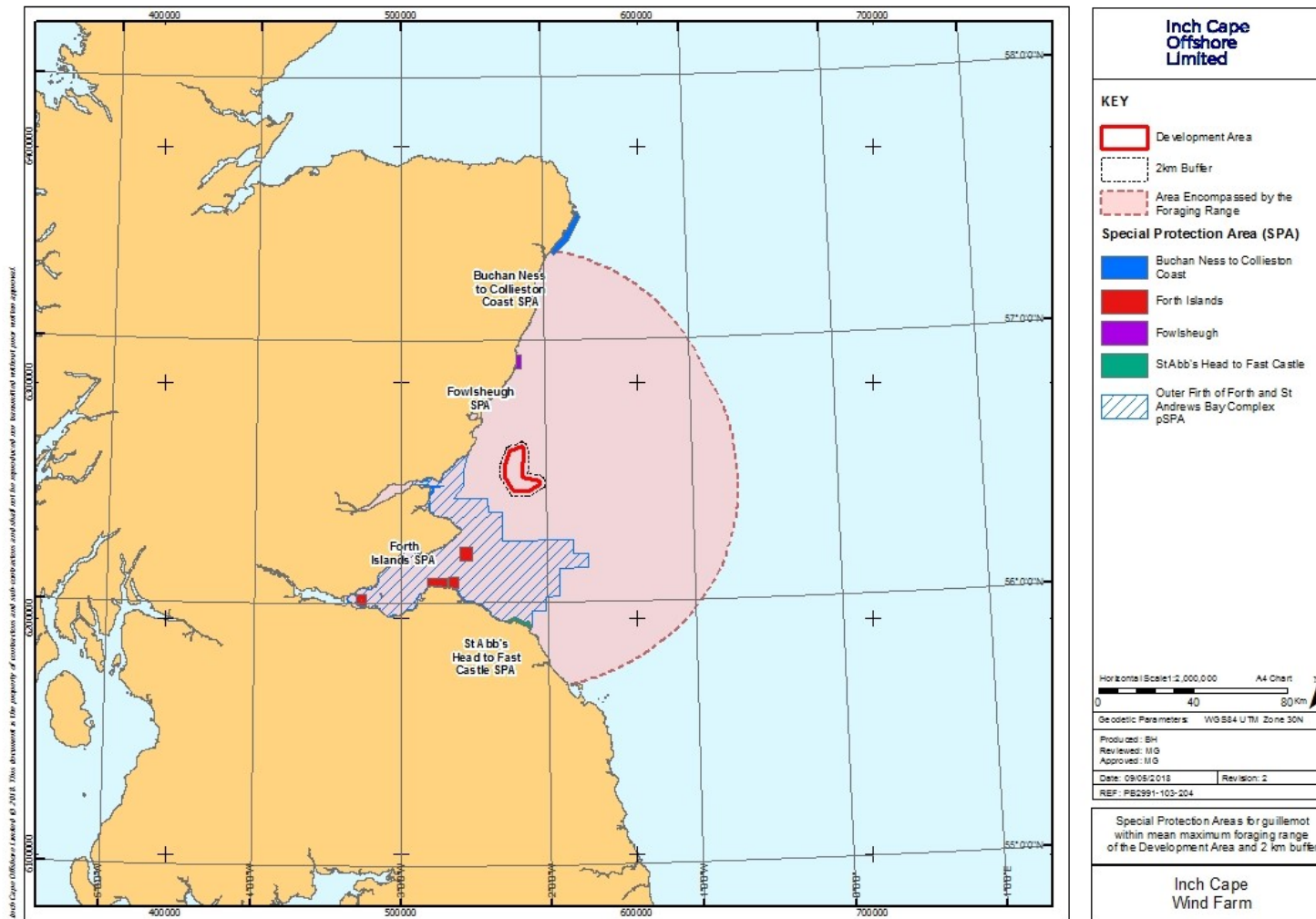


Figure 11.6 Special Protection Areas for Razorbill within Mean Maximum Foraging Range of the Development Area and Two Kilometre Buffer

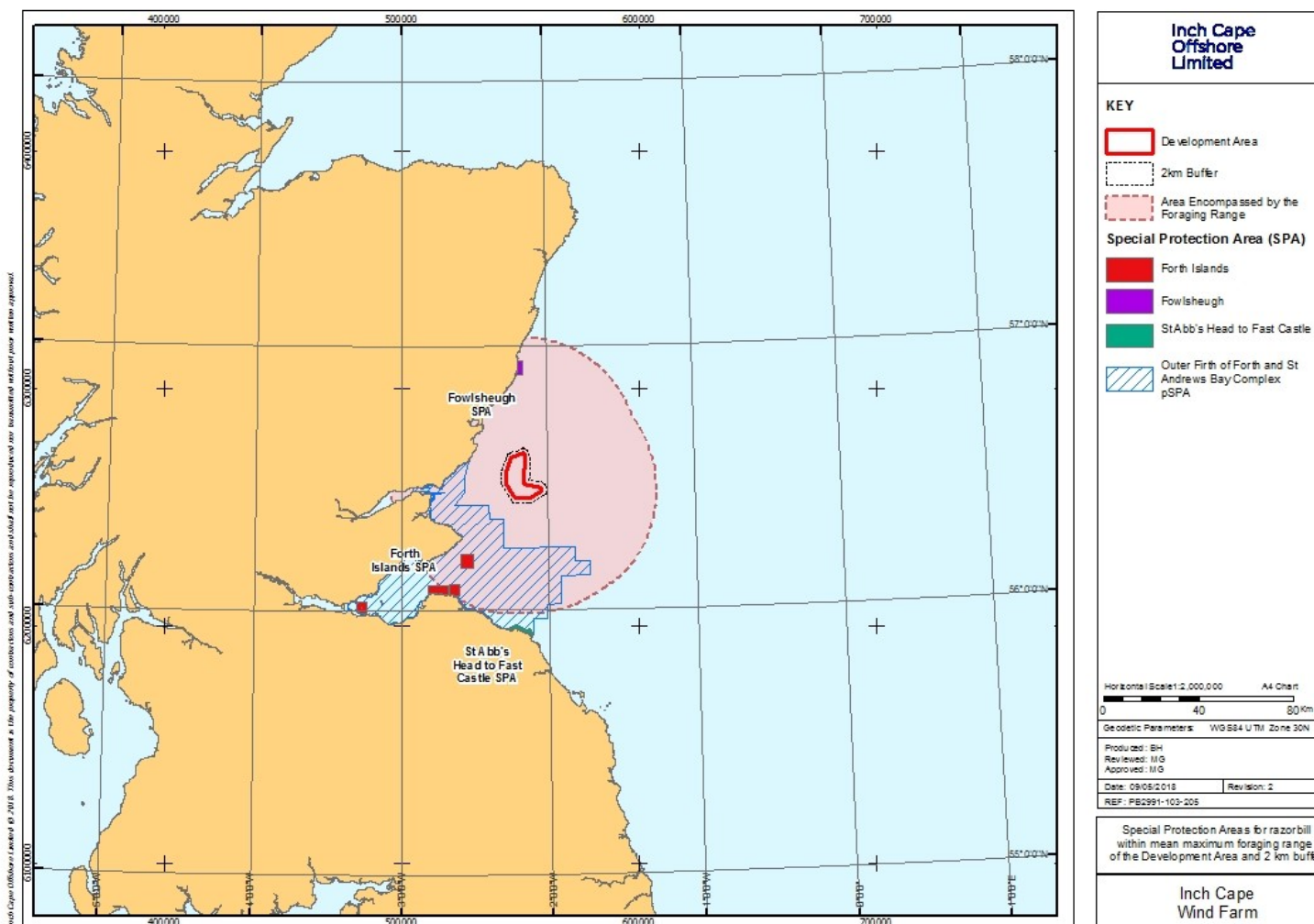
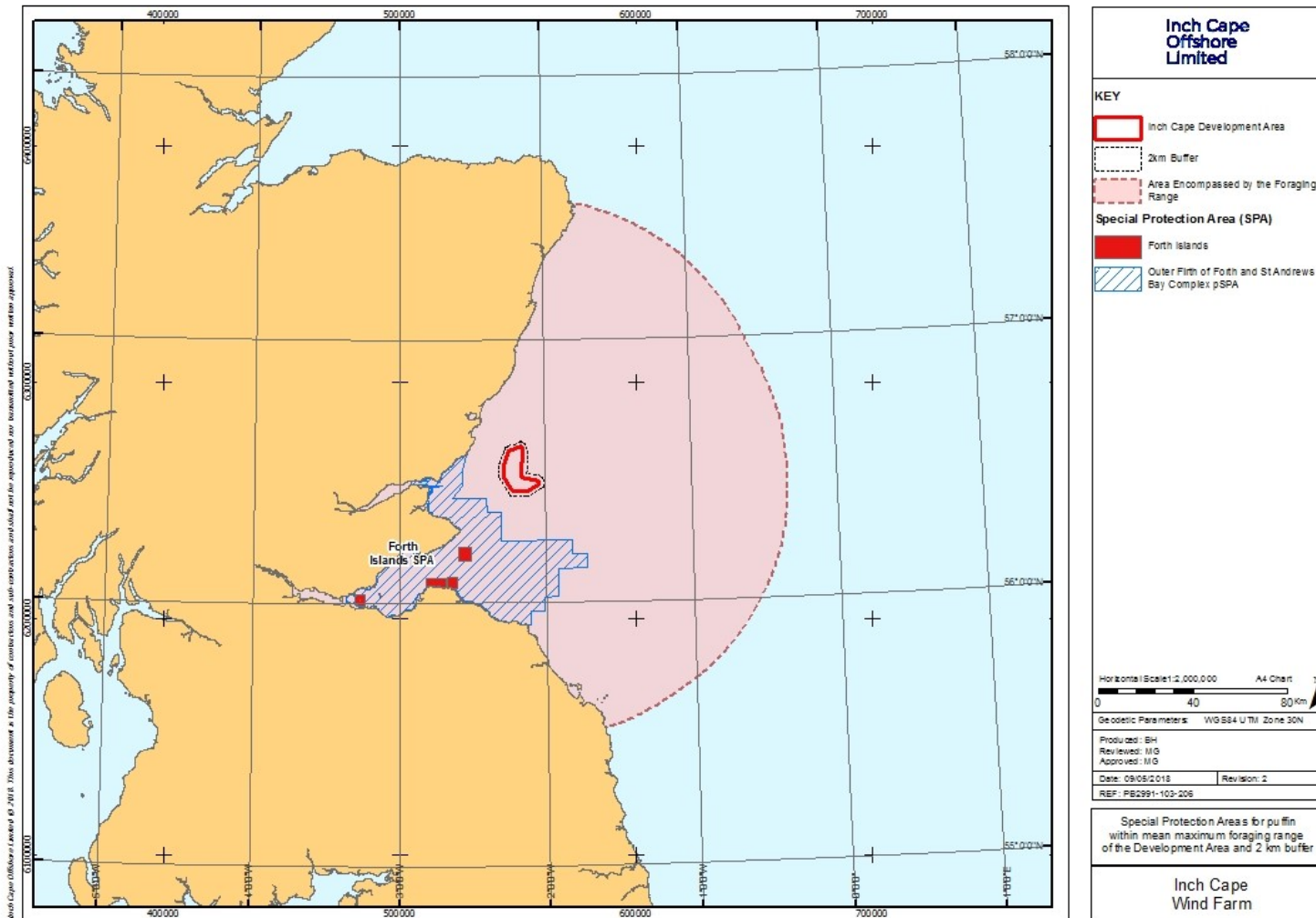


Figure 11.7 Special Protection Areas for Puffin within Mean Maximum Foraging Range of the Development Area and Two Kilometre Buffer



CHAPTER 12 FIGURES ARE PRESENTED IN APPENDICES 12E, 12F AND 12G

Figure 13.1 Wireline models for Bell Rock Lighthouse (HB no. 45197)

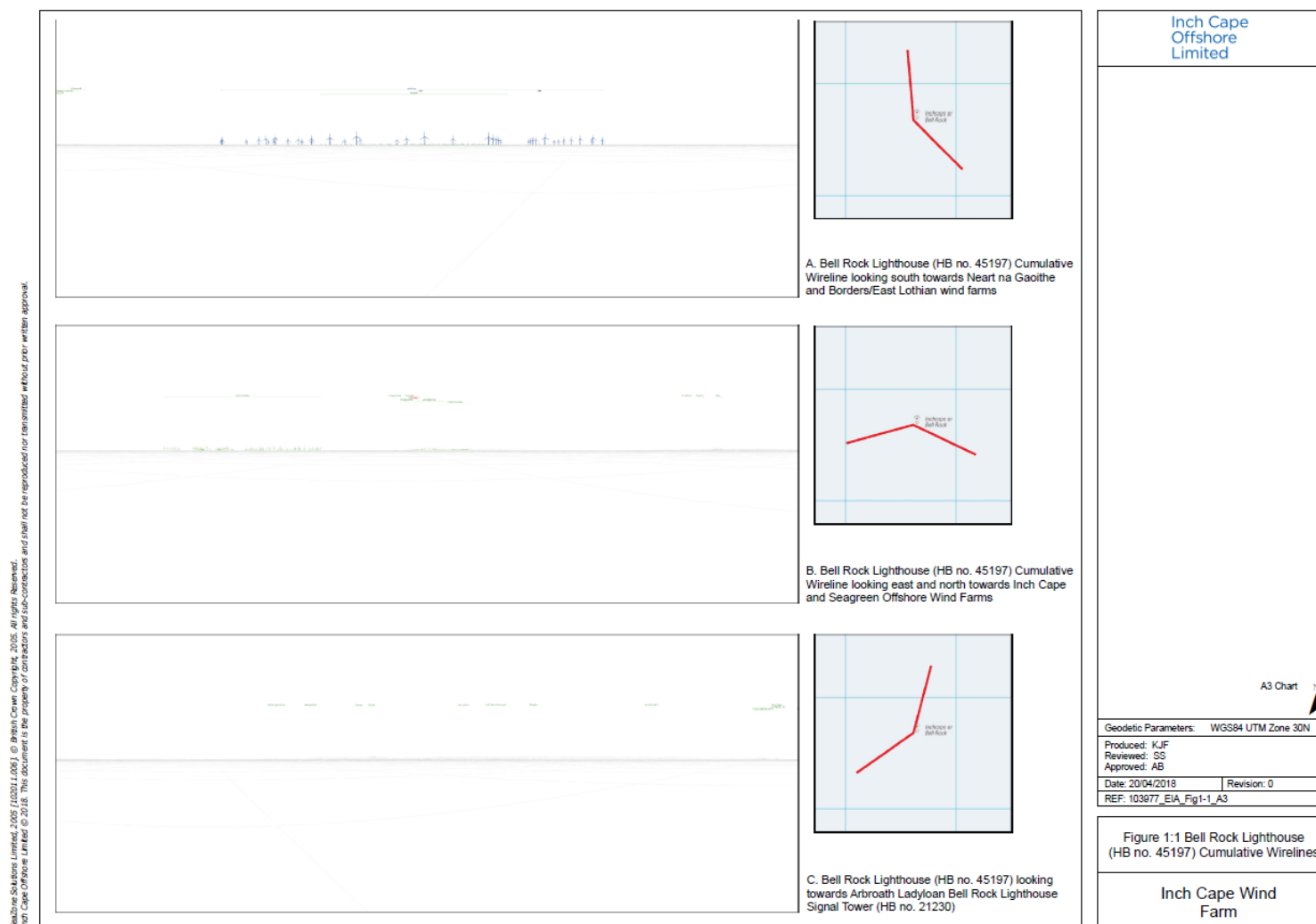


Figure 13.2 Setting Impact Assessment Receptors

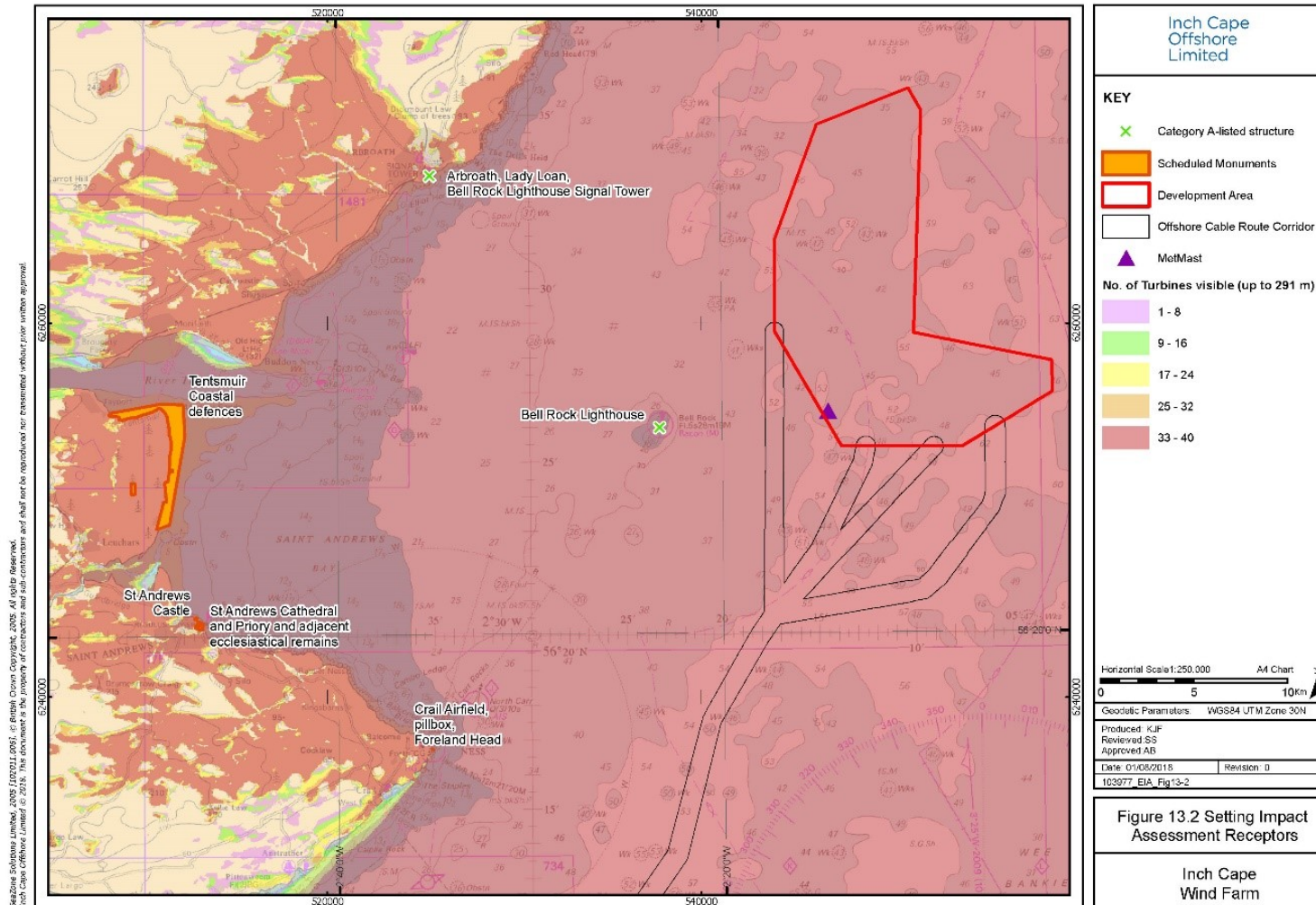


Figure 14.1 Study Area

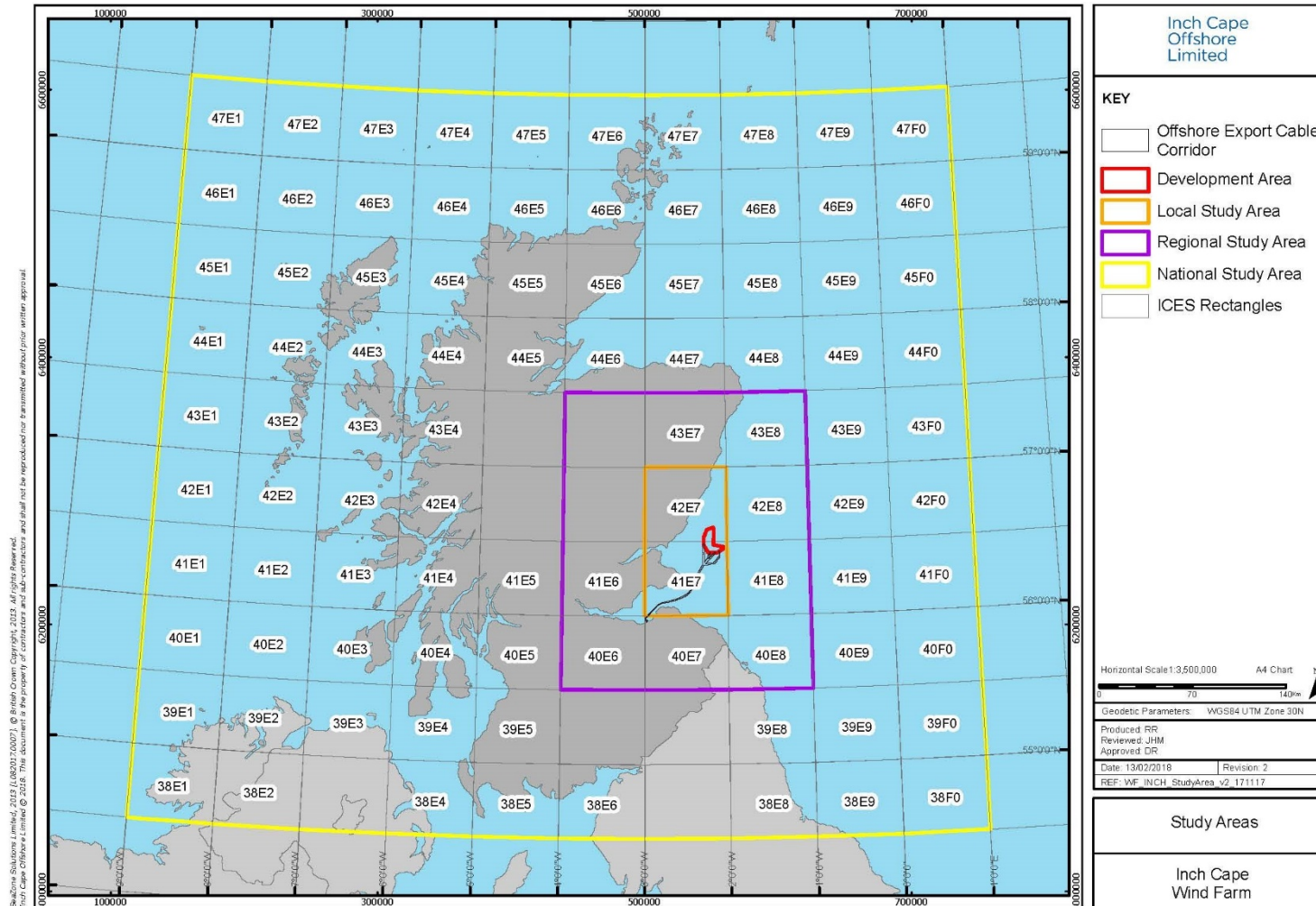


Figure 14.2 Annual landings values by species (average 2011 to 2016) in National Study Area (MMO)

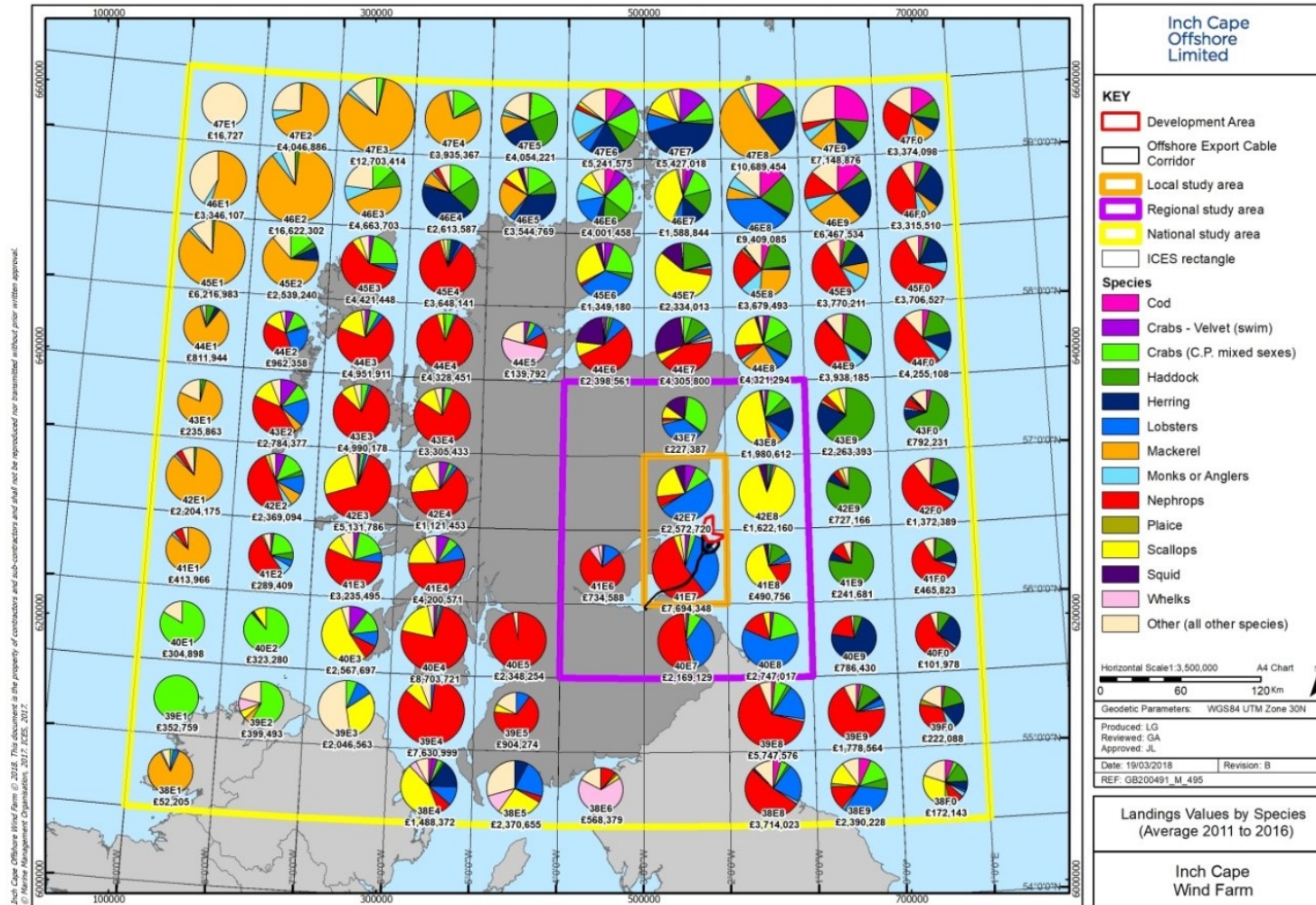


Figure 14.3 Annual landings values by vessel category (Average 2011 to 2016) in Regional Study Area (MMO)

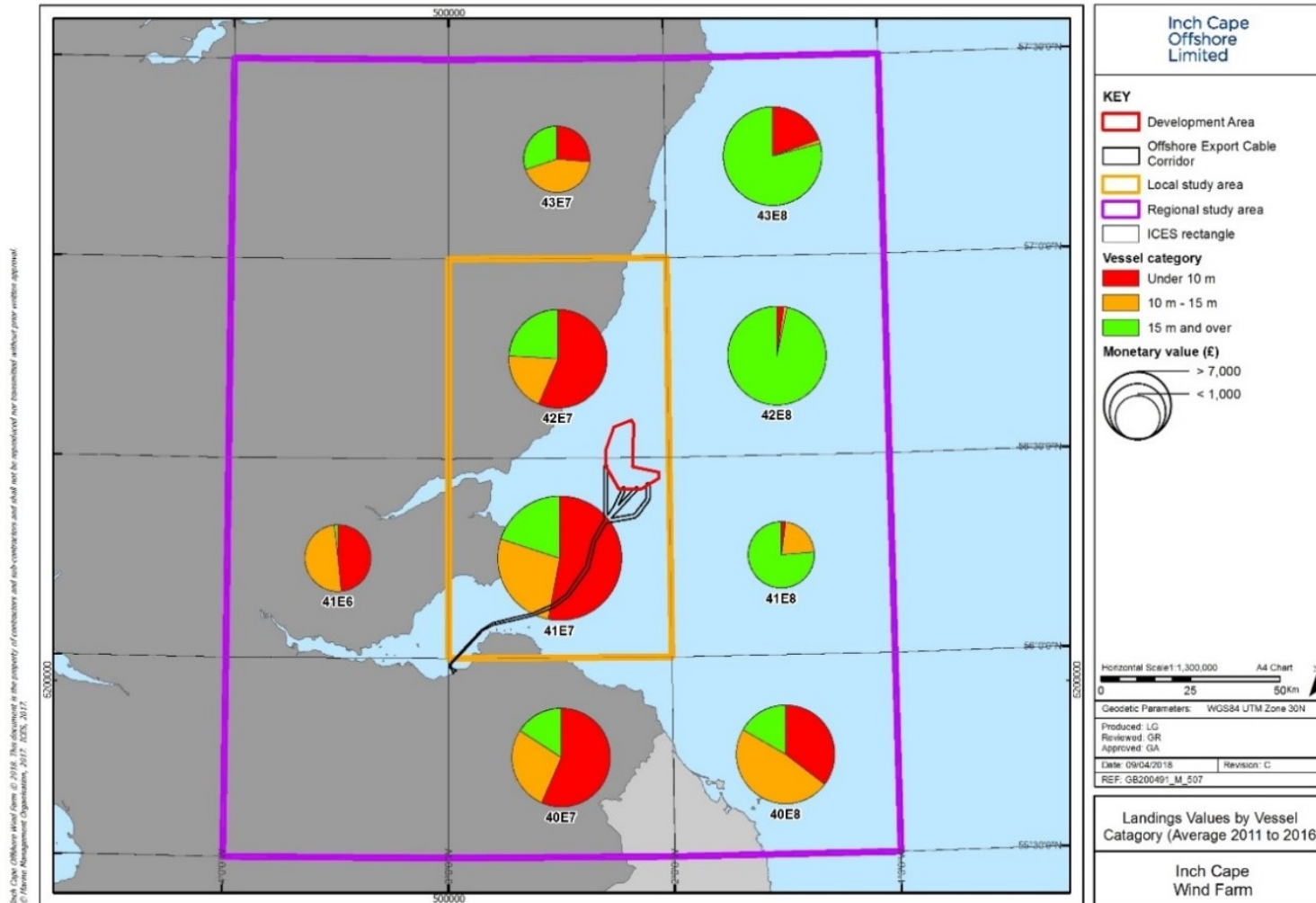


Figure 14.5 Distribution of scallops by intensity (Average 2007-2011) in Regional Study Area (MS; Kafas et al., 2012)

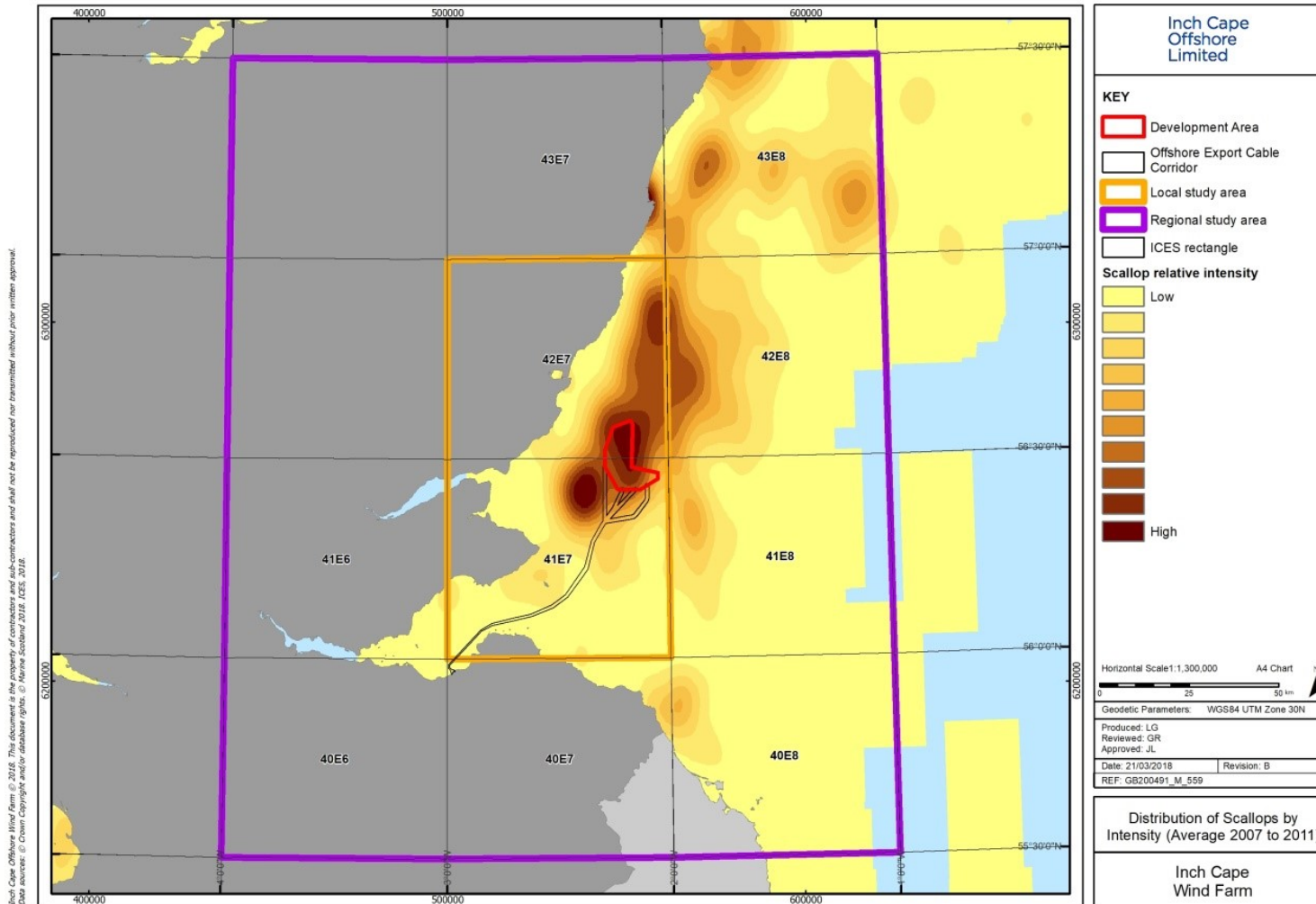


Figure 14.6 Distribution of scallops by intensity (Average 2009-2013) in Regional Study Area (MS; Kafas et al., 2013)

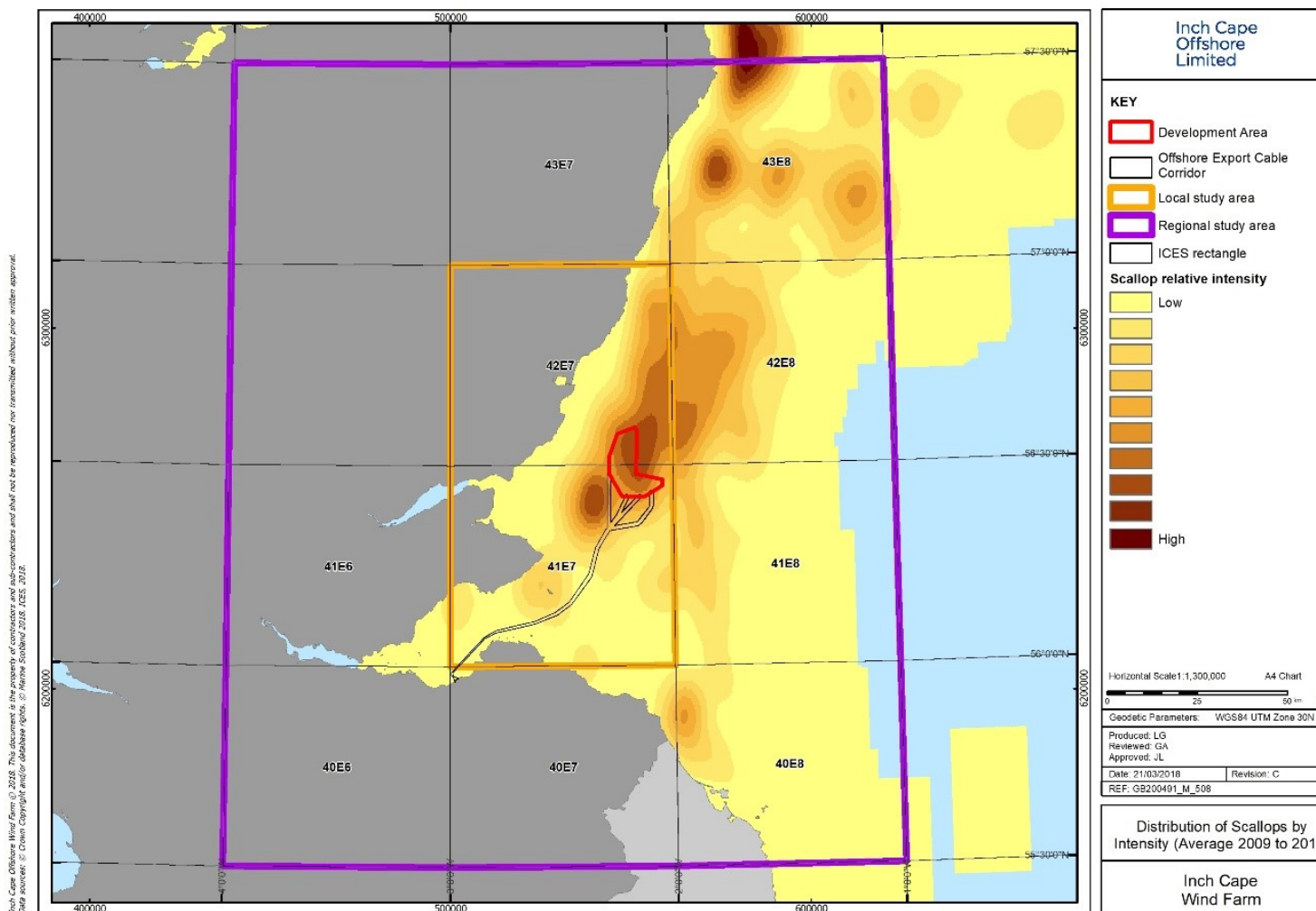


Figure 14.7 VMS density by fishing intensity for dredge (2011-2015) (MMO)

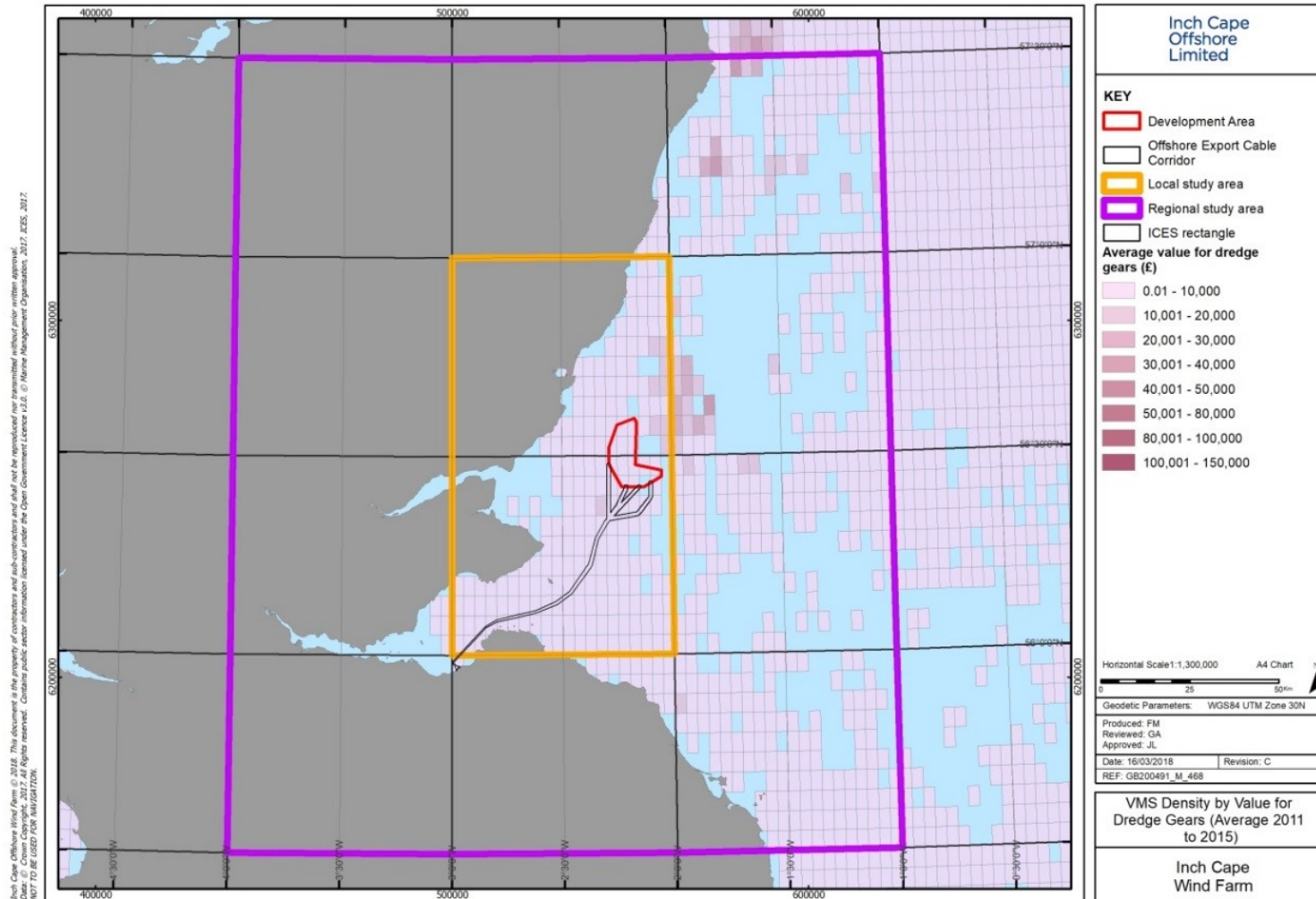


Figure 14.8 VMS density by fishing intensity for dredge (over 12 m vessels) in 2016 (ICES)

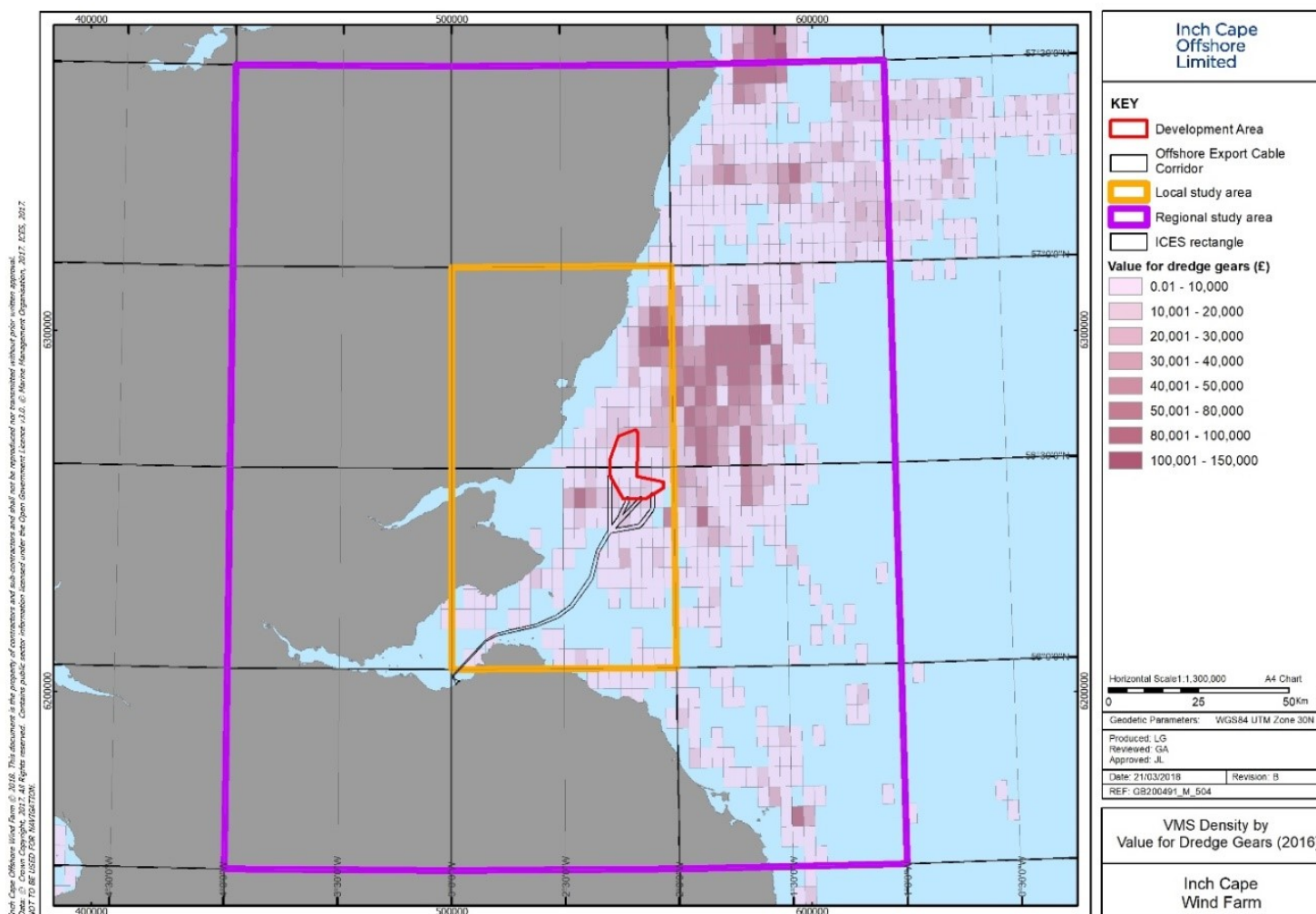


Figure 14.9 Scallop annual landings values (Average 2011 to 2016) in the UK (MMO)

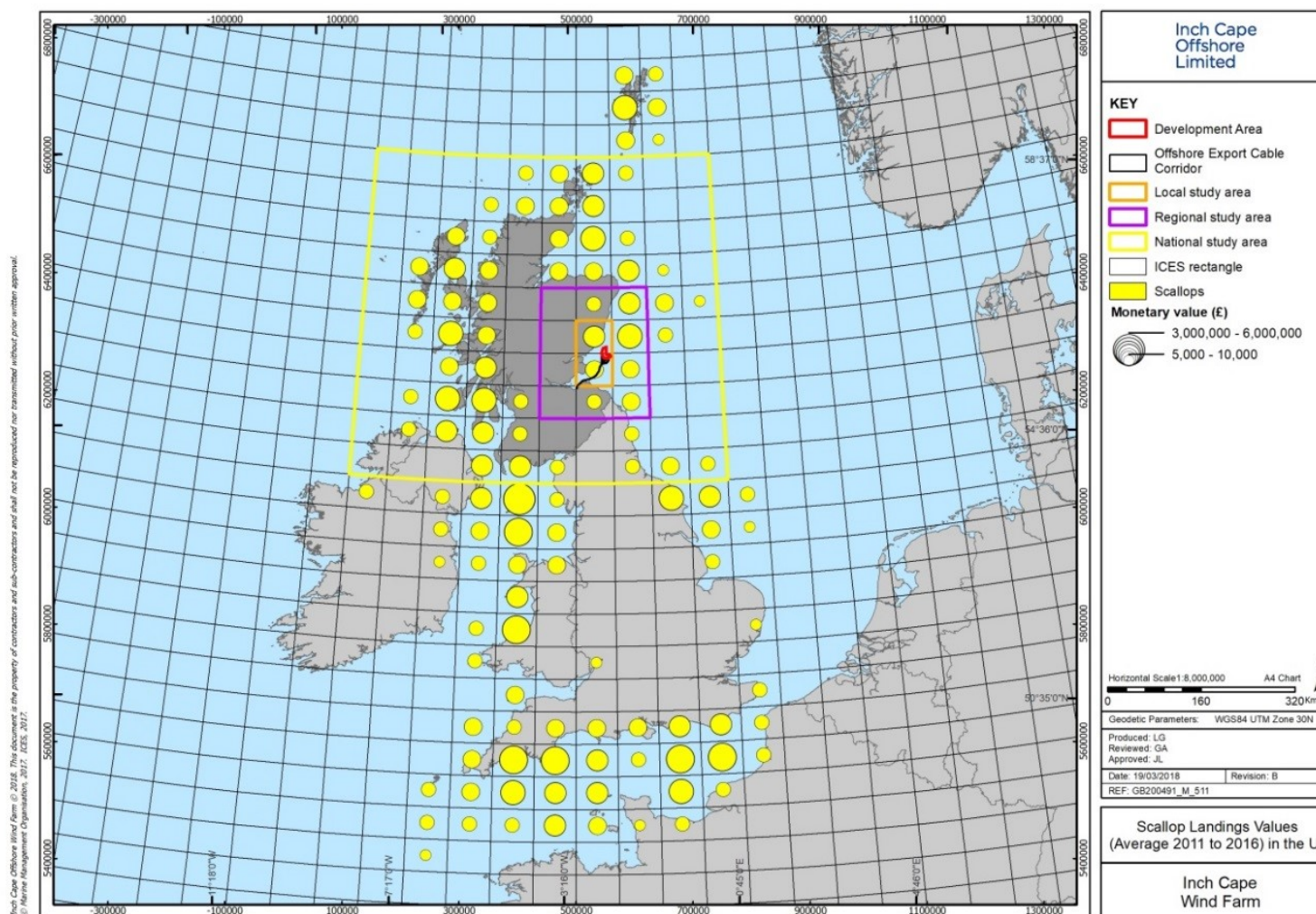


Figure 14.10 Relative annual landings values by species, shellfish only (Average 2011 to 2016) in the National Study Area (MMO)

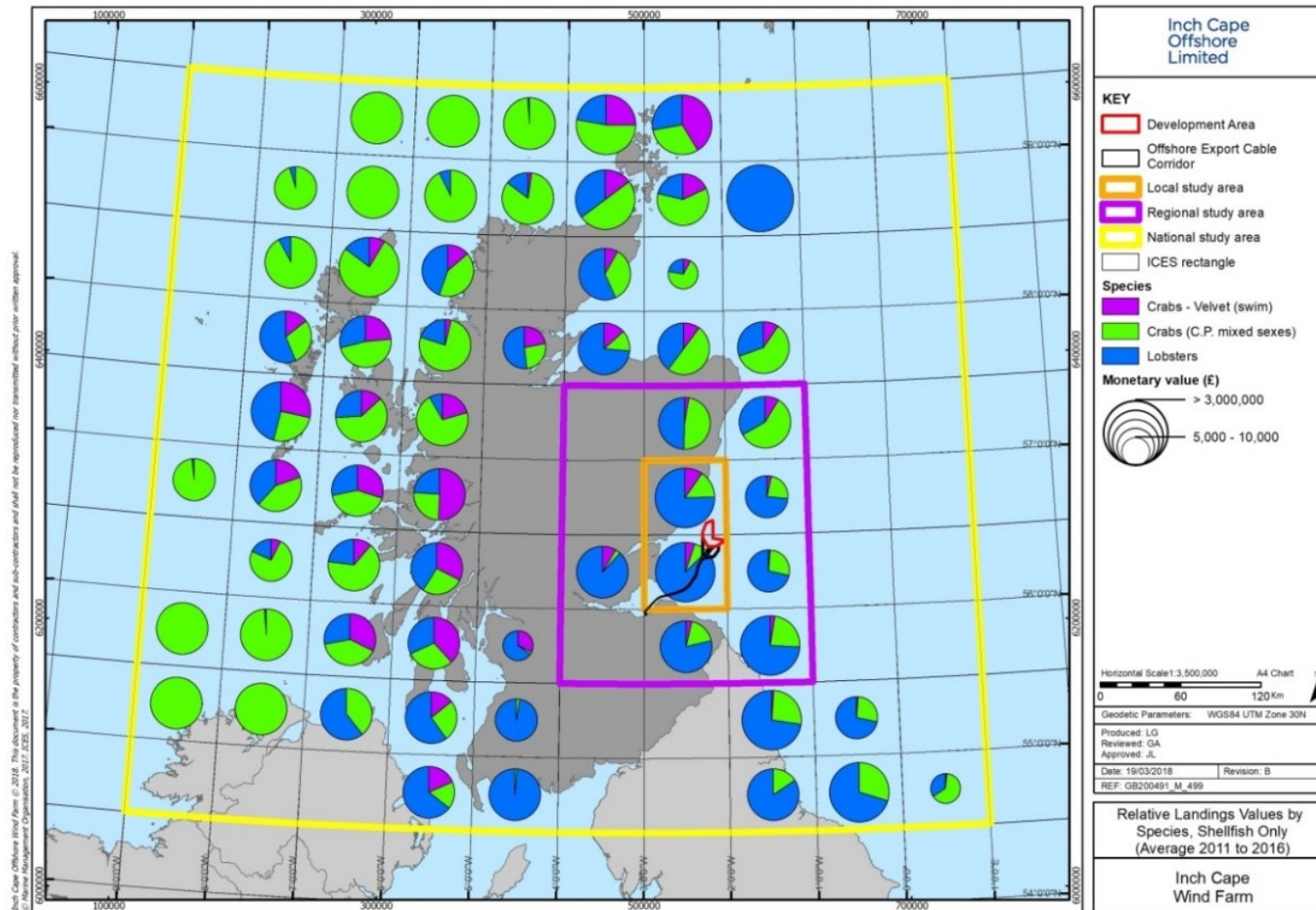


Figure 14.11 Average number of crab/lobster hauls per day per cell (4 km²) (MS, 2017)

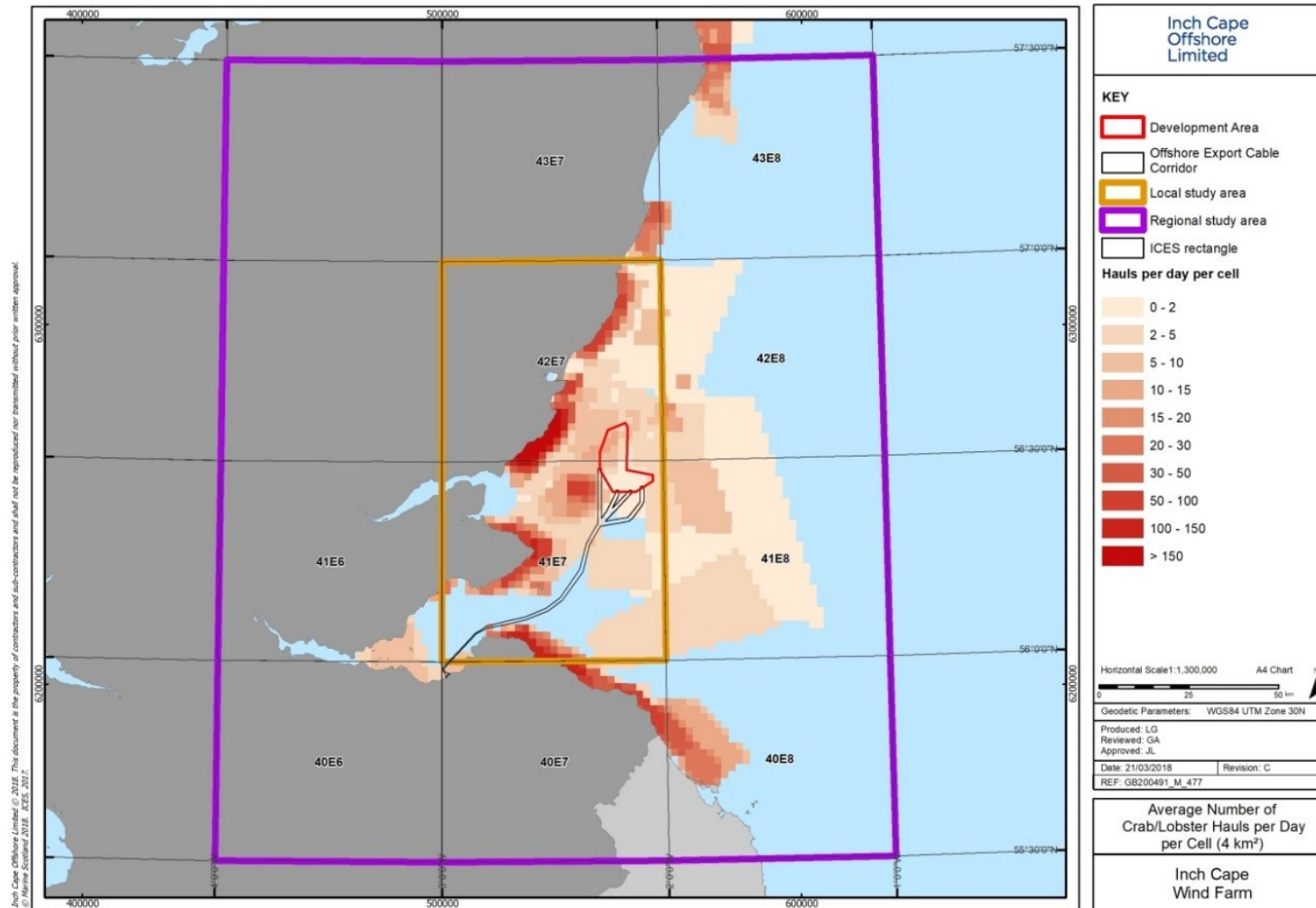


Figure 14.12 Scotmap pots crab/lobster Monetary value (MS, 2012)

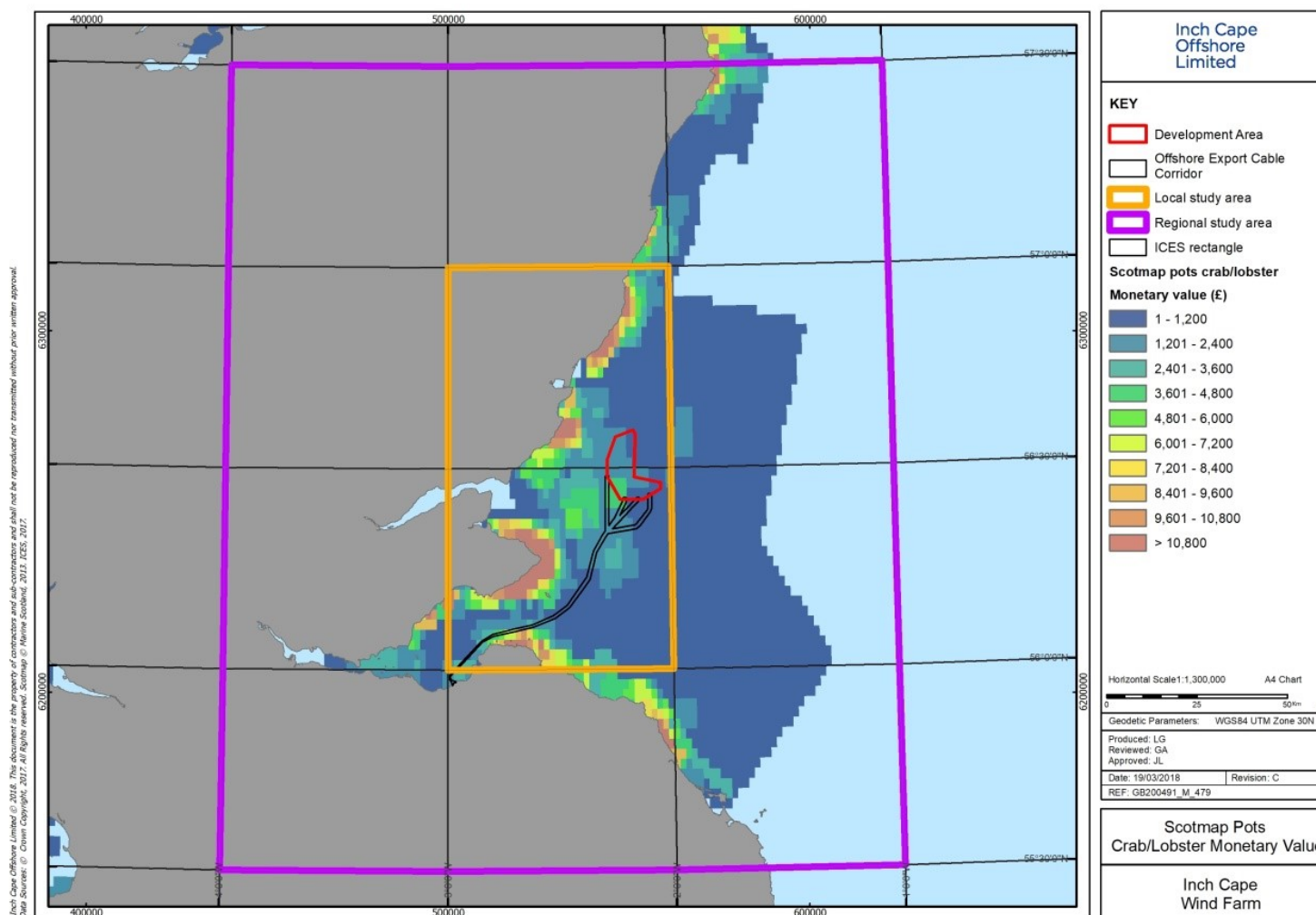


Figure 14.13 Relative annual landings values by species, squid only (Average 2011 to 2016), in the National Study Area (MMO)

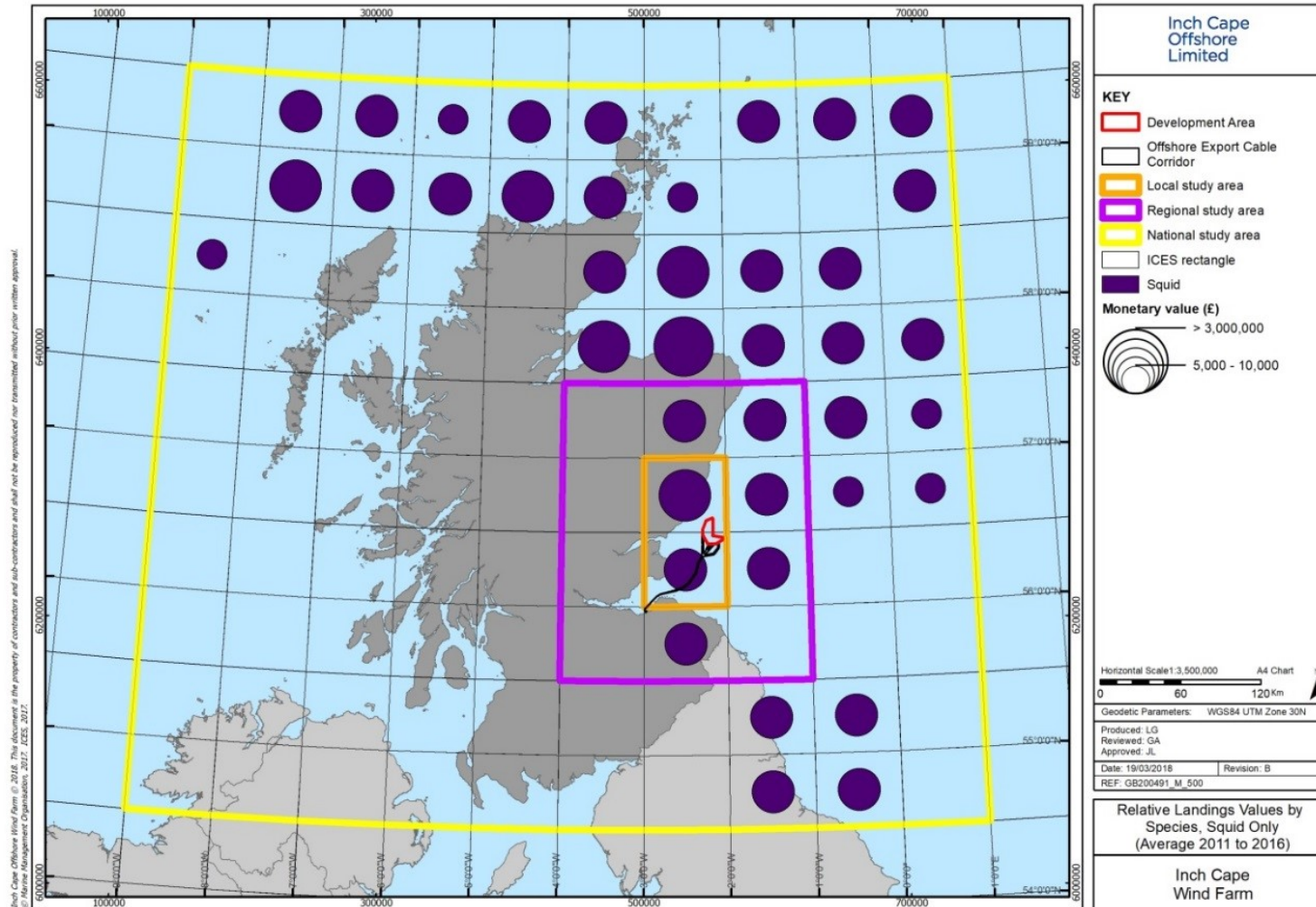


Figure 14.14 Distribution of squid by intensity (Average 2009 to 2013) in the Regional Study Area (MS; Kafas et al., 2013)

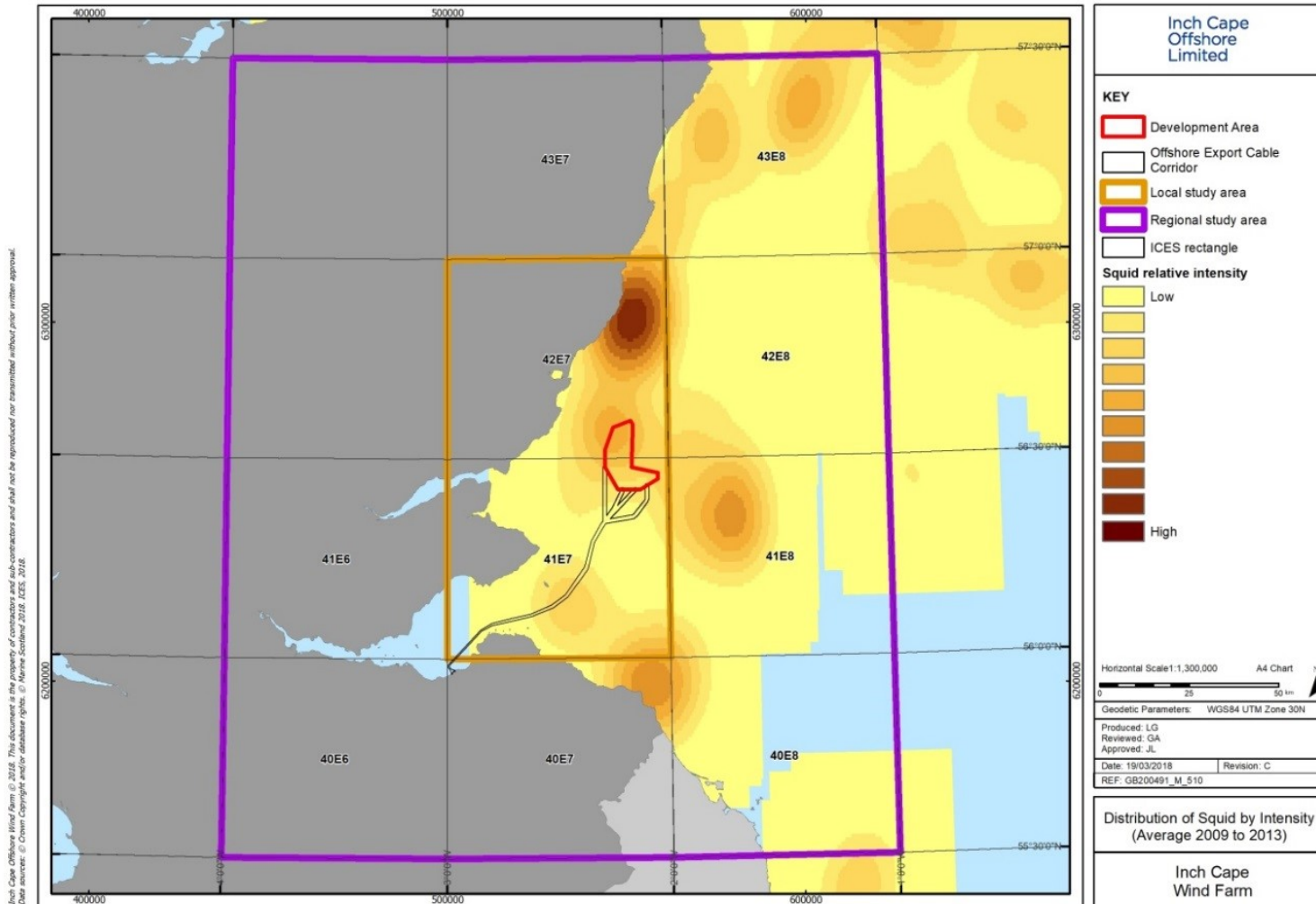


Figure 14.15 Scotmap 'not Nephrops trawls' No. of vessels (MS, 2012)

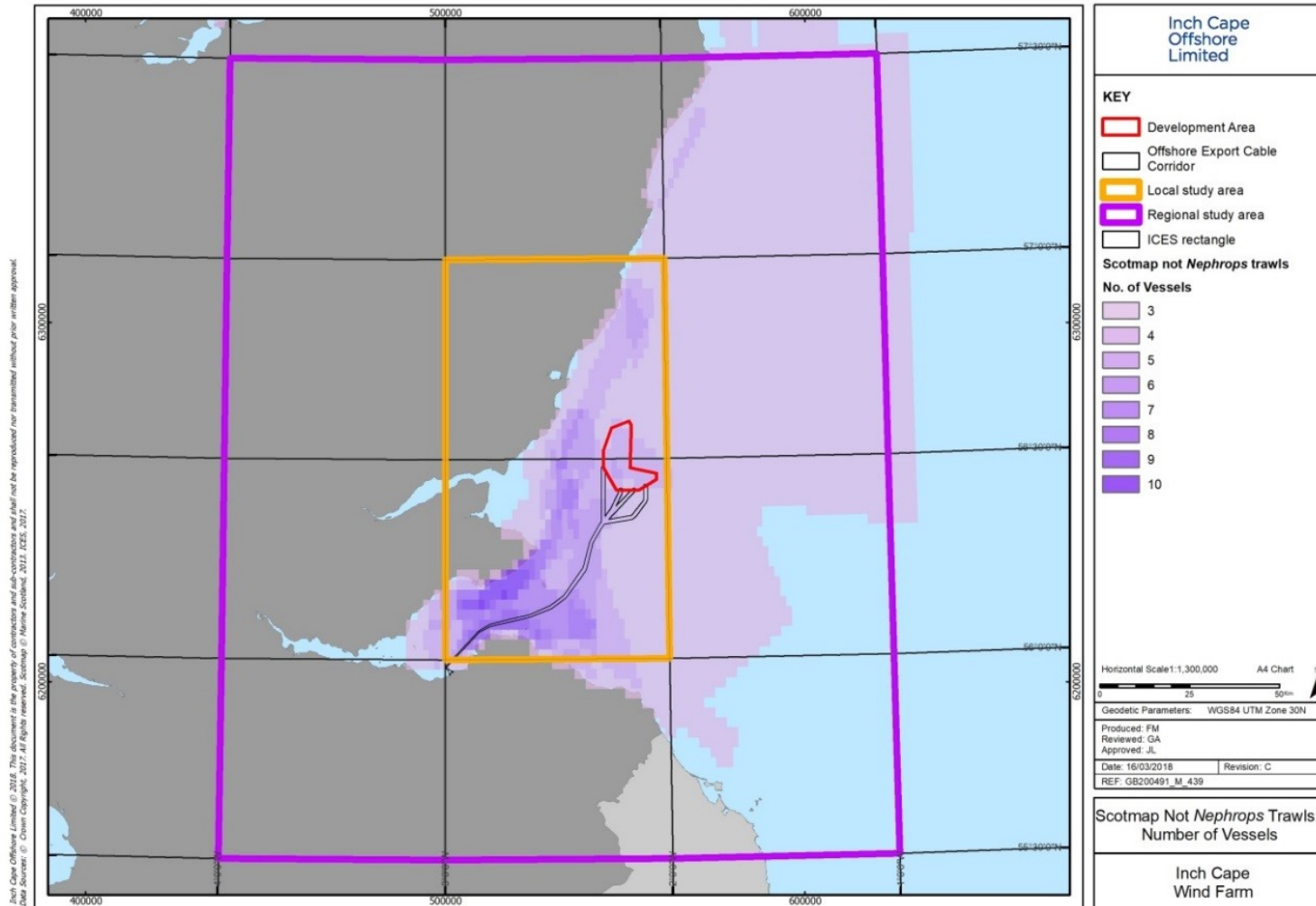


Figure 14.16 Relative annual landings values by species, Nephrops only (Average 2011 to 2016), in the National Study area (MMO)

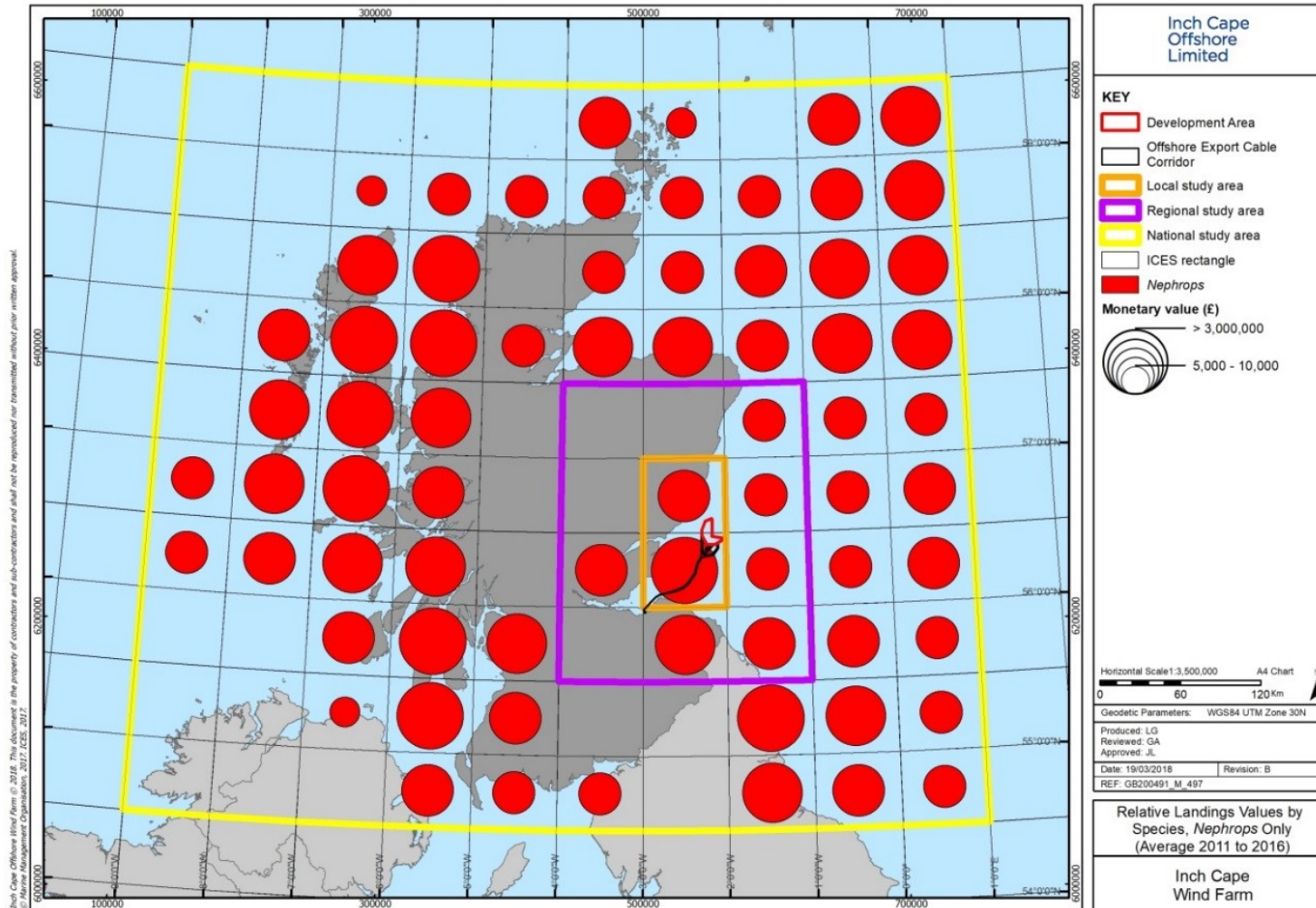


Figure 14.17 VMS density by value for demersal gears (Average 2011 – 2015) (MMO)

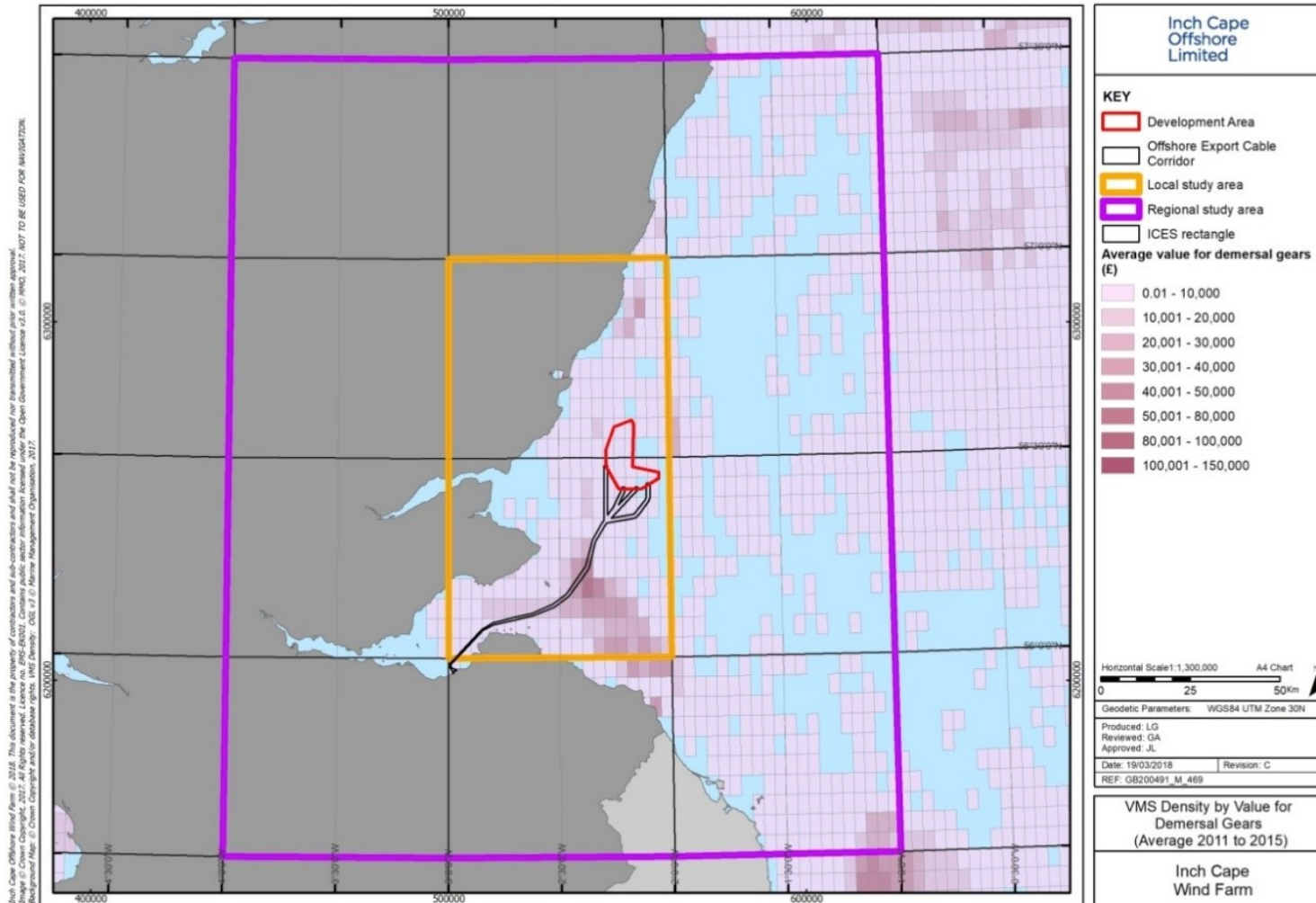


Figure 14.18 Scotmap Nephrops trawls Monetary value (MS, 2012)

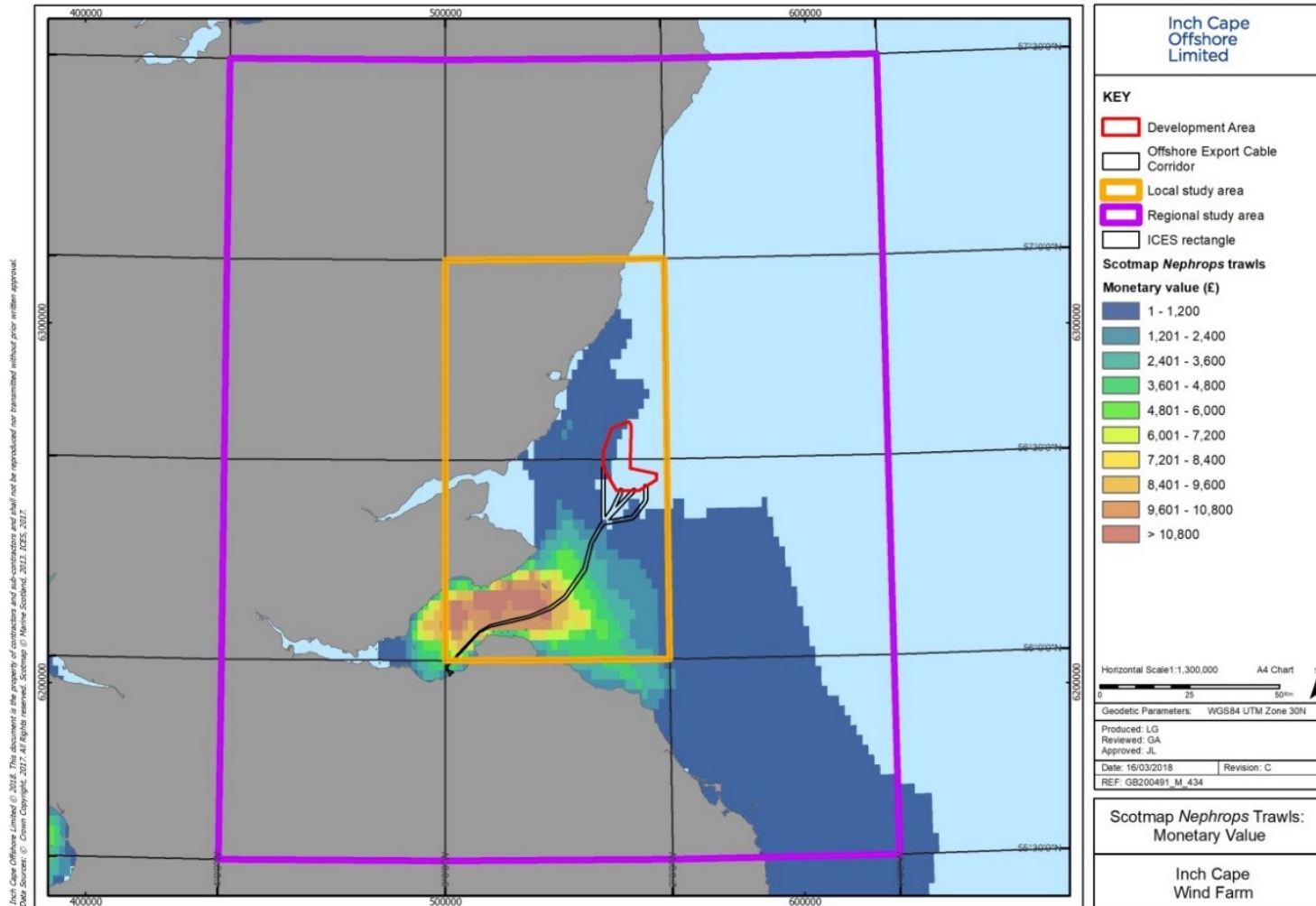


Figure 14.19 VMS density by fishing intensity for Nephrops for vessels of over 12 m (2016) (ICES)

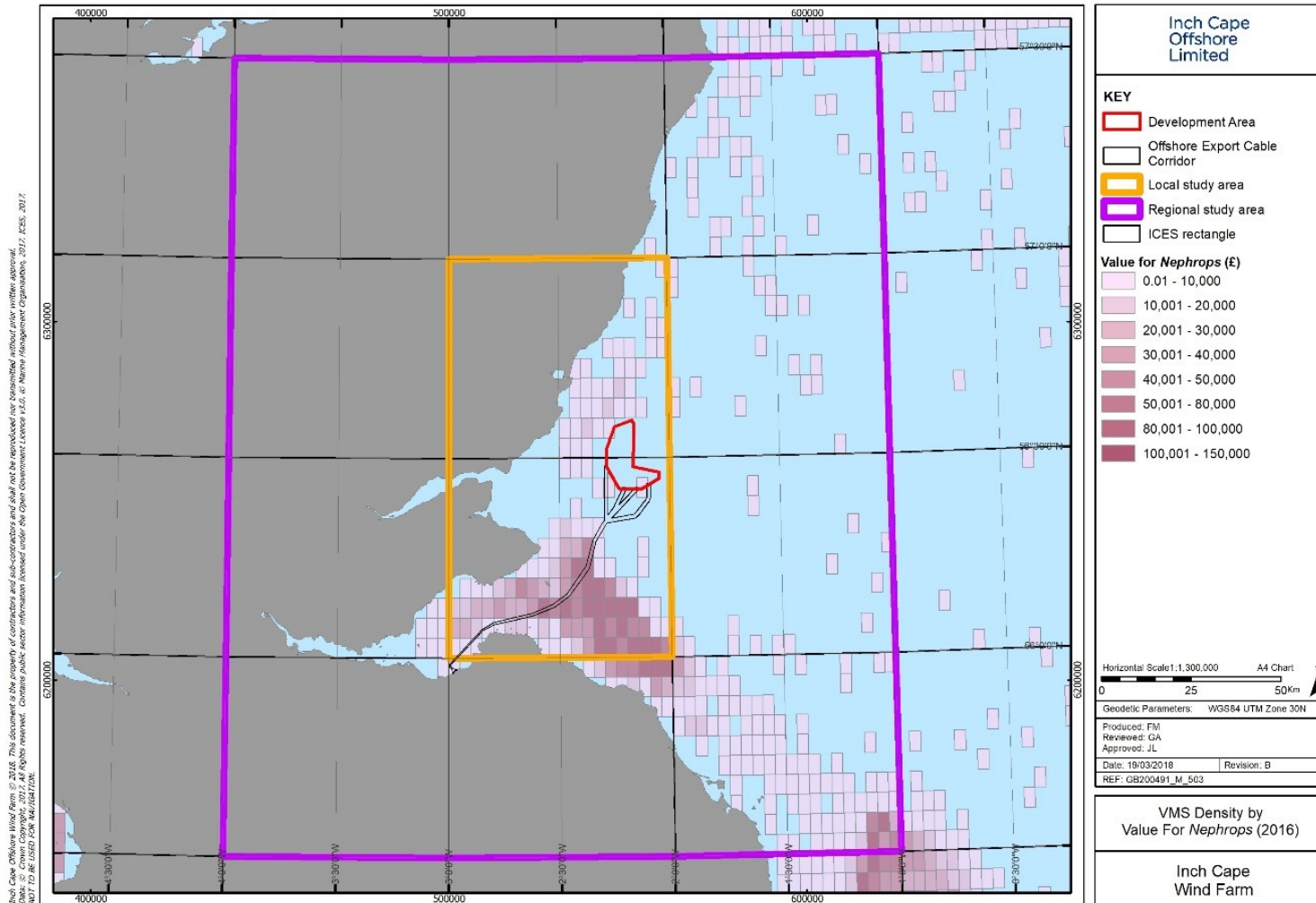


Figure 14.20 Scallop dredging VMS intensity (2007-2016) in relation to the Forth and Tay Projects

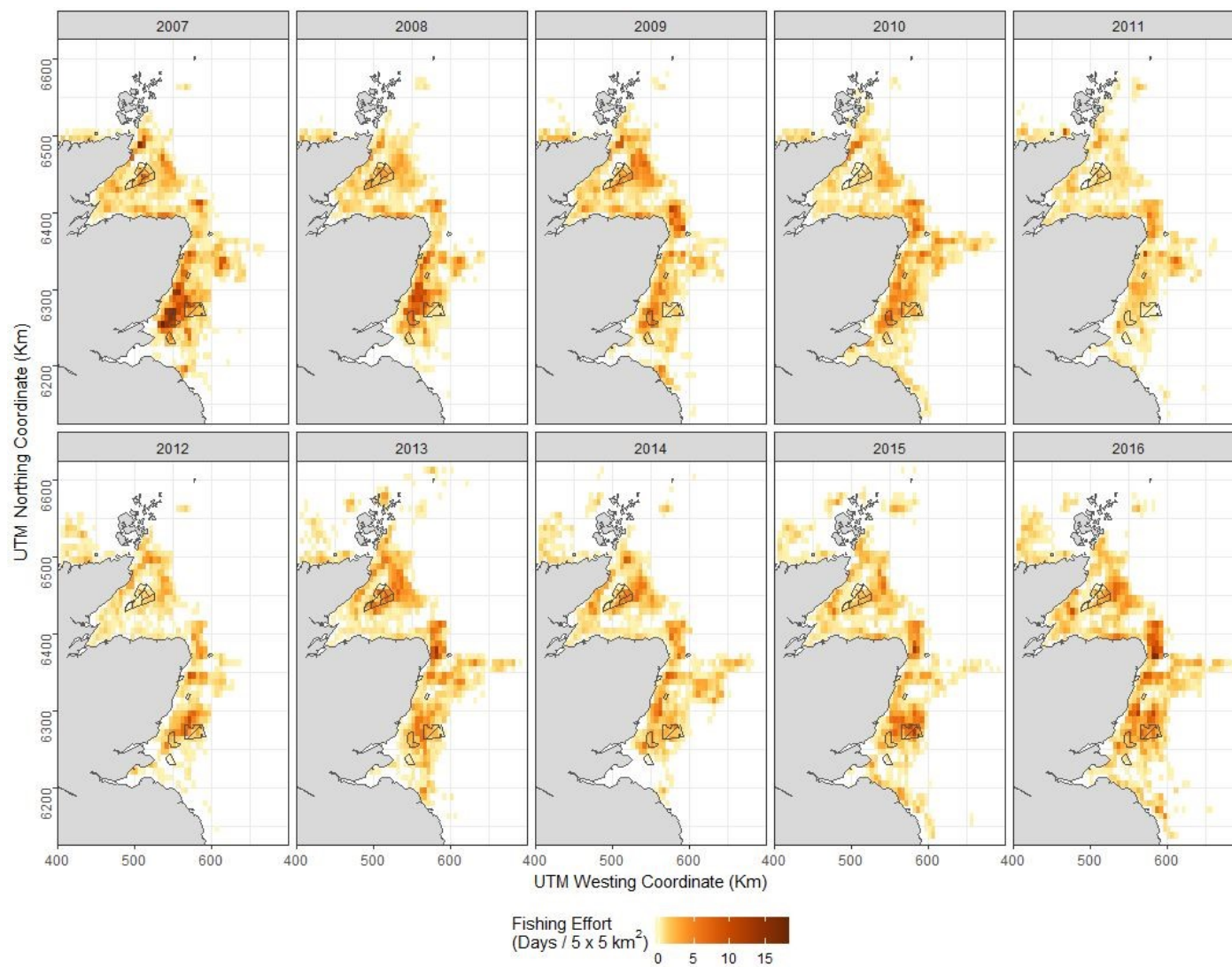


Figure 15.1 Worst case indicative layout

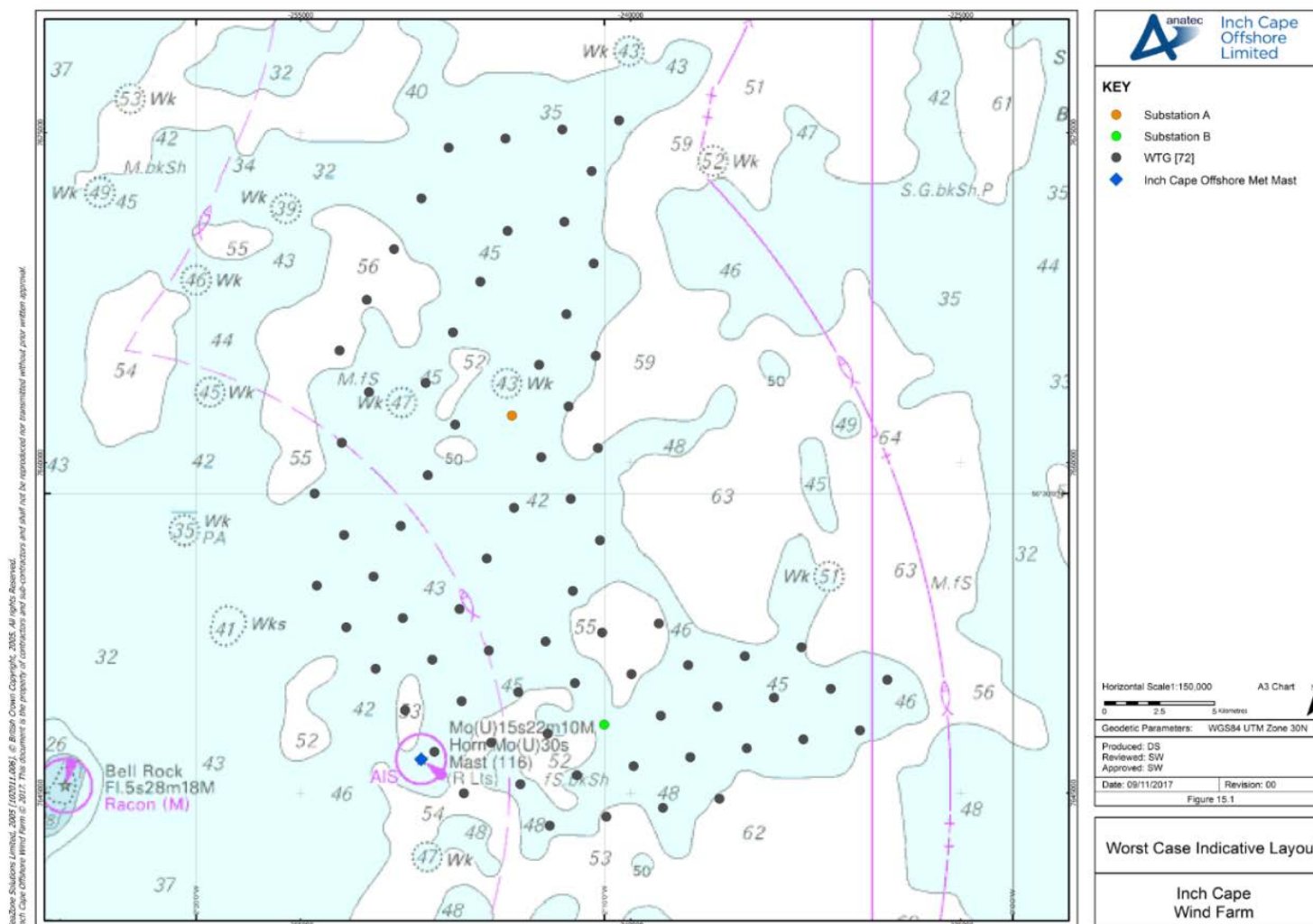


Figure 15.2 Development Area and Offshore Export Cable Corridor Study Areas

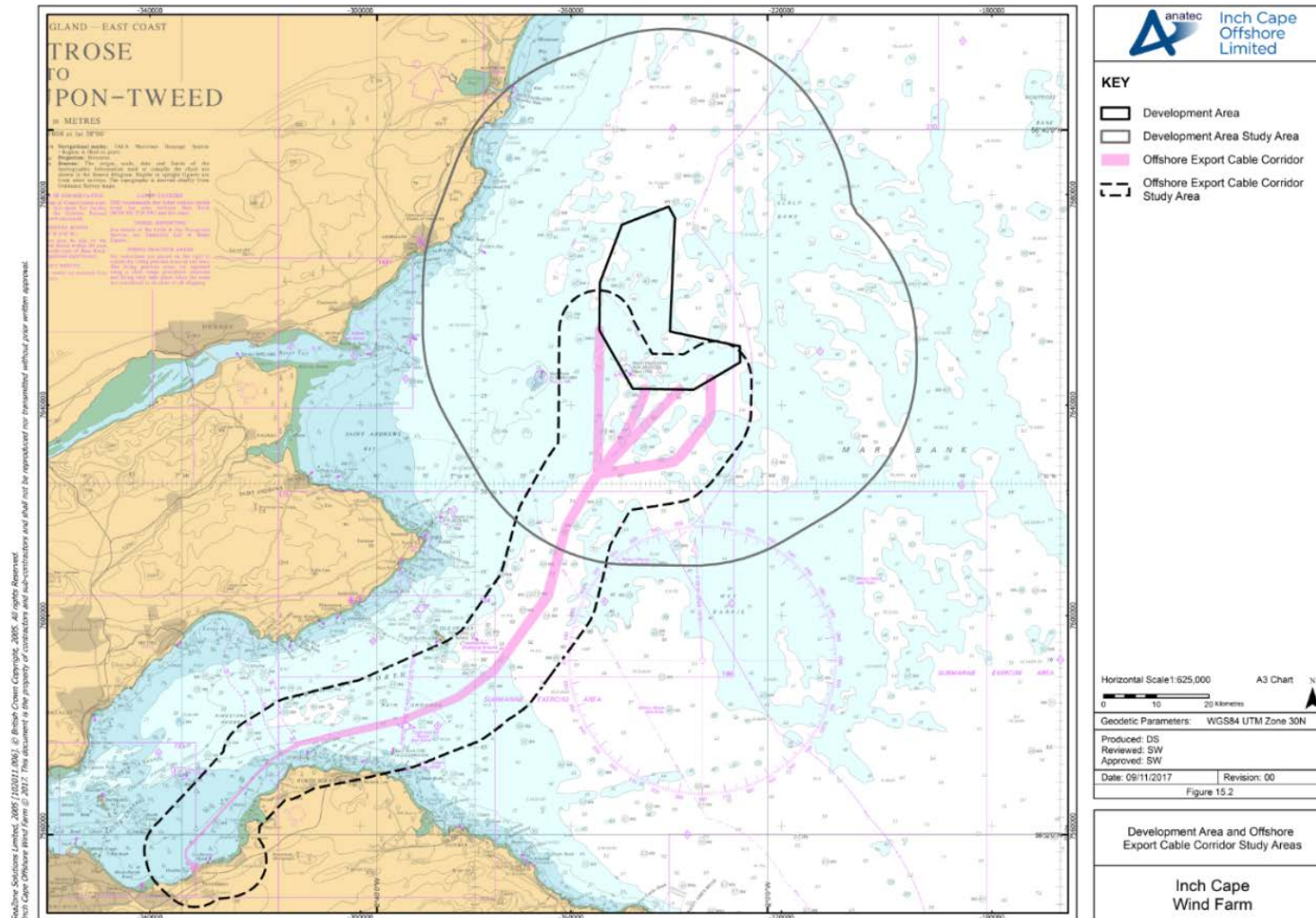


Figure 15.3 AIS data excluding temporary traffic within Development Area Study Area colour-coded by vessel type (28 Days – June and December 2016)

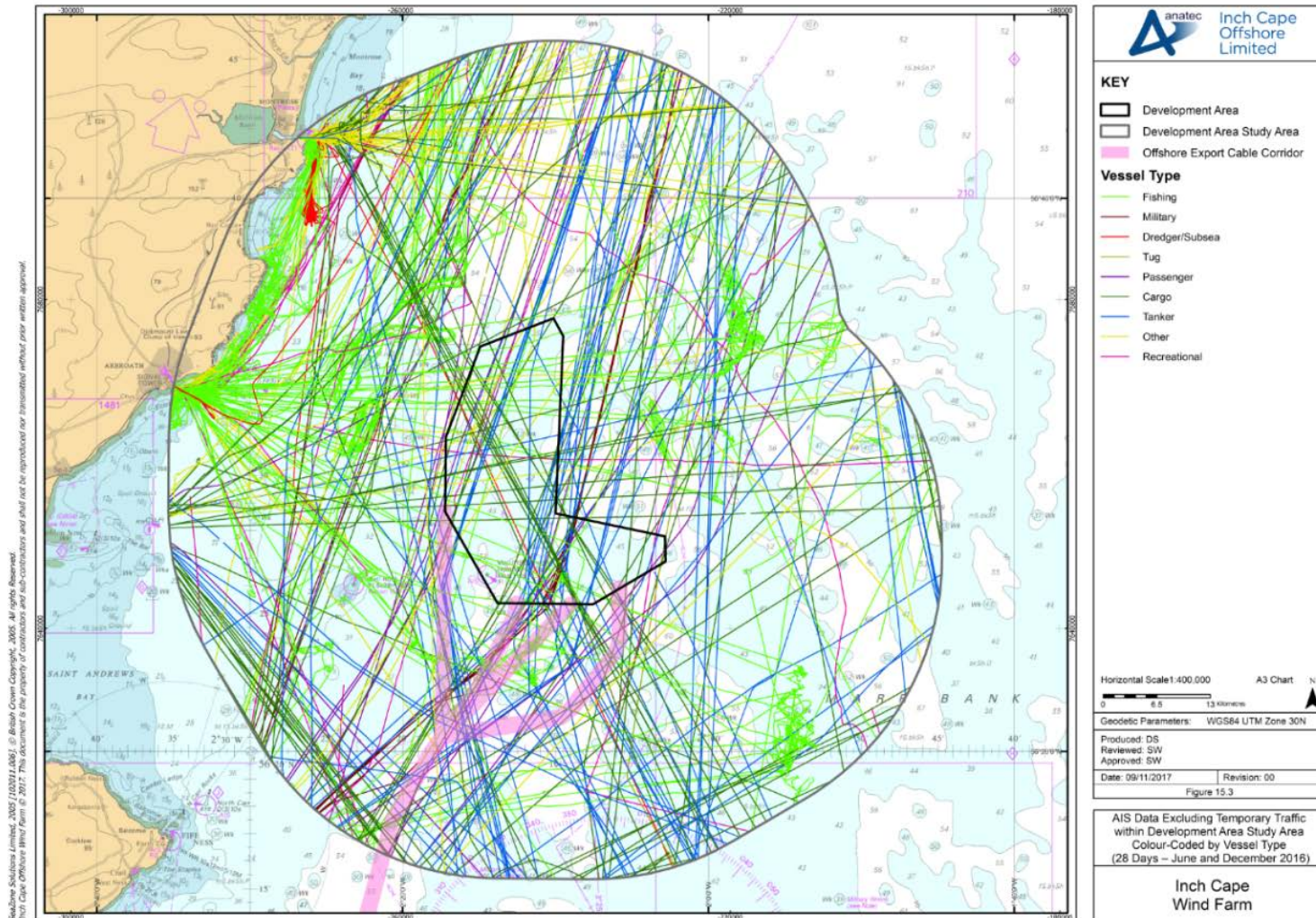


Figure 15.4 Main commercial vessel routes within Development Area Study Area

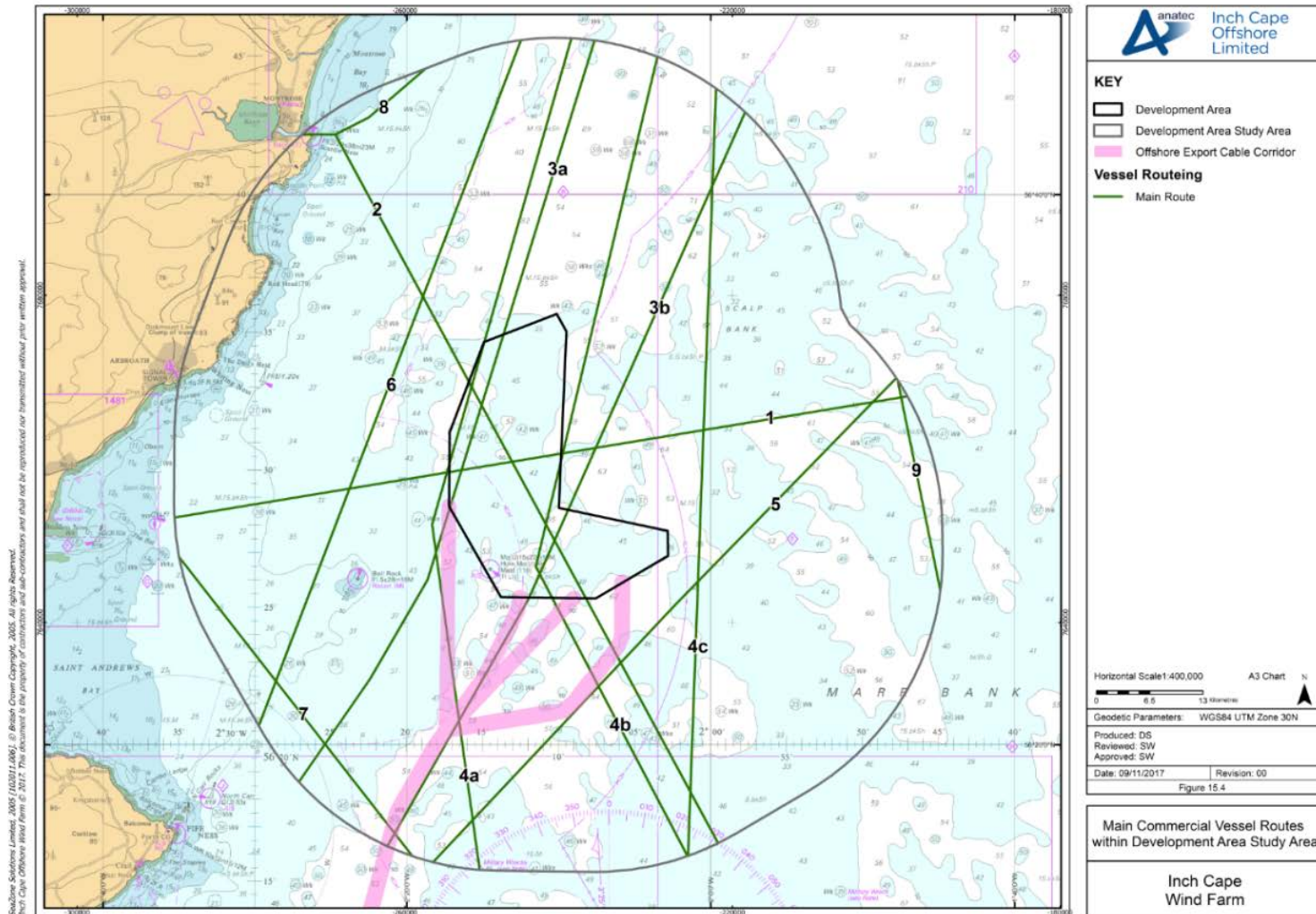


Figure 15.5 AIS fishing vessel data within Development Area Study Area colour-coded by gear type (28 Days – June and December 2016)

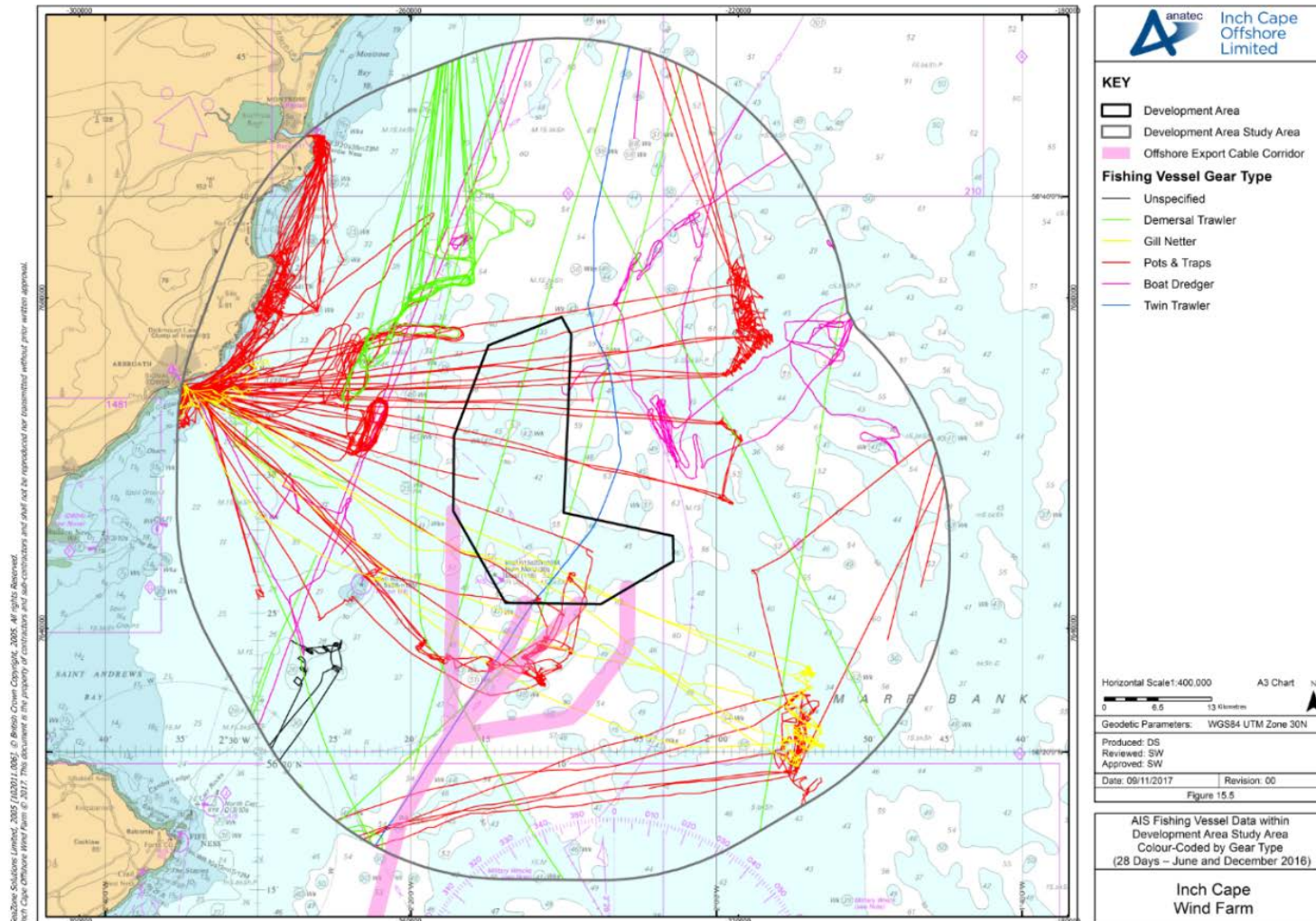


Figure 15.6 AIS recreational vessel data within Development Area Study Area (28 Days – June and December 2016)

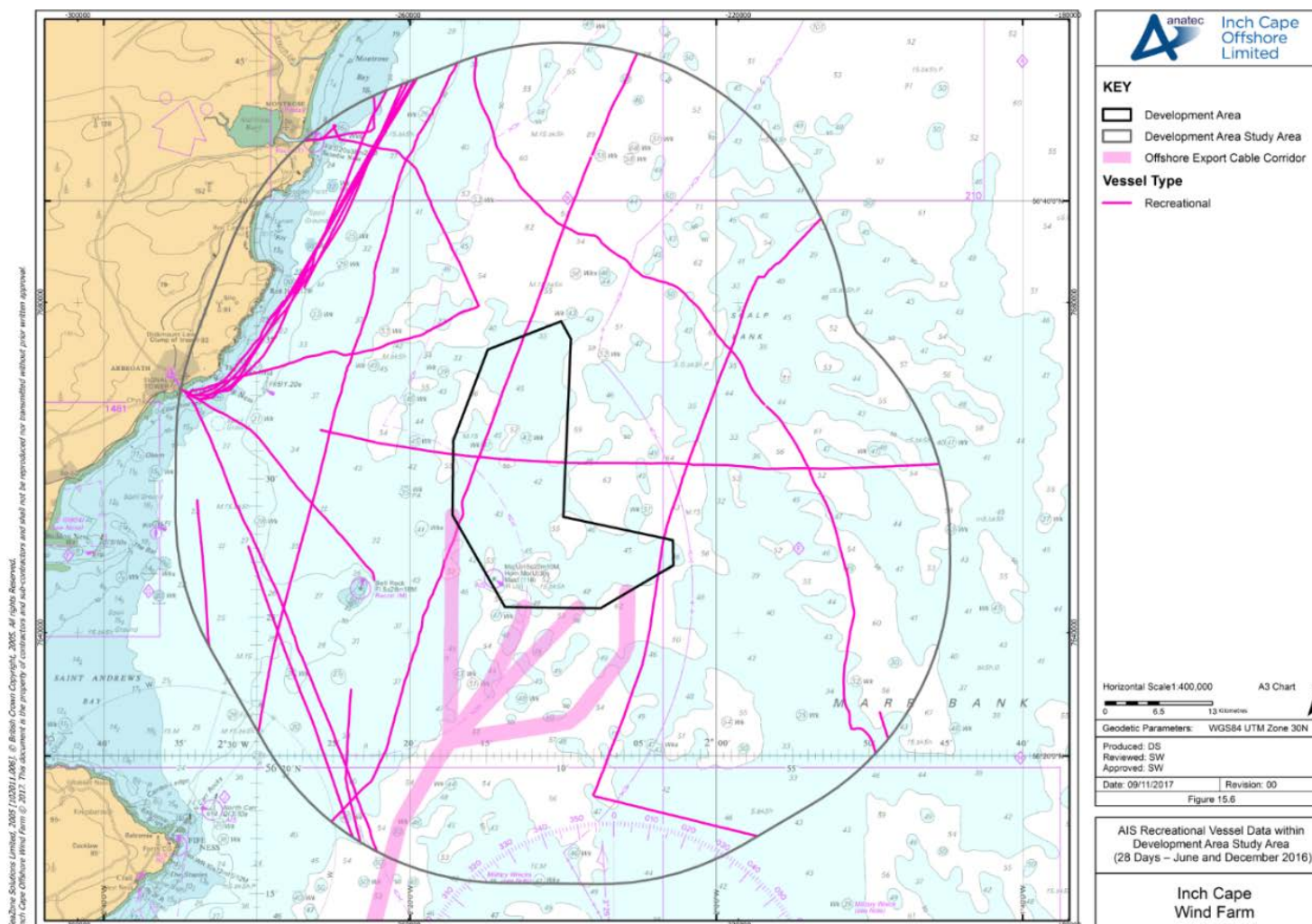


Figure 15.7 RYA dataset in vicinity of Development Area and Offshore Export Cable Corridor

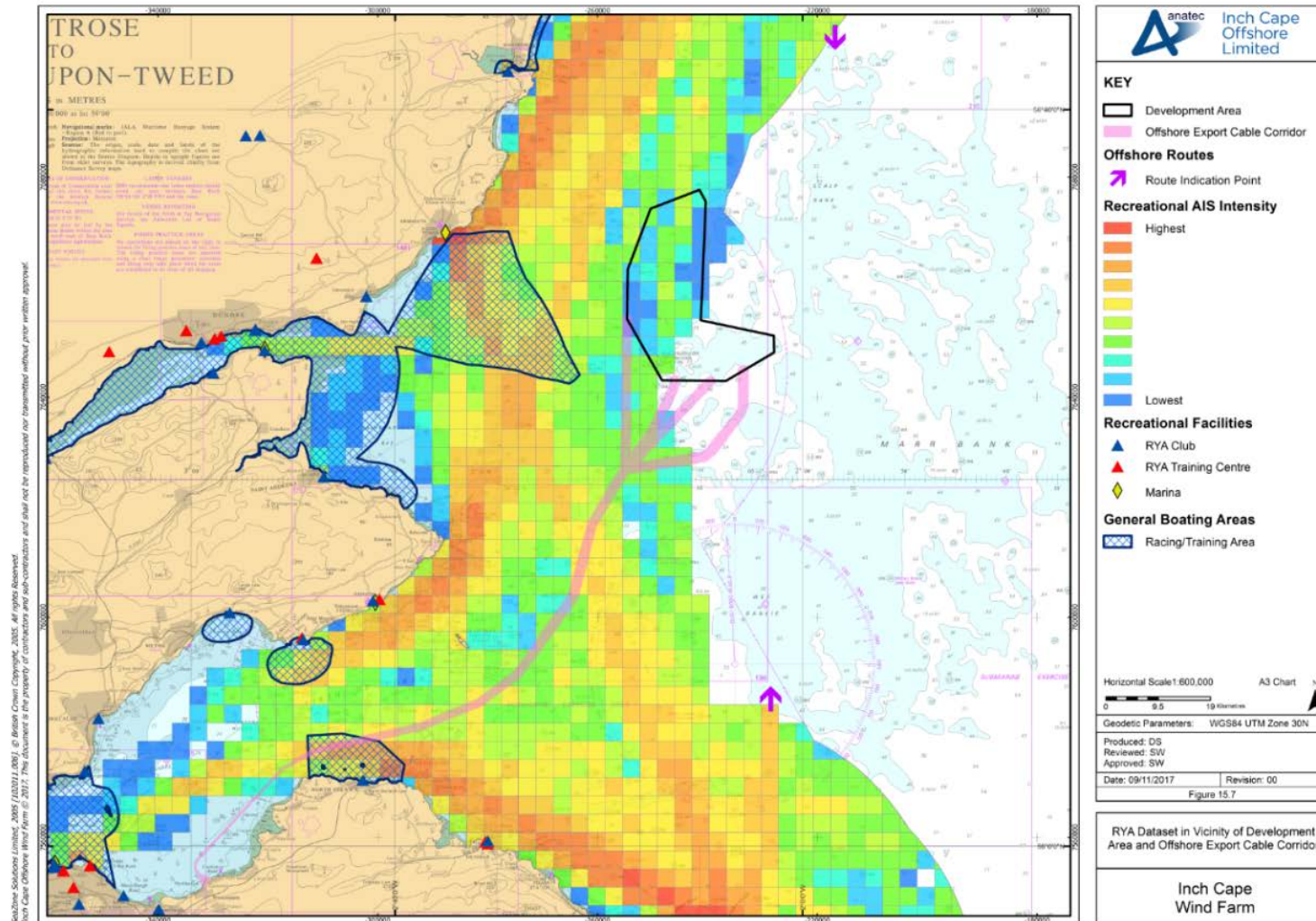


Figure 15.8 MAIB incidents within Development Area and Offshore Export Cable Corridor Study Areas colour-coded by incident type (2005 to 2014)

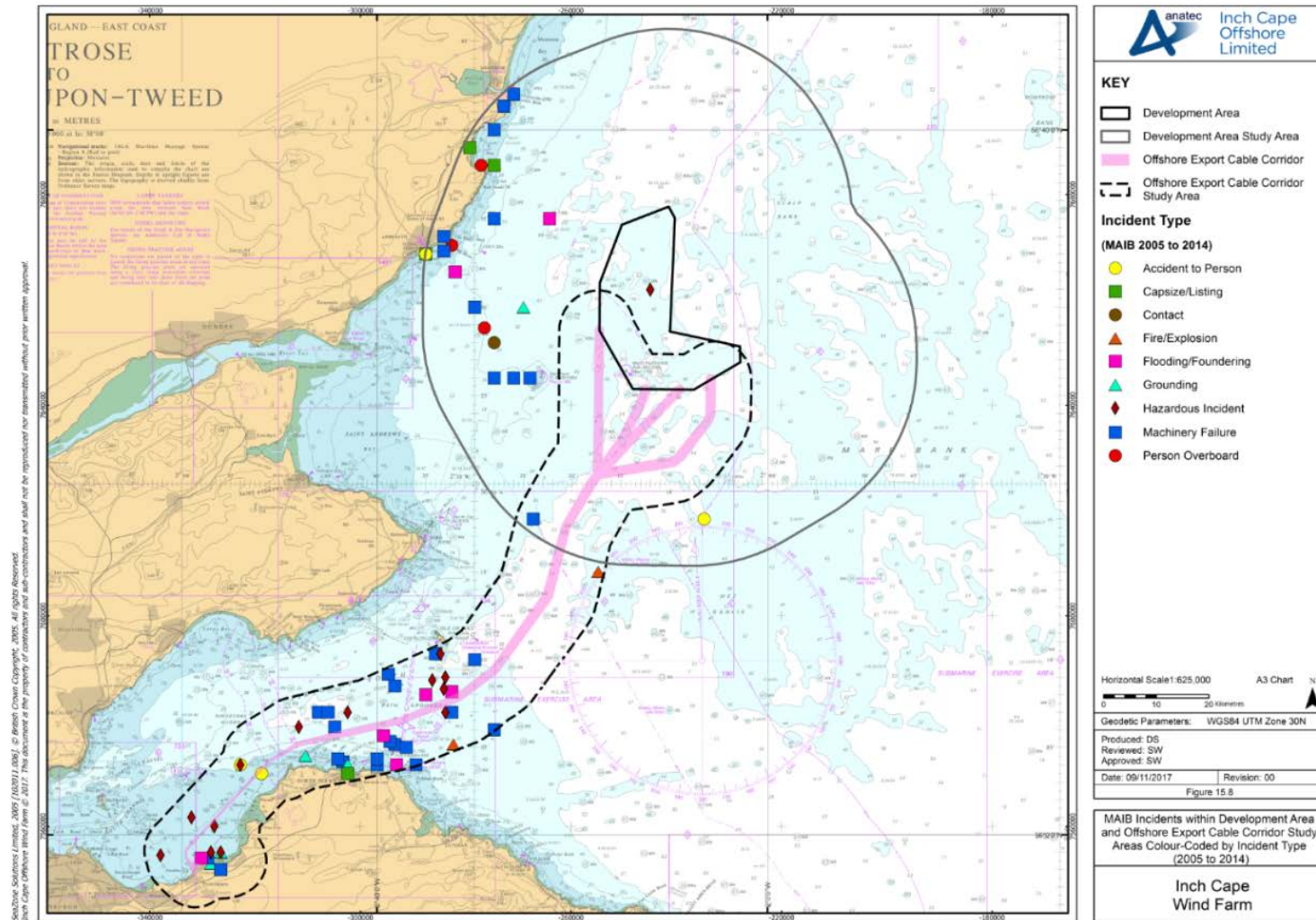


Figure 15.9 RNLI incidents within Development Area and Offshore Export Cable Corridor Study Areas colour-coded by casualty type (2005 to 2014)

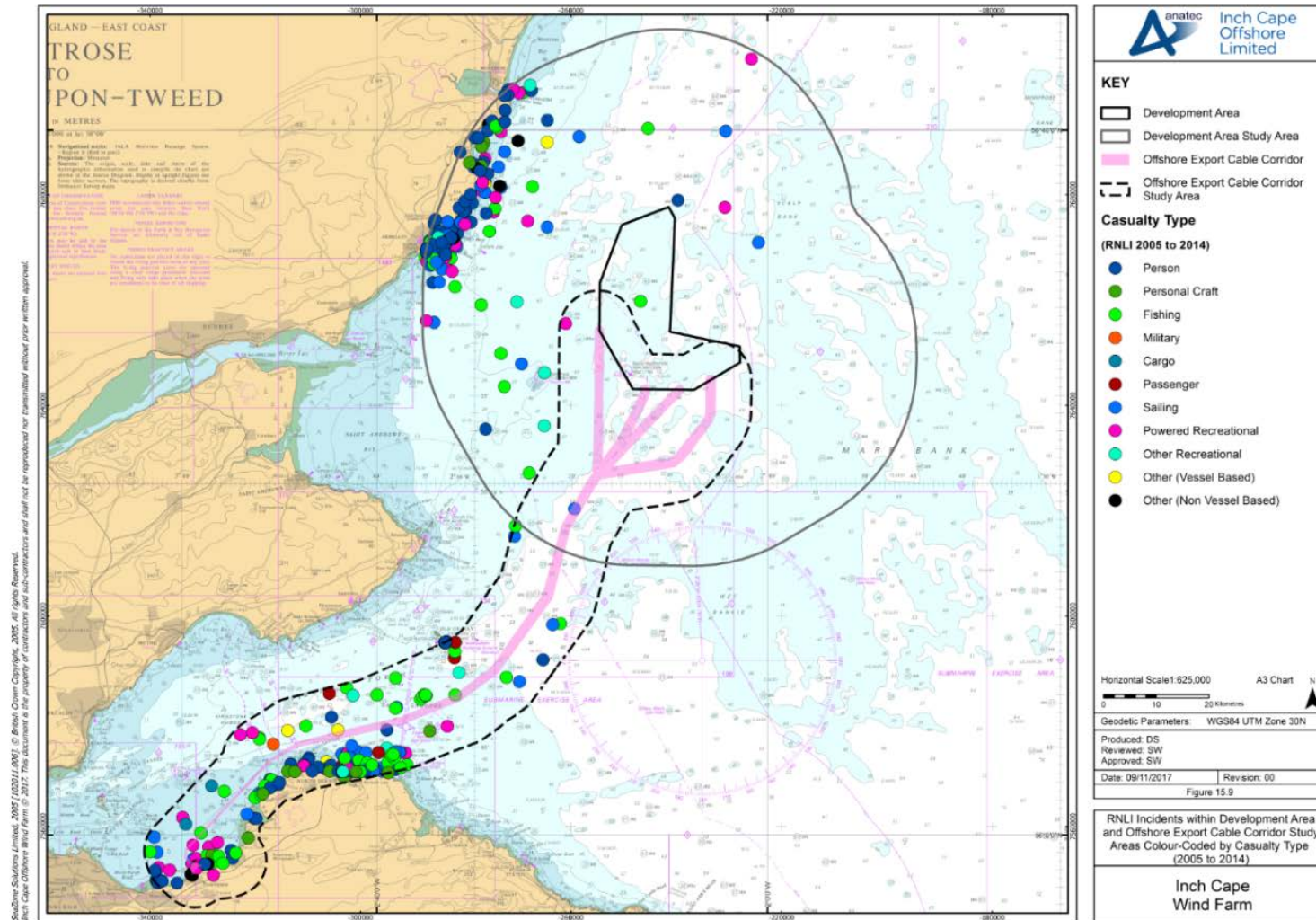


Figure 15.10 AIS data excluding temporary traffic within Offshore Export Cable Corridor Study Area colour coded by vessel type (56 Days – January February 2011 and May 2012)

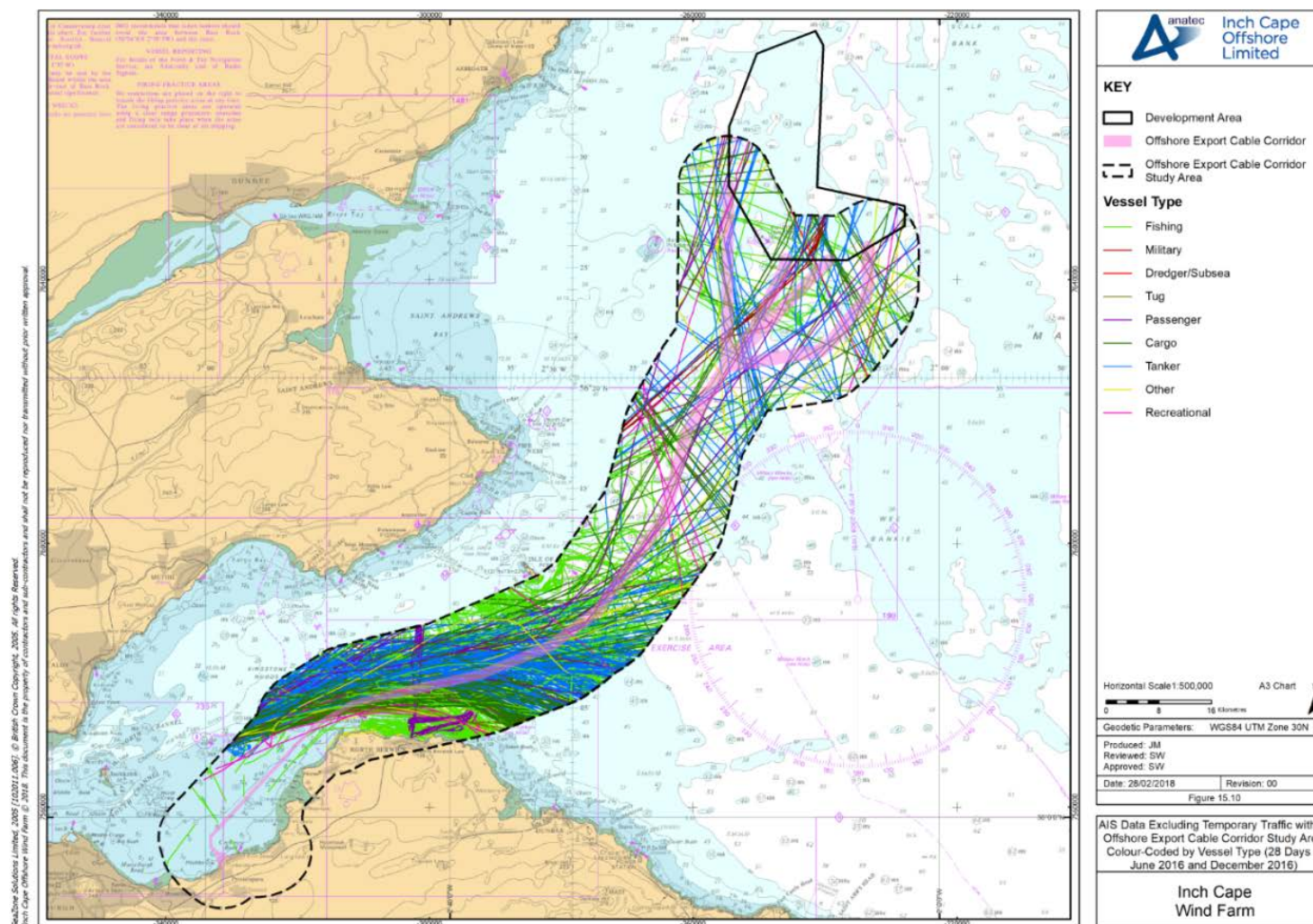


Figure 15.11 AIS fishing and recreational vessel data within Offshore Export Cable Corridor Study Area (28 Days – June and December 2016)

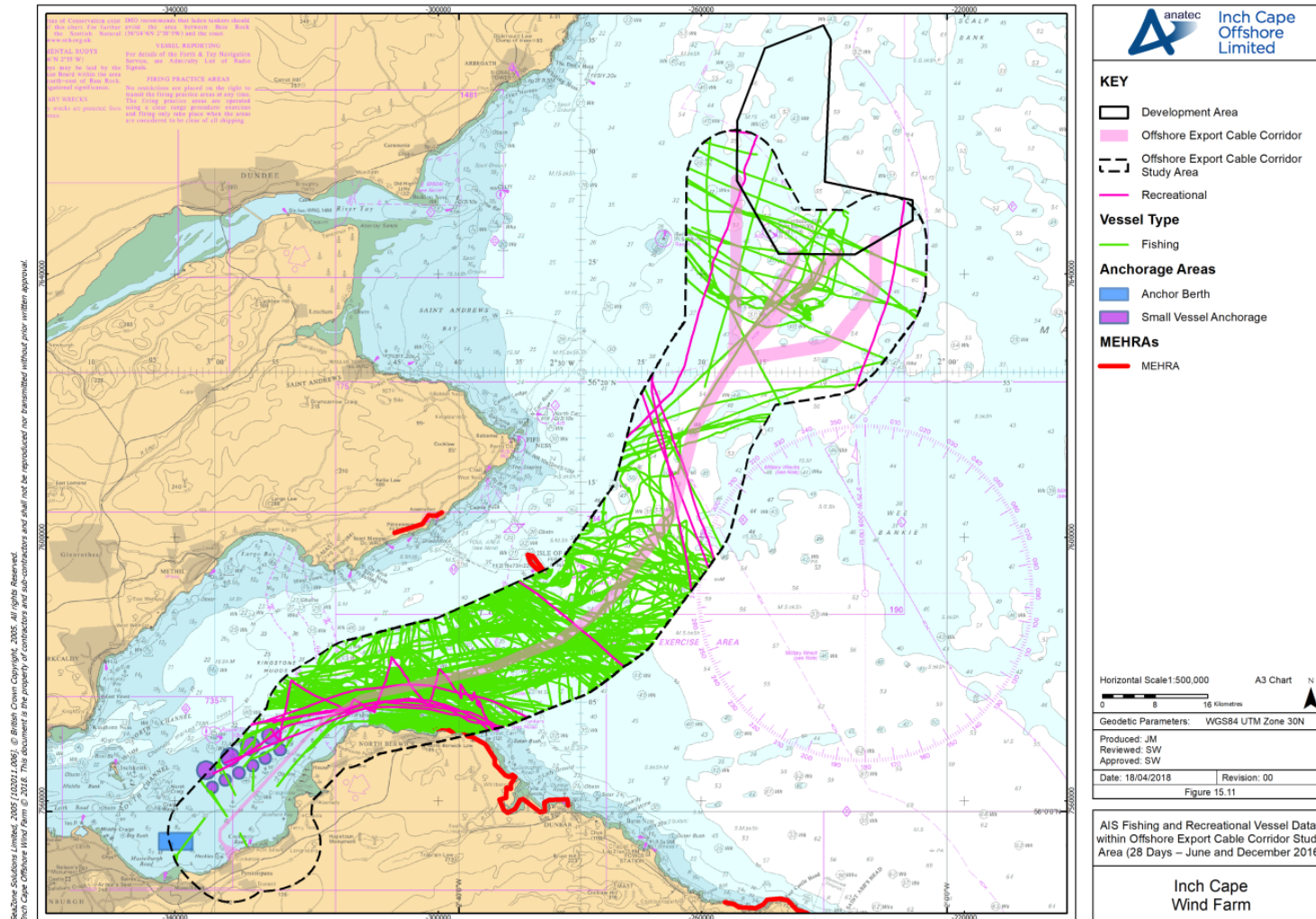


Figure 15.12 Firth of Forth Wind Farms

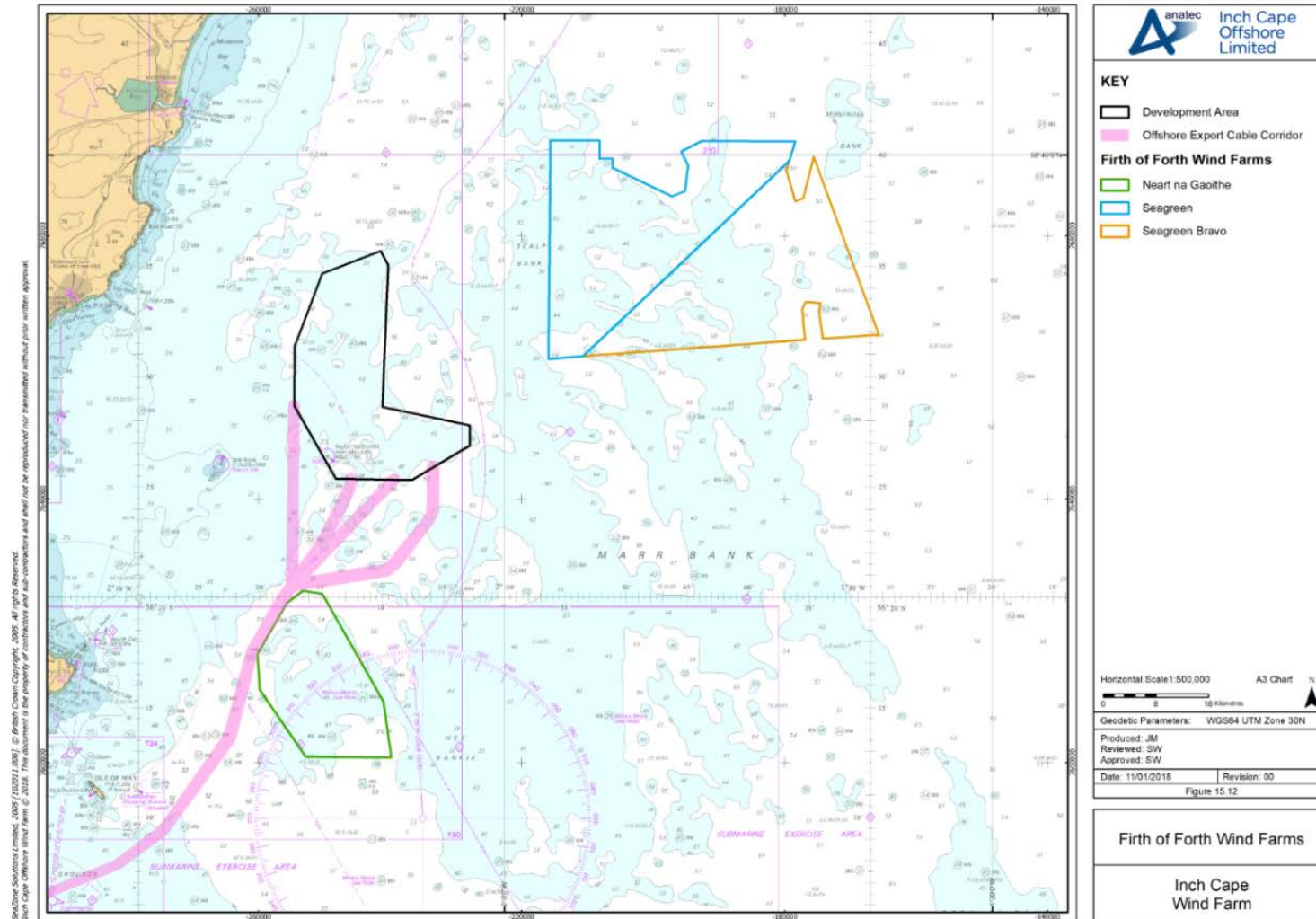


Figure 16.1 Illustration of Economic Study Area

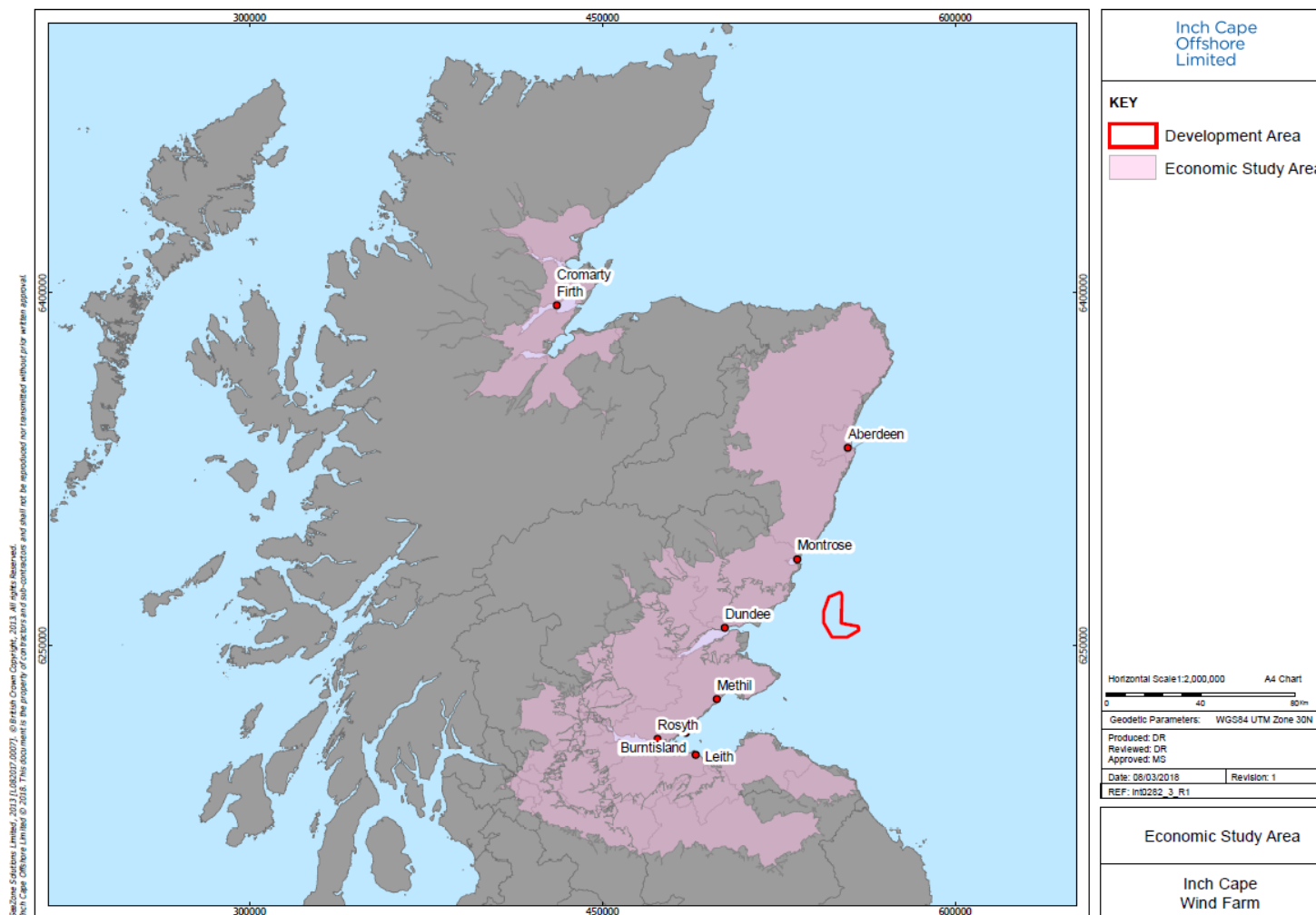


Figure 16.2 Labour market catchment areas

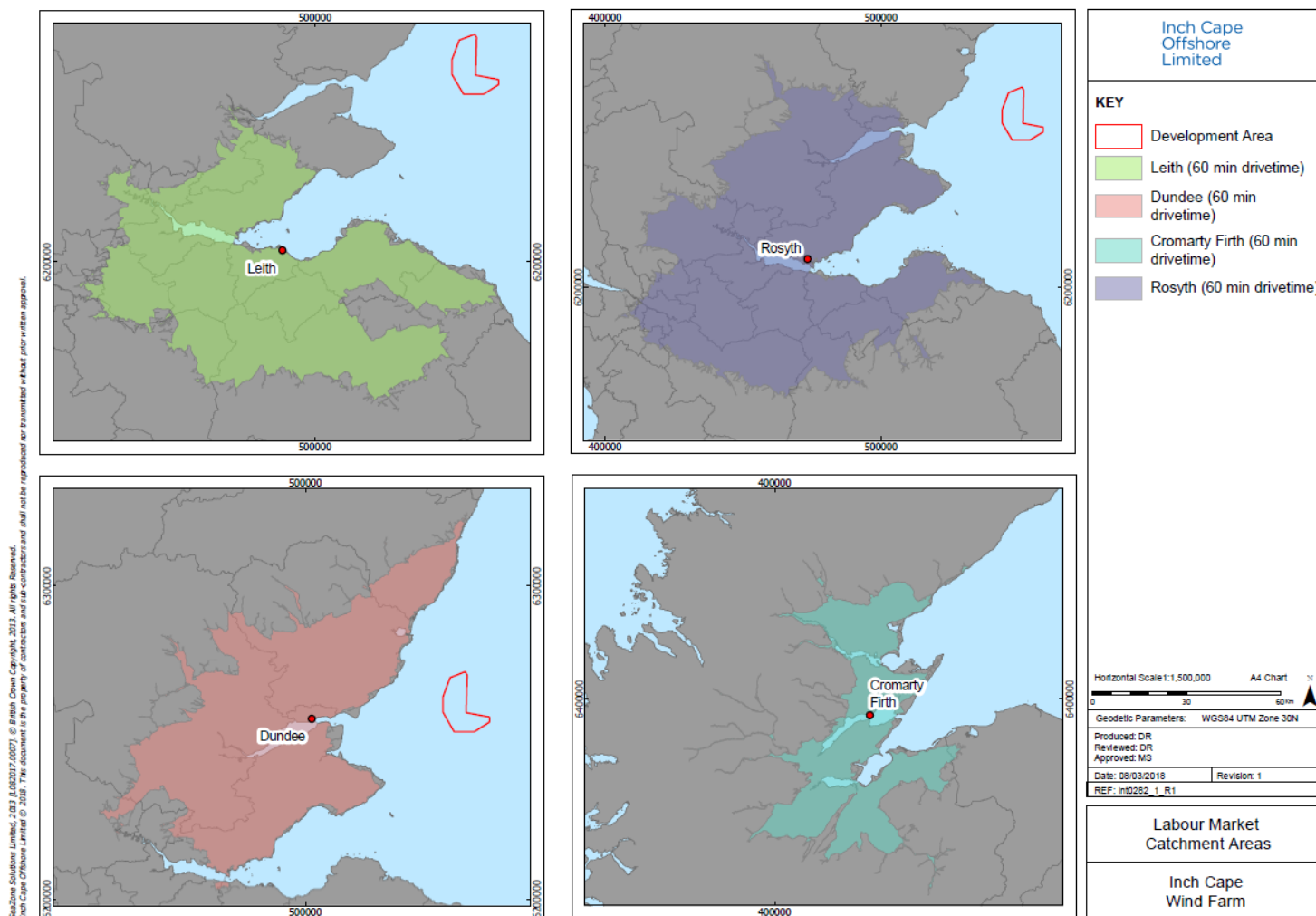


Figure 16.3 Labour market catchment areas

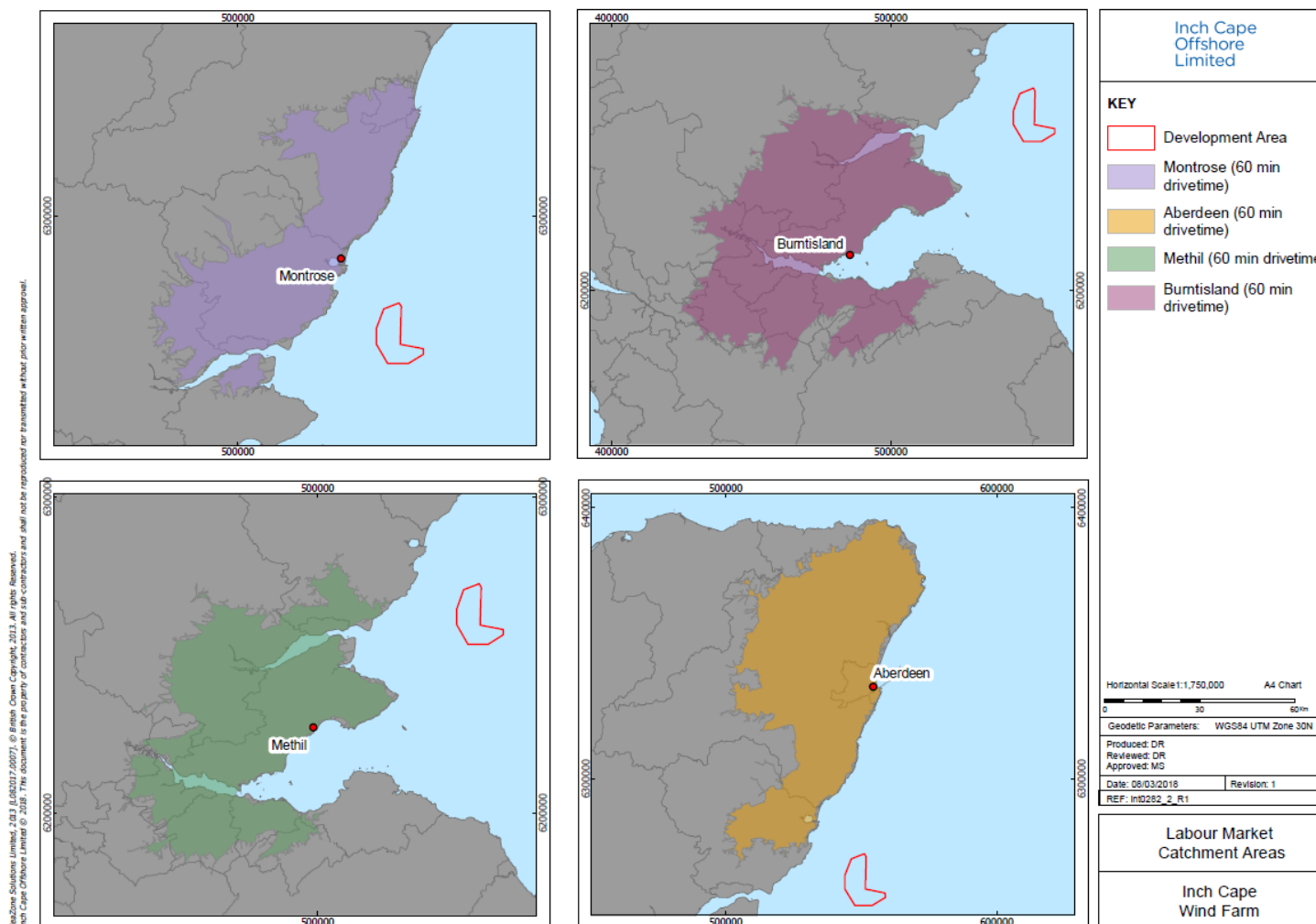


Figure 17.1 Position of Airway P18 relative to Development Area © Reproduced by permission of the CAA, NATS and OS 2018

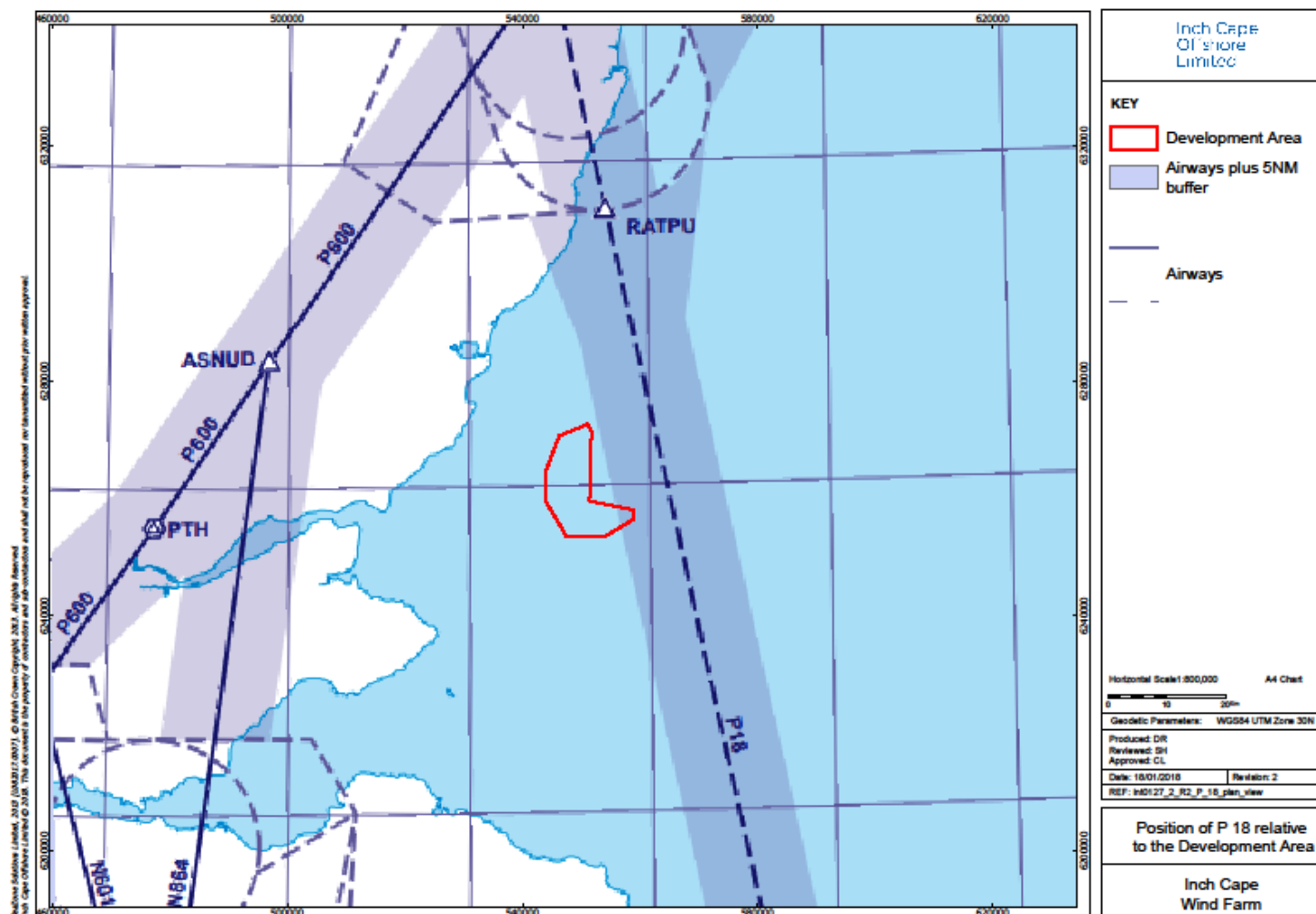


Figure 17.2 Position of UP18 and UP59 relative to the Development Area © Reproduced by permission of the CAA, NATS and OS 2018

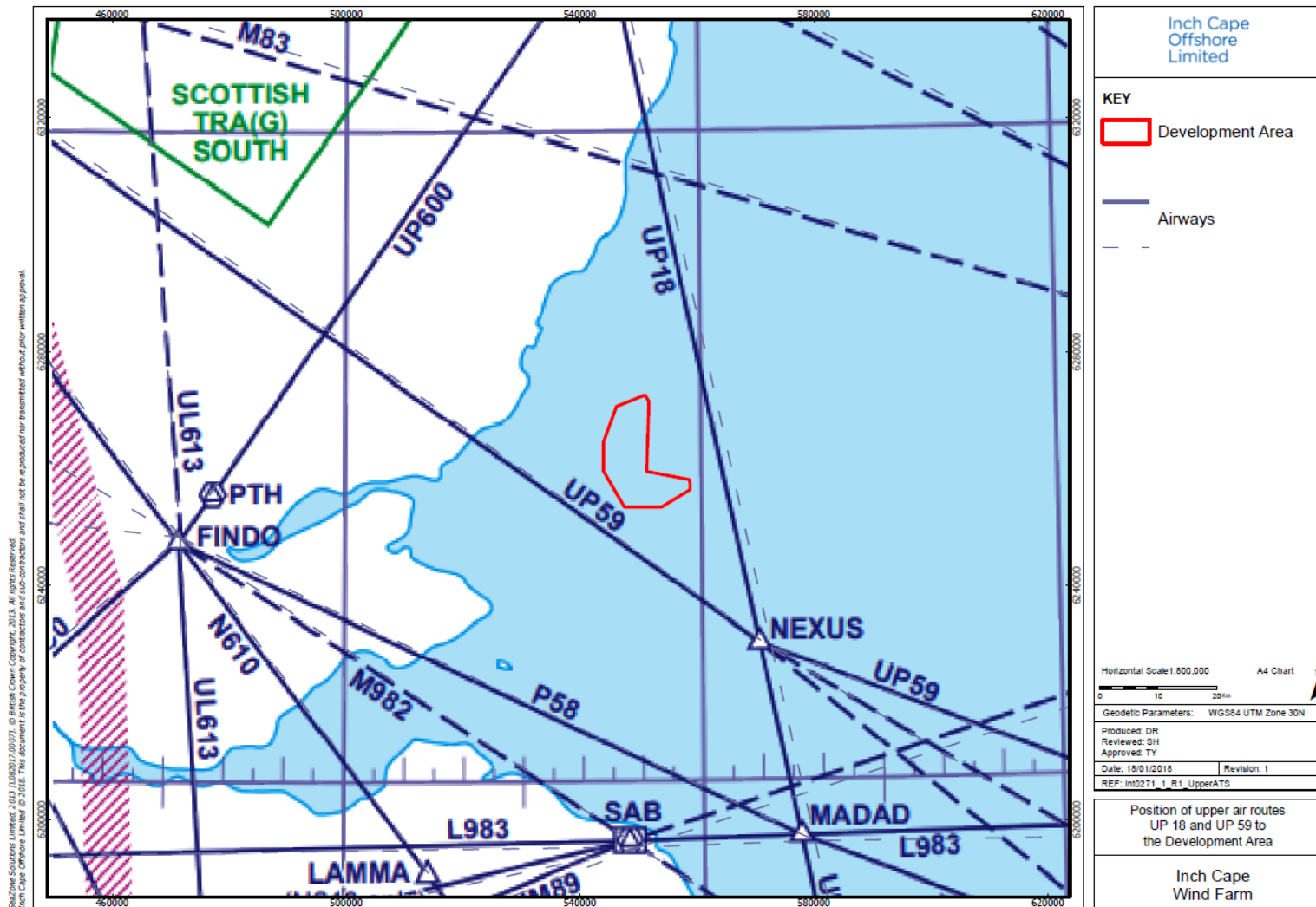
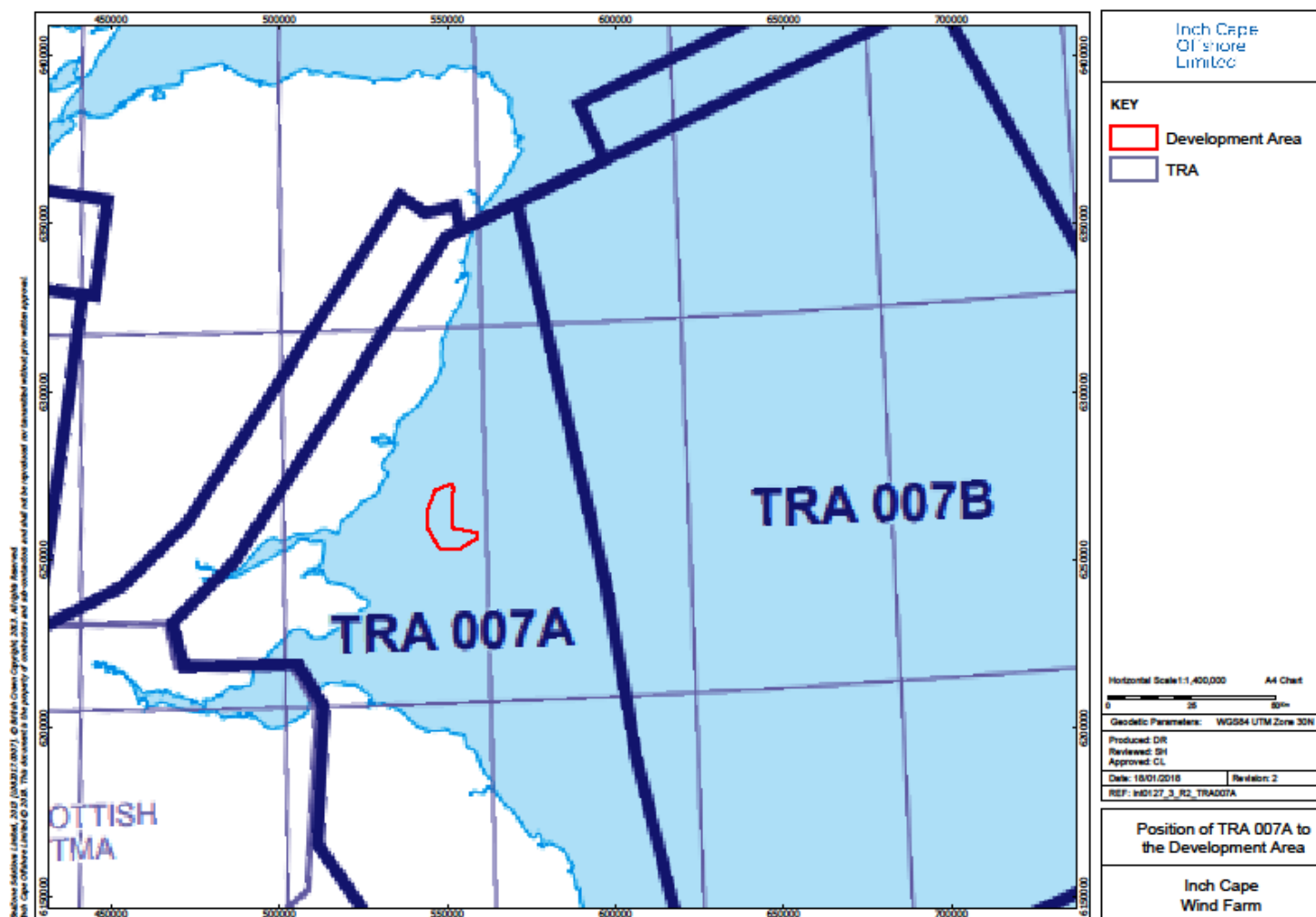


Figure 17.3 Position of TRA 007A relative to the Development Area © Reproduced by permission of the CAA, NATS and OS 2018



NO FIGURES WERE PRESENTED IN CHAPTER 18