

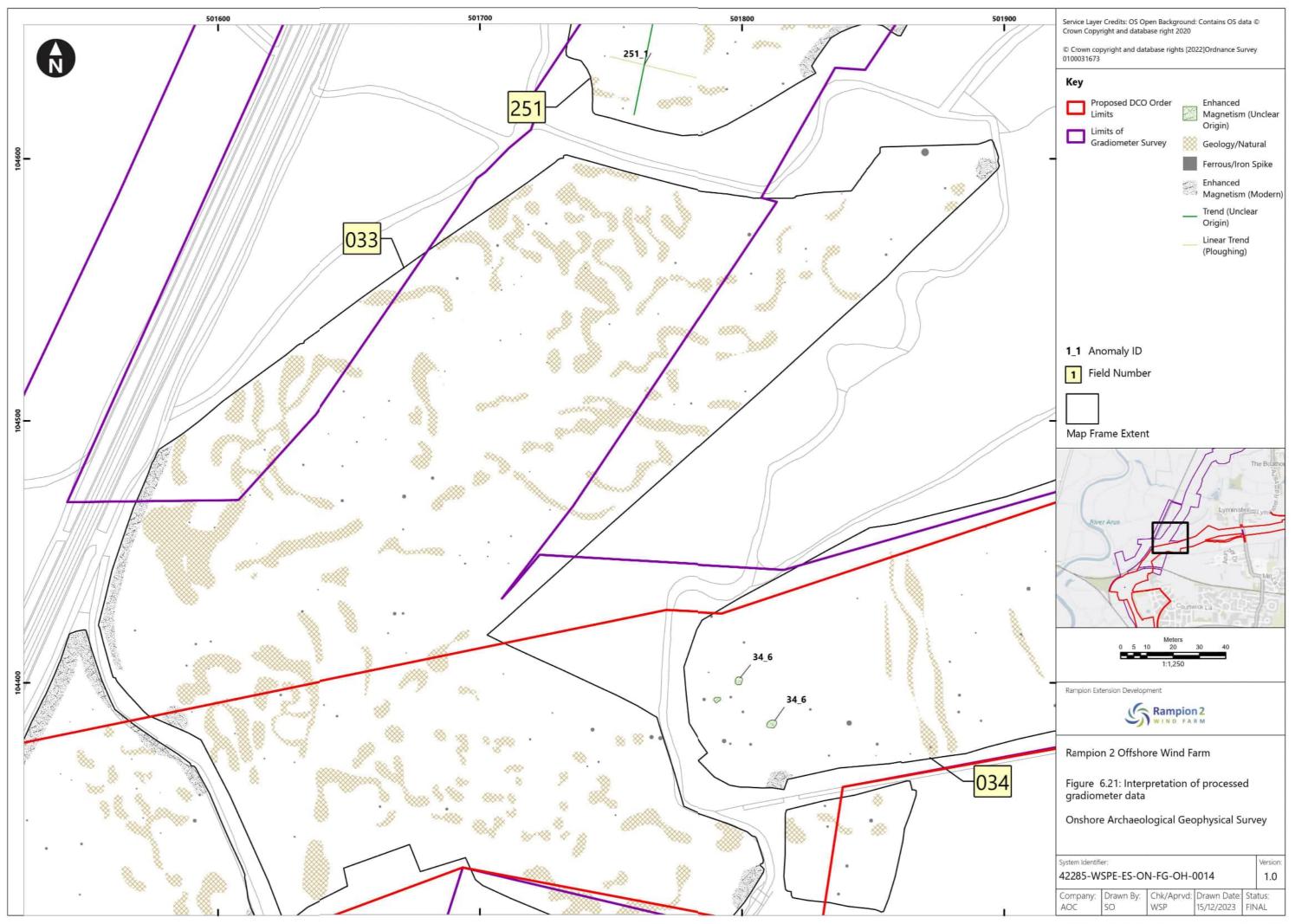
Rampion 2 Wind Farm Category 6: Environmental Statement Volume 4, Appendix 25.4: Onshore geophysical survey report (Part 8 of 8) (clean) Date: January 2024 Revision B

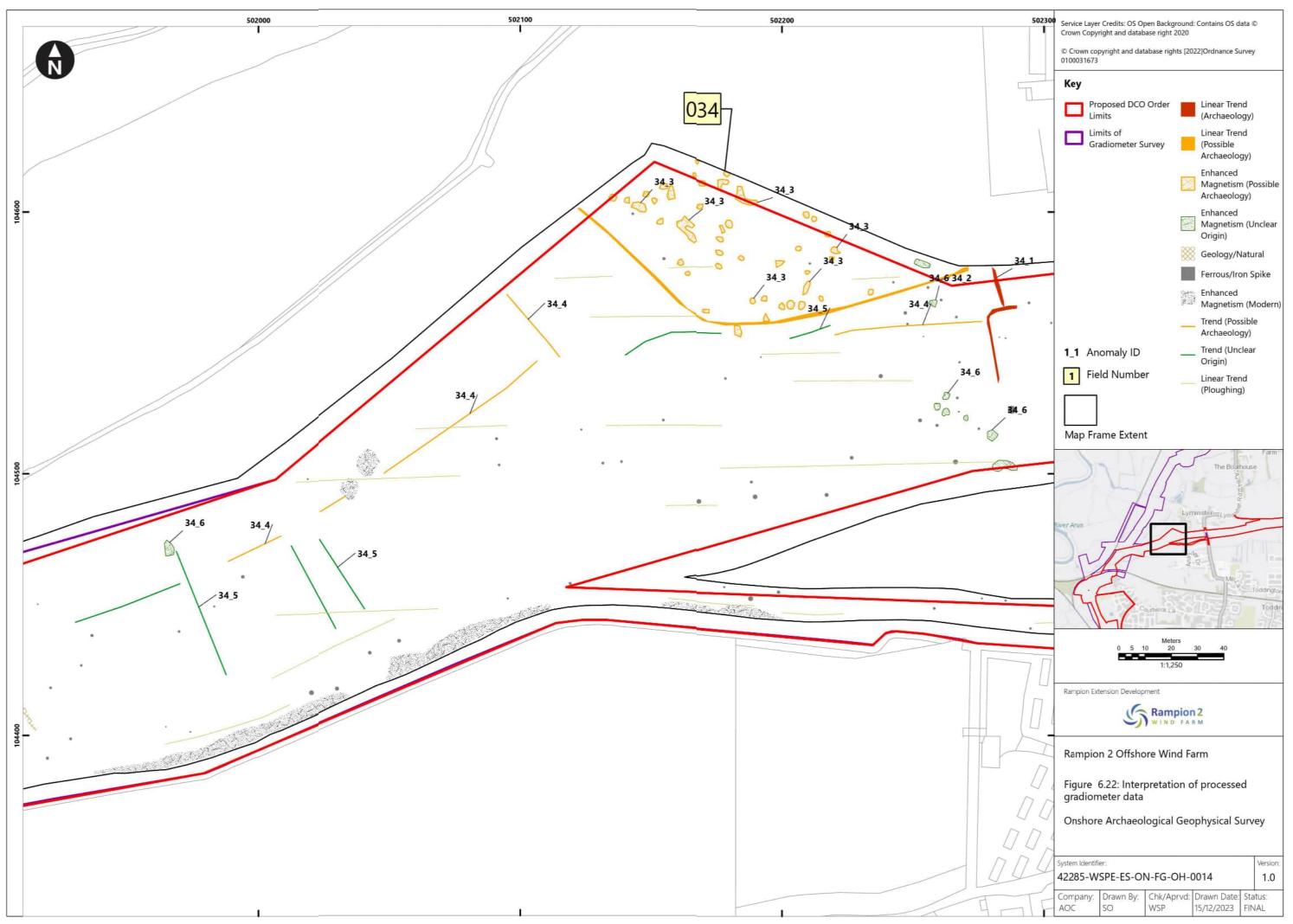
Document Reference: 6.4.25.4 Pursuant to: APFP Regulation 5 (2) (a) Ecodoc number: 004866585-02

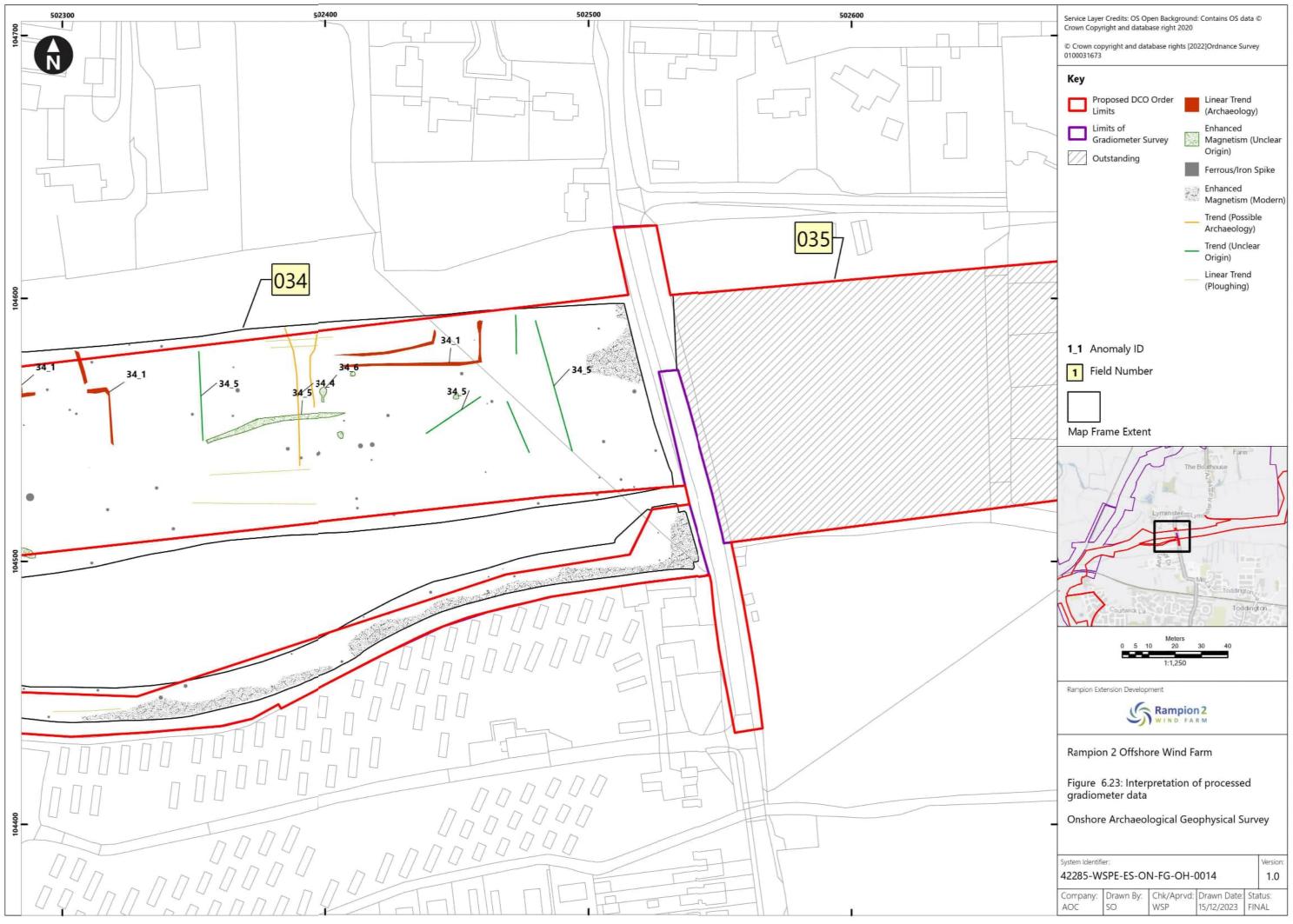


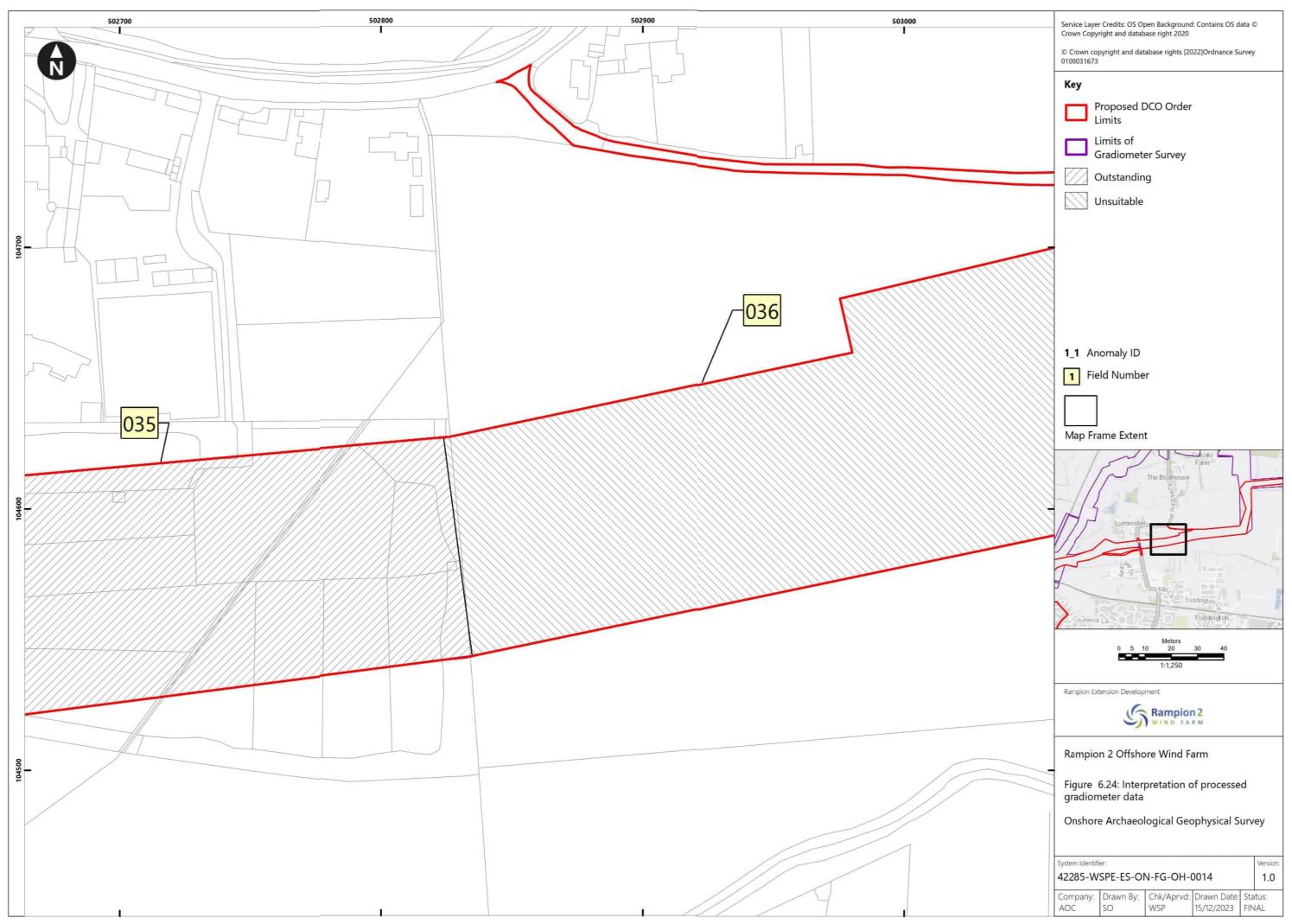
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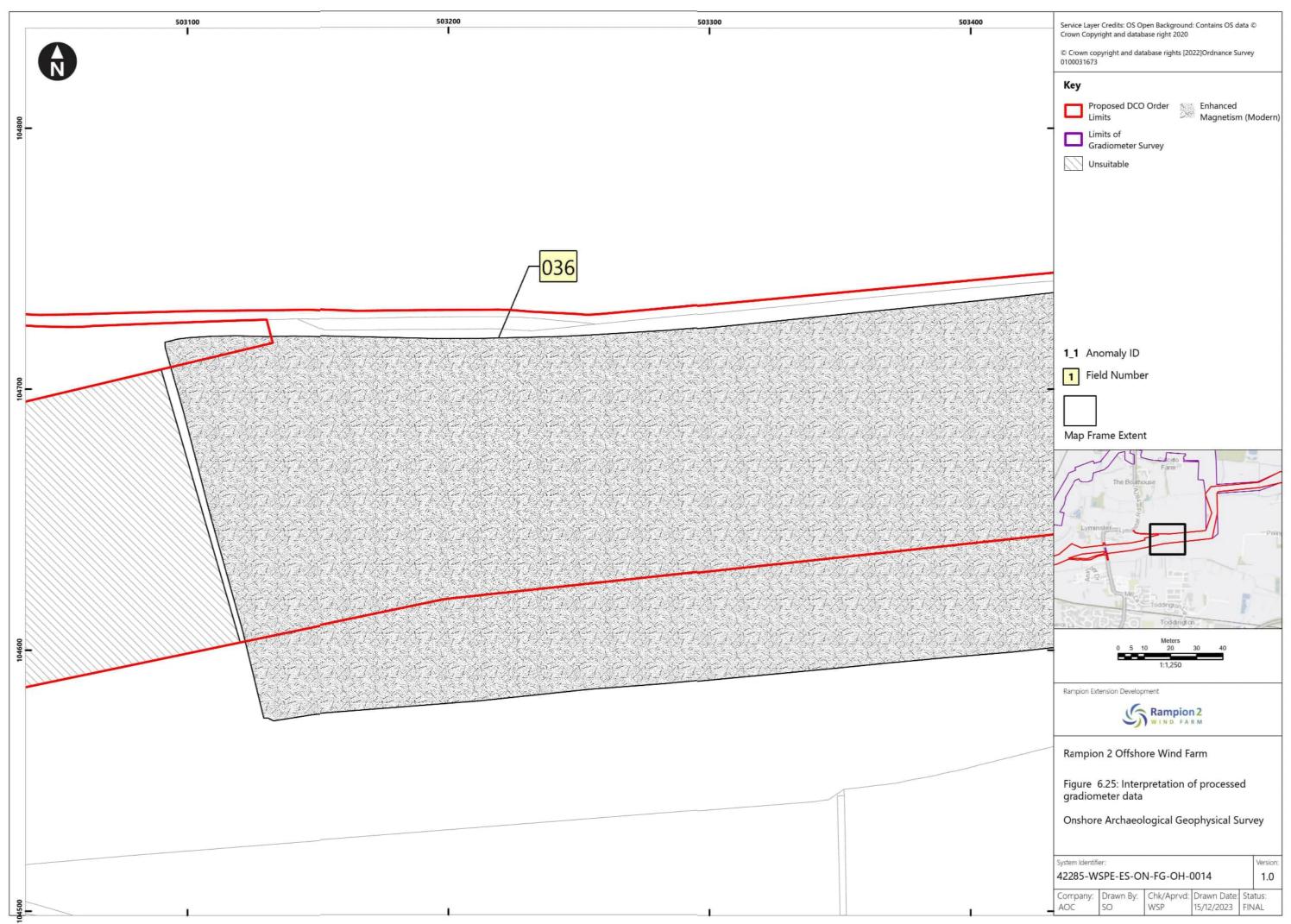
Revision	Date	Status/reason for issue	Author	Checked by	Approved by
Α	04/08/2023	Final for DCO Application	WSP	RED	RED
В	16/01/2024	Updated report and figures with additional geophysical survey results undertaken subsequent to DCO Application.	WSP	RED	RED



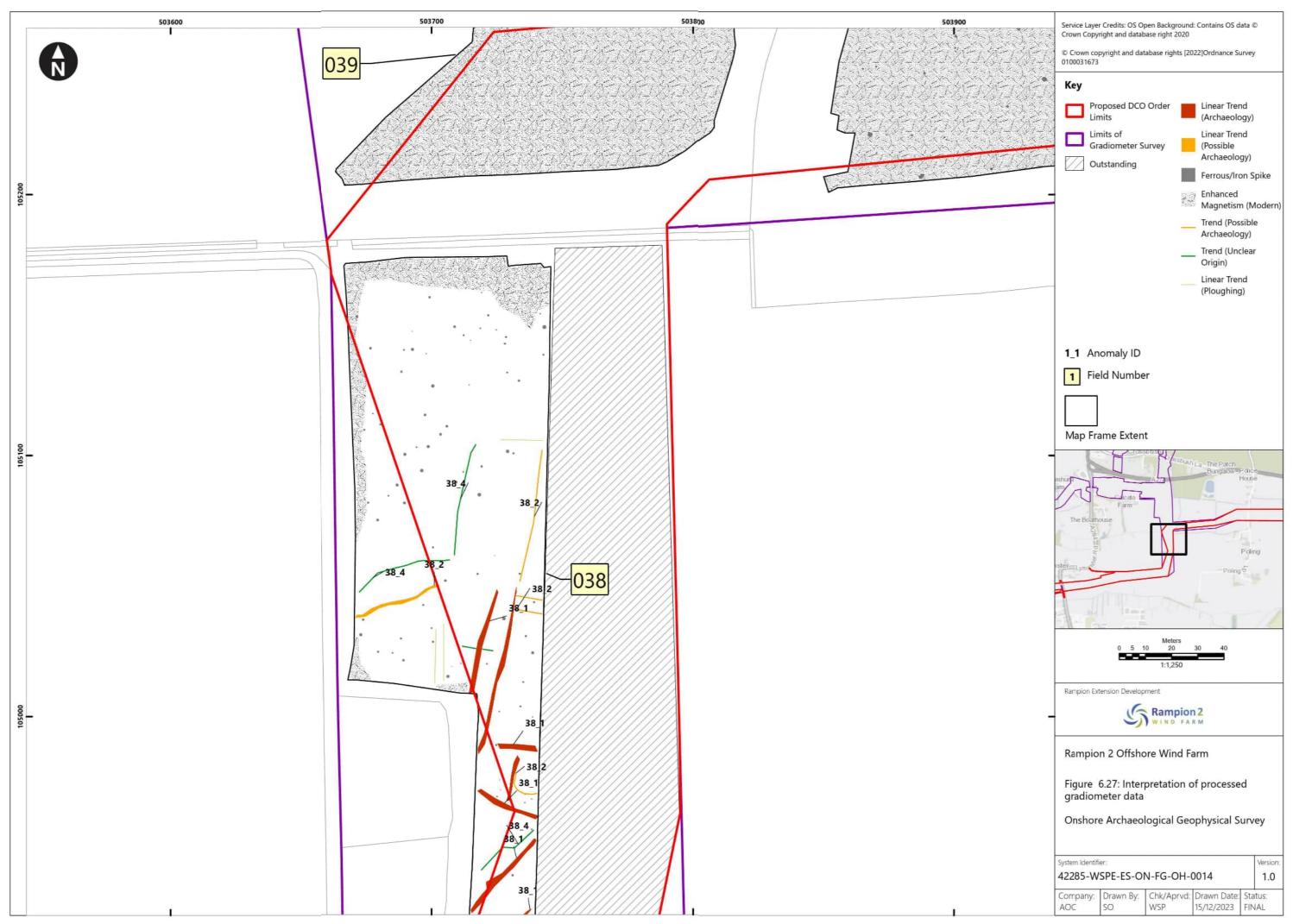




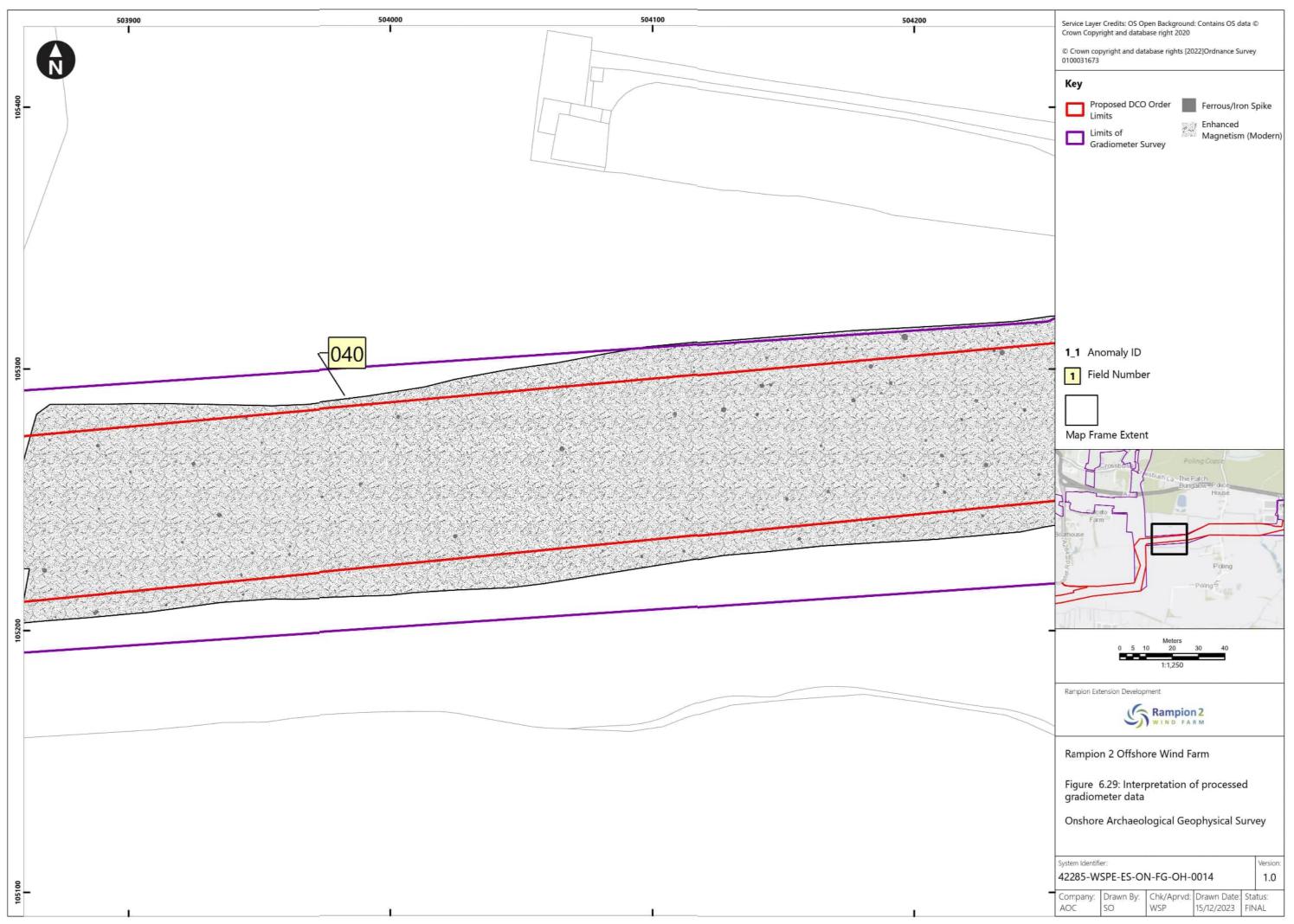


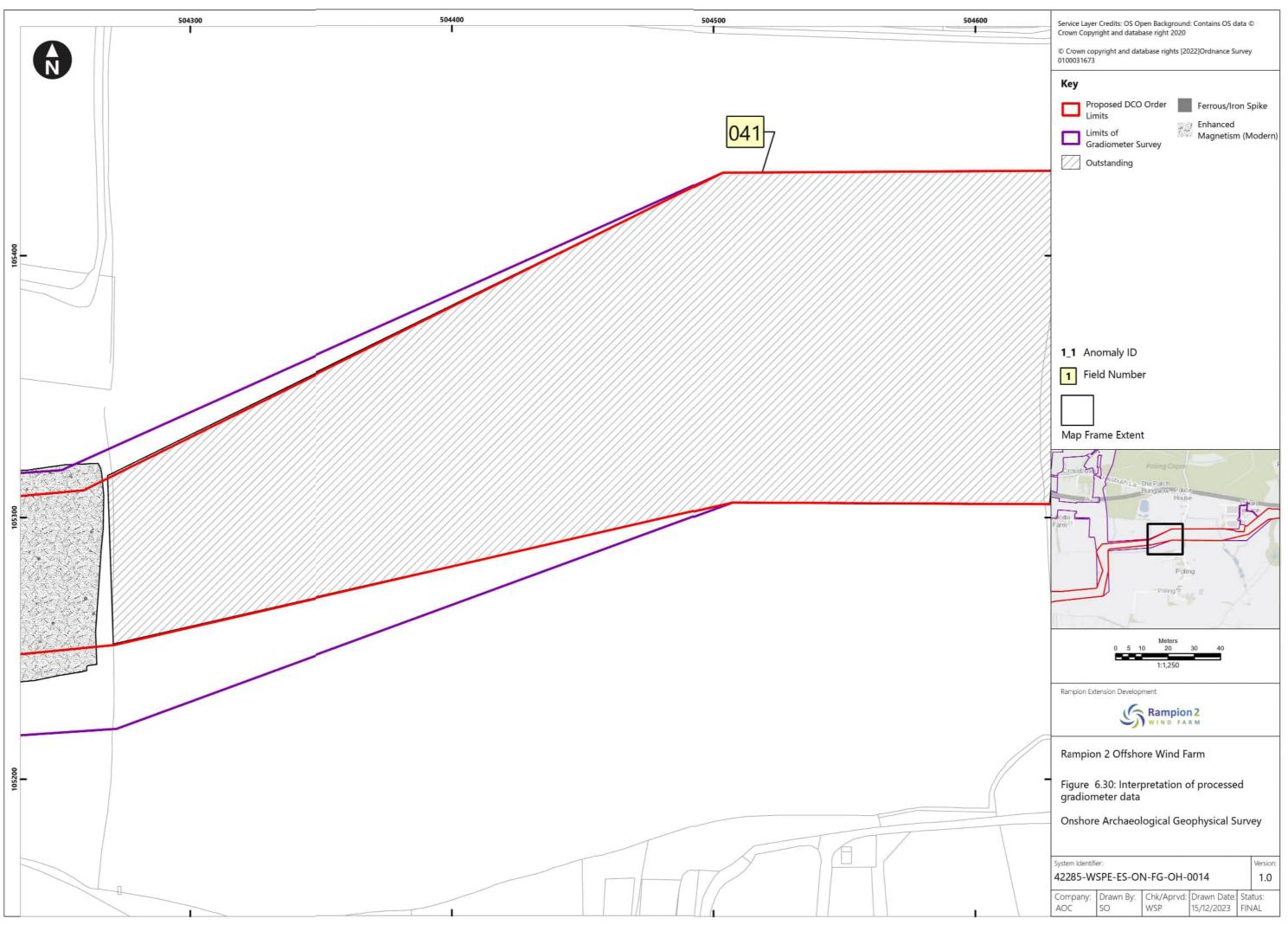


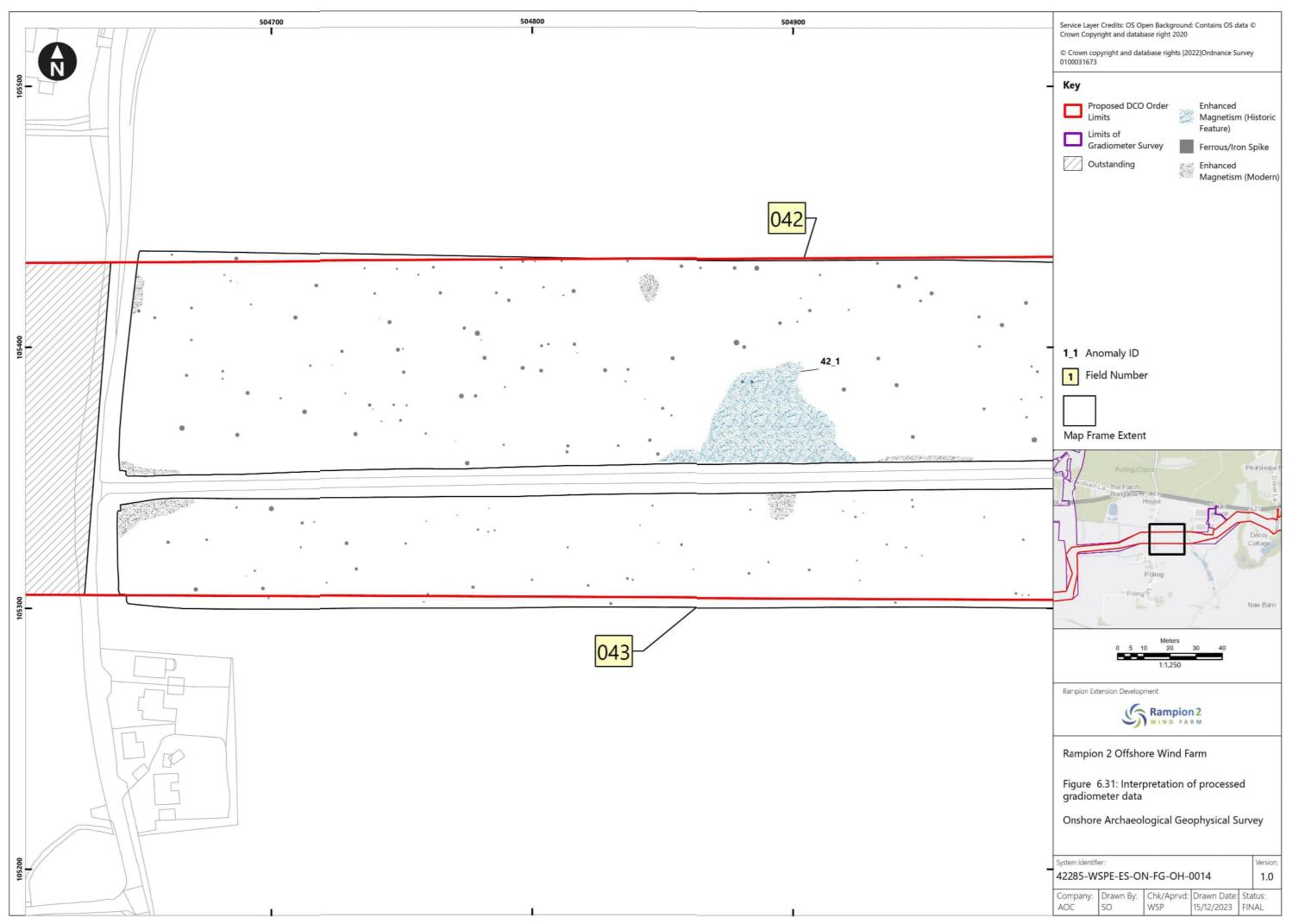


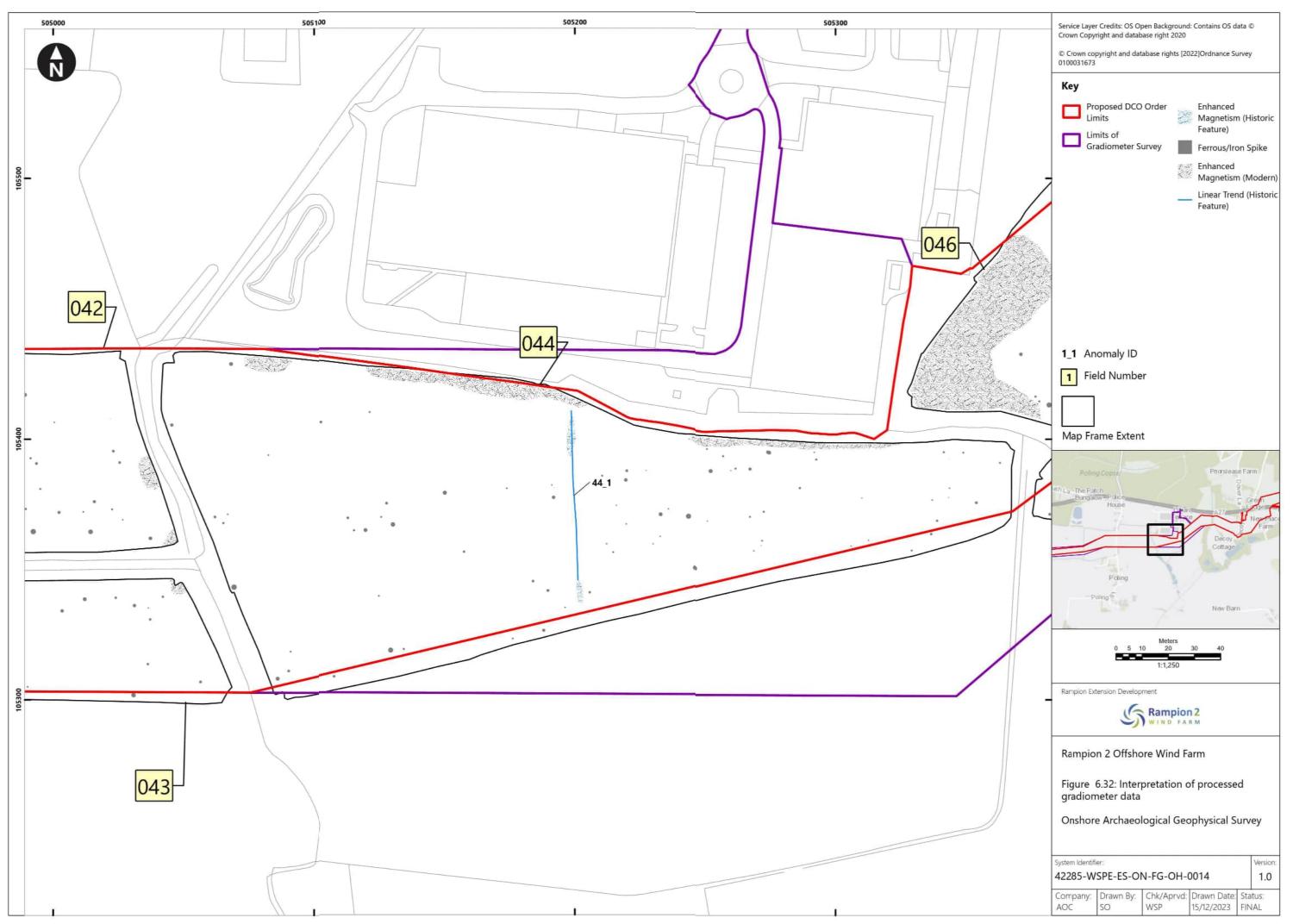


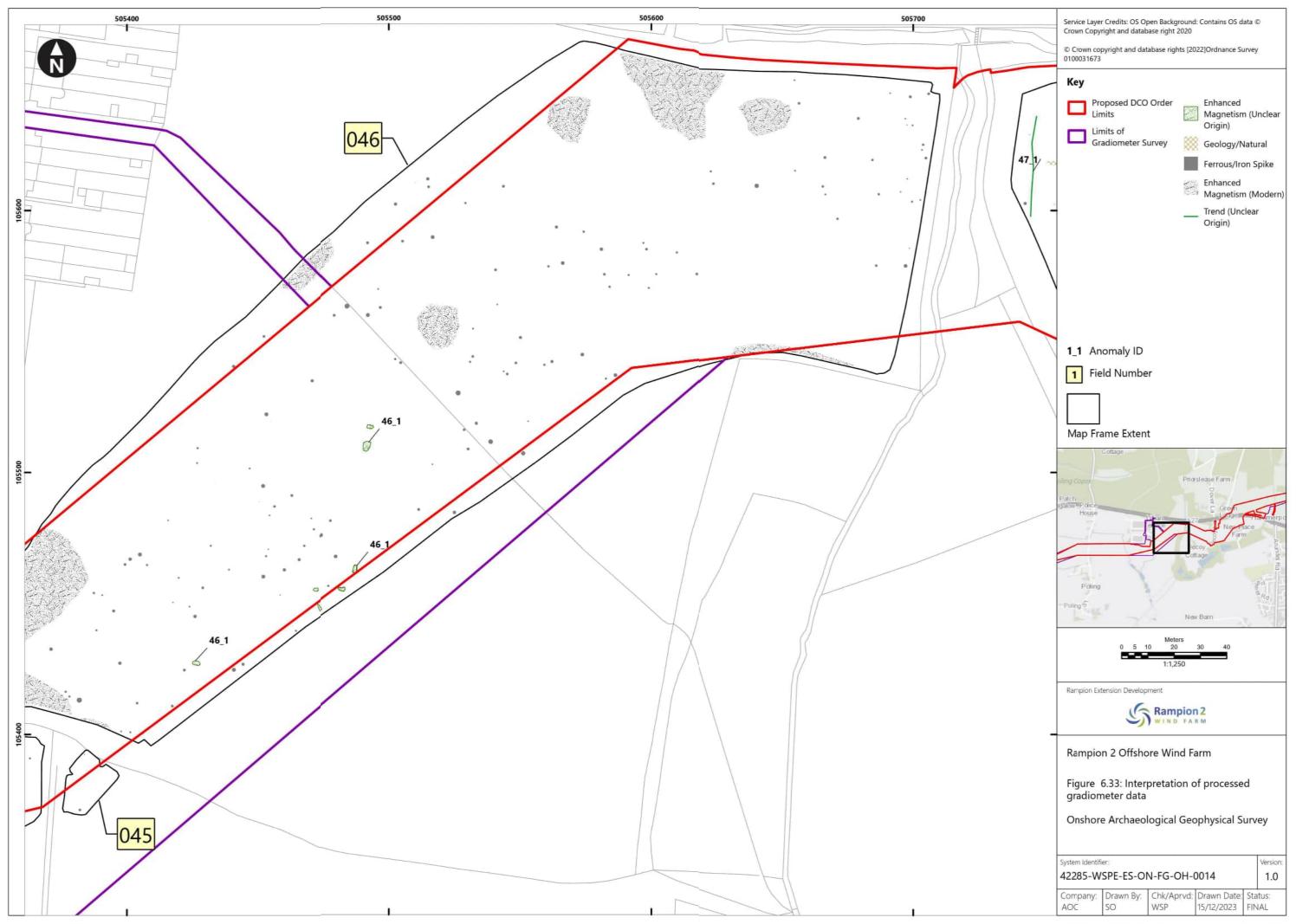


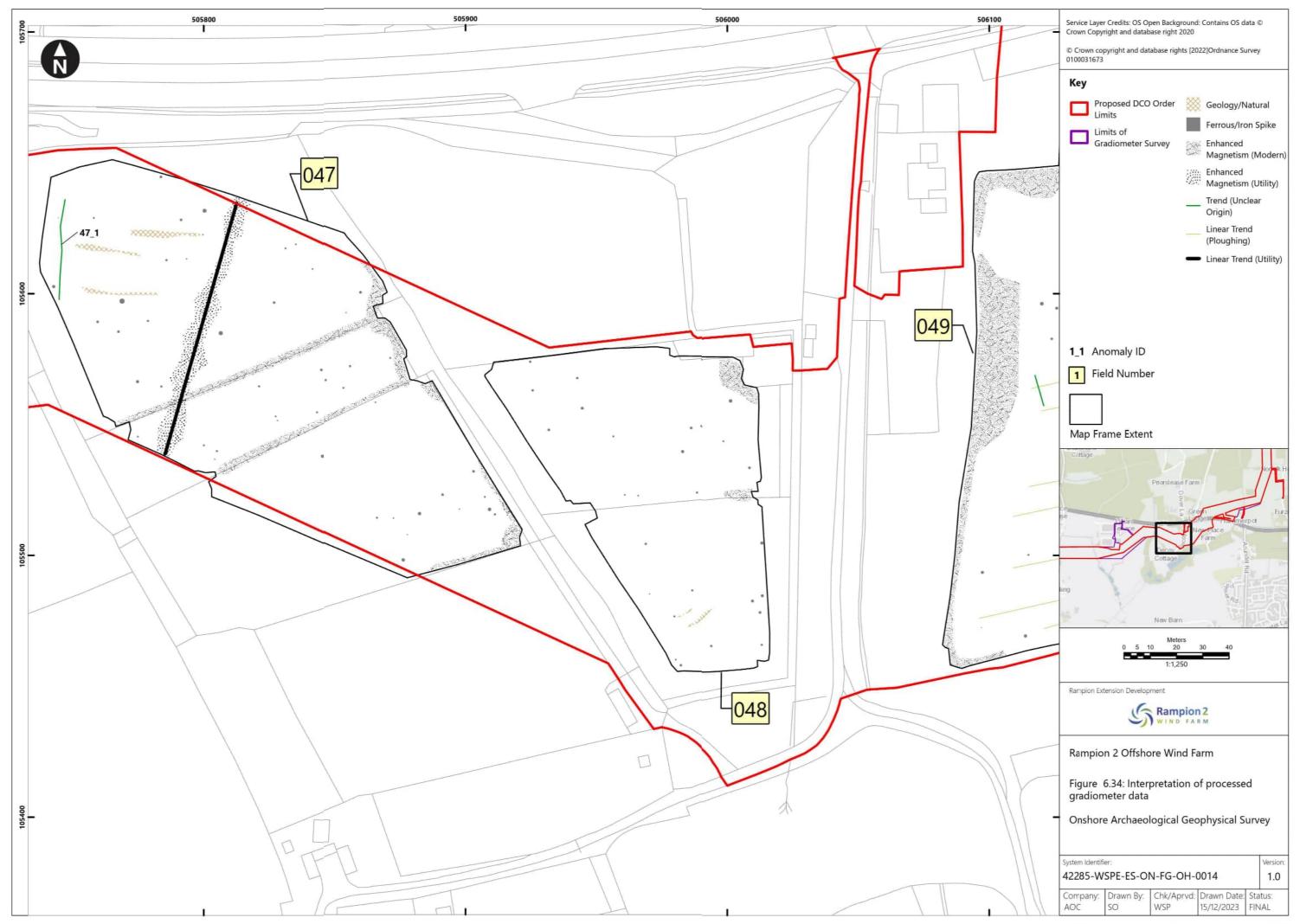


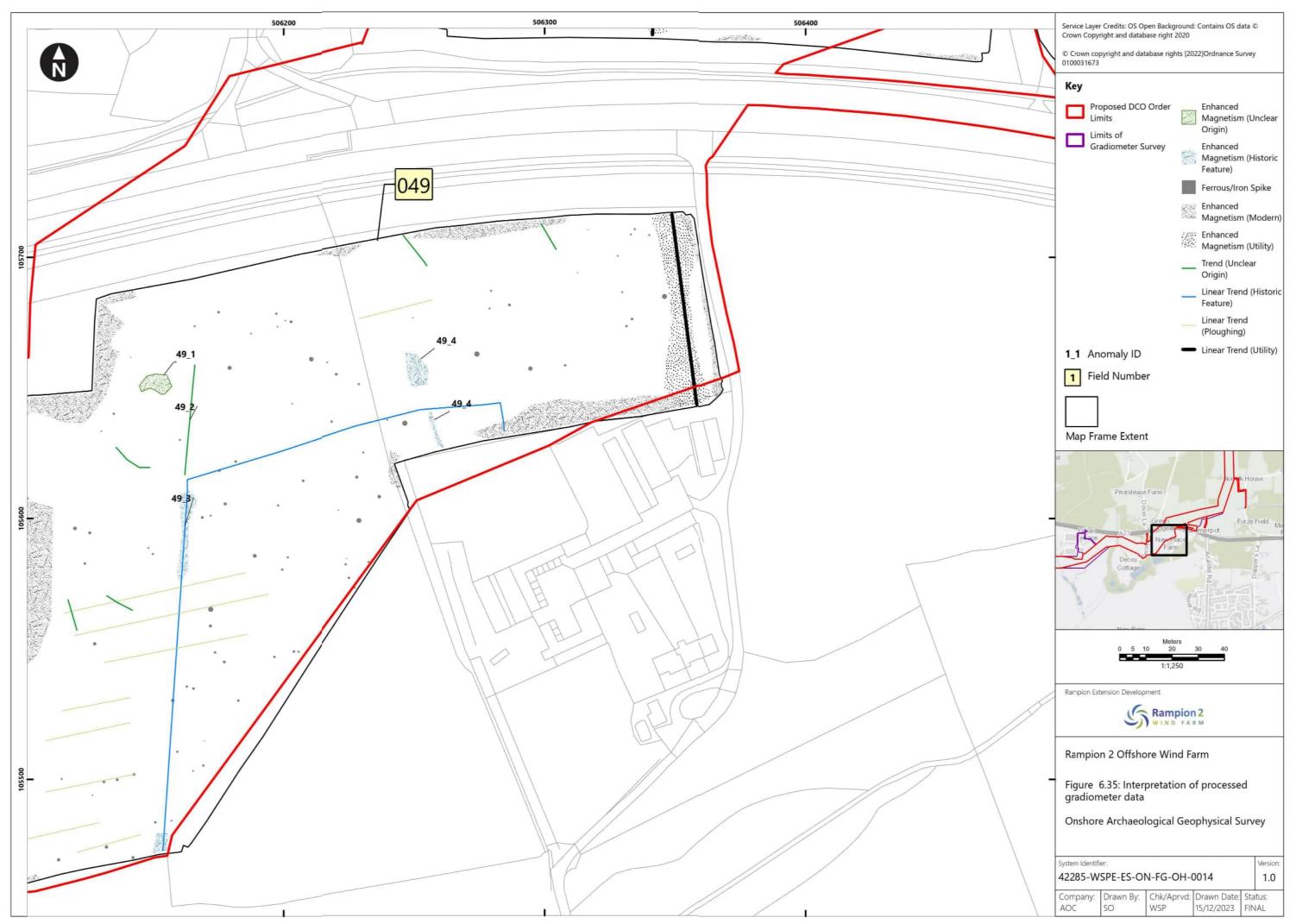


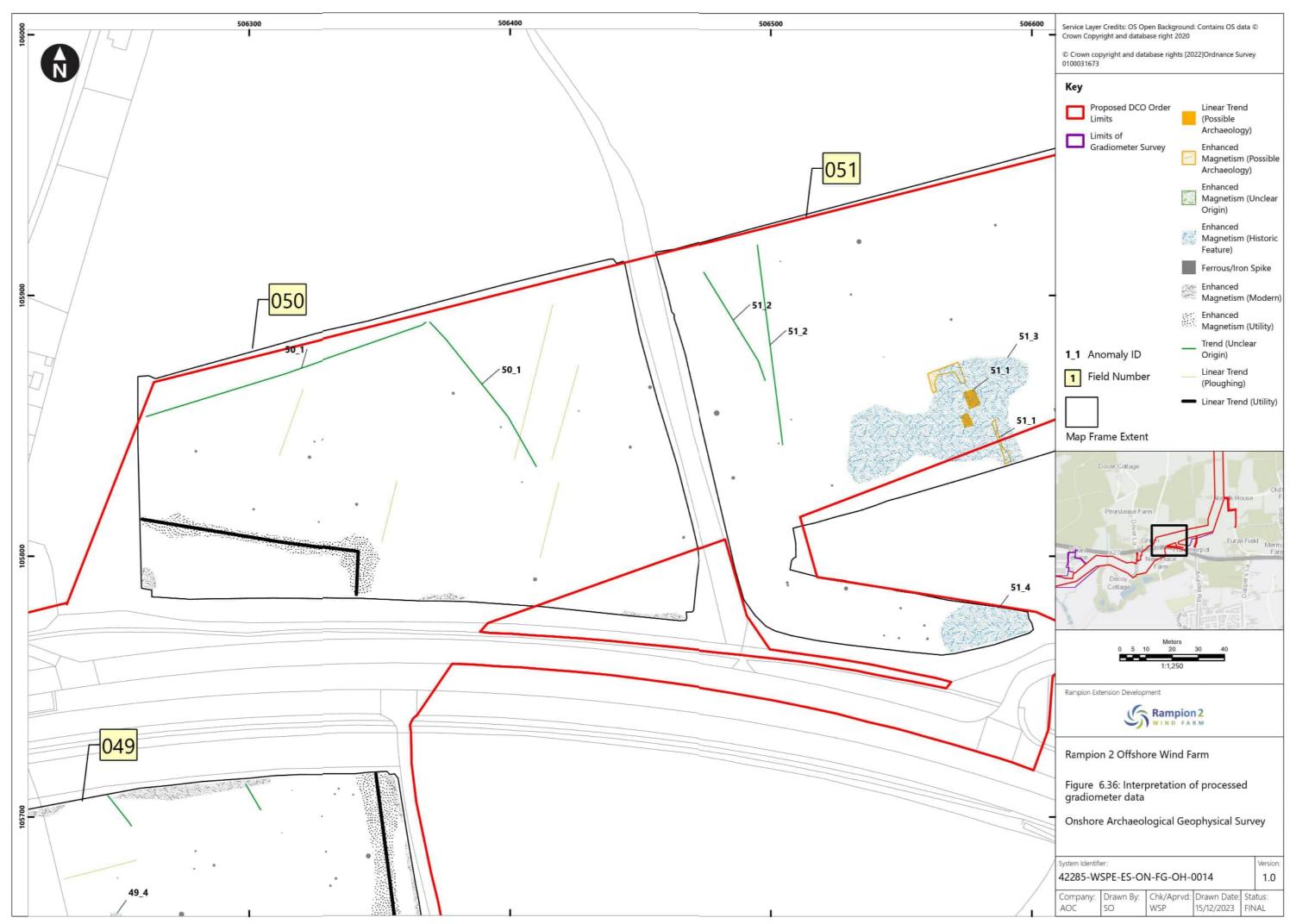


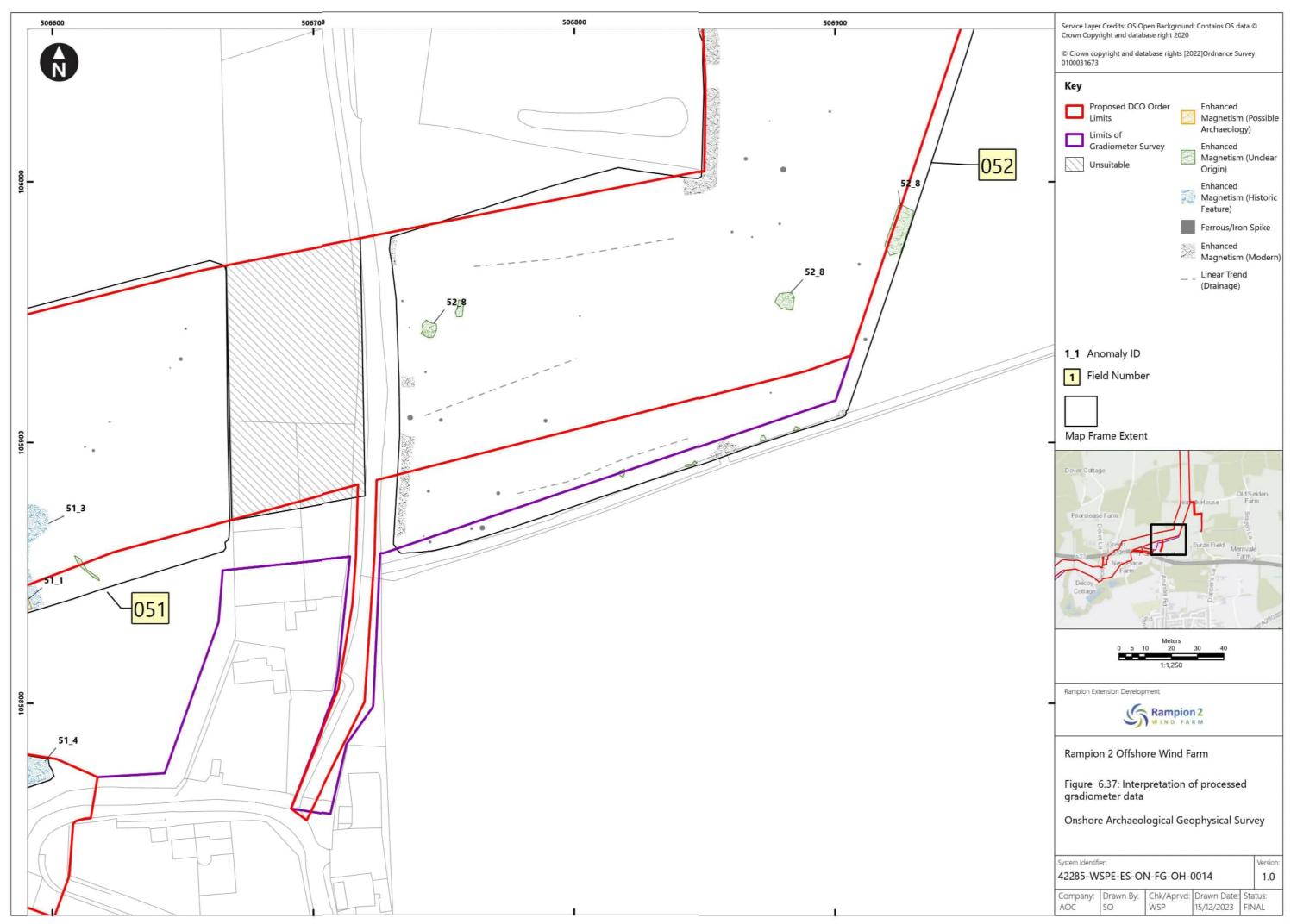


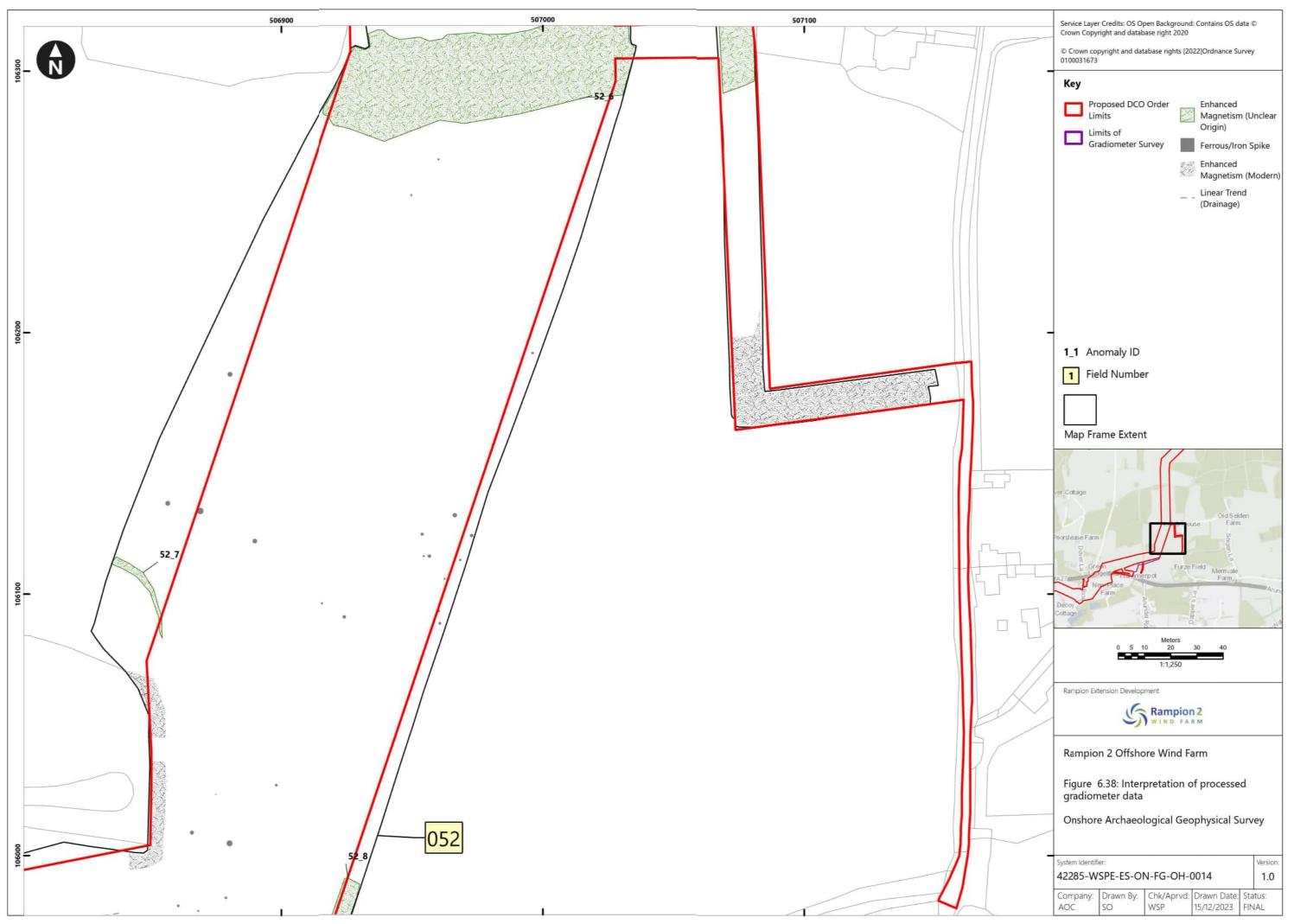




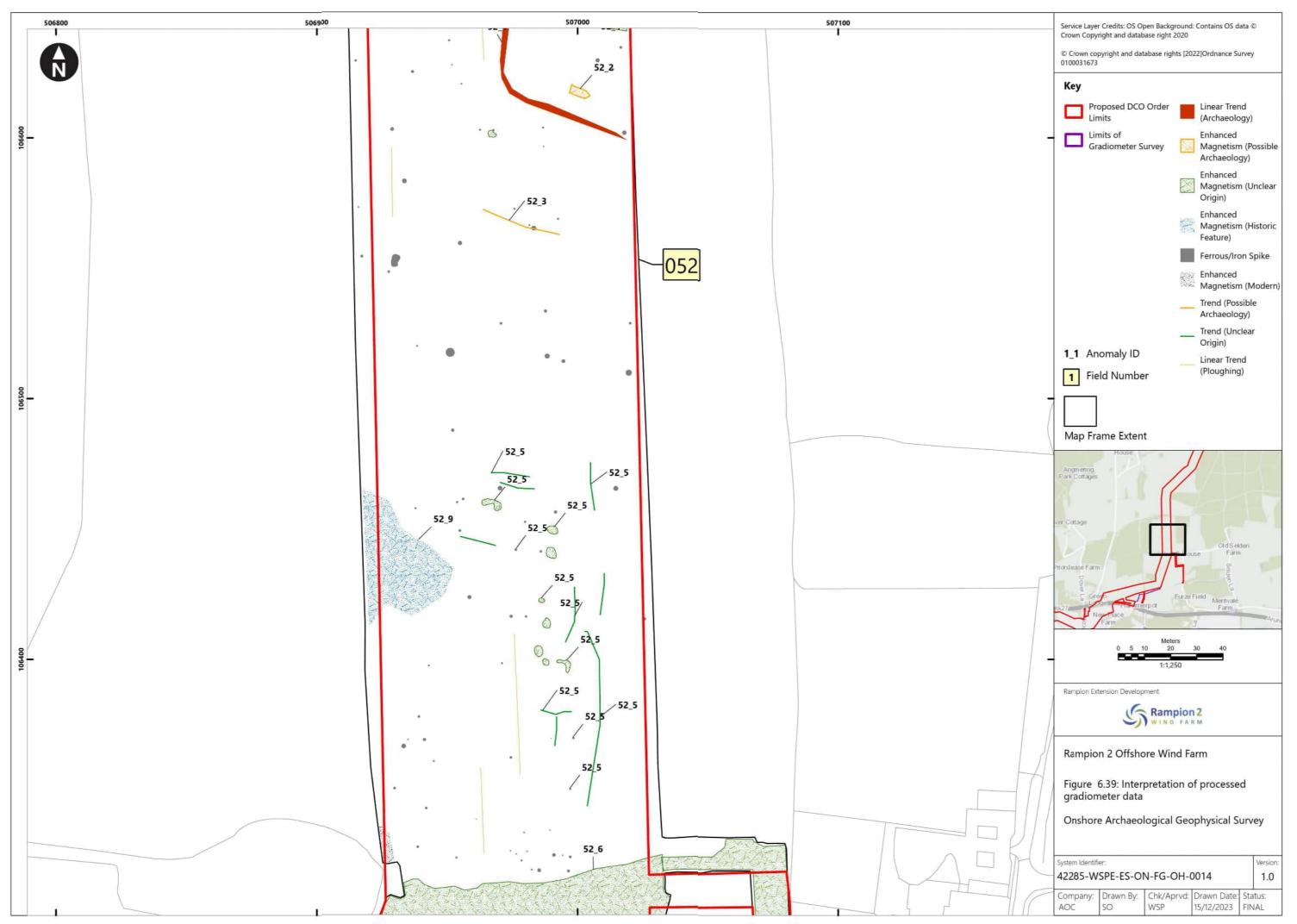




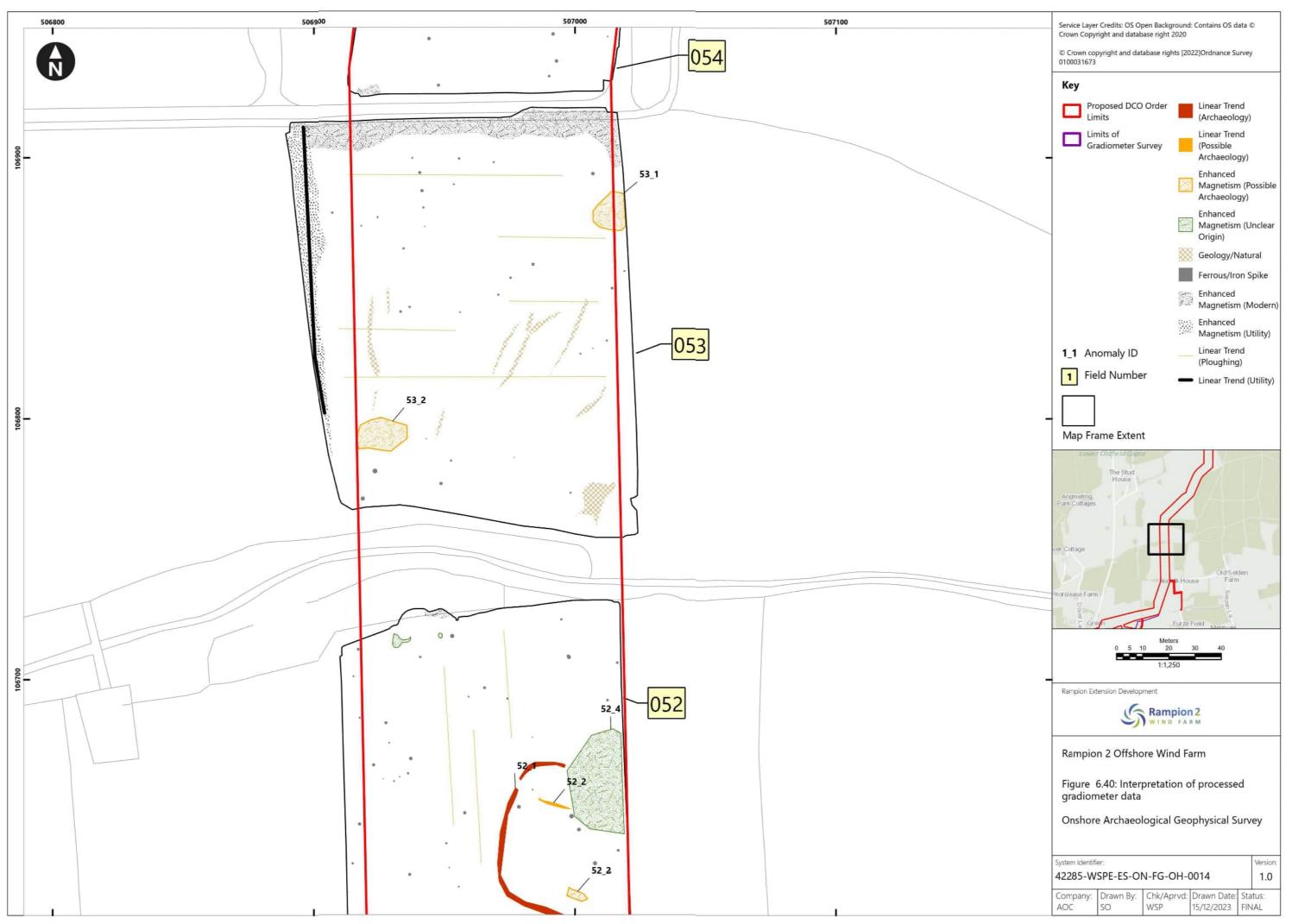


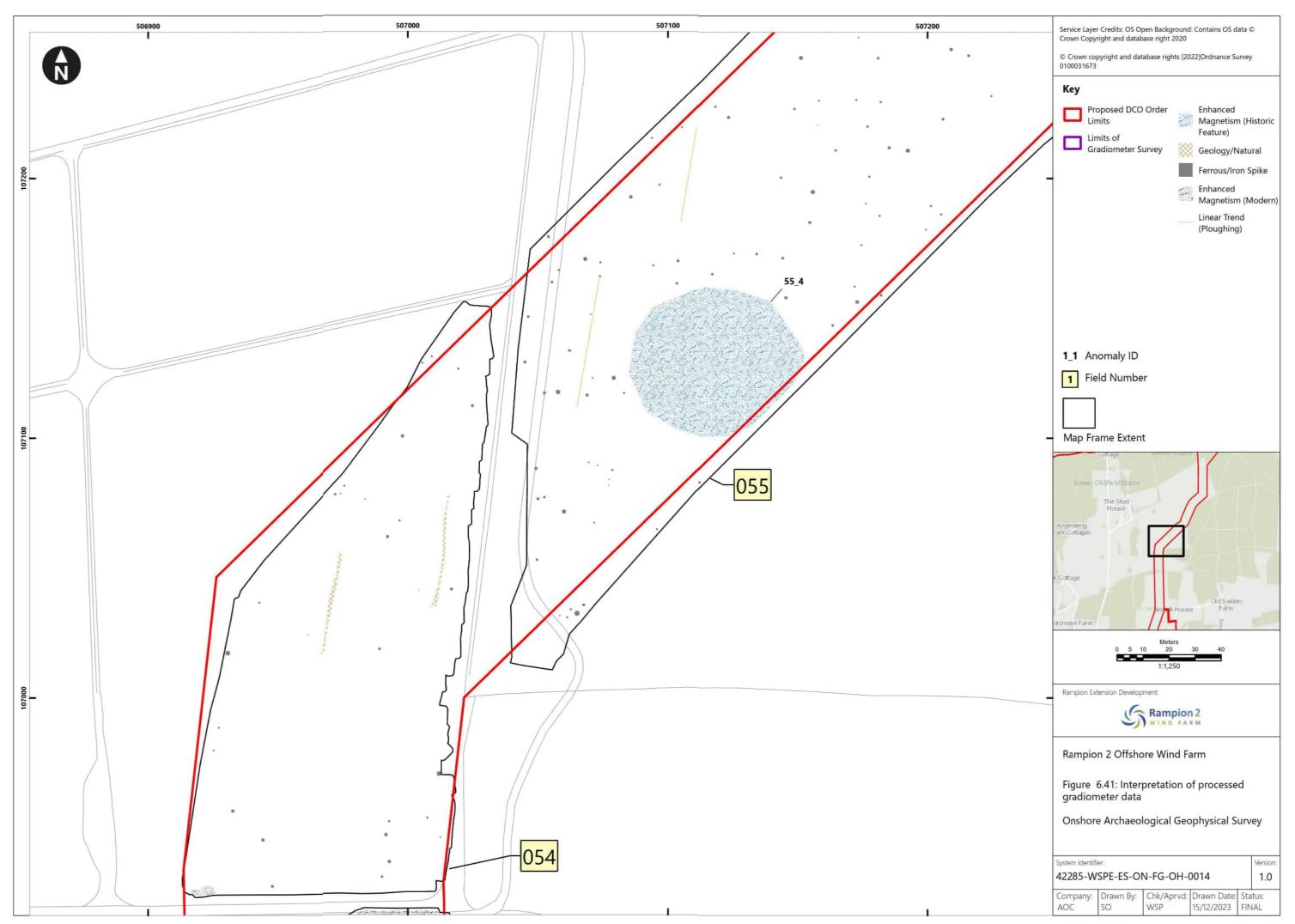


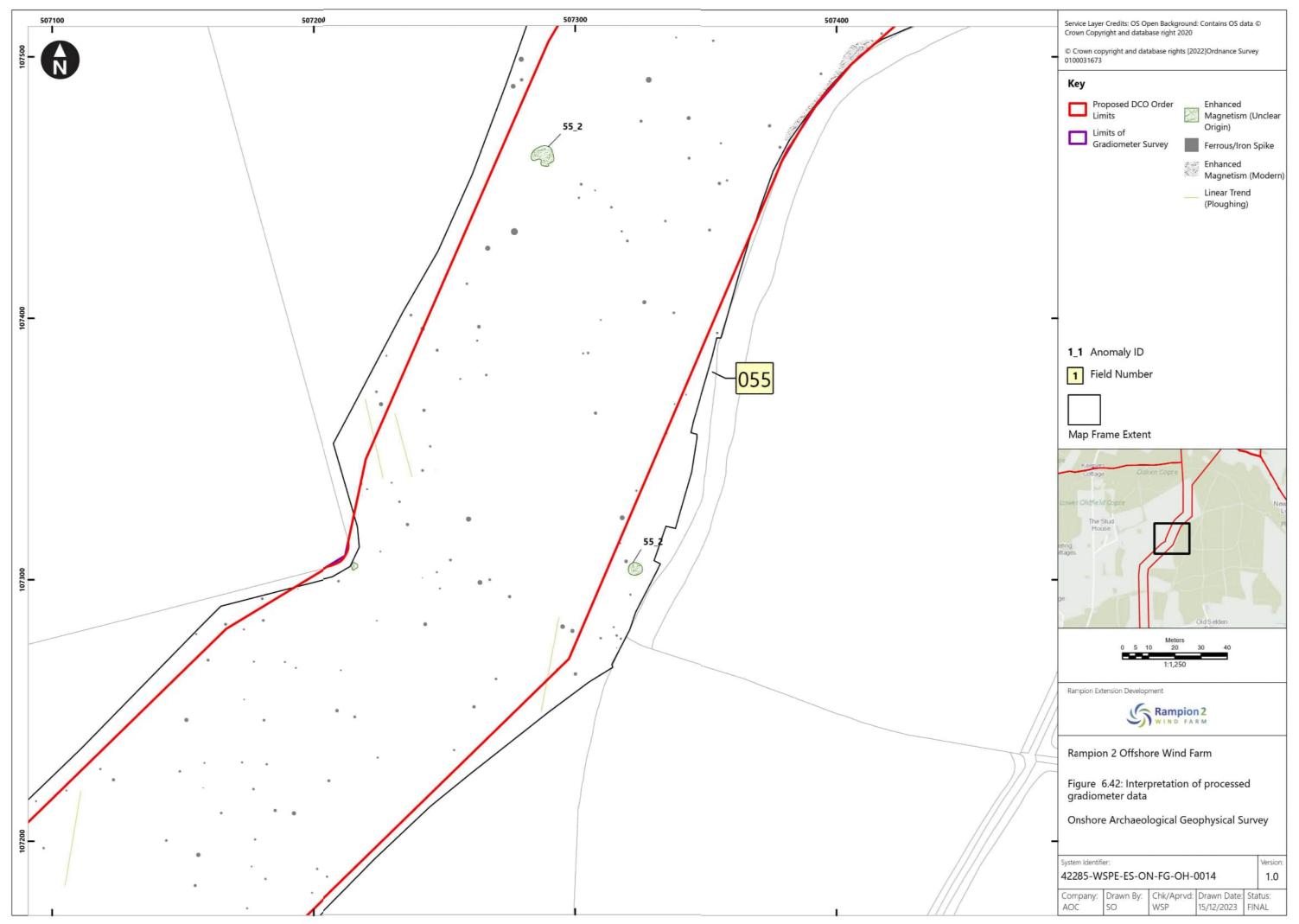
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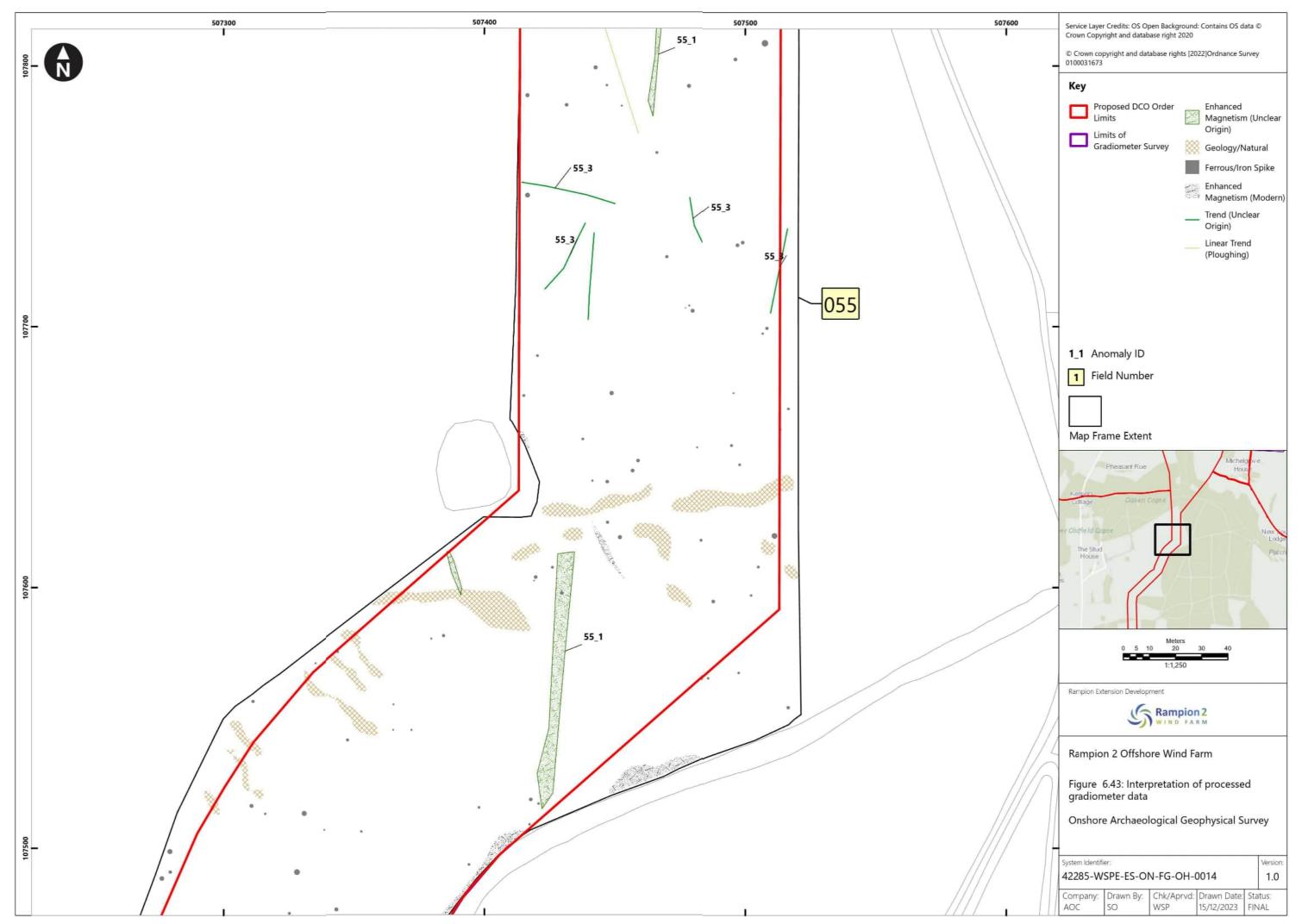


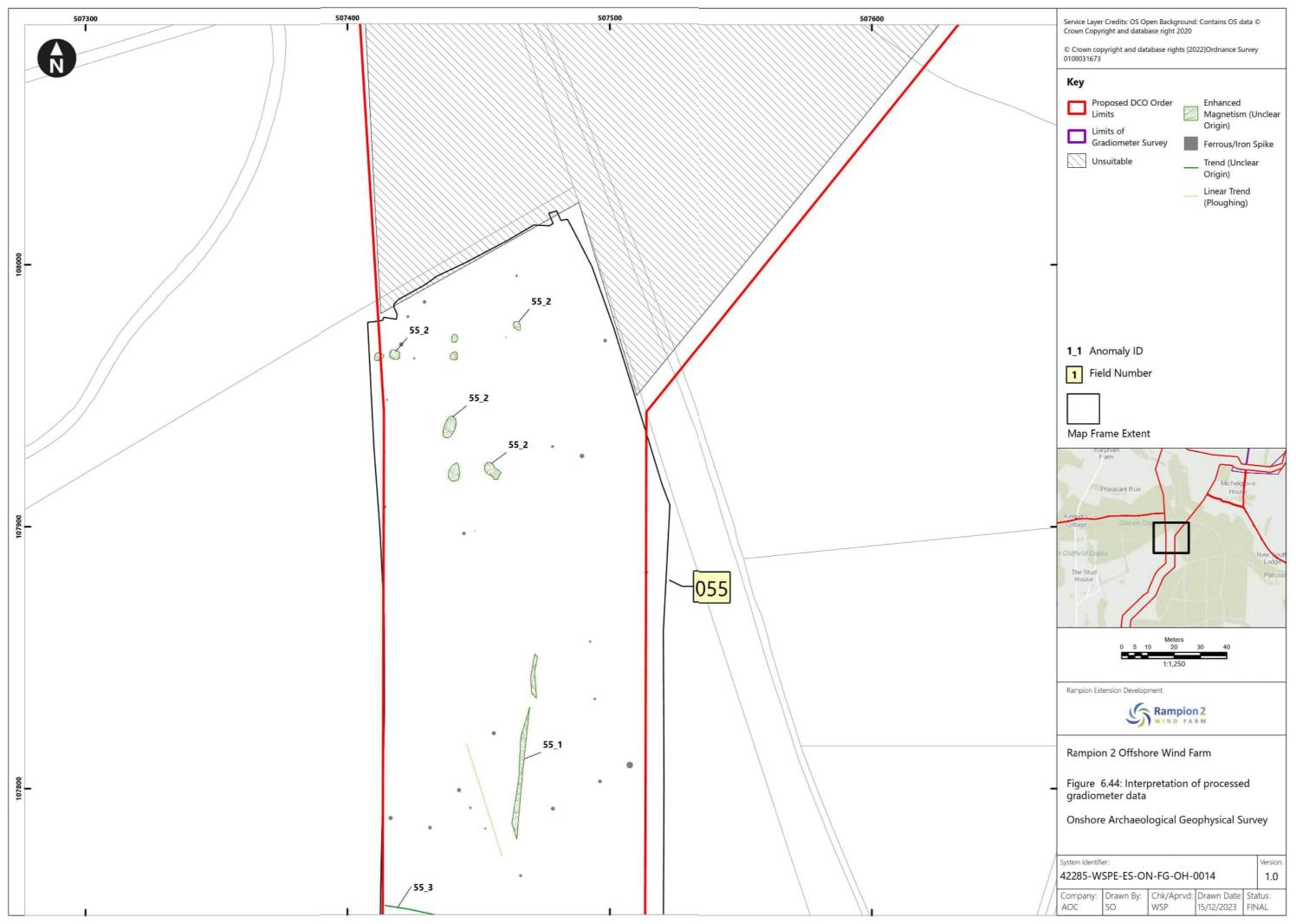
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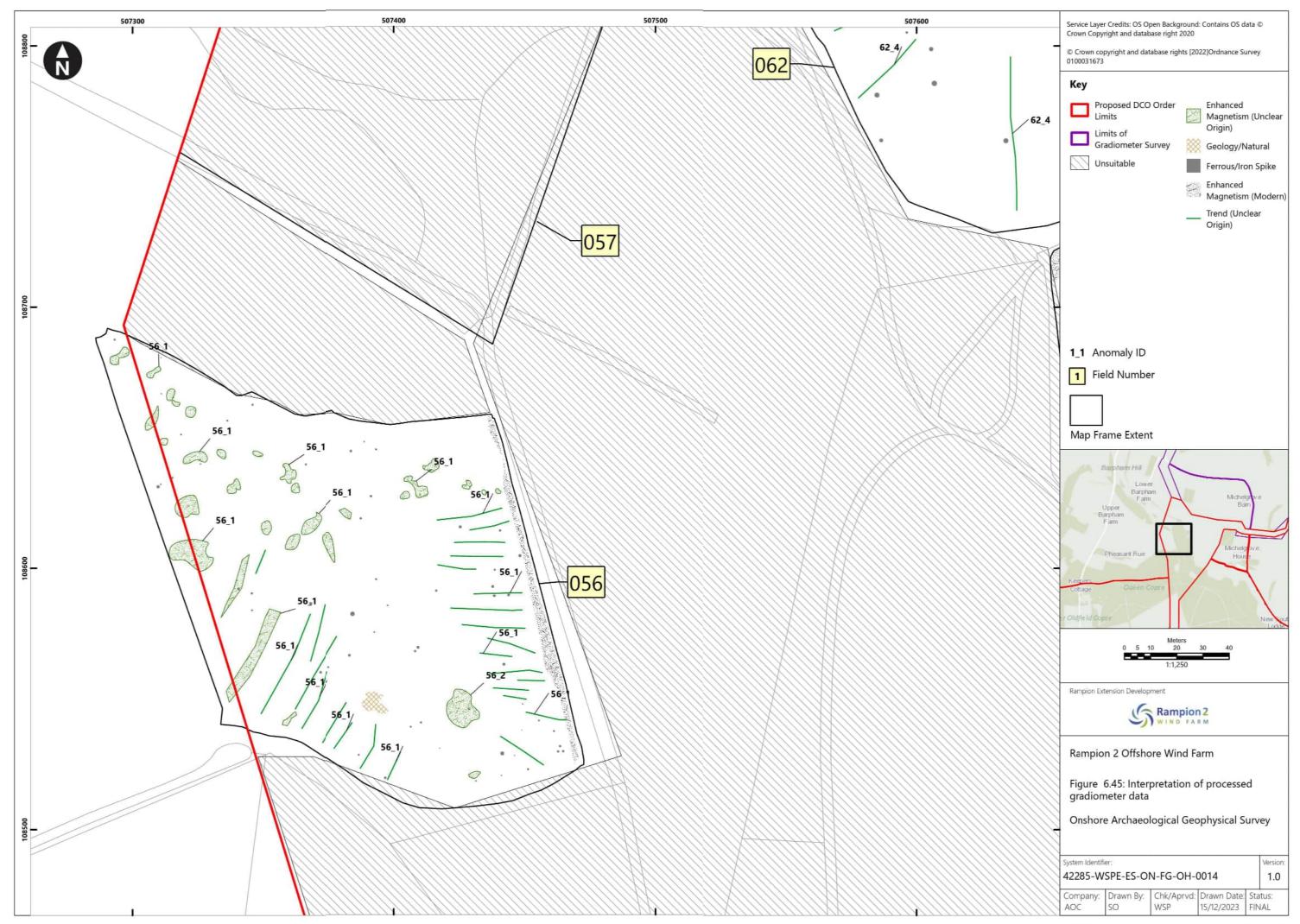


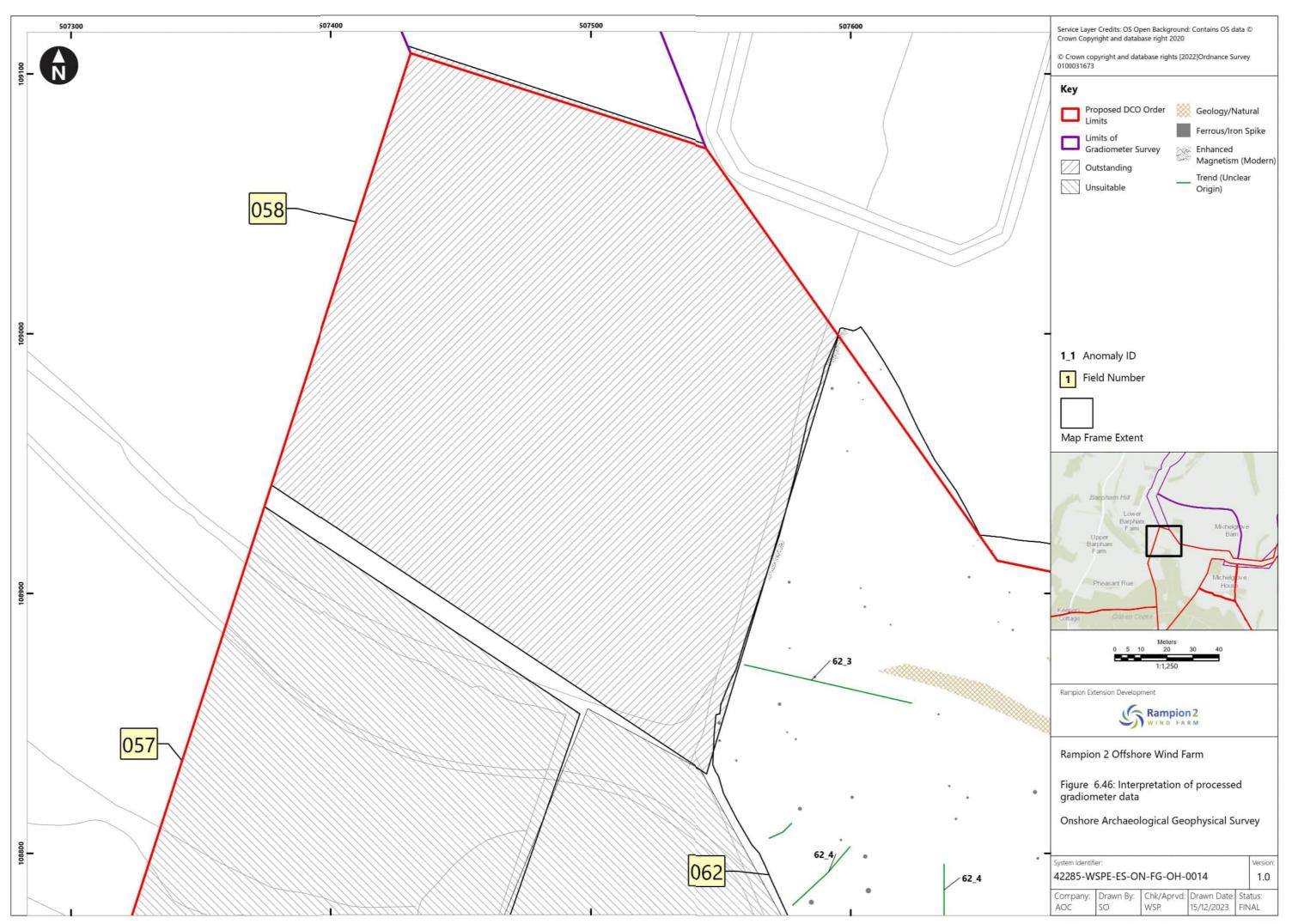


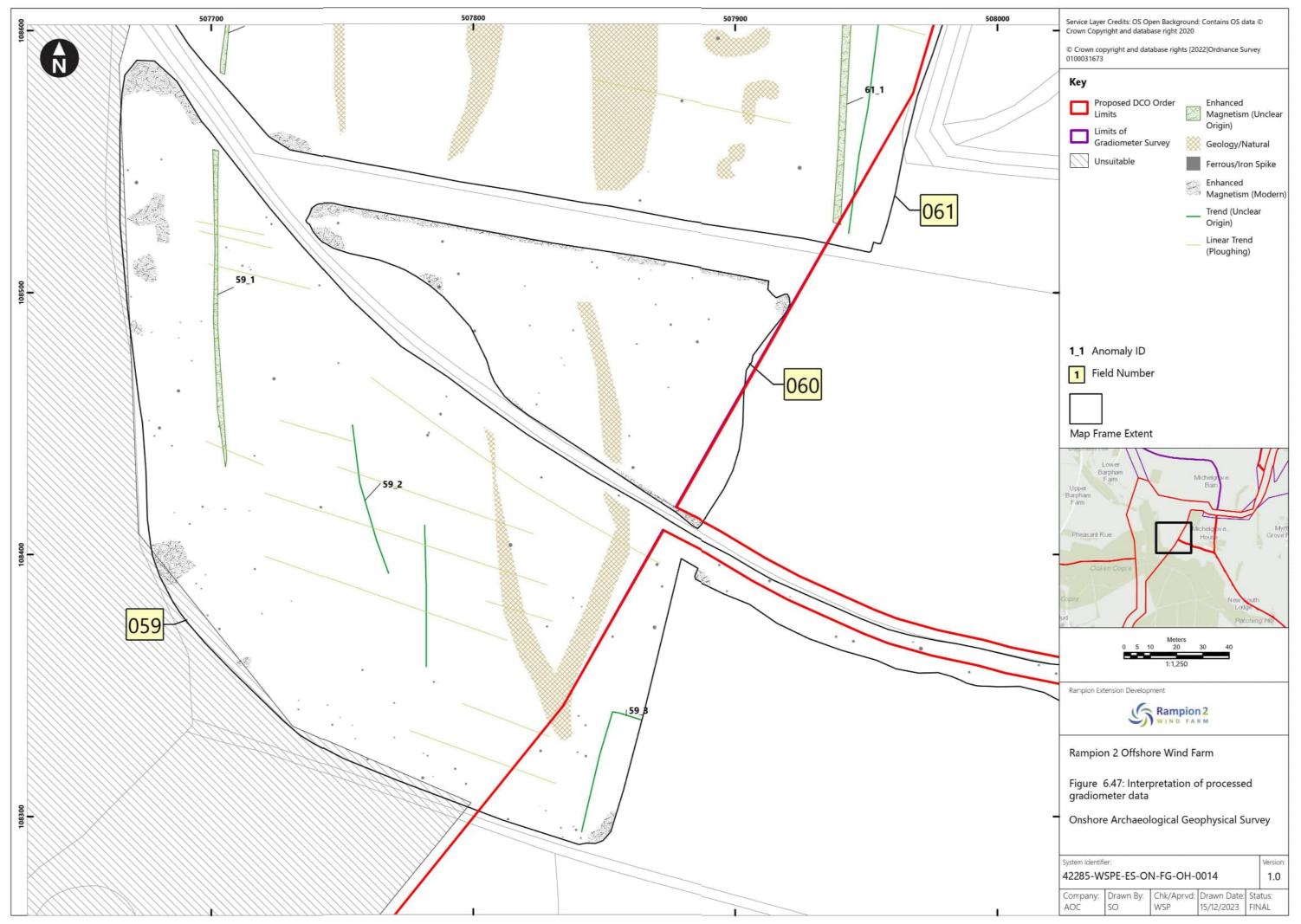


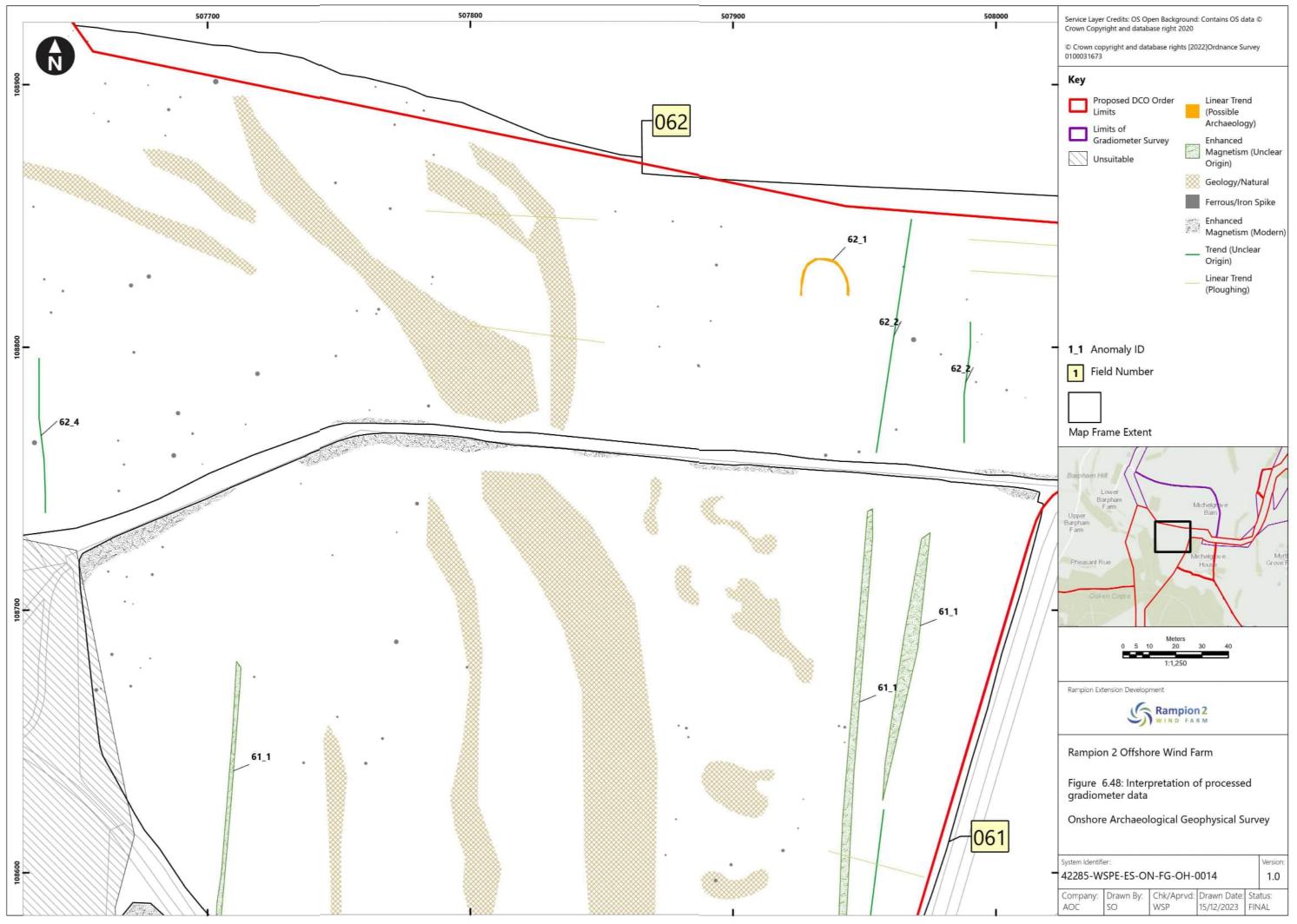


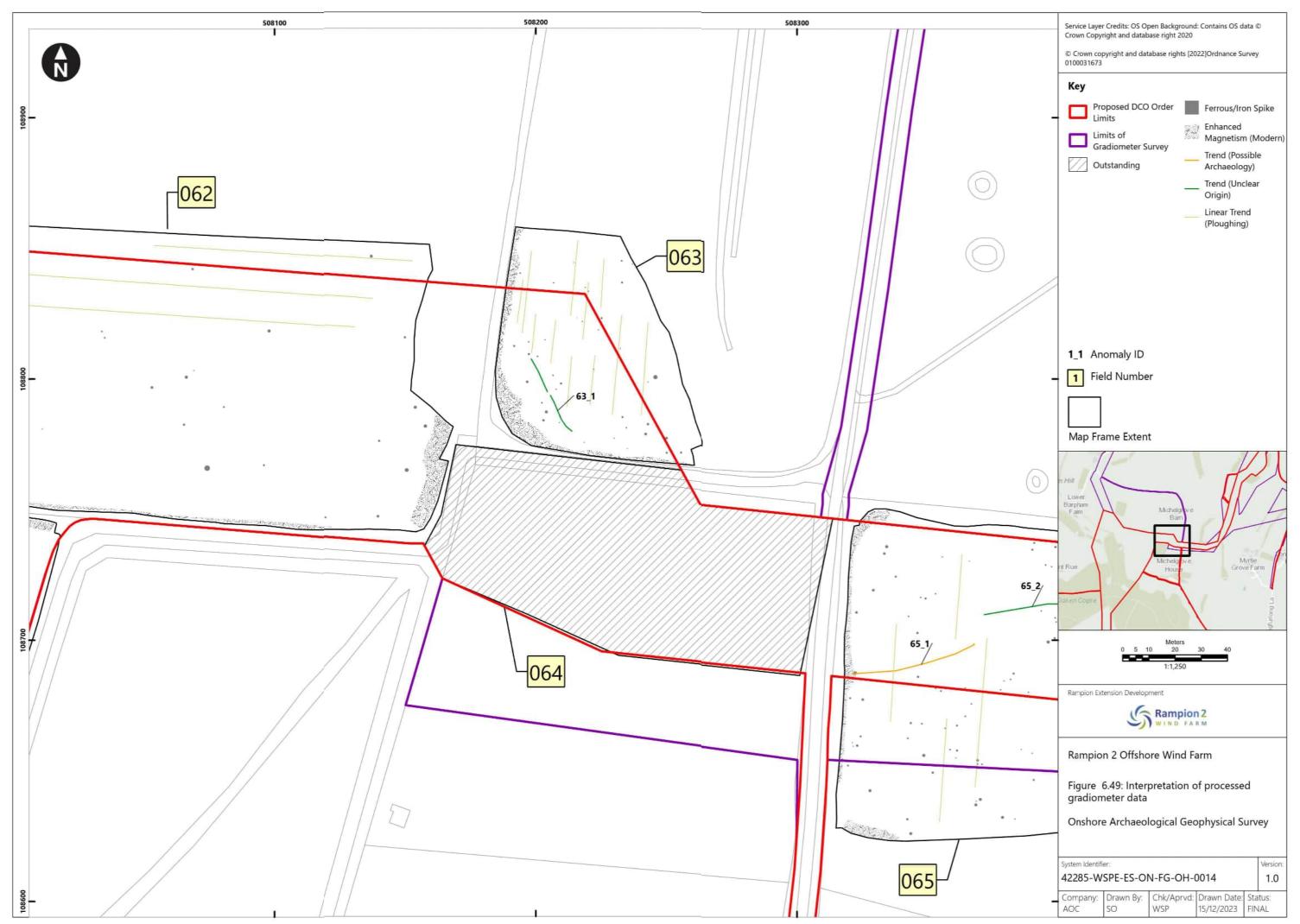


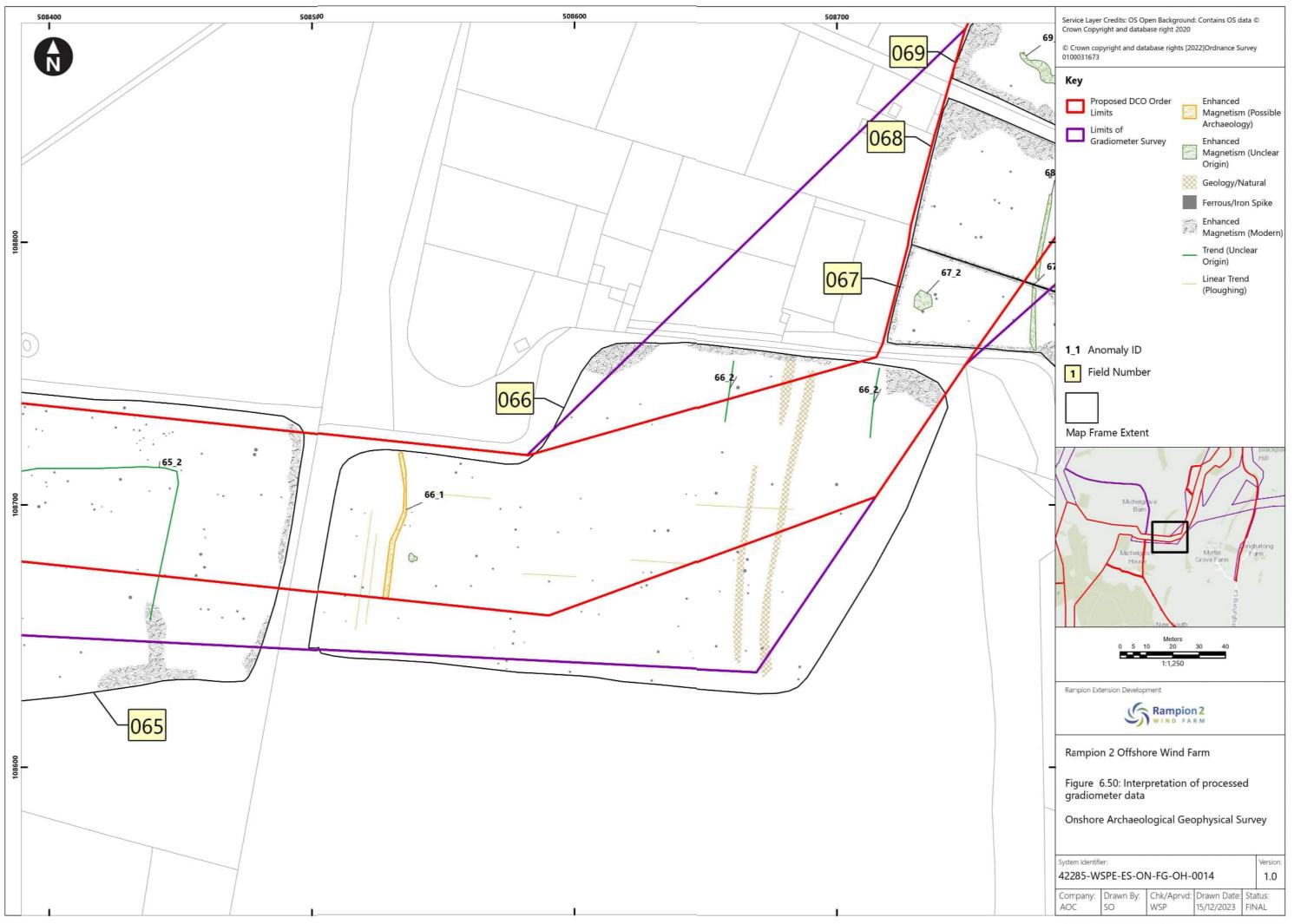


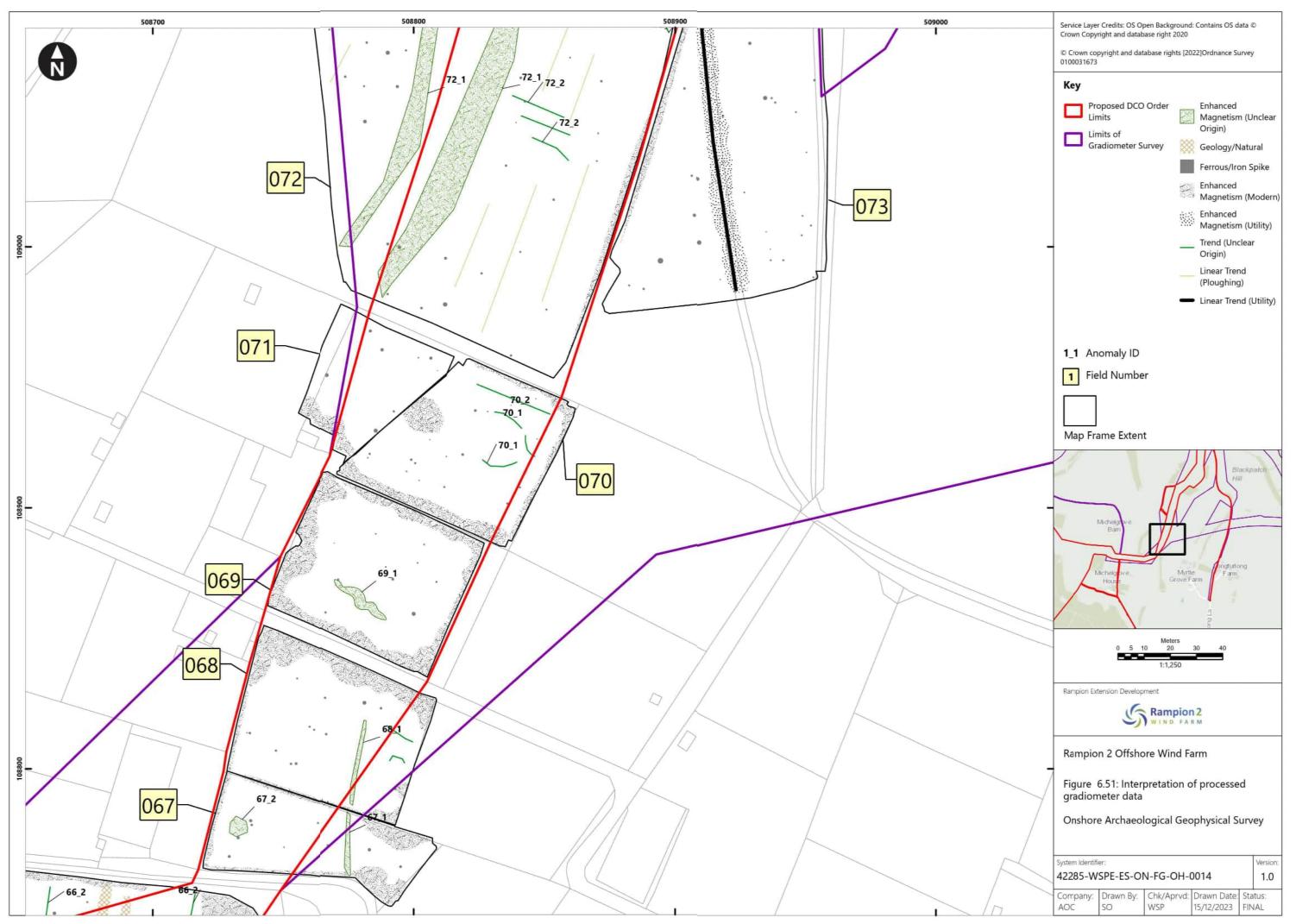


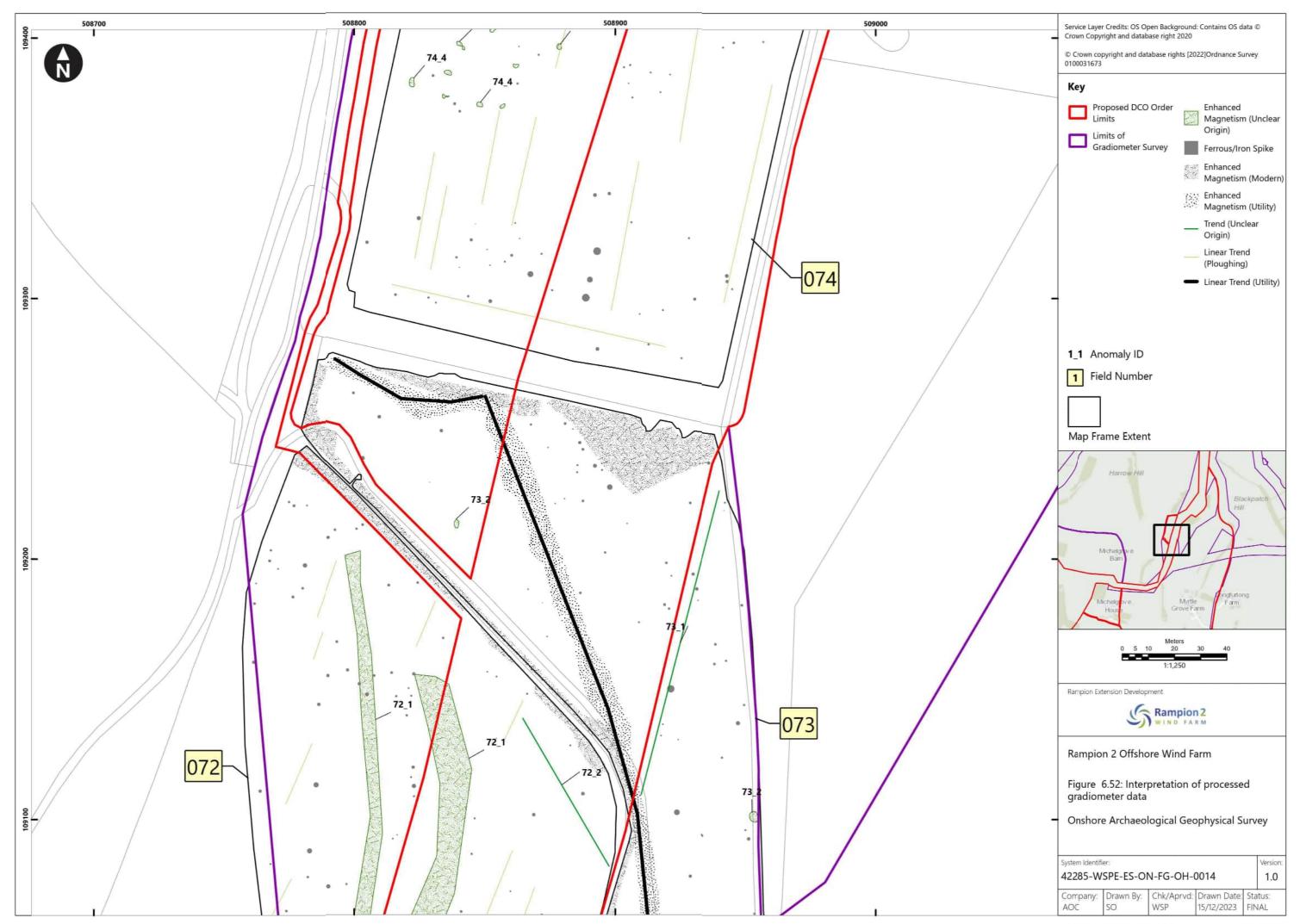


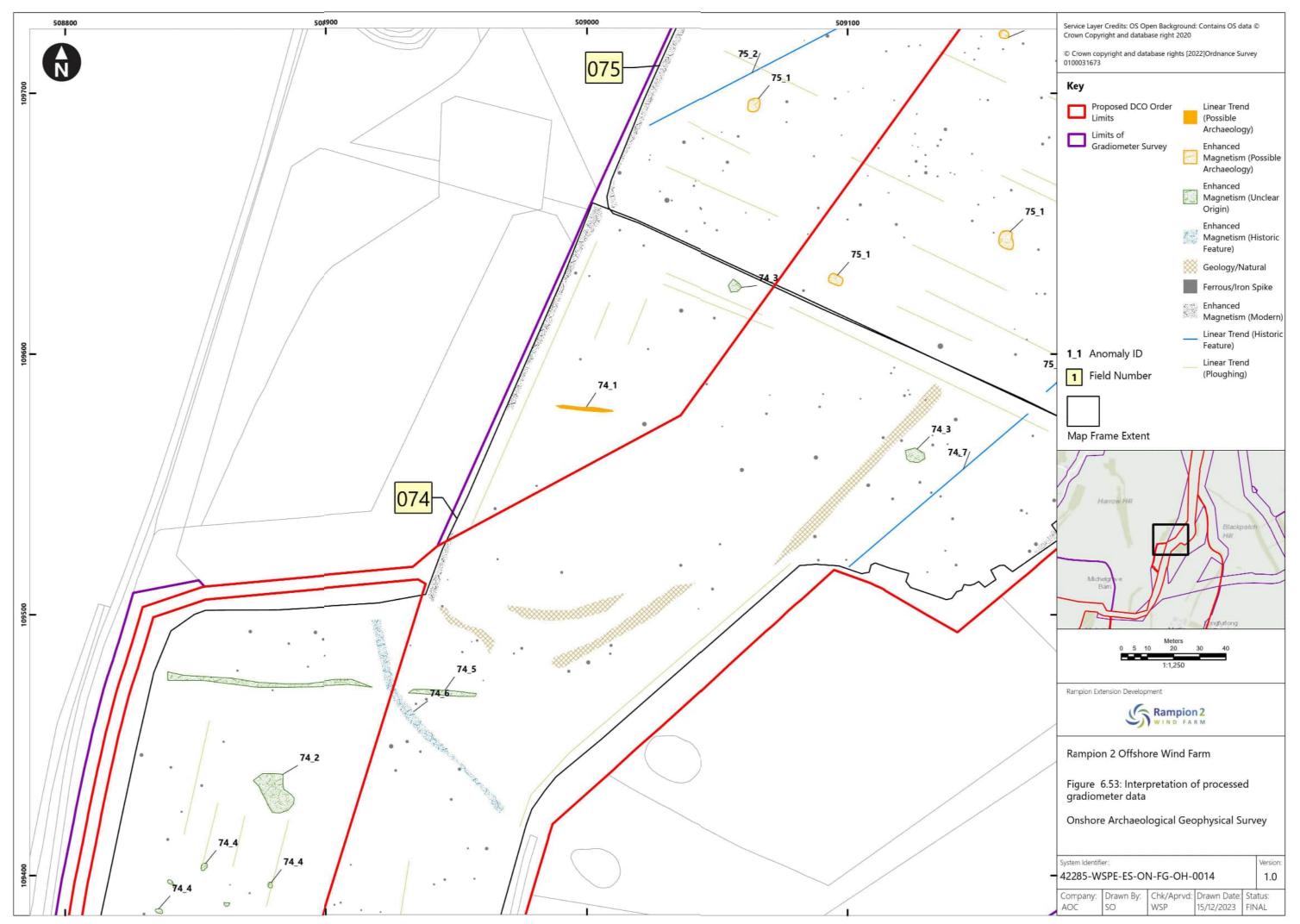


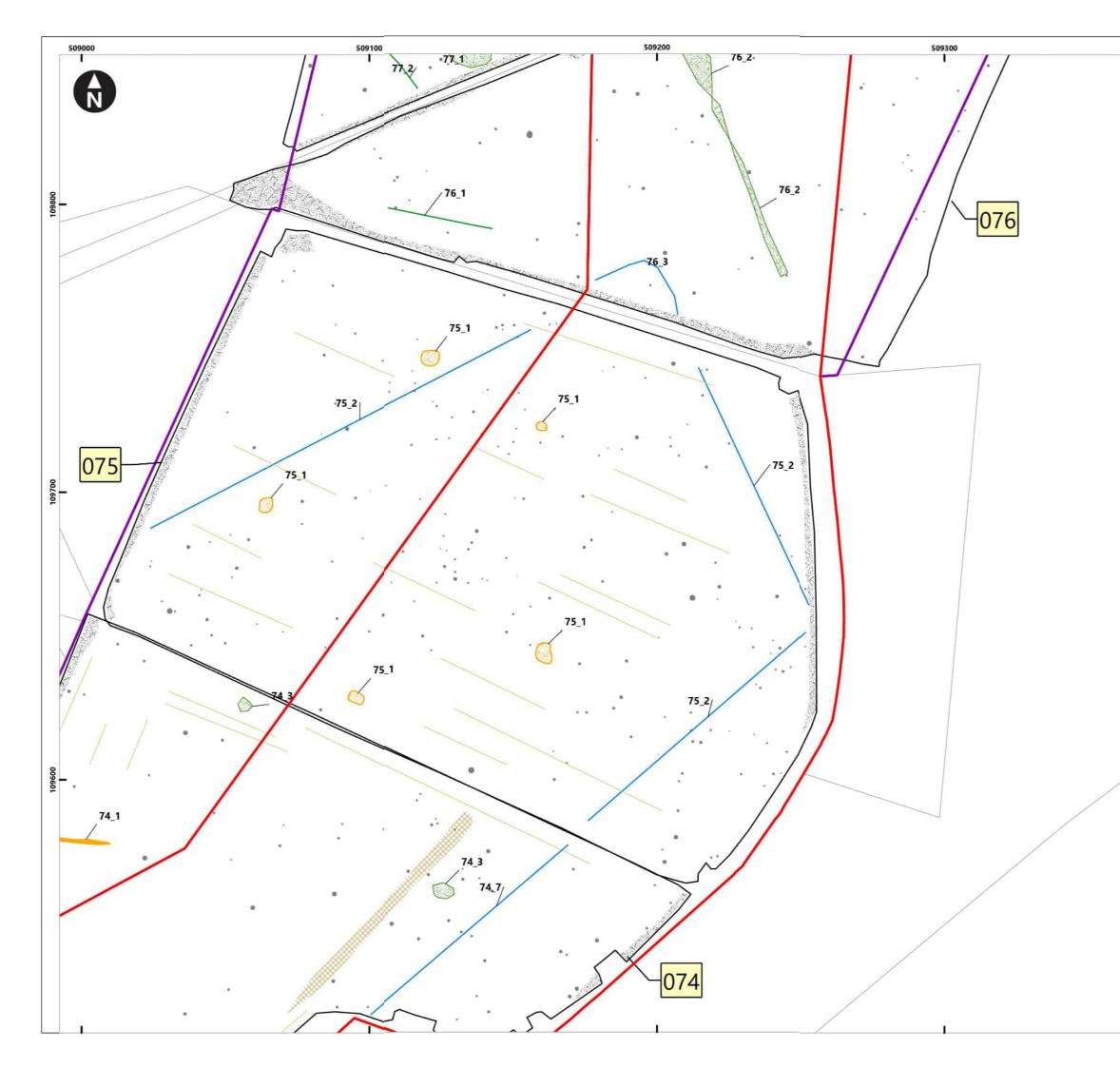


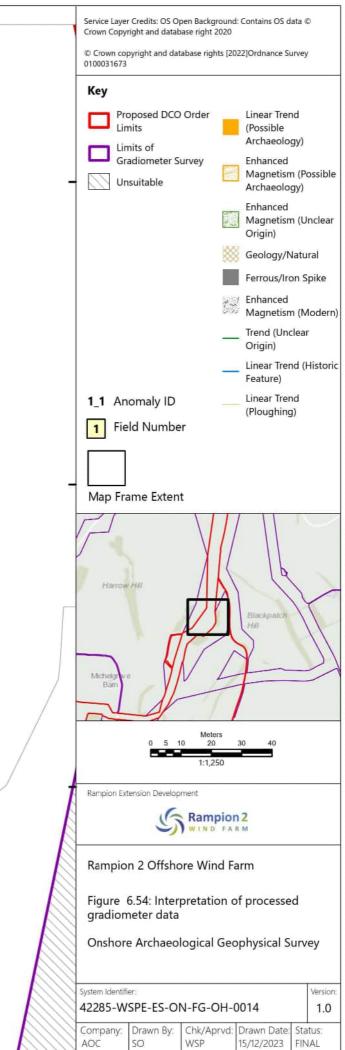


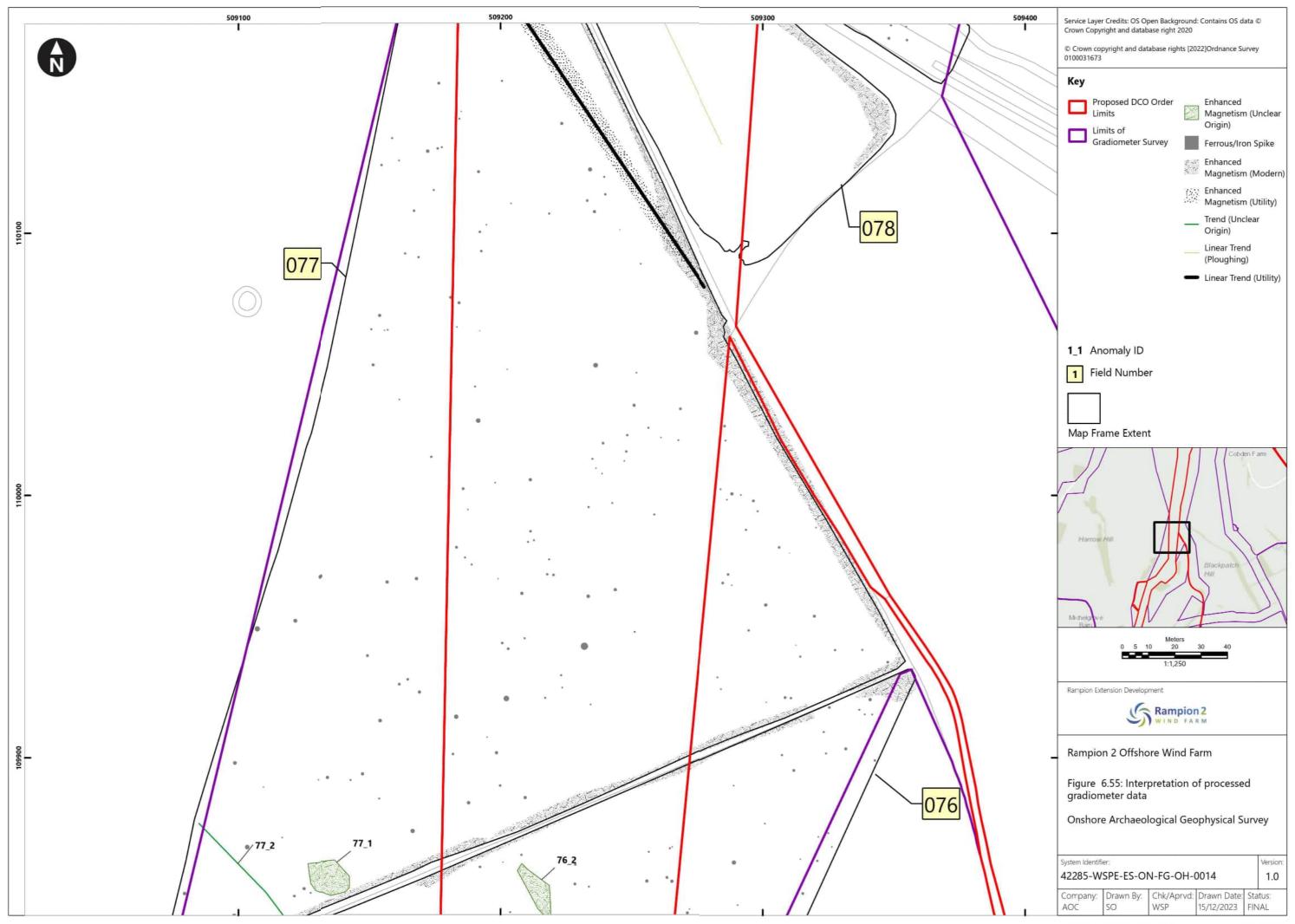




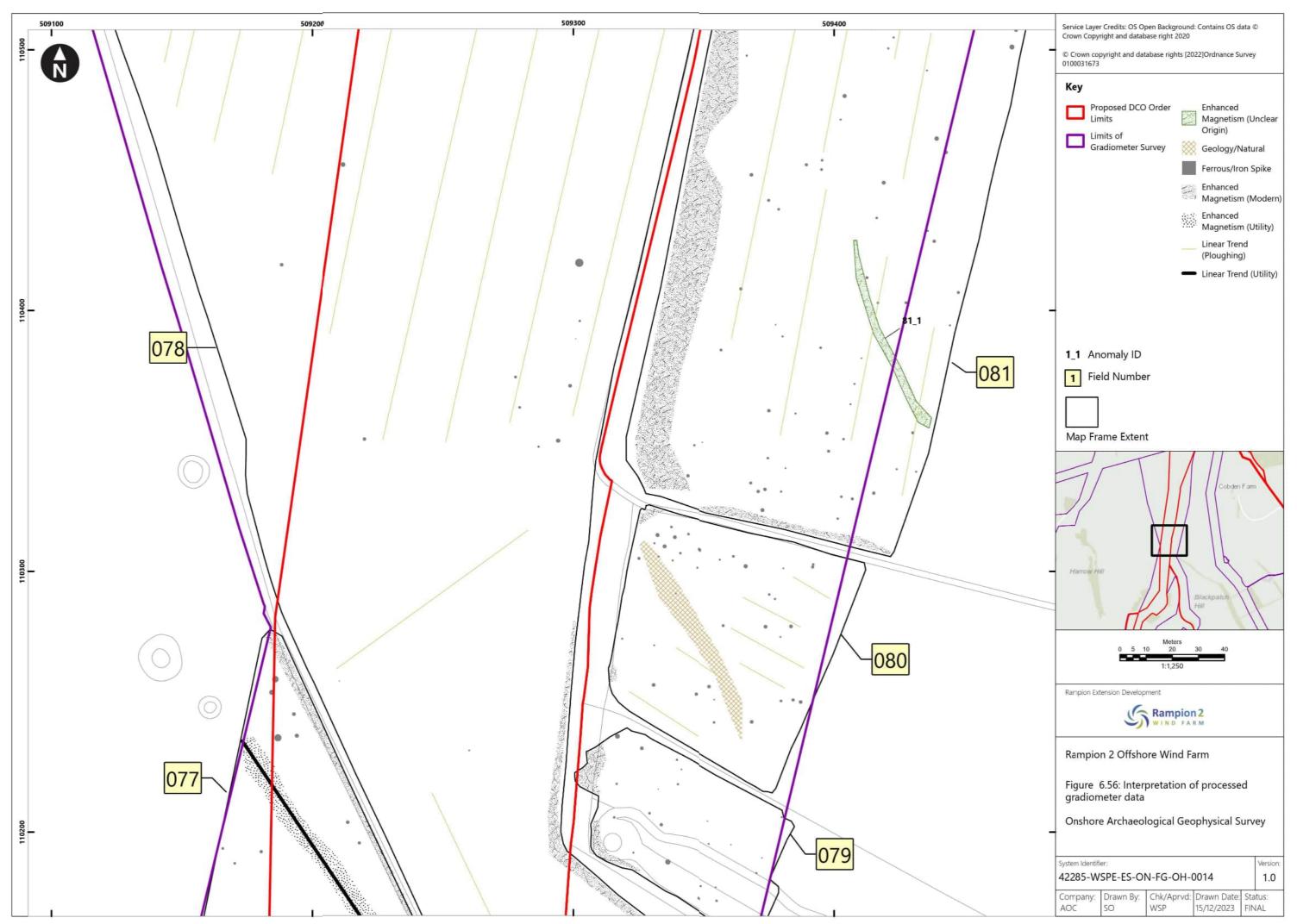


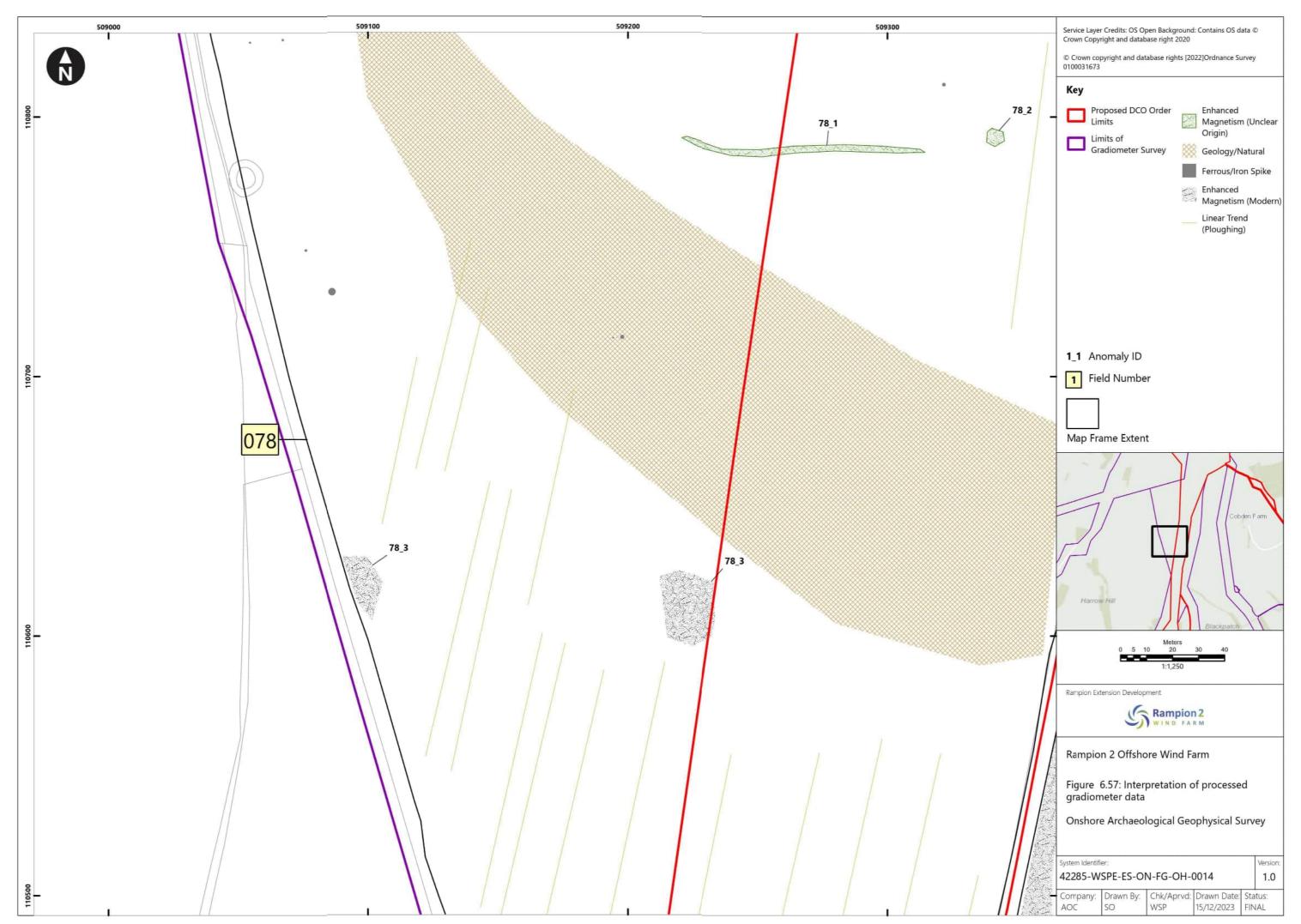




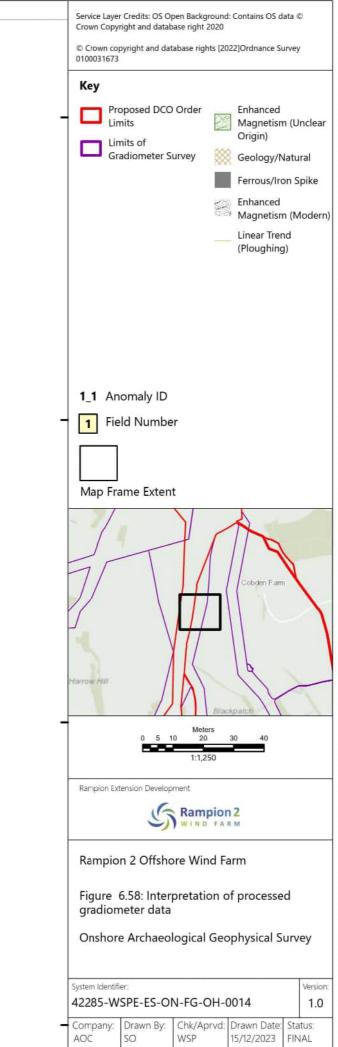


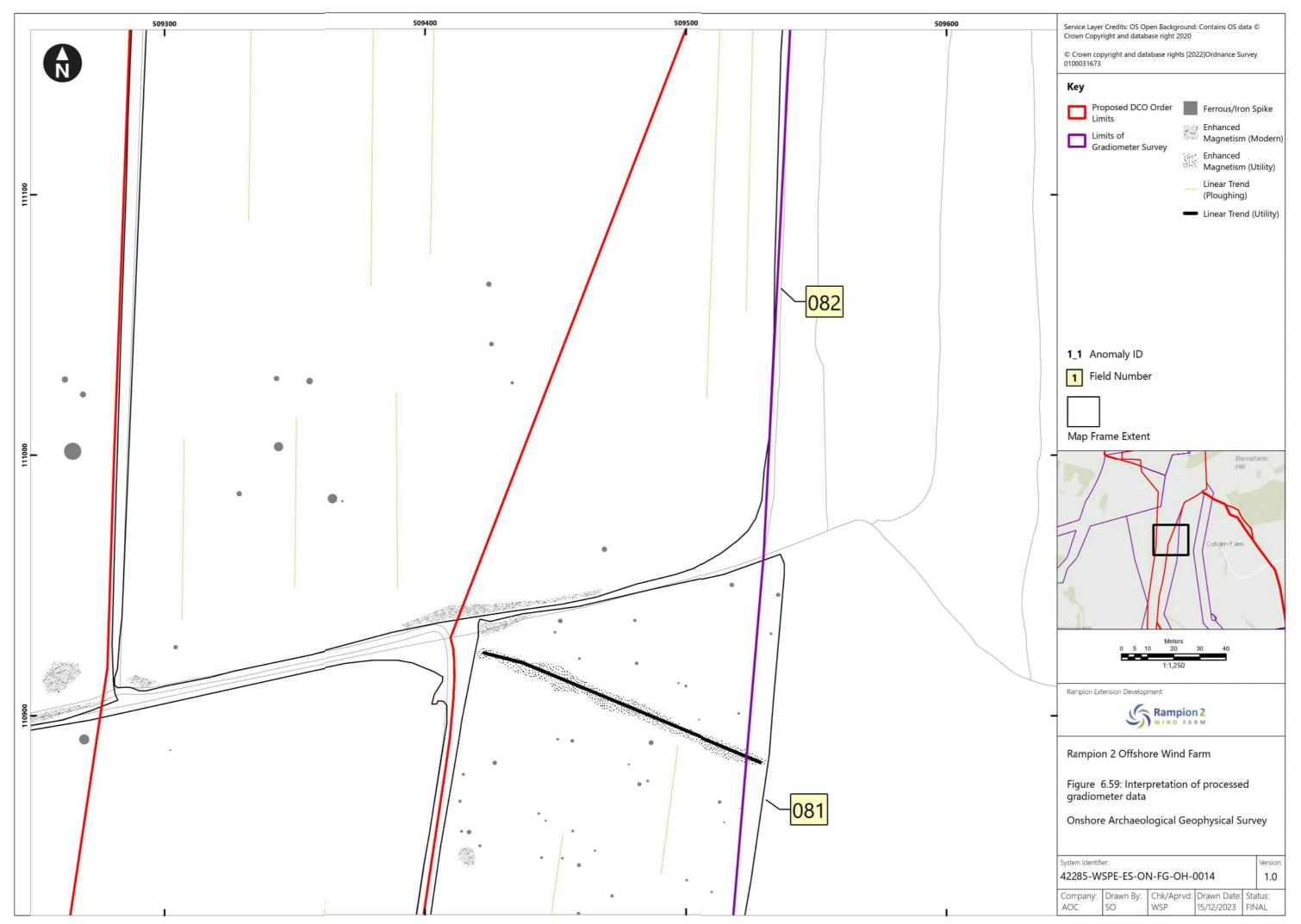
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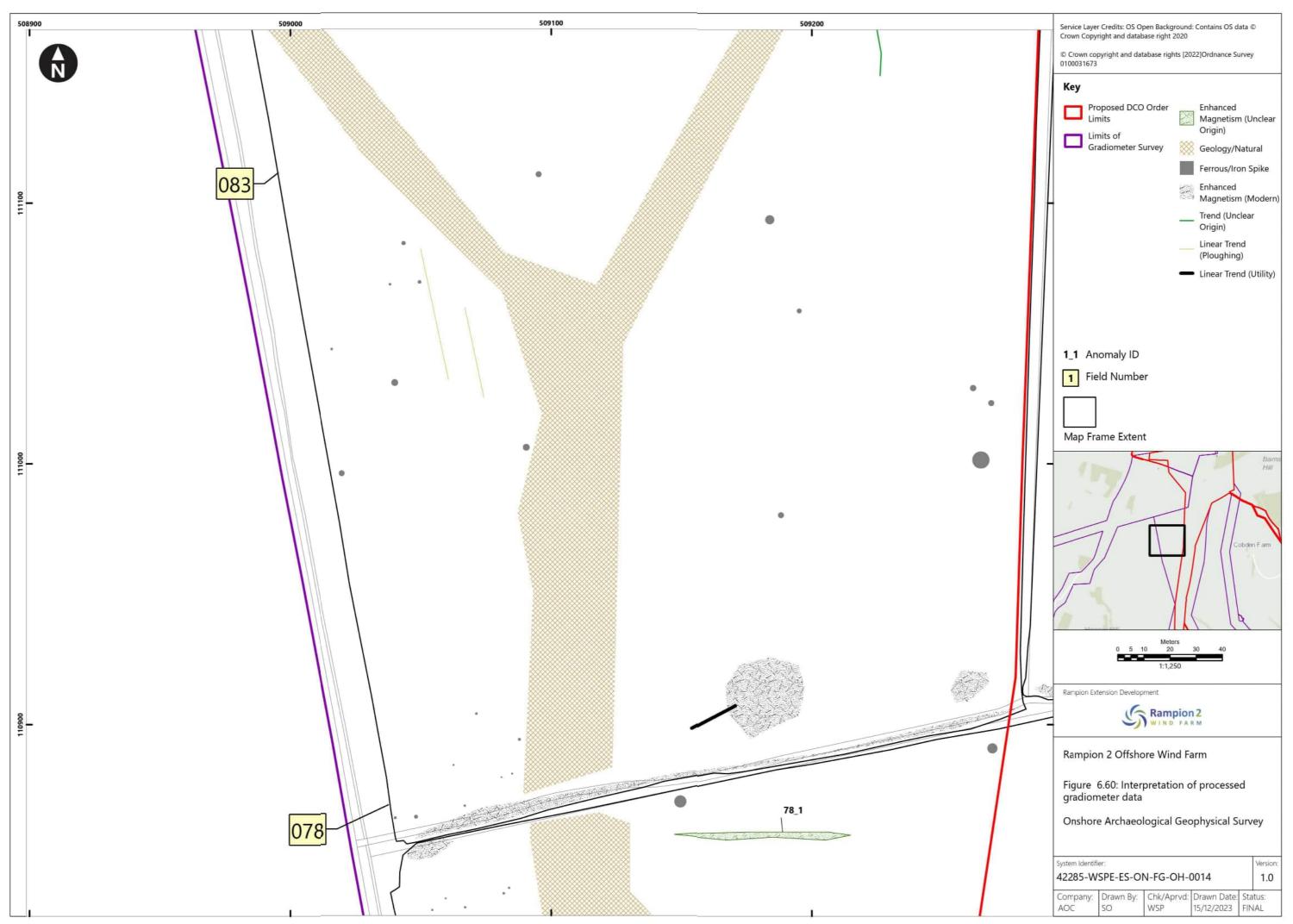


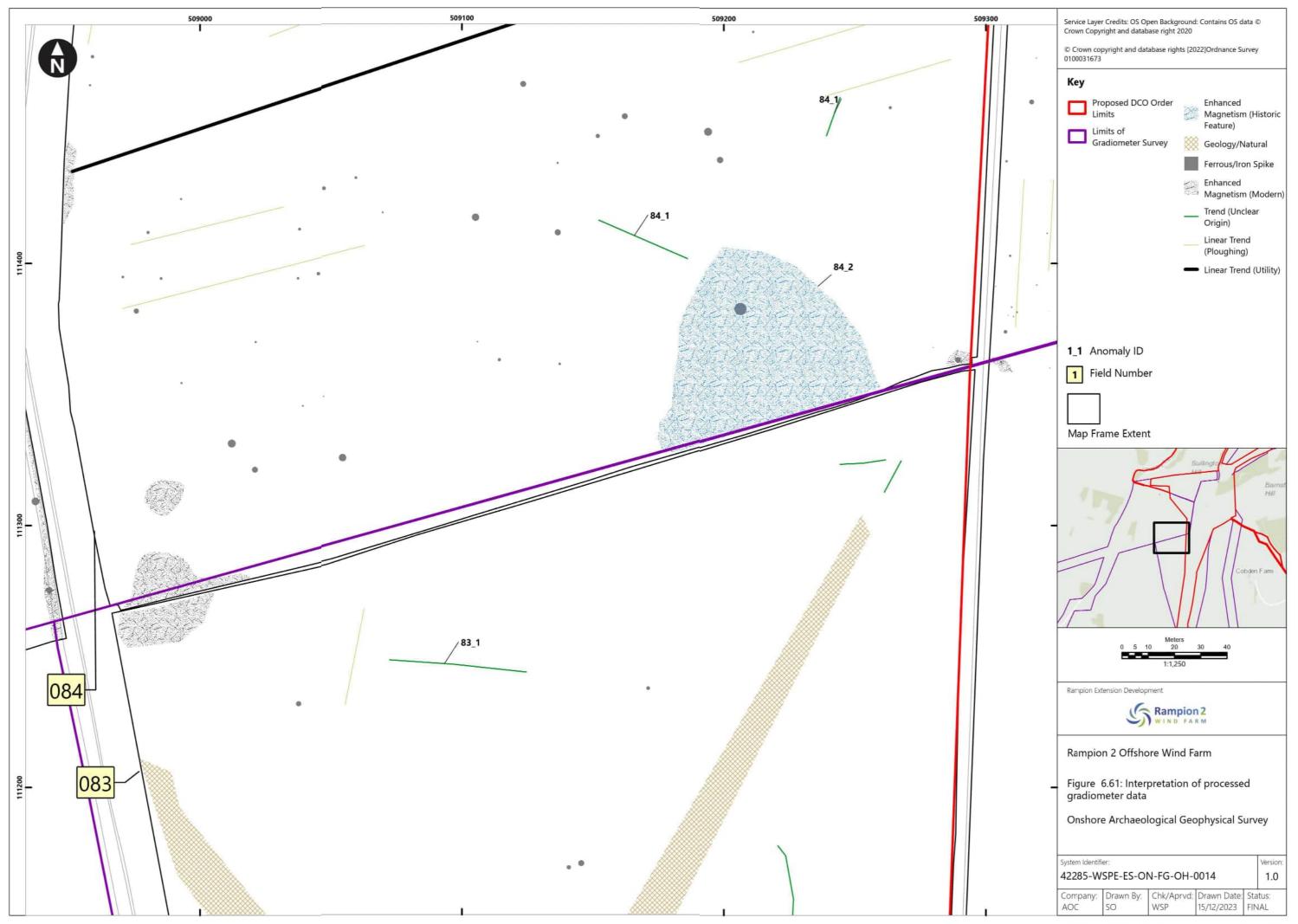


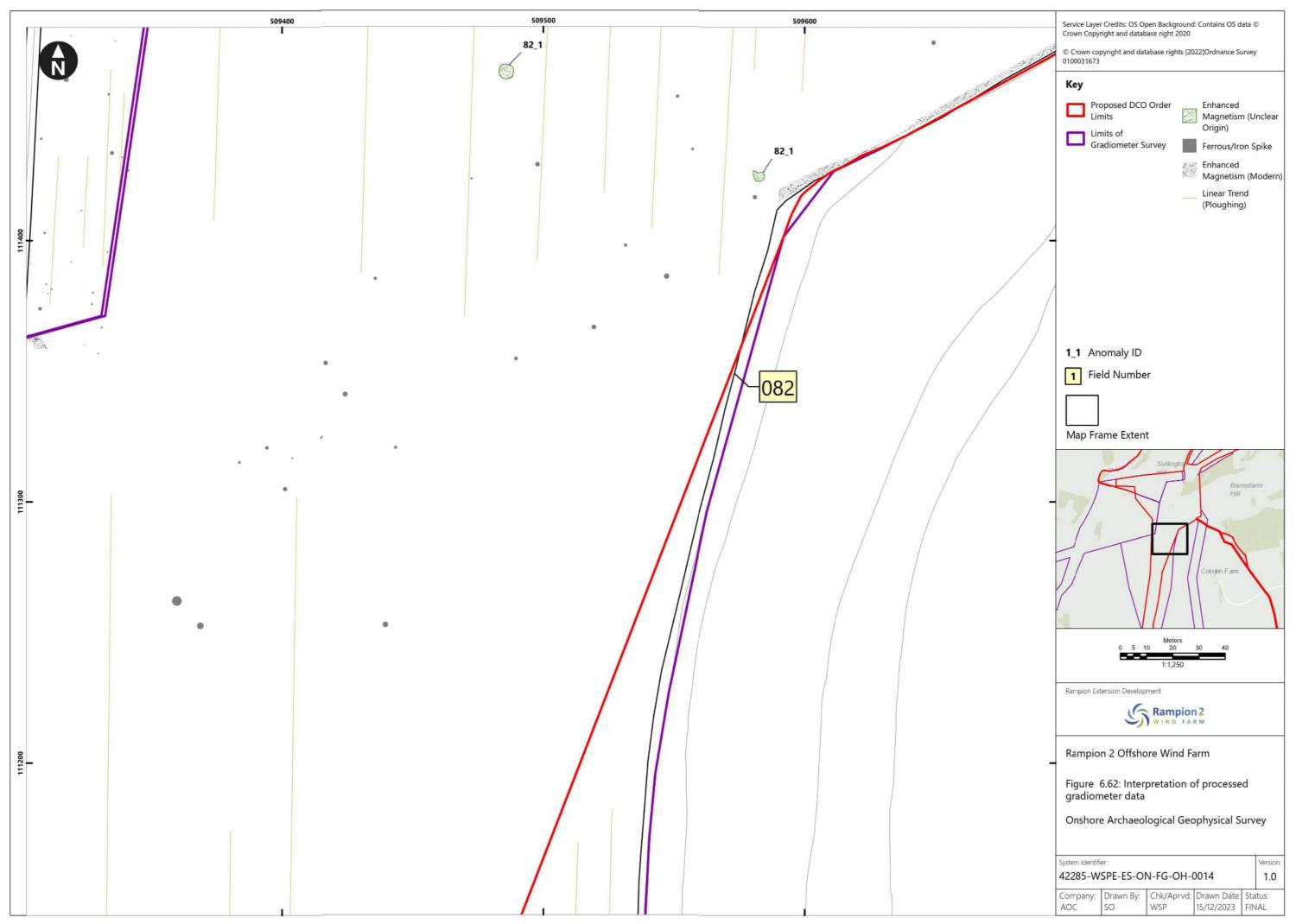


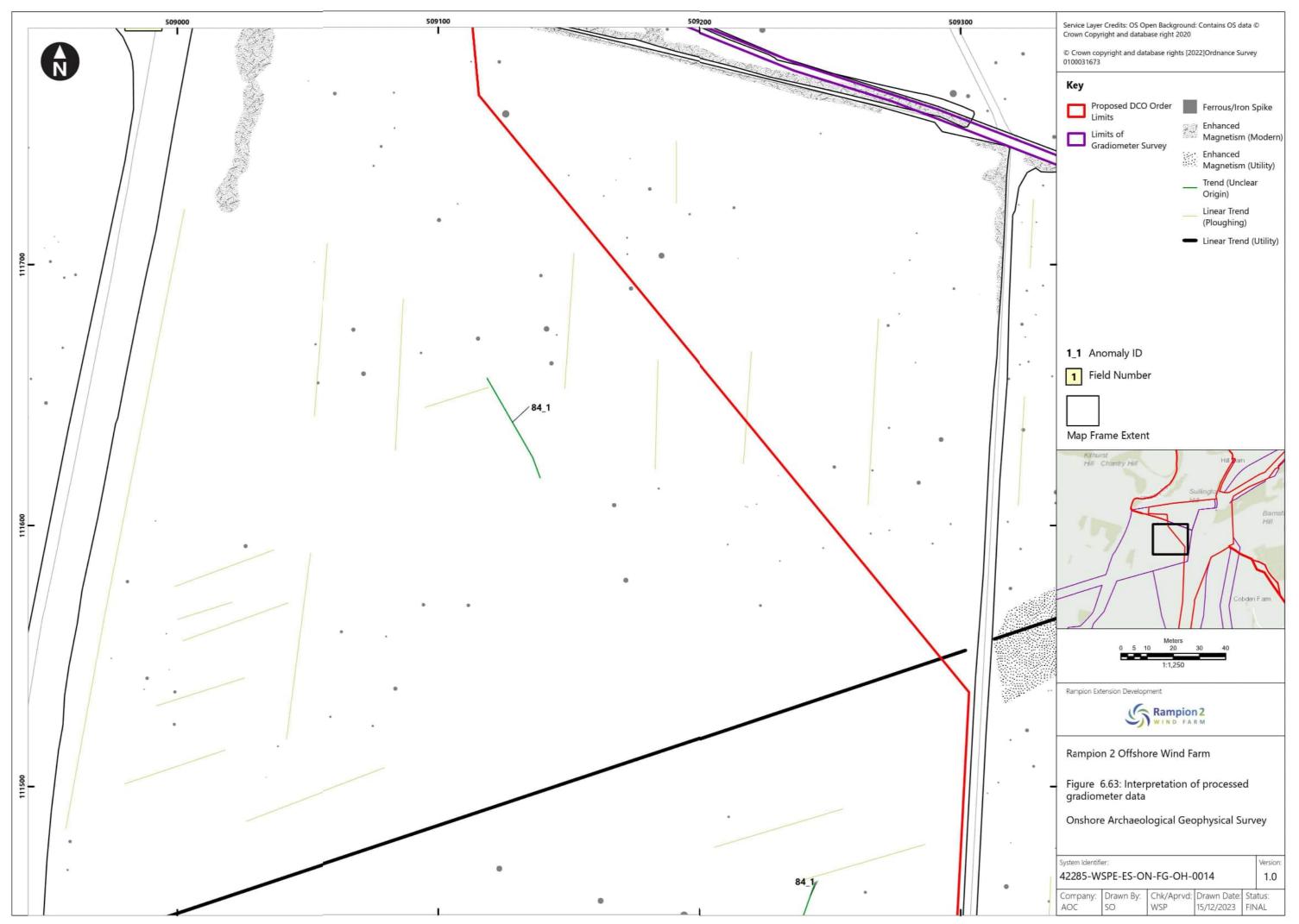


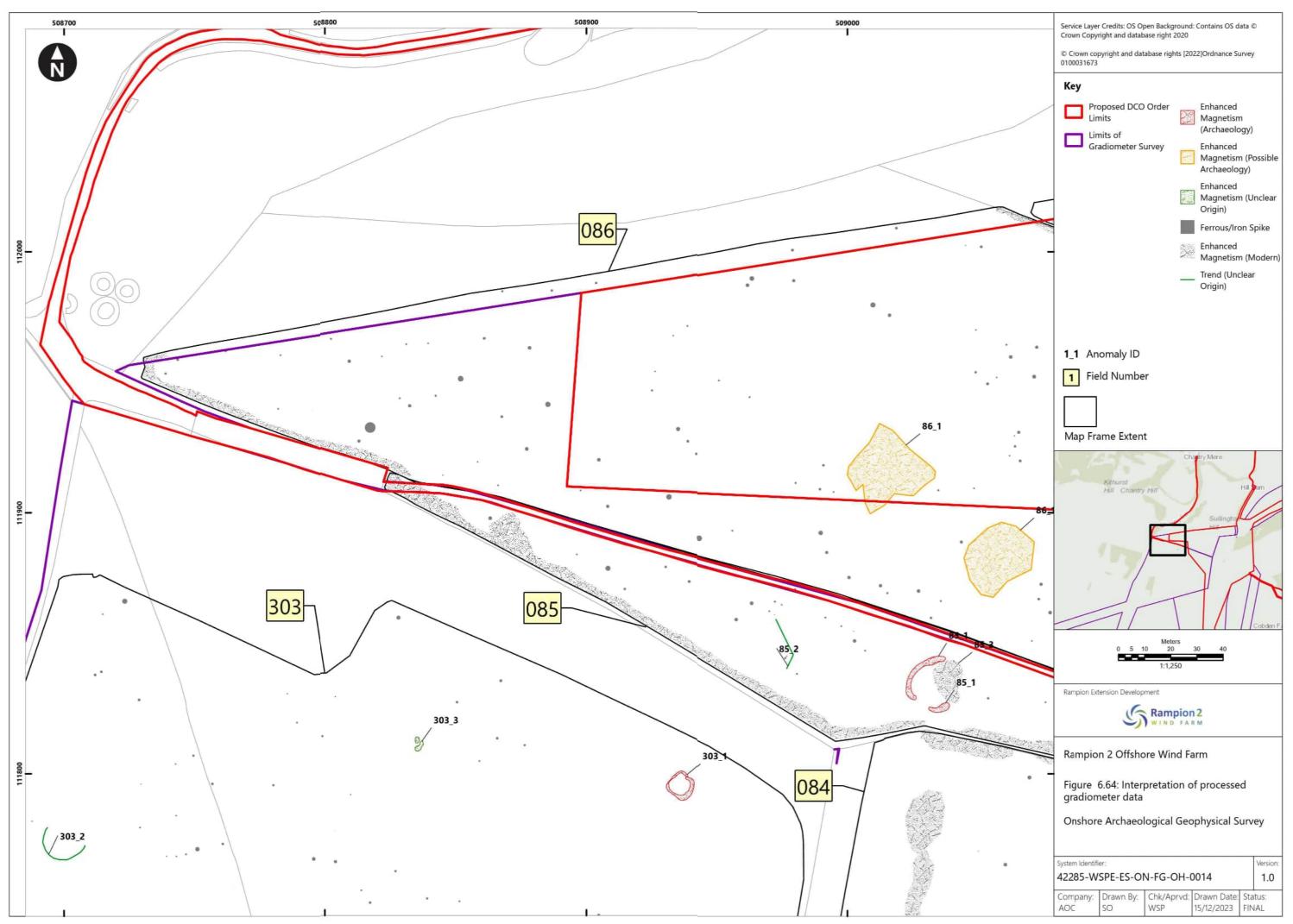


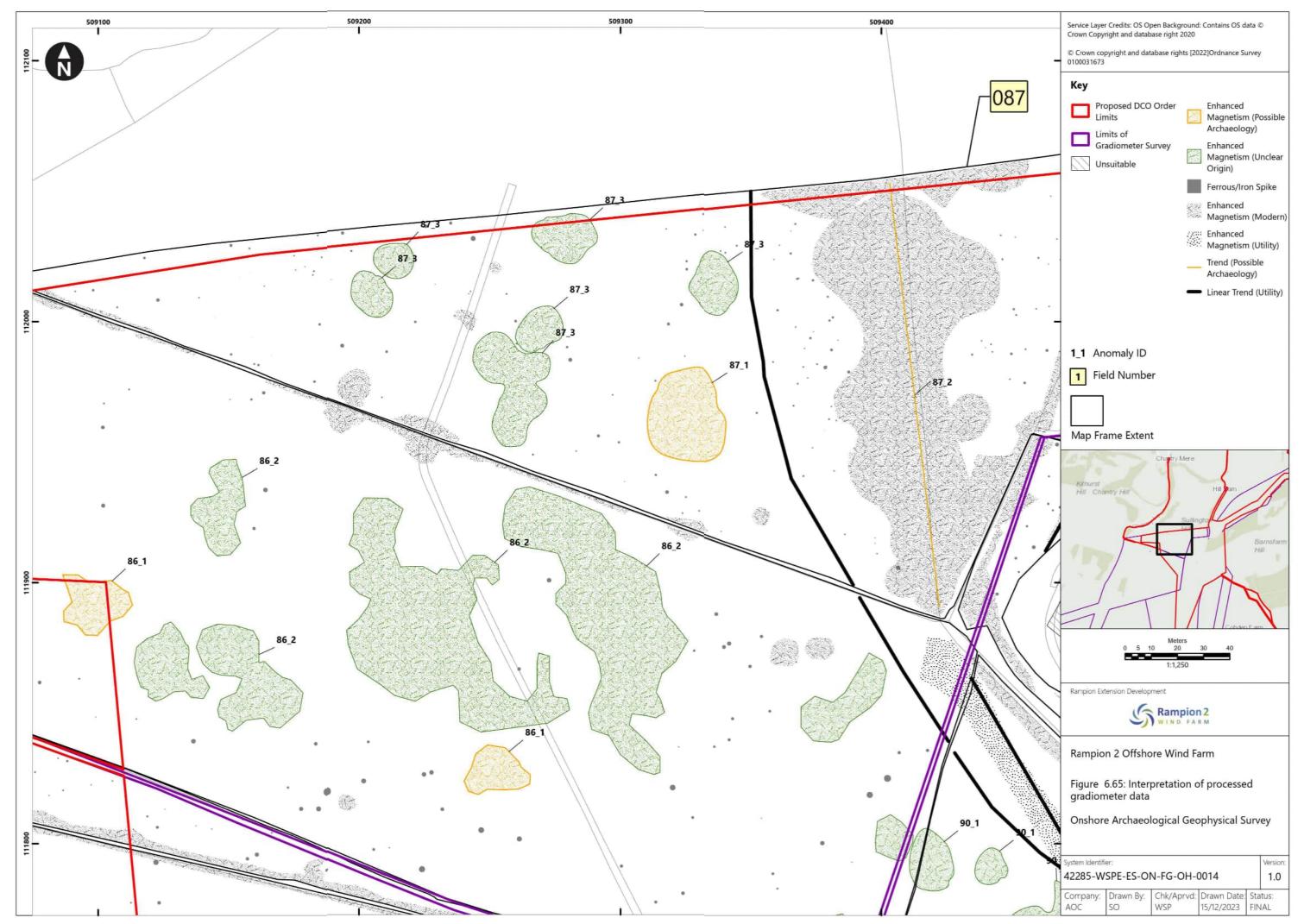


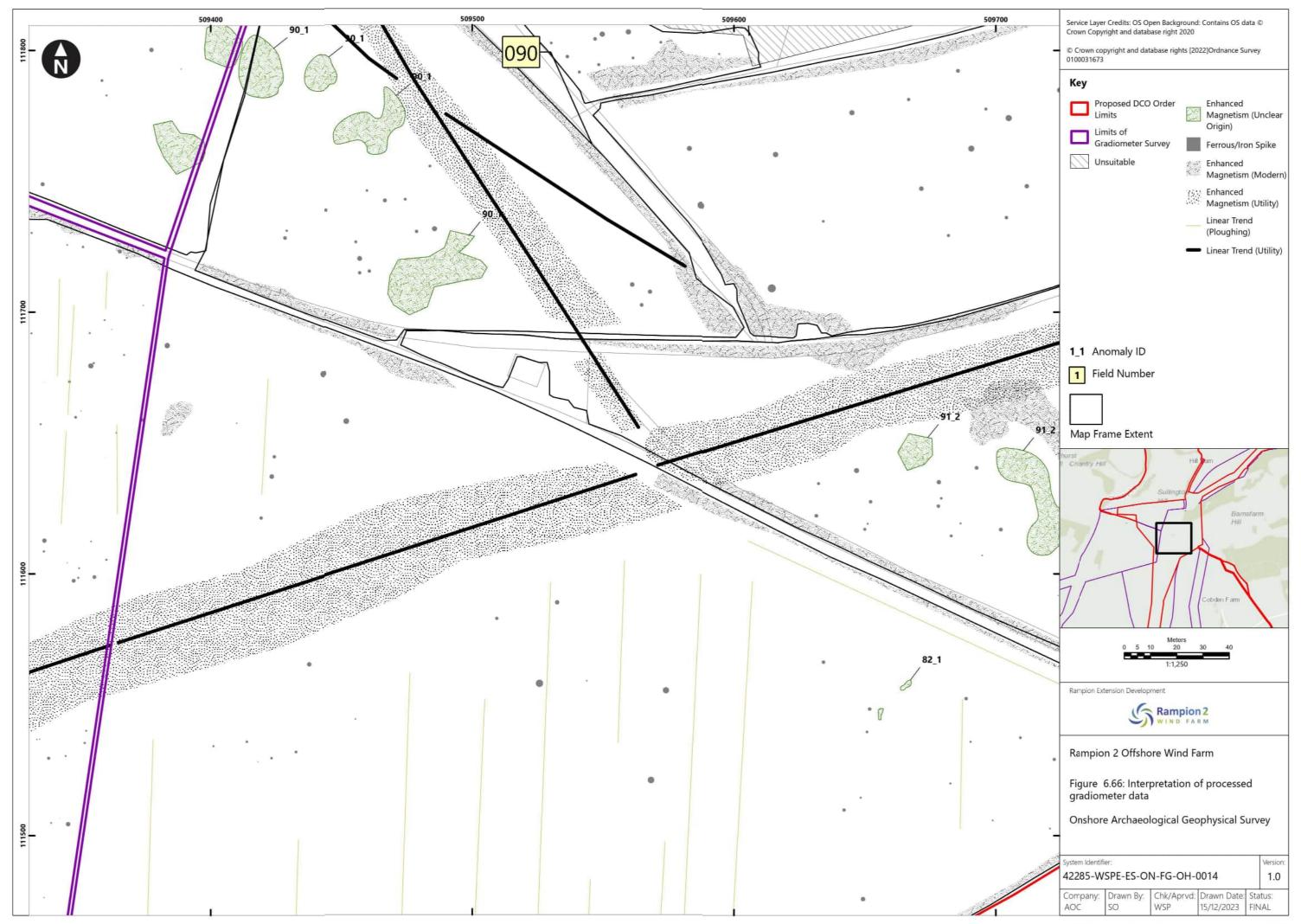


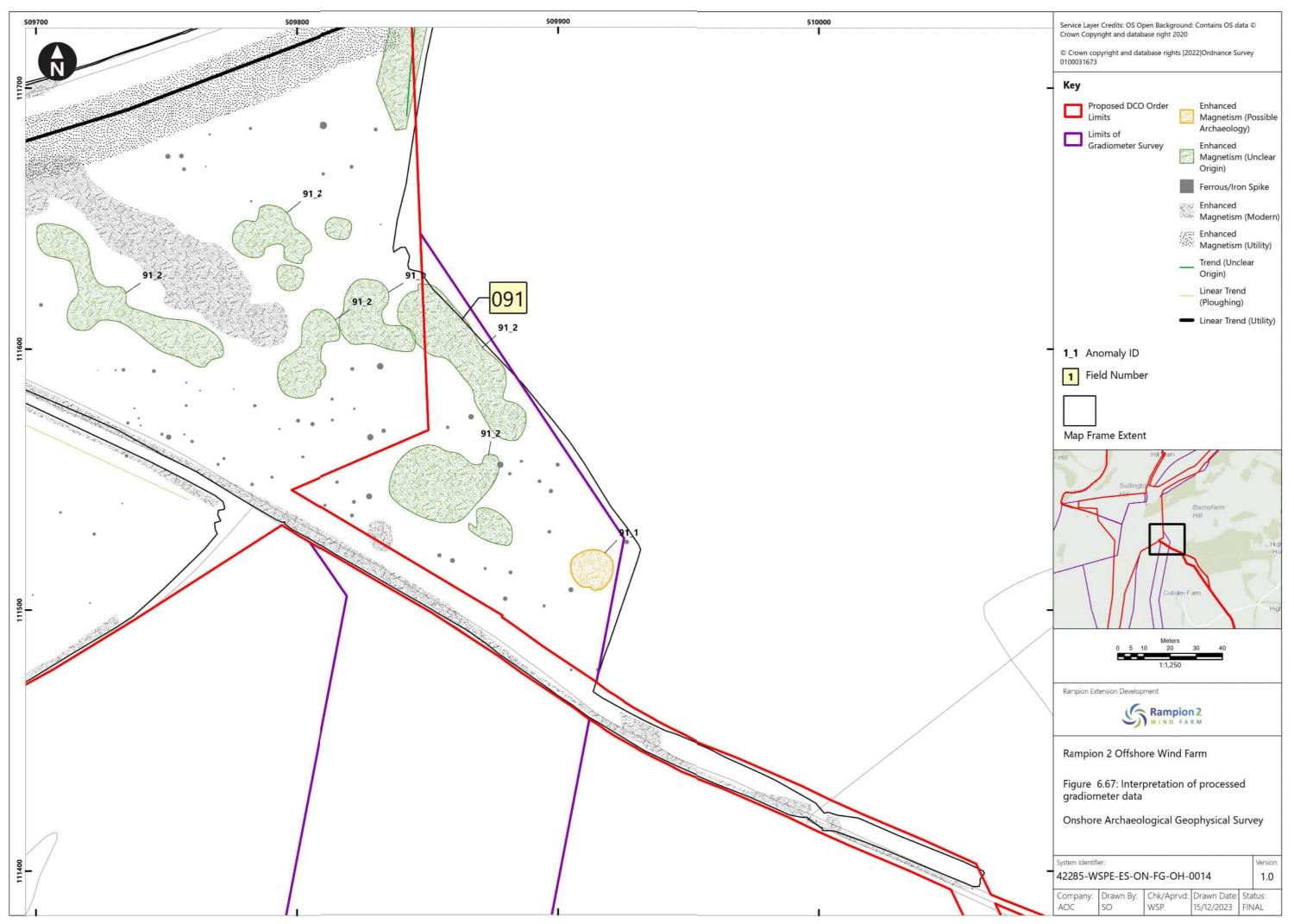


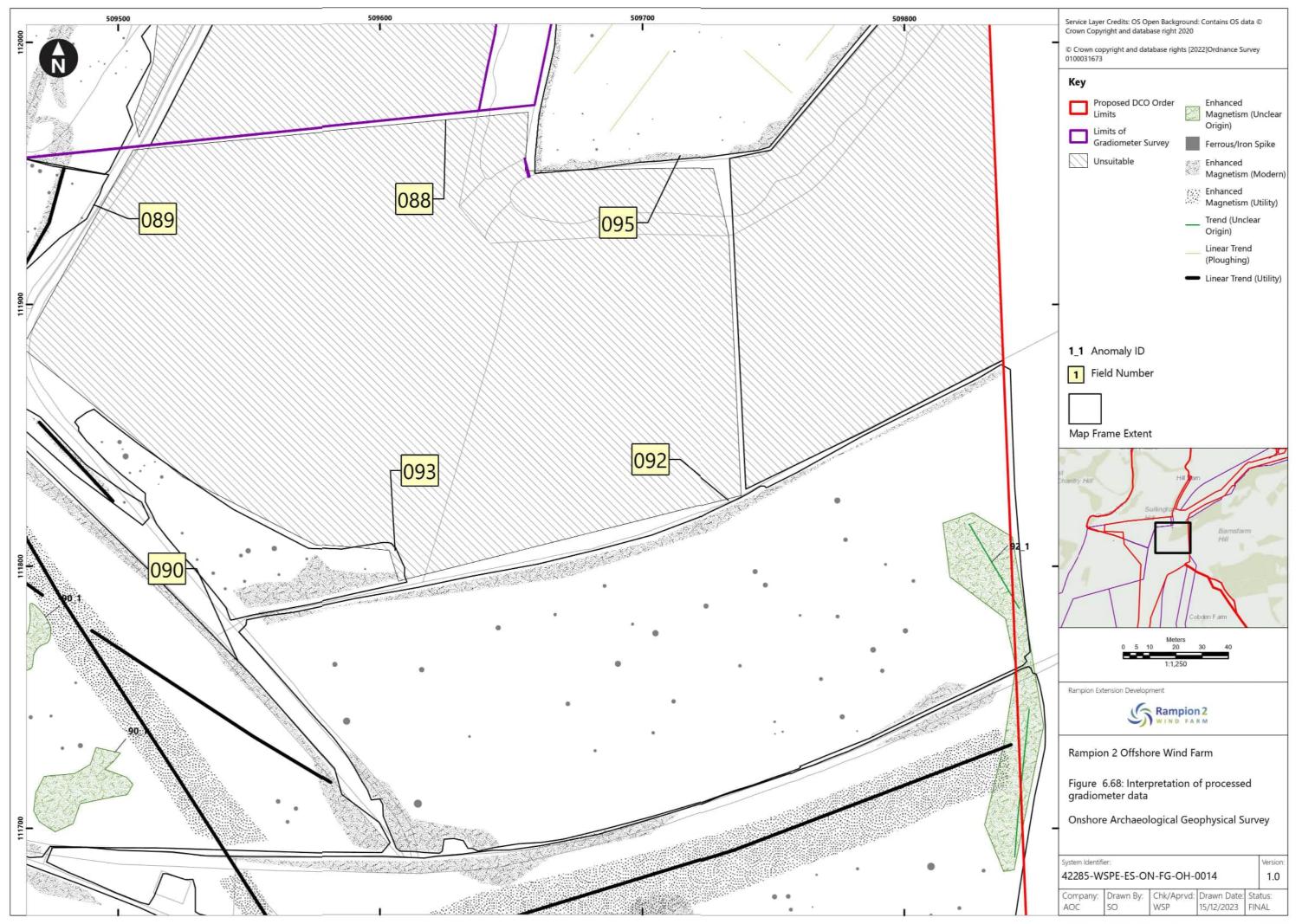


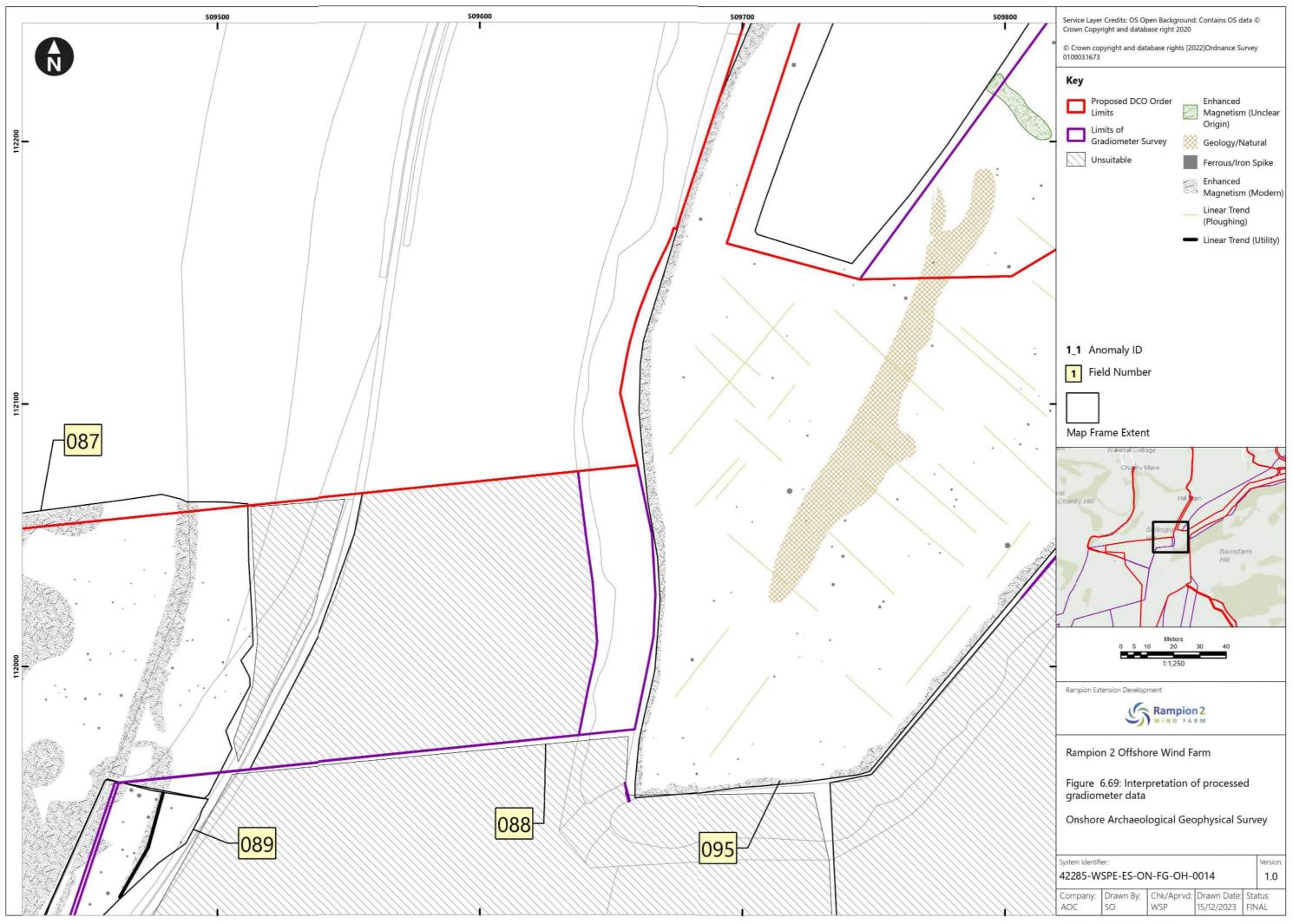


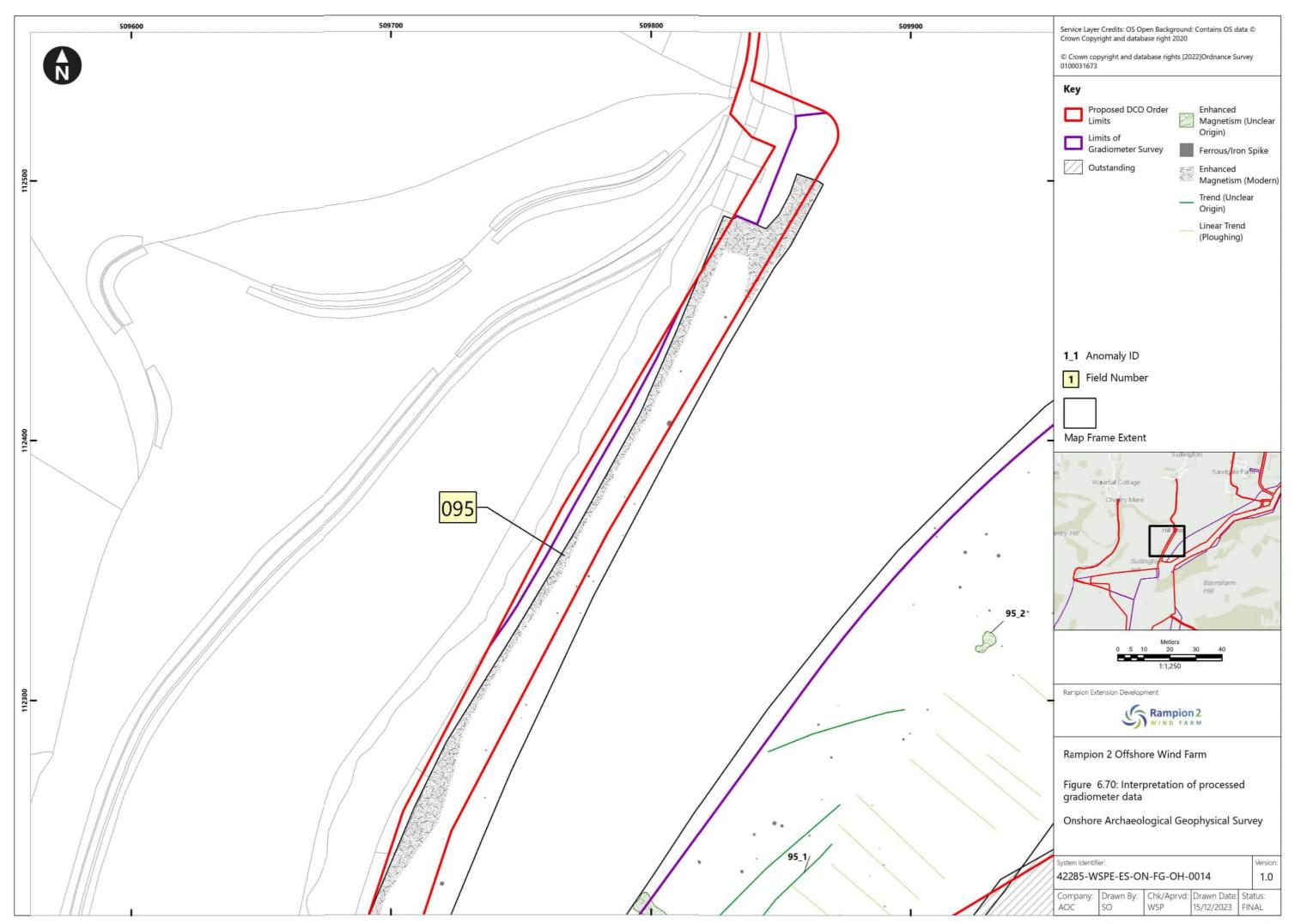


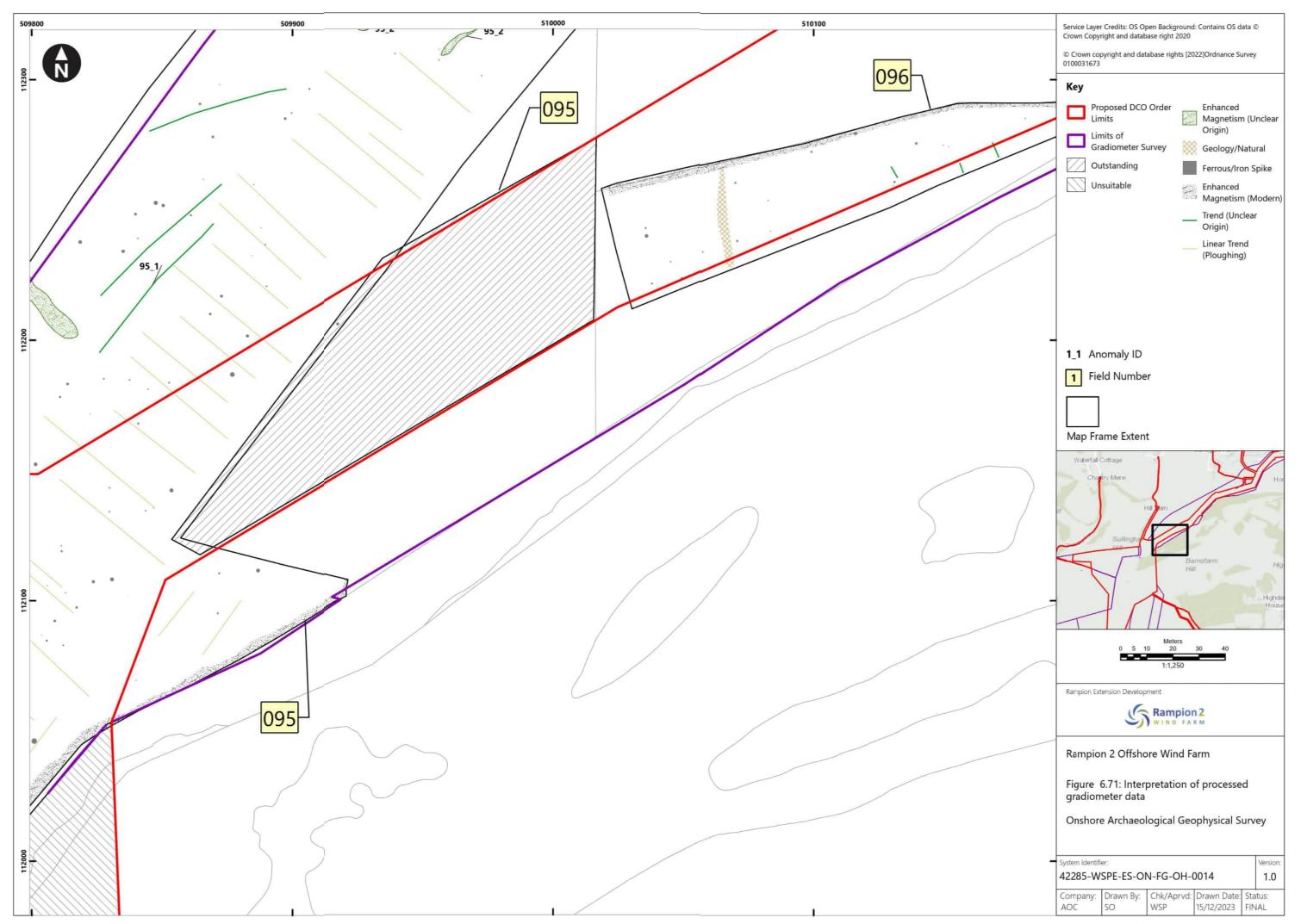


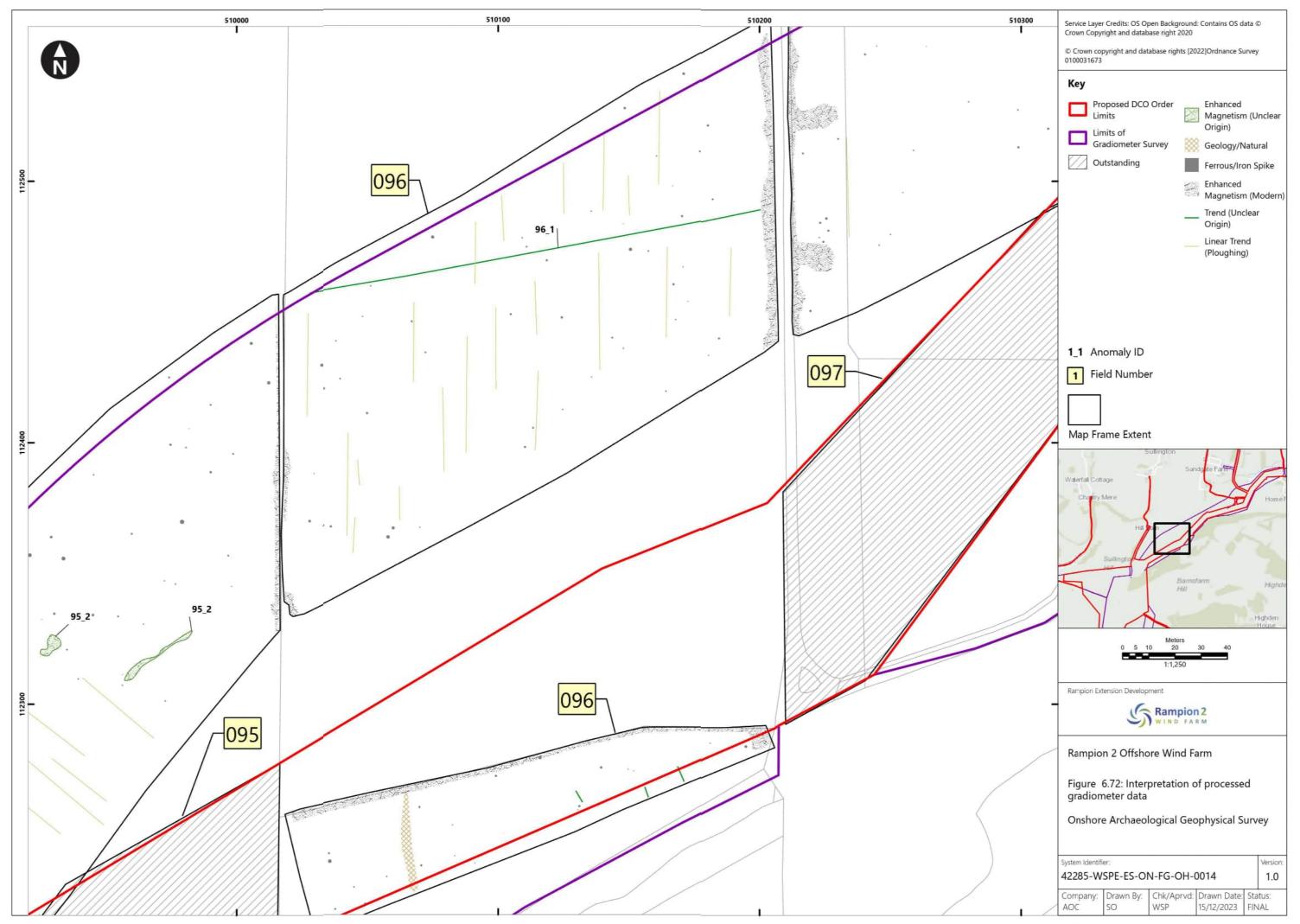


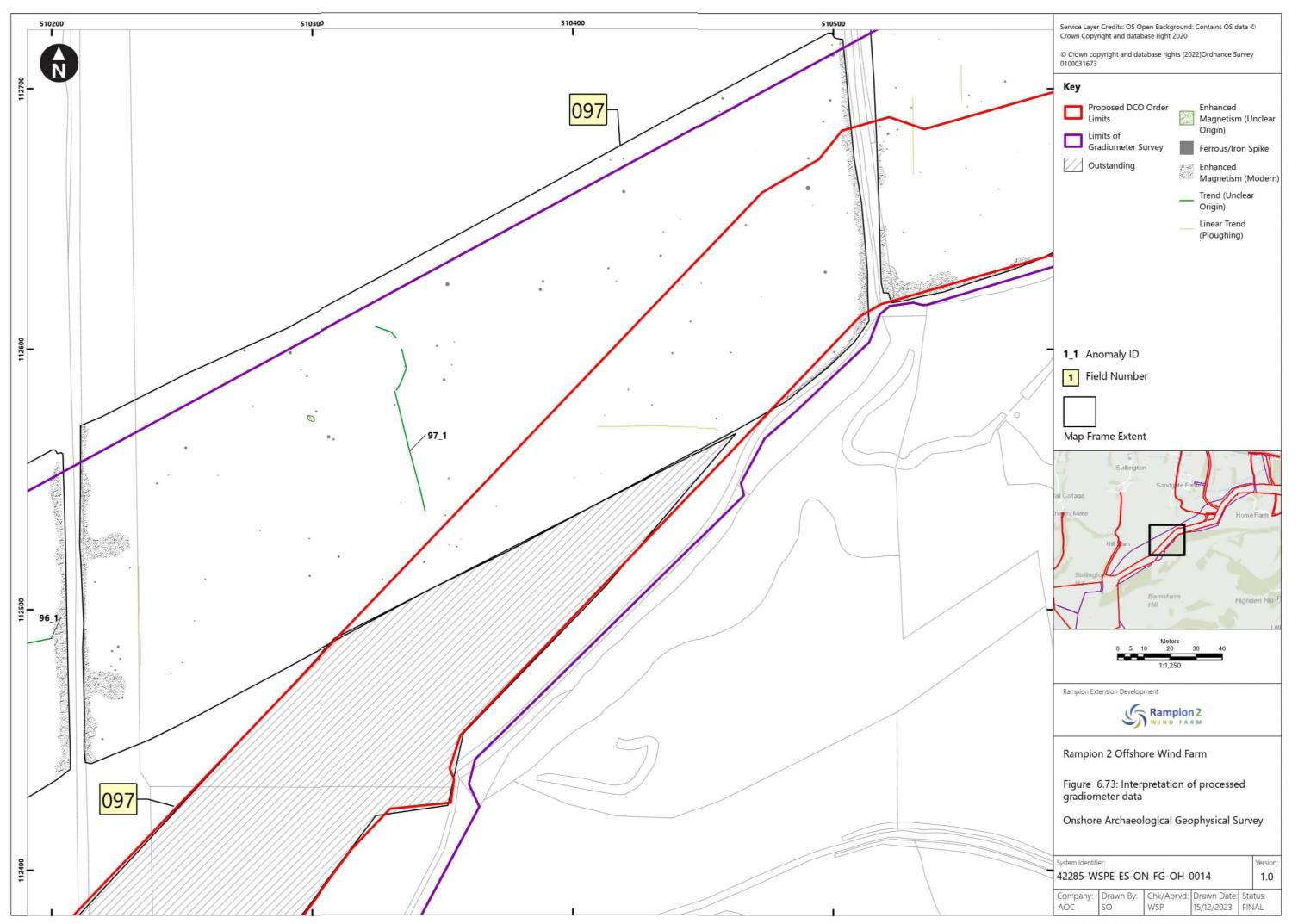


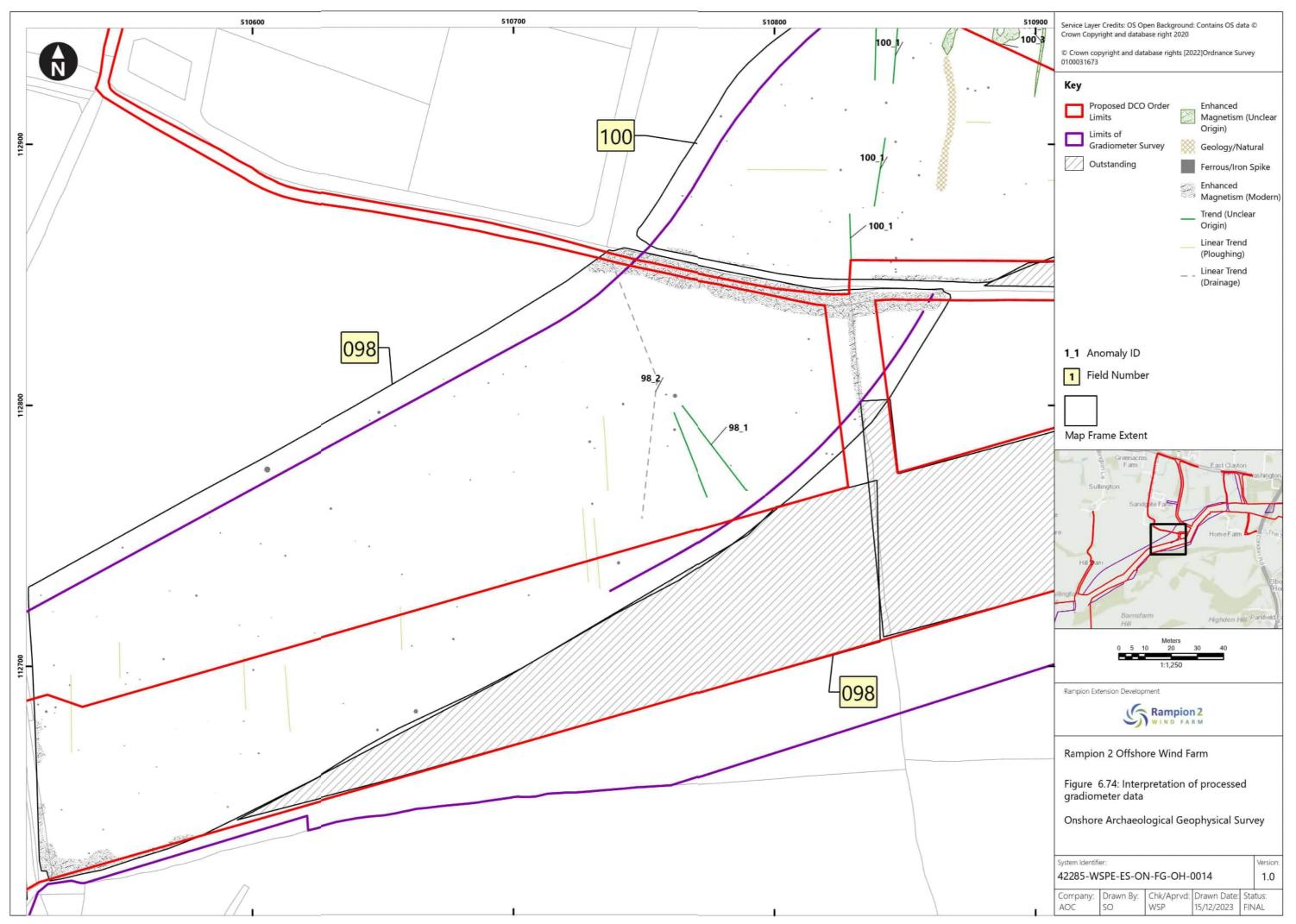


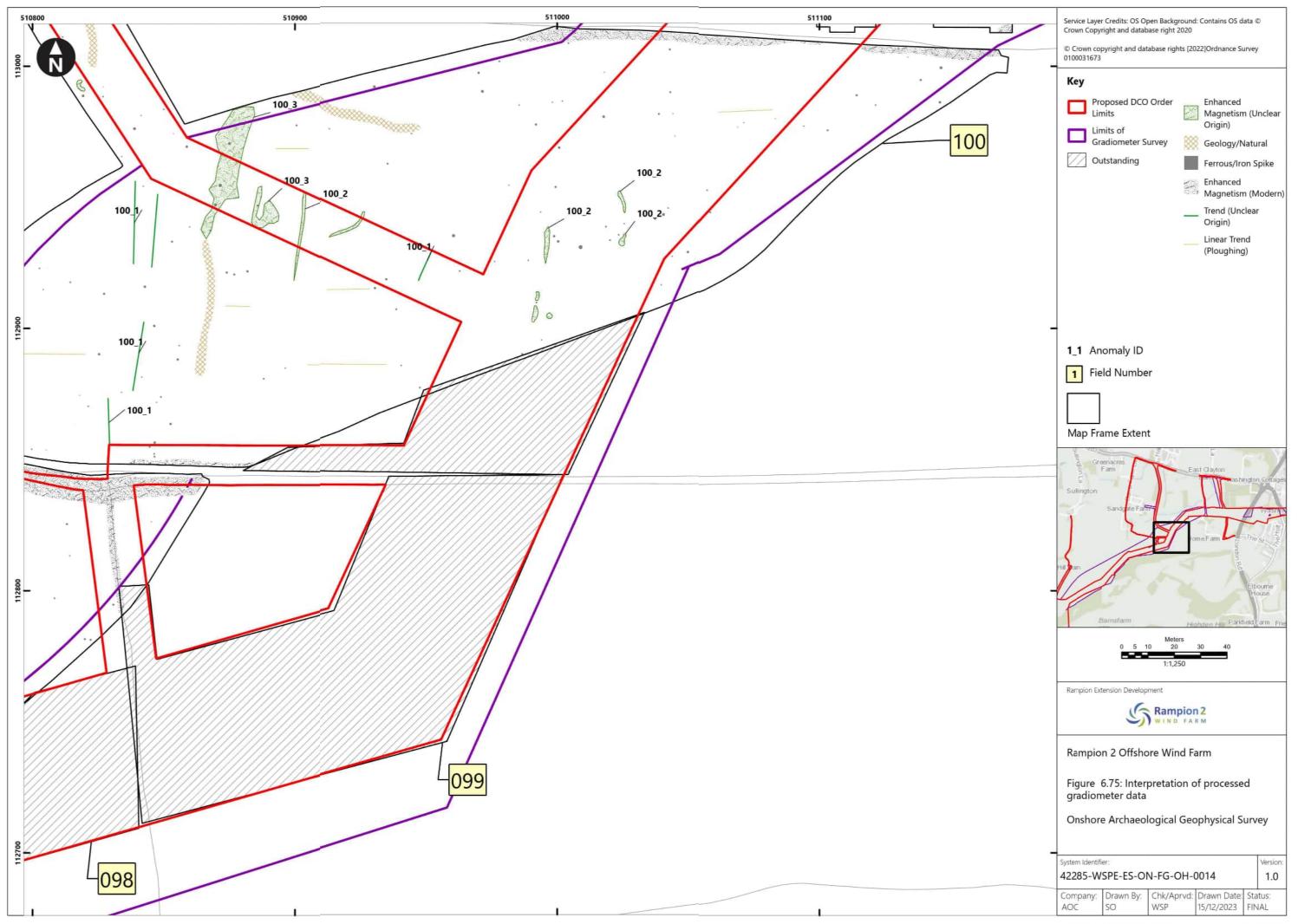


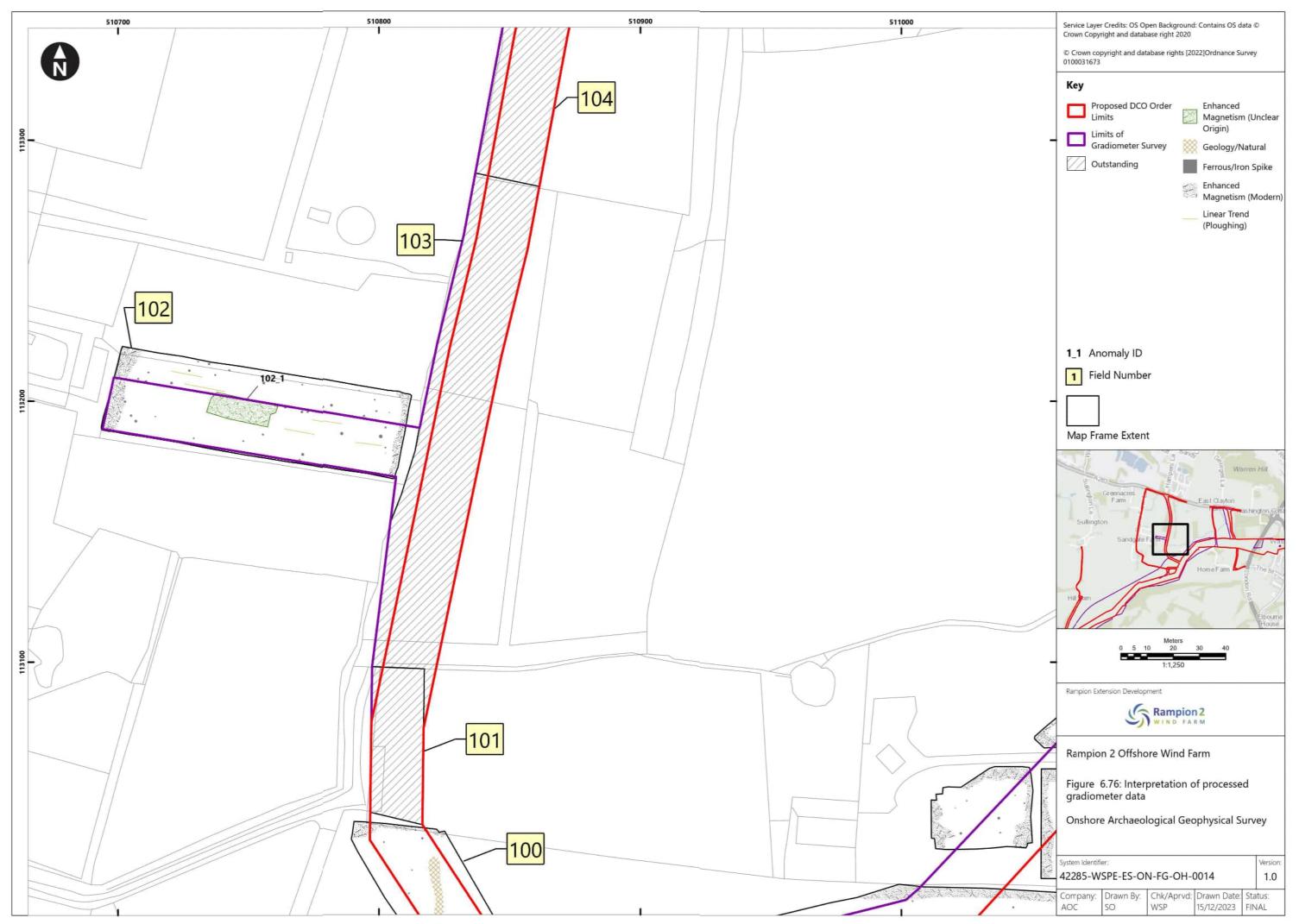


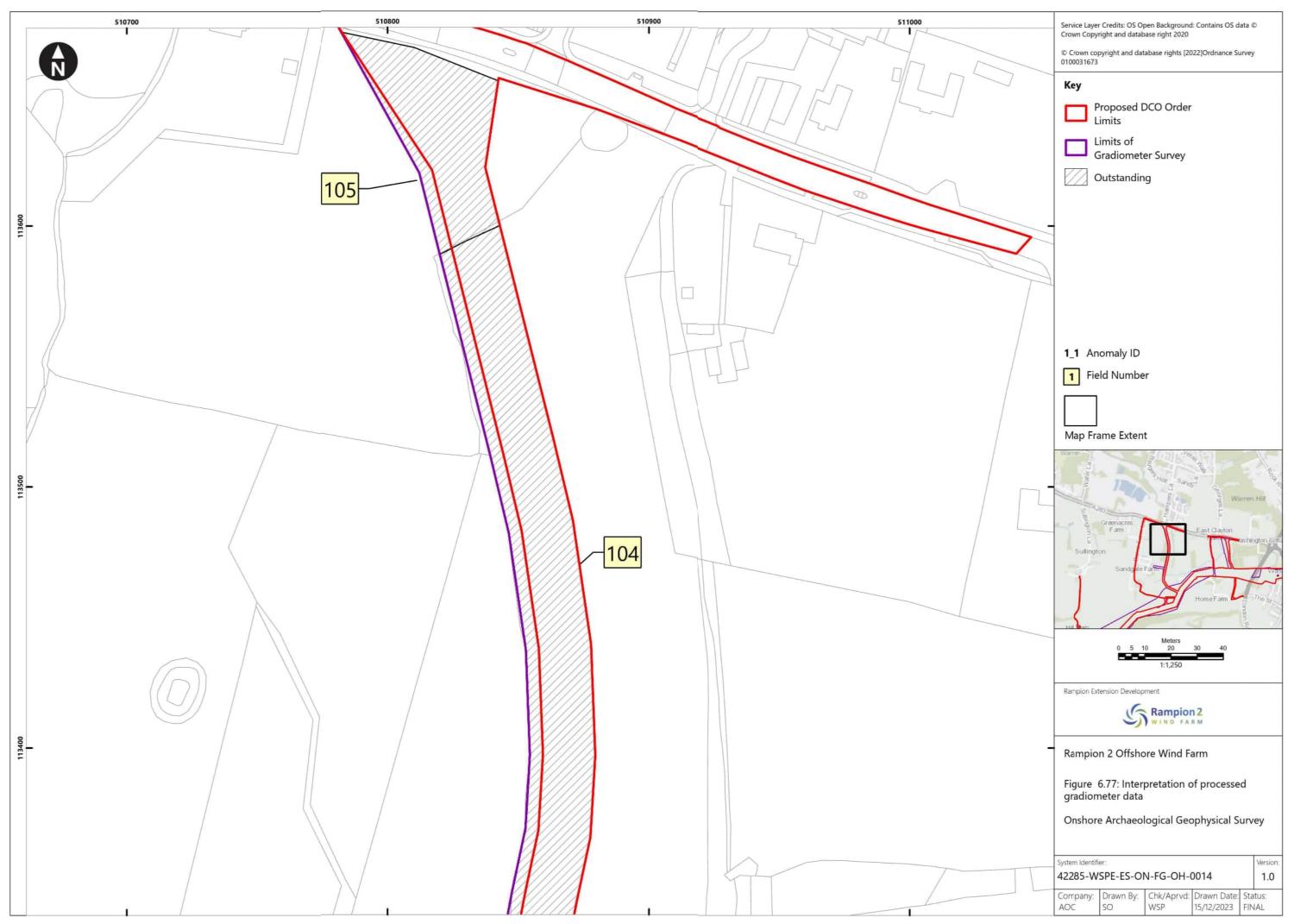


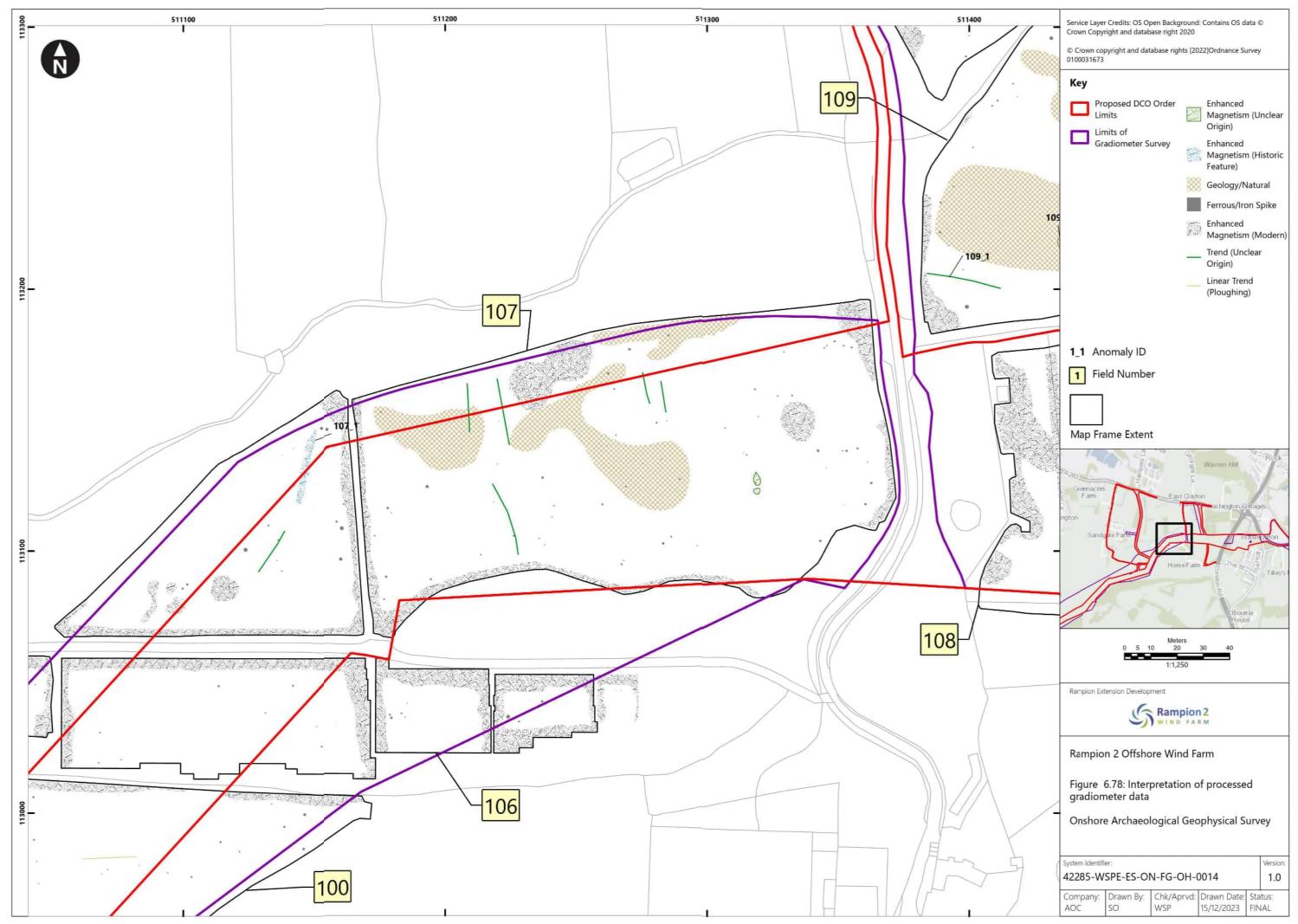


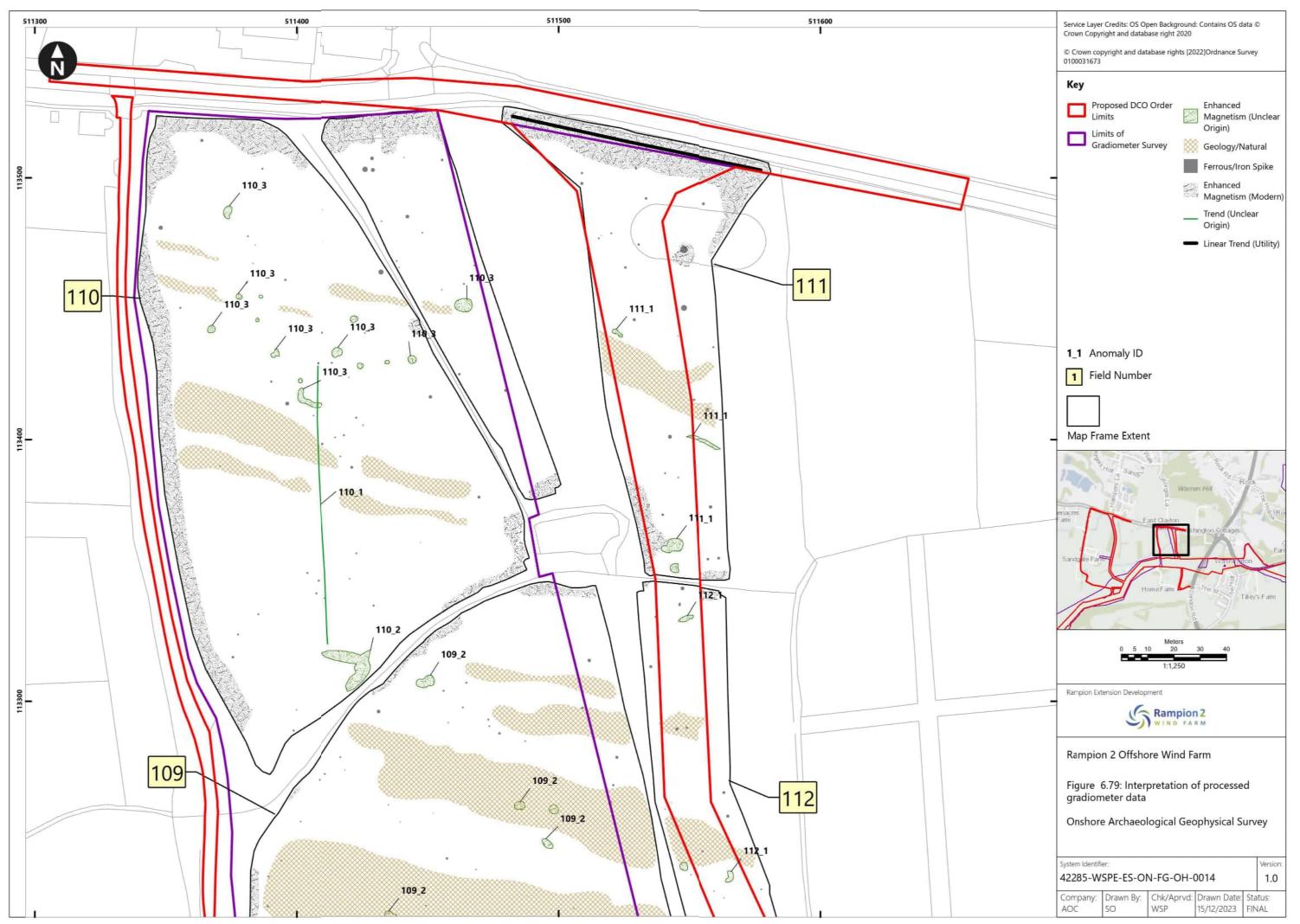


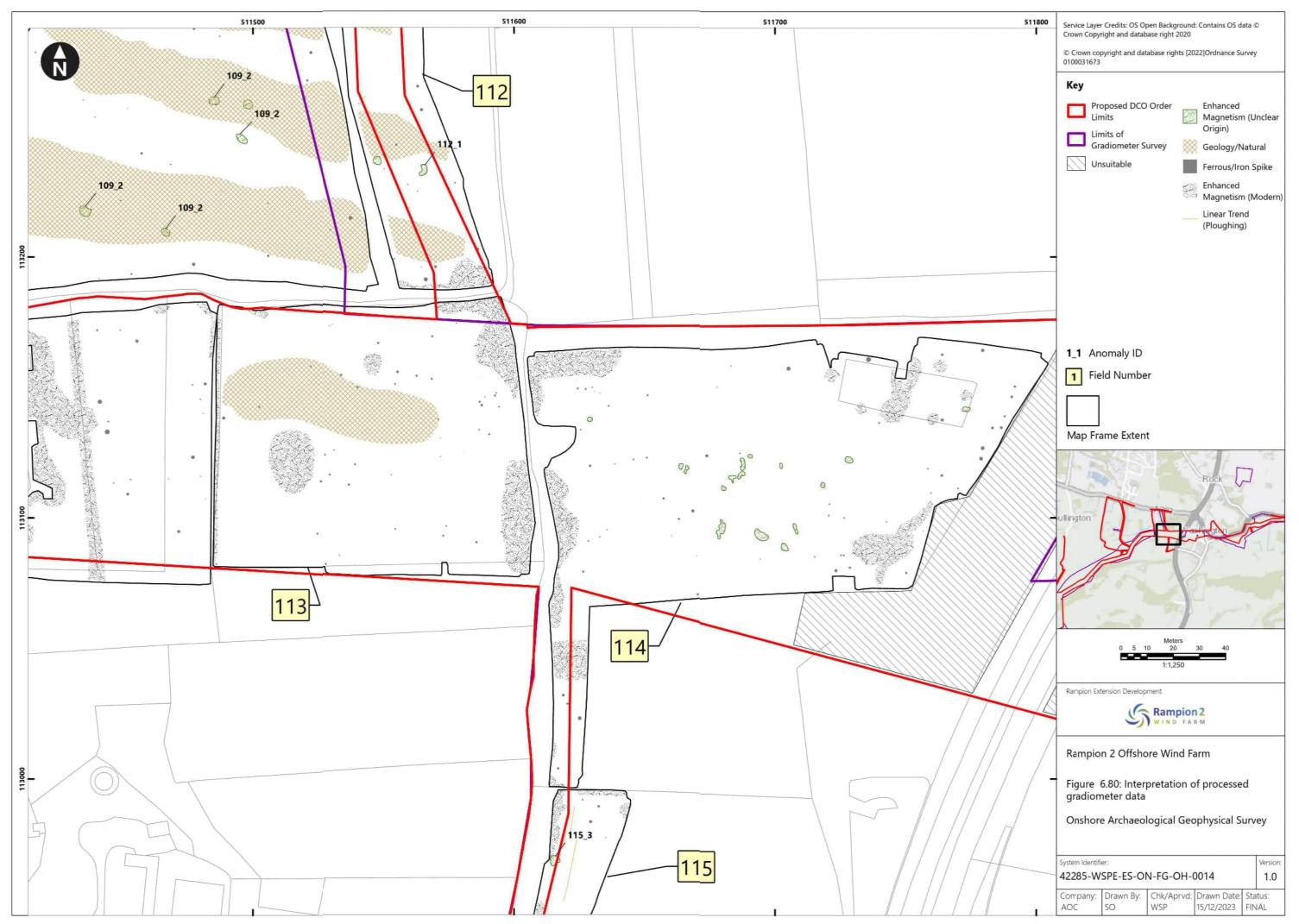


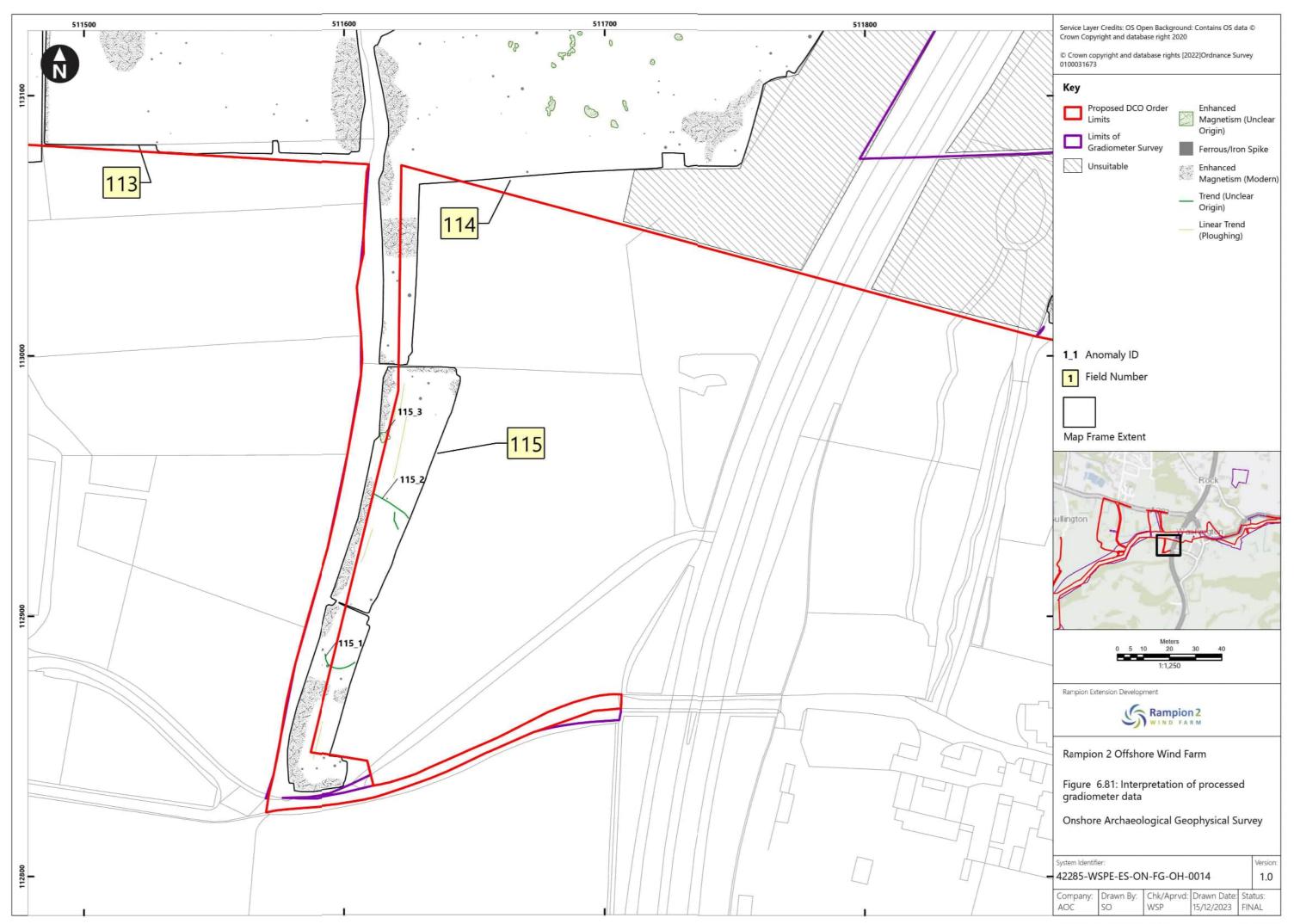




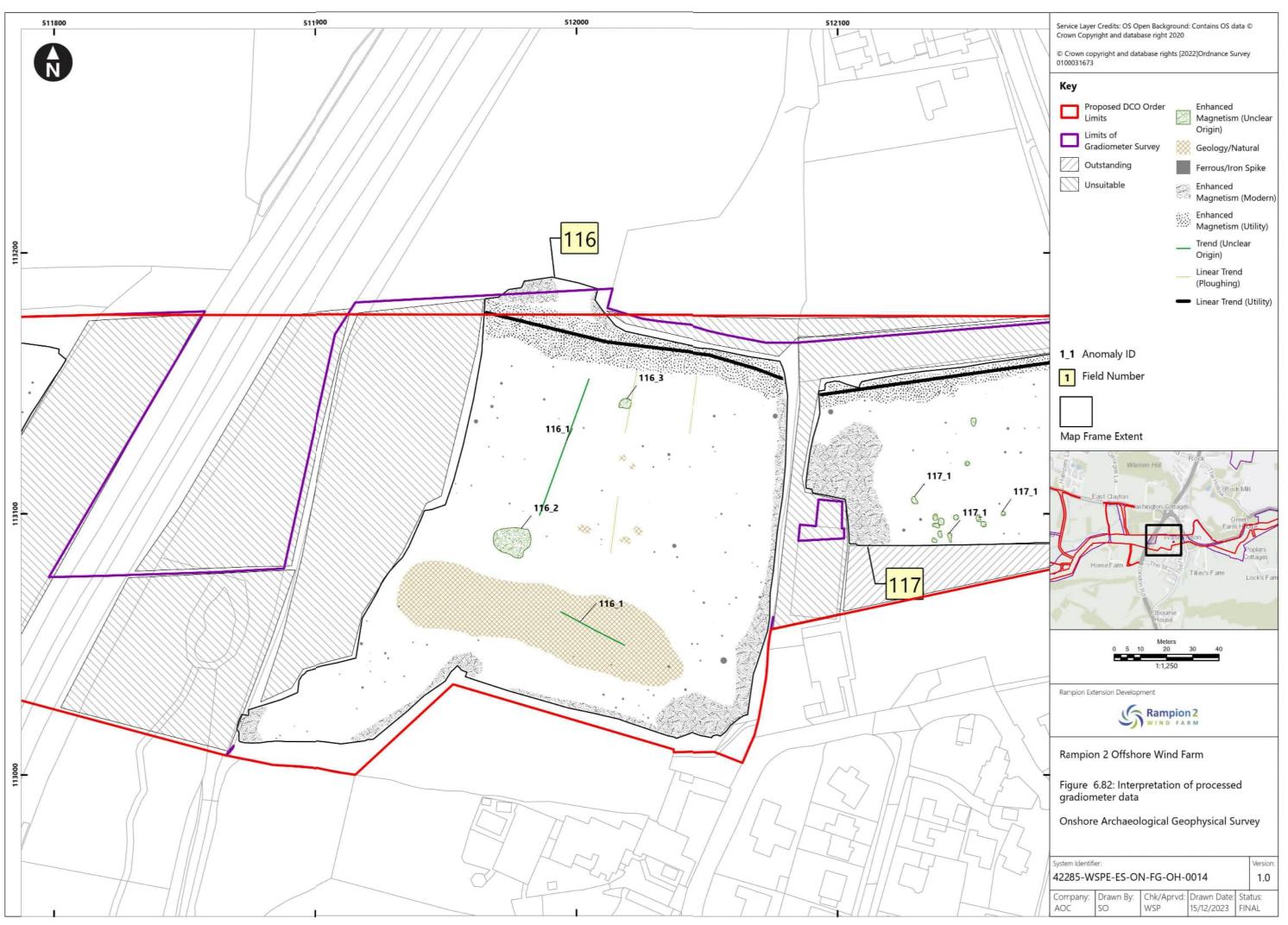


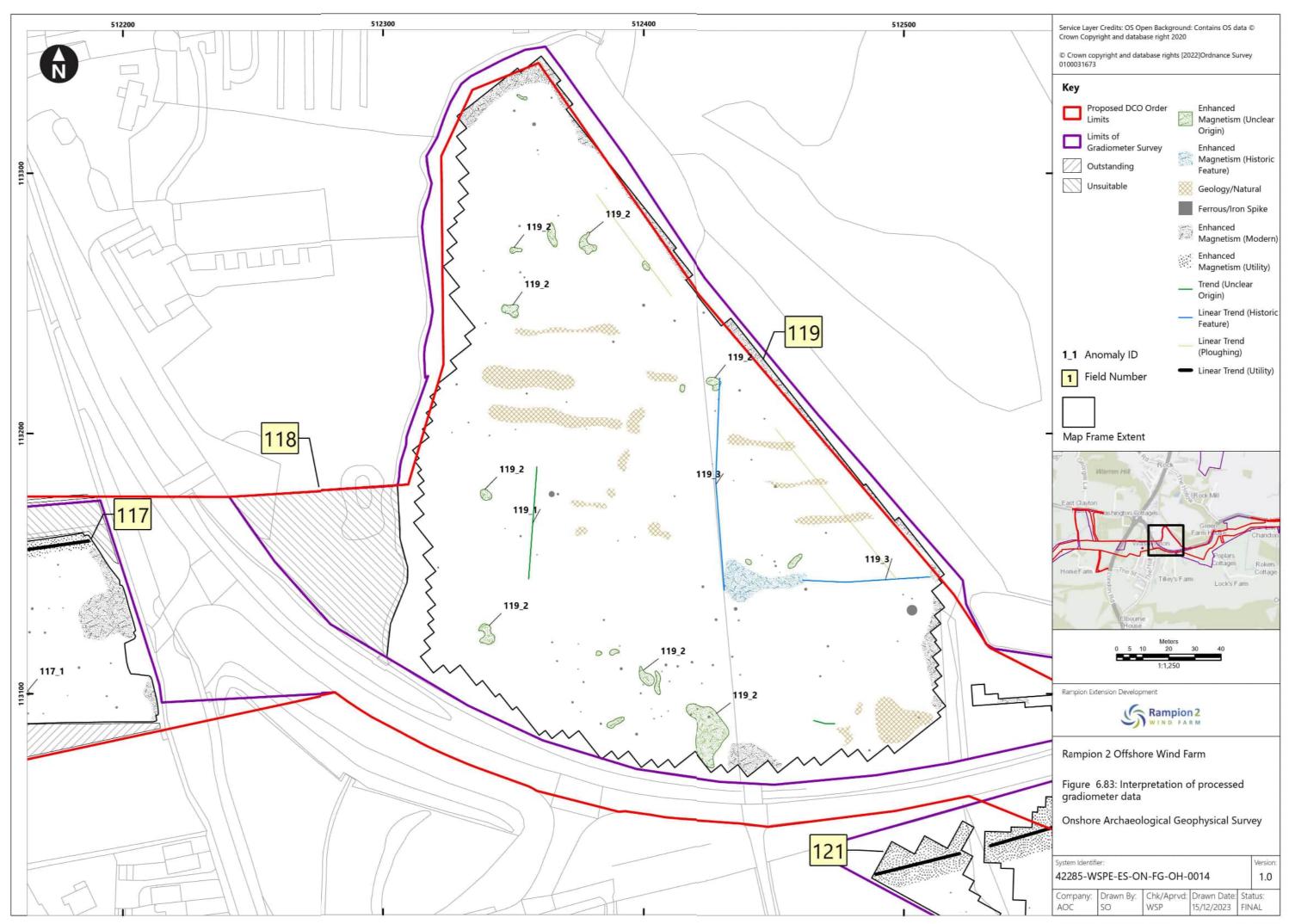


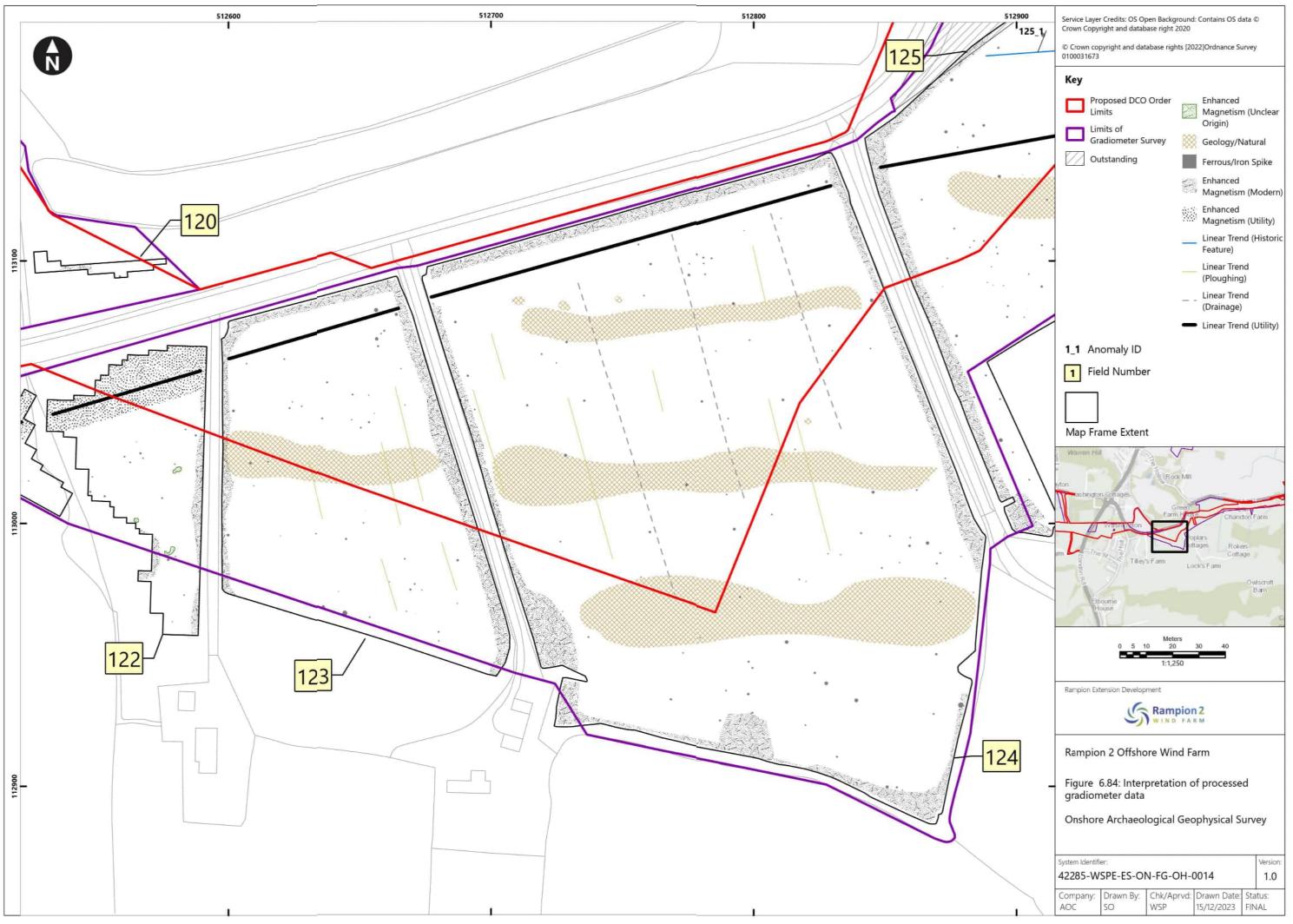


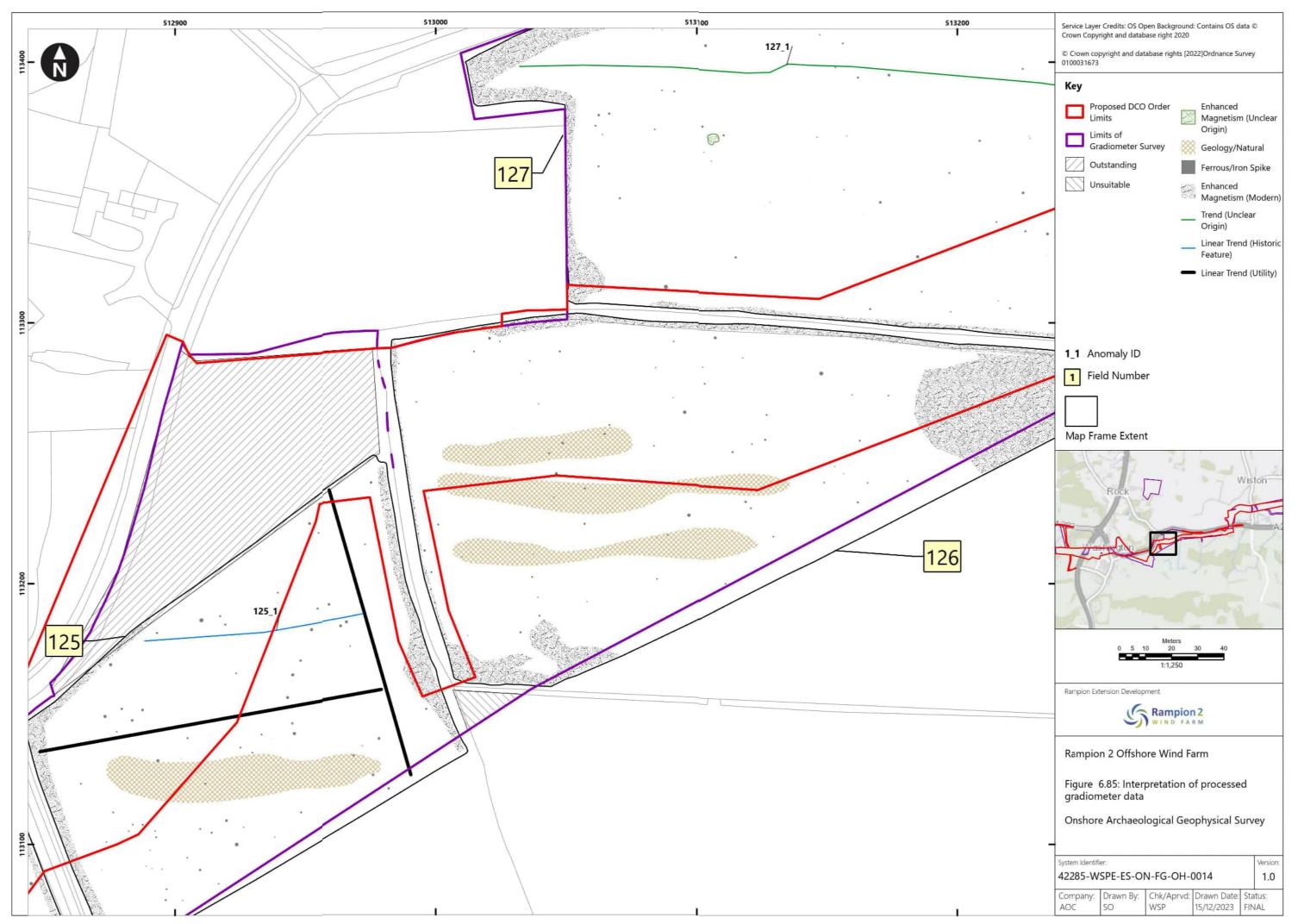


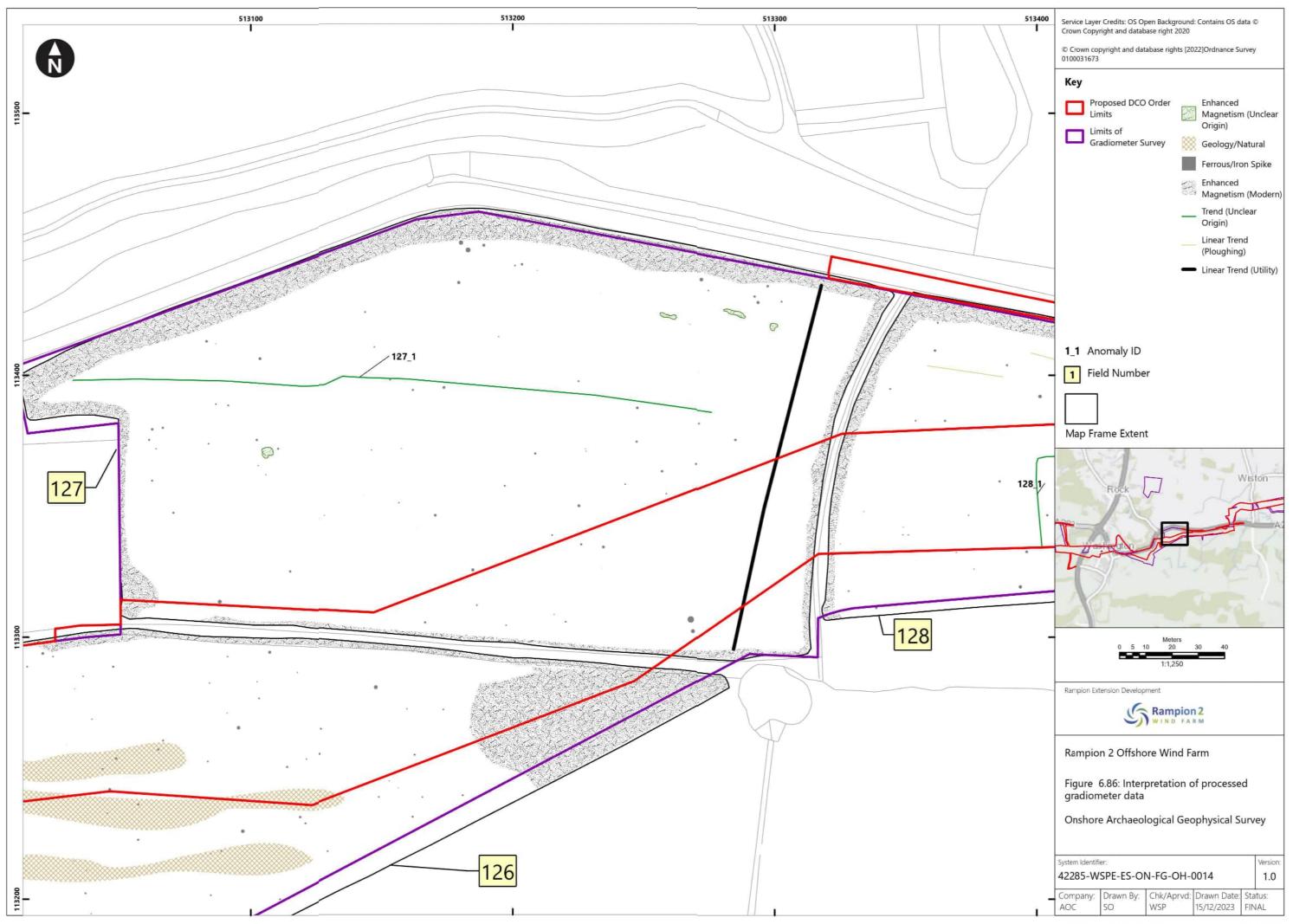
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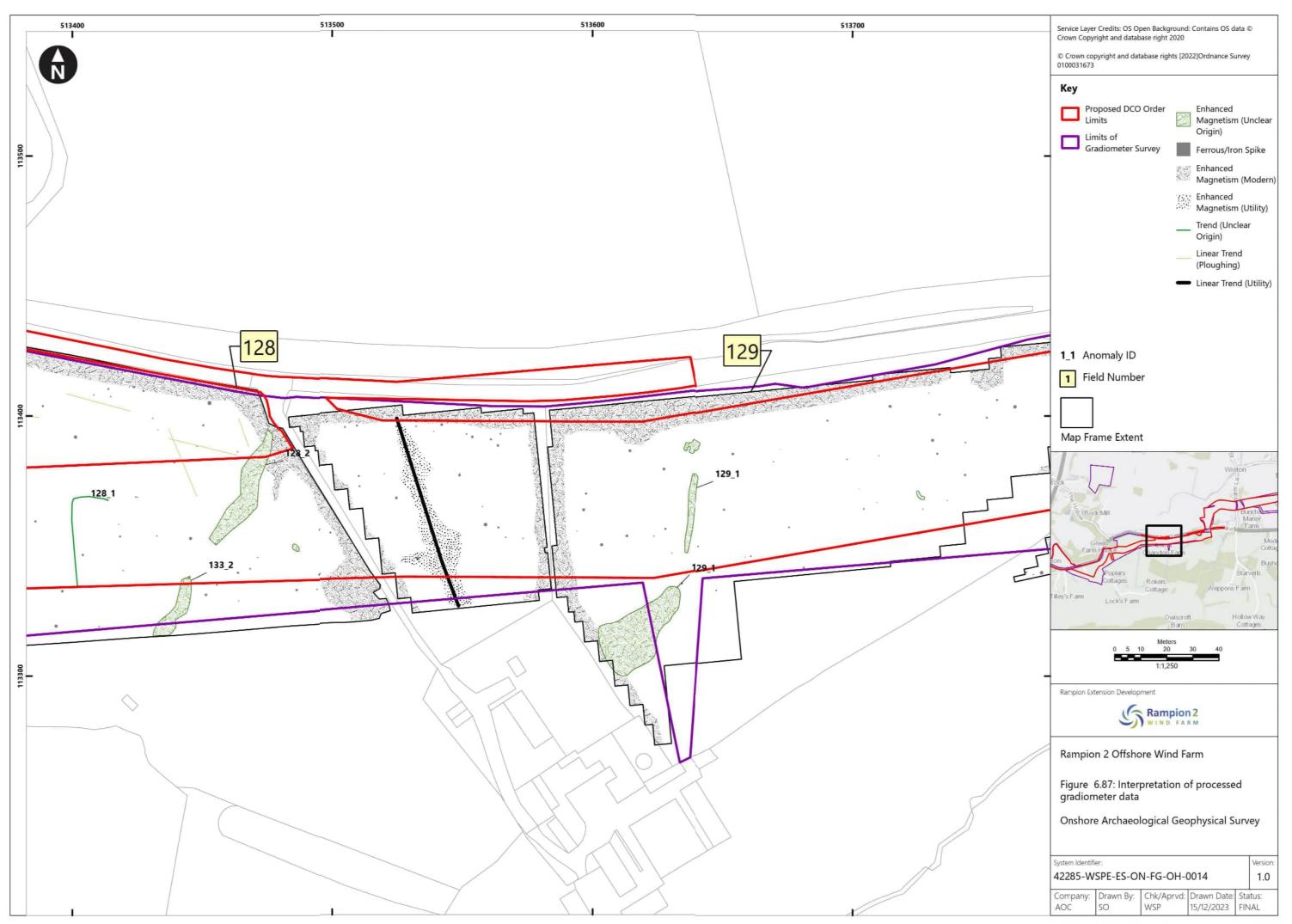


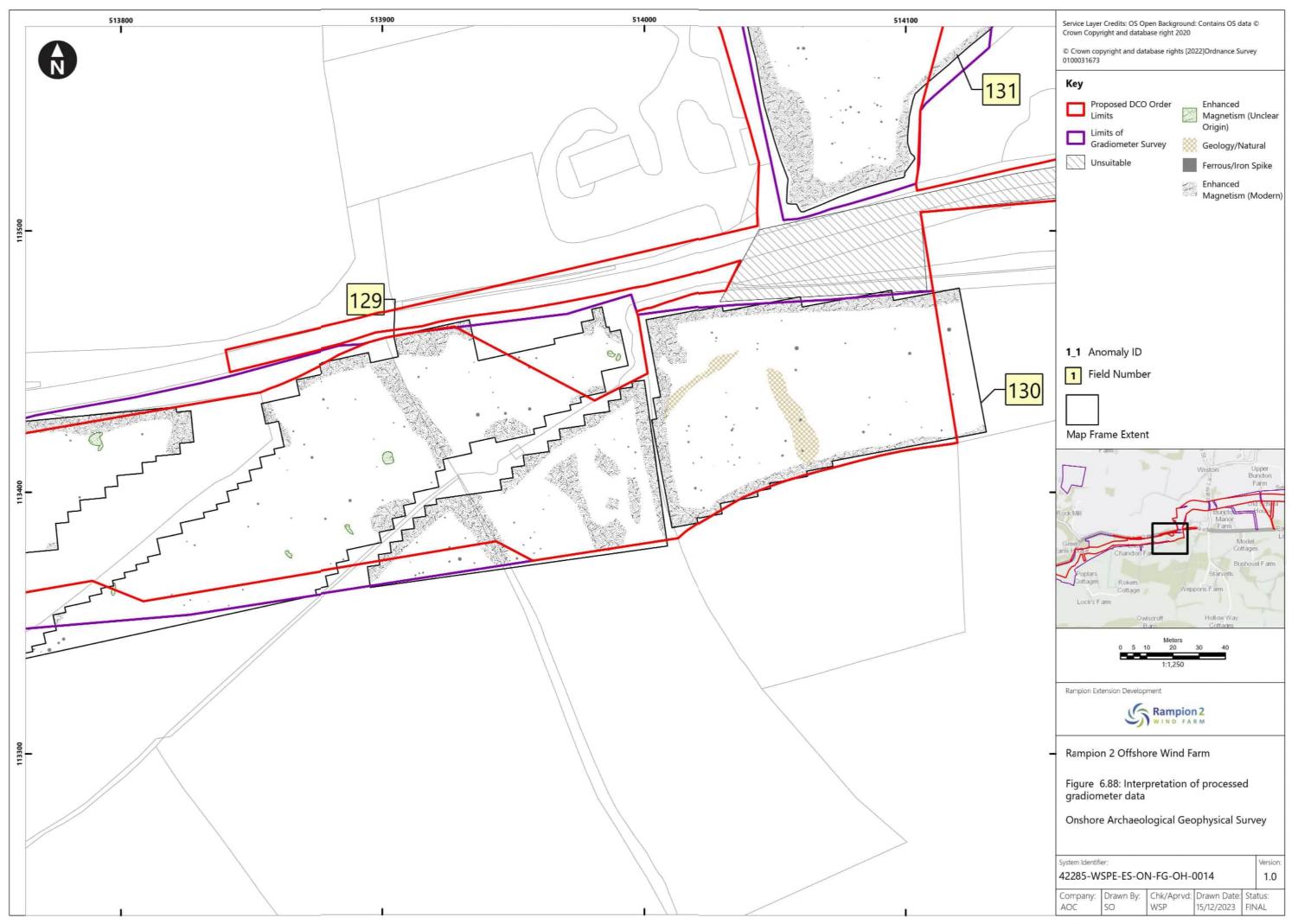


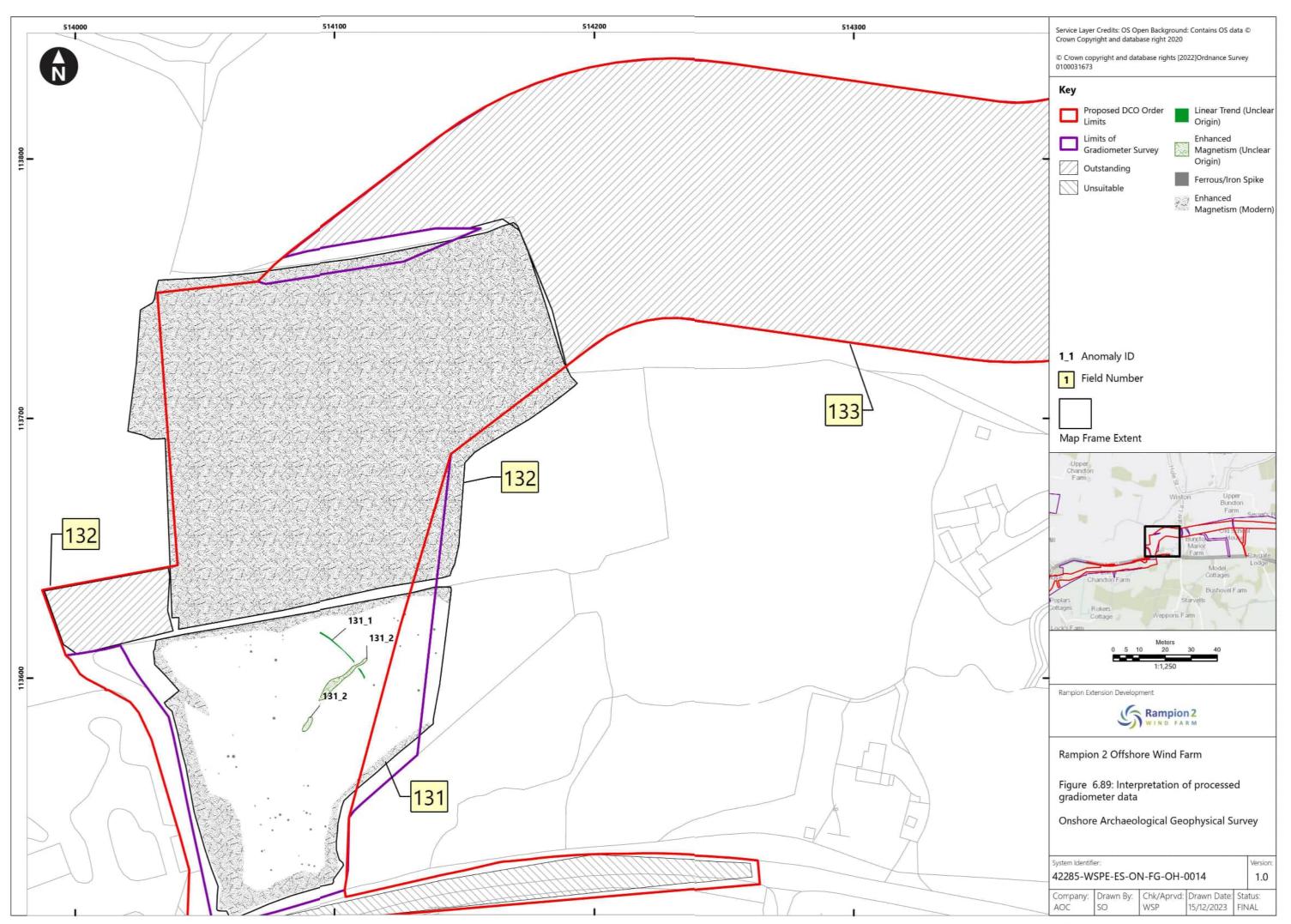


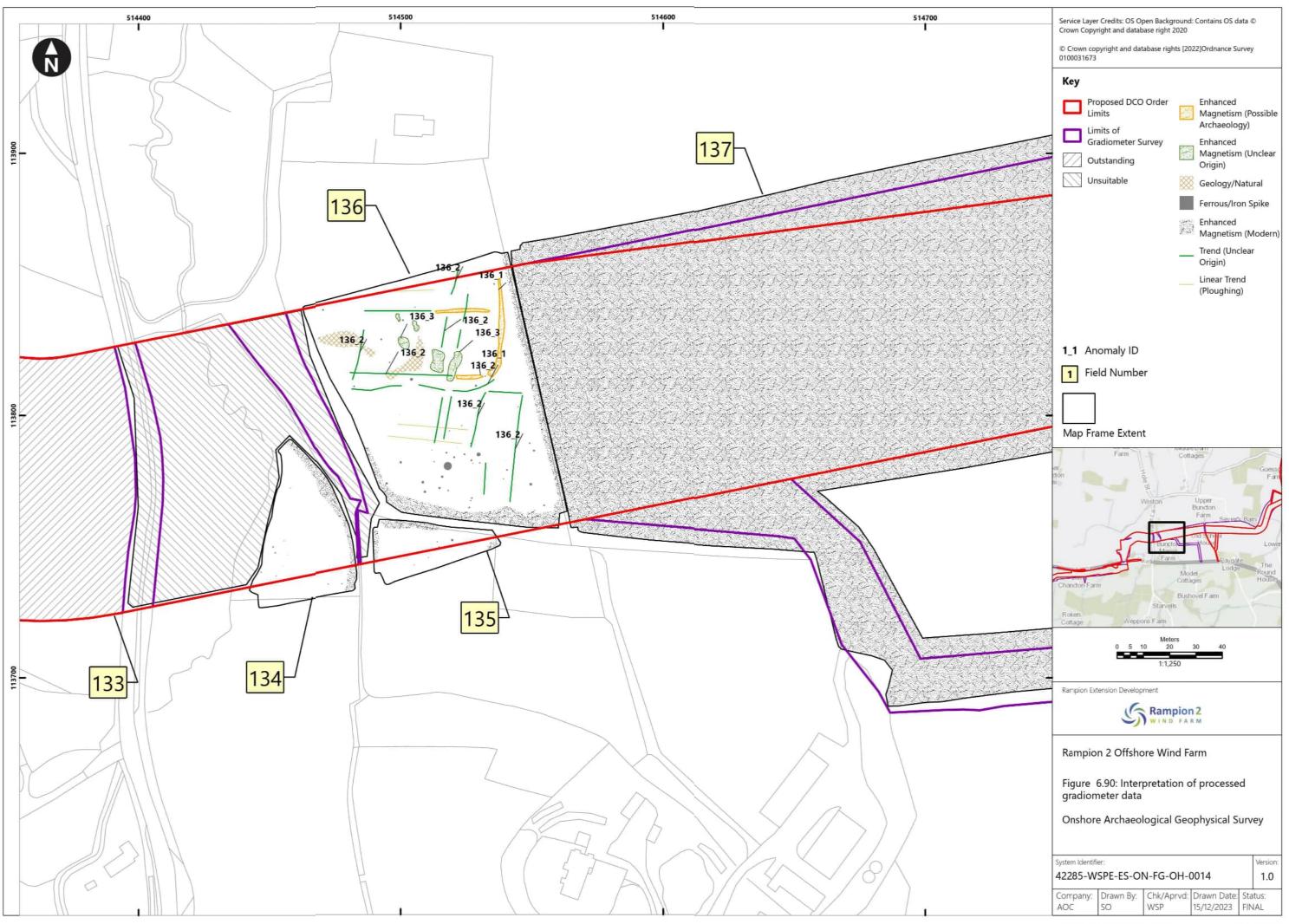






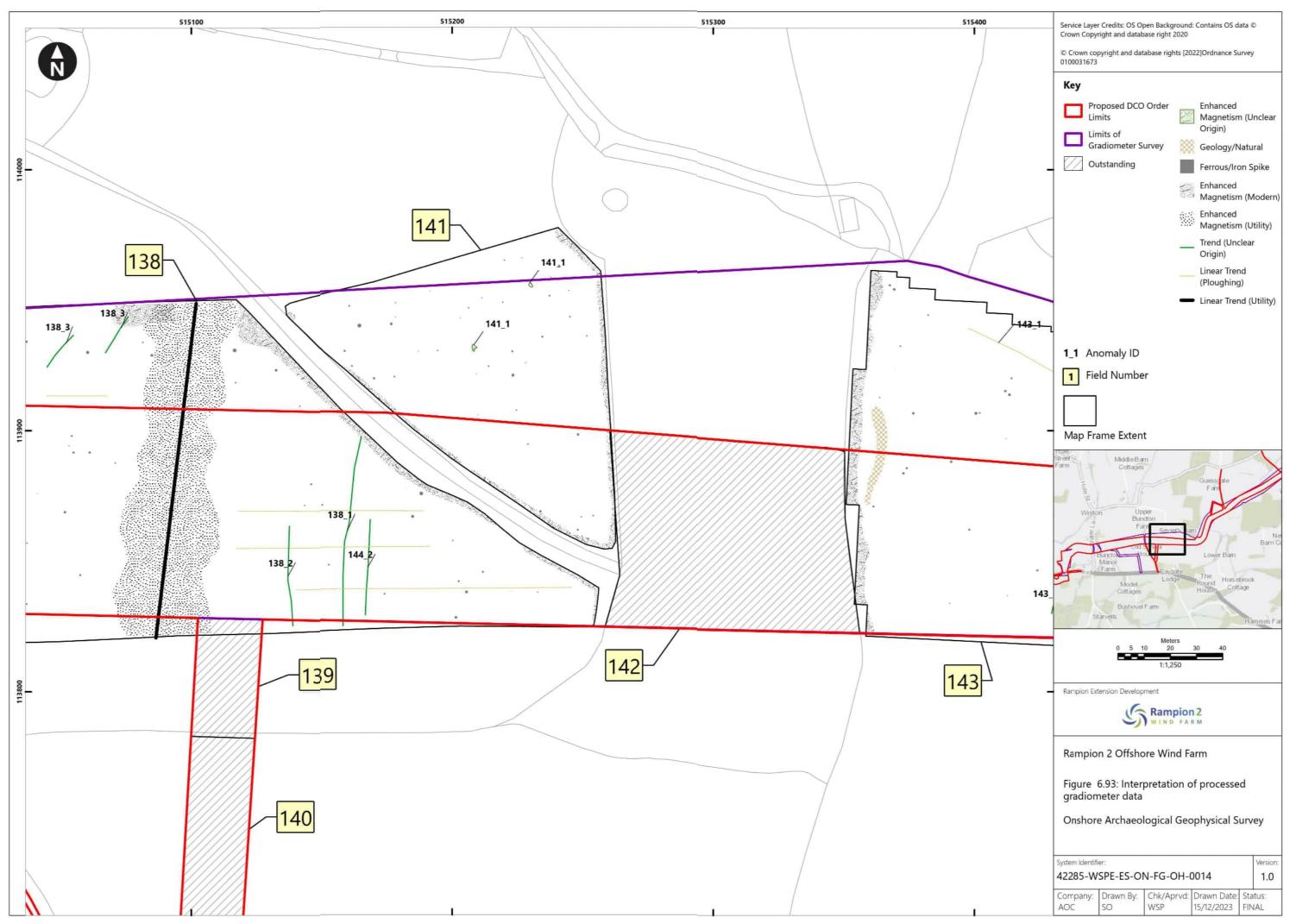


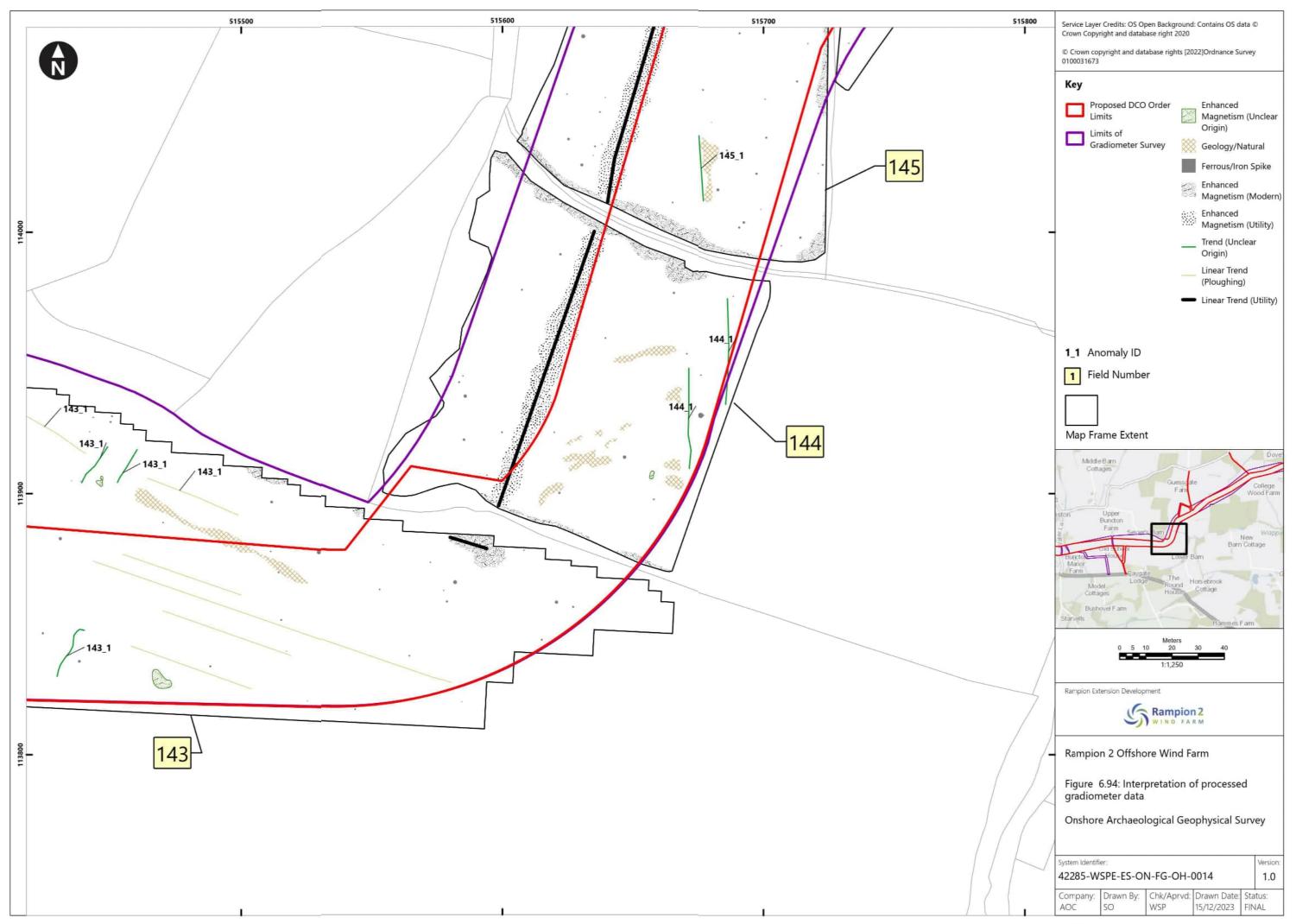


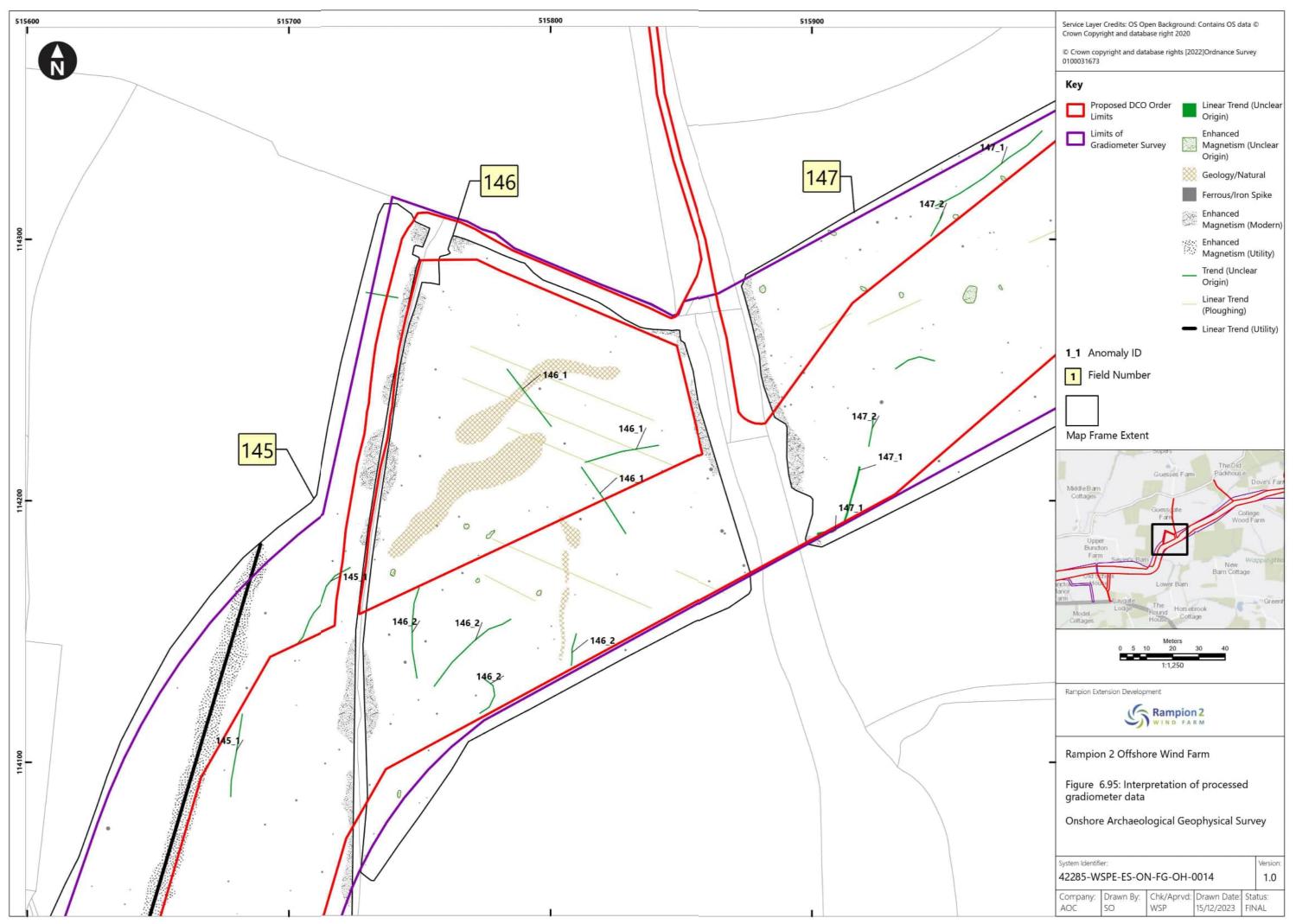








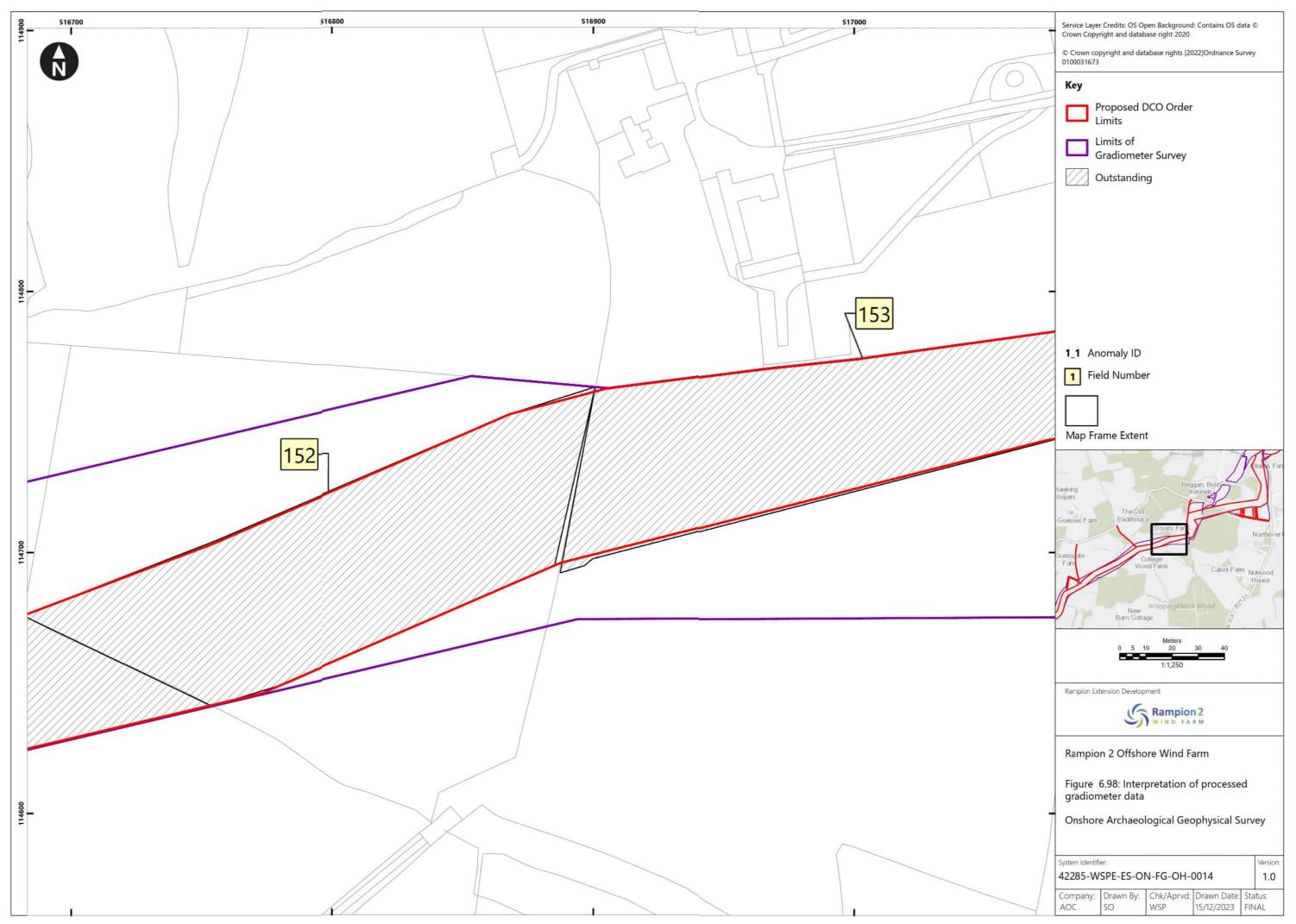


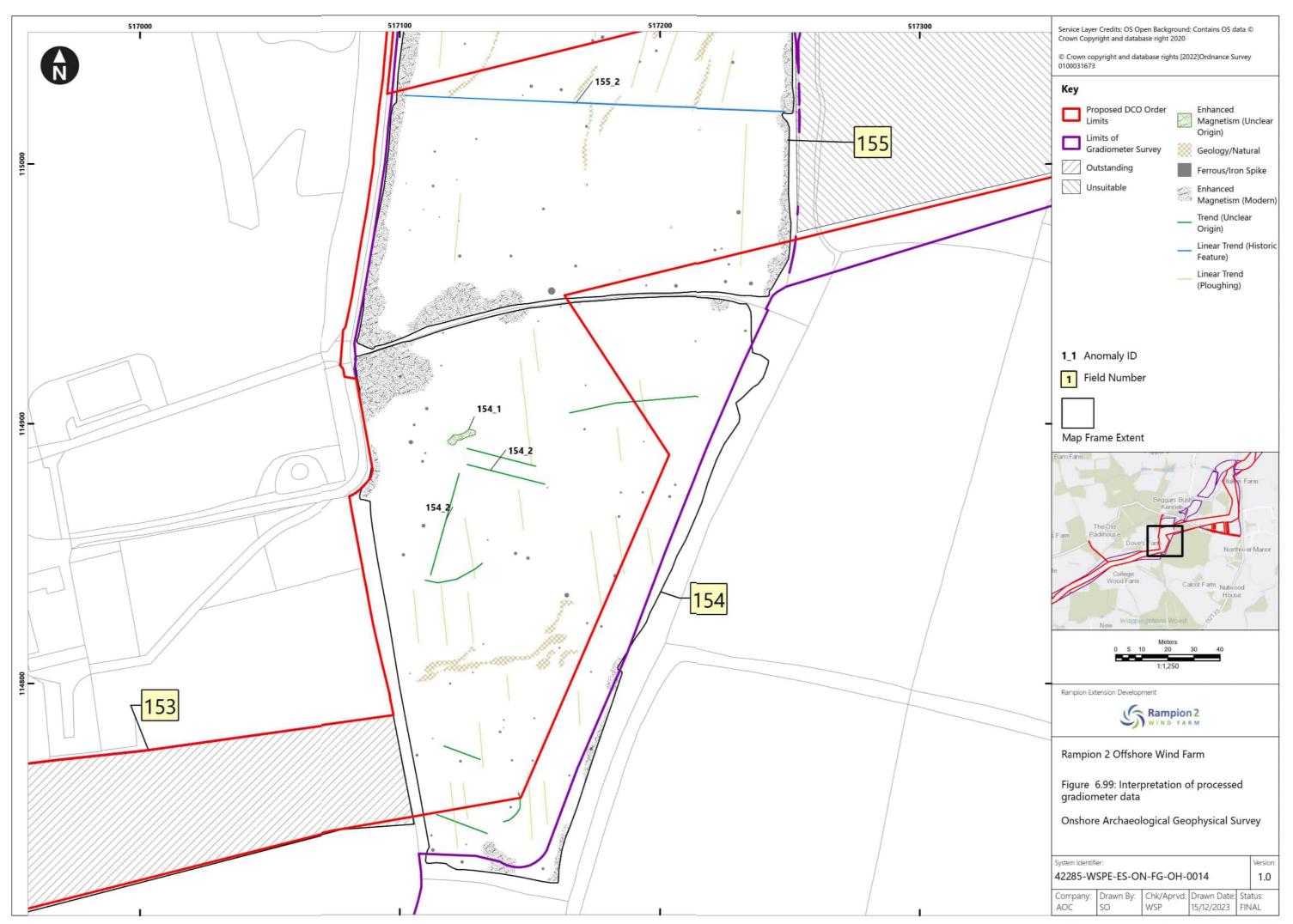


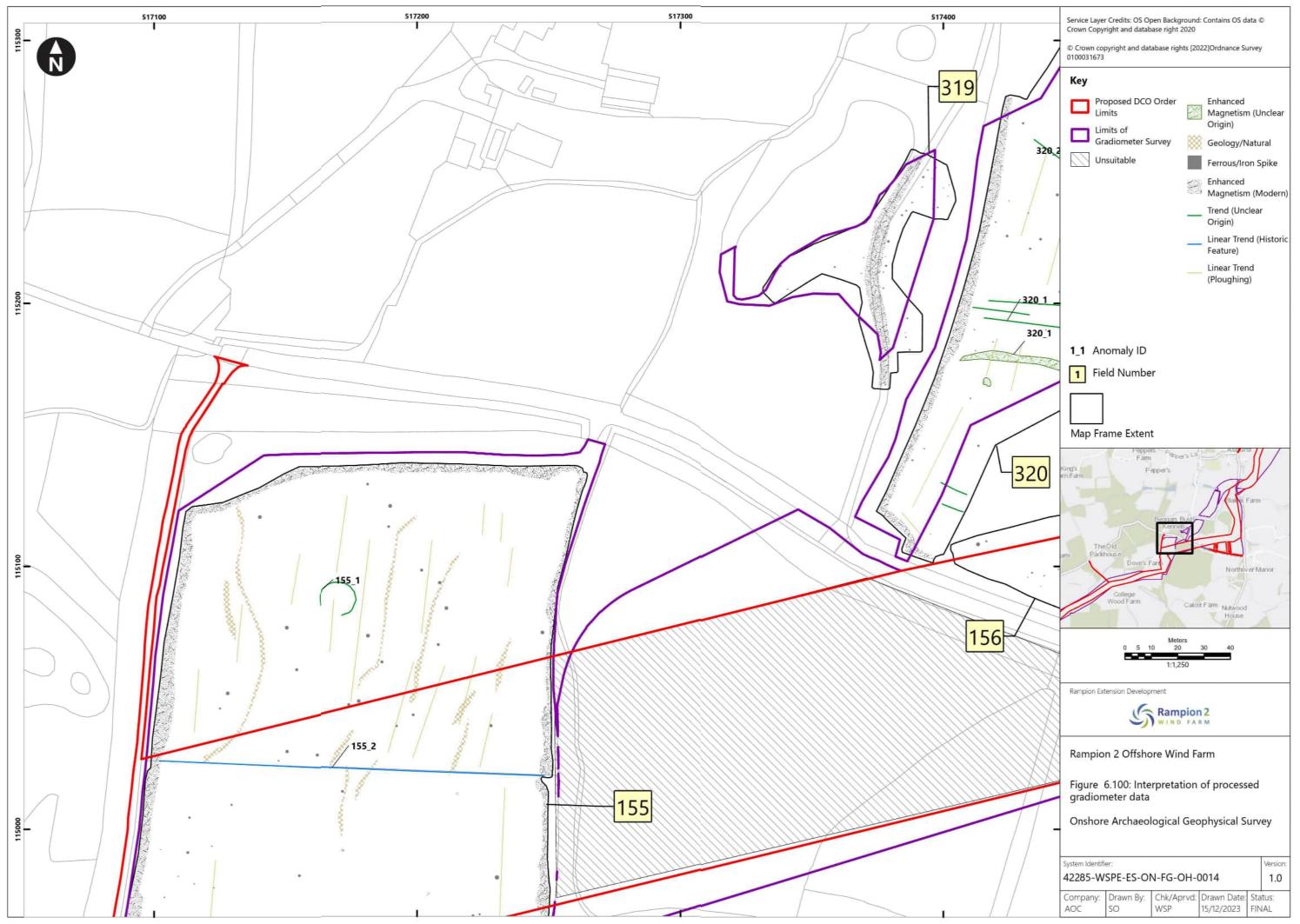


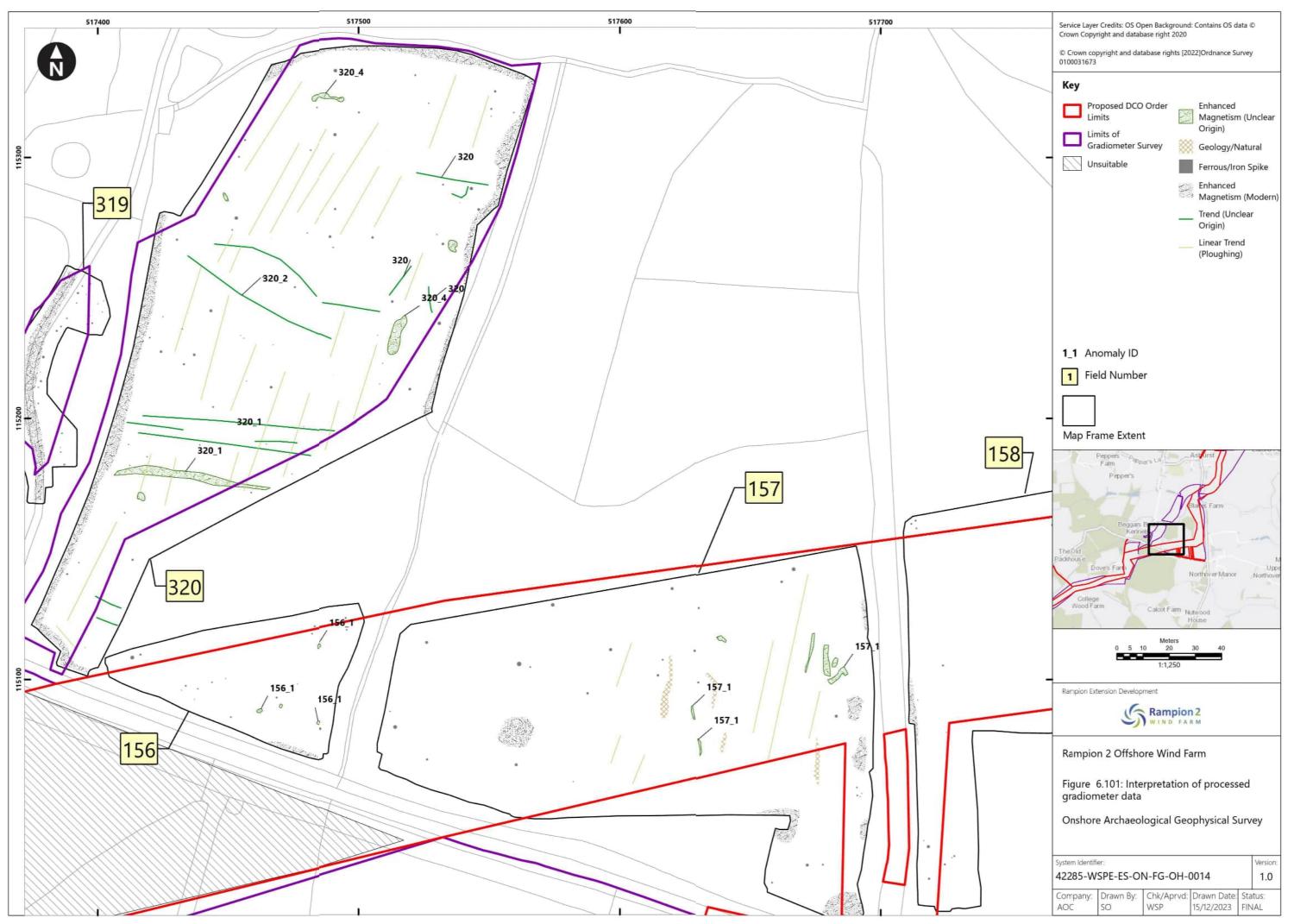


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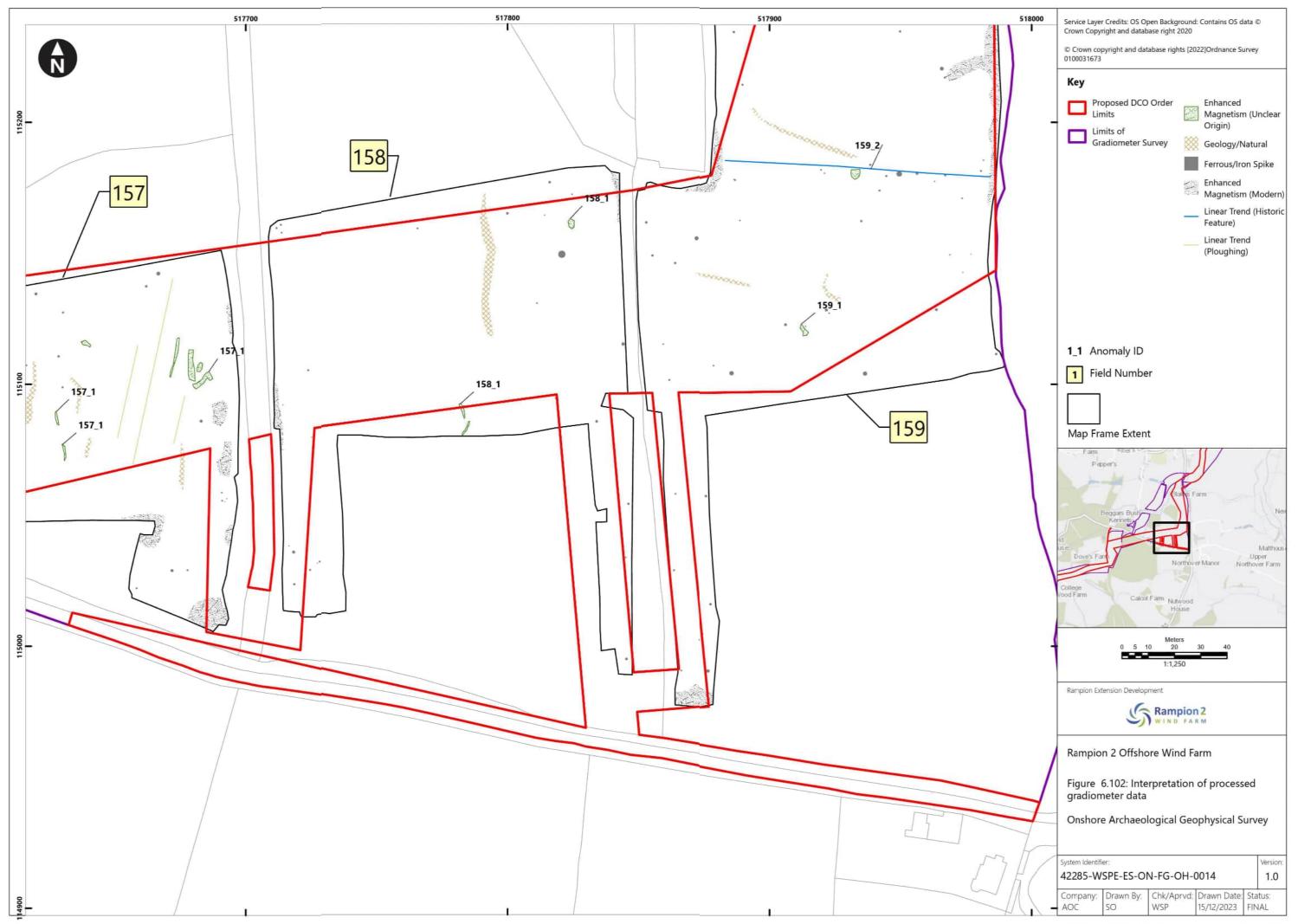




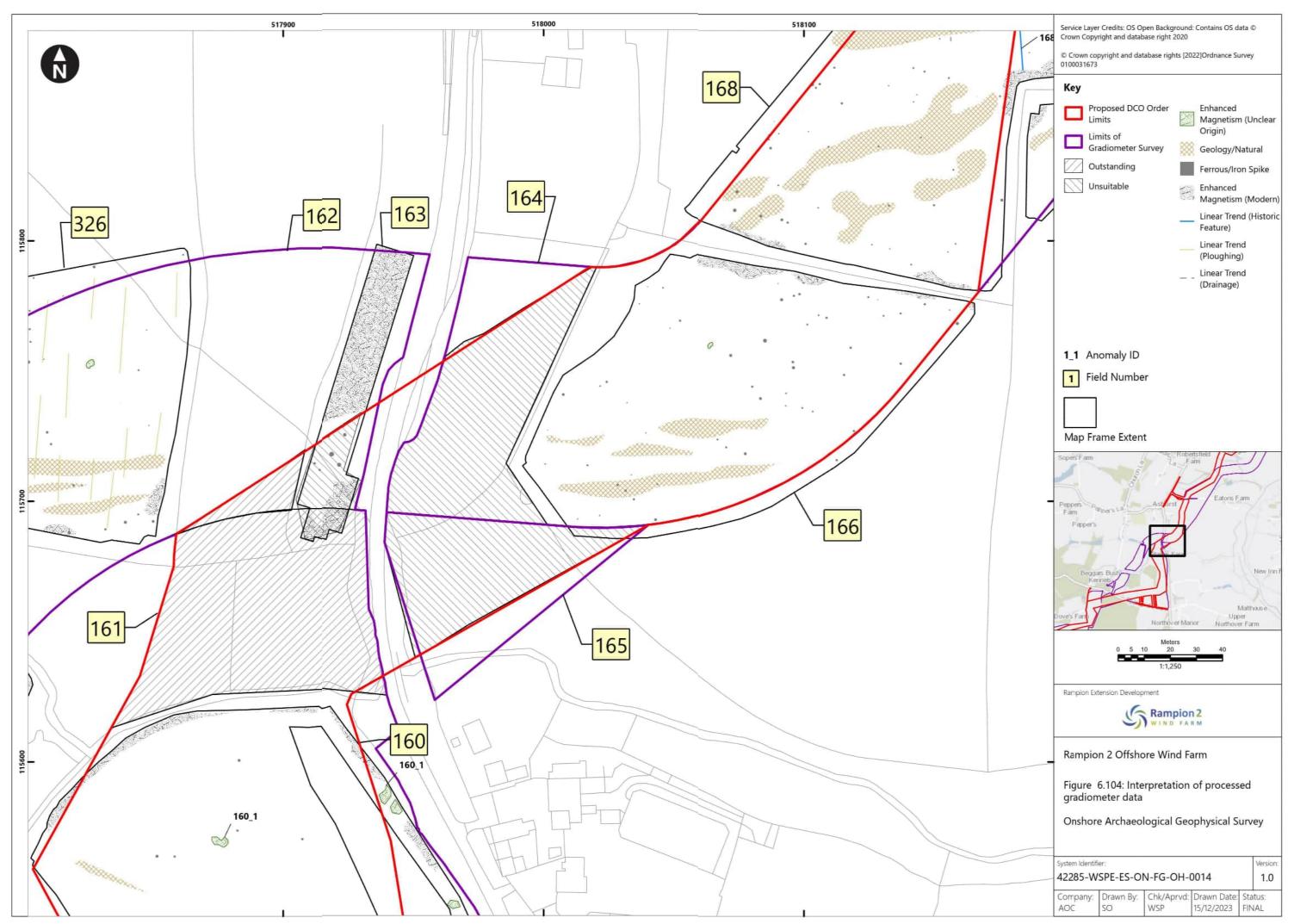


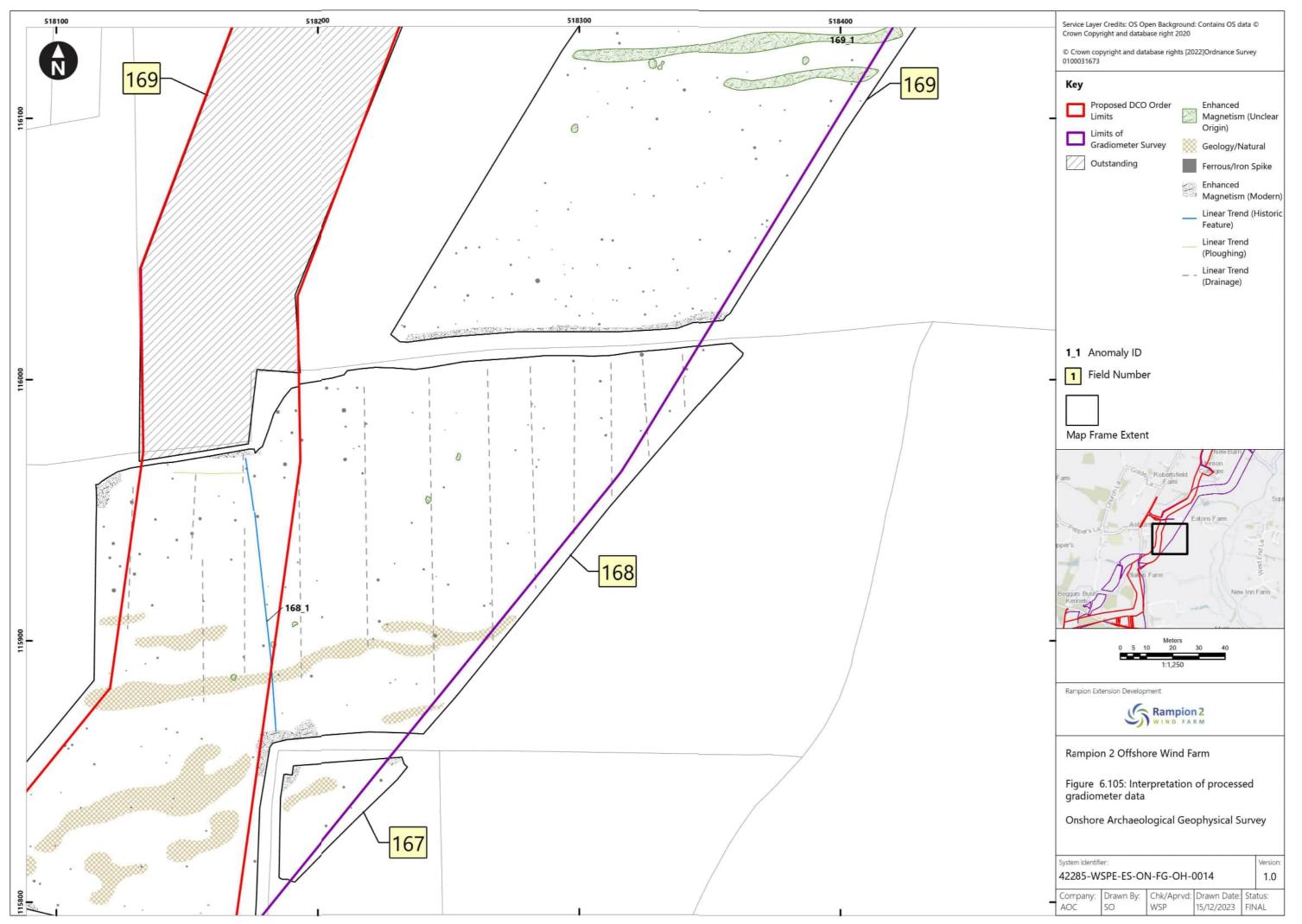


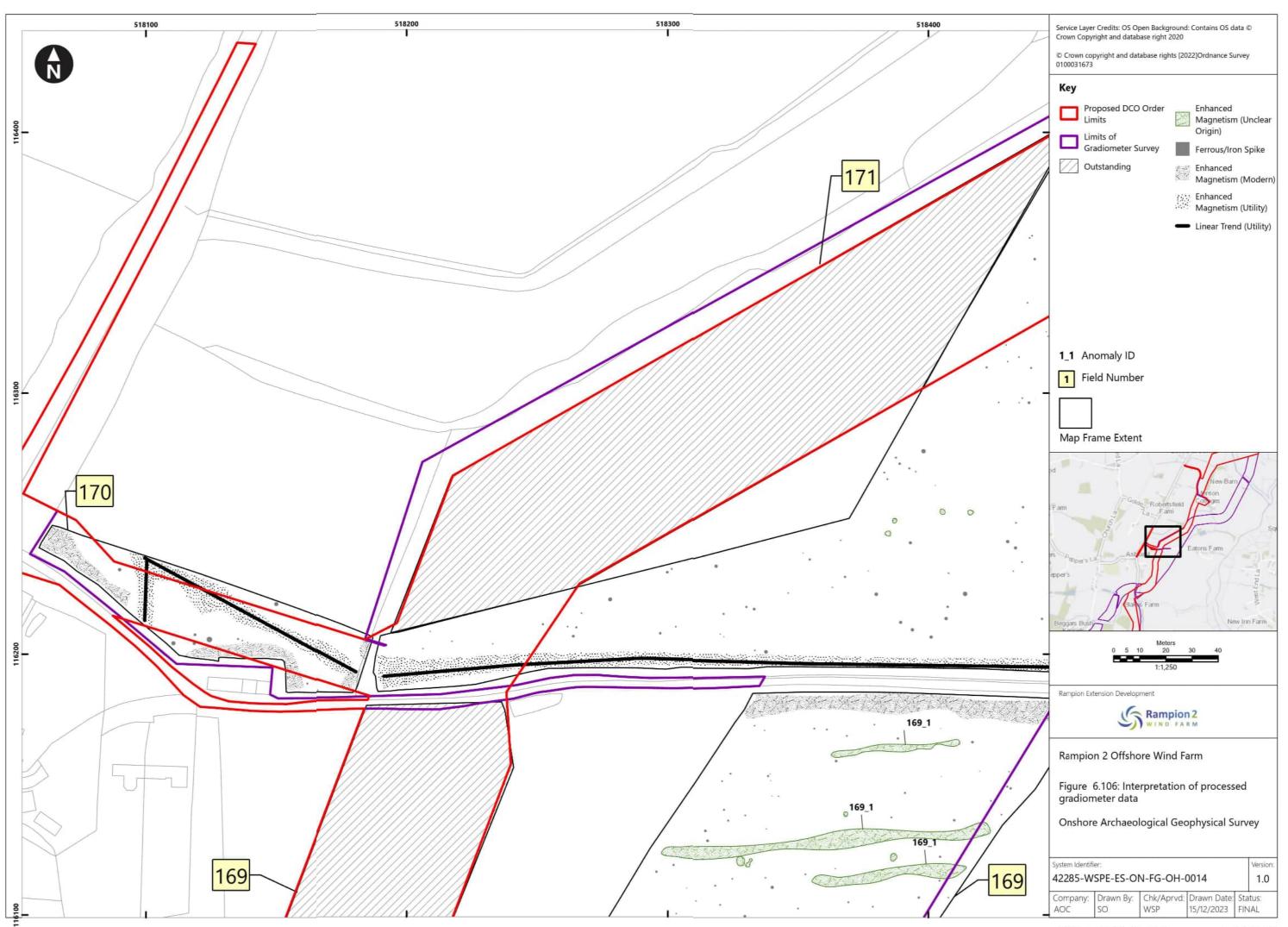
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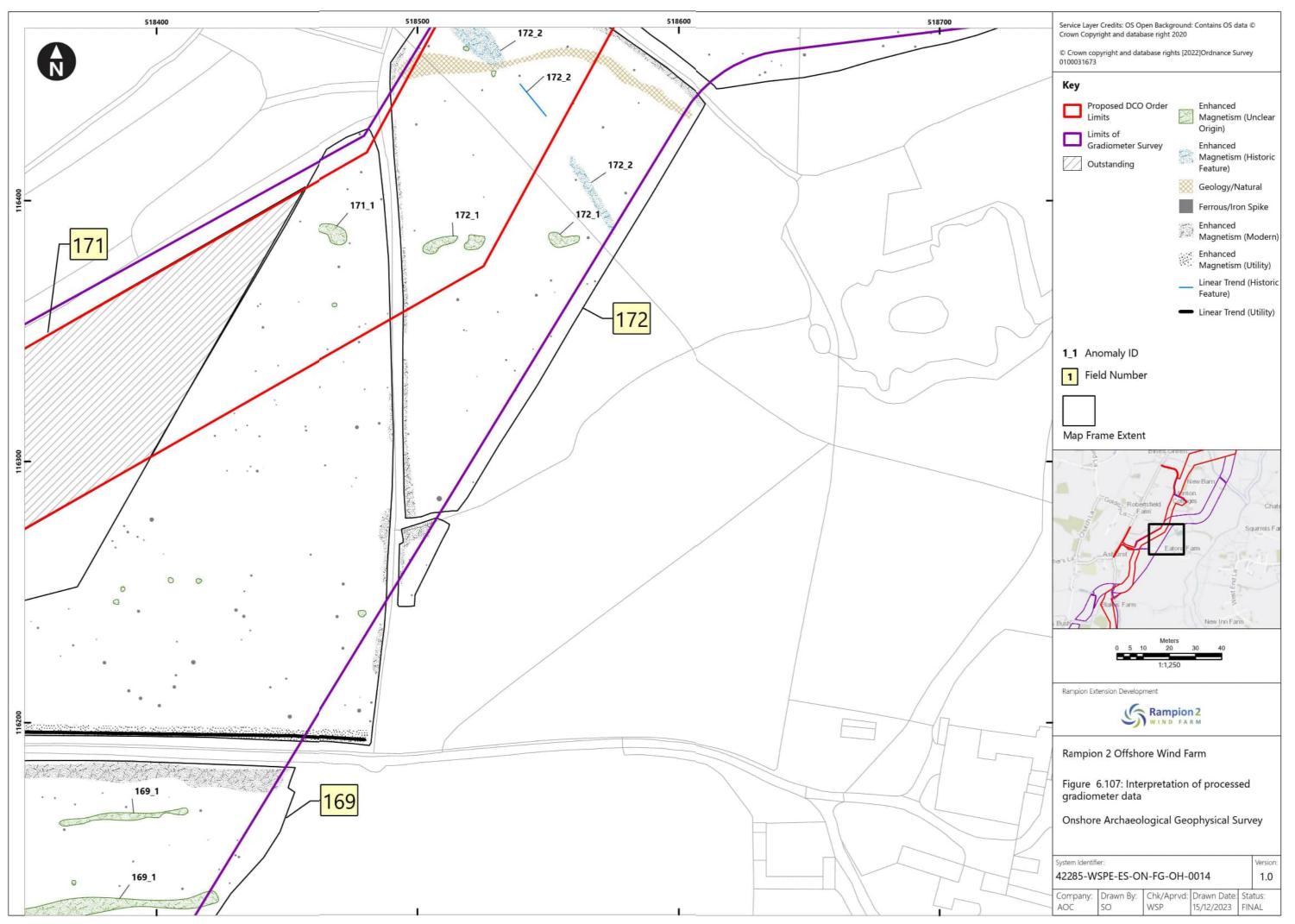


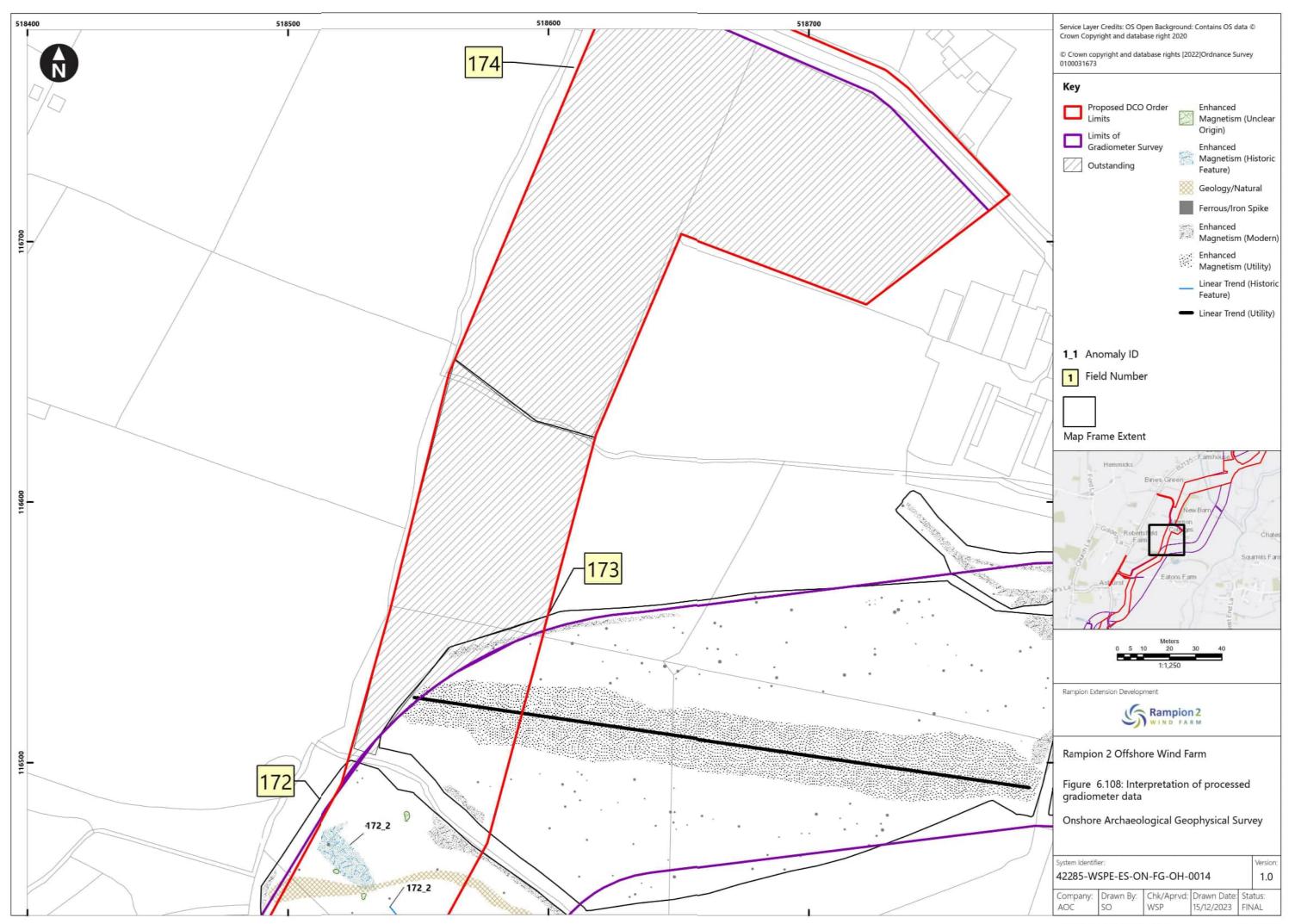


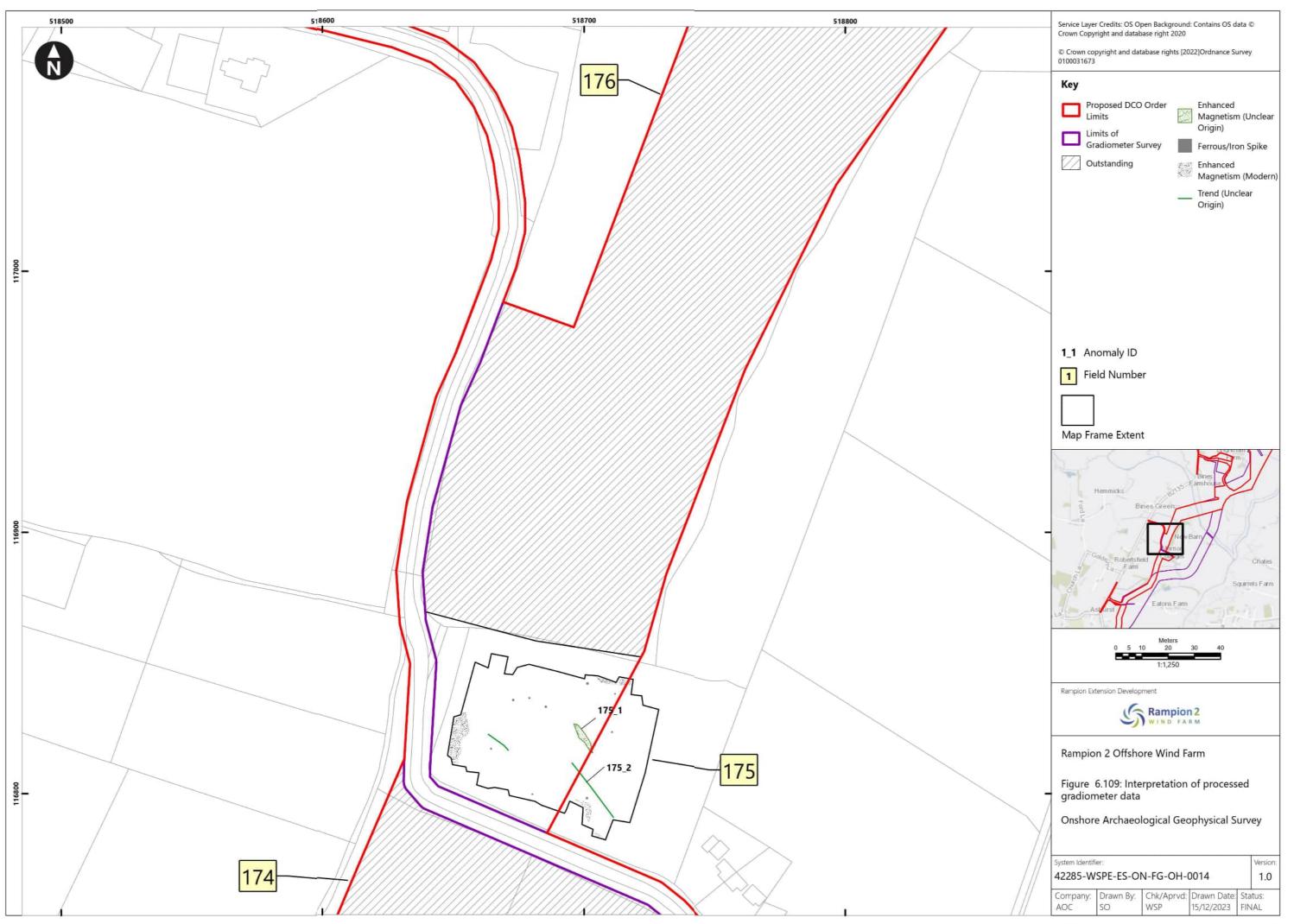


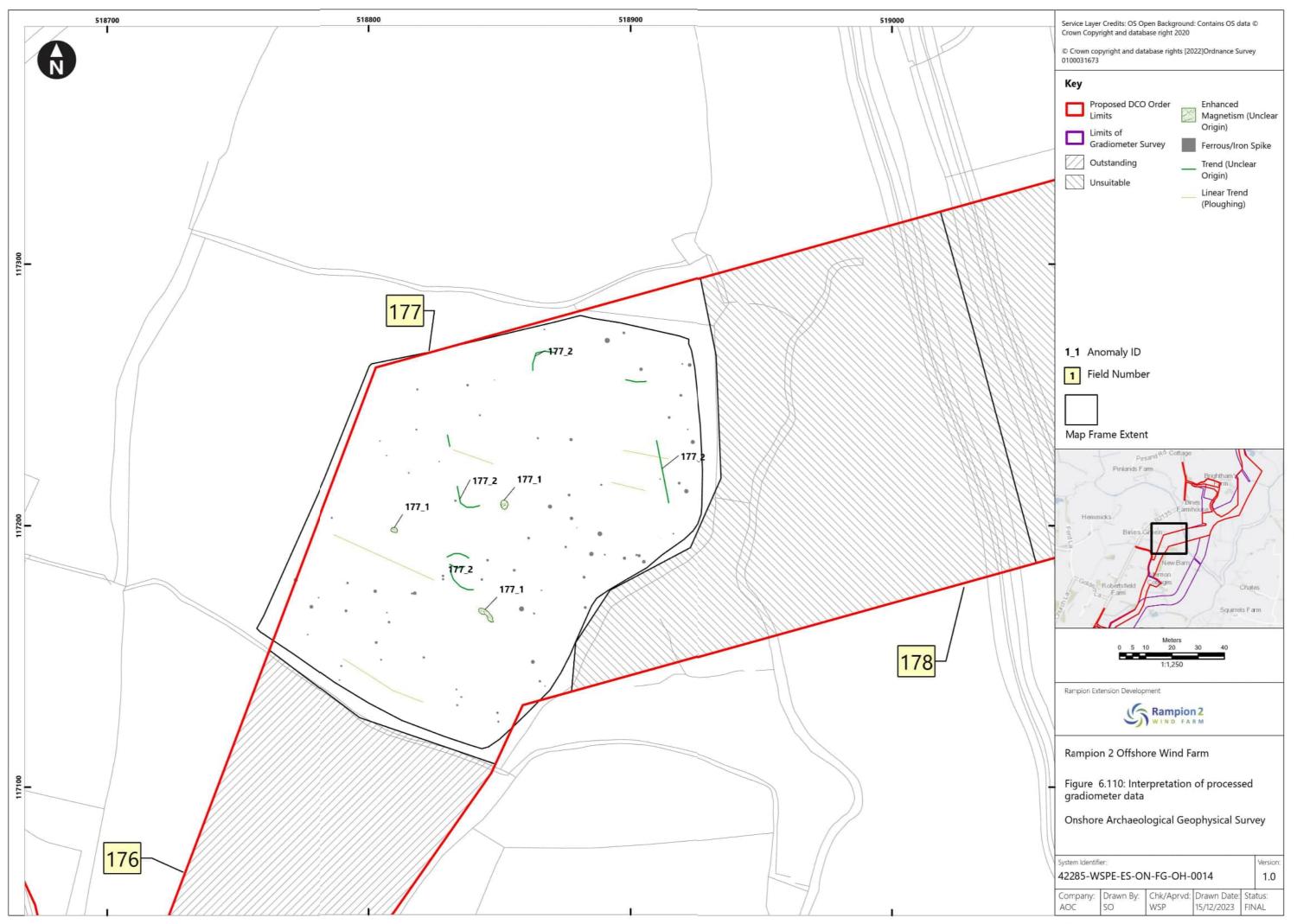


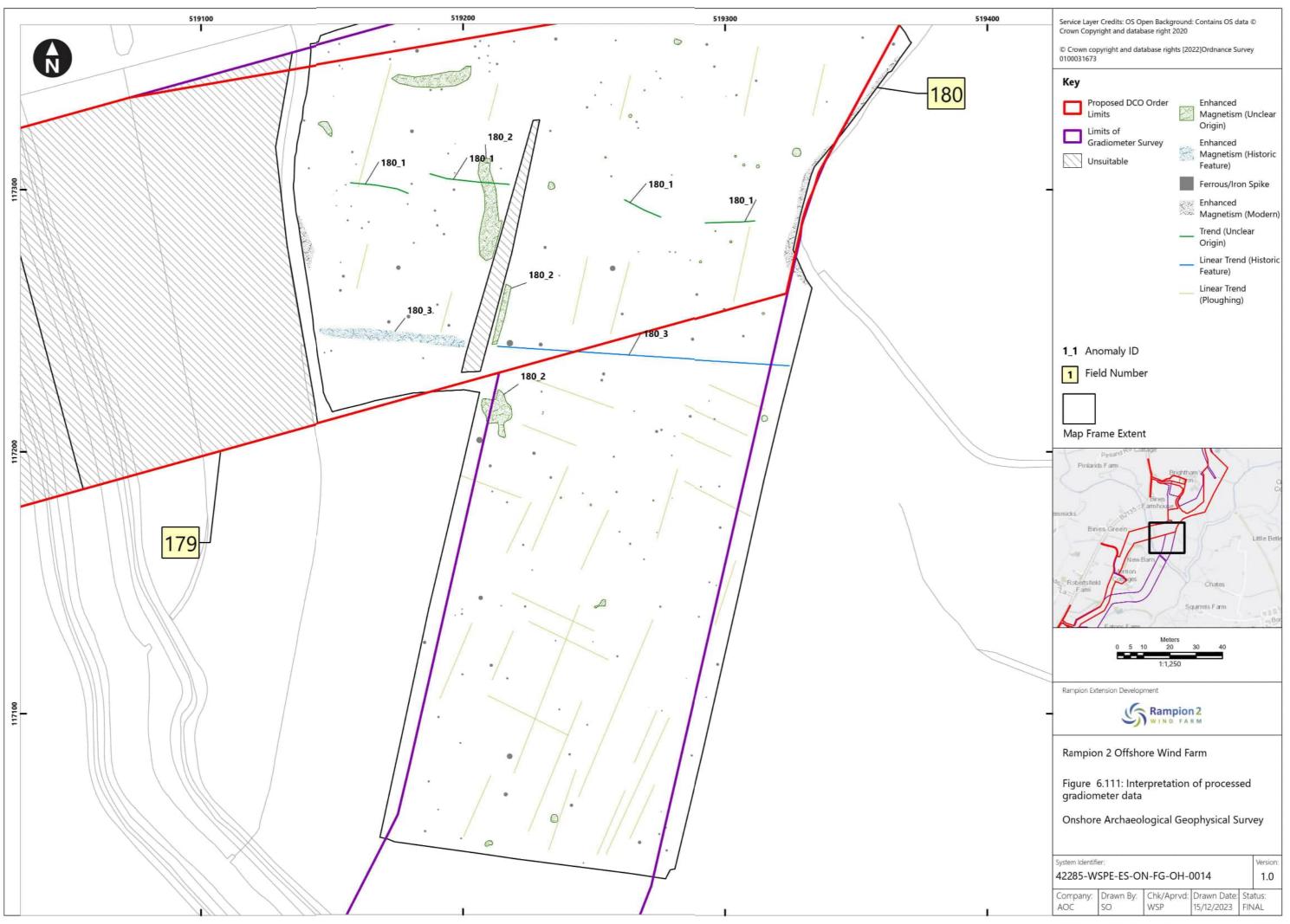


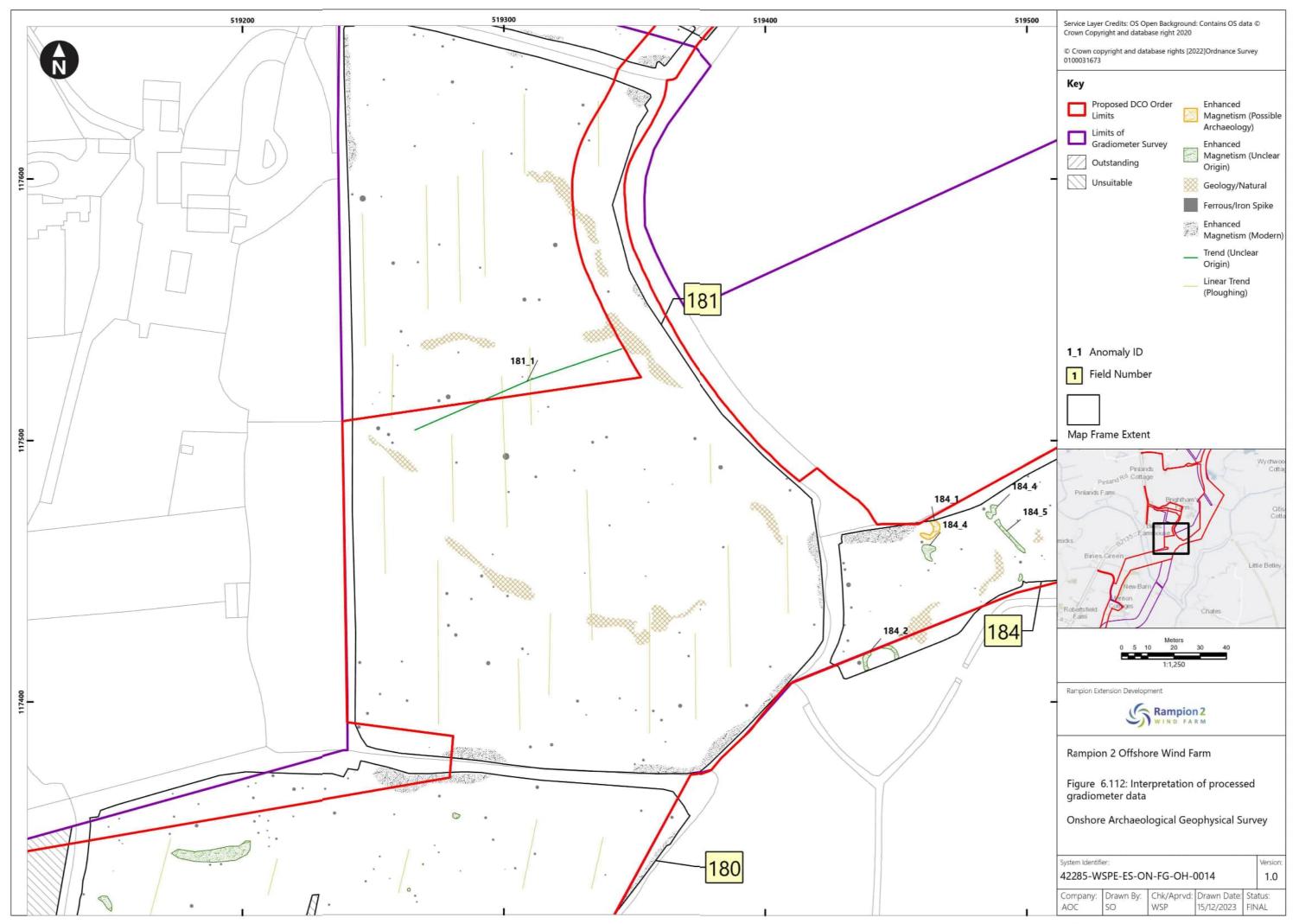


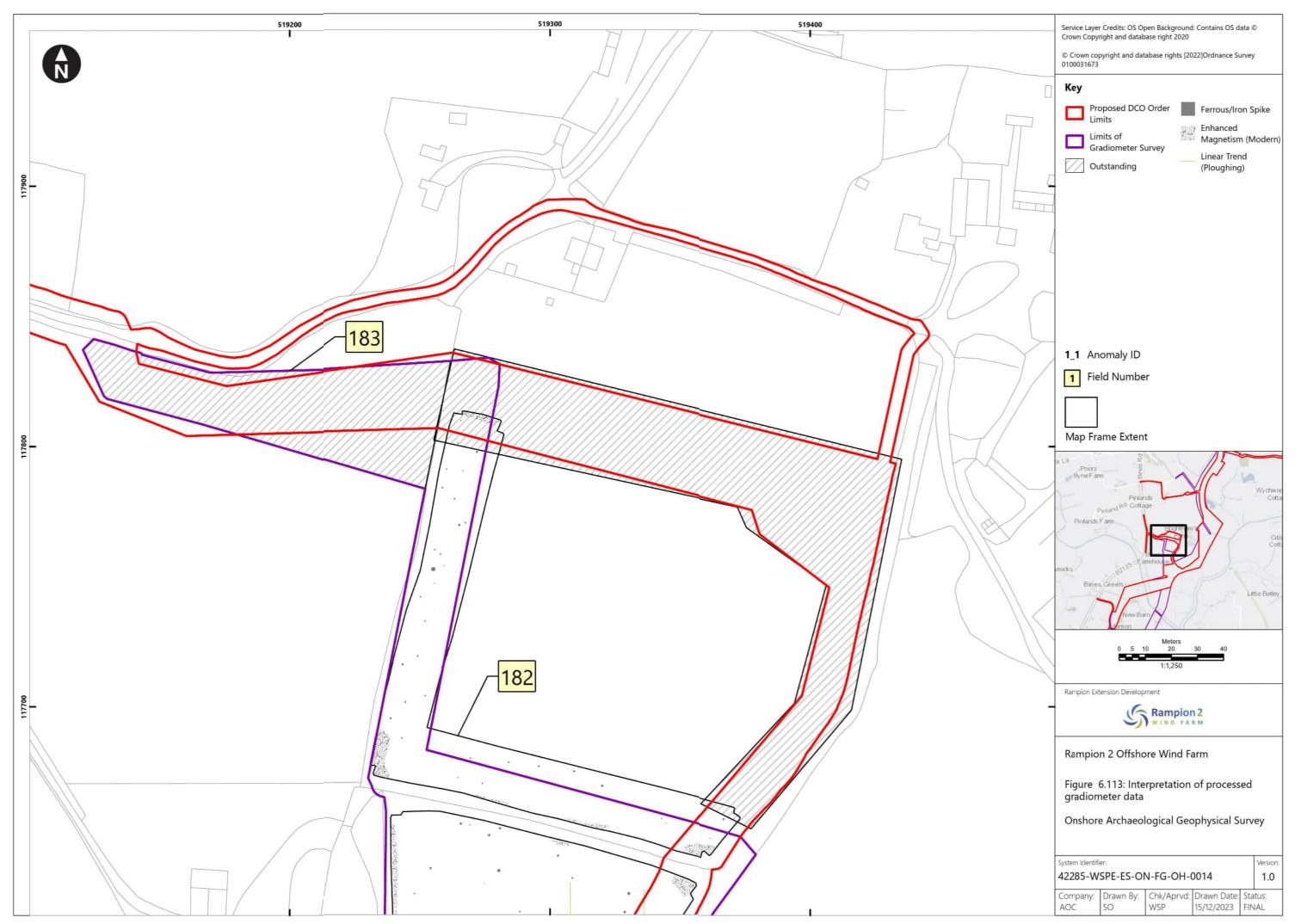


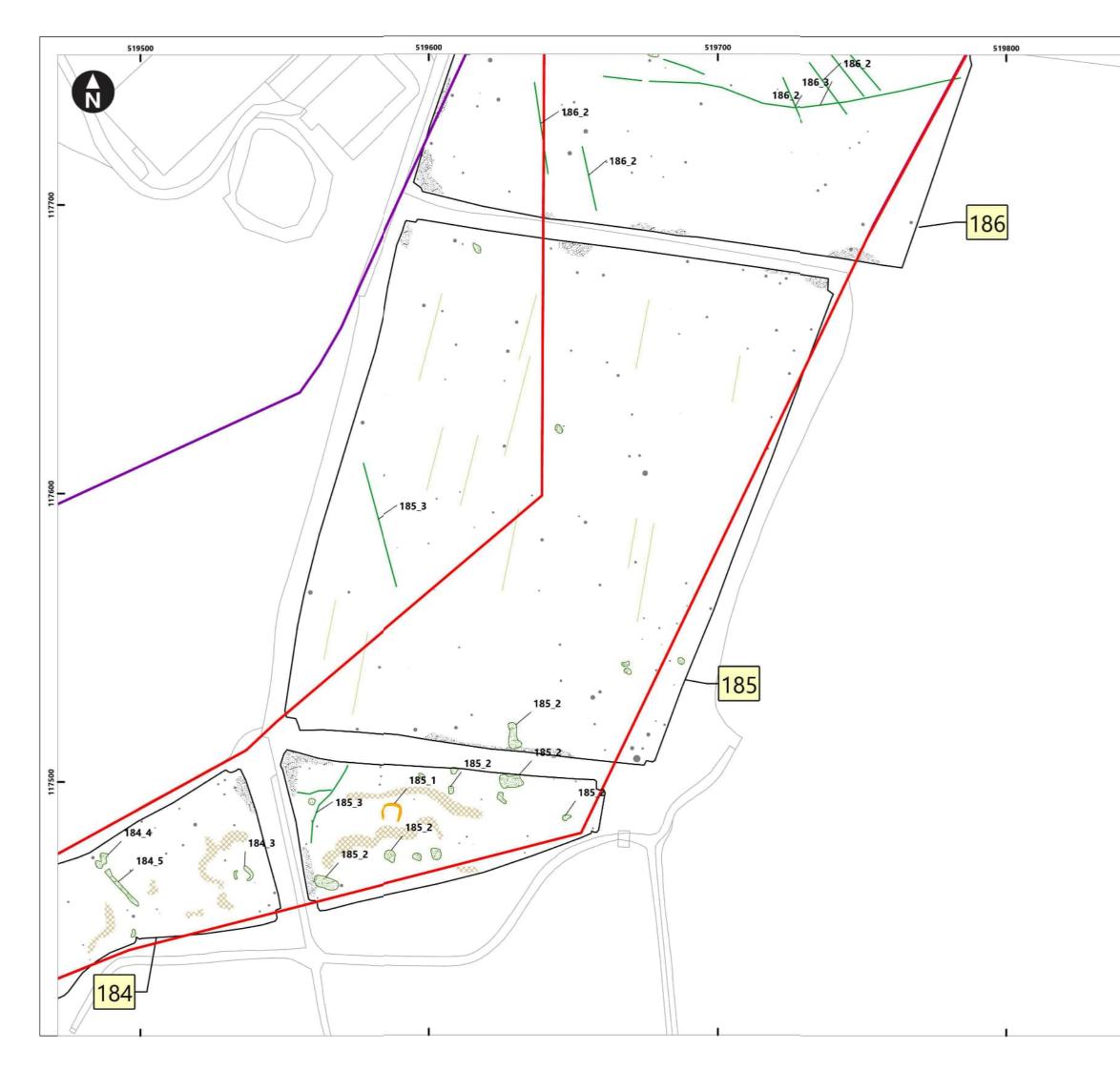


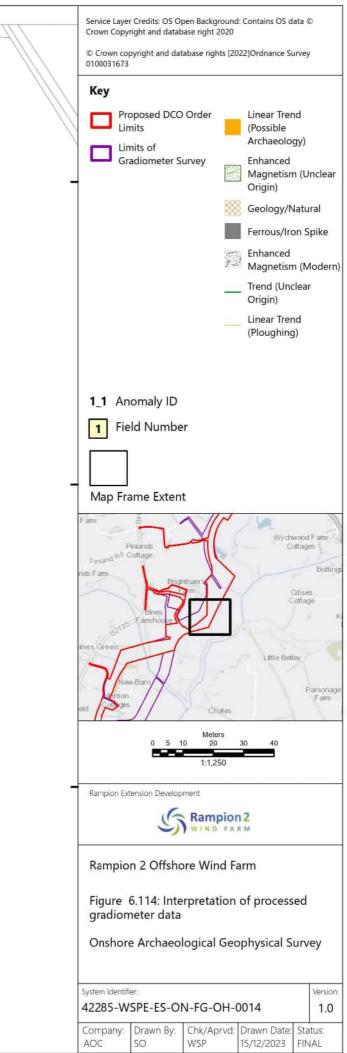




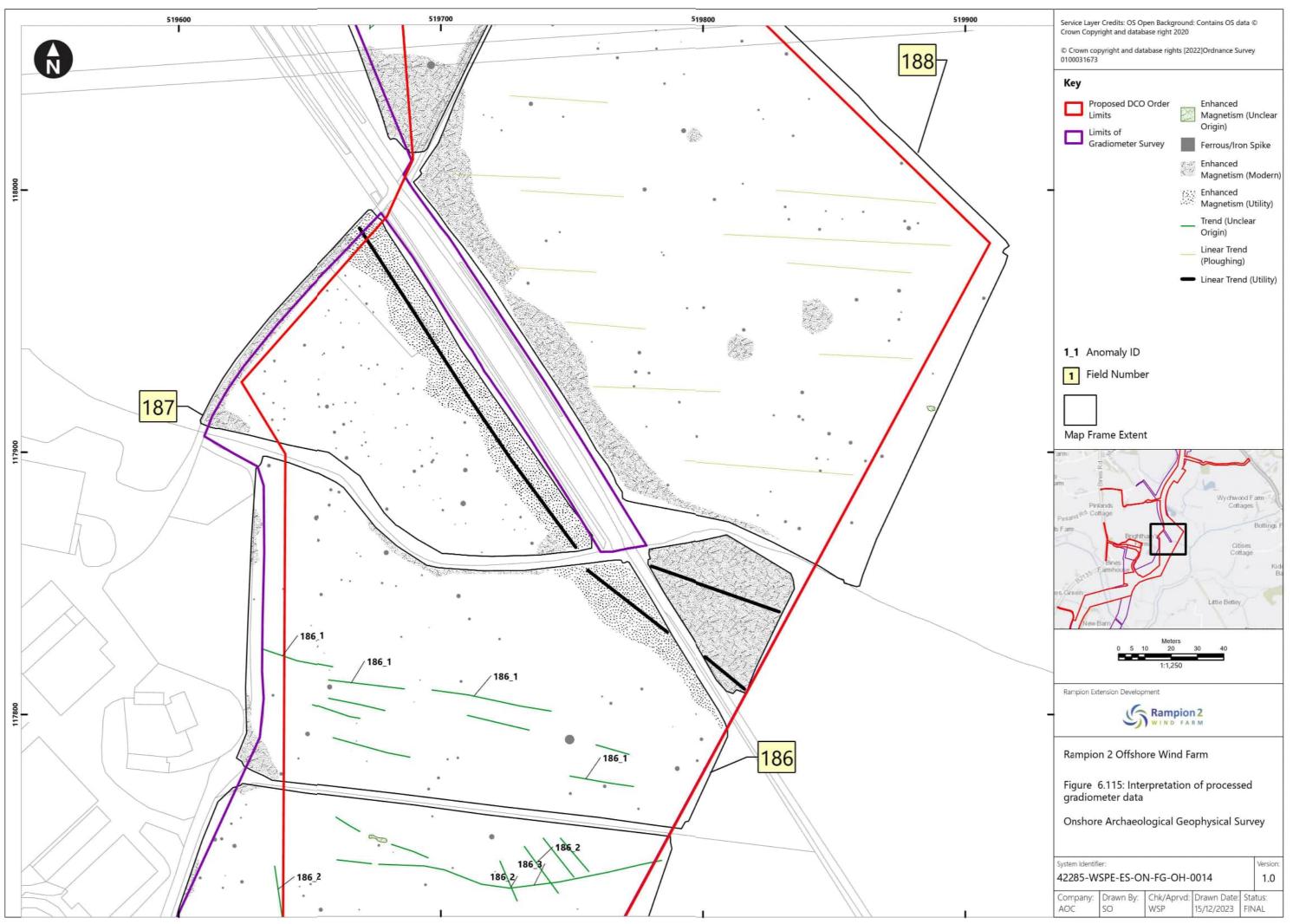


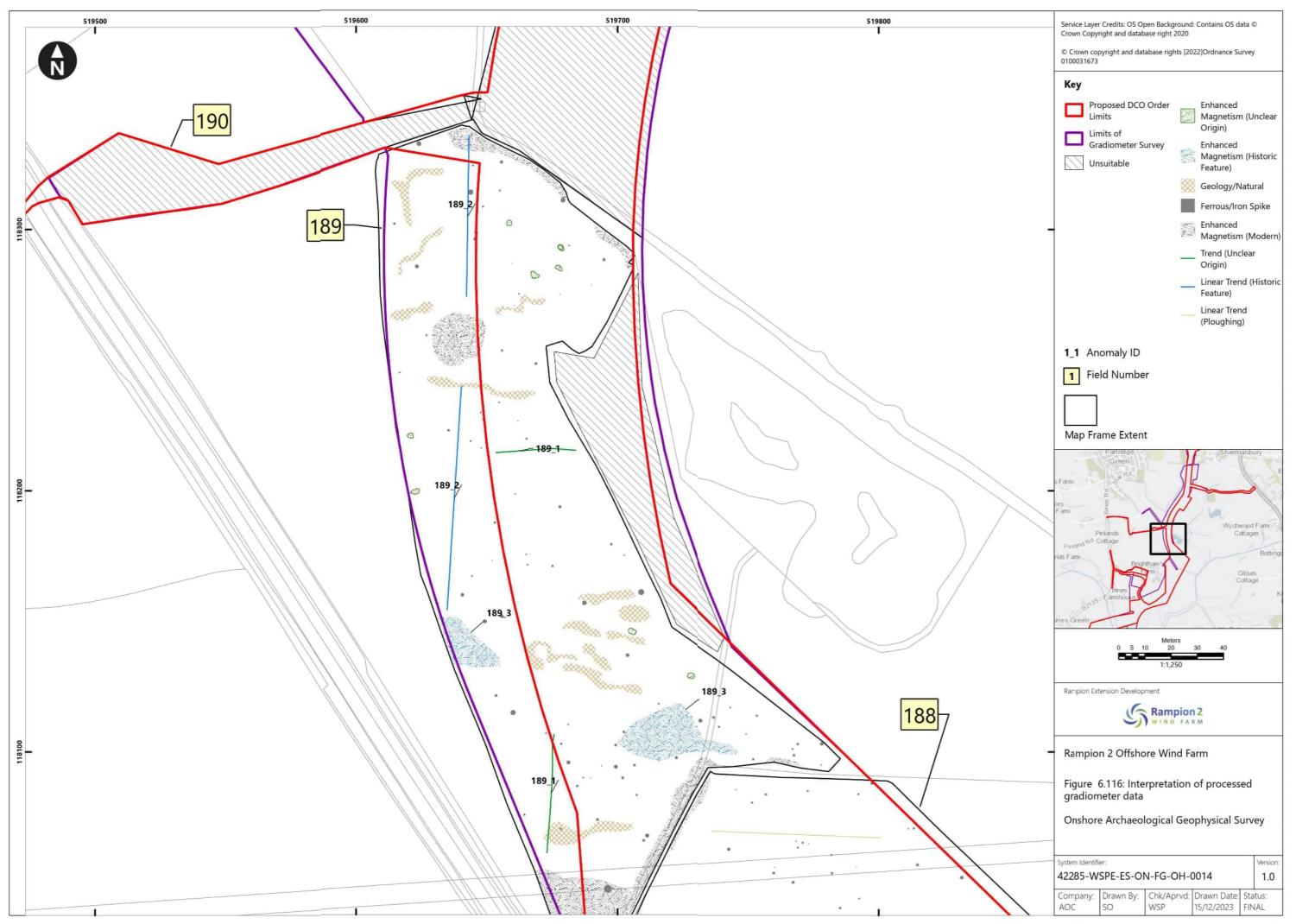


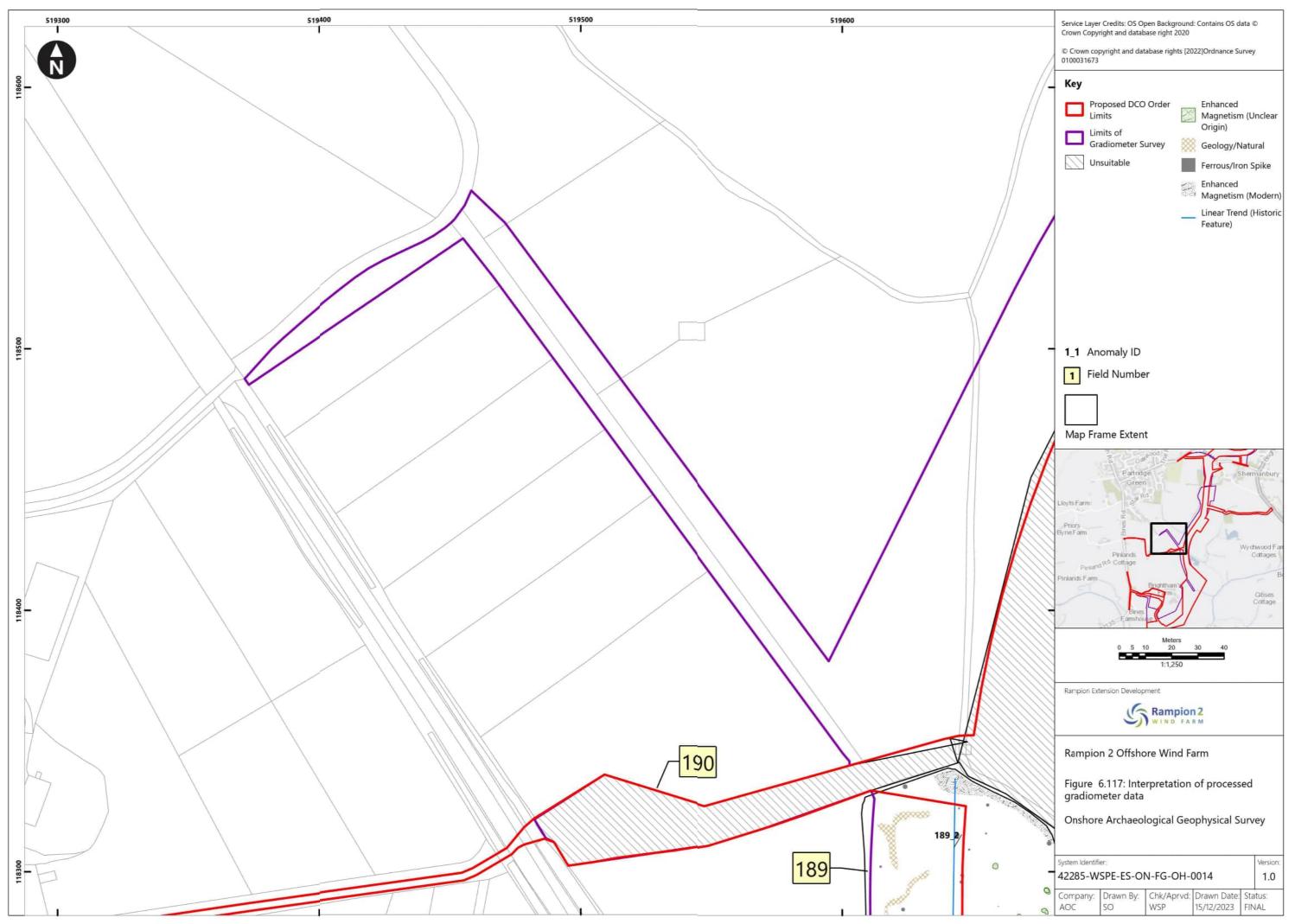


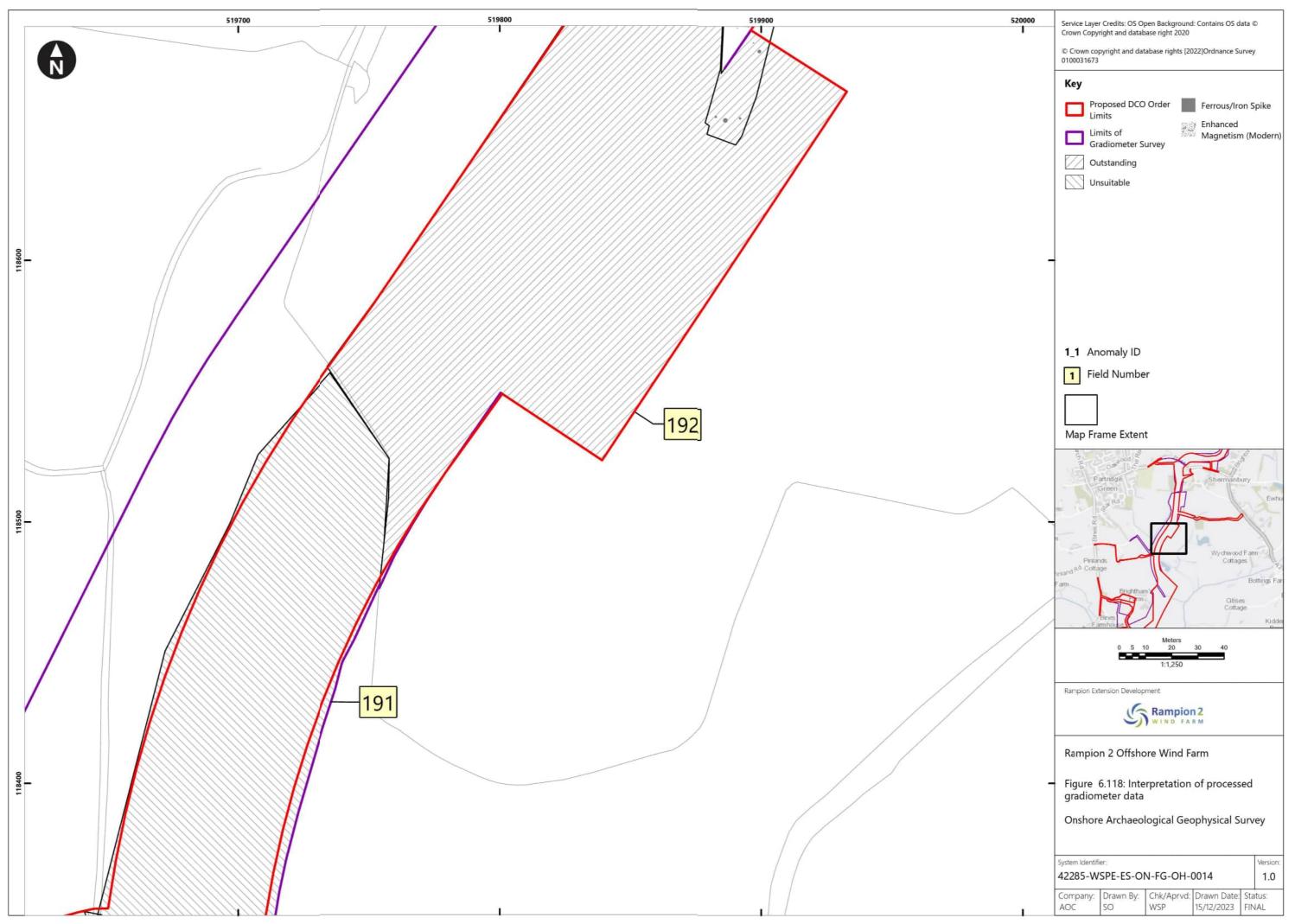


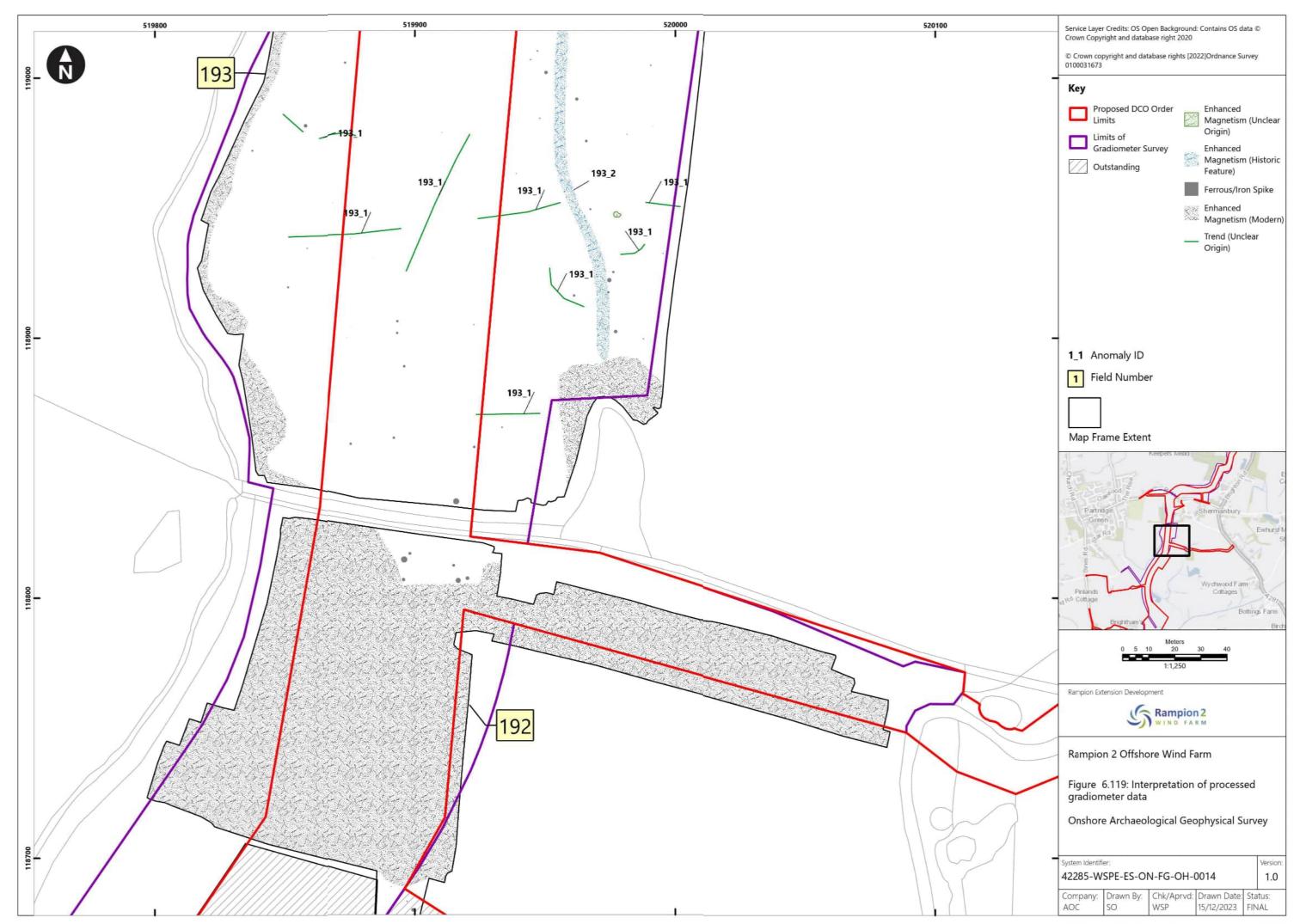
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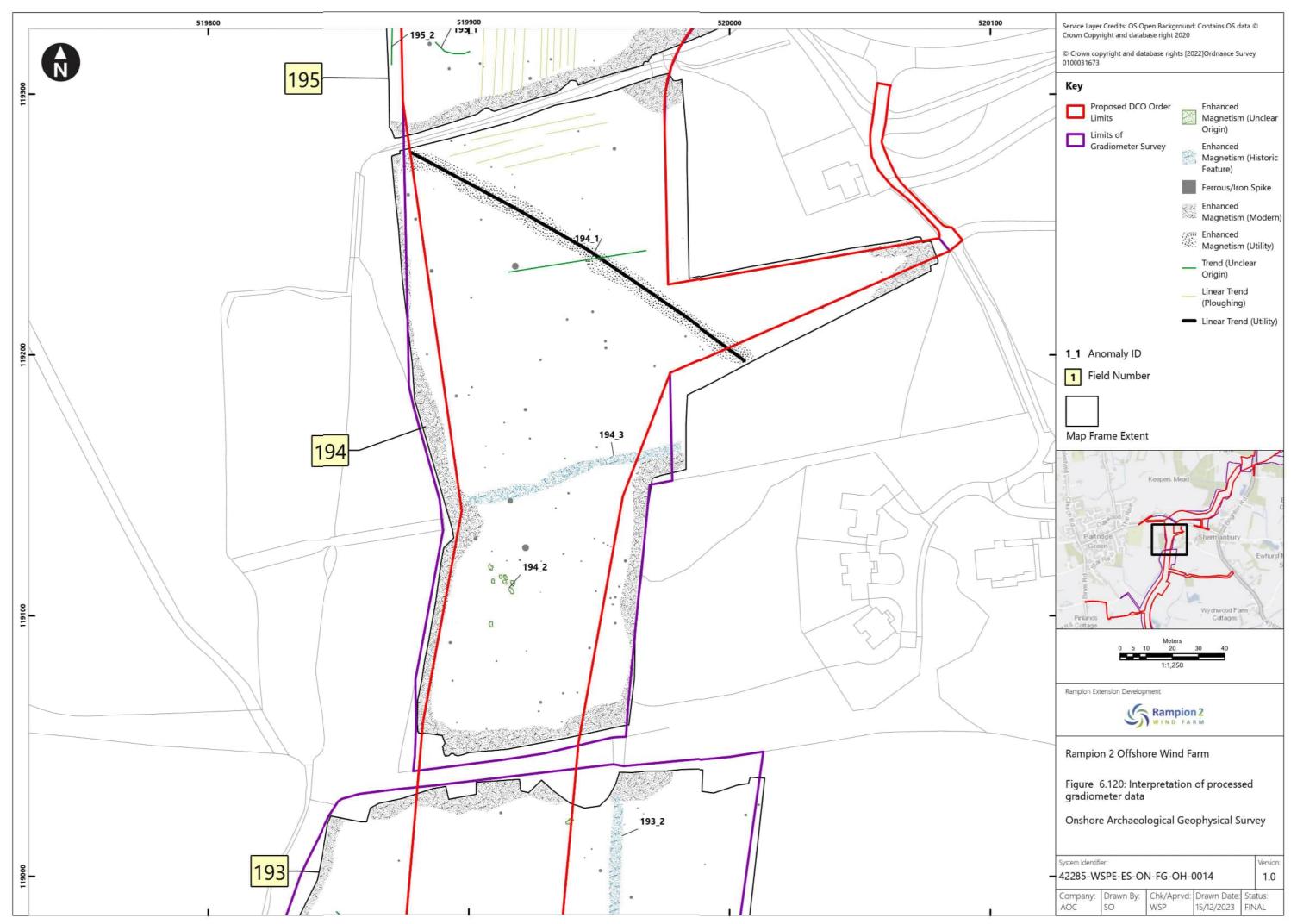


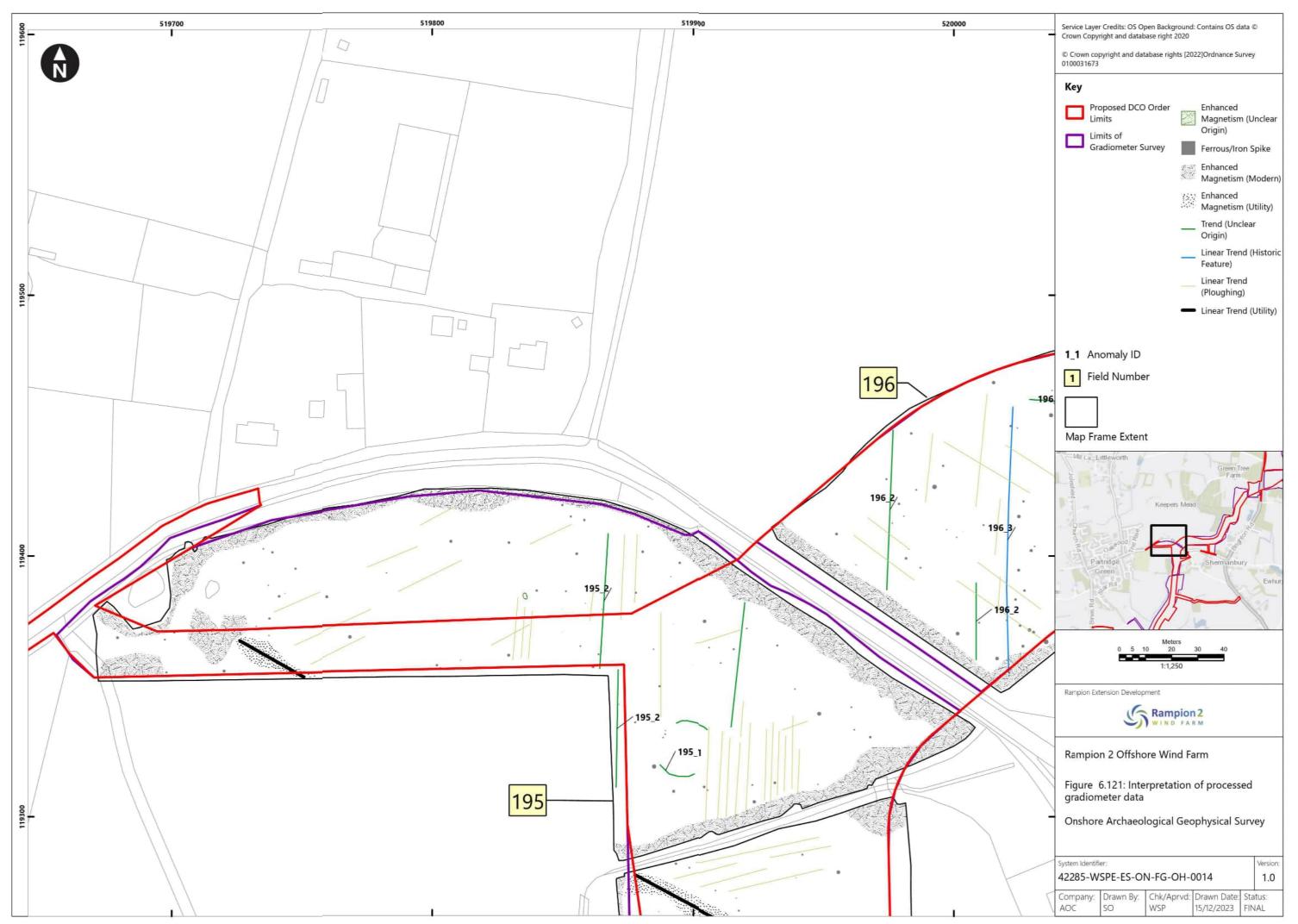


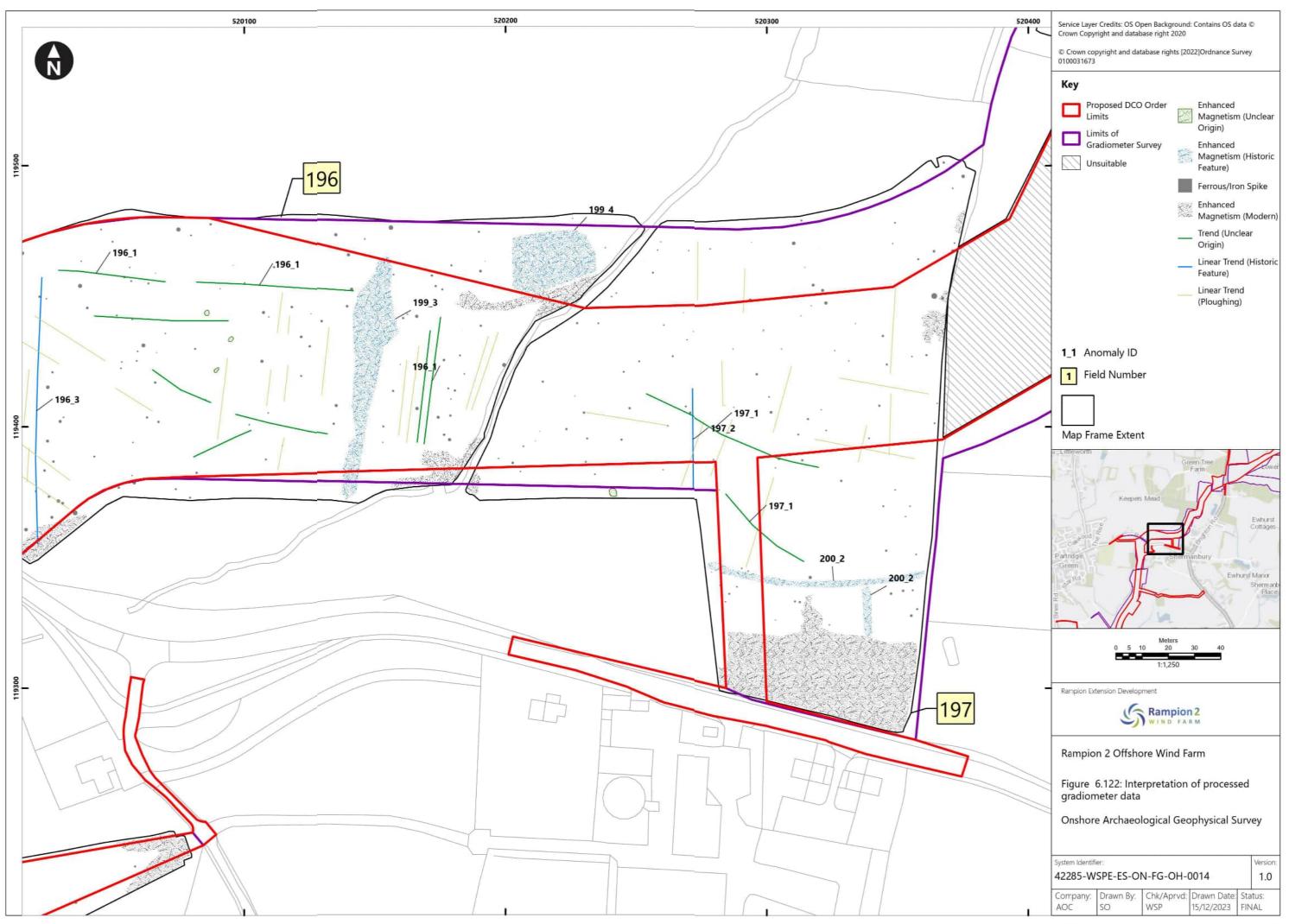


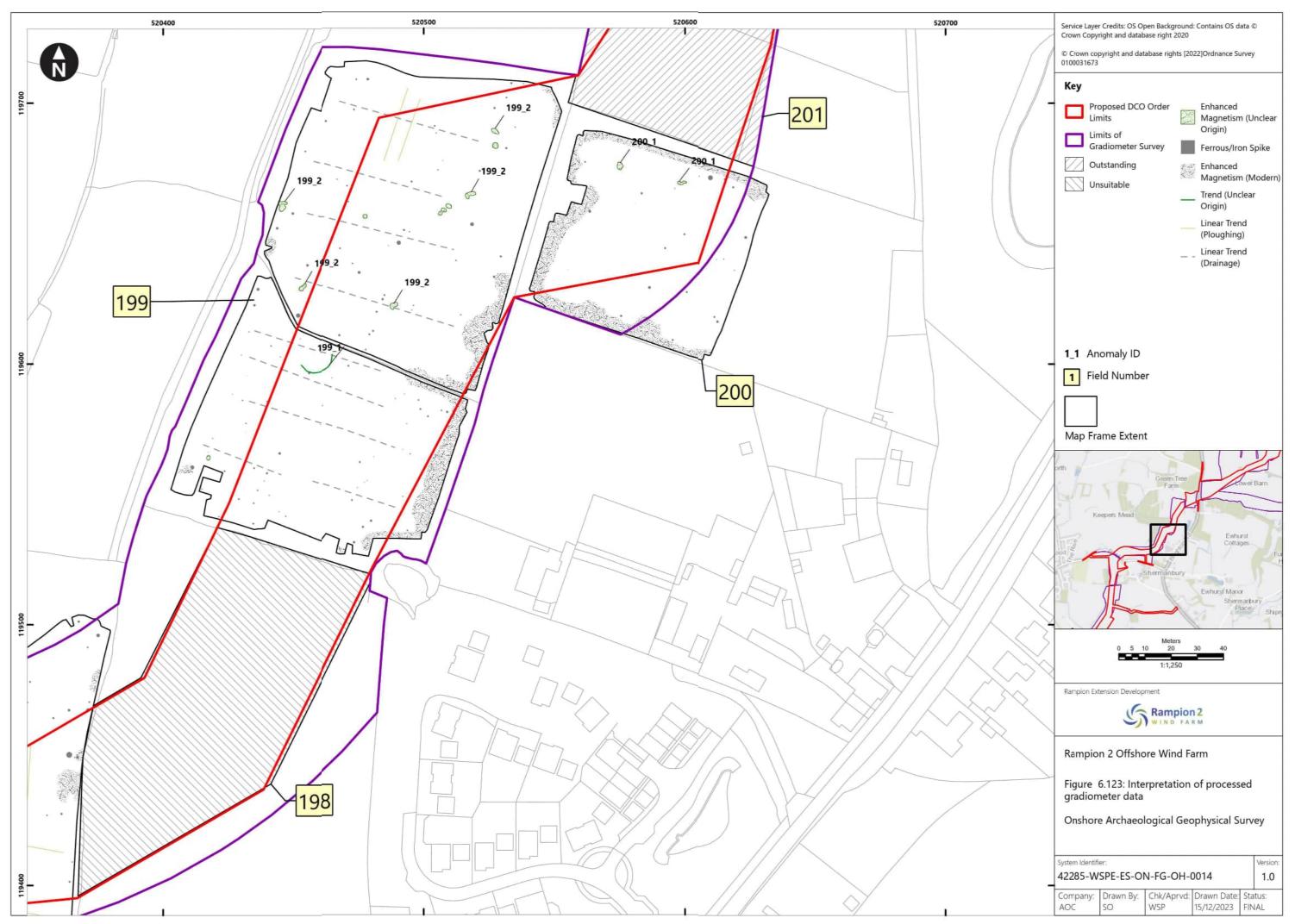


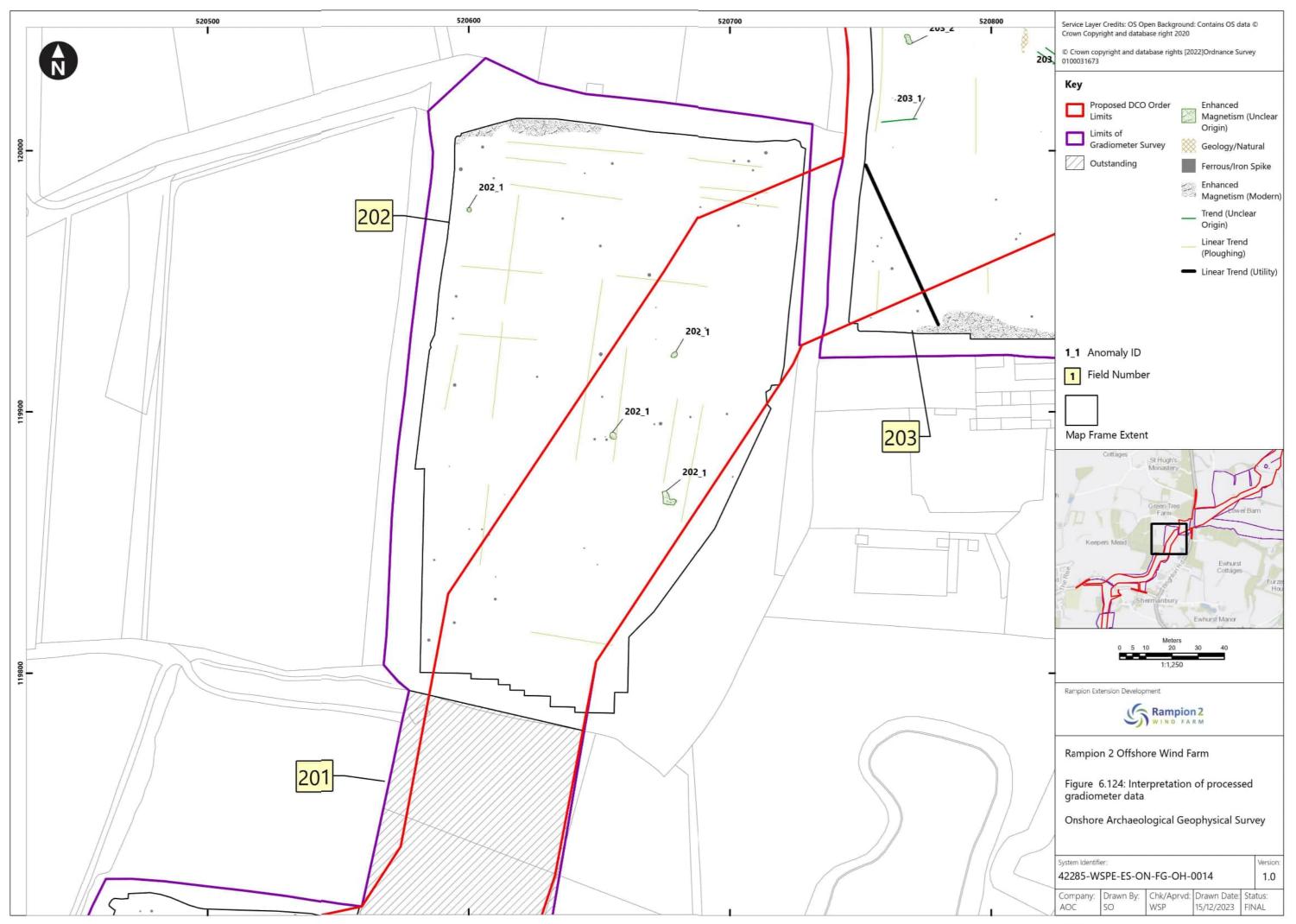


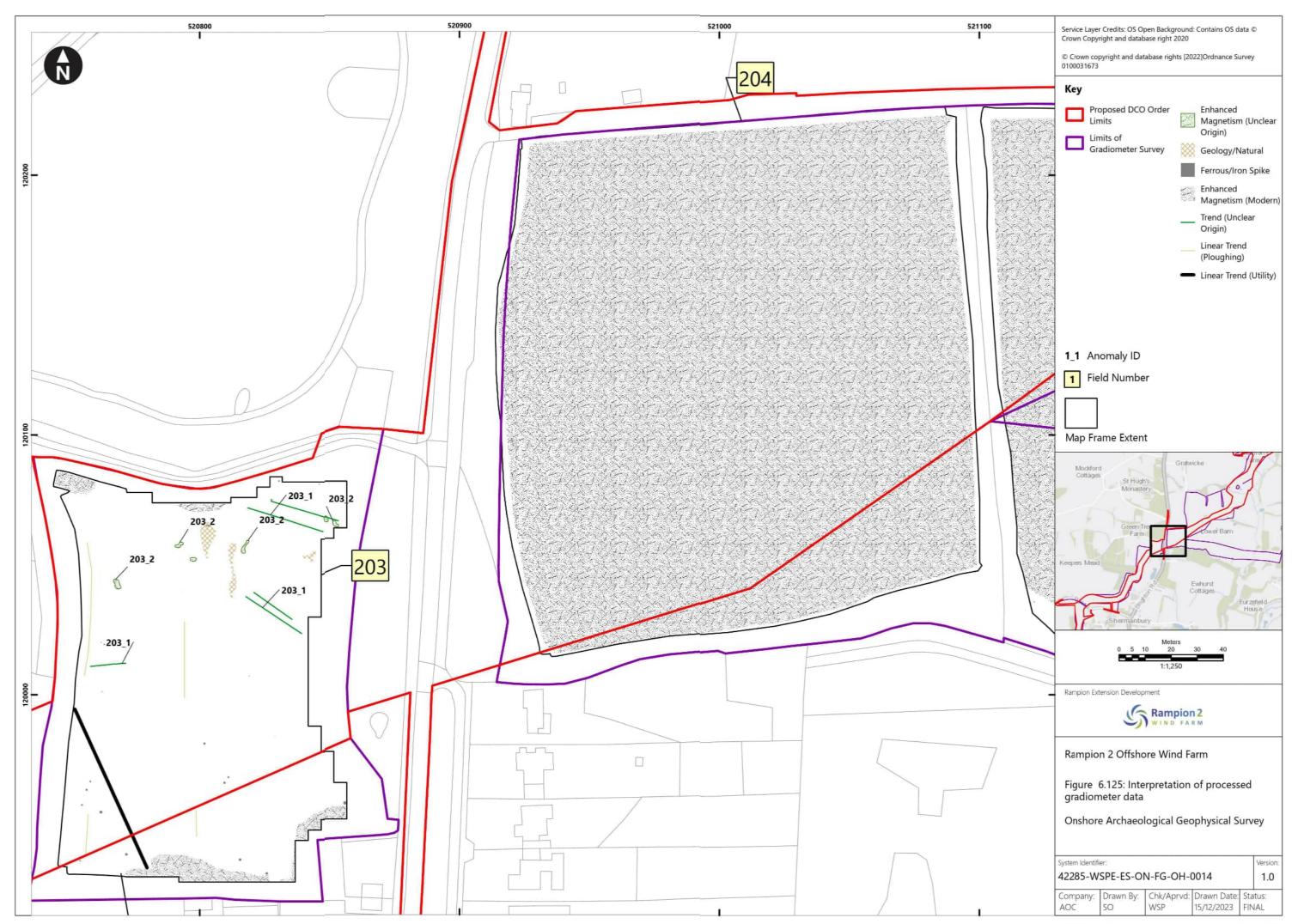


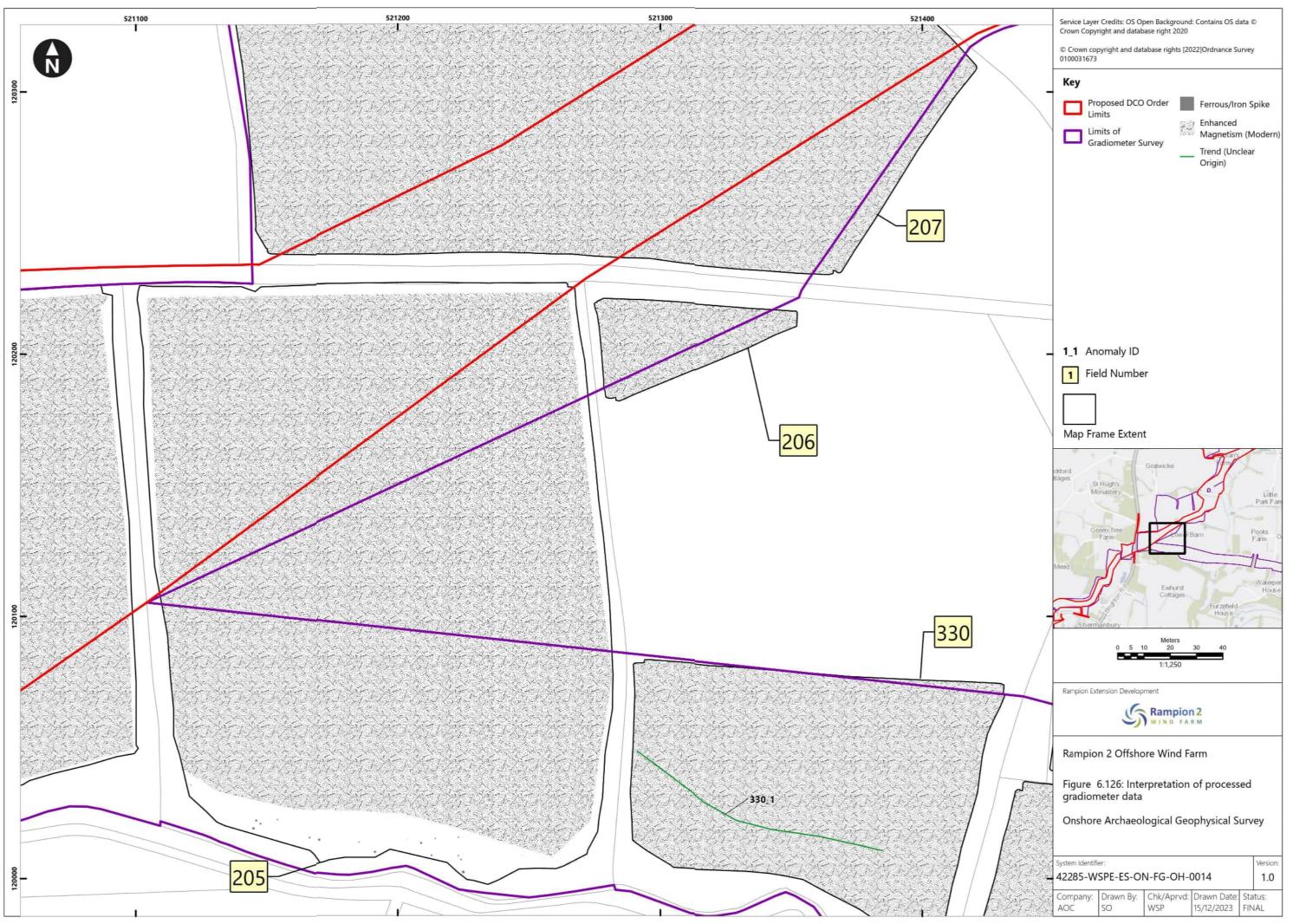


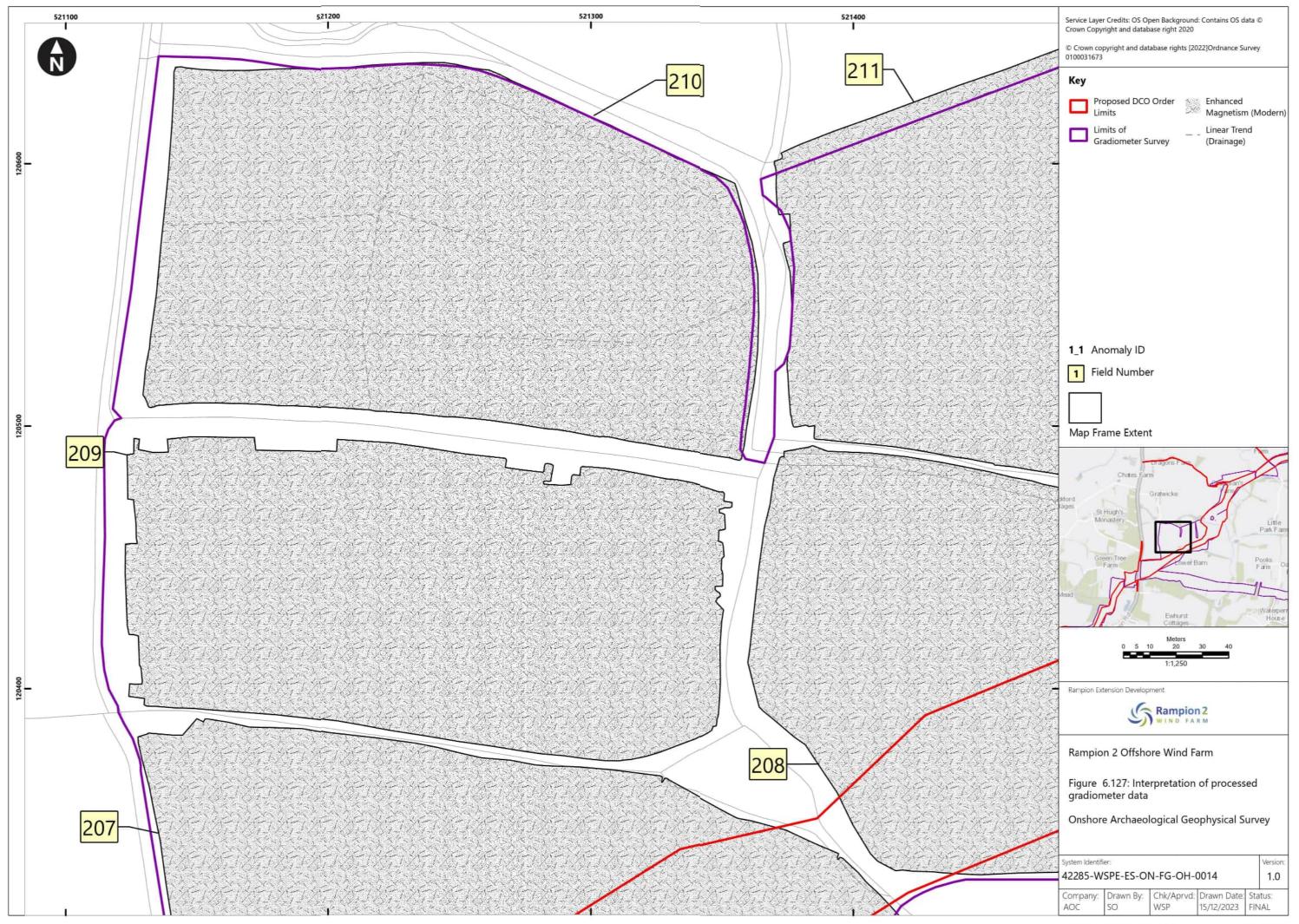


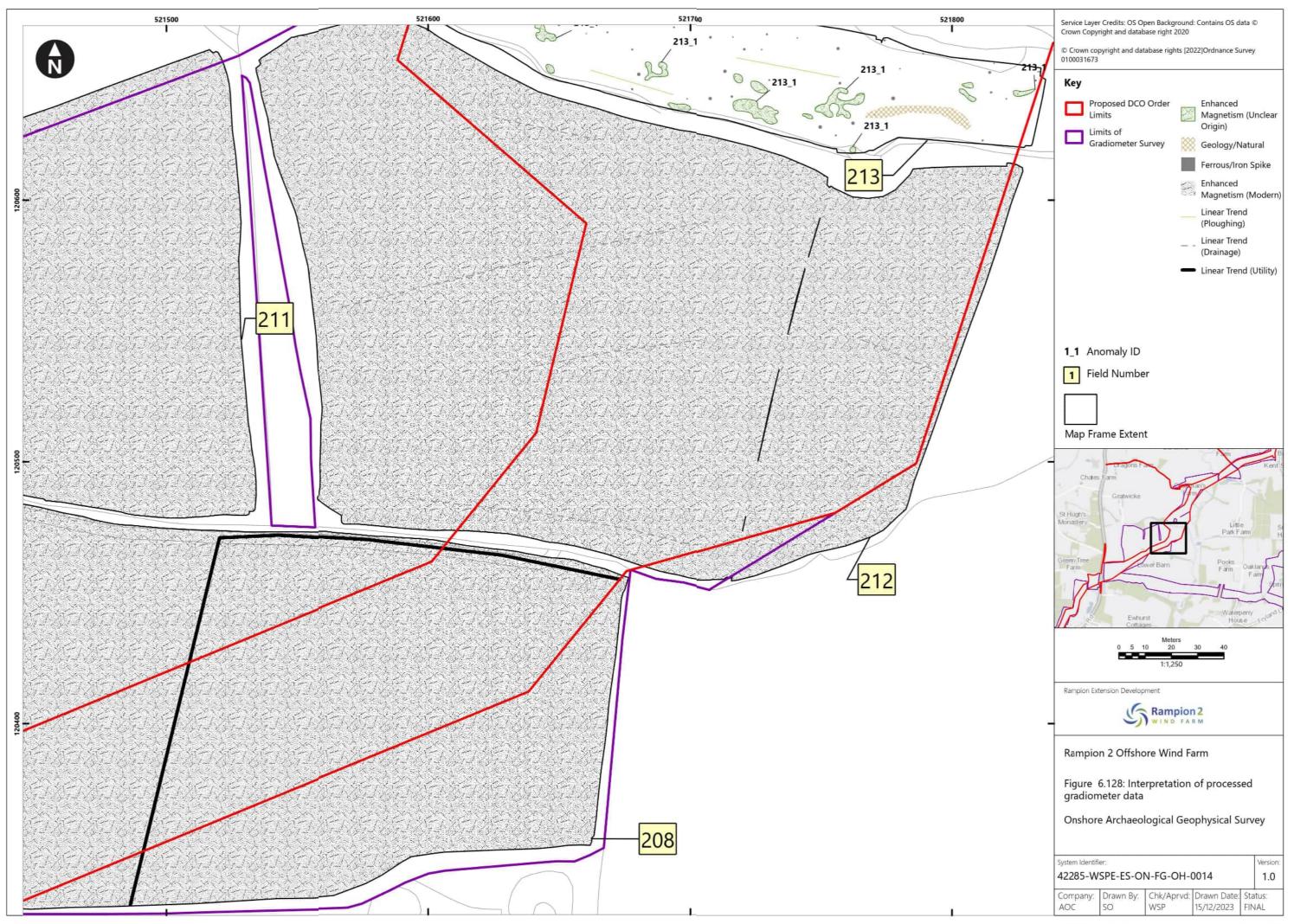


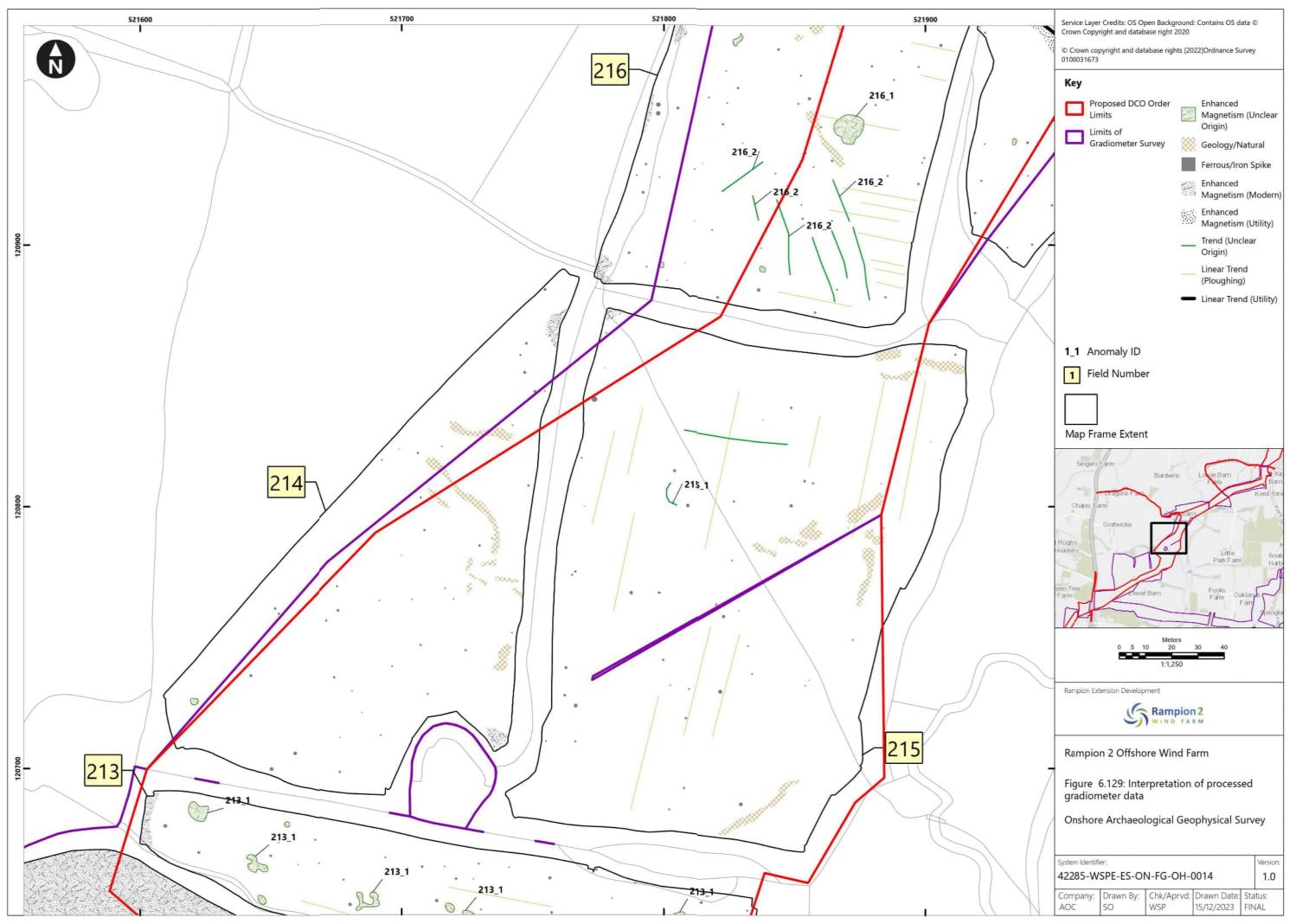


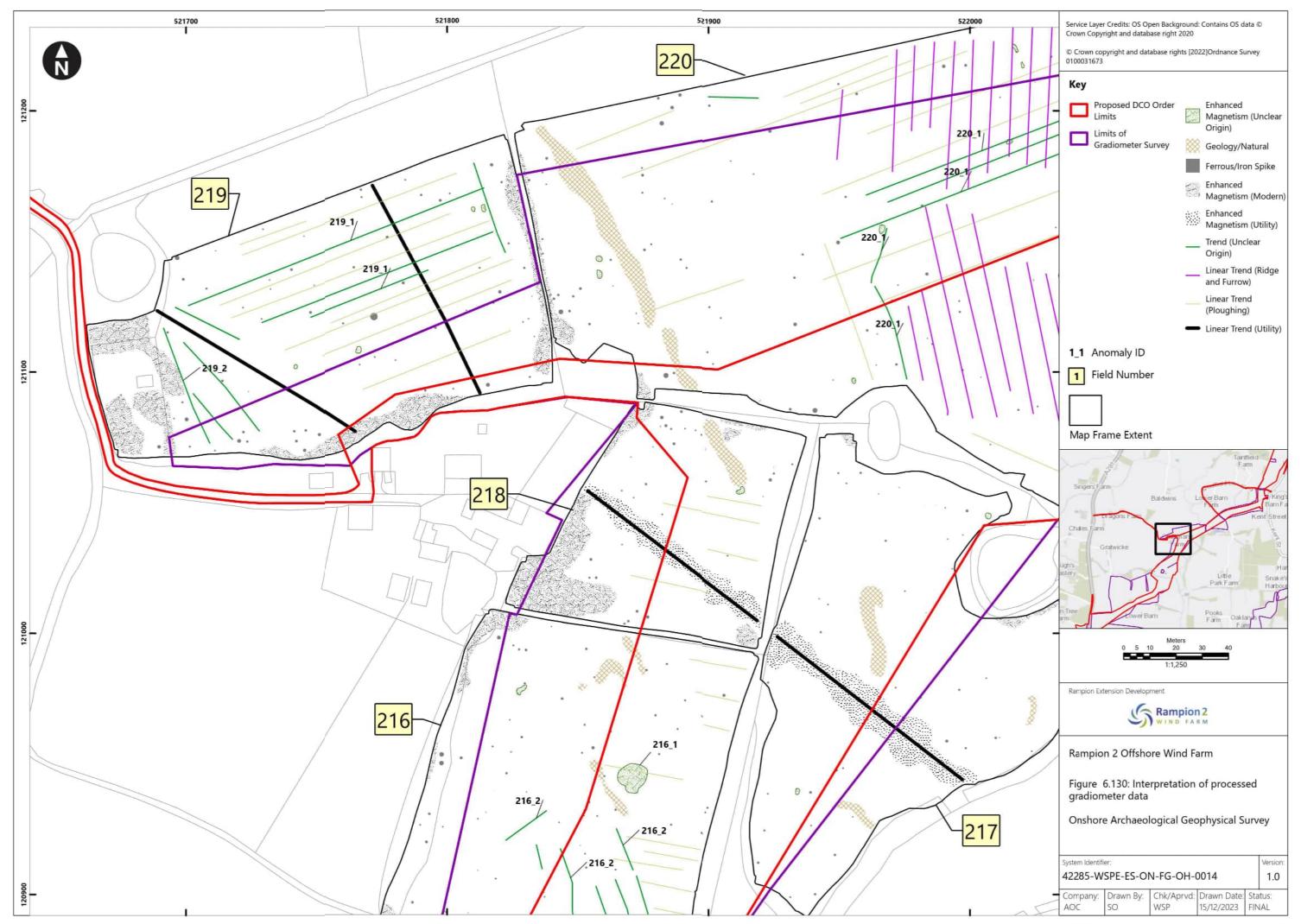


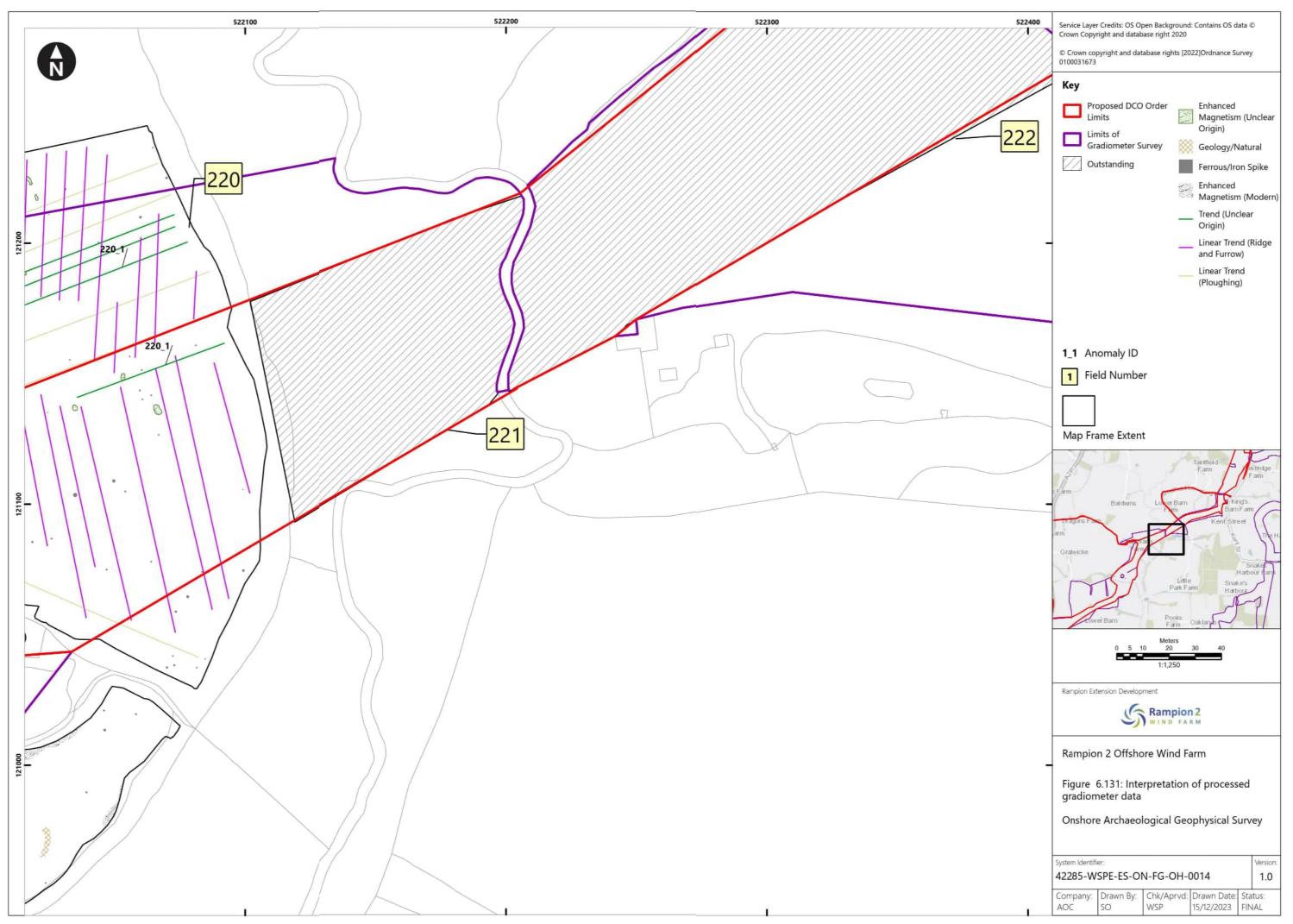


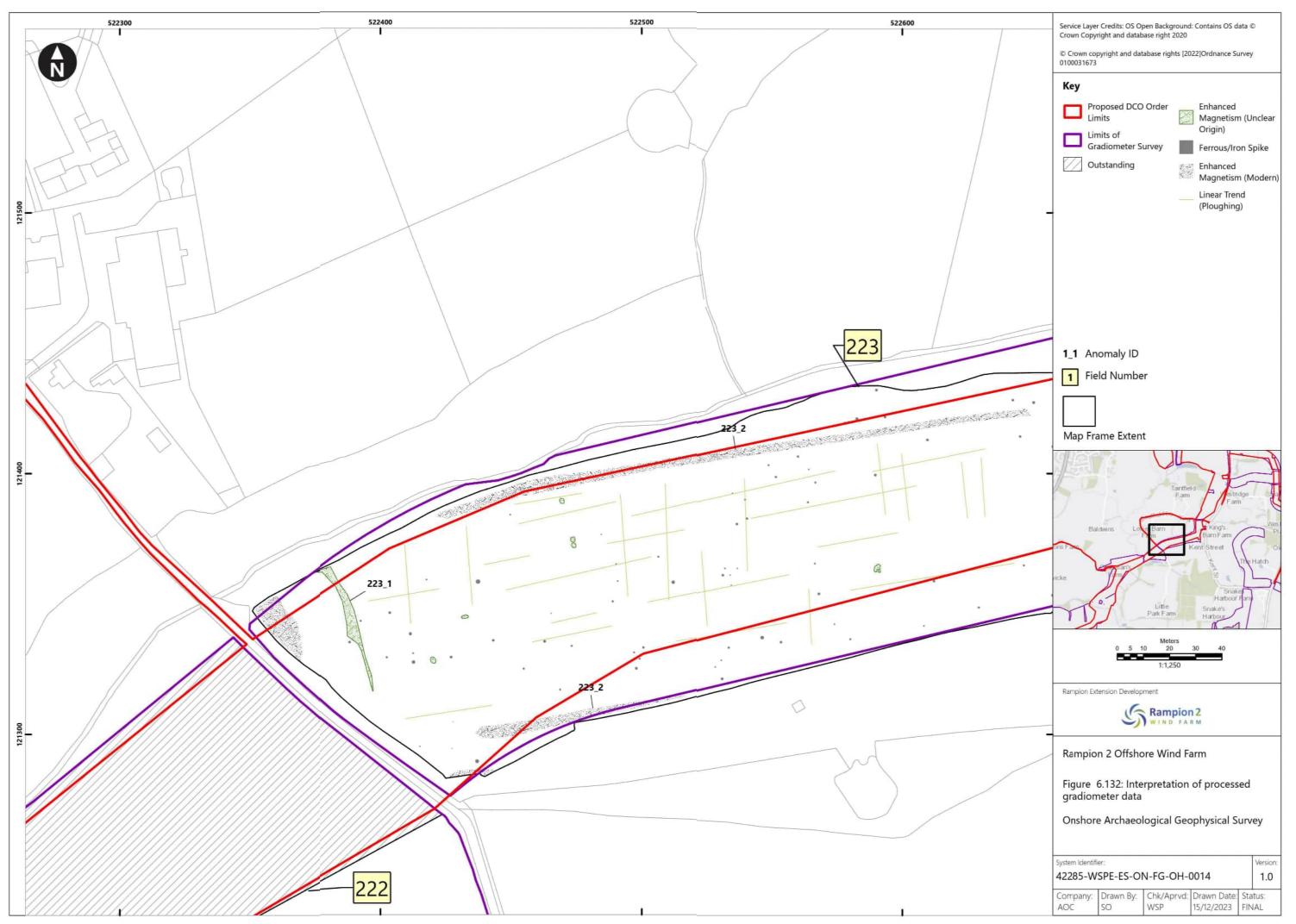


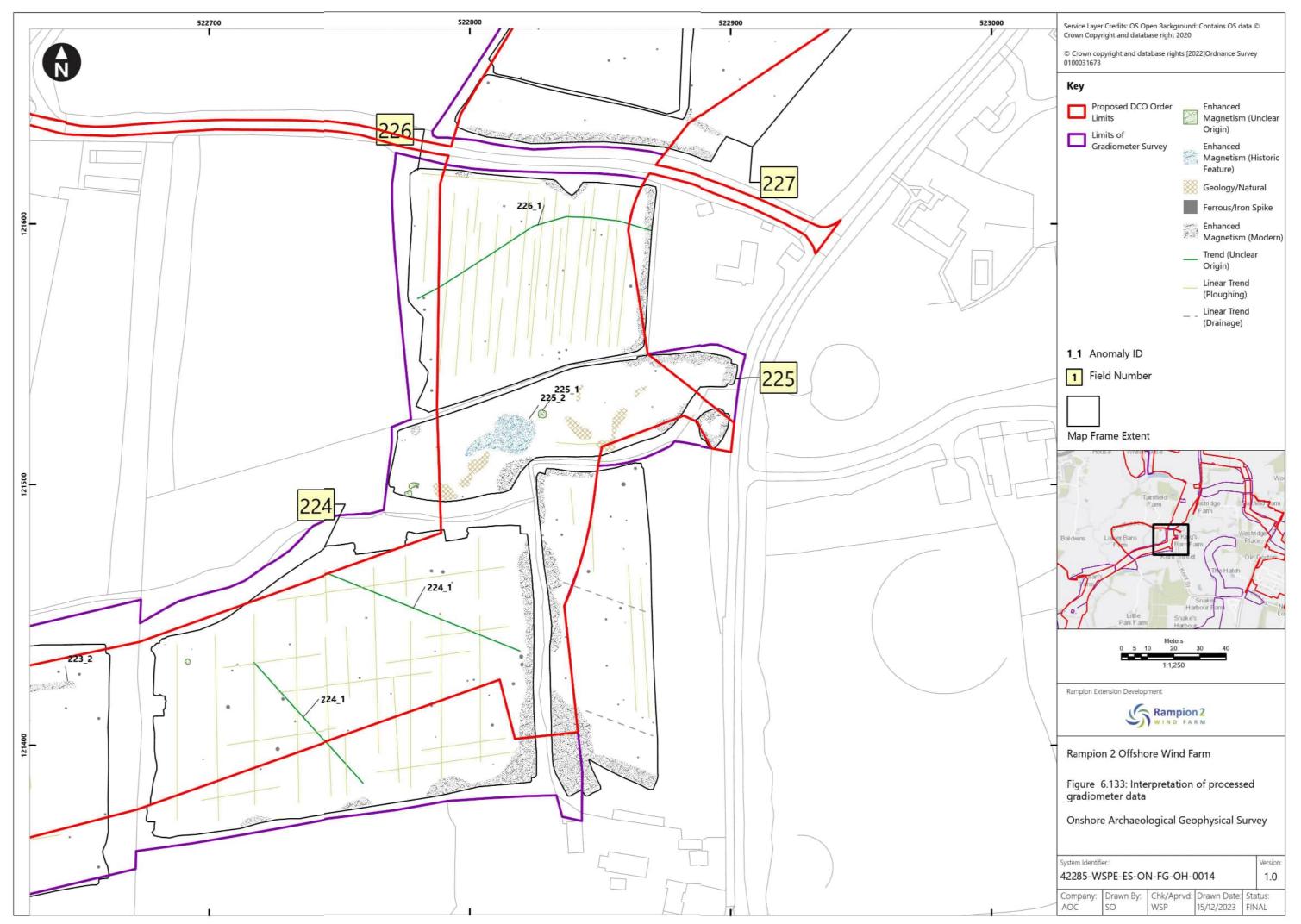


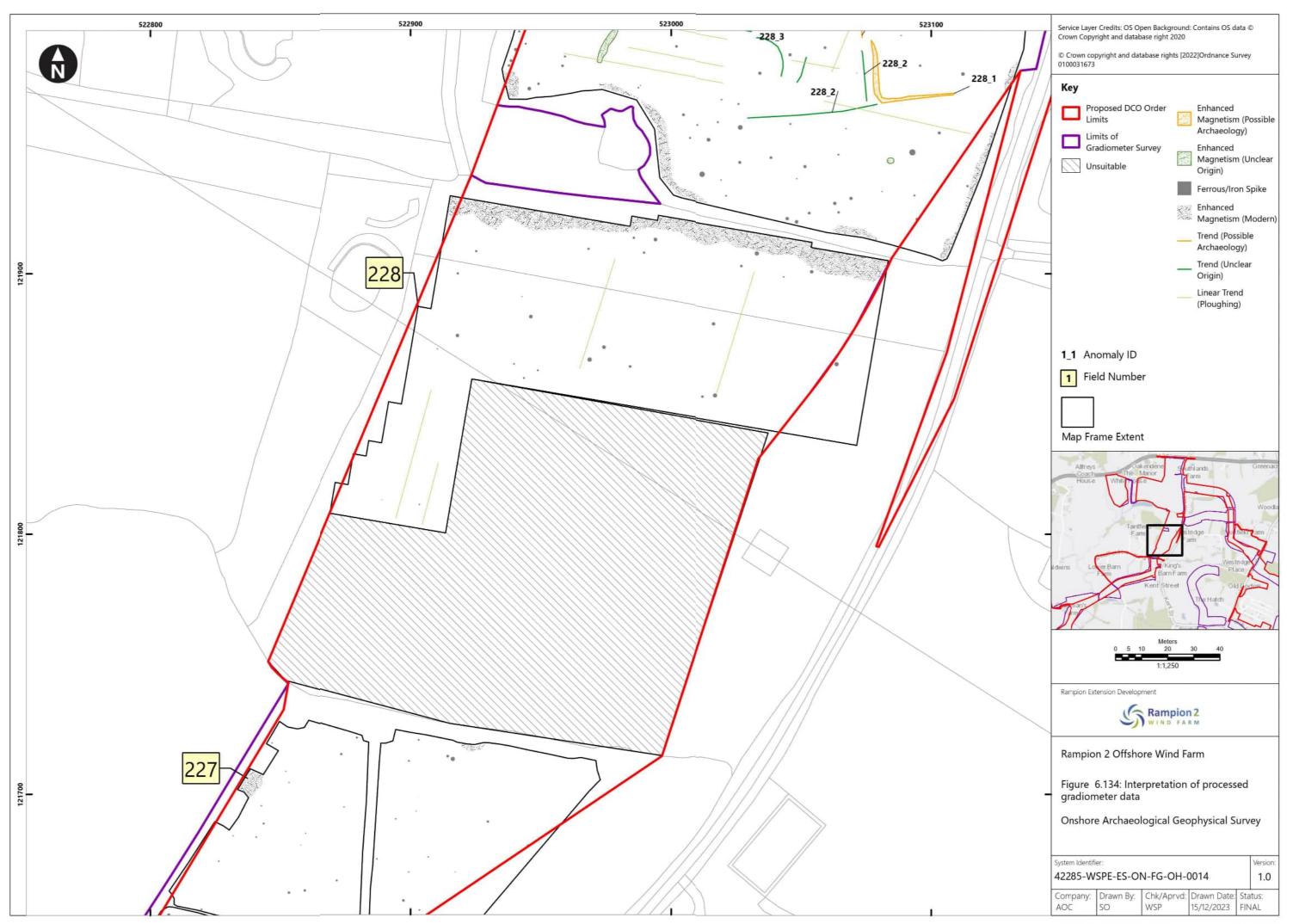


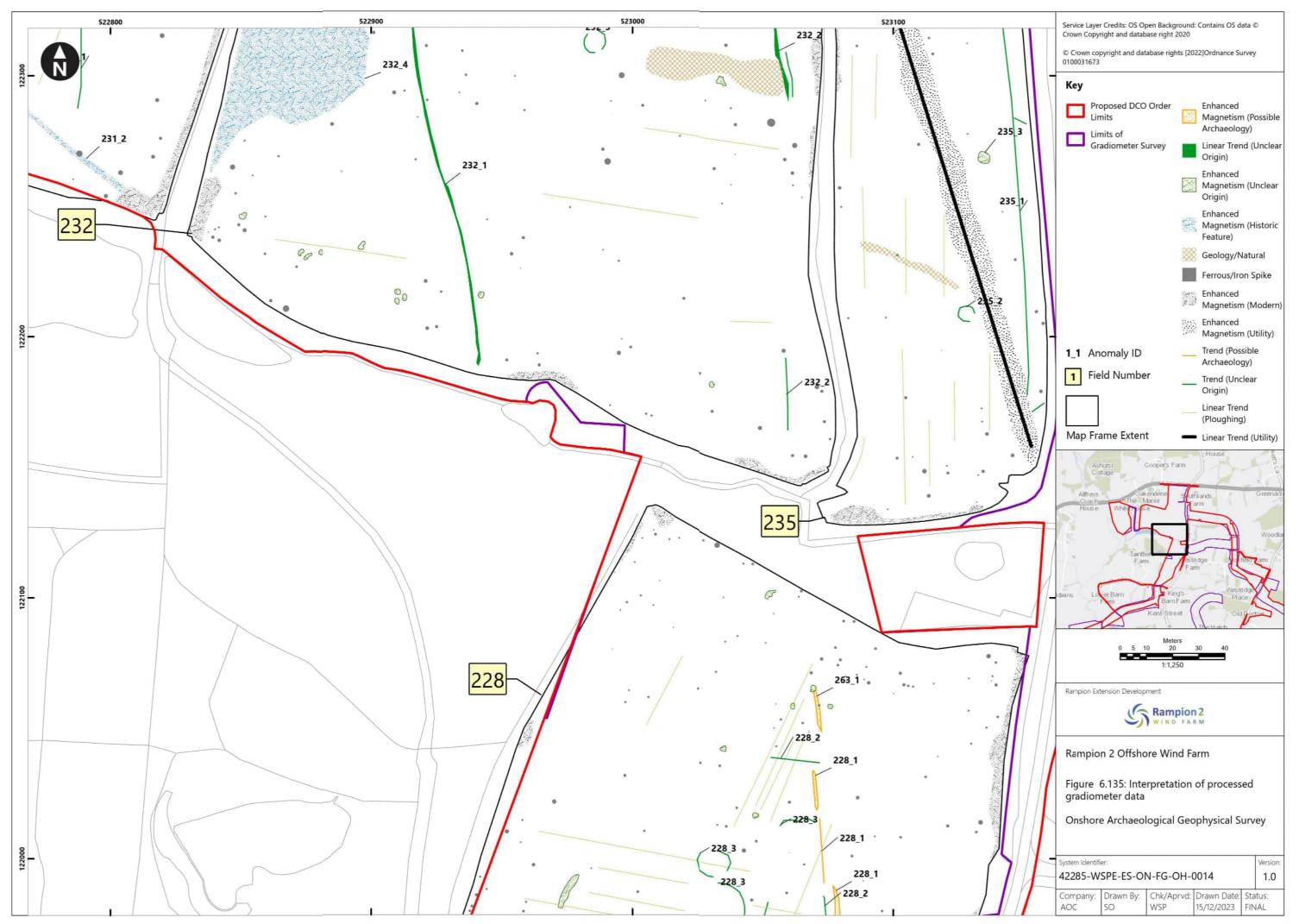




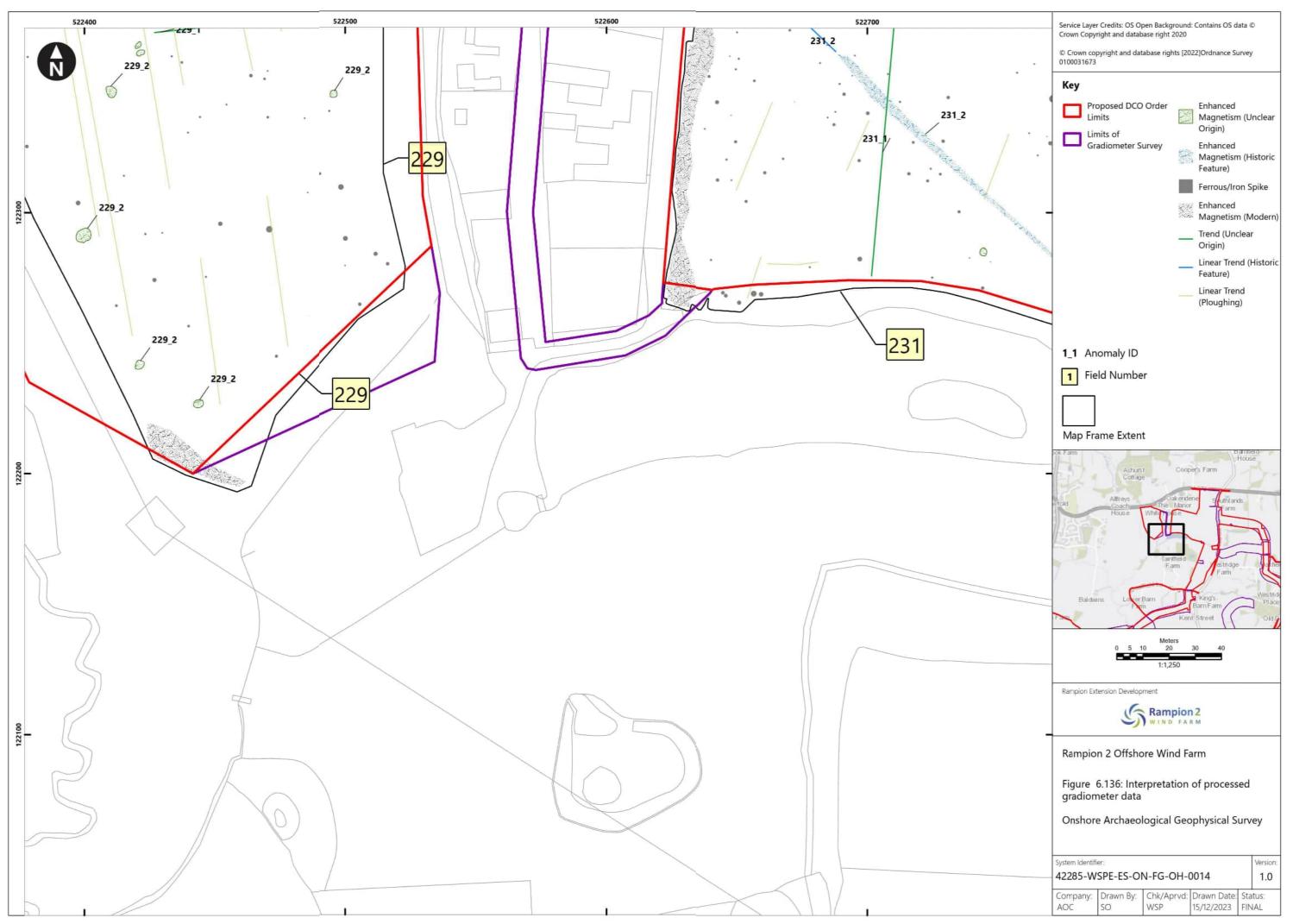


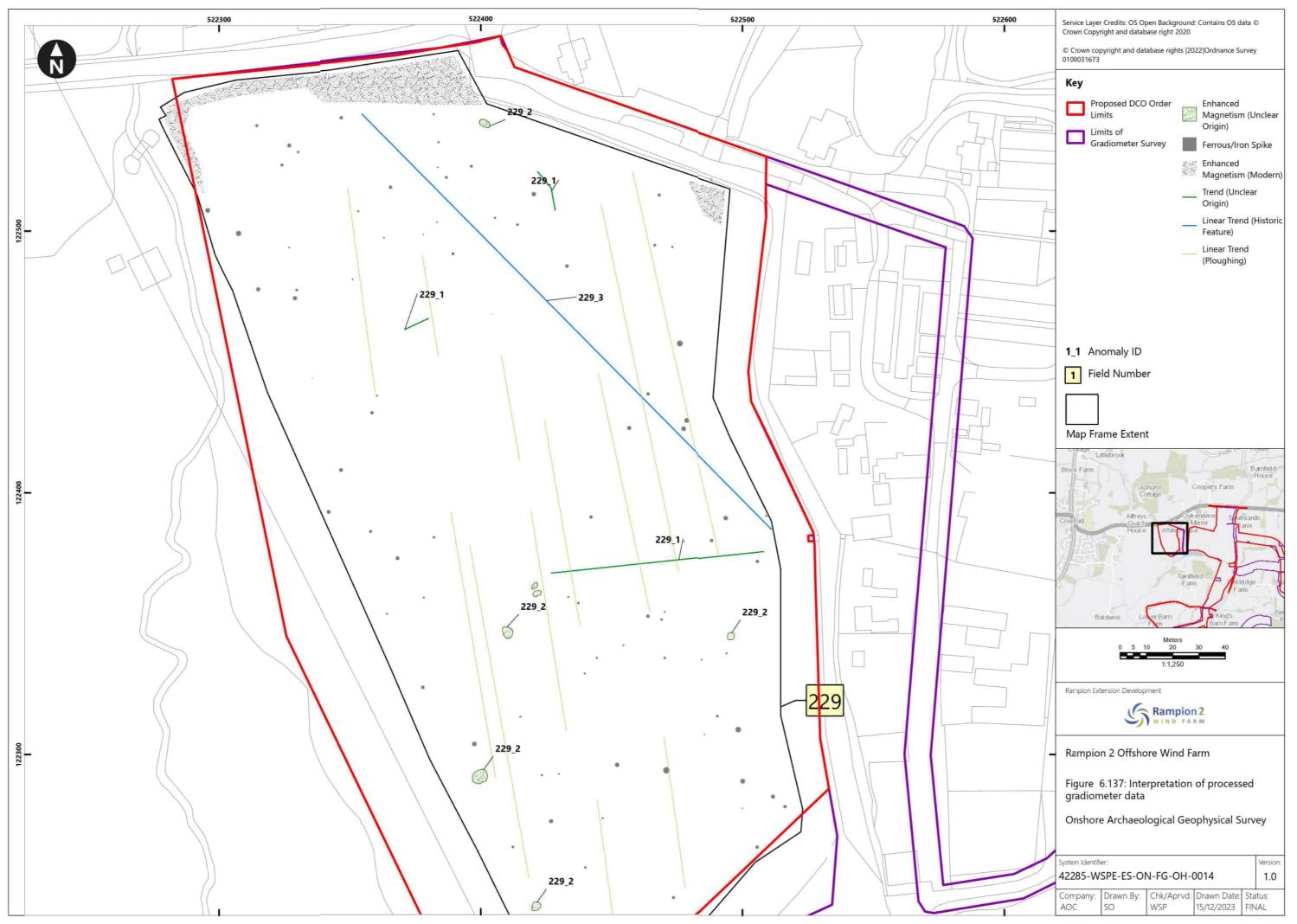


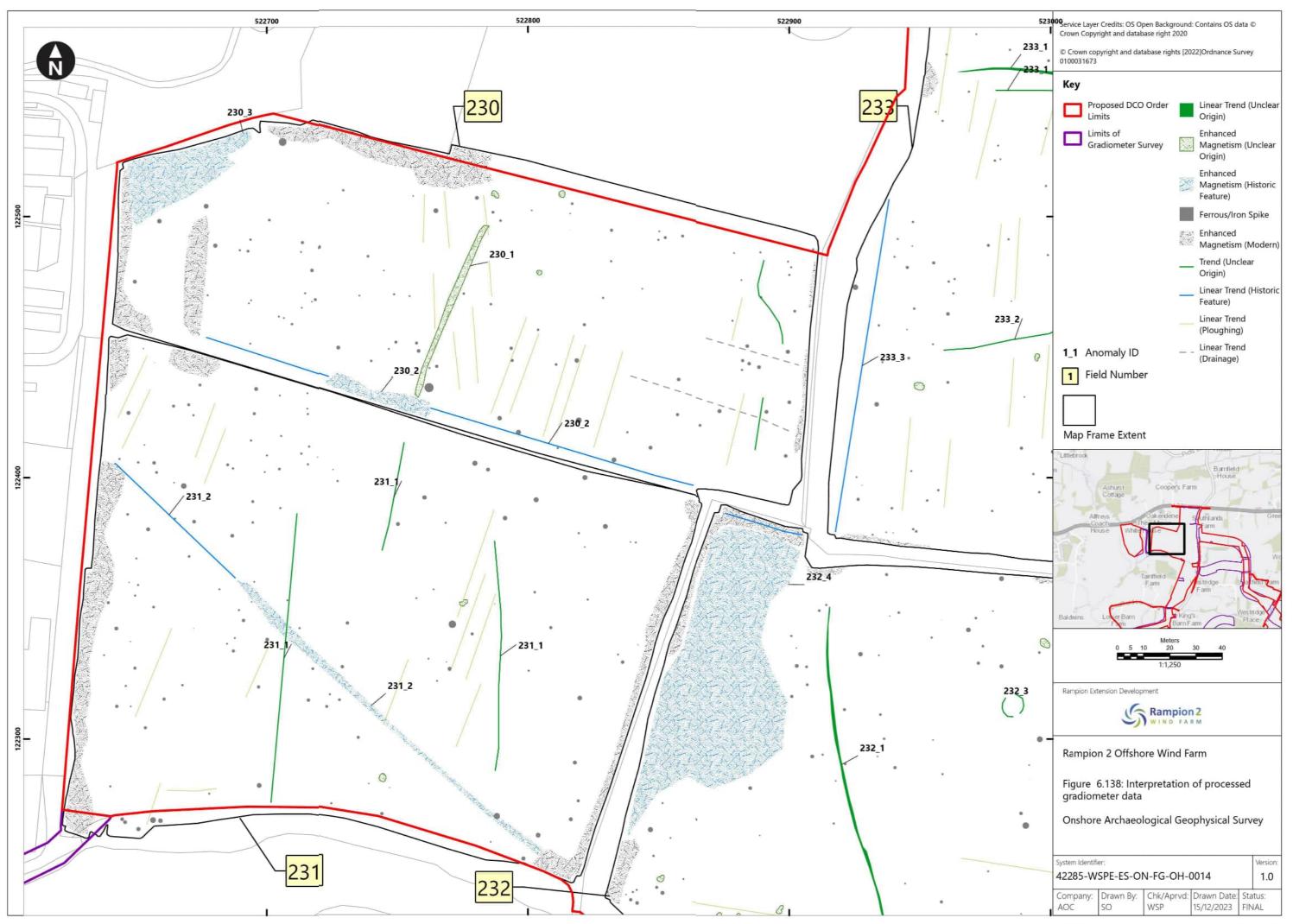


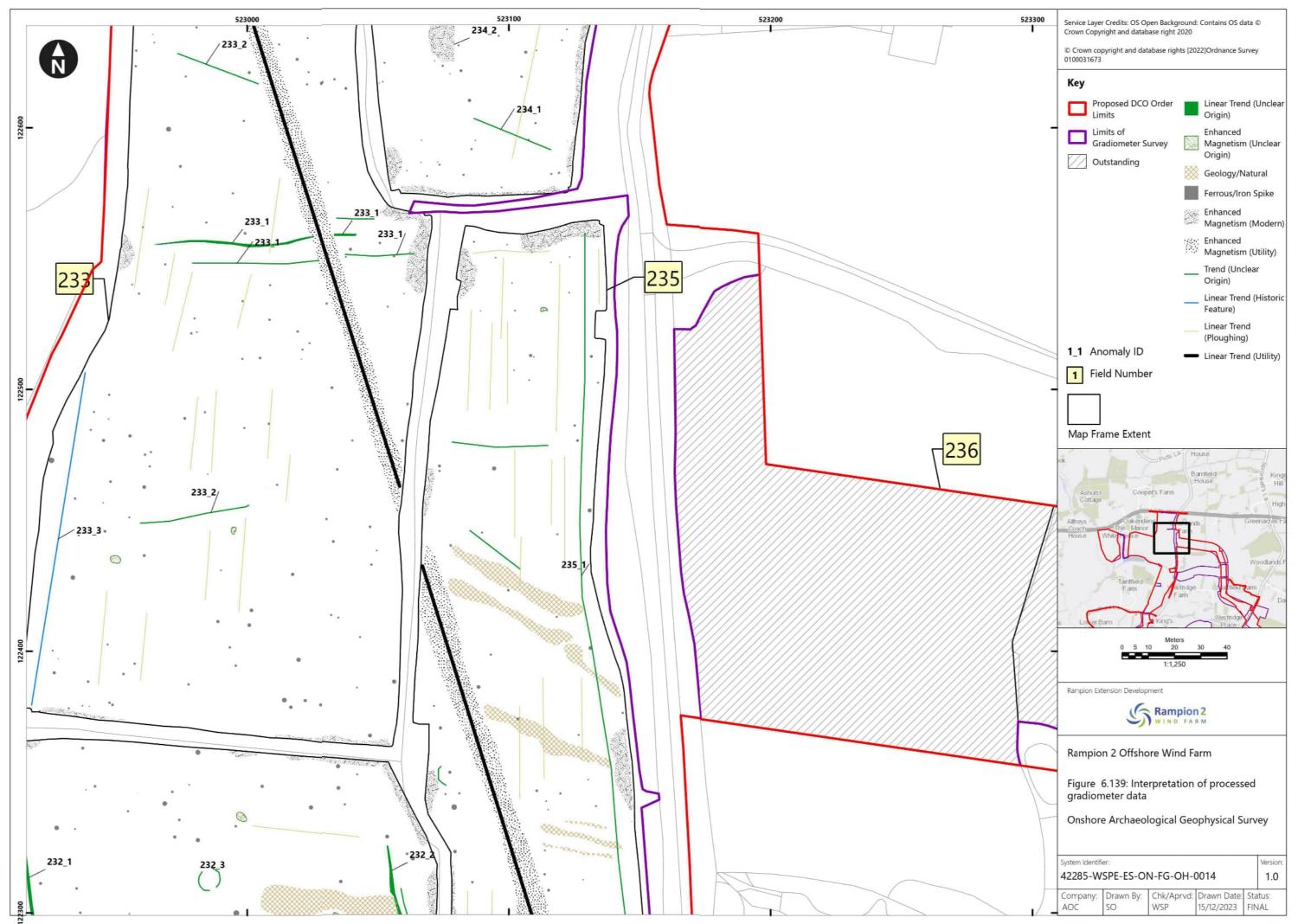


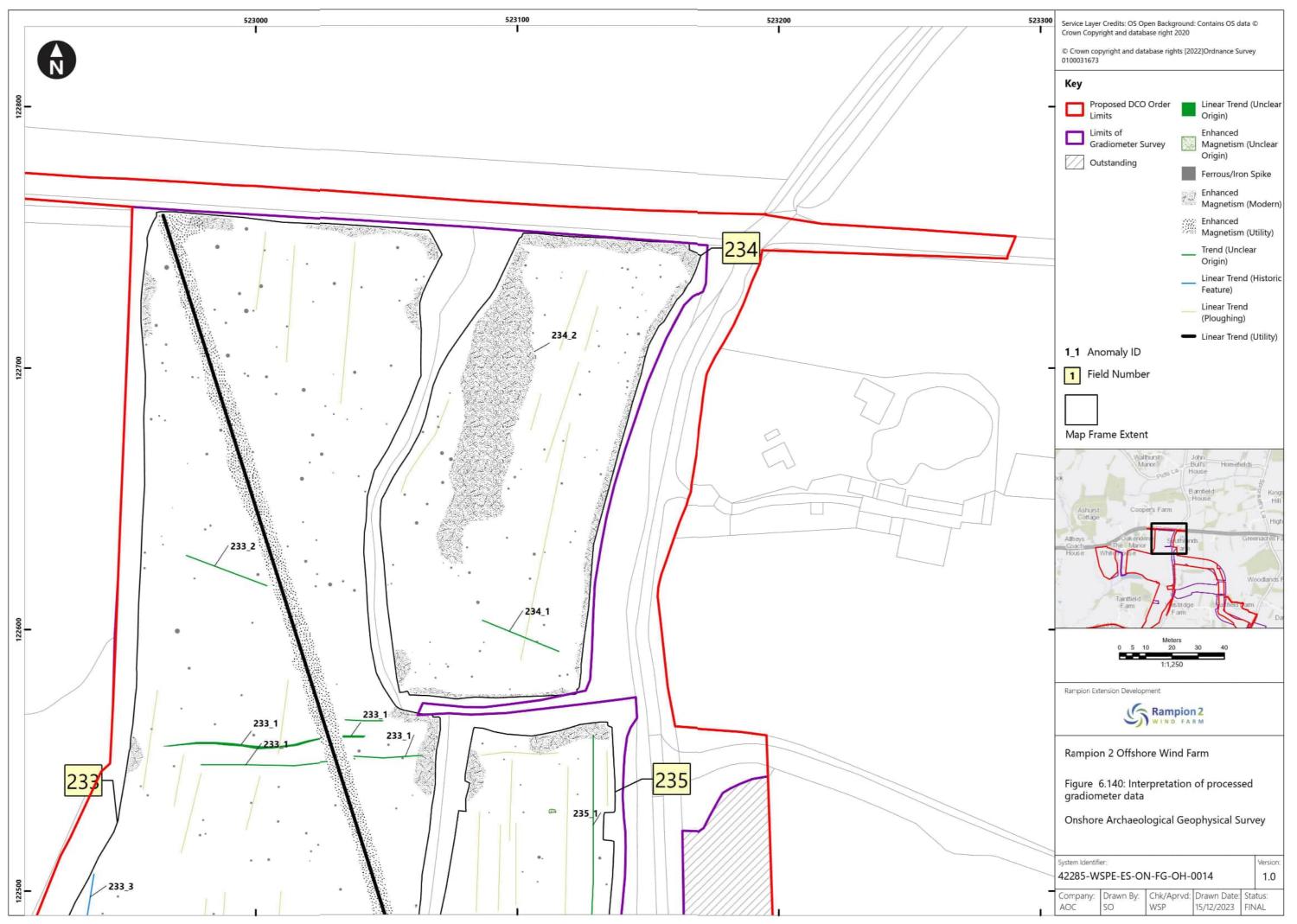
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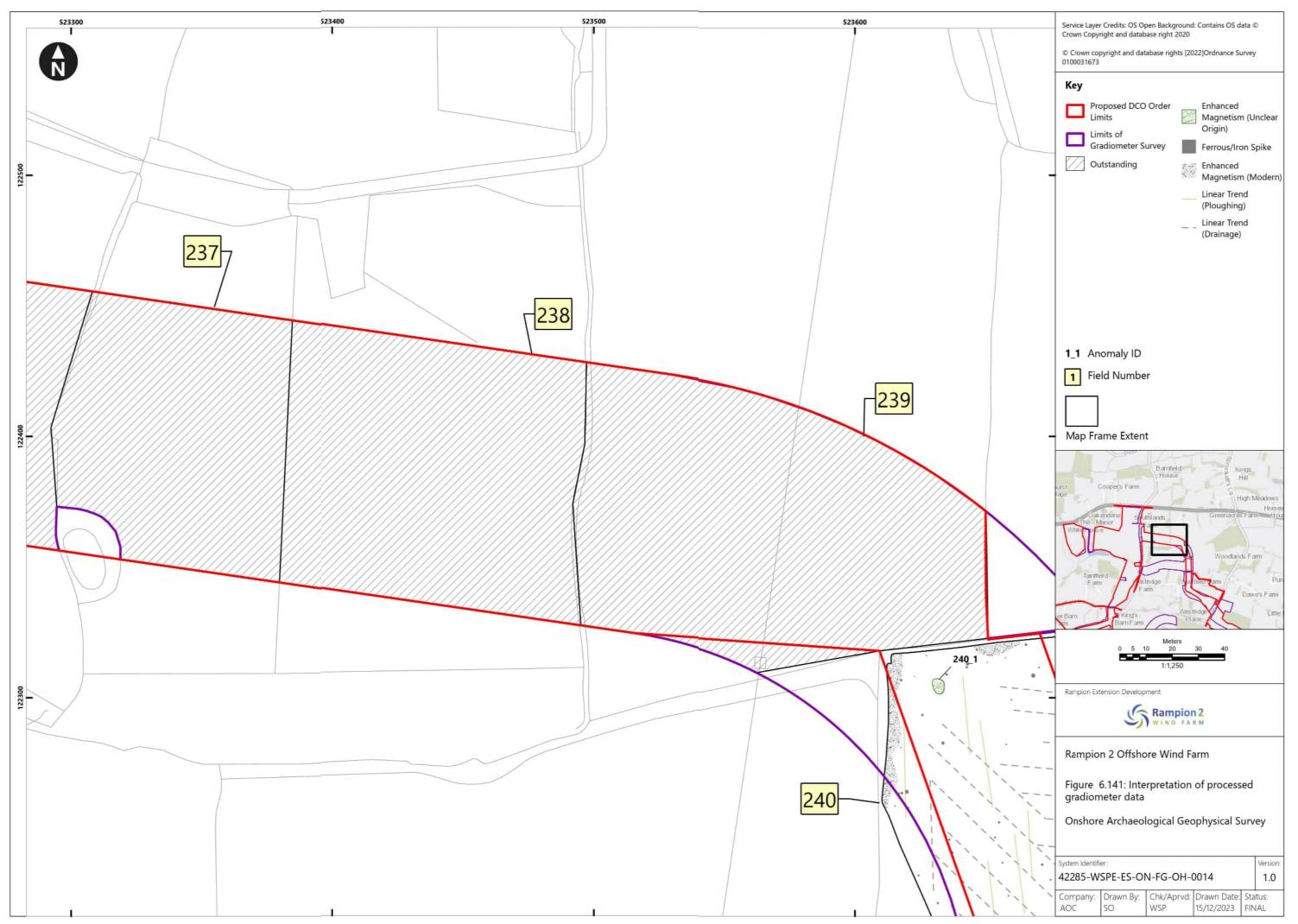


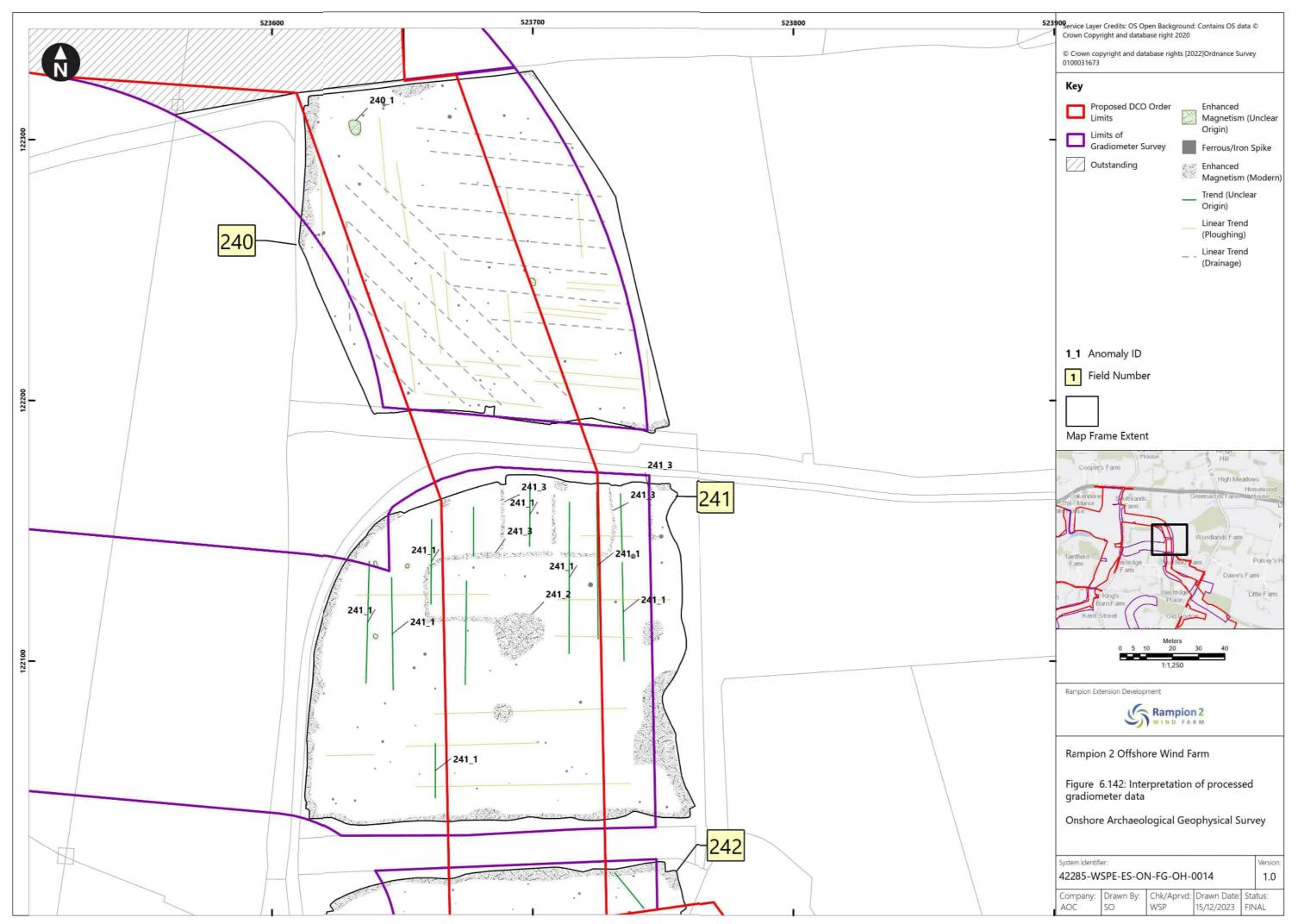


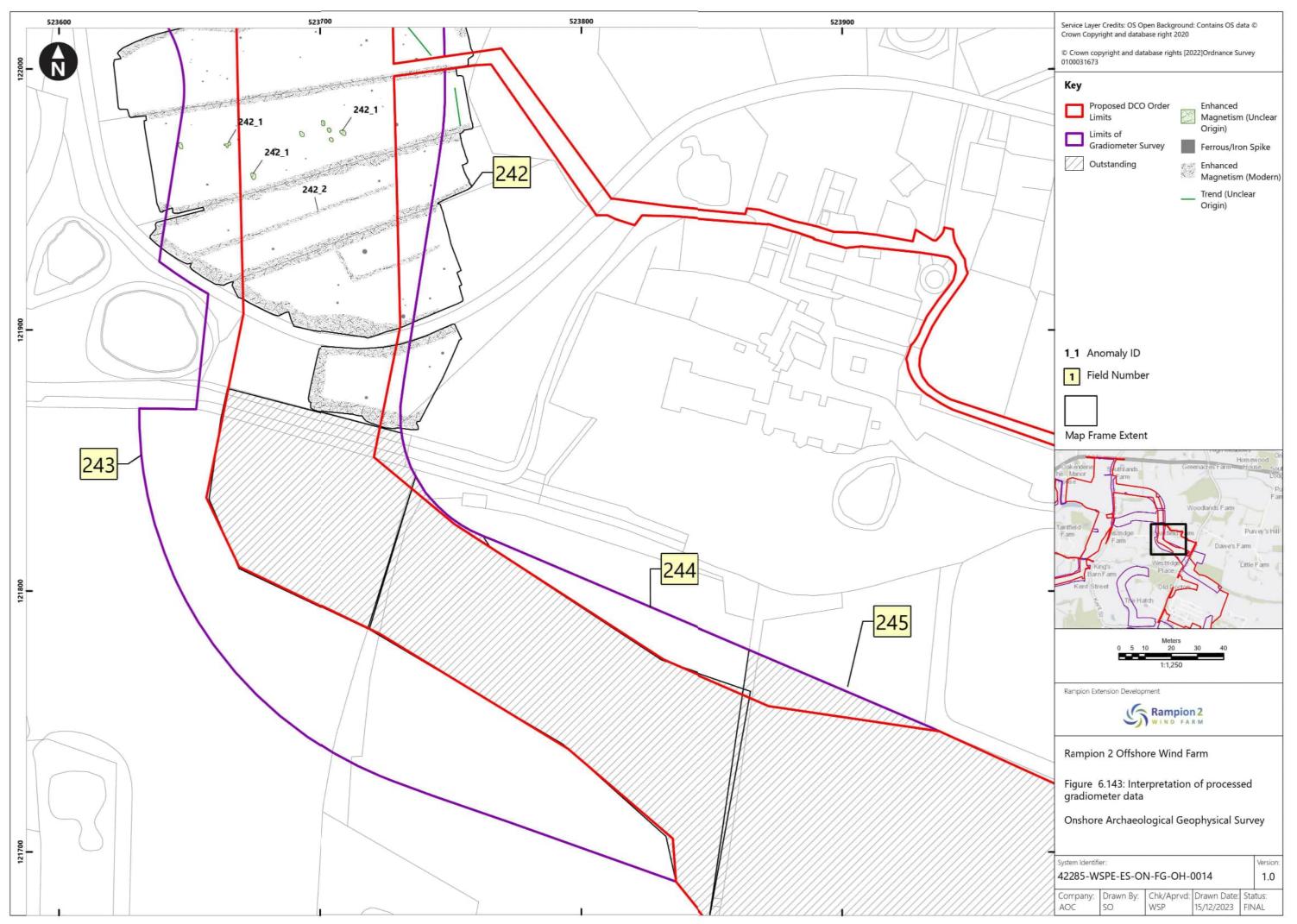


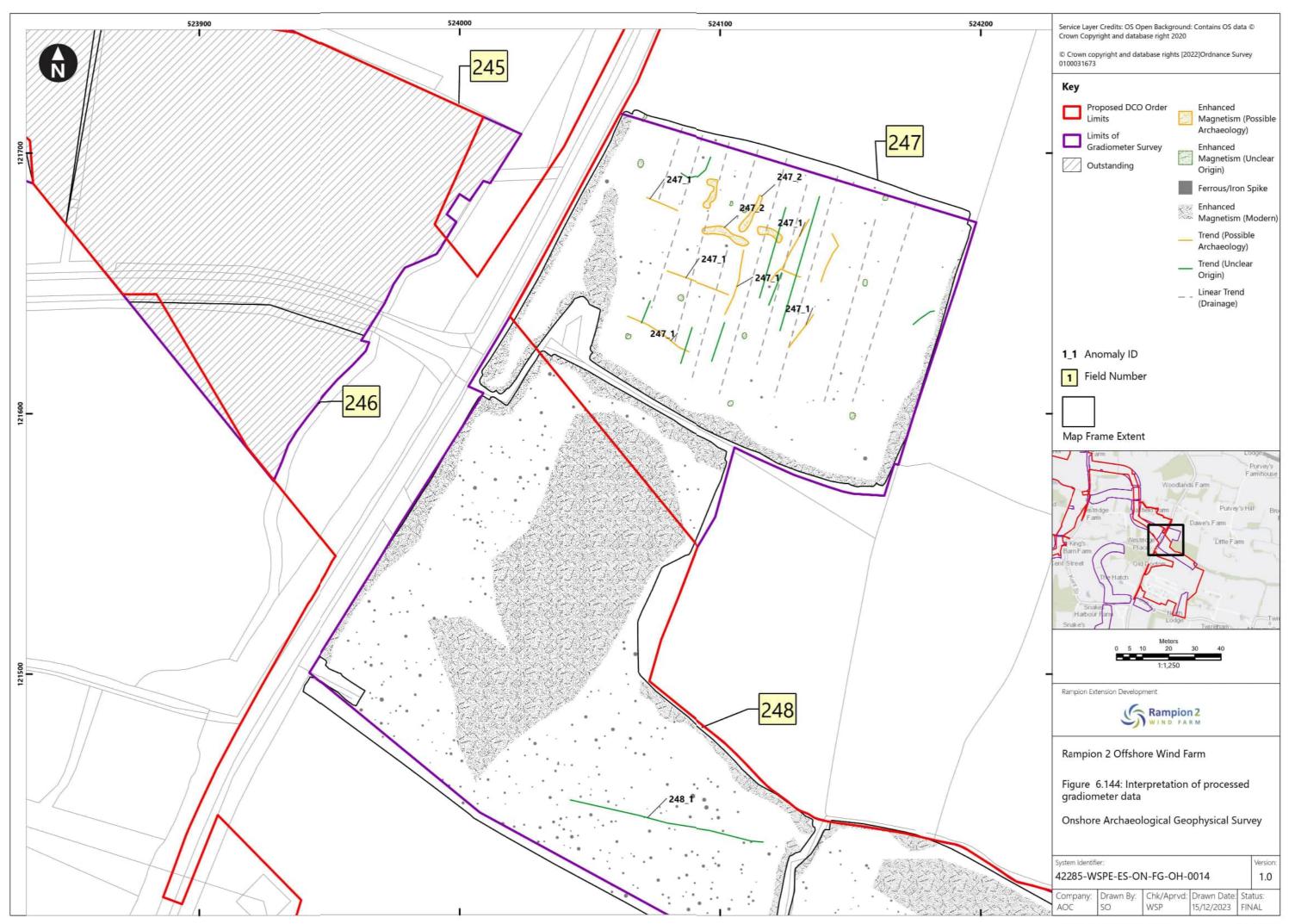


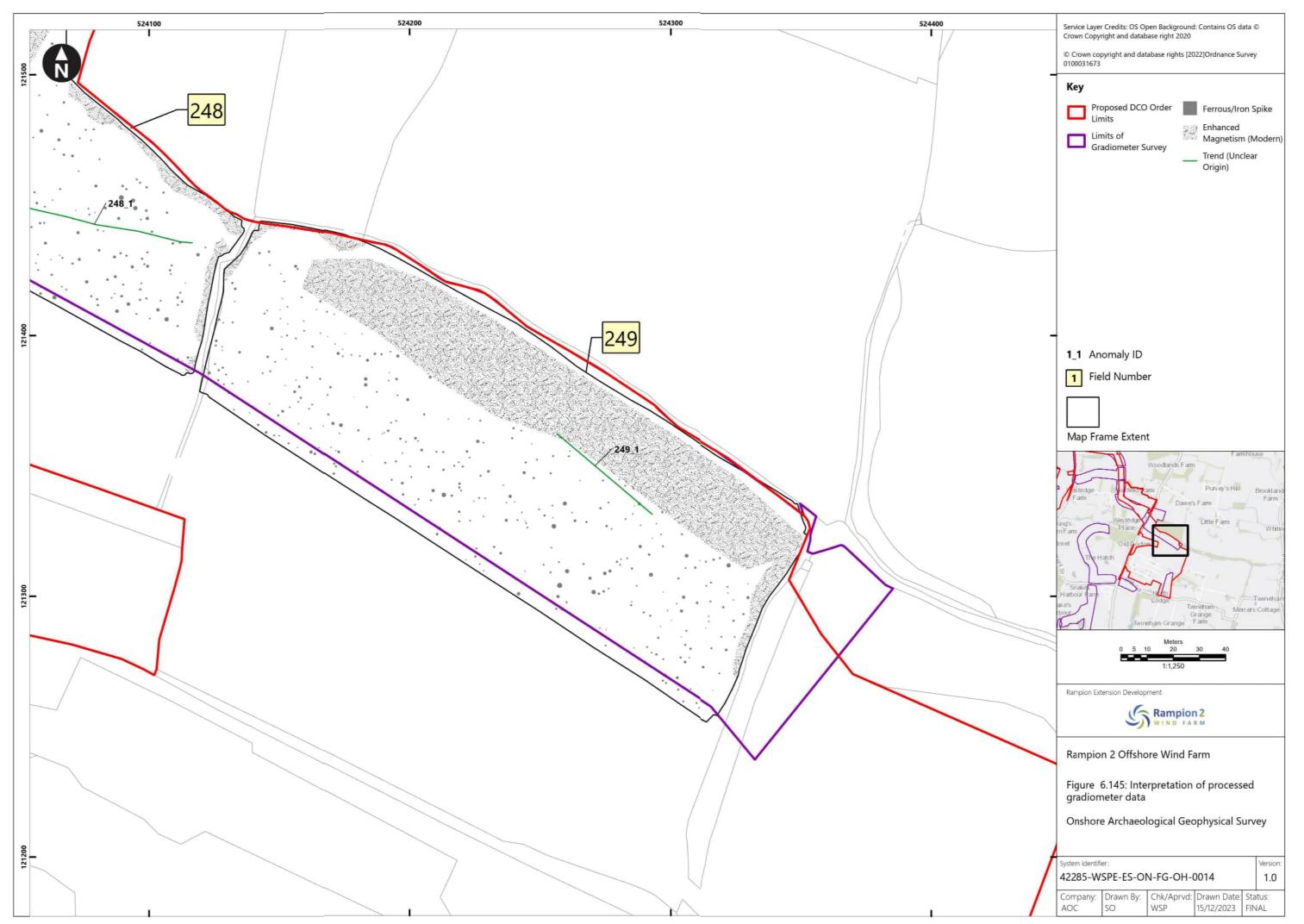


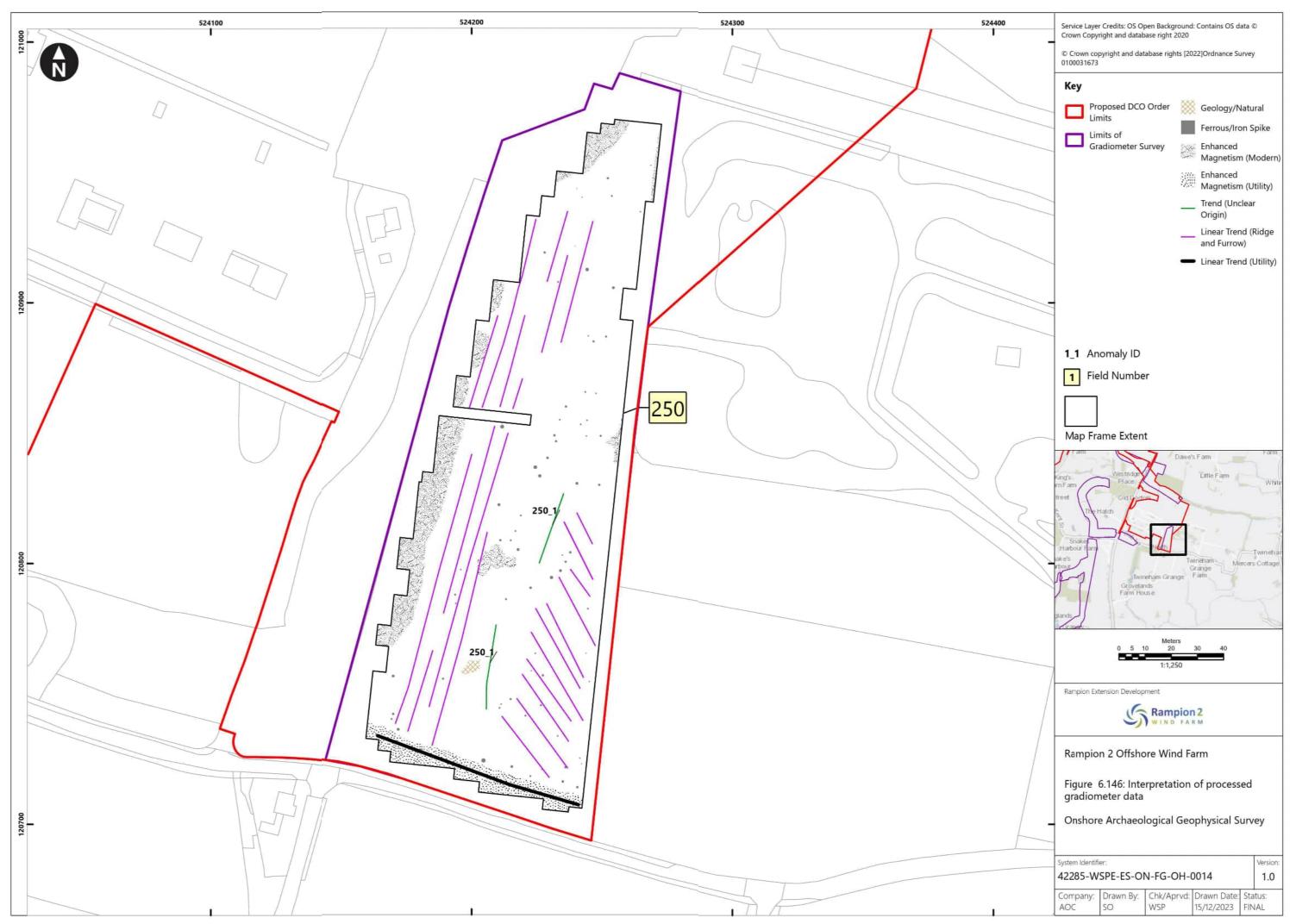


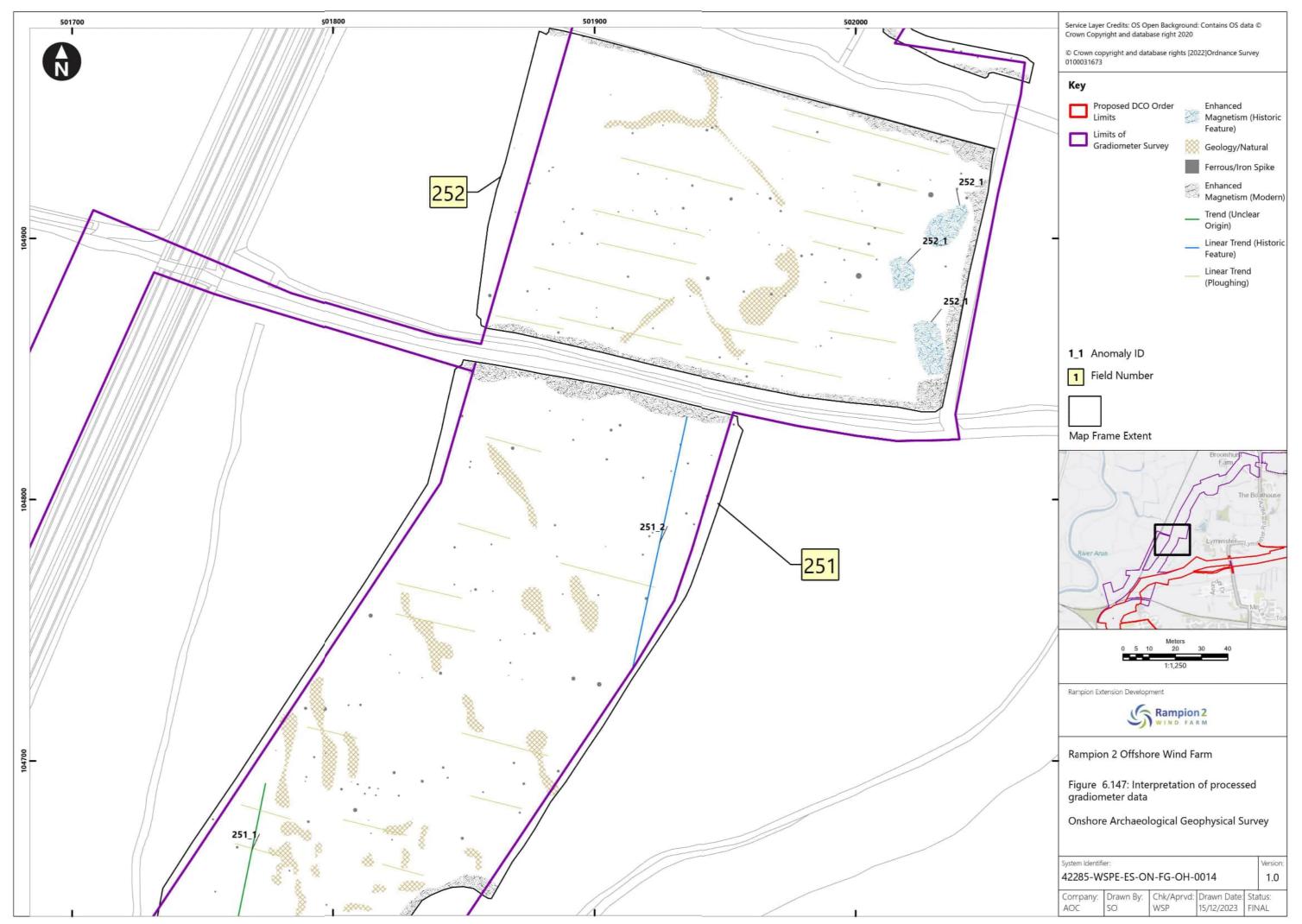


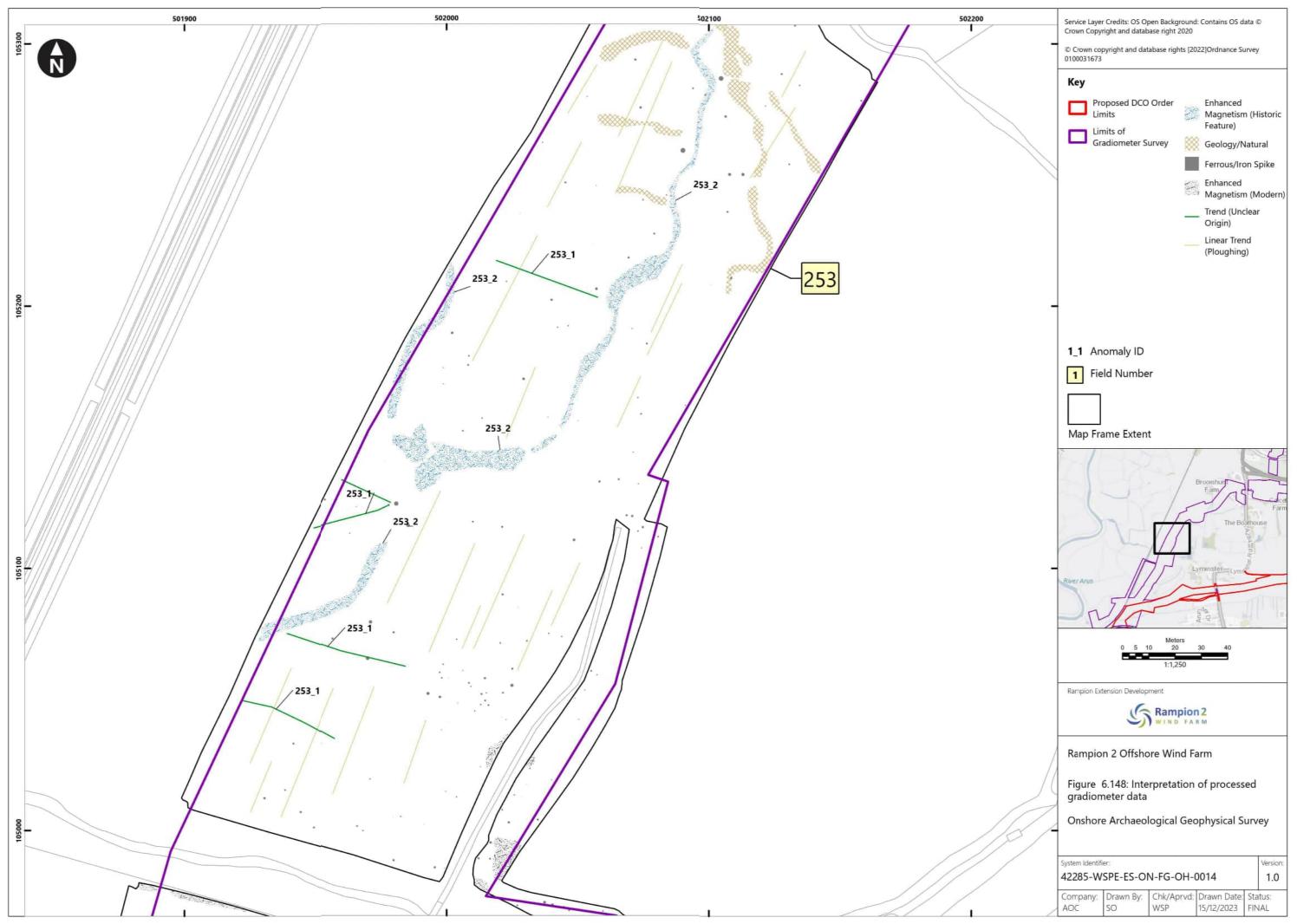


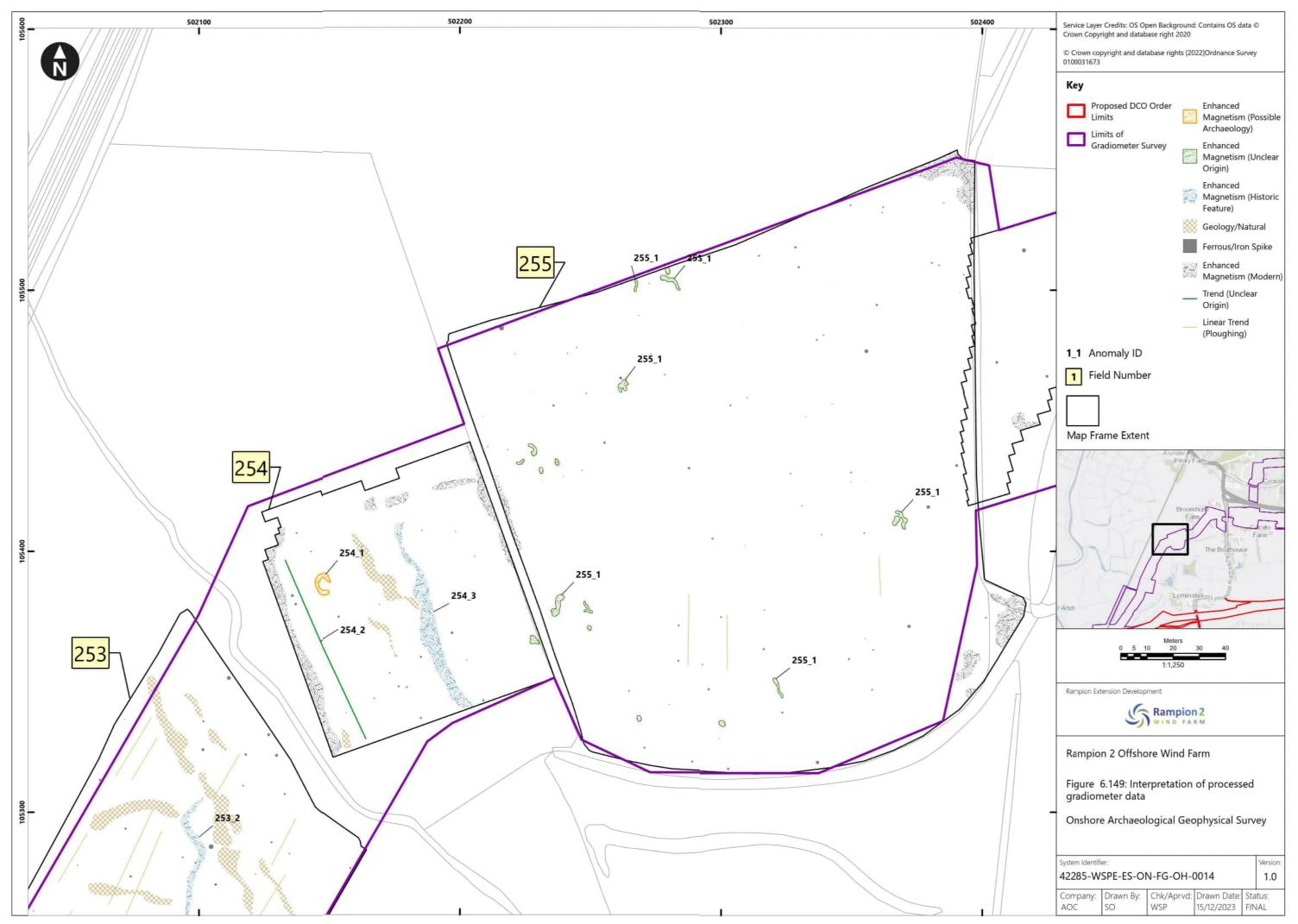


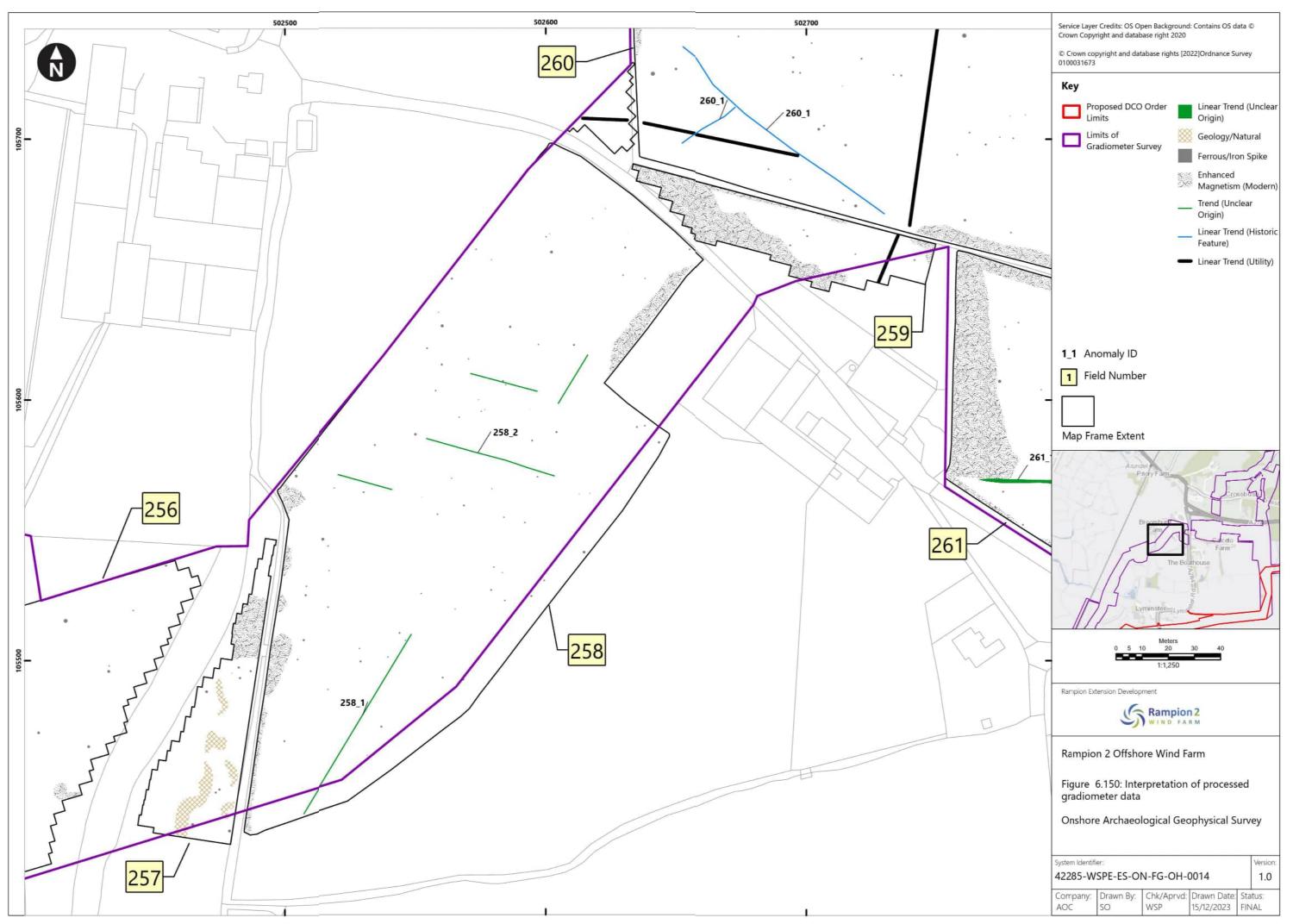


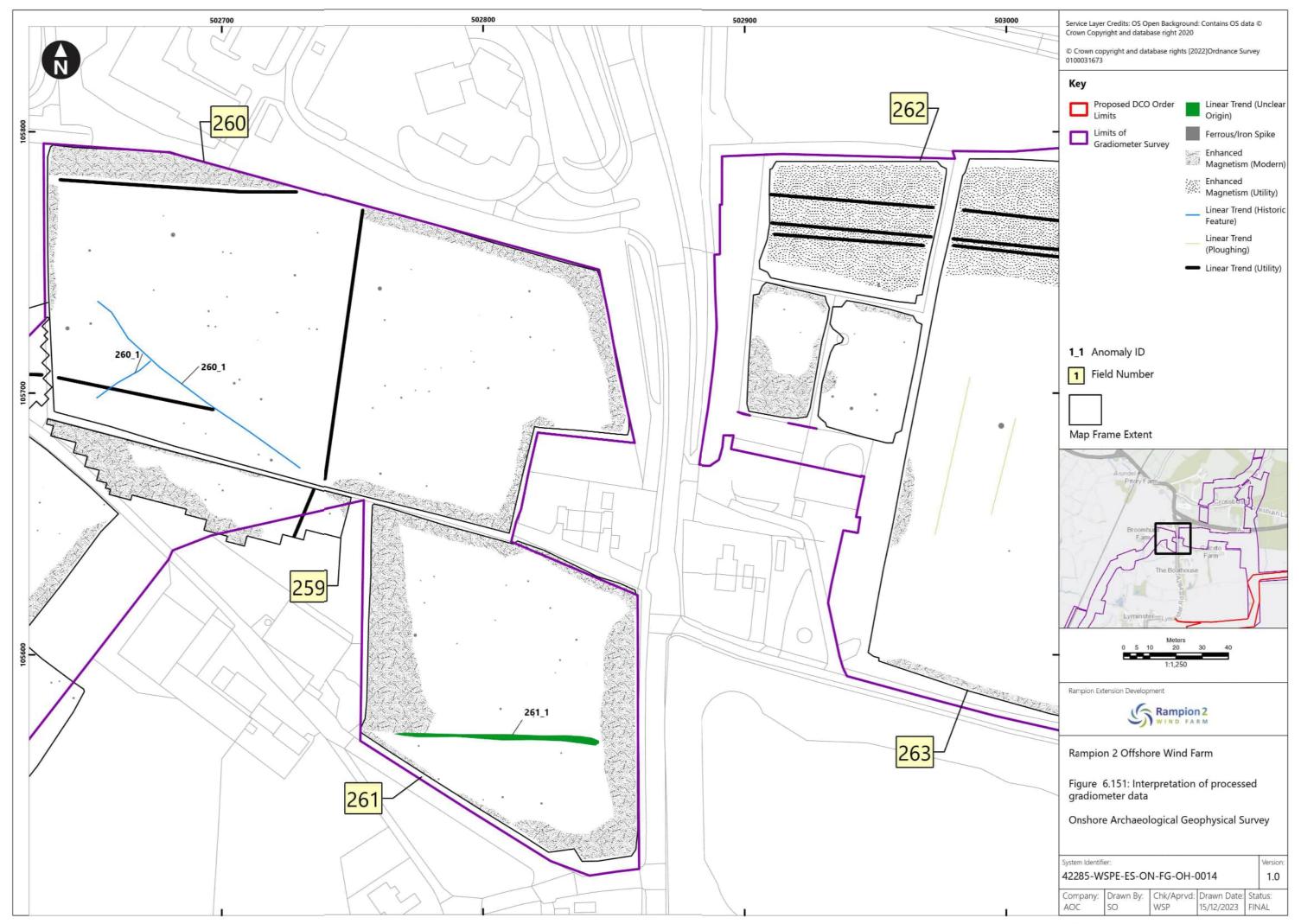




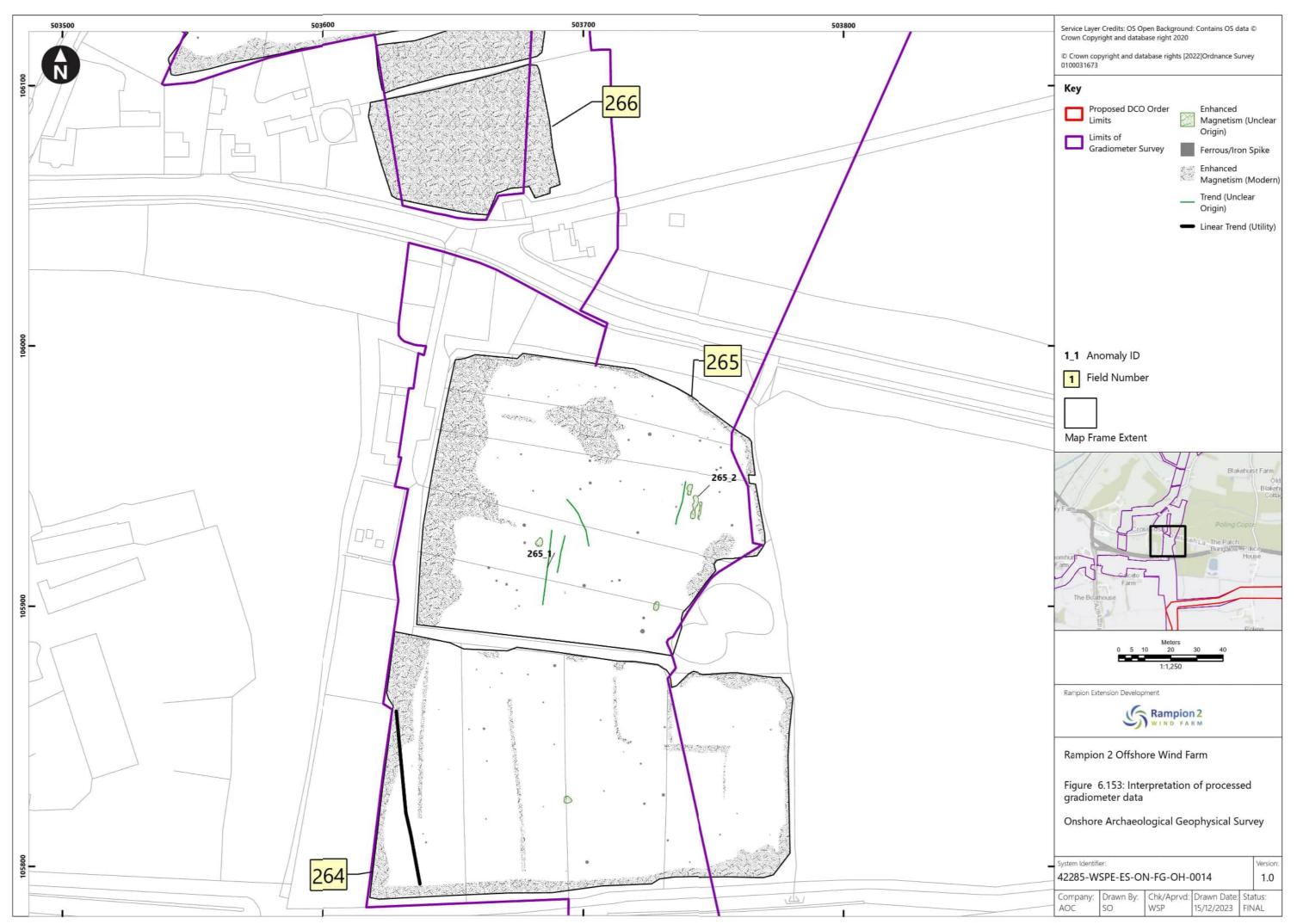


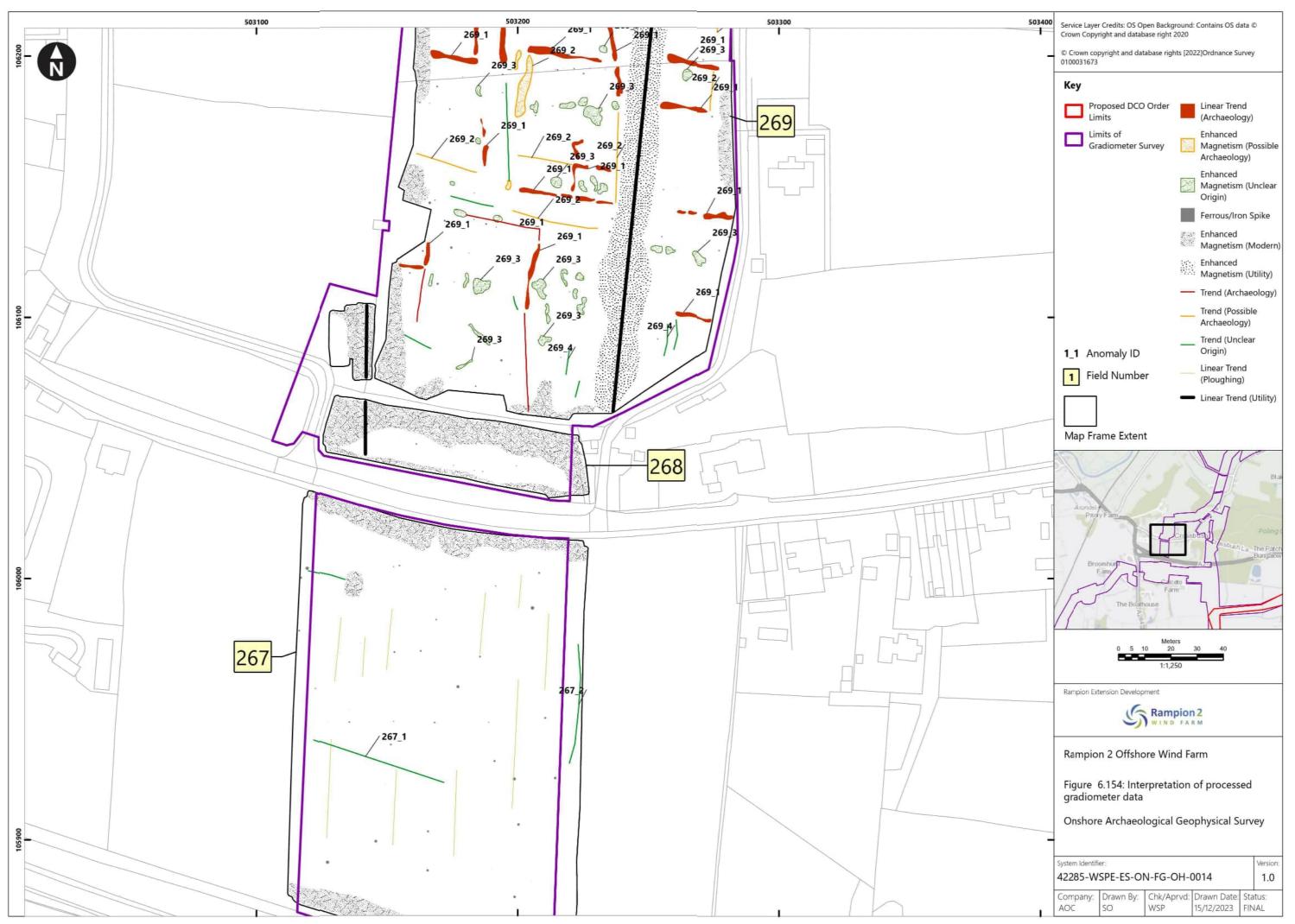


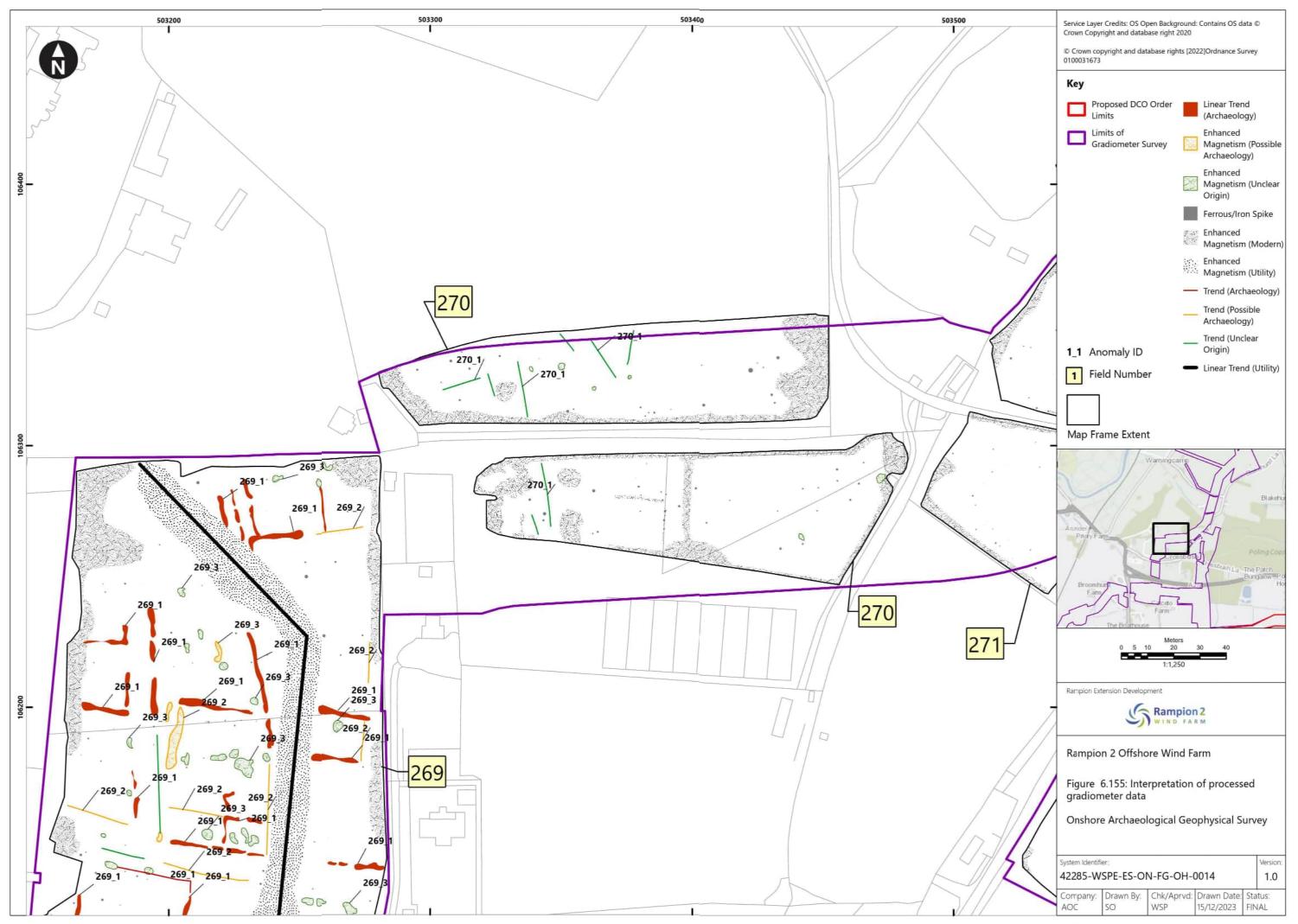


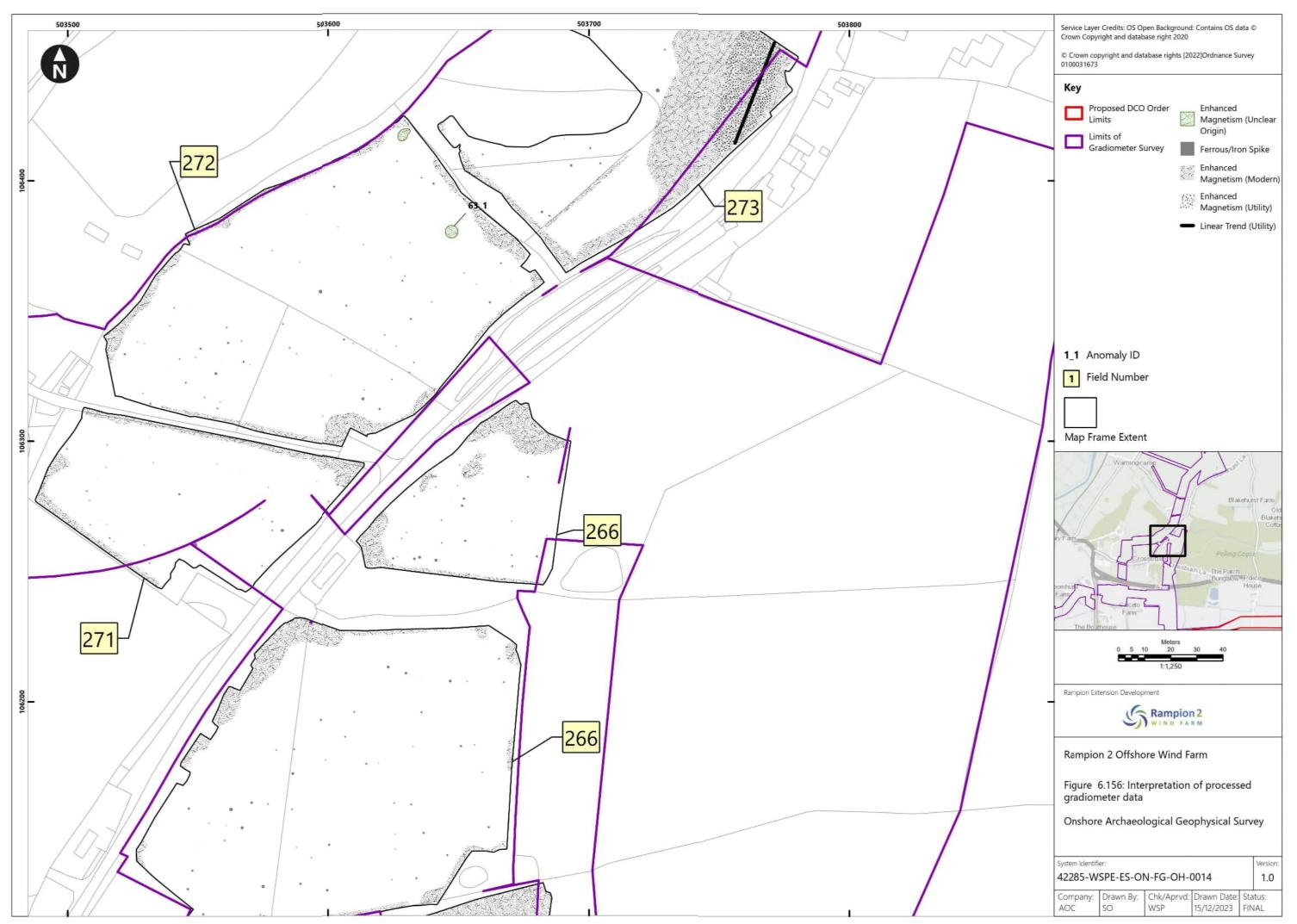


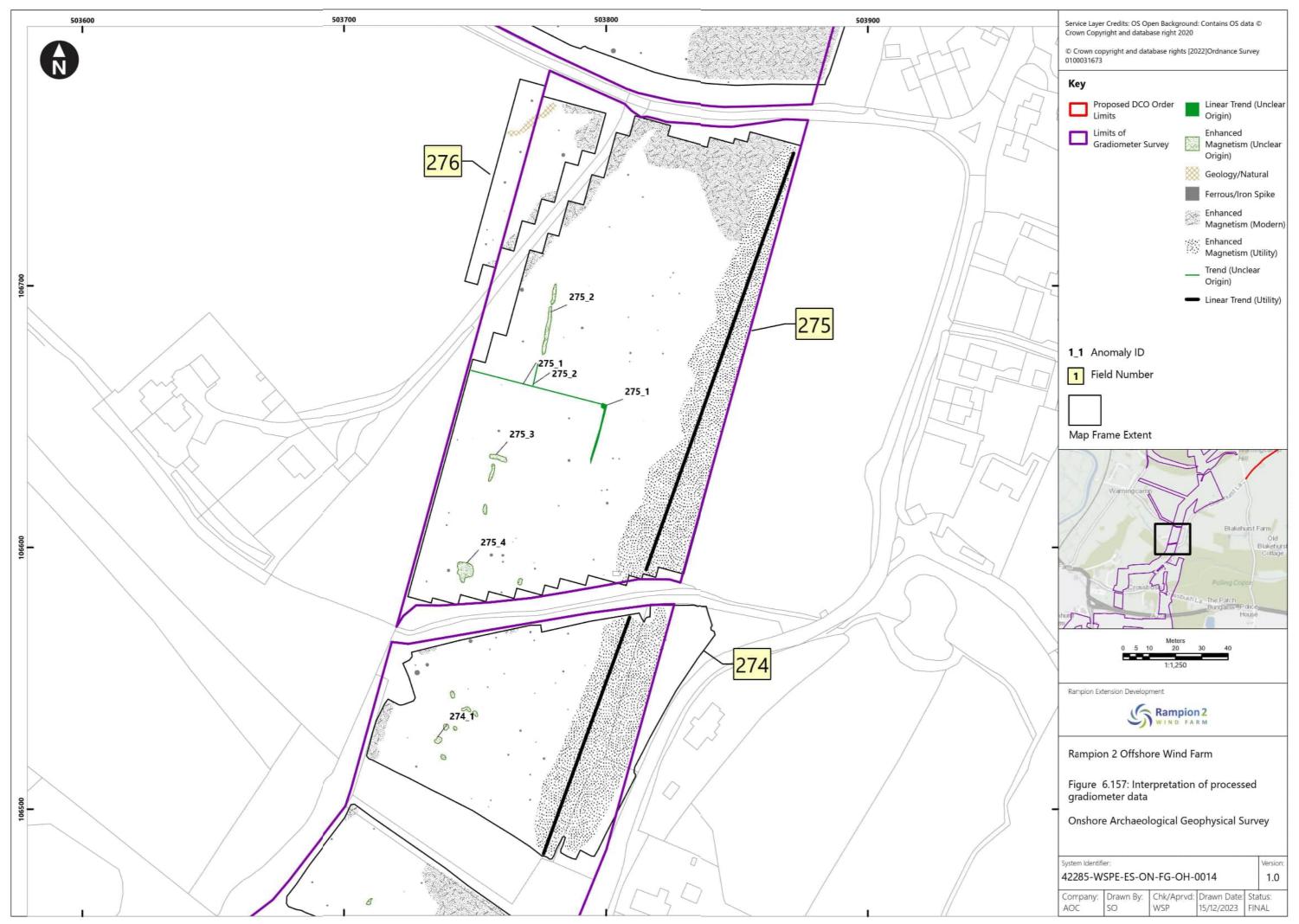


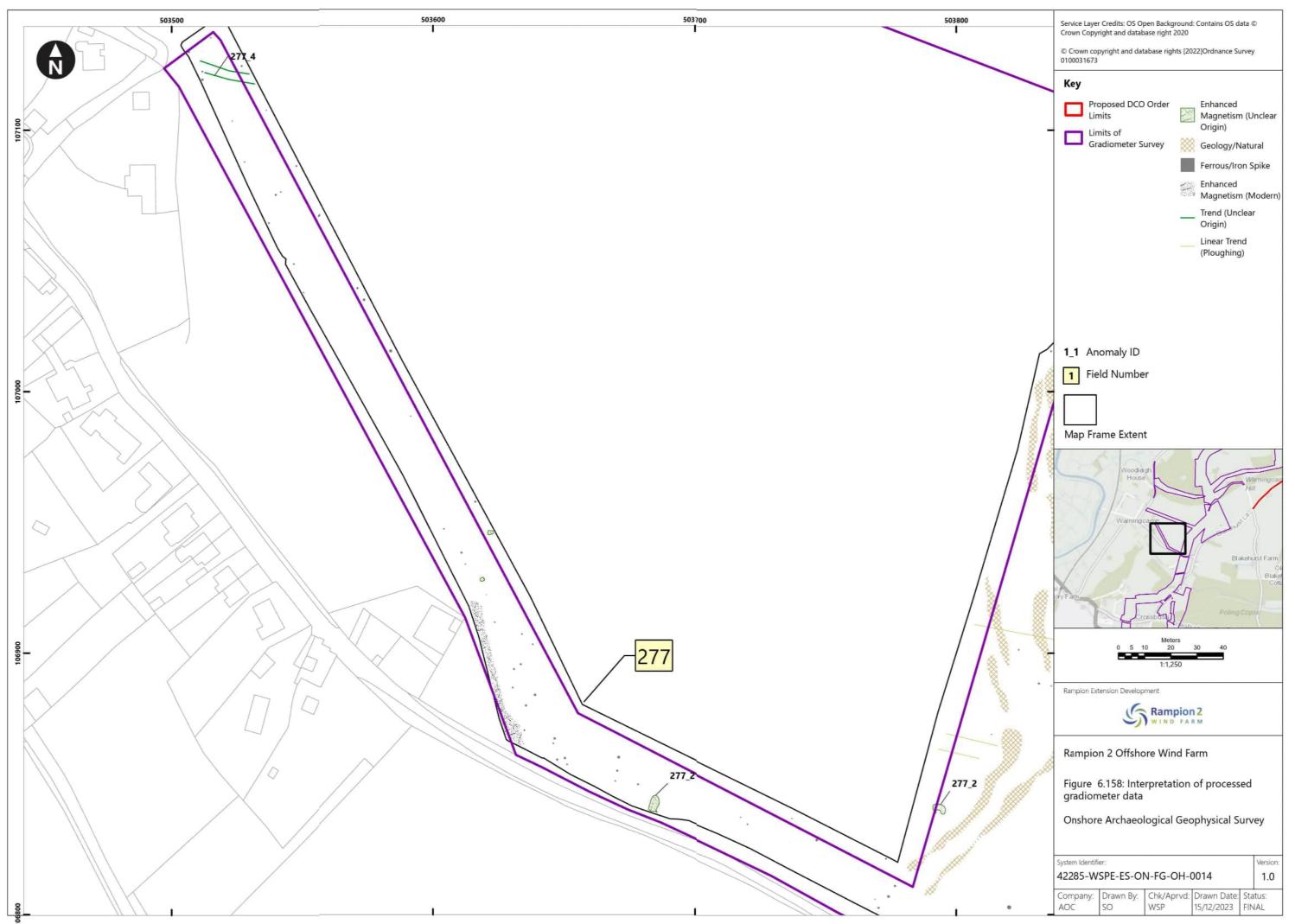


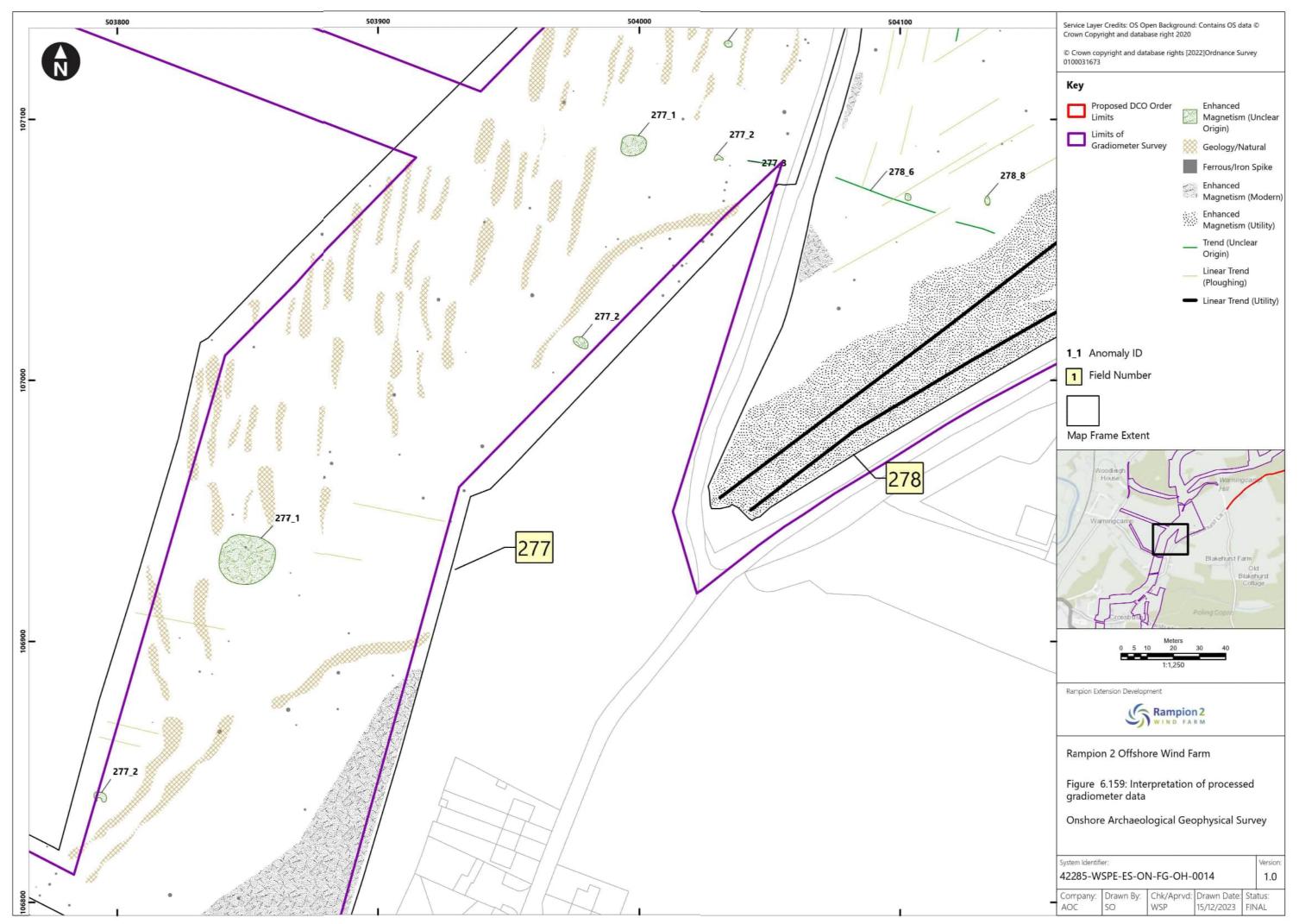


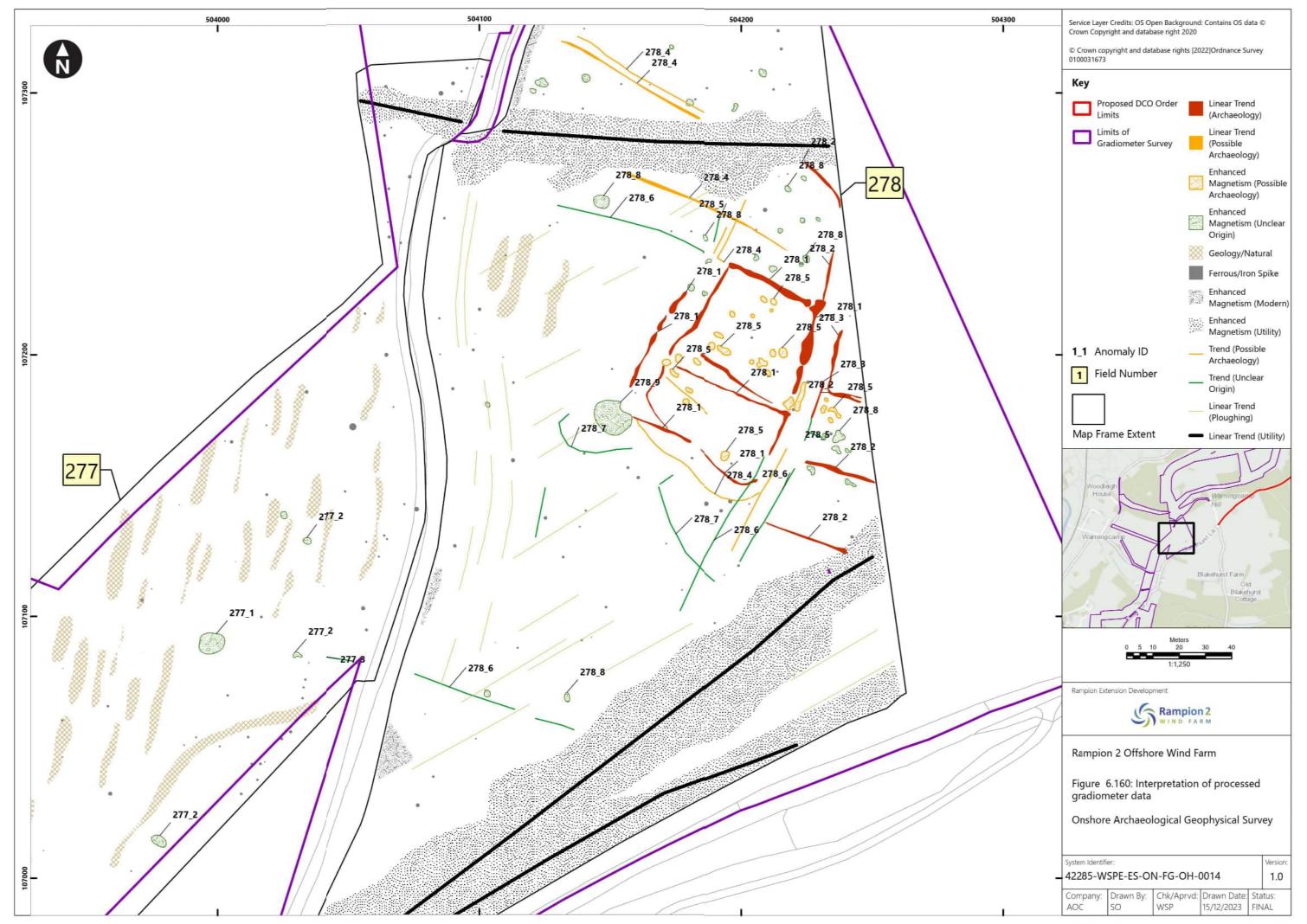


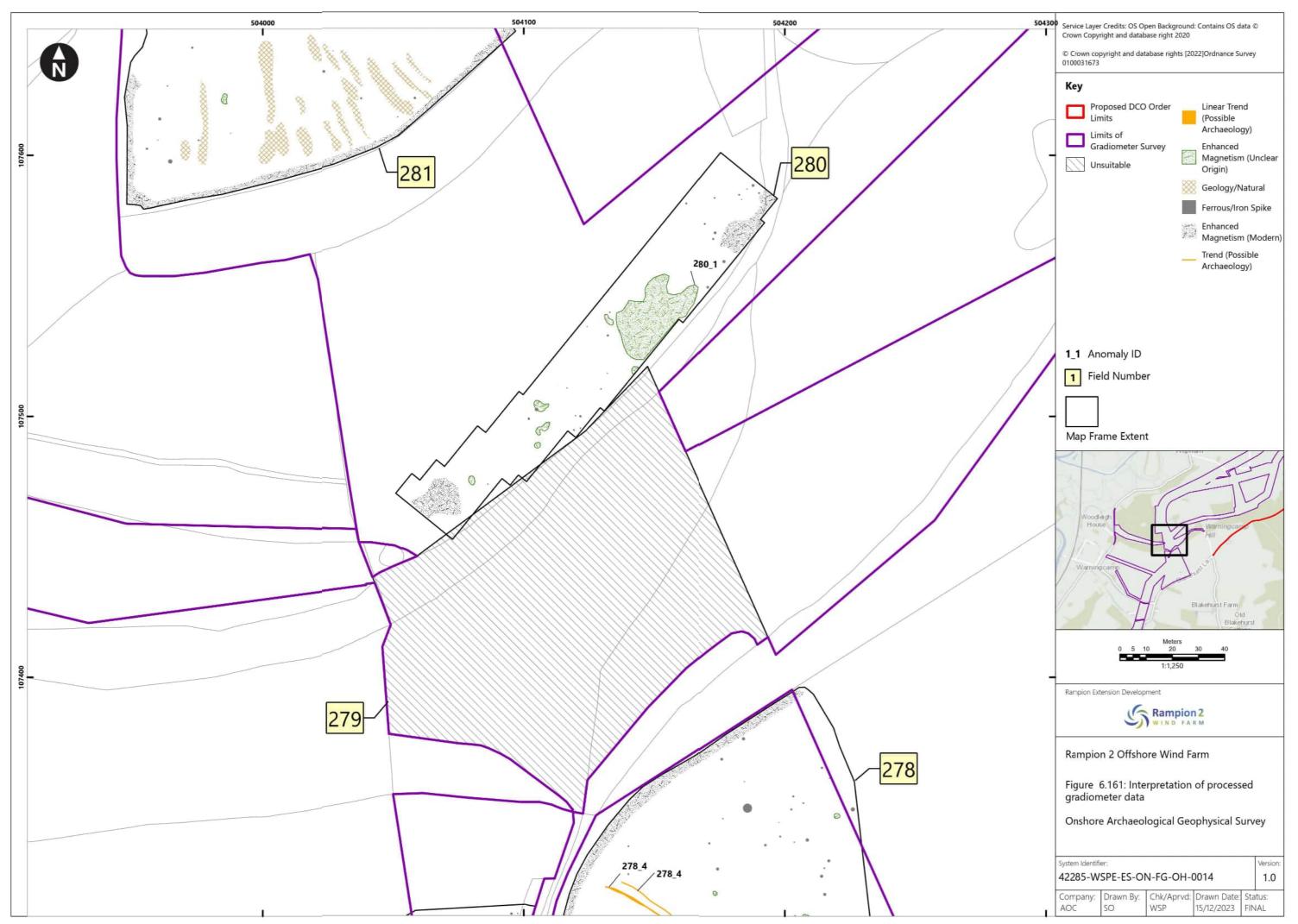


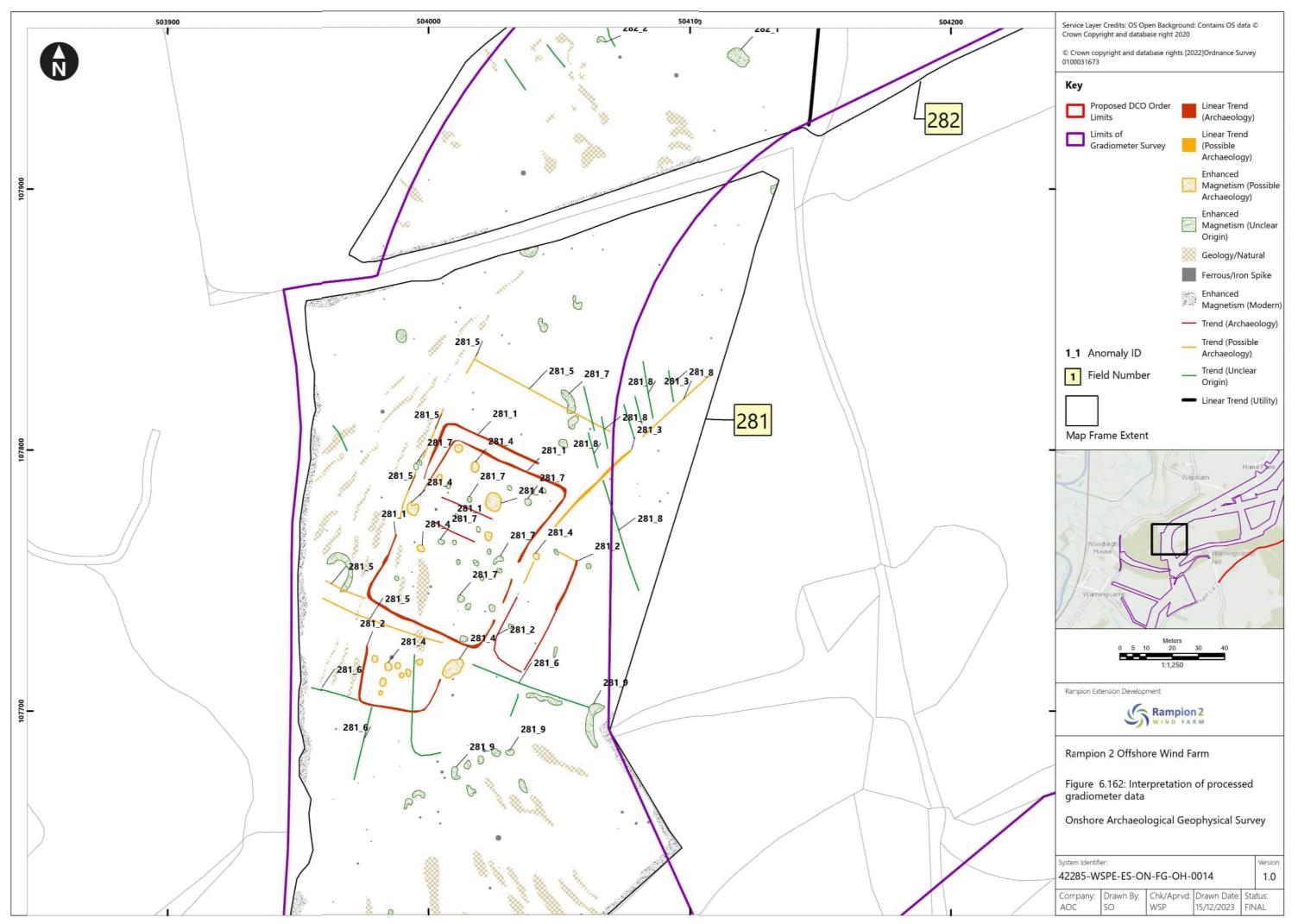


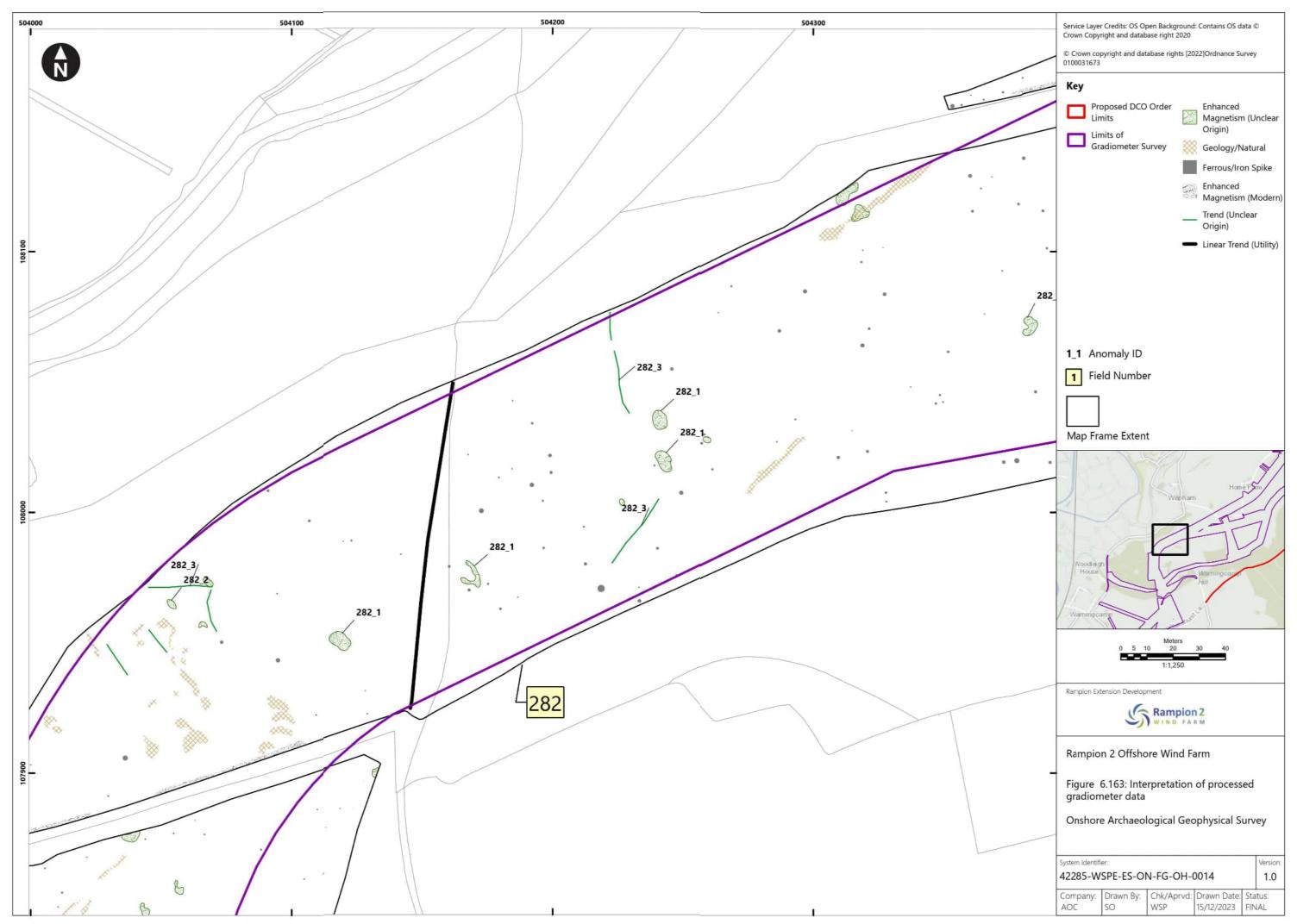


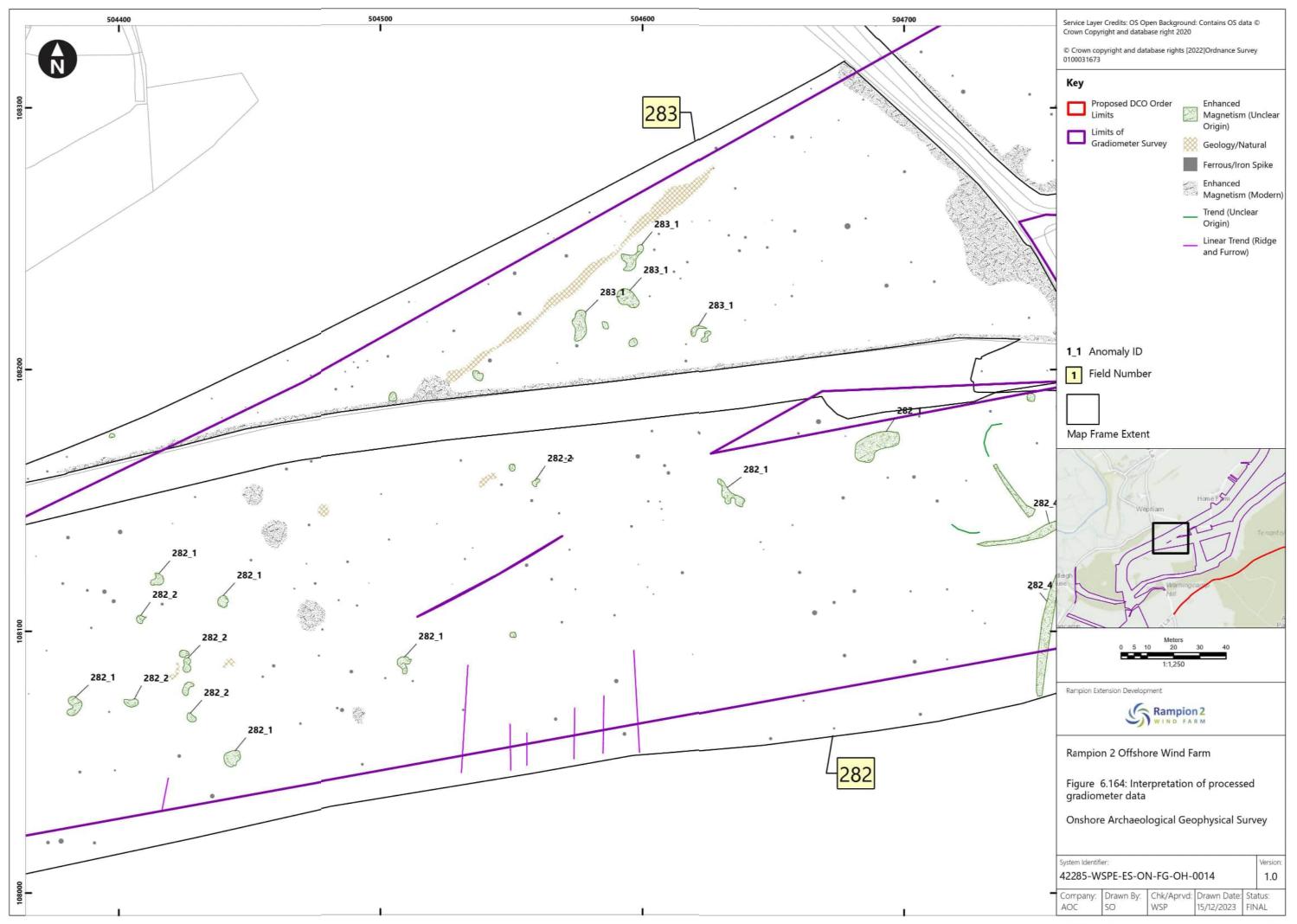


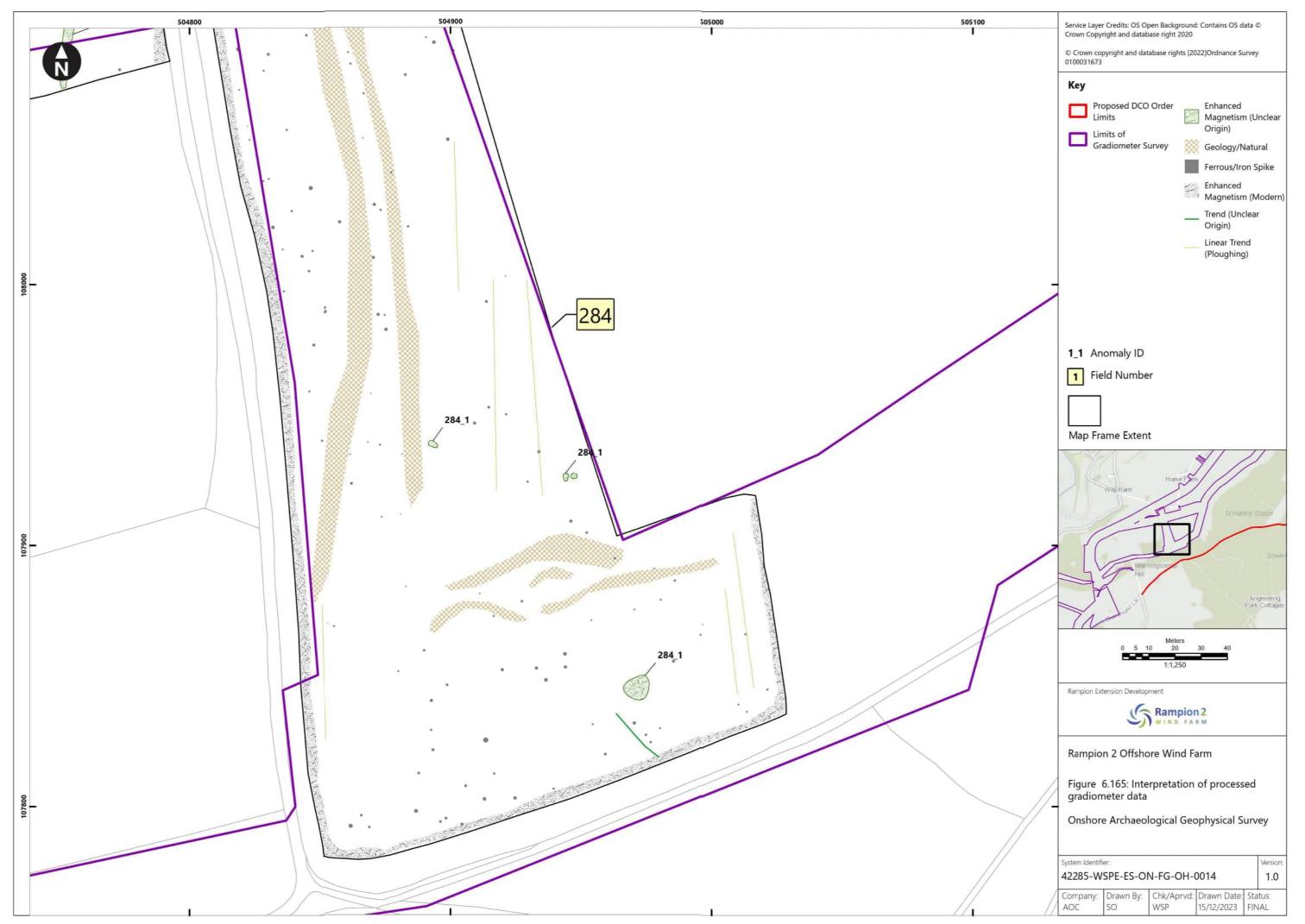


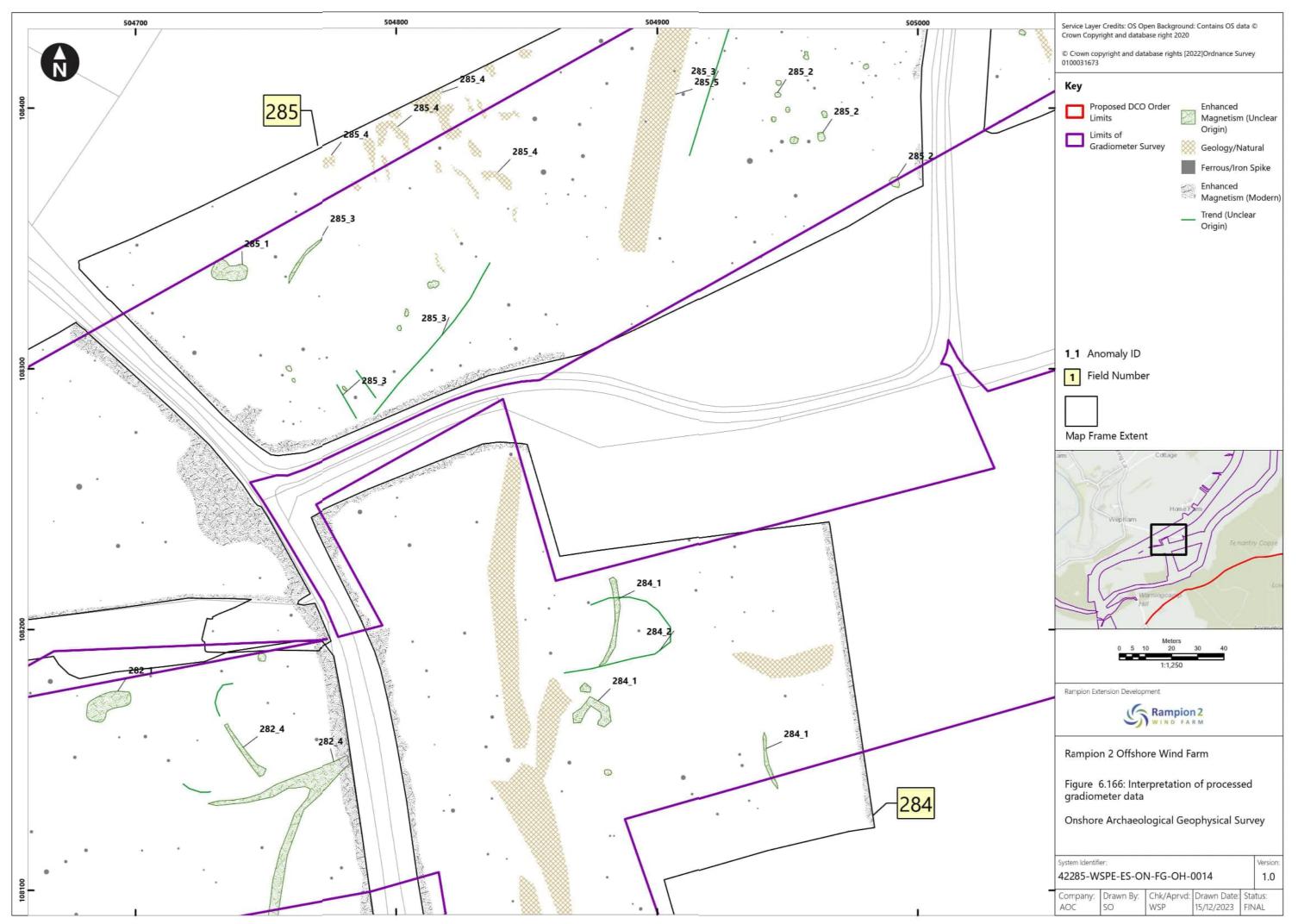


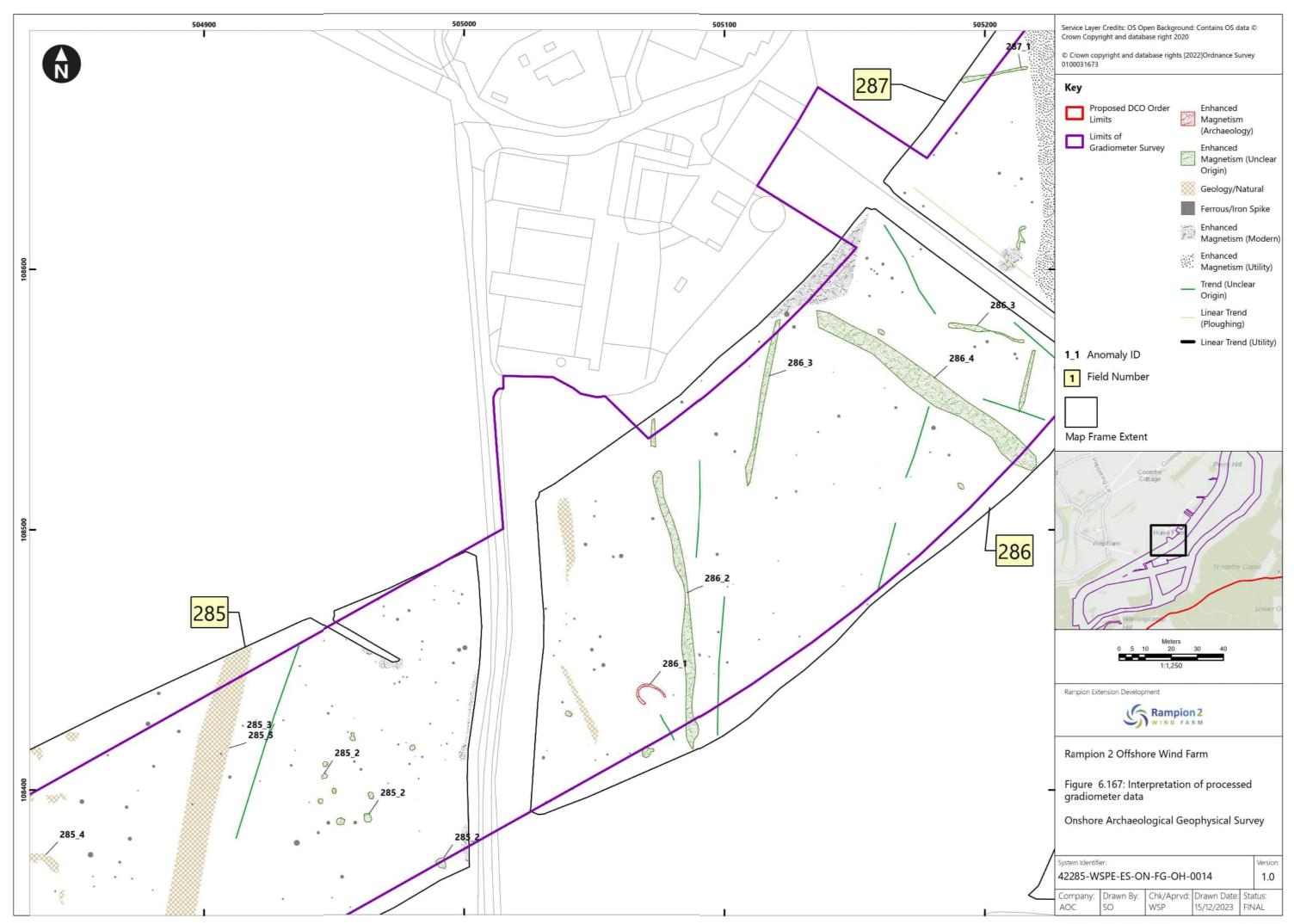


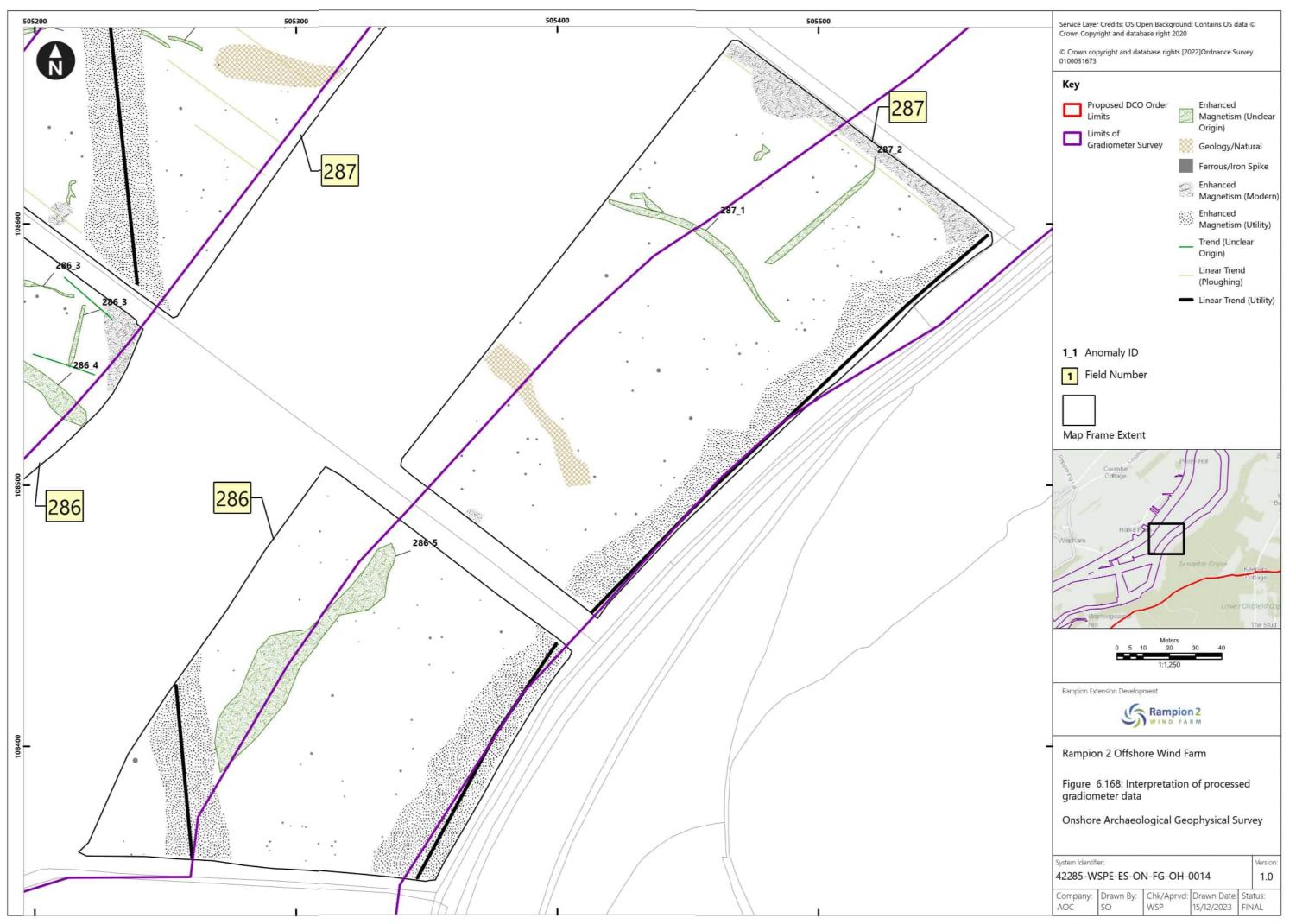




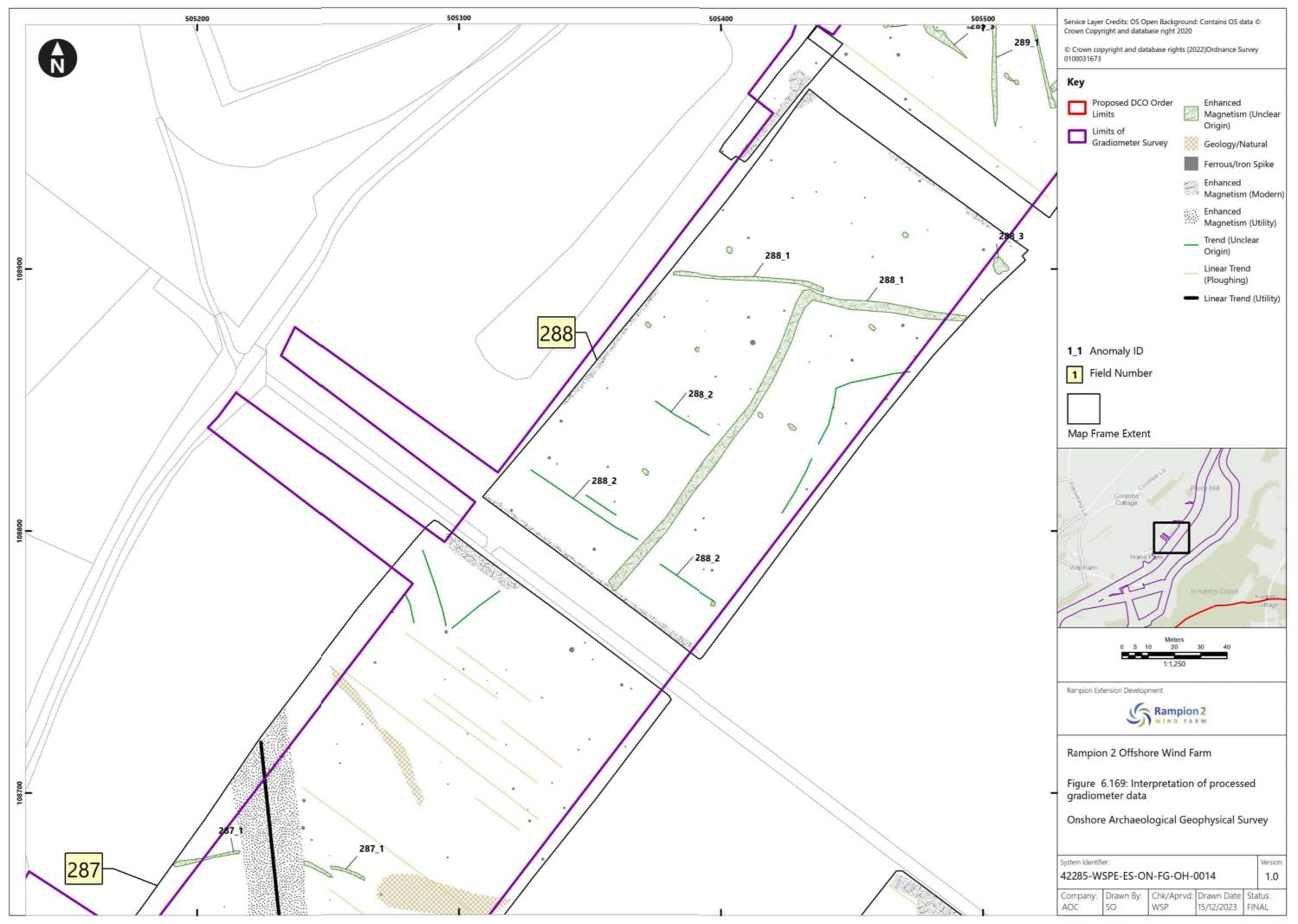


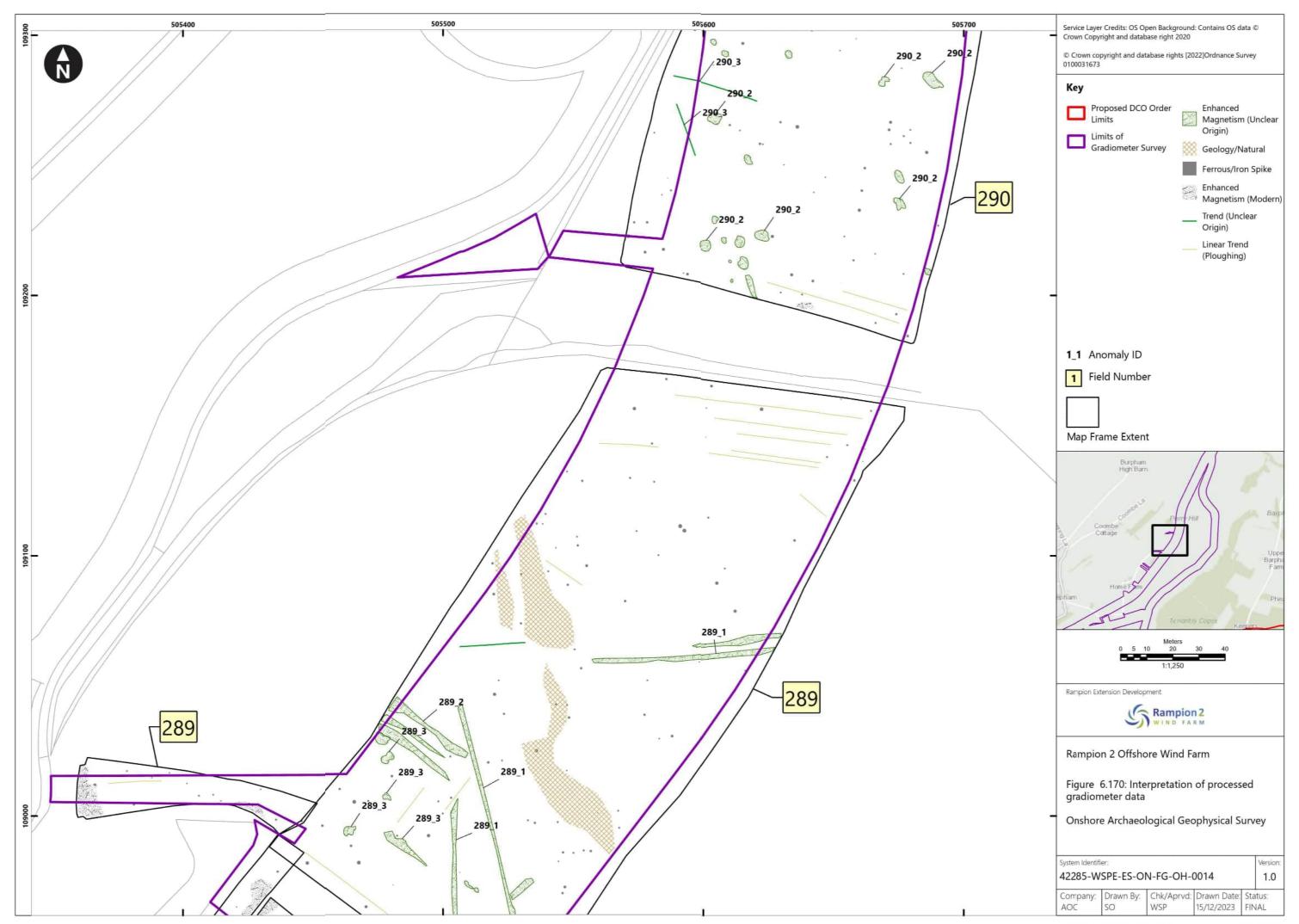






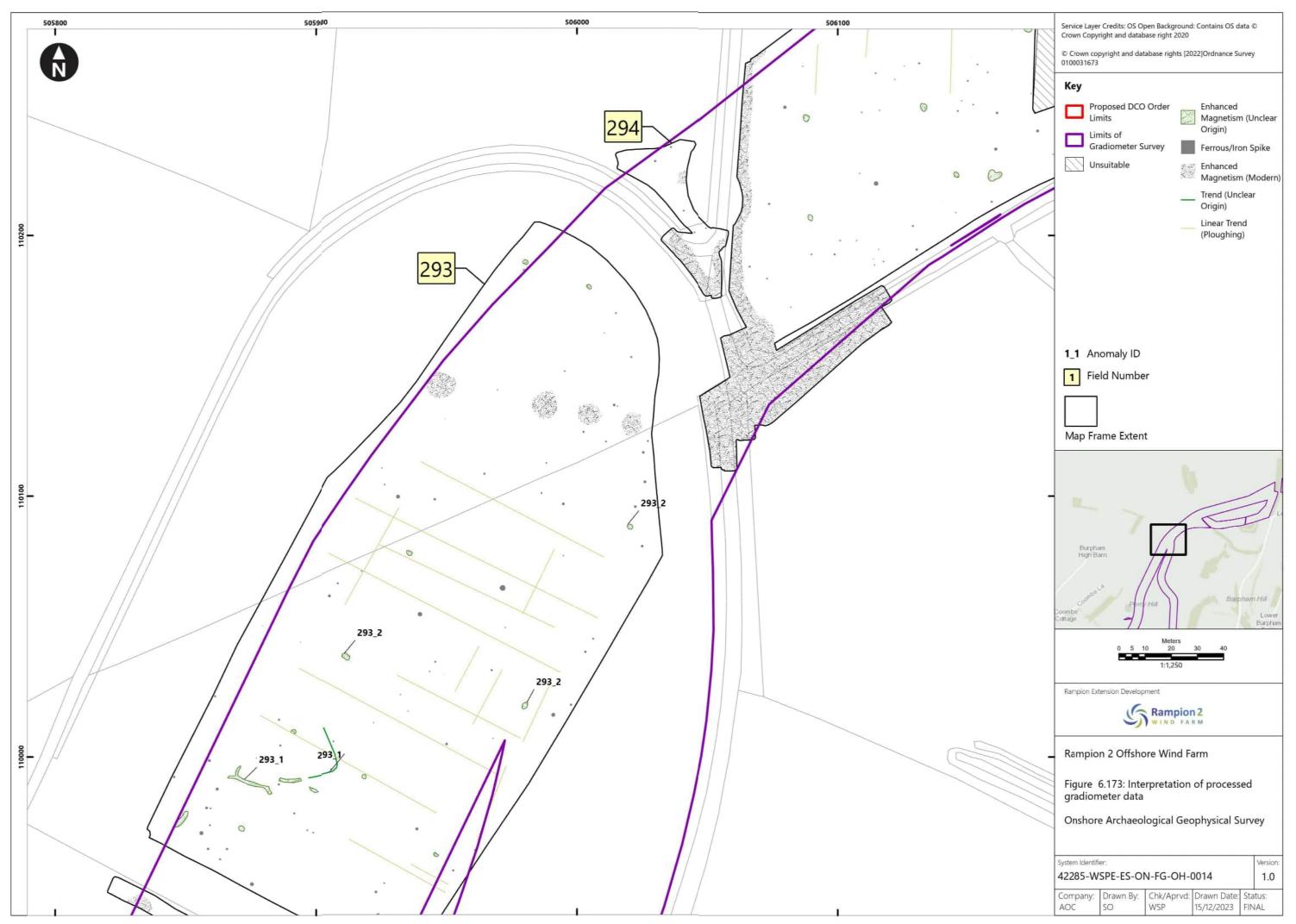
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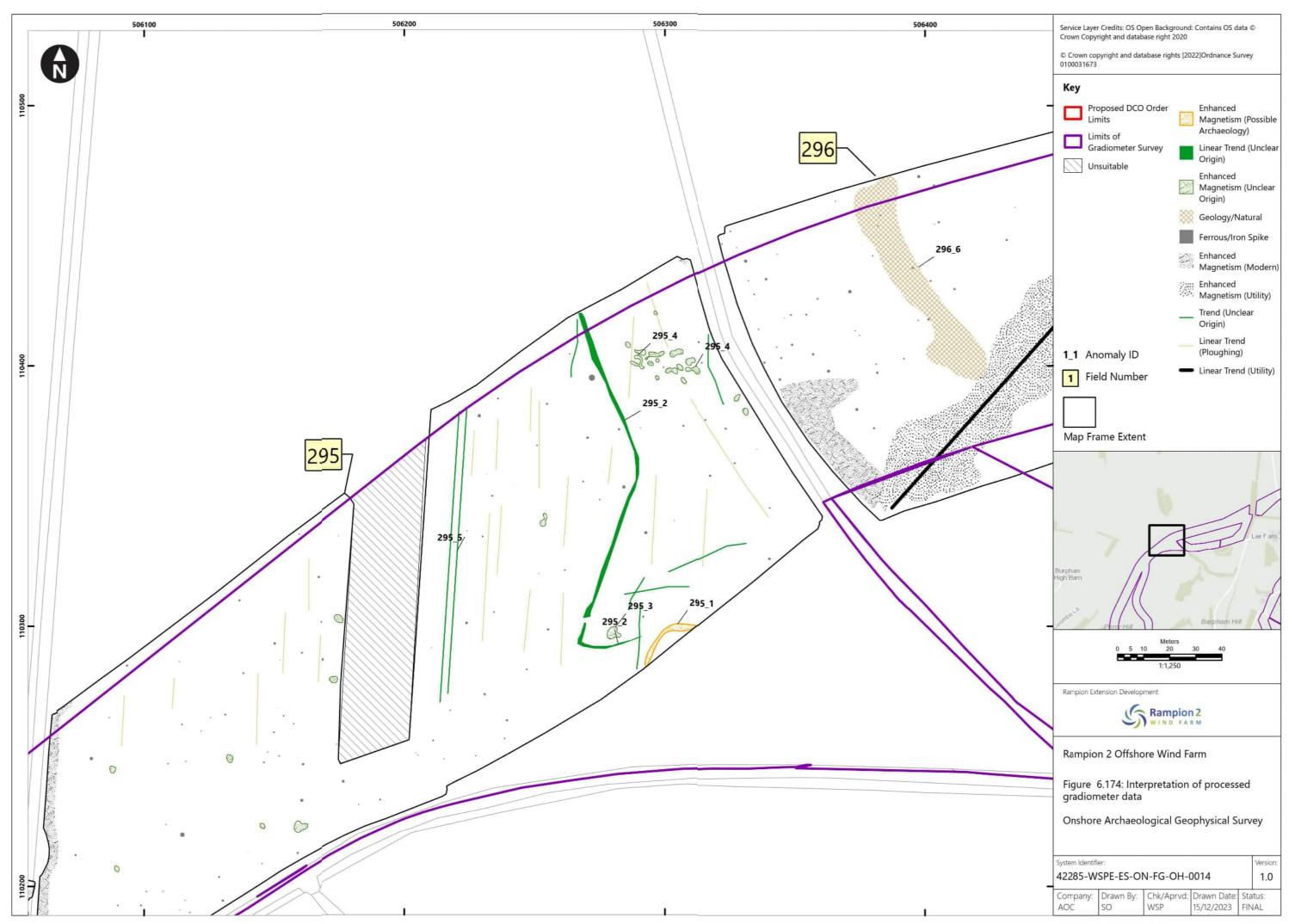


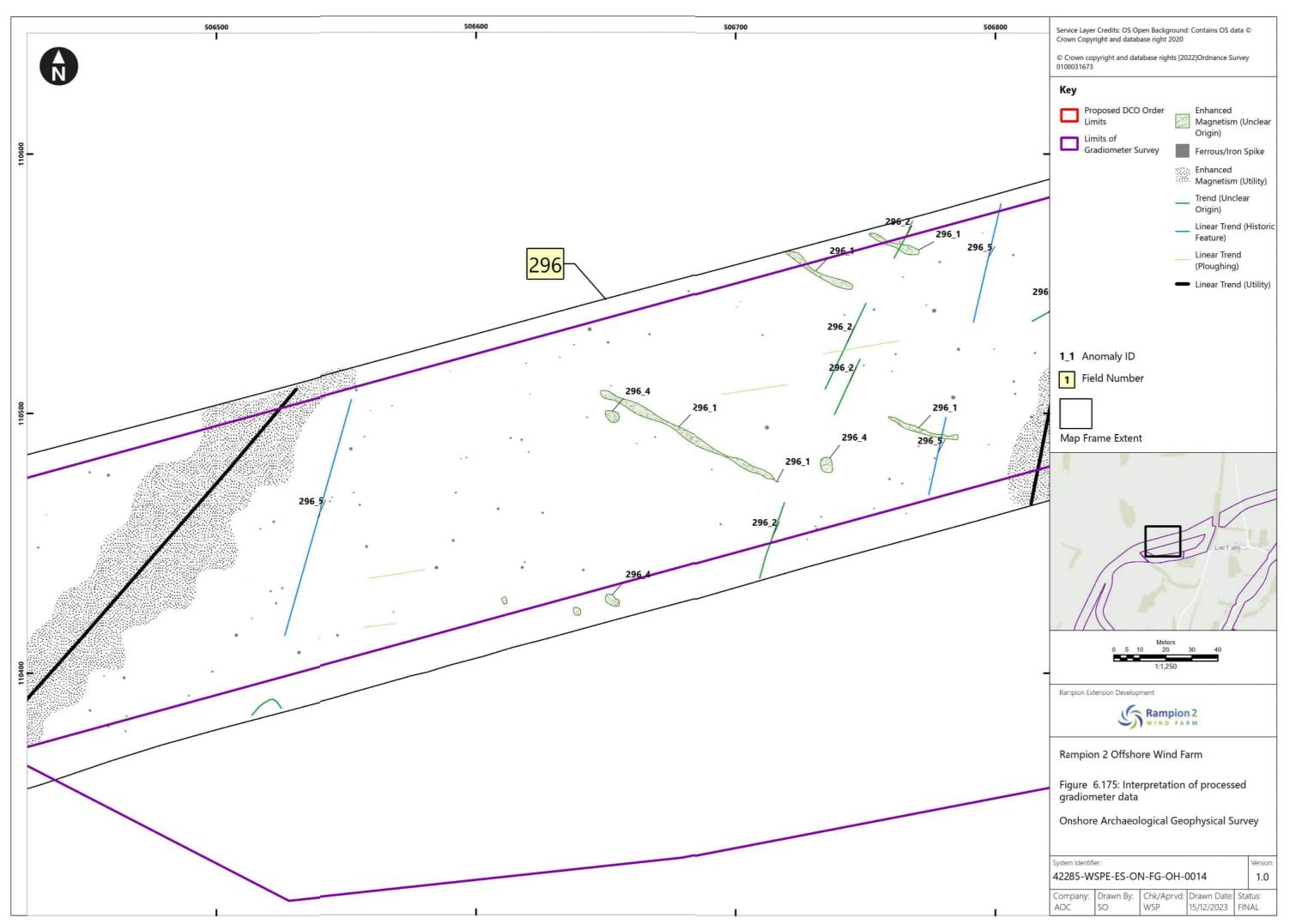


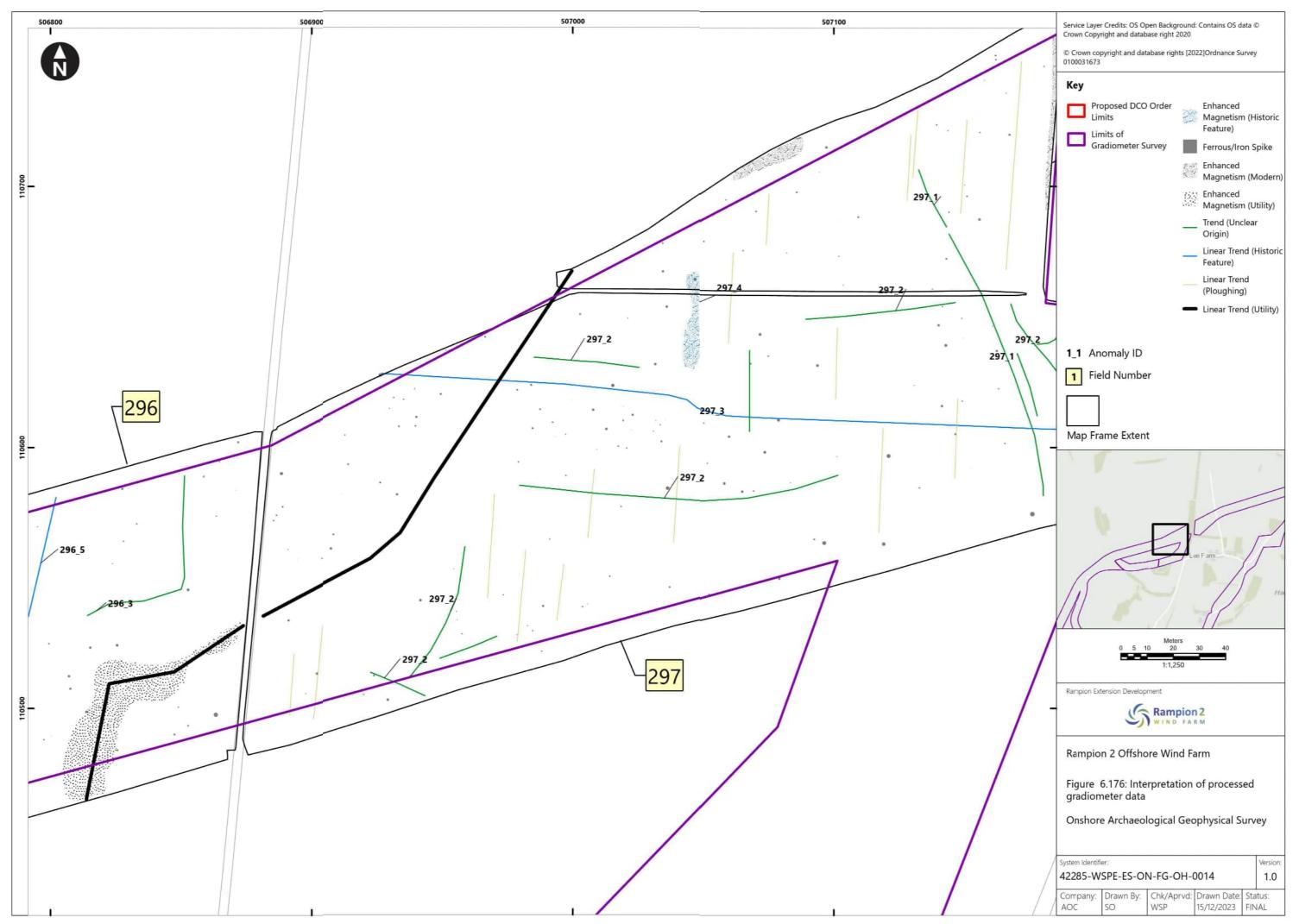




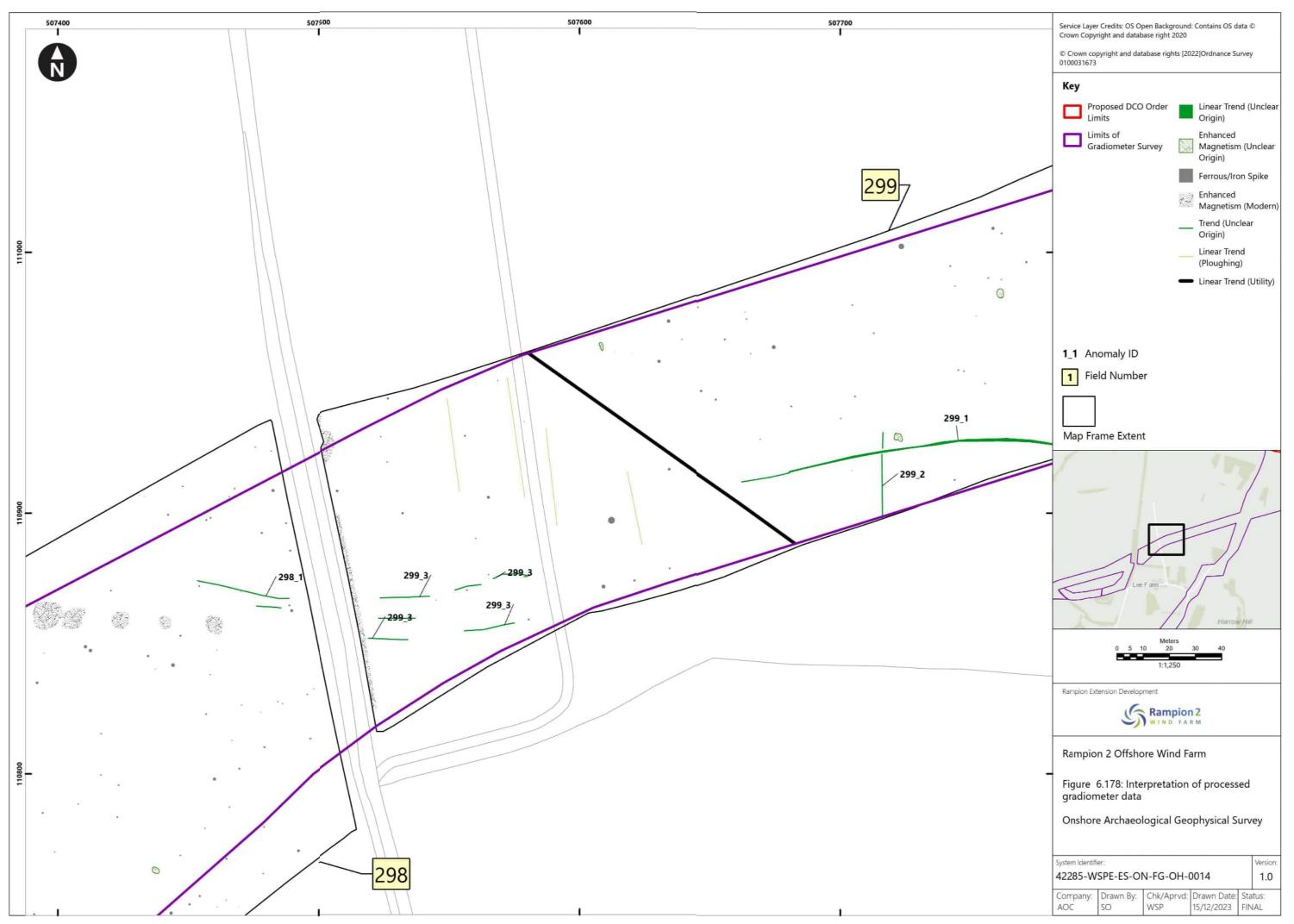


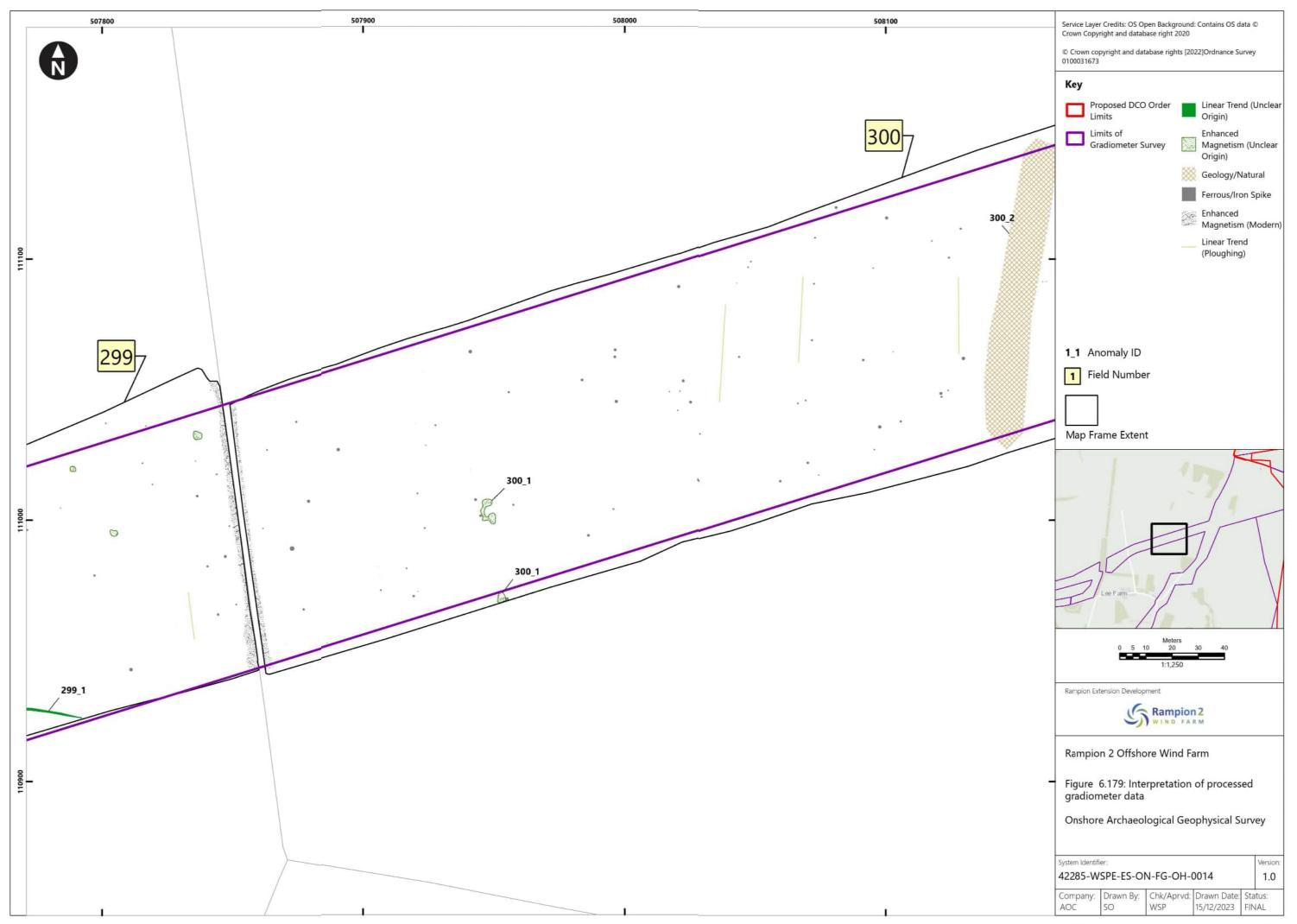


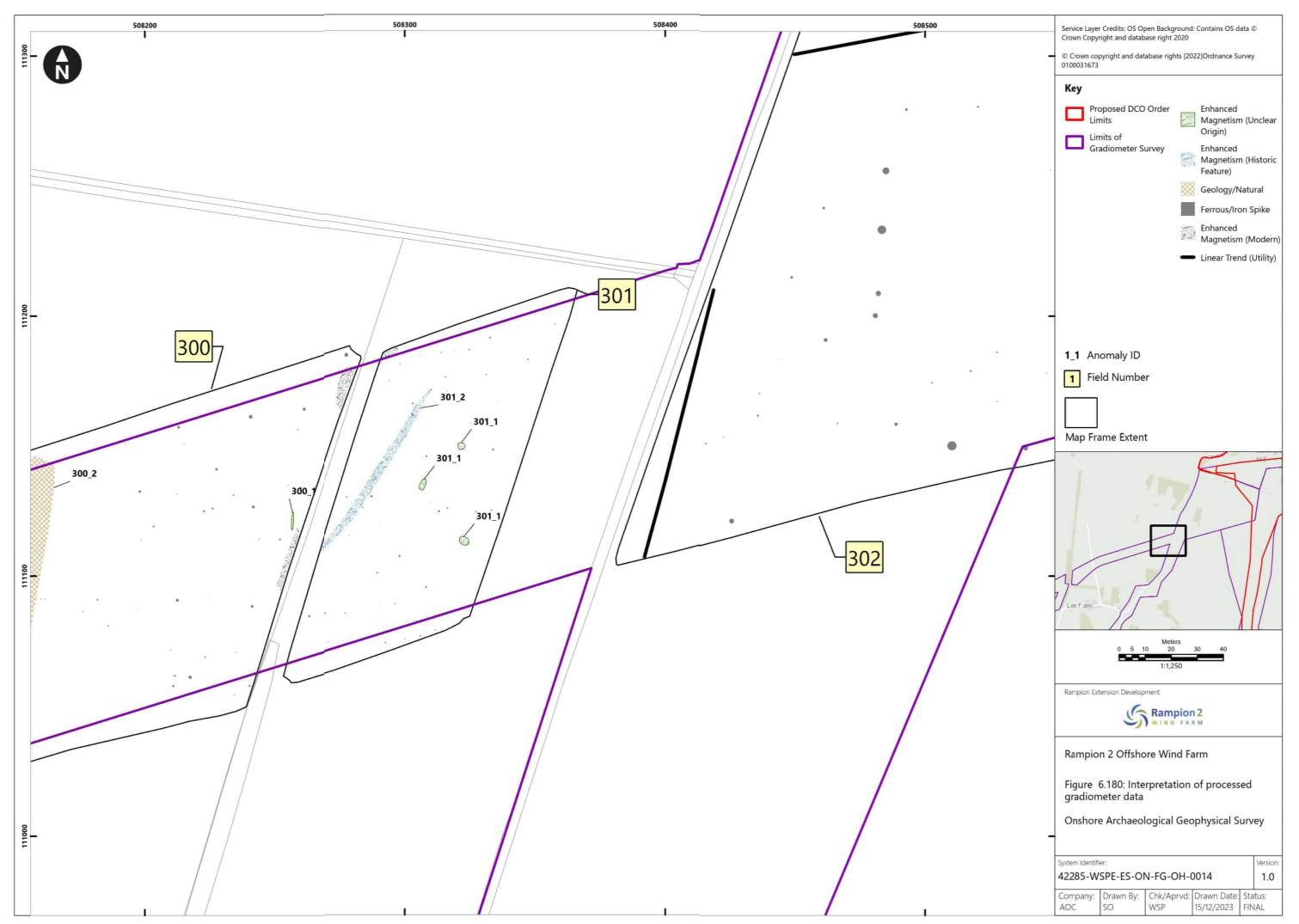


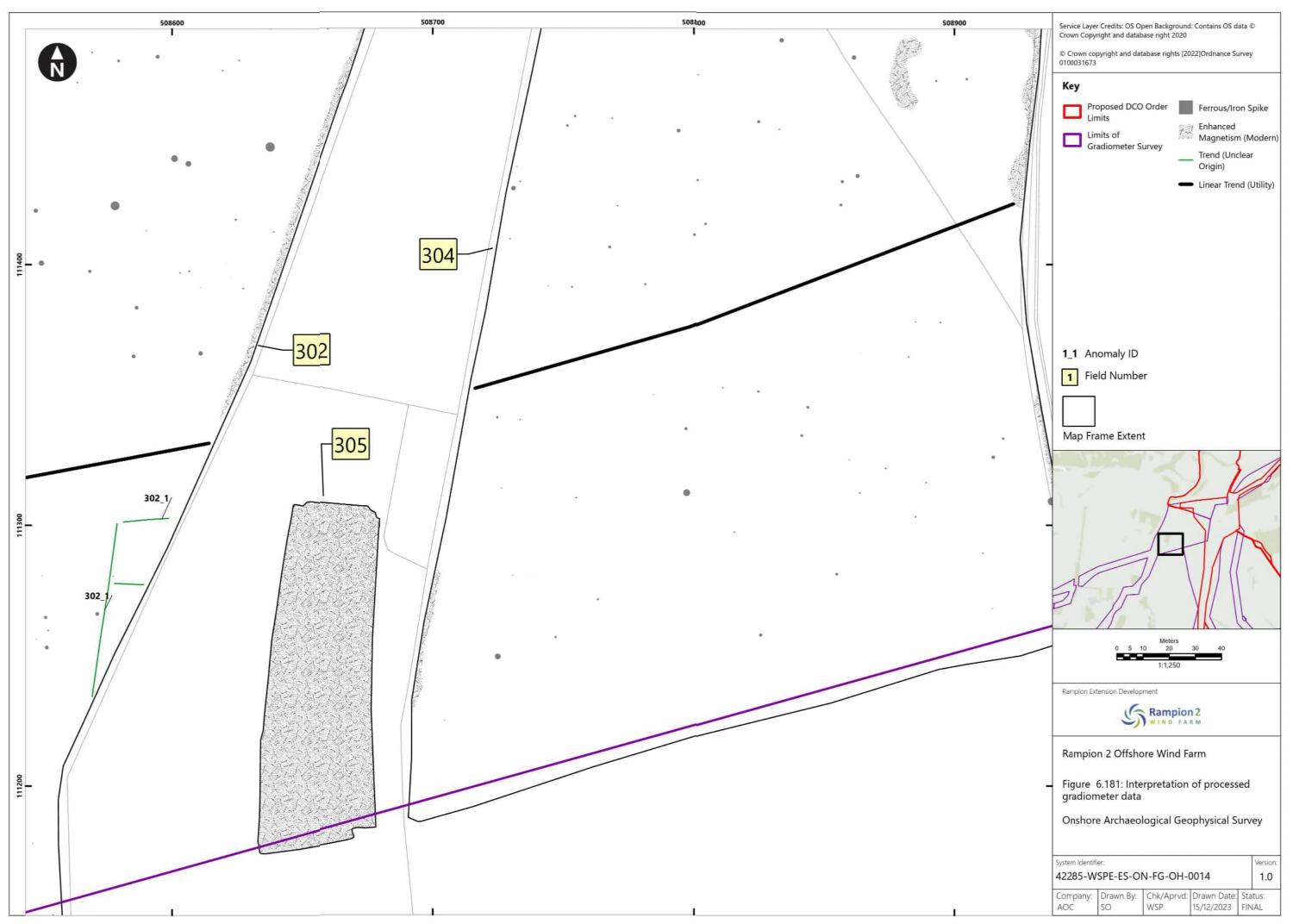




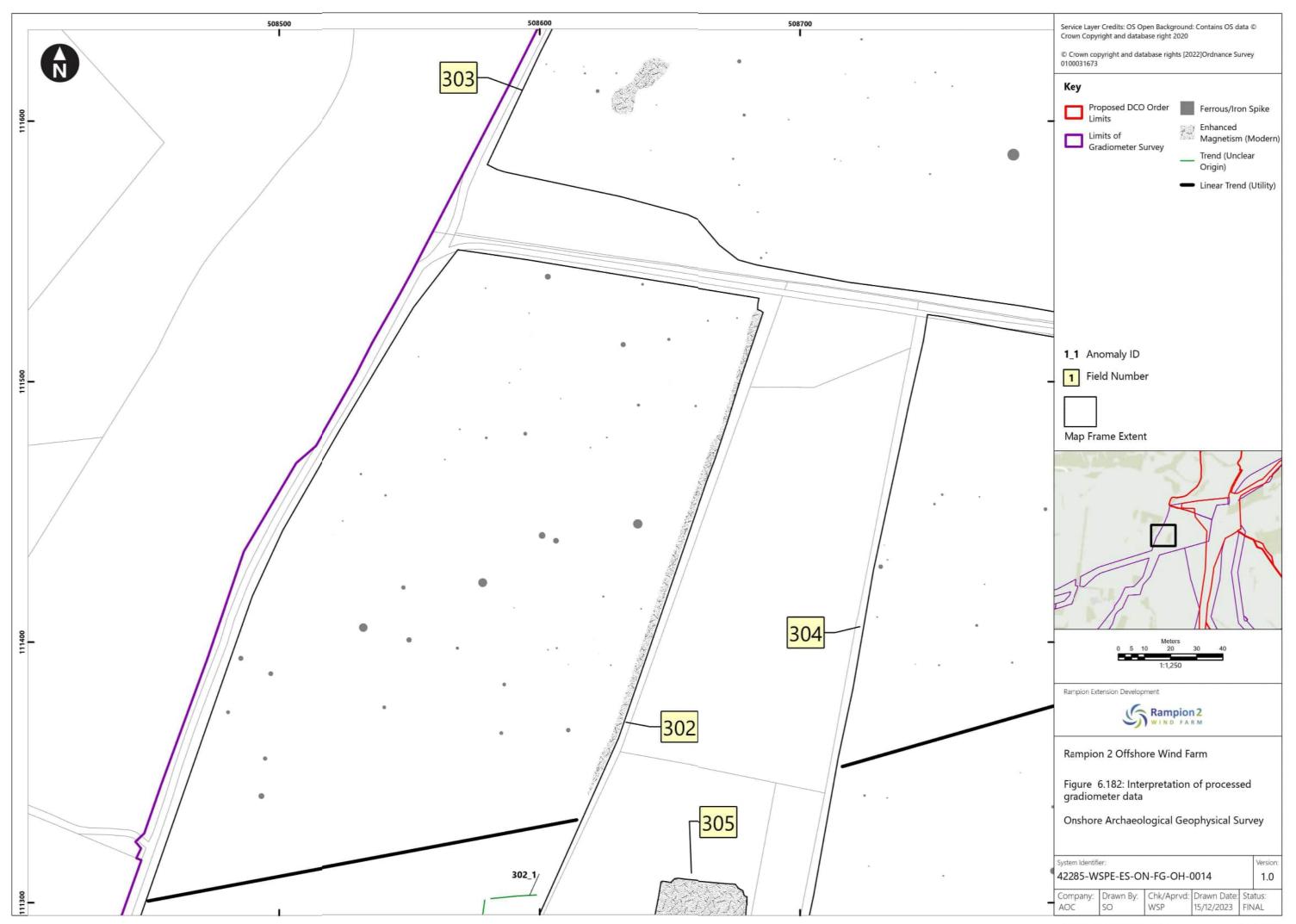


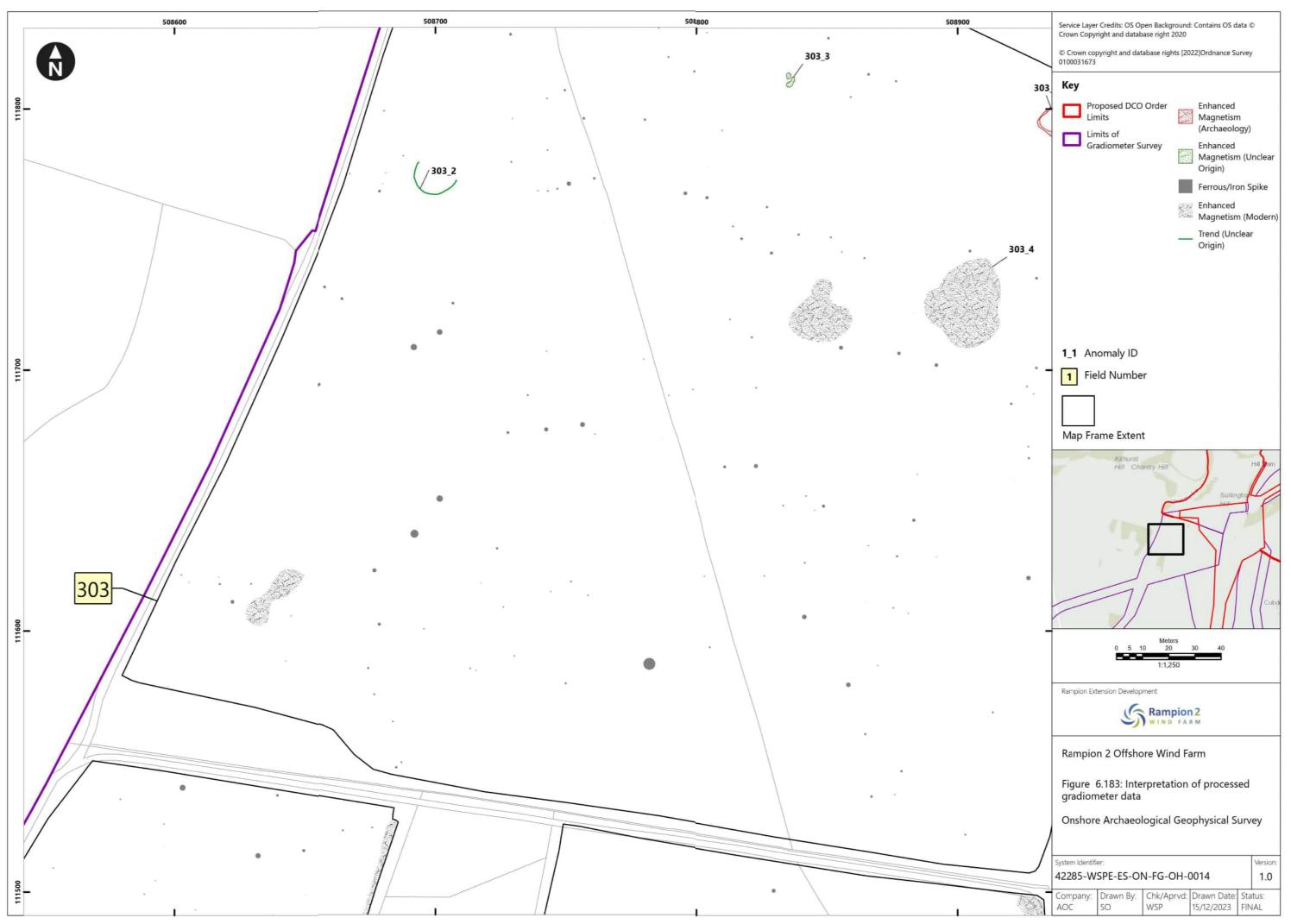


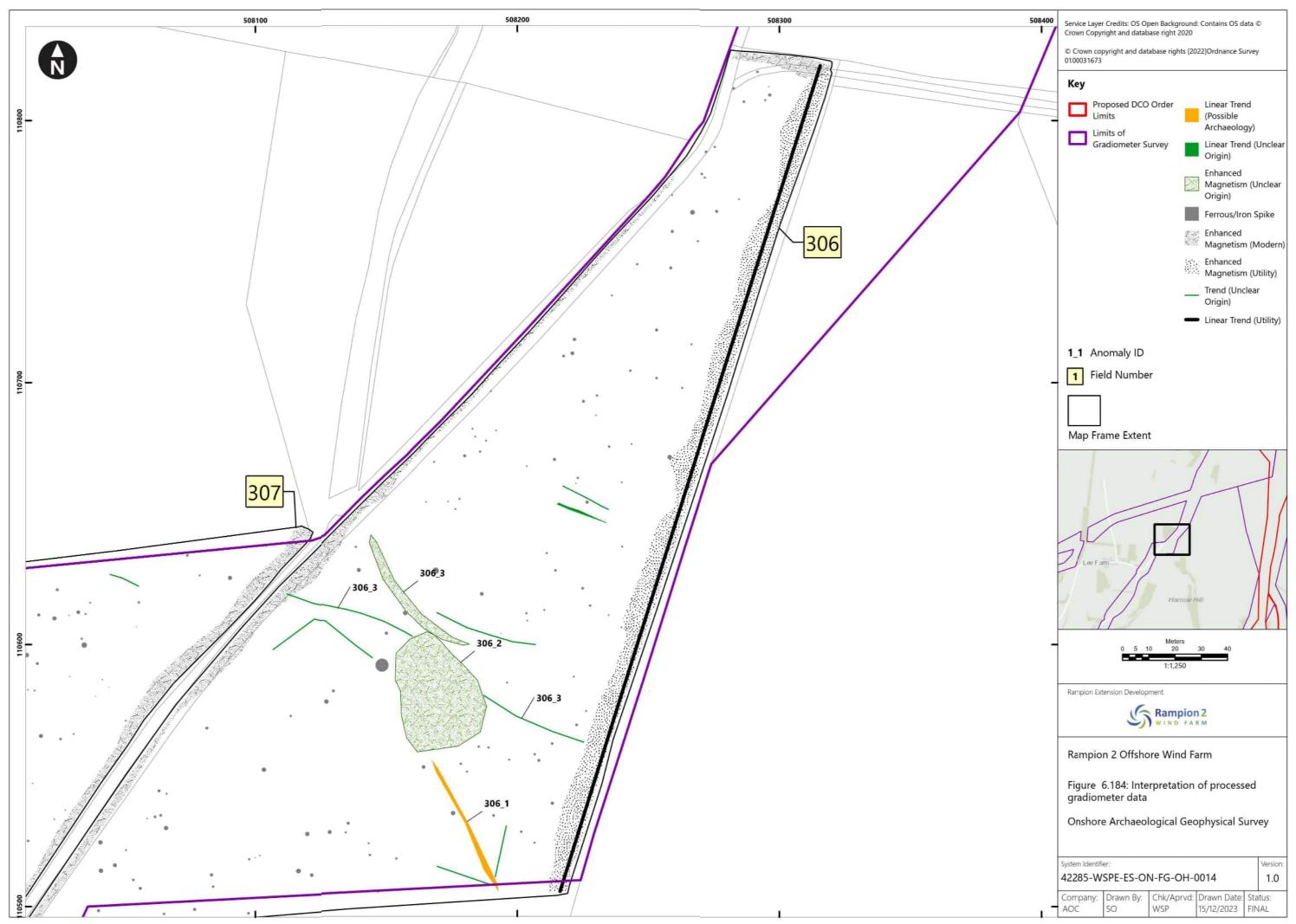


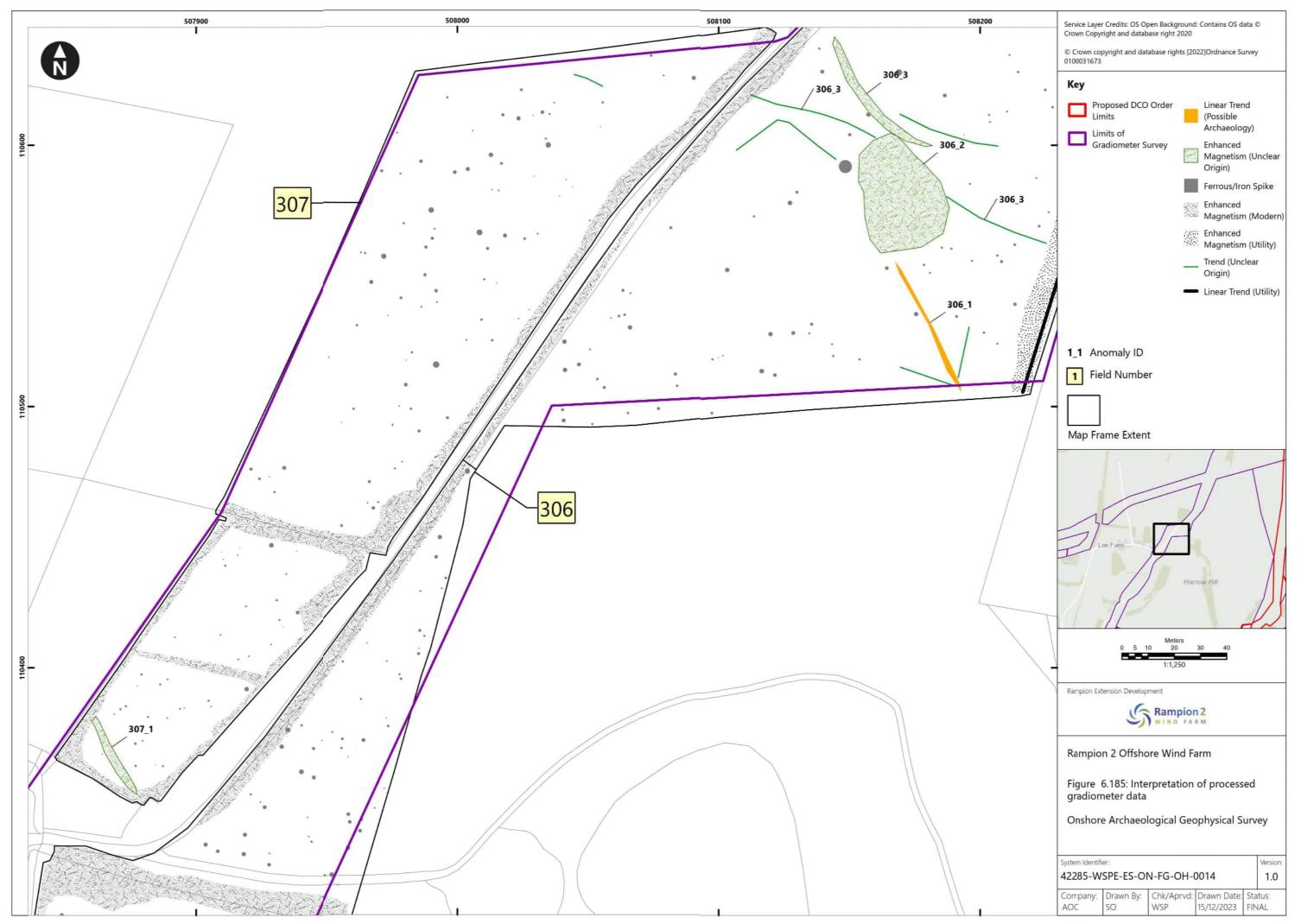


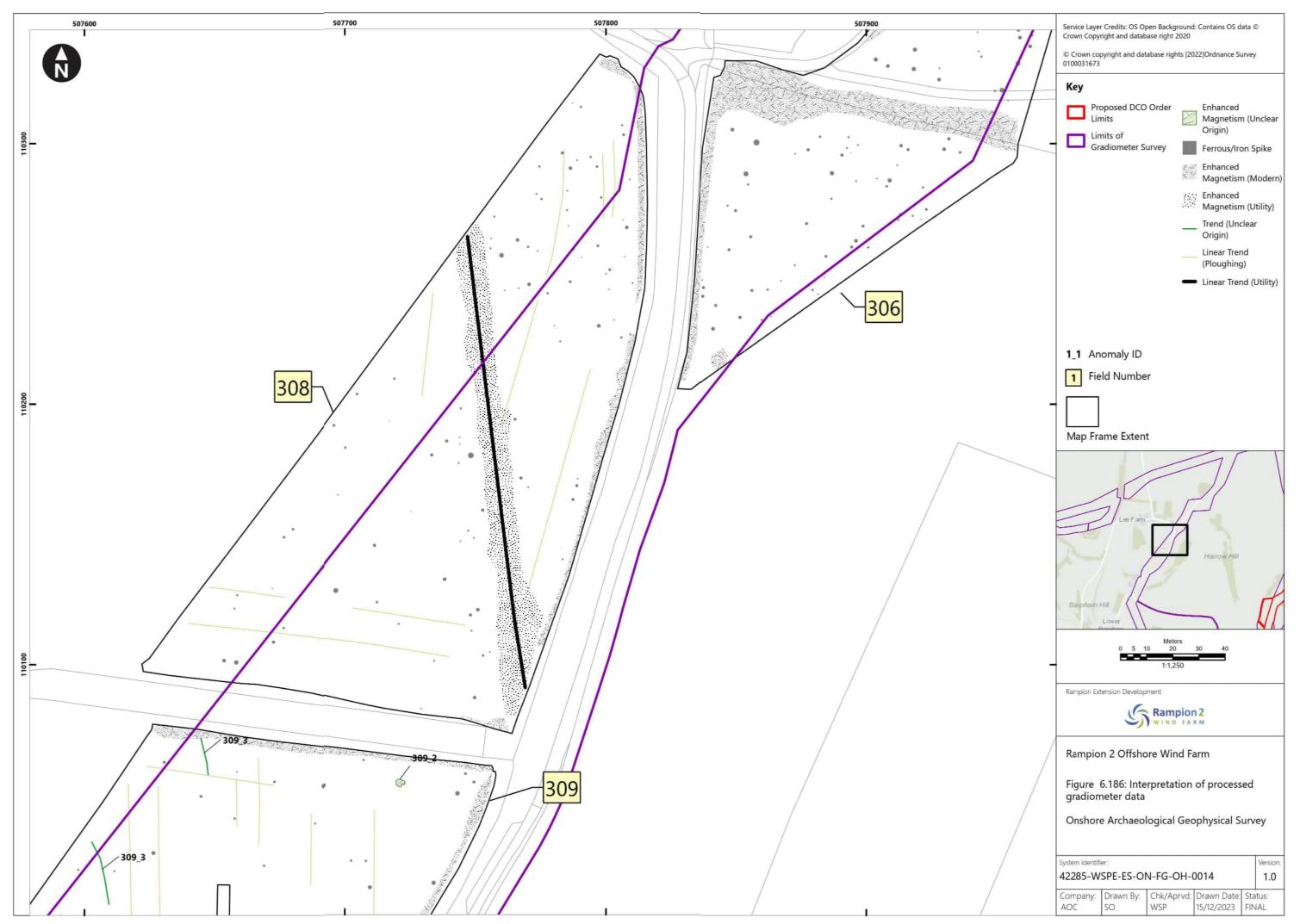
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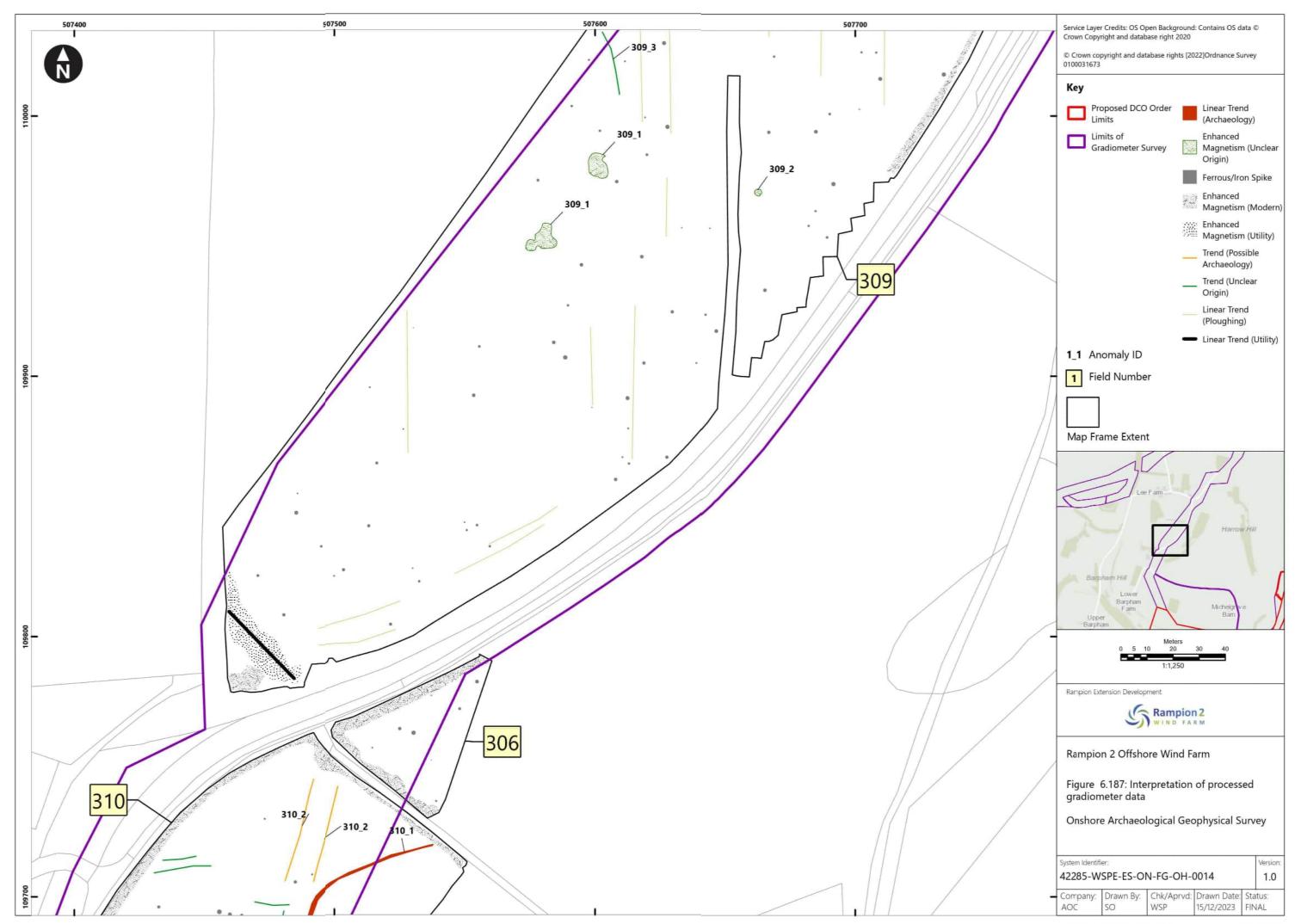


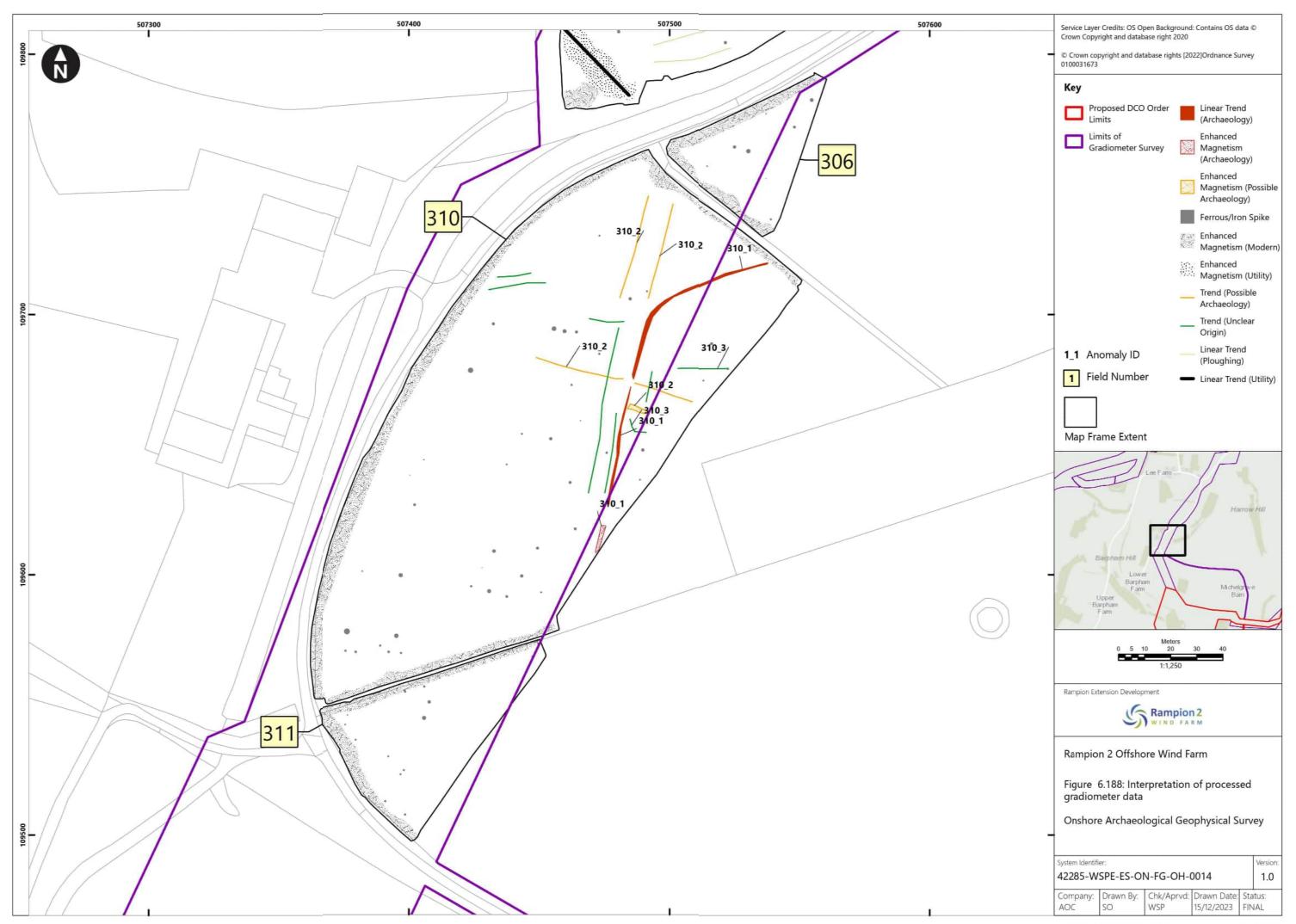


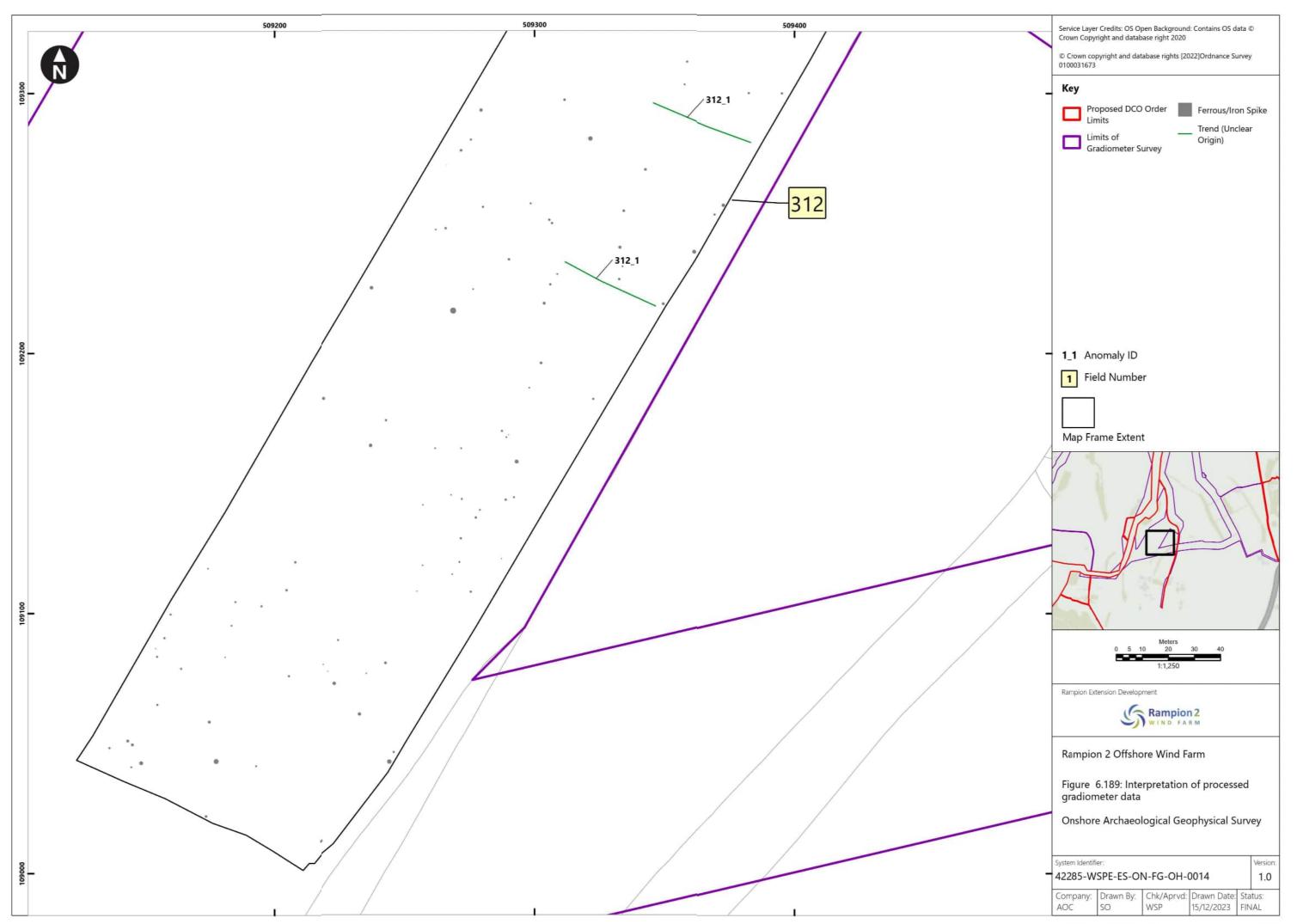


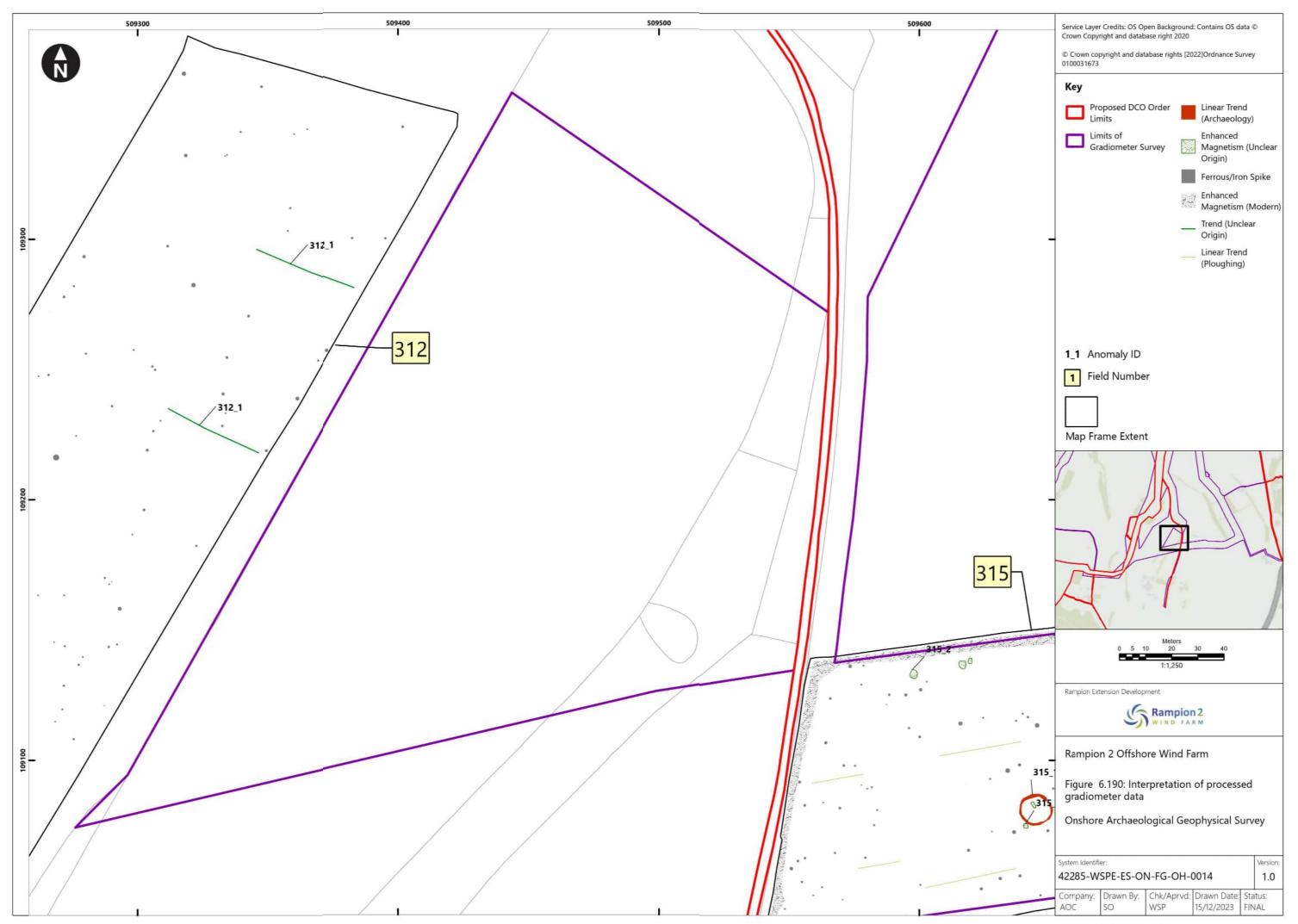


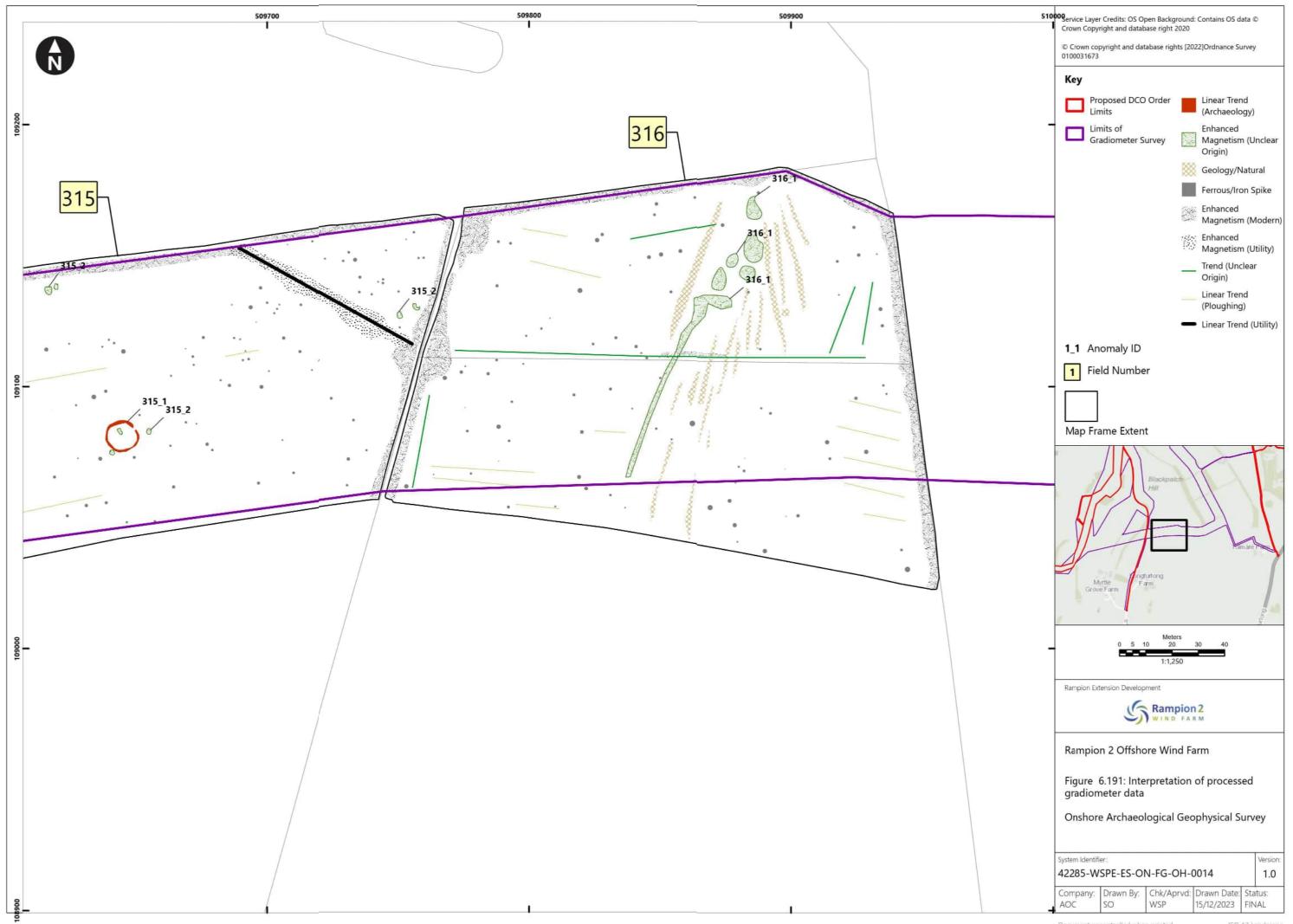


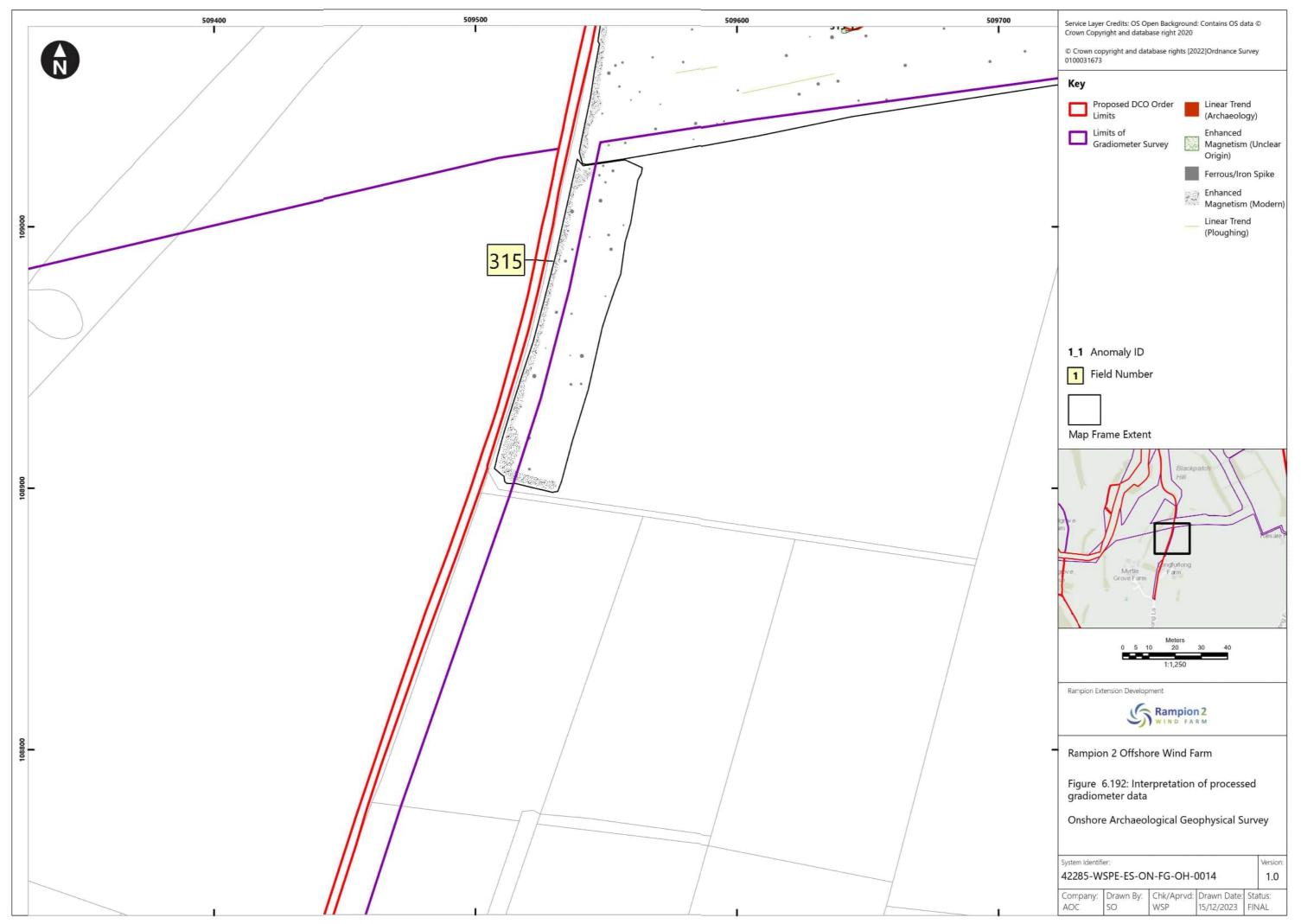


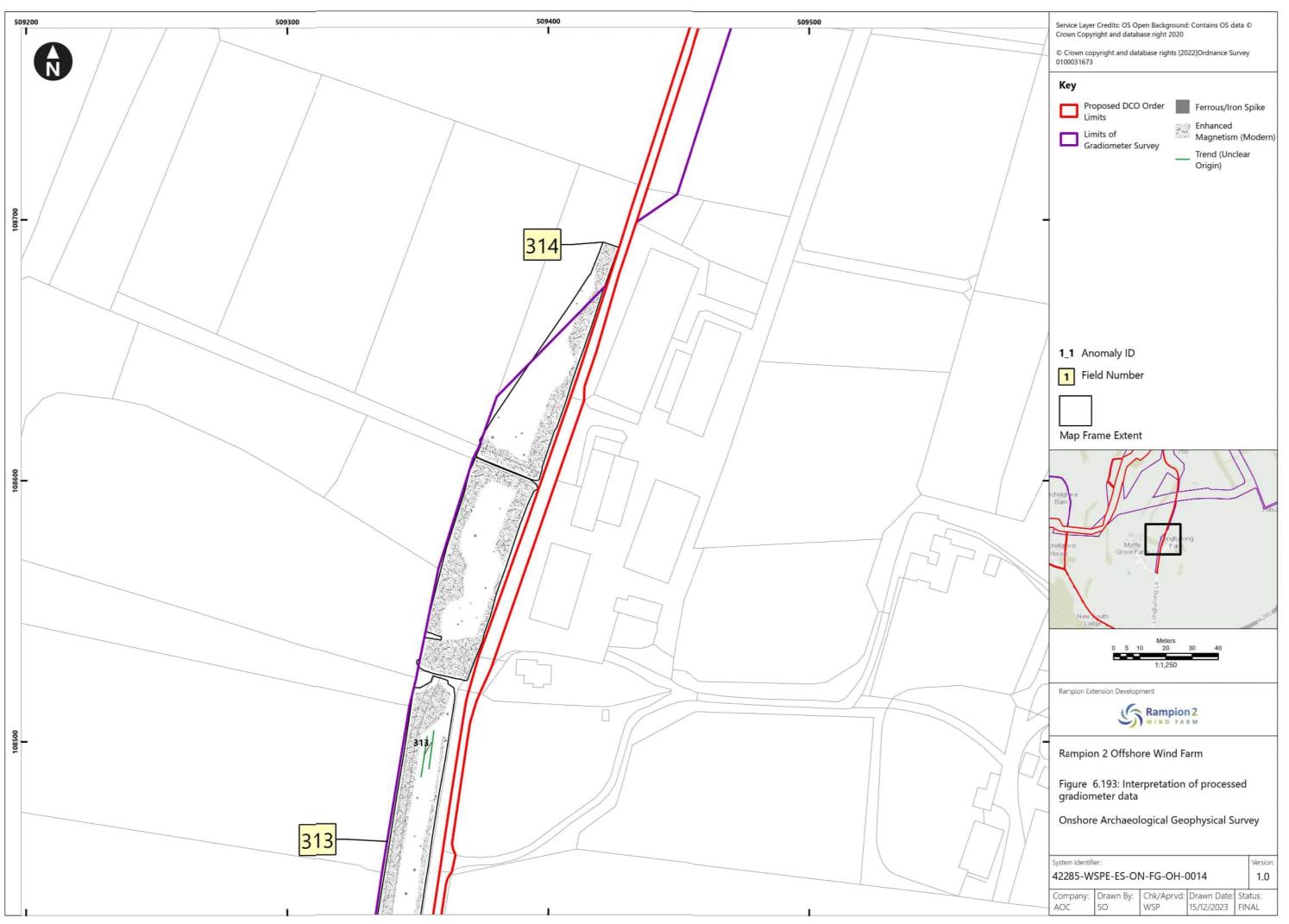


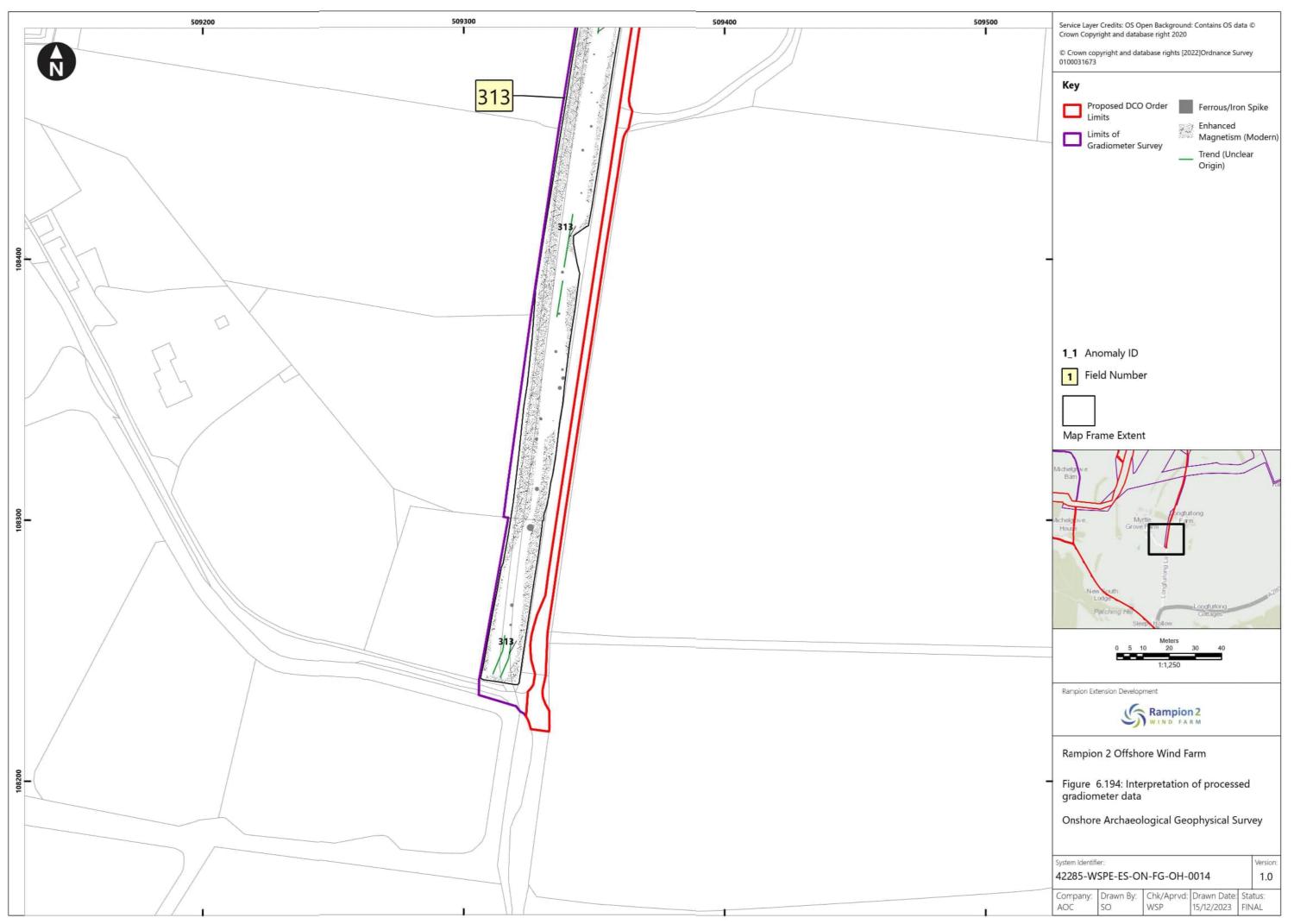


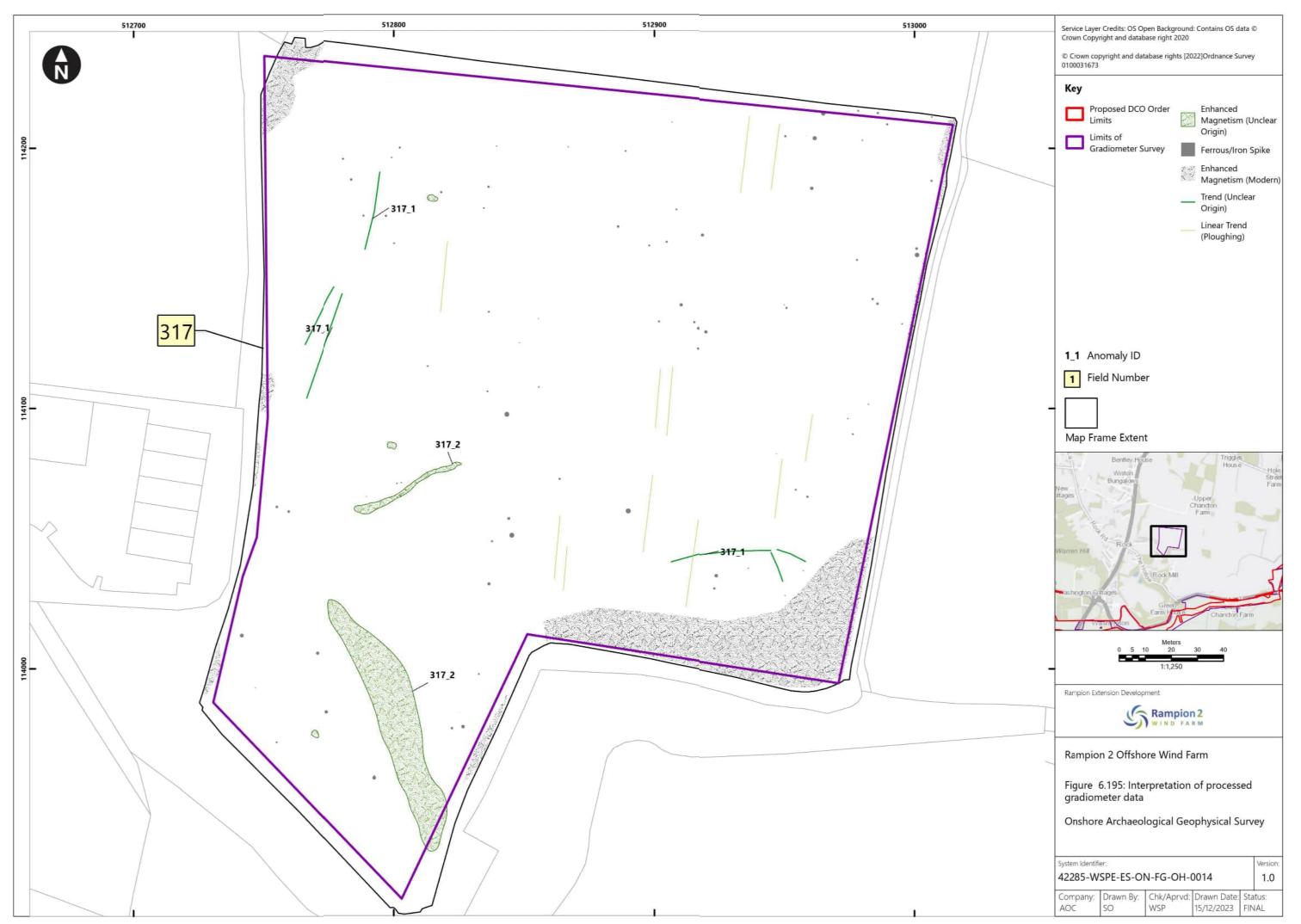


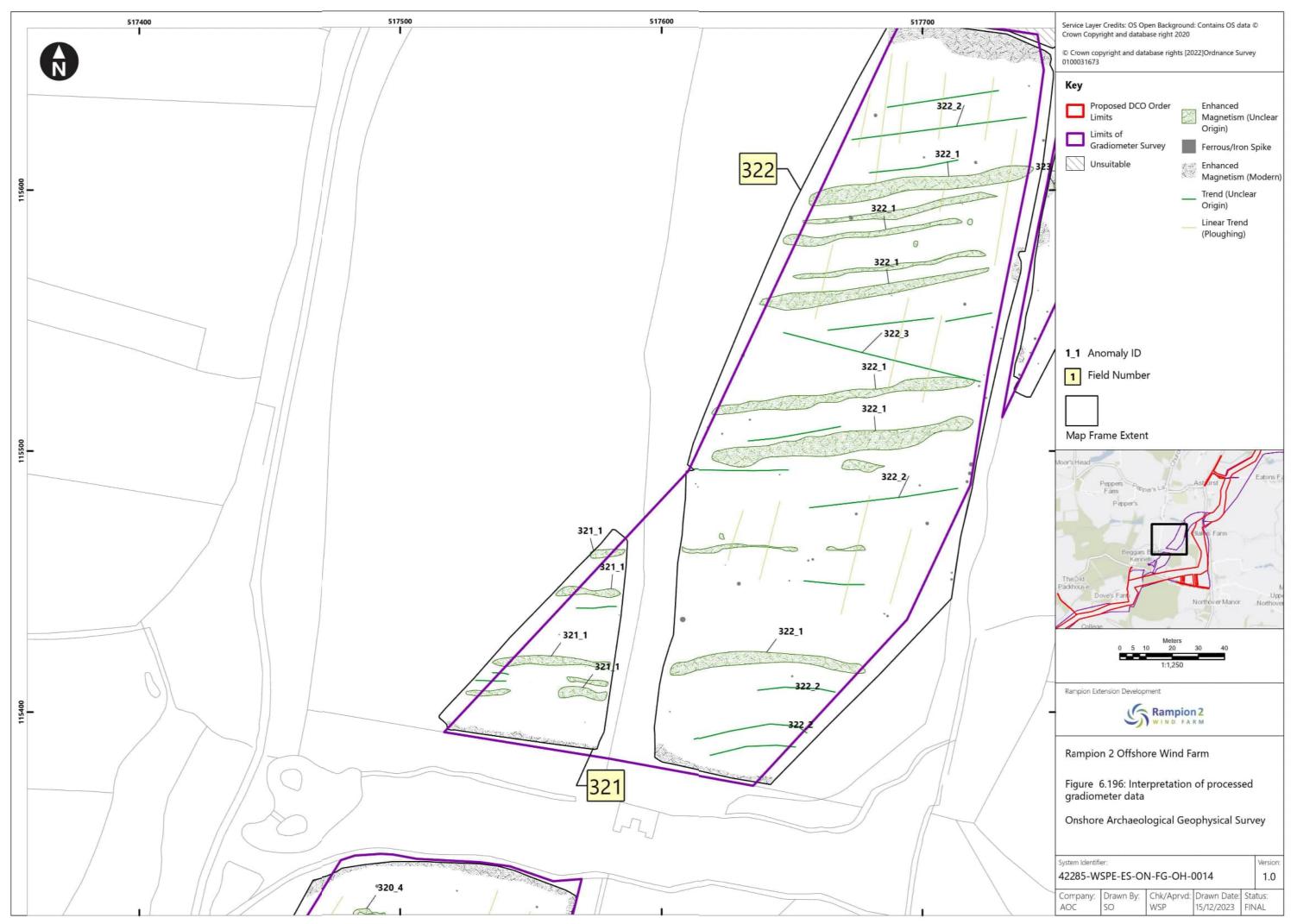


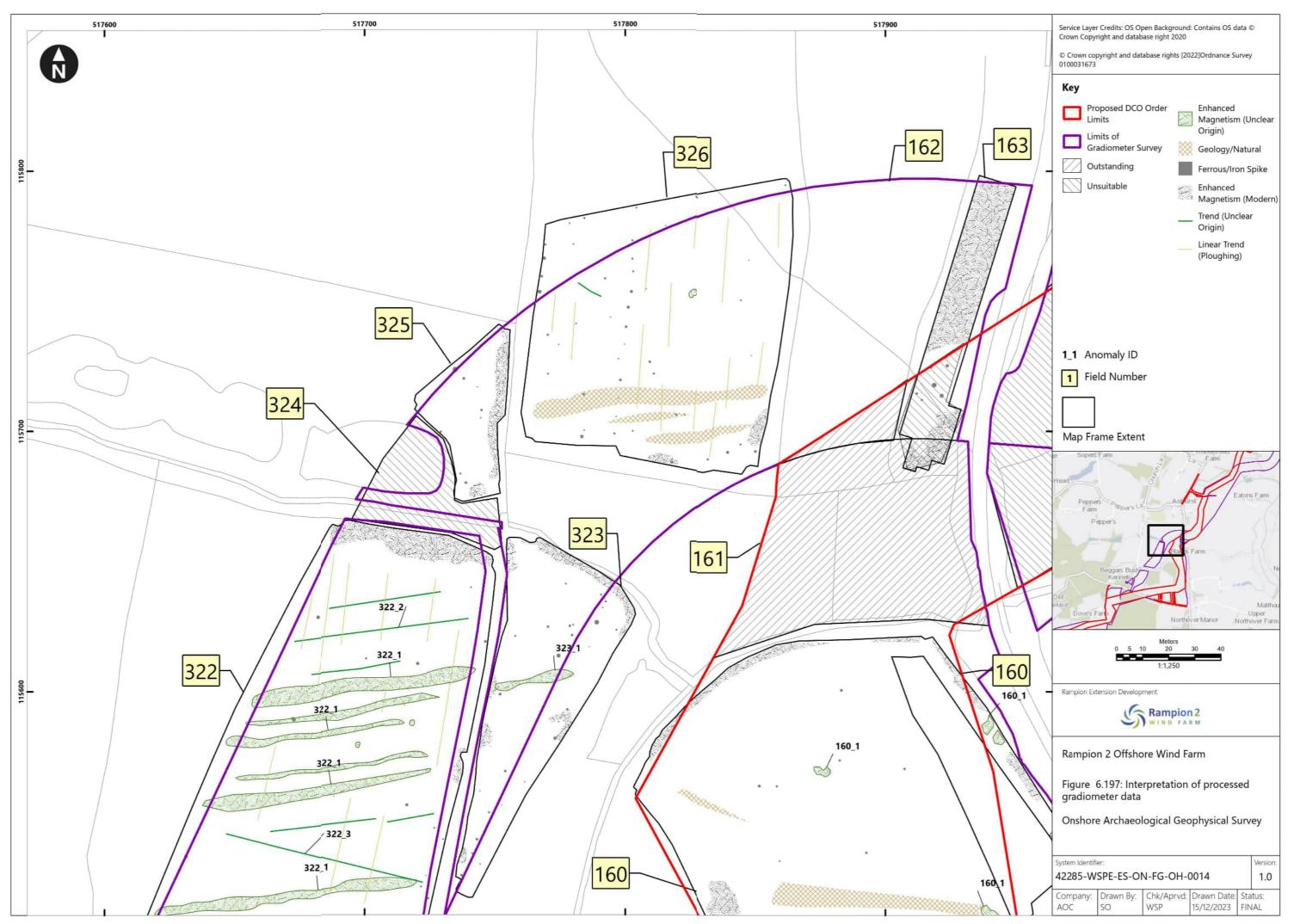




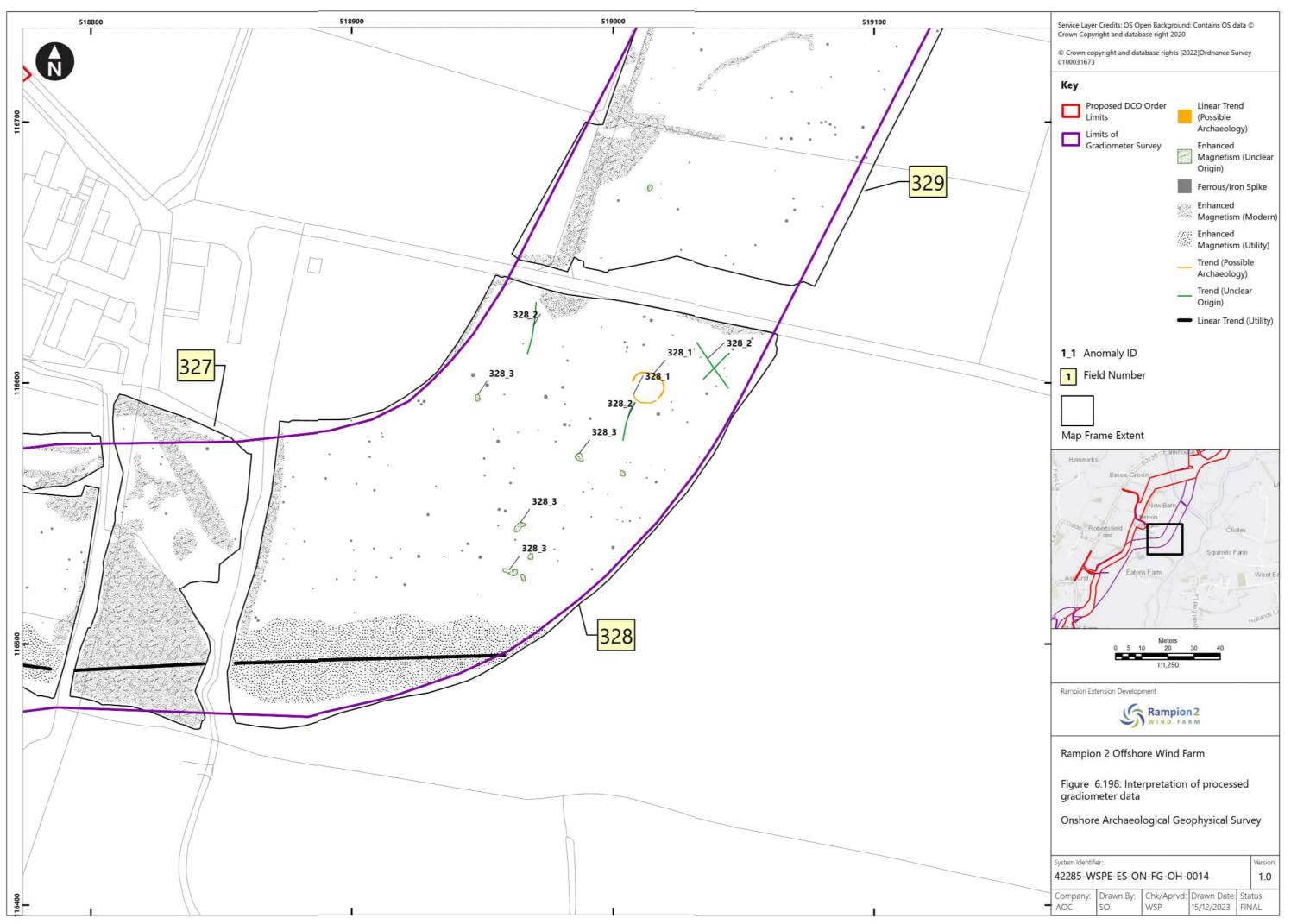


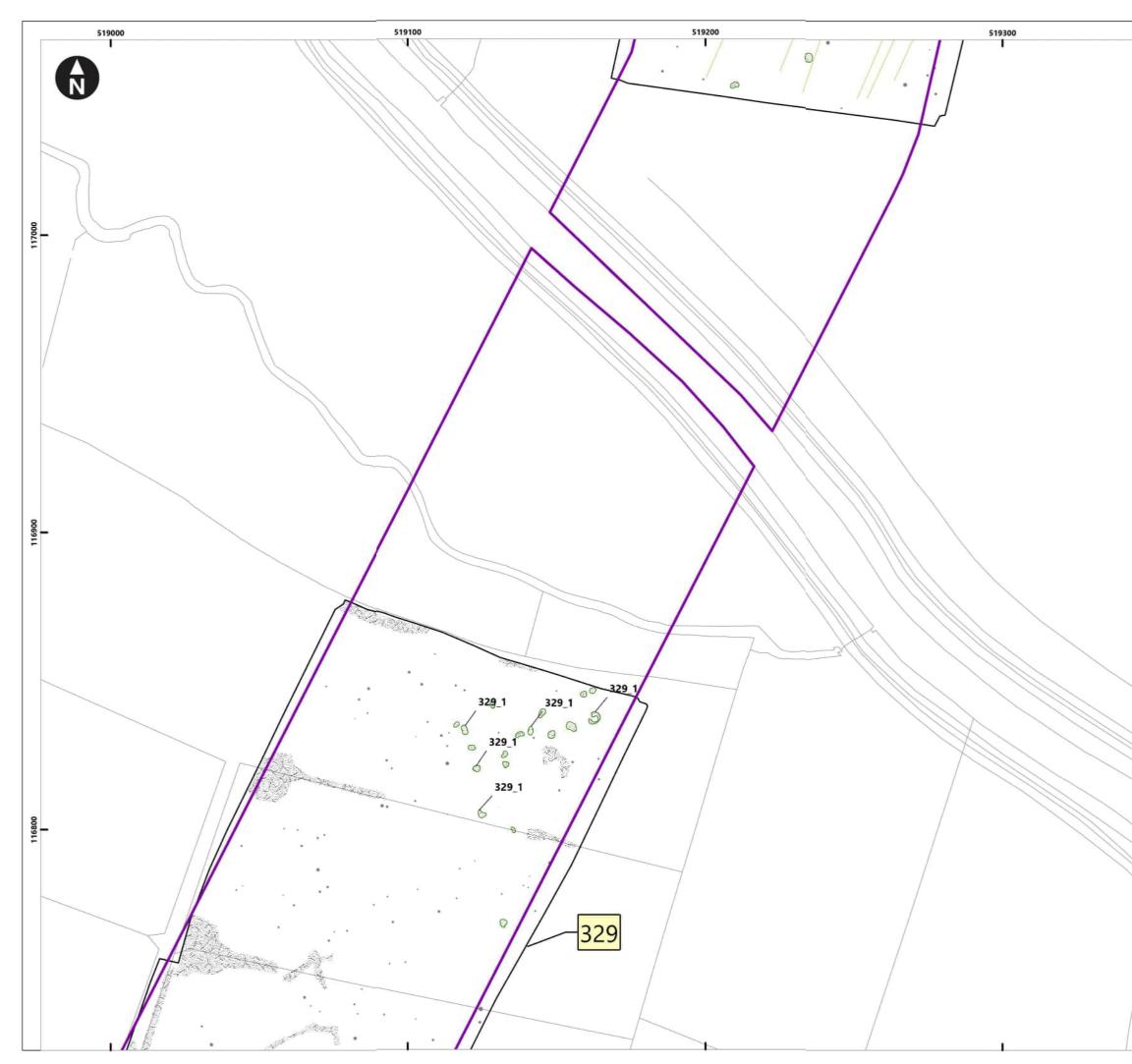


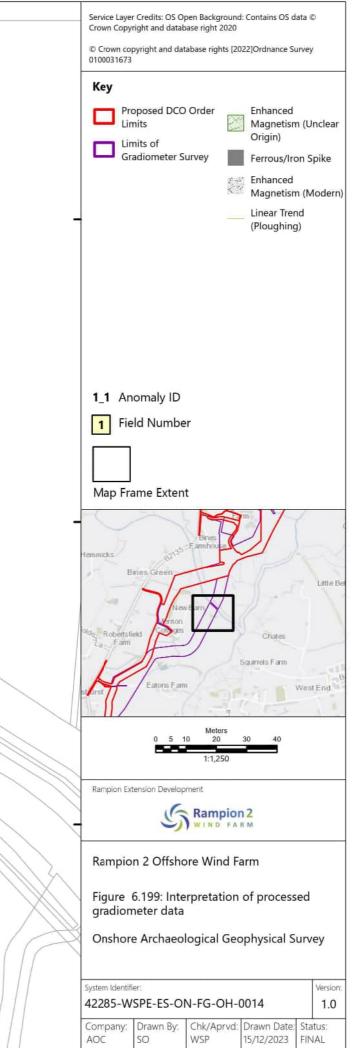




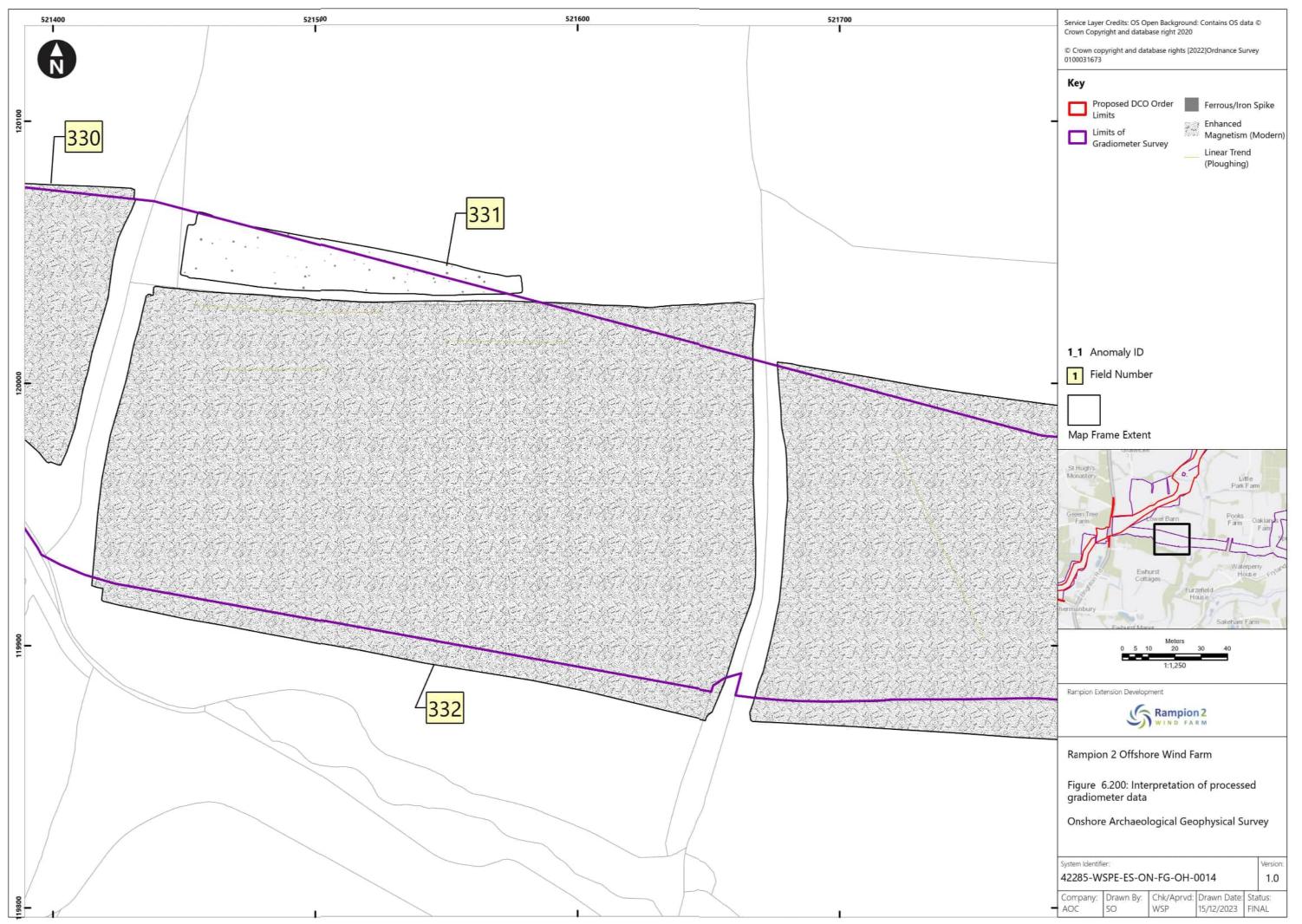
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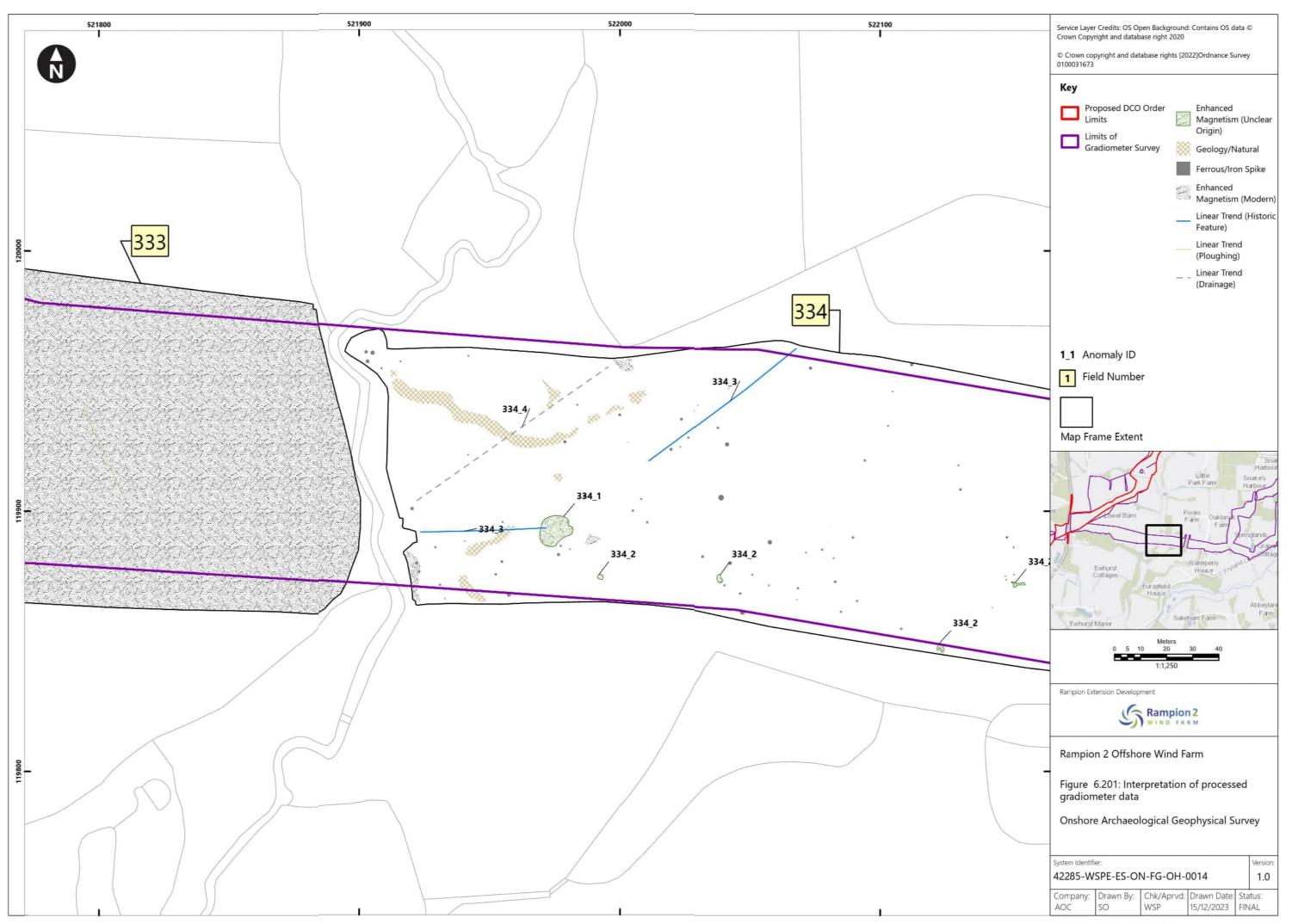


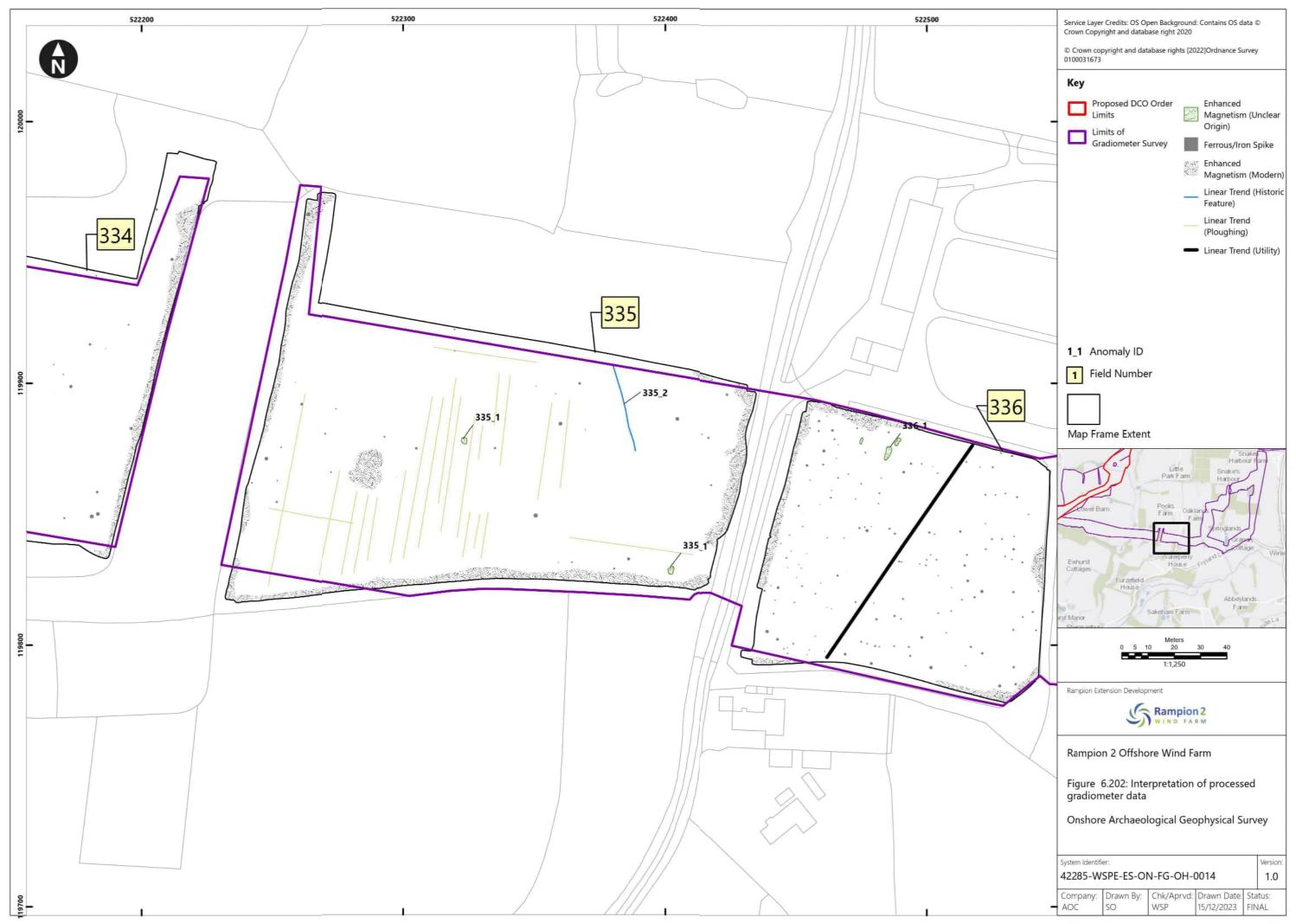


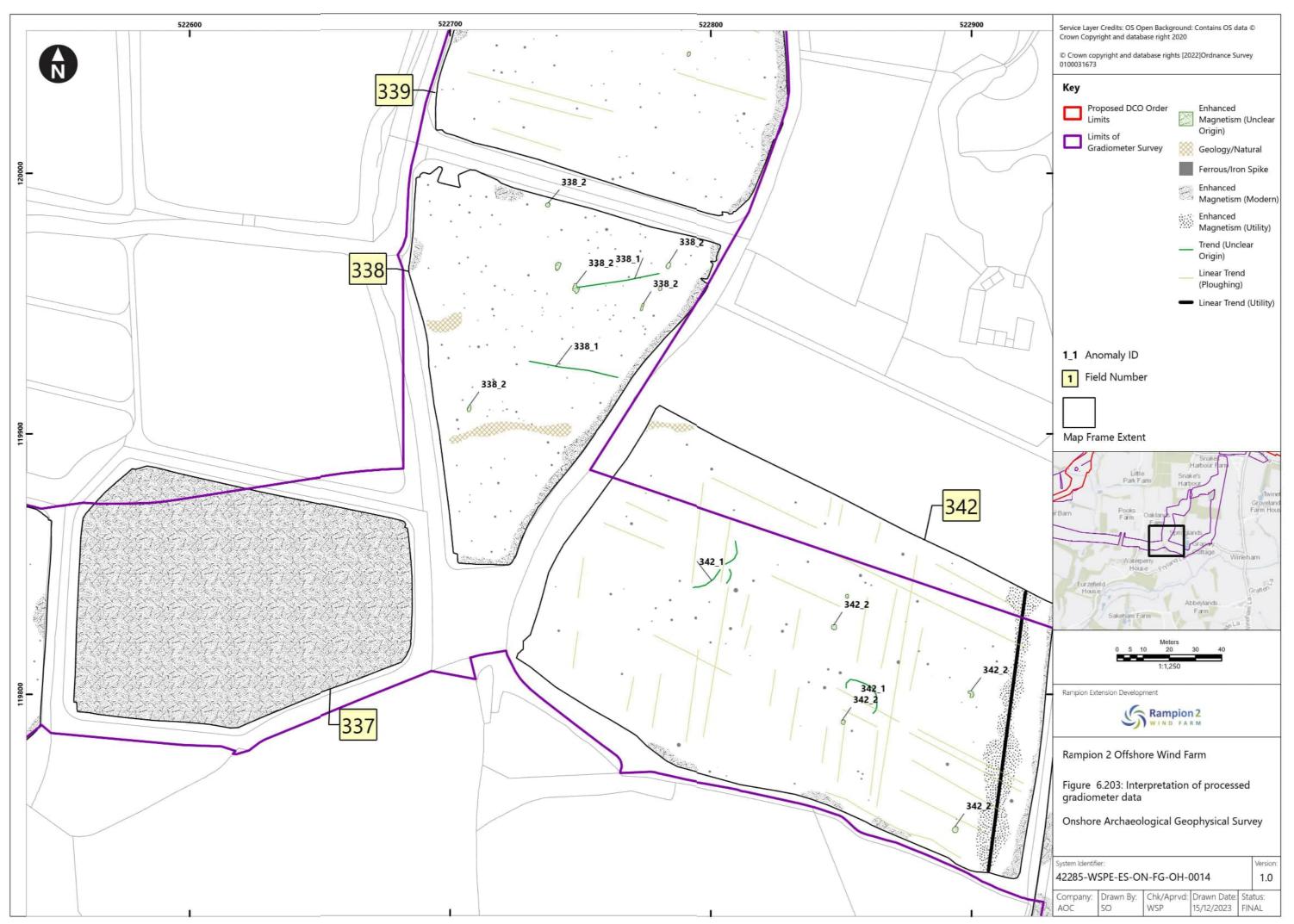


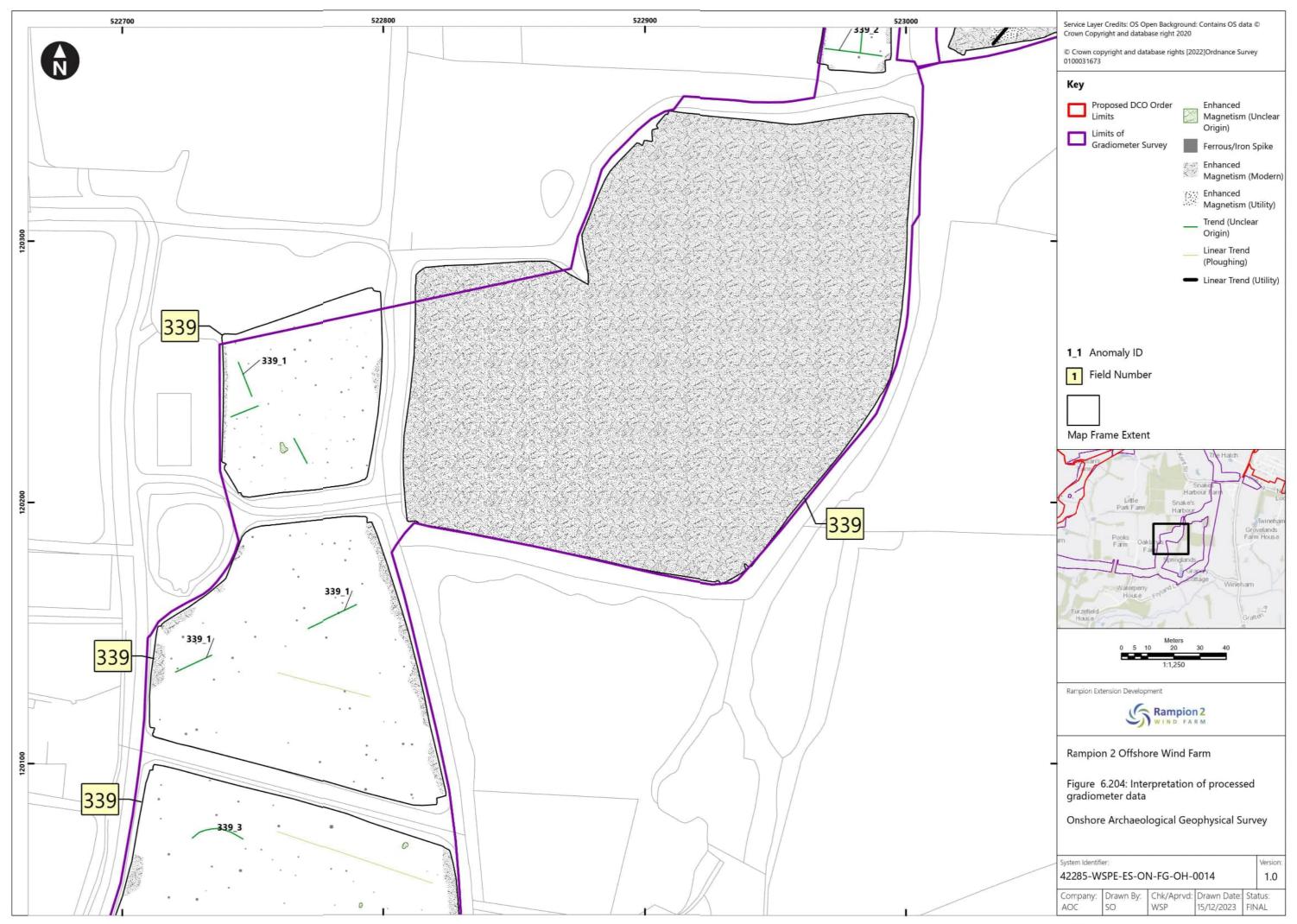
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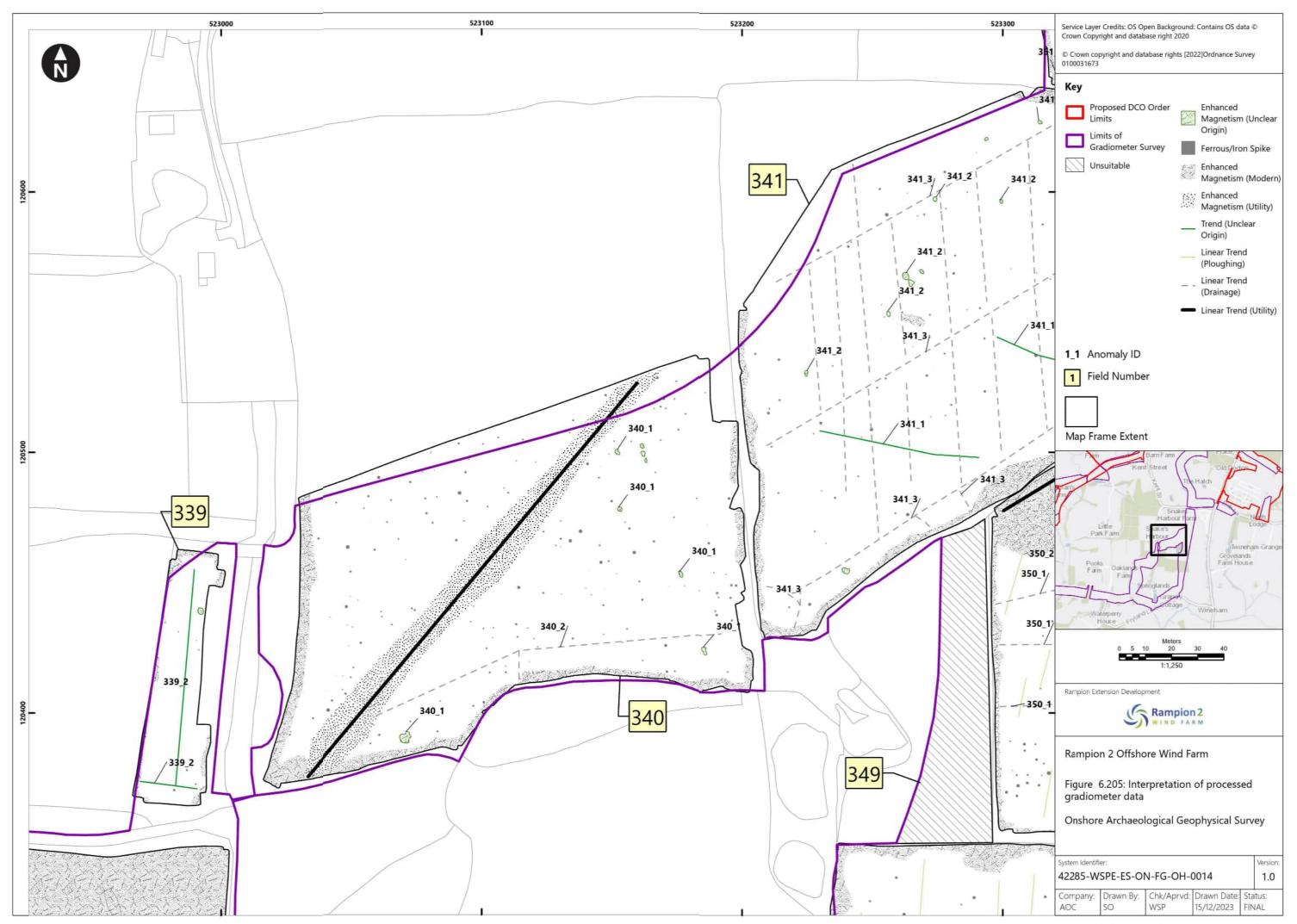


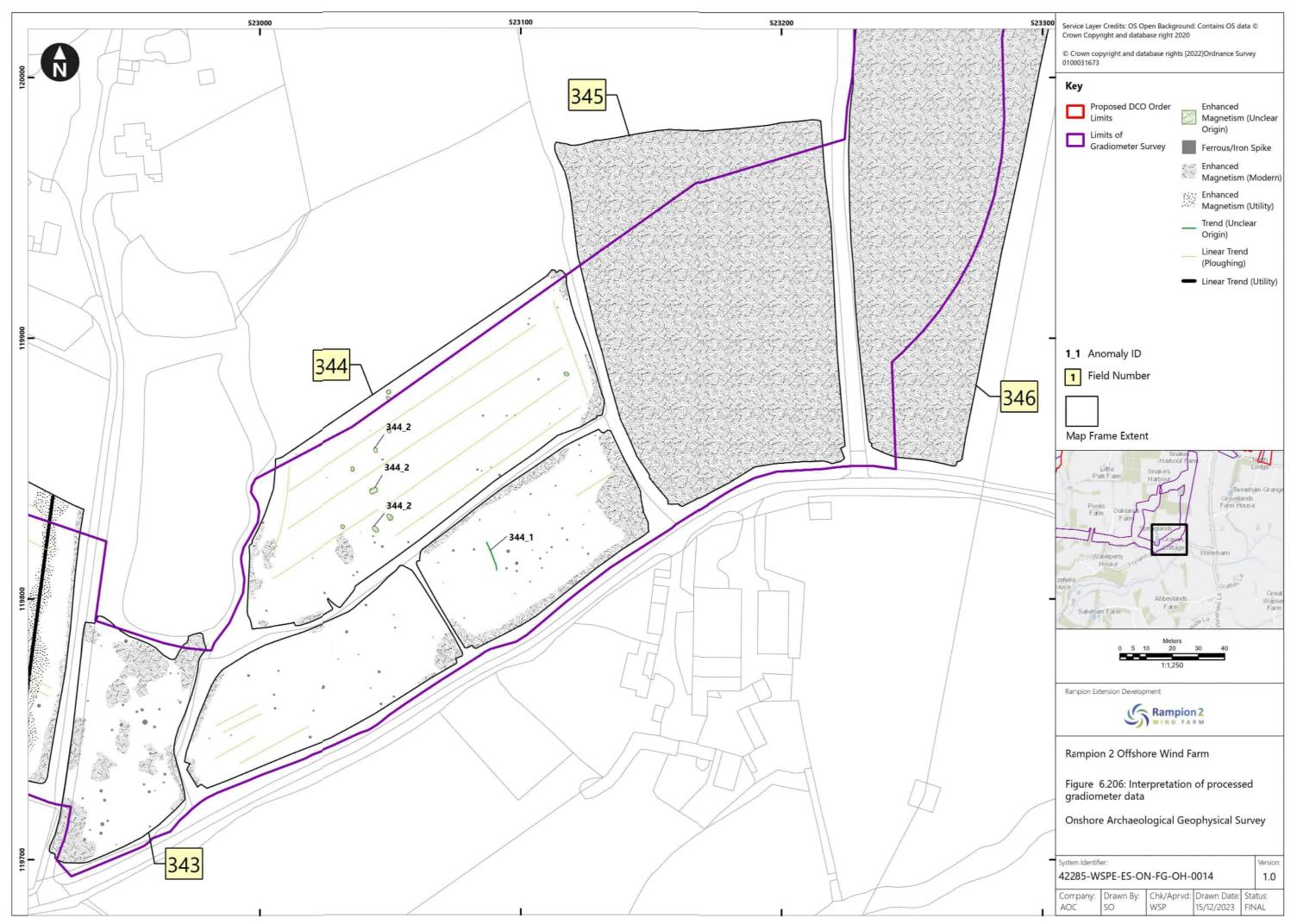


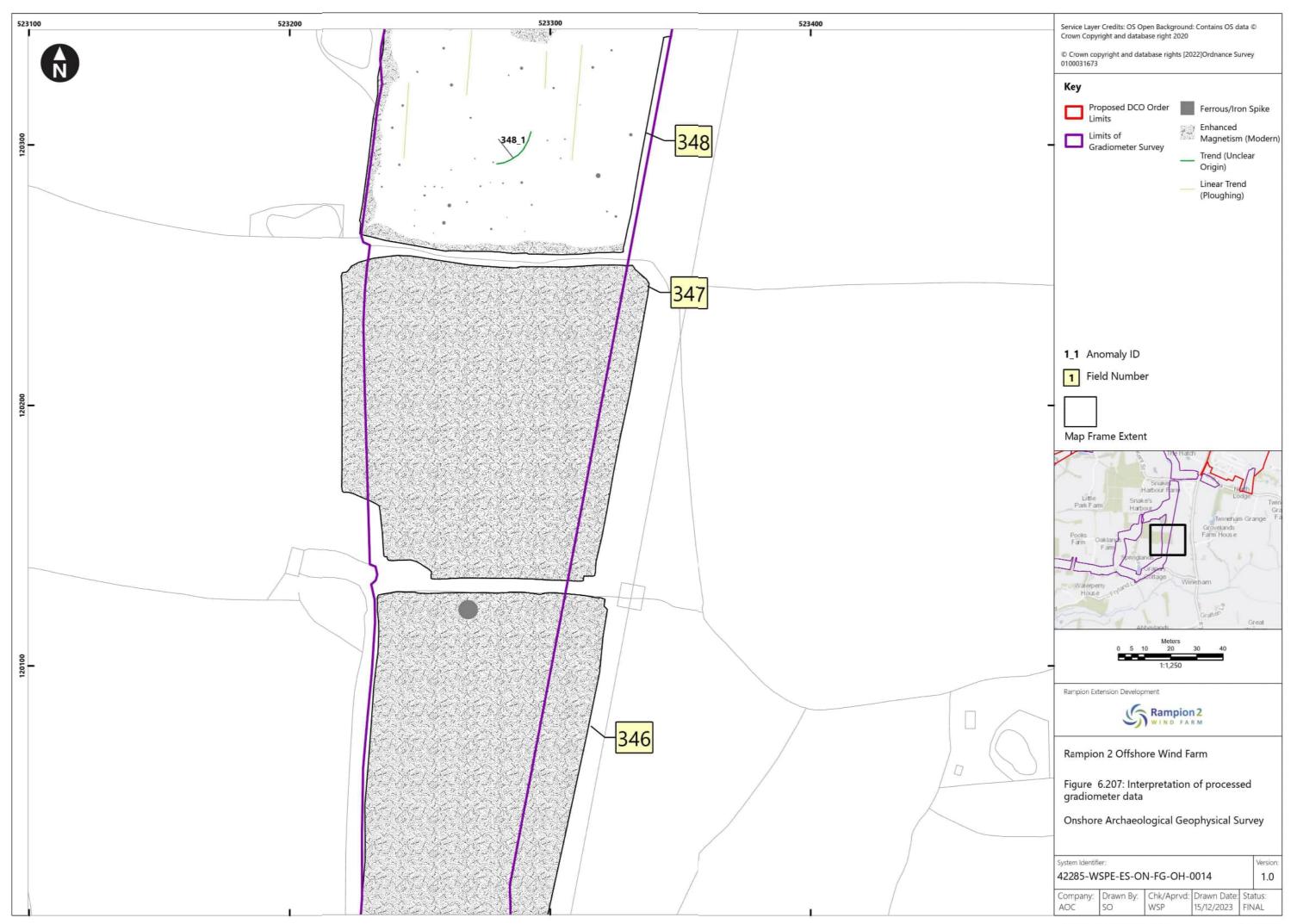


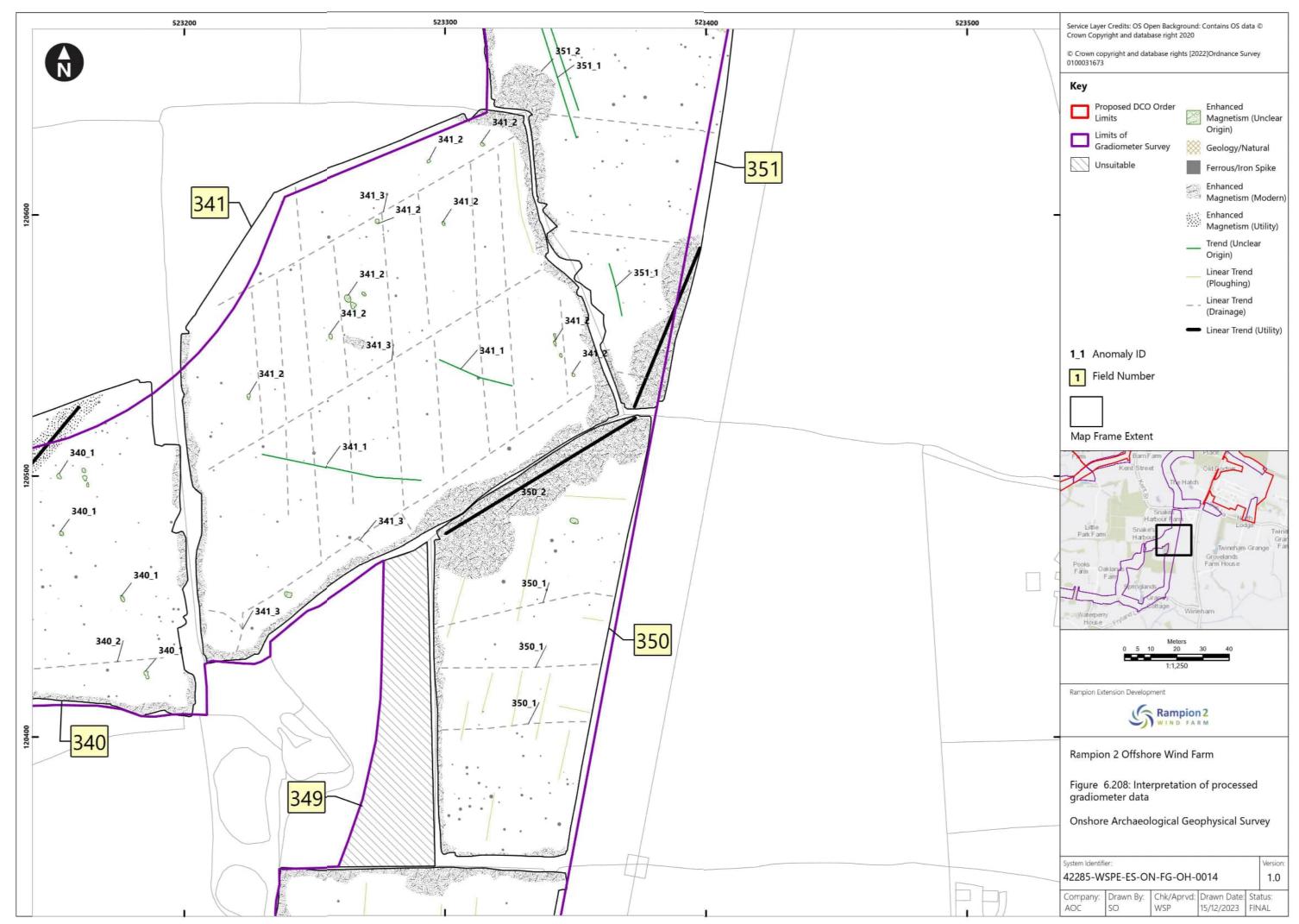


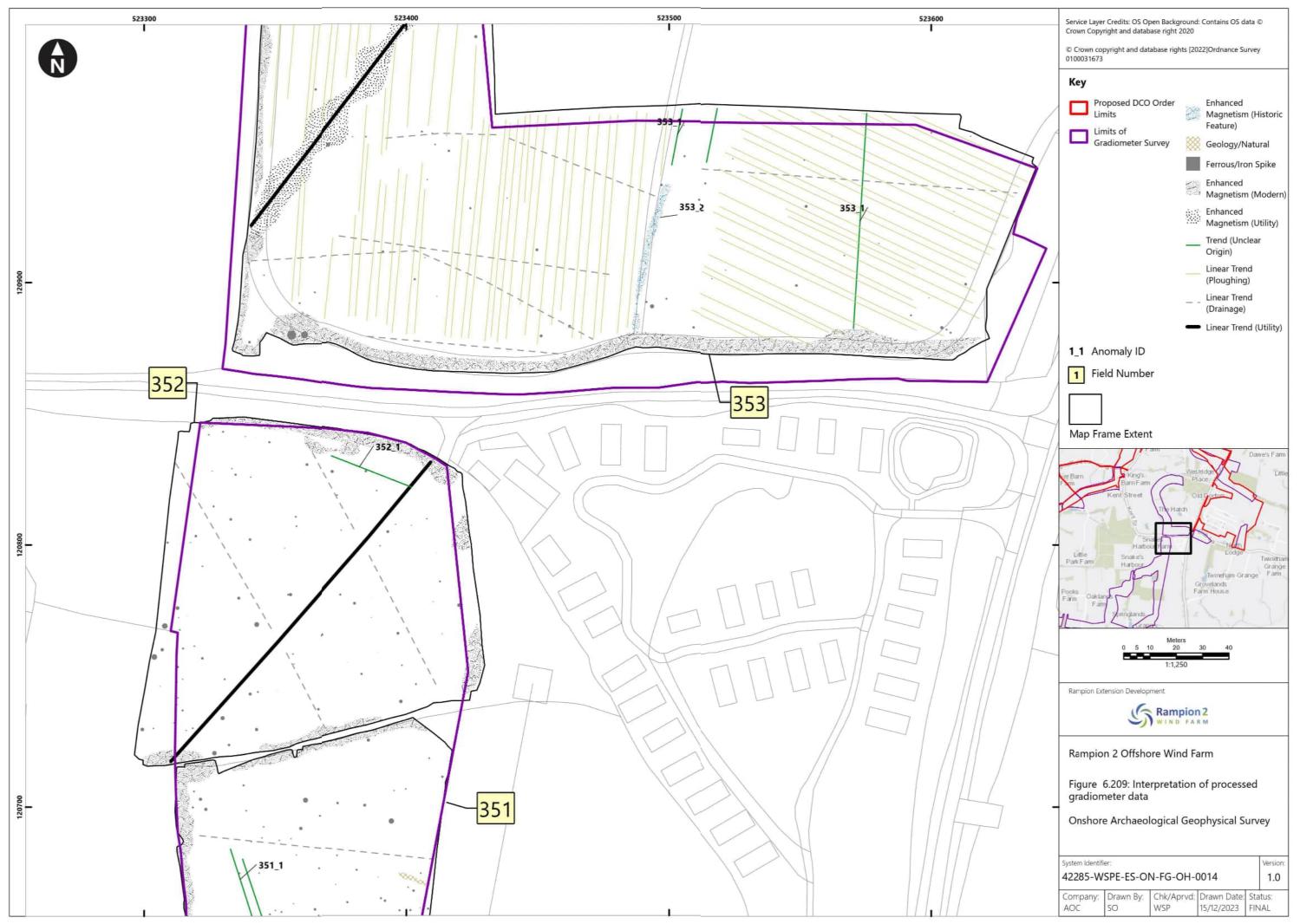


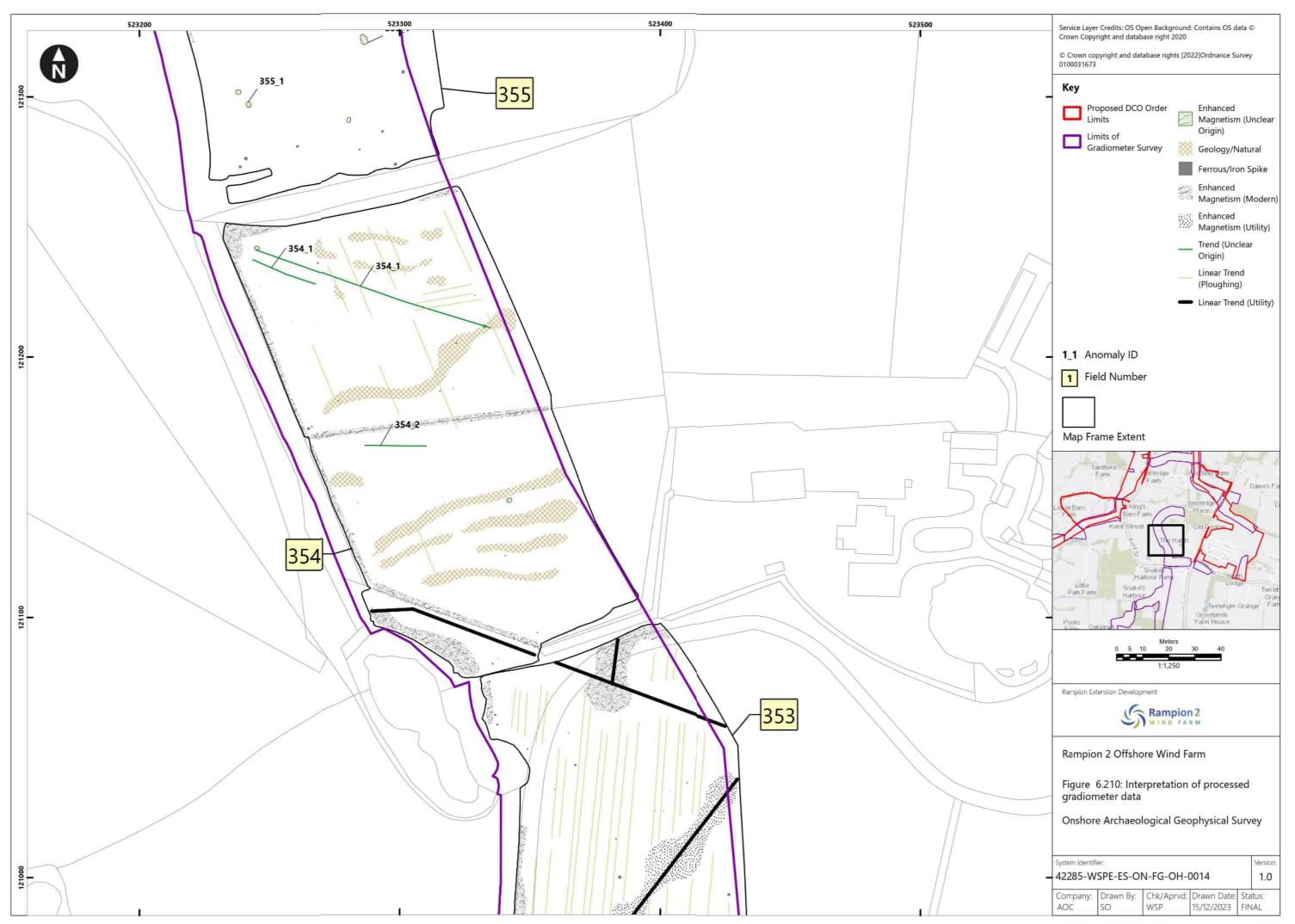




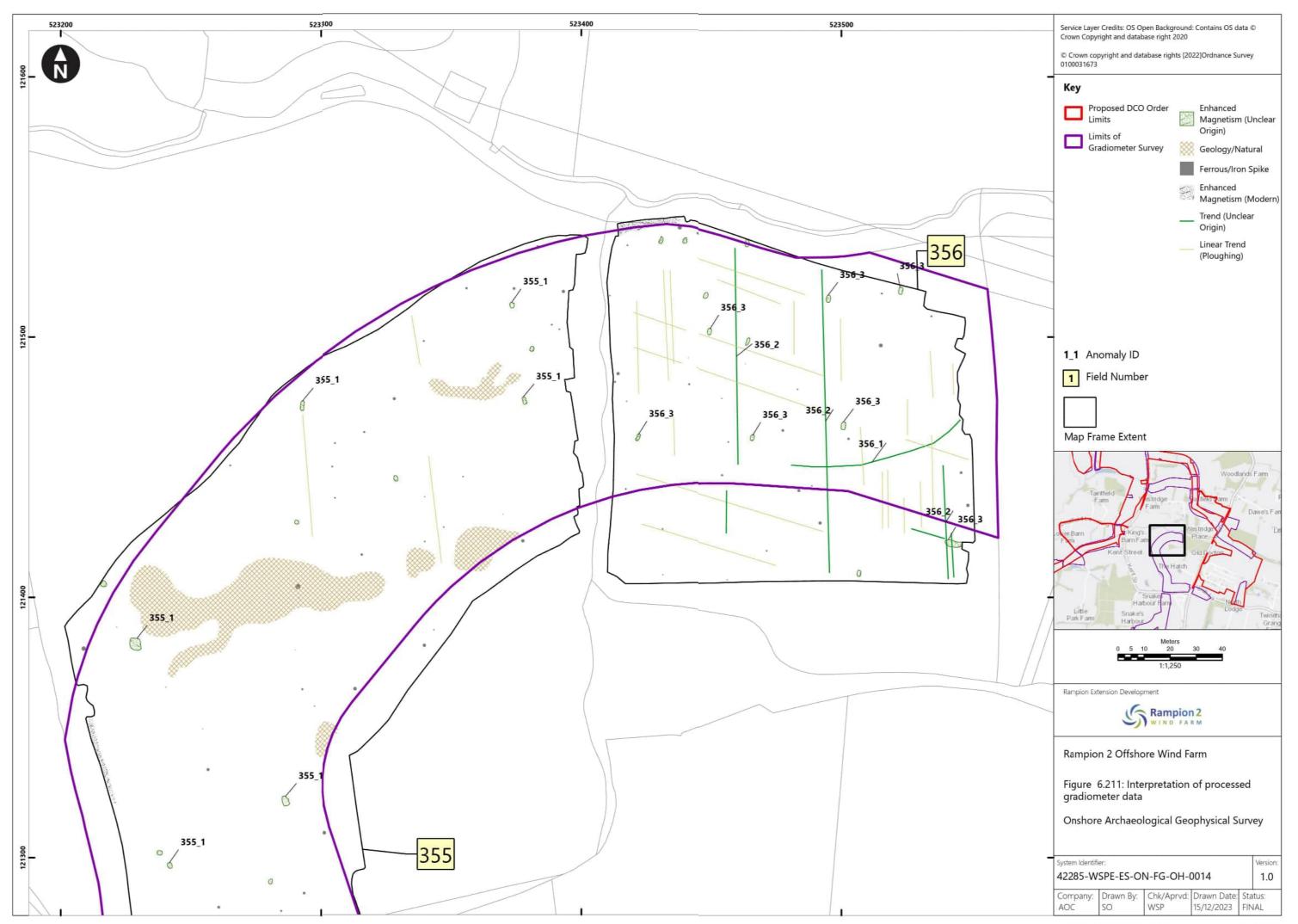








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Annex A Survey Metadata Oasis ID: aocarcha1-436362

Field	Description
Surveying Company	AOC Archaeology
Data collection staff	Chris Sykes, Dan Shiel, Alistair Galt, Sacha O'Connor, Kris Hall, Sarah Gilmer, Rhys Martin, Marguerite Hall, Victoria Huggett, Kinnie Wade, Henry Conran, Gabby Hart, Rob Legg, Reed Haywood,
Client	WSP
Site name	Rampion 2
County	West Sussex
NGR	SW: 500674, 100694 (approximate post code BN17 5RN). NE: 522955, 122759 (approximate post code RH13 8AZ),
Land use/field condition	Varies
Duration	20/9/21 – 21/11/2023
Weather	Varied
Survey type	Magnetic Gradiometer Survey
Instrumentation	Bartington handheld survey: Bartington Grad 601-2 Bartington pushcart survey: Bartington Non-Magnetic Cart, six Bartington Grad 601-2, Trimble R10 GNSS System Sensys towed array: Sensys MAGNETO® MXPDA, Sixteen FGM650/3 fluxgate gradiometer sensors mounted upon a frame at 0.25m meter separation Trimble R10 GPS,
Area covered	Approx 837 ha
Download software	Grad601 PC Software v313/MLGrad601/
Processing software	Geoplot v3.0/v4.0/Geomar, MultiGrad601/DPLMGS and TerraSurveyor/
Visualisation software	ArcGIS Pro
Geology	Varied



Field	Description
Soils	Varied
Scheduled Monument	No
Known archaeology on Site	Various
Historical documentation/mapping on Site	
Report title	Rampion 2 Wind Farm: Onshore Archaeological Geophysical Survey Report
Project number	40214
Report Author	Susan Ovenden
Quality Checked by	James Lawton

Annex B Summary of Data Processing

Process	Effect
Clip	Limits data values to within a specified range
De-spike	Removes exceptionally high readings in the data that can obscure the visibility of archaeological features. In resistivity survey, these can be caused by poor contact of the mobile probes with the ground. In gradiometer survey, these can be caused by highly magnetic items such as buried ferrous objects.
De-stagger	Corrects a misalignment of data when the survey is conducted in a zig-zag traverse pattern.
High pass filter	Removes low-frequency, large scale detail to remove background trends in the data, such as variations in geology.
Interpolate	Increases the resolution of a survey by interpolating new values between surveyed data points, creating a smoother overall effect.
Low Pass filter	Uses a Gaussian filter to remove high-frequency, small scale detail, typically for smoothing the data.
Periodic Filter	Used to either remove or reduce the appearance of constant and reoccurring features that distort other anomalies, such as plough lines.
Remove Turns (TerraSurveyor)	Uses analysis of the direction of travel derived from the GNSS data to break continuous streams of data into individual traverses.
Zero Mean Traverse/Destripe	Resets the mean value of each traverse to zero to address the effect of striping in the data and counteract edge effects.
Discard Overlap	Uses analysis of the GNSS data to delete data points which overlap too much for optimum processing.



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Annex C Technical terminology

Type of Anomaly	Description
Archaeology	Interpretation is supported by the presence of known archaeological remains or by other forms of evidence such as HER records, LiDAR data or cropmarks identified through aerial photography.
Trend	Linear/curvilinear/rectilinear anomalies either characterised by an increase or decrease in values compared to the magnetic background.
Area of enhanced magnetism	A zone of enhanced magnetic responses over a localised area. These anomalies do not have the high dipolar response which are manifested in an 'iron spike' anomaly and likely have a relationship with nearby archaeological trends.
Pit	An anomaly composed of an increase in magnetic values with a patterning on the XY trace plot that is pit-like in appearance.
Possible Archaeology	Trends are likely to have an archaeological origin, however without supporting evidence from known archaeological remains, HER records, LiDAR or aerial photography, they can only be classed as having a possible archaeological origin.
Pit-like anomaly	An anomaly composed of an increase in magnetic values with a patterning on the XY trace plot that is pit-like in appearance.
Burnt area	An anomaly with a patterning on the XY trace plot that is suggestive of industrial activity such as a kiln or hearth.
Unclear Origin	Trends are magnetically weak, fractured or isolated and their context is difficult to ascertain. Whilst an archaeological origin is possible, an agricultural, geological or modern origin is also likely.
Agricultural	Trends associated with agricultural activity, either historical or modern.

Type of Anomaly	Description
Old Field Boundary	These isolated long linear anomalies, most often represented as a negative or fractured magnetic trend, relate to former field boundaries when their positioning is cross referenced with historical mapping.
Historical Features	Features observed on historical mapping that correspond with anomalies or trends in the data. Areas of enhanced magnetism could relate to former buildings, trackways, quarries or ponds.
Ridge and Furrow/Rig and Furrow	A series of regular linear or curvilinear anomalies either composed of an increased or decreased magnetic response compared to background values. The wide regular spacing between the anomalies is consistent with that of a ridge and furrow/rig and furrow ploughing regime. The anomalies often present as a positive 'ridge' trend adjacent to a negative 'furrow' trend.
Ploughing Trends	A series of regular linear anomalies either composed of an increased or decreased magnetic response compared to background values. Anomalies seen parallel to field edges are representative of headlands caused by ploughing.
Field Drainage	A series of magnetic linear anomalies of an indeterminate date, usually with a regular or herringbone patterning.
Non - Archaeology	Trends which are likely to have derived from non-archaeological processes or activities.
Geology/Natural	An area of enhanced magnetism that is composed of irregular weak increases or decreases in magnetic values compared with background readings. It is likely to indicate natural variations in soil composition or reflect variations in the bedrock or superficial geology.
Possible Modern Service	Anomalies of a linear form often composed of contrasting high positive and negative dipolar values. Such anomalies usually signify a feature with a high level of magnetisation and are likely to belong to modern activity such as pipes or modern services.
Magnetic Disturbance	A zone of highly magnetic disturbance that has been caused by or is a reflection of modern activity, such as metallic boundary fencing, gateways, roads, boreholes, adjacent buildings, rubbish at field edges or a spread of green waste material.

Type of Anomaly Description

Isolated Dipolar Anomalies/Ferrou s (iron spikes) and Ferrous Zones A response caused by ferrous materials on the ground surface or within the subsoil, which causes a 'spike' in the data representing a rapid variation in the magnetic response. These generally represent modern material often re-deposited during manuring.



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Annex D Glossary of terms and abbreviations

Term or Acronym	Definition
ADS	Archaeology Data Service
ANA	Archaeological Notification Area
Barrow	Artificial mound of earth, turf and/or stone, normally constructed to contain or conceal burials.
Bronze Age	This period follows on from the Neolithic and is characterized by the increasing use of Bronze work. It is subdivided in the Early, Middle and Late Bronze Age. Archaeological period lasting from 2,600-700 BC
Chartered Institute for Archaeologists (ClfA)	CIfA is the leading professional body representing archaeologists working in the UK and overseas.
Code of Construction Practice	The code sets out the standards and procedures to which developers and contractors must adhere to when undertaking construction of major projects. This will assist with managing the environmental impacts and will identify the main responsibilities and requirements of developers and contractors in constructing their projects.
Cropmark	Patterns or variations in the colour or growth rates of crops which are usually caused by the differential effects on plant ecology of below-ground disturbances or soil enrichment, including the presence of archaeological features. These patterns can be observed from the air.
(DECC)	Department of Energy and Climate Change, now part of the Department for Business, Energy & Industrial Strategy, as of July 2016
Development Consent Order (DCO)	This is the means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects, under the Planning Act 2008.
DMV	Deserted Medieval Village



Term or Acronym	Definition
EAC	European Archaeology Council
Early Medieval	This dates from the breakdown of Roman rule in Britain to the Norman invasion in 1066 and is to be used for monuments of post Roman, Saxon and Viking date. Archaeological period lasting from 1066 to 410
Early Prehistoric	For monuments which are characteristic of the Palaeolithic to Mesolithic but cannot be specifically assigned. Archaeological period lasting from 50,000 to 4,000 BC
Enclosure	An area of land enclosed by a boundary ditch, bank, wall, palisade or other similar barrier.
Environmental Impact Assessment (EIA)	The process of evaluating the likely significant environmental effects of a proposed project or development over and above the existing circumstances (or 'baseline').
Environmental Statement (ES)	The written output presenting the full findings of the Environmental Impact Assessment.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach and the information required to support the EIA and HRA for certain aspects.
GIS	Geographical Information System. A programme that creates, manages, analyses, and maps all types of data
GPS	Global Positioning System
HER	Historic Environment Record
Heritage	The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.
Historic England	The public body that champions and protects England's historic places.
Historic Landscape Character (HLC)	The identification and interpretation of the varying historic character within an area that looks beyond individual heritage assets providing understanding of the whole landscape and townscape area into HLC Types.

Term or Acronym	Definition
Iron Age	This period follows on from the Bronze Age and is characterized by the use of iron for making tools and monuments such as hillforts and oppida. The Iron Age is taken to end with the Roman invasion. Archaeological period lasting from 800 BC to 43 AD.
km	kilometres
Light Detection and Ranging (LiDAR)	A surveying method that measures distance to a target by illuminating the target with laser light and measuring the reflected light with a sensor. Differences in laser return times and wavelengths can then be used to make digital 3-D representations of the target.
Listed Building (LB)	A building which is for the time being included in a list compiled or approved by the secretary of state, any object or structure fixed to the building; any object or structure within the curtilage of the building which, although not fixed to the building, forms part of the land and has done so since before 1 July 1948 shall be treated as part of the building.
LPA	Local Planning Authority
Magnitude (of change)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short term or long term in duration'. Also known as the 'degree' or 'nature' of change.
Medieval	The Medieval period or Middle Ages begins with the Norman invasion and ends with the dissolution of the monasteries. Archaeological period lasting from 1066-1540 AD.
Mesolithic	The Middle Stone Age, falling between the Palaeolithic and the Neolithic; marks the beginning of a move from a hunter gatherer society towards food producing society. Archaeological period lasting from 10,000-4,000 BC.
Ministry of Housing Communities and Local Government (MHCLG)	The Ministry for Housing, Communities and Local Government (now Department for Levelling Up, Housing and Communities) is the UK Government department for housing, communities, local government in England and the levelling up policy.



Term or Acronym	Definition
Monument Unique Identification (MonUID)	This is the reference number or code for known assets, sites and artefacts contained within the Historic Environment Records.
National Heritage List for England (NHLE)	is the only official, up to date, register of all nationally protected historic buildings and sites in England - listed buildings, scheduled monuments, protected wrecks, registered parks and gardens, and battlefields.
Nationally Significant Infrastructure Project (NSIP)	Nationally Significant Infrastructure Projects are major infrastructure developments in England and Wales which are consented by DCO. These include proposals for renewable energy projects with an installed capacity greater than 100MW.
Neolithic	This period follows on from the Palaeolithic and the Mesolithic and is itself succeeded by the Bronze Age. This period is characterized by the practice of a farming economy and extensive monumental constructions. Archaeological period lasting from 4,000-2,600 BC.
NHLE	National Heritage List for England
NE	Northeast
NPPF	National Planning Policy Framework
NPS	National Policy Statement
nT	nanotesla
NW	Northwest
Ordnance Survey (OS)	Ordnance Survey is the national mapping agency for Great Britain. Since 1 April 2015 part of Ordnance Survey has operated as Ordnance Survey Ltd, a government- owned company, 100% in public ownership.
Palaeochannel	The course or channel of a river or stream preserved as a geological feature.
Palaeolithic	The period is defined by the practice of hunting and gathering and the use of chipped flint tools. This period is usually divided up into the Lower, Middle and Upper Palaeolithic. Archaeological period lasting from 50,000-10,000 BC

Term or Acronym	Definition
PC	Personal Computer
PEIR Assessment Boundary	The PEIR Assessment Boundary combines the search areas for the offshore and onshore infrastructure associated with the Proposed Development in the PEIR. It is defined as the area within which the Proposed Development and associated infrastructure will be located, including the temporary and permanent construction and operational work areas.
PEIR SIR	PEIR Supplementary Information Report
Post medieval	Begins with the dissolution of the monasteries and ends with the death of Queen Victoria. Use more specific period where known. Archaeological period lasting from 1540-1901 AD.
Preliminary Environmental Information Report (PEIR)	The written output of the Environmental Impact Assessment undertaken to date for the Proposed Development. It is developed to support formal consultation and presents the preliminary findings of the assessment to allow an informed view to be developed of the Proposed Development, the assessment approach that has been undertaken, and the preliminary conclusions on the likely significant effects of the Proposed Development and environmental measures proposed.
Proposed Development	The development that is subject to the application for development consent, as described in Chapter 4: The Proposed Development, Volume 2 of the ES (Document Reference: 6.2.4).
RED	Rampion Extension Development Limited (the Applicant)
Roman	Traditionally begins with the Roman invasion in 43AD and ends with the emperor Honorius directing Britain to see to its own defence in 410AD. Archaeological period lasting from 43-410 AD.
RTK	Real Time Kinetic
SE	Southeast
Secretary of State (SoS)	The body who makes the decision to grant development consent.



Term or Acronym	Definition
SIM	Subscriber Identity Module
SM	Scheduled Monument
SNDP	South Downs National Park
SNDPA	South Downs National Park Authority
SW	Southwest
SDTA	South Downs Training Area
The Applicant	Rampion Extension Development Limited (RED)
UXO	Unexploded Ordnance
West Sussex Historic Environment Record (HER)	This record collection provides details of all known archaeological assets, sites and former archaeological events within West Sussex.
WSCC	West Sussex County Council

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