

East Meath to North Dublin Grid Upgrade Environmental Impact Assessment Report (EIAR): Volume 3 (Appendices)

Appendix A13.2 - LiDAR Review for the East Meath - North Dublin Grid Upgrade

EirGrid

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Executive Summary

Jacobs were commissioned by EirGrid to undertake a review of Light Detection and Ranging (LiDAR) data captured for the East Meath to North Dublin Grid Upgrade Project (hereafter referred to as the Proposed Development). The aim of the review was to inform the archaeology, architectural heritage and cultural heritage baseline for the Environmental Impact Assessment Report (EIAR) for the Proposed Development by gathering additional information on the form, extent and condition of known archaeological constraints and identifying, mapping and interpreting any previously unrecorded potential archaeological constraints. This Appendix report presents the results of the review of the LiDAR data.

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Appendix A13.2 LiDAR Review for the East Meath to North Dublin Grid Upgrade

1. Introduction

Jacobs were commissioned by EirGrid to undertake a review of Light Detection and Ranging (LiDAR) data captured for the East Meath - North Dublin Grid Upgrade Project (hereafter referred to as the Proposed Development) to identify previously unrecorded potential archaeological constraints and gather additional information on known archaeological constraints. High-resolution LiDAR data was captured for the Step 4b Route which extends approximately 37km (kilometres) from Woodland Substation, near Batterstown in County Meath, to Belcamp Substation, near Belcamp in County Dublin (refer to Figure 1).

This Appendix presents the results of the review of the LiDAR data.

Section 1 of this Appendix presents the aims and objectives of the review. Section 2 provides the background to the review of the LiDAR data as well as a summary of the baseline environment, including topographical and geological background. Section 3 outlines the method used for the review of the LiDAR data, including supplementary sources of information consulted to verify the interpretations of archaeological constraints. Section 4 presents a summary of the results of the review of the LiDAR data and Section 5 discusses the results. An inventory identifying all archaeological constraints identified during the review of the LiDAR data is also provided (Appendix A) and an overview of the locations of archaeological constraints is shown on Figure 1.

1.1 Aims and Objectives

The aim of the review of the LiDAR data was to inform the archaeology, architectural heritage and cultural heritage Chapter for the Environmental Impact Assessment Report (EIAR) (refer to Chapter 12 (Archaeological, Architectural Heritage and Cultural Heritage) in Volume 2 of this EIAR) for the Proposed Development by gathering additional information on the form, extent and condition of known archaeological constraints and identifying, mapping and interpreting any previously unrecorded potential archaeological constraints within the study area (see Section 3).

This was achieved through:

- Processing and visualising the LiDAR data acquired for the Proposed Development;
- Undertaking a review of the visualisations to identify, map and interpret any previously unrecorded potential archaeological constraints and gather additional information on known archaeological constraints ;
- Verifying the results against other sources (see below); and
- The production of a shapefile and inventory of the results of the review of the LiDAR data, as well as this report summarising the results.

2. Baseline Environment

2.1 Location, Topography and Geology

The Step 4b Route extends south from Woodland in County Meath to Belcamp in County Dublin (refer to Figure 1). While the Step 4b Route is located within a largely rural landscape, within the existing carriageways of regional and local roads, the route also includes a number of offline sections. It passes through rural roadside settlements characterised by clusters of houses, farms and commercial facilities. More recent development includes the M1, M2 and M3 Motorways, as well as Dublin Airport. The Step 4b Route also crosses the River Tolka, River Pinkeen and River Ward, as well as a number of minor watercourses.

The underlying geology is largely limestone and shale, with outcropping bedrock noted along the Step 4b Route in the townlands of Cullendragh, Spricklestown, Killamonan, Ward Upper, Corrstown, Shallon, Barberstown, and Forrest Great (Geological Survey of Ireland n.d.). Superficial deposits comprise till, alluvium, lacustrine sediments, and gravels (Geological Survey of Ireland n.d.).

2.2 Archaeology, Architectural Heritage, and Cultural Heritage

A summary of archaeology, architectural heritage, and cultural heritage constraints identified at Step 4A along with a discussion on the general character and nature of the constraints present is presented in Appendix B (Step 4A Archaeology, Architectural Heritage, and Cultural Heritage Baseline Information) of the CP1021 East Meath - North Dublin Grid Upgrade Step 4A Report - Analysis of Route Options report (Jacobs 2023) and has not been duplicated here.

A total of 23 known archaeological constraints have been identified within the study area (see Section 3) from the Record of Monuments and Place (RMP) and / or Sites and Monuments Record (SMR) (including seven excavated sites (five of these are included under their classifications in Table 1 with 'site of' added as these have been excavated; refer to Table 1)). These largely comprise ringforts and enclosures of unknown date, religious sites dating from the medieval period (5th to 16th Centuries AD (Anno Domini)) onwards, and evidence of domestic and agricultural activity dating from the prehistoric to post-medieval periods.

Table 1: Known Archaeological Constraints Within the Study Area Identified from the RMP and / or SMR.

Type	Count
Burnt mound (site of)	1
Castle - unclassified	1
Church	1
Enclosure	4
Excavation - miscellaneous	2
Field system	1
Graveyard	2
Habitation site (site of)	1
House - 16th/17th century	1
House - 18th/19th century	1
Kiln (site of)	2
Mound	1
Ringfort - unclassified	3
Ritual site - holy well	1
Structure (site of)	1

3. Method

LiDAR is a remote sensing technique for determining three-dimensional data points through "*the use of laser light to determine distance to an object or surface*" (Historic Environment Scotland 2018). The resulting data provides accurate topographic information which can aid the identification of archaeological remains, even very indistinct earthworks, including within areas of thick vegetation (Lambrick 2008).

High resolution LiDAR data for the Proposed Development was acquired by Bluesky on behalf of EirGrid. The LiDAR was captured on 14 February 2023 at 0.25m (metres) lateral resolution and accurate to +/- 0.05m vertical resolution. Digital Elevation Models (DEMs), both a Digital Surface Model (DSM) and a Digital Terrain Model (DTM), were provided. A DSM is a model that "*contains elevations of natural terrain features including objects on it, i.e. vegetation and cultural features such as buildings*", whereas a DTM "*represents the elevation of 'bare earth', i.e. the shape of terrain without any objects on it*" (Kokalj and Hesse 2017). Data were tied to Irish Transverse Mercator (ITM).

The LiDAR data were converted from ASCII (plain text files) to raster format using ArcGIS 10.6.1. A mosaic of the converted data was created and used to produce visualisations using the ArcToolbox and the methodologies in *Processing and Working with LiDAR Data in ArcGIS: A Practical Guide for Archaeologists* (Davis 2012) and *LiDAR-derived Local Relief Models – a new tool for archaeological prospection* (Hesse 2010).

A number of complementary visualisations were created to review the LiDAR data. These comprised:

- Single direction hillshades – a technique based on the "*hypothetical illumination of a surface... to show subtle changes in the topography of DEMs with the use of shadow*" (Historic England 2018). Hillshade models of the DEMs were produced using various azimuths to allow for comparison and the identification of features which may be imperceptible when lit from certain angles (i.e. linear earthworks);
- Multi-directional hillshade – a technique that produces a composite of a number of single direction hillshades lit from different directions (commonly 16 directions) containing information from all the separate elements. This technique can be used to counter the issue of certain features being imperceptible when lit from certain angles. However, features may become 'washed out' as a result of over exposed areas; and
- Simple Local Relief Model (LRM) – a technique that "*separates local small-scale features from large scale landscape forms*" which enhances the visibility of shallow topographic features irrespective of the illumination (Kokalj and Hesse 2017; Hesse 2010). Local relief can be presented in simple colours which enhance the readability of the model.

For the review of the LiDAR data, a study area comprising the Step 4b Route and an area extending 100m to either side of it was defined and overlaid on each visualisation (see above). To facilitate the review, the study area was also divided into 1km (kilometre) grid squares.

For each grid square, the visualisations produced from the LiDAR data were visually inspected and the extents of previously unrecorded potential archaeological constraints were digitised. In addition, the locations of known archaeological constraints identified from the SMR and / or RMP were reviewed to gather additional information about the form, extent and condition of these constraints, including digitising any visible features.

For each identified archaeological constraint the following sources of information were also consulted:

- Aerial imagery available online, including GoogleEarth and BlueSky aerial imagery via Project Mapper;

- Historic aerial photographs available online via the Cambridge University Collection of Aerial Photography (CUCAP; 2023) and National Collection of Aerial Photography (NCAP; n.d.);
- Publicly accessible historic Ordnance Survey mapping (6" to 1 mile, 1837 – 1842, and 25" to 1 mile, 1888-1913);
- Modern mapping, including Google Street View; and
- Known archaeological constraints identified as part of the Step 4A Report (Appendix B: Archaeology, Architectural Heritage, and Cultural Heritage Baseline Information (Jacobs 2023)).

A shapefile of the results was created which captured the following information for each archaeological constraint:

- 1km grid square number – the unique reference given to the 1km² (kilometres squared) grid square the archaeological constraint is located within or, where an archaeological constraint overlaps grid squares, the grid square the majority of the archaeological constraint is located within;
- Unique Reference Number – the unique reference number, prefixed with 'LI', ascribed to all archaeological constraints identified, including previously recorded archaeological constraints;
- Associated known constraint reference (if applicable) – the unique reference for the known archaeology, architectural heritage and cultural heritage constraint, or known constraint located in proximity to the previously unrecorded potential archaeological constraint that may be associated with it;
- National dataset reference (if relevant) – the corresponding RMP or SMR reference number for the archaeological constraint;
- Easting and Northing – ITM coordinates of the centroid of the archaeological constraint;
- Townland – the name of the townland within which the archaeological constraint is located;
- Sources – the sources which were referred to inform and verify the interpretation of the archaeological constraint;
- Confidence:
 - High – strong possibility the archaeological constraint is as interpreted;
 - Medium – the archaeological constraint is tentatively interpreted; and
 - Low – limited possibility the archaeological constraint is as interpreted.
- Site type – the type of site based on the interpretation of the archaeological constraint.

Some potential archaeological constraints identified from the LiDAR data were found to be non-archaeological following review against other sources (see above), such as the circular wear patterns around modern animal feeders, mounds of modern material and field drainage. These were not recorded and are not discussed further below.

A summary of the results is presented in Section 4. Full details for the archaeological constraints identified are provided in Appendix A (Inventory of Archaeological Constraints) and the locations of archaeological constraints are shown on Figure 1.

3.1 Limitations

While processing the LiDAR data in the Geographic Information System (GIS) enables the visualisation and analysis of the data, the use of raster surfaces can result in the loss of some original data during processing.

LiDAR provides topographic information which can aid the identification of potential archaeological constraints. However, many archaeological constraints do not have above ground features and therefore not all archaeological constraints that may be present can be identified from LiDAR. There is therefore the

potential for further previously unrecorded underground archaeological features to be present within the study area.

4. Results

This Section presents a summary of the results of the review of LiDAR data. Further details for the archaeological constraints identified are provided in Appendix A (Inventory of Archaeological Constraints) and the locations of archaeological constraints are shown on Figure 1.

4.1 Overview

The review of the LiDAR data has identified 71 archaeological constraints within the study area (refer to Table 2 and see Figure 1). Of these, six were interpreted as being associated with known constraints within the Study Area including those identified from the SMR and/or RMP (such as LI_078 (AY_41; DU011-043); Image 4.1) with the remaining 65 being previously unrecorded.

Table 2: Summary Classification of Archaeological Constraints Identified within the Study Area.

Type	Count
Boundary	5
Building(s) (Site of)	4
Church / churchyard	1
Designed landscape feature	1
Ditch	4
Driveway	1
Enclosure	8
Farm (Site of)	1
Field boundary(ies)	22
Field system	10
Gravel pit / quarry	6
Palaeochannel	4
Pit	1
Ringfort	1
Road	1
Track	1

A ringfort recorded on the RMP (DU011-043) was identified at Step 4 (AY_41). It comprises a large circular earthwork depicted on First Edition Ordnance Survey mapping (1837 – 1842) located within an arable field to the north of the R108 Regional Road. The site has been interpreted as a platform-type ringfort with a waterlogged external fosse (ditch). The ringfort, which is approximately 80m in diameter, was visible on the LiDAR data (see Image 4.1). It has been truncated to the east and south-east by the R108 Regional Road and to the north by airport infrastructure (lighting).

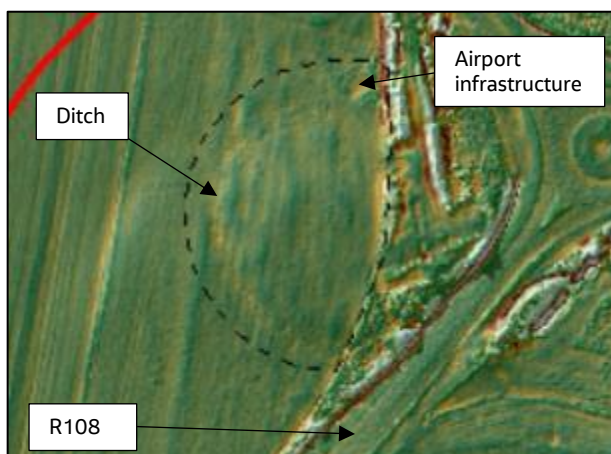


Image 4.1: A ringfort in the townland of Forest Great (LI_52; AY_41; DU011-043) of possible early medieval date recorded on the RMP (DU011-043). The ringfort has been truncated to the east and south-east by the R108 Regional Road. However, the outer ditch remains perceptible in a pasture field west of the road.

Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.

Eight possible previously unrecorded enclosures (LI_31 (Image 4.2), LI_34 (Image 4.3), LI_40 (Image 4.4), LI_53 (Image 4.5), LI_54 (Image 4.6), LI_63 (Image 4.7) LI_65 (Image 4.8), and LI_71 (Image 4.9)) were also identified from the LiDAR data in the townlands of Kinoristown, Stokestown, Irishtown, Forest Great, Cloghran, Vesingtown, Harlockstown and Ballystrahan. The enclosures identified within the study area are circular in shape and defined by ditches, banks, or a combination of ditches and banks, and range in diameter from approximately 17m to 88m. LI_63 in Harlockstown (Figure 8) is a rectangular enclosure, measuring approximately 18m by 10m .

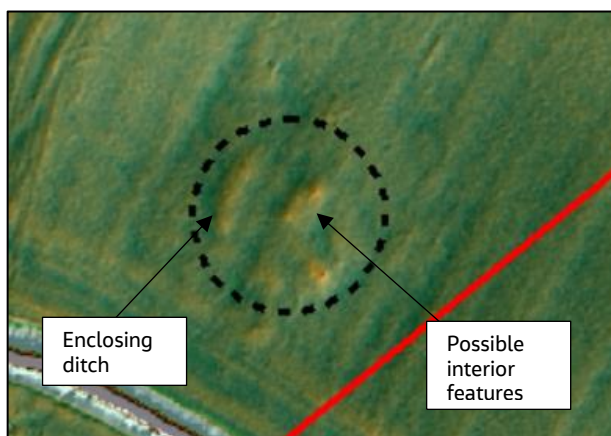


Image 4.2: An ephemeral circular feature in the townland of Kinoristown tentatively interpreted as a possible enclosure (LI_31), approximately 30m in diameter, comprising a portion of a sub-circular enclosing ditch with possible interior features.

Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.

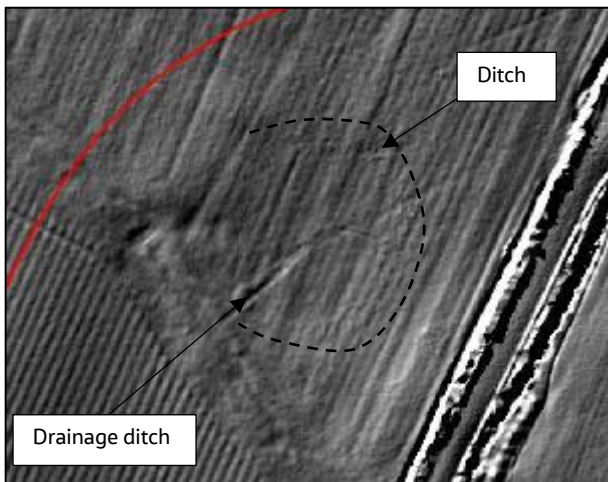


Image 4.3: An ephemeral circular feature in the townland of Stokestown tentatively interpreted as a possible enclosure (LI_34) comprising a circular enclosing ditch surrounding an area approximately 4.1m in diameter. It has been partially truncated by a later drainage ditch.

Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.

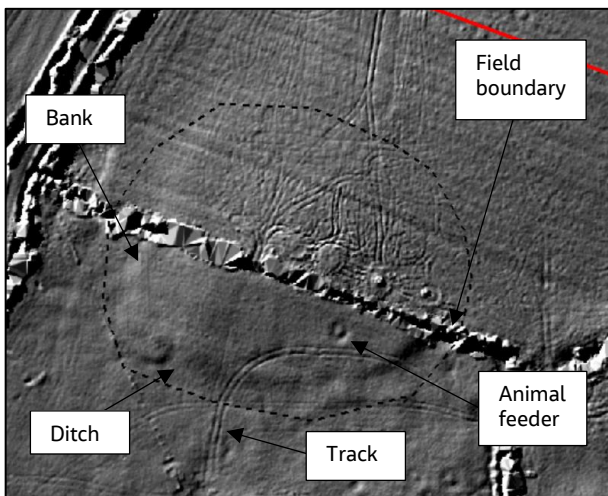


Image 4.4: A possible enclosure (LI_40) in the townland of Irishtown comprising a raised interior with a sub-circular enclosing ditch (continuing into the field to the north) and very ephemeral possible interior bank. Partially truncated by a field boundary and track. North-eastern portion not perceptible. A circular wear pattern around a modern animal feeder is also visible within the enclosure.

Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.

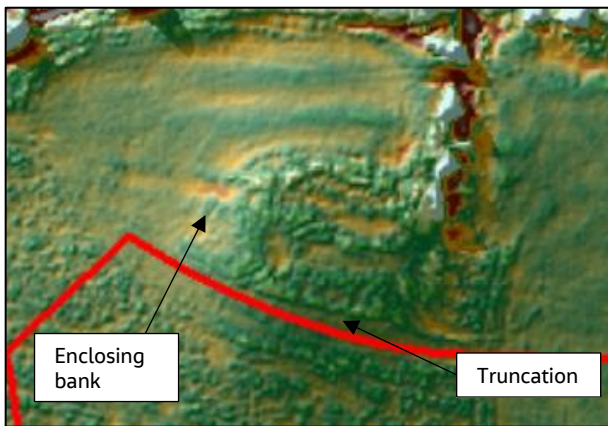


Image 4.5: A sub-circular area of rough ground in the townland of Forest Great interpreted as a possible enclosure (LI_53), approximately 30m in diameter, including a possible section of enclosing bank. Appears to have been truncated to the south and east.

Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.

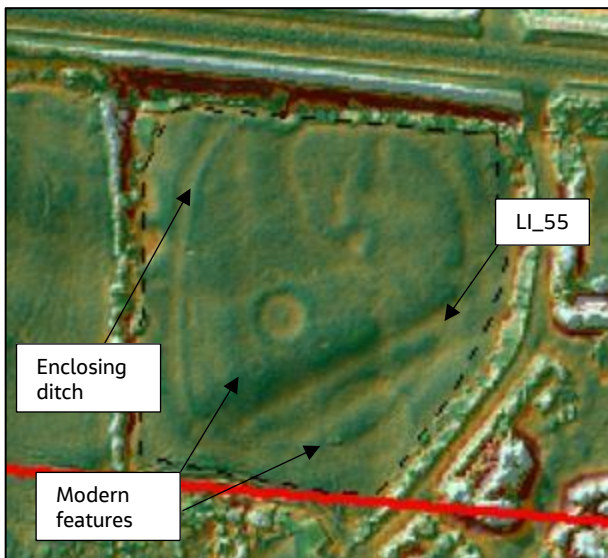


Image 4.6: A possible large sub-circular enclosure (LI_54), in the townland of Cloghran, measuring approximately 76m by 64m, with possible interior features including a circular feature measuring approximately 10m in diameter. Modern features were also noted and the enclosure appear to have been truncated by the Stockhole Lane to the north and bisected by a former road (LI_55).

Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.

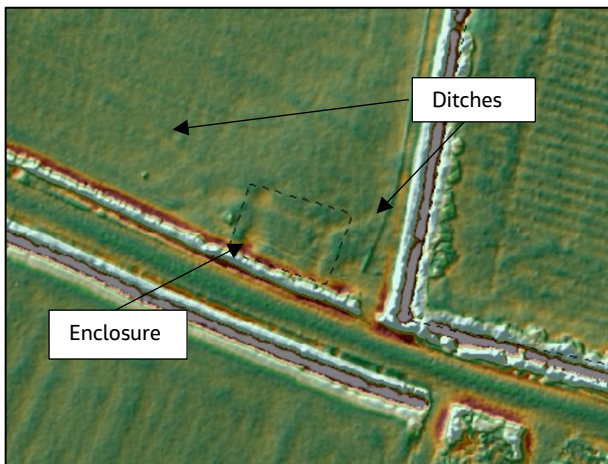


Image 4.7: A rectangular feature (LI_63), defined by an enclosing ditch, measuring approximately 18m by 10m. Interpreted as a small rectangular enclosure of unknown date in the townland of Harlockstown. Two adjoining linear features, possible ditches, are visible extending from the corners of the enclosure suggesting it may be part of a larger complex.

Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.



Image 4.8: A very ephemeral circular feature (LI_65), defined by a possible circular enclosing ditch, measuring approximately 17m in diameter and interpreted as a possible enclosure in the townland of Vesingtown.

Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.

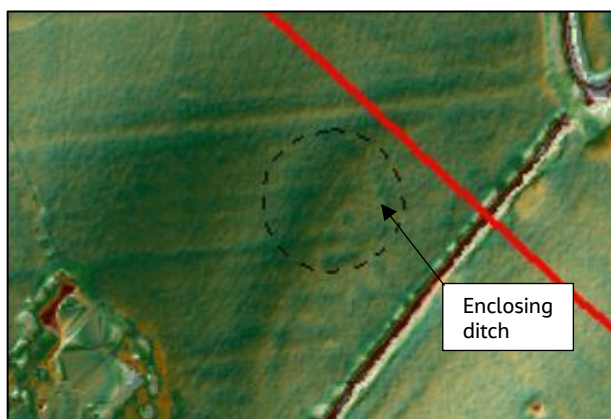


Image 4.9: A circular area in Ballystrahan measuring approximately 27m in diameter, with a possible enclosing ditch perceptible to the north-east, and interpreted as a possible enclosure (LI_71).

Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.

A total of 22 former field boundaries (LI_02, LI_03, LI_06, LI_12, LI_19, LI_22, LI_23, LI_26, LI_28, LI_29, LI_32, LI_35, LI_38, LI_45, LI_46, LI_48, LI_50, LI_51, LI_56, LI_57, LI_60, and LI_61) and 10 field systems (LI_04, LI_05, LI_07, LI_09, LI_10, LI_11, LI_16, LI_18, LI_21 (Image 4.10), and LI_24) were identified from the LiDAR data. While 24 of these reflect the boundaries and field pattern depicted on First Edition Ordnance Survey mapping (6" to 1 mile, 1837 – 1842), eight (LI_04, LI_07, LI_09, LI_11, LI_18, LI_21 (Image 4.10), LI_23 and LI_24) are not depicted on First Edition Ordnance Survey mapping (6" to 1 mile, 1837 – 1842) or on subsequent editions which suggests they could be earlier in date than the First Edition. In addition, five boundaries (LI_01, LI_13, LI_15 (Image 4.11), LI_62, and LI_67) associated with buildings depicted on Ordnance Survey mapping (6" to 1 mile, 1837 – 1842, and 25" to 1 mile, 1888-1913) were also identified.

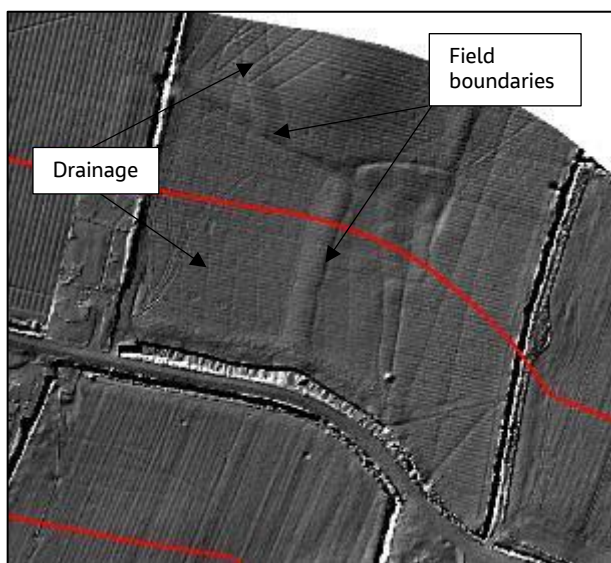


Image 4.10: A network of linear features in Baytownpark (LI_21) interpreted as possible former field boundaries forming a field system of unknown date (extends to the north beyond the extent of the Study Area). Areas of more ephemeral narrow parallel linear features, interpreted as drainage (likely later in date), were also noted.

Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.

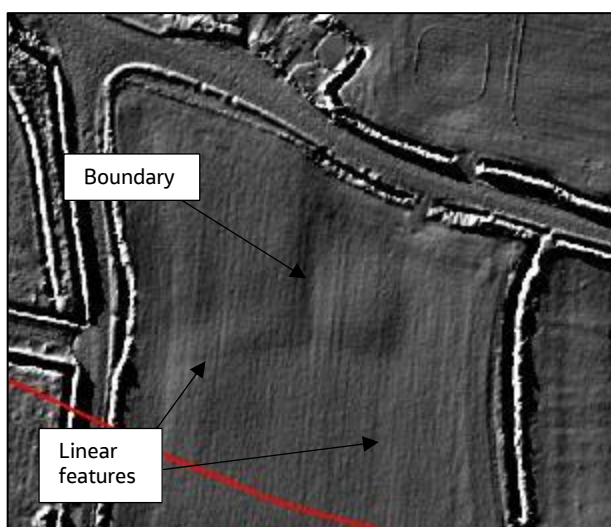


Image 4.11: Linear features forming the boundaries of a sub-rectangular enclosure (LI_15) in Blackhall Big, with other linear features noted adjoining the feature. Interpreted as the boundary to a plot depicted on historic Ordnance Survey mapping (1837) surrounding a small group of roadside buildings.

Single Direction Hillshade Model: DTM azimuth 315° and altitude 10

Four sites of previously unrecorded buildings were identified from the LiDAR data (LI_08 (Image 4.12), LI_14 (Image 4.13), LI_44, and LI_64). These are characterised by individual or small groups of rectangular features, often with linear features interpreted as associated boundaries. While two (LI_14 (Image 4.13) and LI_44) correspond with buildings depicted on historic Ordnance Survey mapping, LI_08 (Image 4.12) and LI_64 are not depicted on First Edition Ordnance Survey mapping (6" to 1 mile, 1837 – 1842) or on subsequent editions and therefore may pre-date the First Edition.

In addition, the site of a farm in Upper Middleton (LI_59; also CH_34) was also identified from LiDAR data. LI_59 comprises an irregular area of disturbance that corresponds with 'Upper Middleton' on historic Ordnance Survey mapping (1843).

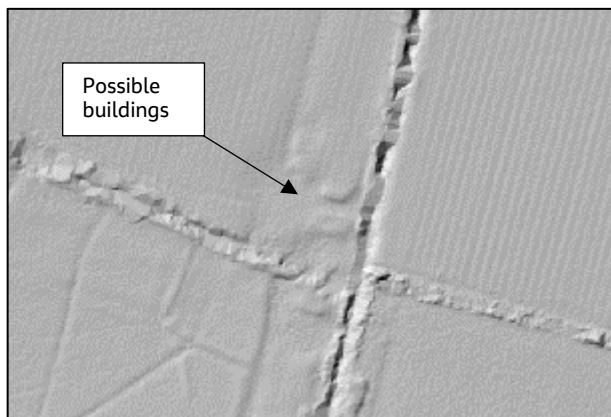


Image 4.12: A cluster of rectangular features in Cullendragh (LI_08). These features are not depicted on historic Ordnance Survey mapping but are similar to other buildings visible on historic Ordnance Survey mapping.

Single Direction Hillshade Model: DTM azimuth 315° and altitude 45°.

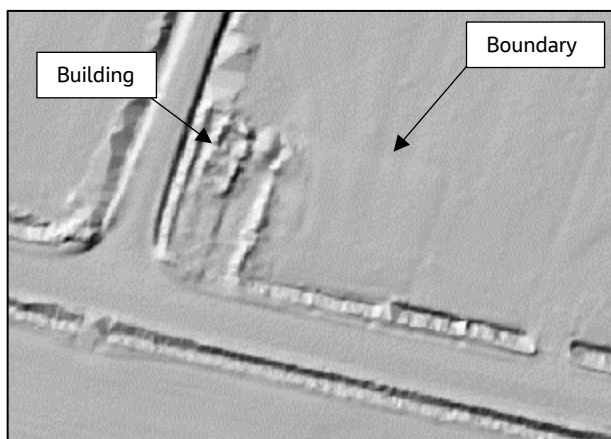


Image 4.13: The rectangular footings of a possible roadside building (LI_14) along with an ephemeral boundary feature that correspond with a building depicted on historic Ordnance Survey mapping (1837) identified as a 'Police Station' in Culcommon.

Single Direction Hillshade Model: DTM azimuth 315° and altitude 45°.

St. Brigid's Church and Graveyard (LI_43; Image 4.14) is recorded on the RMP (DU011-039001 and DU011-039001) and the Record of Protected Structures (RPS) (RPS 660) and was identified at Step 4 (AY_23, AY_24 and AH_07). Surrounded by a wall, the church yard comprises a raised sub-circular area surrounding the ruins of a rectangular medieval parish church with rows of headstones dating to the 19th and 20th Centuries. Both the church yard, headstones and footings of the church were visible on the LiDAR data (Image 4.14).



Image 4.14: St. Brigid's Church & Graveyard (LI_43; Also AY_23, AY_24 and AH_06; DU011-039001, DU011-039002 and RPS 660) in Ward Lower comprising a raised sub-circular enclosed church yard, with memorials, surrounding a rectangular church building.

Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.

A possible pit (LI_20), approximately 7m in diameter, with two smaller (approximately 3m in diameter) features located adjacent, was also identified in the townland of Baytownpark. However, this interpretation is tentative, and this feature may comprise evidence of agricultural activity or be natural in origin.

A potential archaeological constraint associated Hollywoodrath Garden and Designed Landscape (GDL) (NIAH 2267; DL_05), was also identified from the LiDAR data (LI_41). This comprises an irregular area measuring approximately 15m across in the location of a pond depicted on First Edition Ordnance Survey mapping (1843; 1909). In addition, a driveway (LI_17) comprising a pair of parallel linear features was also identified from LiDAR data. It corresponds with a driveway depicted on historic Ordnance Survey mapping (1837) associated with an unnamed house.

A total of four linear features, interpreted as ditches, were identified from the LiDAR data (LI_25, LI_42, LI_49 and LI_70). LI_42 is located within demesne lands (DL_05). However, there are no corresponding features depicted on First Edition Ordnance Survey mapping (6" to 1 mile, 1837 – 1842) suggesting they may be earlier in date than the First Edition. The remaining ditches comprise individual linear features with no diagnostic features and therefore the date and function of these are unknown.

A total of six gravel pits and quarries (LI_30, LI_33, LI_37 (Image 4.15), LI_39, LI_47, and LI_68) were identified from the LiDAR data. These are characterised by areas of disturbance that correspond with sites depicted on historic Ordnance Survey mapping, or those located near to known areas of extraction (such as LI_37; Image 4.15).

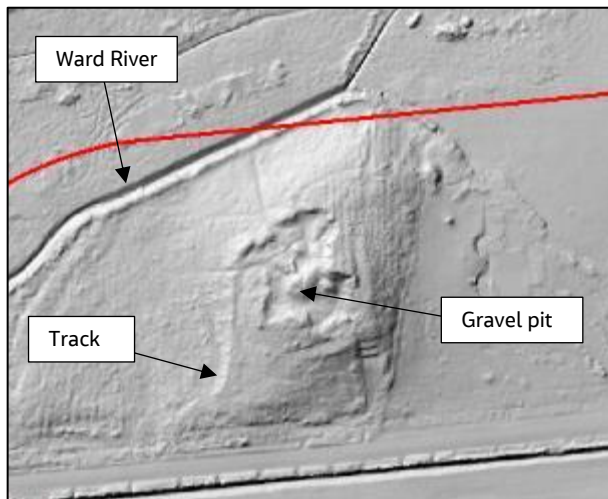


Image 4.15: An irregular area, within an area of established woodland in Priest Town, interpreted as a possible gravel pit (LI_37). A track was noted to the south and the Ward River is located to the north. Another area of woodland located to the north-east, is the location of a gravel pit depicted on historic Ordnance Survey mapping (1837).

Single Direction Hillshade Model: DTM azimuth 315° and altitude 45°.

The former alignments of a road (LI_55) and a track (LI_66) were identified from LiDAR data. The road comprises a linear feature in Cloghran and corresponds to the alignment of the road depicted on historic Ordnance Survey mapping (1843). LI_66 comprises a pair of parallel linear features and was tentatively interpreted as a possible track of unknown date in Cushinstown.

Six possible palaeochannels (LI_18, LI_24, LI_27 (Image 4.16), LI_36, LI_58, and LI_69 (Image 4.17)) were also identified from LiDAR data. These constraints comprise channels of former watercourses, including possible river terraces and levees. While LI_69 (Image 4.17) is depicted on historic Ordnance Survey mapping (1837) as the meandering channel of the River Tolka prior to the channel being straightened, the others do not reflect the channels of known watercourses shown on historic or modern mapping and therefore are likely to be former watercourses that have been filled or buried.



Image 4.16: A wide curvi-linear channel (LI_27) in Pace, interpreted as a possible palaeochannel, located near the River Tolka; however, not depicted on historic or modern mapping.

Single Direction Hillshade Model: DTM azimuth 315° and altitude 45°.



Image 4.17: A narrow irregular channel to the north-east of the River Tolka in Pace (LI_69). Corresponds with the meandering course of the river depicted on First Edition Ordnance Survey mapping (1837) then as the former channel on later editions (1911).

Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.

Further information on the archaeological constraints including known archaeological constraints identified during the review of the LiDAR data is presented in Appendix A (Inventory of Archaeological Constraints) and the locations of archaeological constraints is shown on Figure 1.

4.2 Summary of Findings

Table 2 in Section 4.1 provides a summary of the classification of archaeological constraints identified within the study area. A summary of the main site types is provided below, and a detailed inventory is presented in Appendix A.

4.2.1 Agricultural Activity

The majority of the archaeological constraints identified were interpreted as evidence of agricultural activity. A total of 10 field systems (fields that form a coherent group) and 22 field boundaries were identified within the study area.

While 22 of these former field boundaries and field systems correspond with the field pattern depicted on historic Ordnance Survey mapping (for example, LI_28 in Pace), possible earlier examples were also identified comprising groups of smaller and more irregular field shapes, such as LI_21 in Baytownpark (Image 4.10). Given that these field systems are not depicted on historic Ordnance Survey mapping, they may be of earlier date than the First Edition.

A further four linear features interpreted as ditches were also identified from LiDAR data. However, given the lack of diagnostic information it was not possible to attribute a date or function to these constraints from the sources identified in Section 3.

4.2.2 Enclosures

LI_52 (Image 4.1) is a platform ringfort recorded on the RMP (DU011-043). Ringforts comprise roughly circular or oval areas surrounded by an earth bank with an external ditch, with platform ringforts typically constructed by scarping a natural knoll or drumlin (O'Sullivan *et al.* 2021). They are likely to have been farmsteads and broadly date to the Early Medieval period (c. AD 500 to AD 1000).

In addition, eight possible enclosures were identified during the review of the LiDAR data. These largely comprise circular and curvi-linear features interpreted as enclosing ditches. While these constraints could be the remains of ringforts, their interpretation is tentative and they may equally be natural features or the result of more recent disturbance.

4.2.3 Buildings and their Environs

Four possible buildings and five boundaries were identified within the study area. Seven of these correspond with buildings and plots depicted on historic Ordnance Survey mapping (6" to 1 mile, 1837 – 1842, and 25" to 1 mile, 1888-1913), such as LI_14 in Culcommon (Image 4.13). However, two (LI_08 in Cullendraugh (Image 4.12) and LI_64 in Waynestown) comprise similar constraints that are not depicted on historic mapping and therefore may be earlier in date than First Edition Ordnance Survey mapping (6" to 1 mile, 1837 – 1842). In addition, landscape features associated with houses and farms were identified such as a driveway (LI_17 in Staffordstown Little), a pond (LI_41 in Irishtown), and the former alignments of roads and trackways (LI_55 and LI_66 in Cloghran and Cushinstown respectively).

In addition, the remains of a medieval parish church and associated walled church yard (LI_43; Image 4.14) in Ward Lower were identified within the study area. LI_43 is a Recorded Monument (DU011-039001 and DU011-039002) and Protected Structure (RPS 660), and is depicted on historic Ordnance Survey mapping (1908) as 'in ruins'.

4.2.4 Mineral Extraction

A total of six quarries and gravel pits, evidencing post-medieval mineral extraction, were identified within the study area. These constraints, comprising irregular areas, largely correspond with or are located near to the location of quarries and gravel pits depicted on First Edition Ordnance Survey mapping (6" to 1 mile, 1837 – 1842) such as the gravel pits in the townlands of Priest Town (LI_37; Image 4.15) and Dunboyne (LI_68).

4.2.5 Palaeochannels

A total of six possible palaeochannels (LI_18, LI_24, LI_27 (Figure 17), LI_36, LI_58, and LI_69 (Image 4.17)) were identified within the study area. These areas may comprise locations of higher archaeological potential as watercourses were often the focus of human activity and there is the potential for votive offerings, objects apparently deposited for religious reasons, in rivers, and areas of alluvium have the potential to preserve previously unknown archaeological remains, including paleoenvironmental and organic materials.

4.2.6 Miscellaneous

A small group of possible pits (LI_20), was identified in Baytownpark. However, given the lack of diagnostic information this interpretation is tentative and these constraints may equally evidence more recent agricultural activity or be natural in origin.

5. Discussion

The review of the LiDAR data for the Proposed Development identified 71 archaeological constraints within the study area, six of which are possibly associated with known constraints (AY_23, AY_24 and AH_06 (DU011-039001, DU011-039002 and RPS 660), CH_34, DL_04 and DL_05). The interpretations of the archaeological constraints identified was informed by information gathered from the sources listed in Section 3.

Of the 71 archaeological constraints identified, 14 may be of some significance comprising:

- Eight possible enclosures (LI_31 (Image 4.2), LI_34 (Image 4.3), LI_40 (Image 4.4), LI_53 (Image 4.5), LI_54 (Image 4.6), LI_63 (Image 4.7), LI_65 (Image 4.8), and LI_71 (Image 4.9)) of unknown date and function; and
- Six possible palaeochannels in Harlockstown (LI_18), Dunboyne (LI_24), Pace (LI_27 (Image 4.16) and LI_69 (Image 4.17)), Nuttstown (LI_36), and Cloghran (LI_58).

6. References

Directives and Legislation

National Monuments Acts 1930-2004

Maps

Ordnance Survey 6", 1837 – 1842

Ordnance Survey 25", 1888-1913

Aerial Photographs

Sortie	Frame	Date	Type	Source
FSL/7196/03	3488	02 October 1971	Vertical	https://ncap.org.uk/frame/11-1-2-76-42
FSL/7196/03	3487	02 October 1971	Vertical	https://ncap.org.uk/frame/11-1-2-76-41

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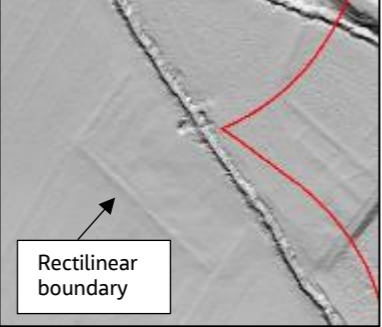
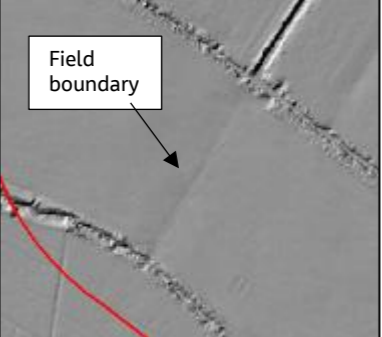
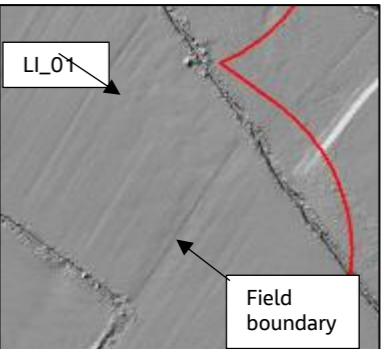
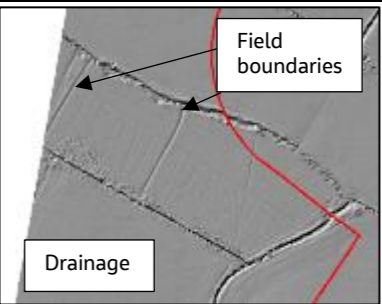
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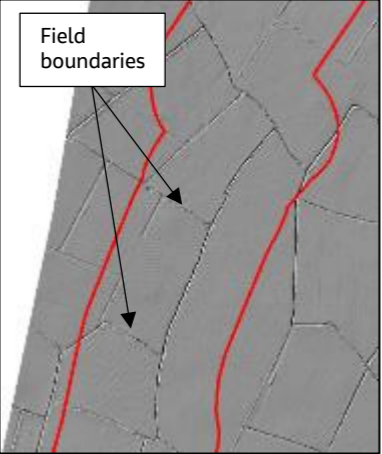
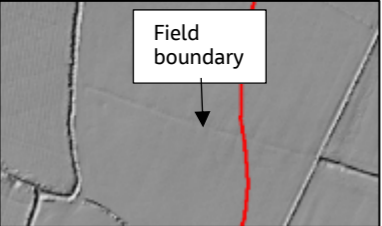
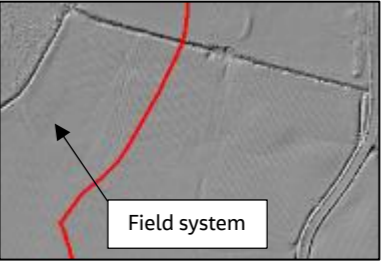
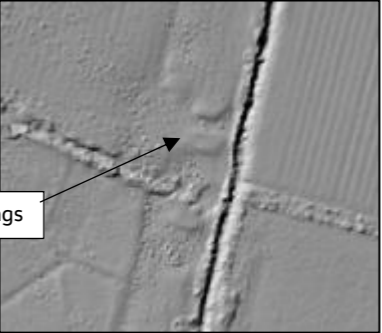
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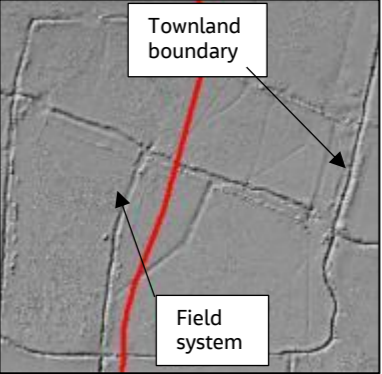
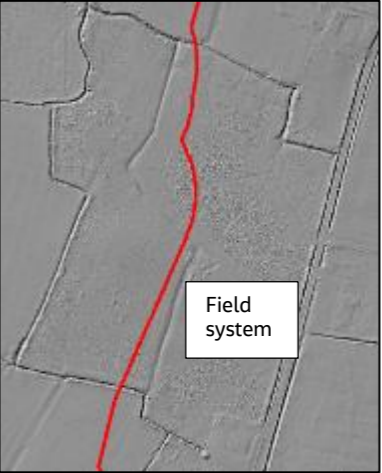
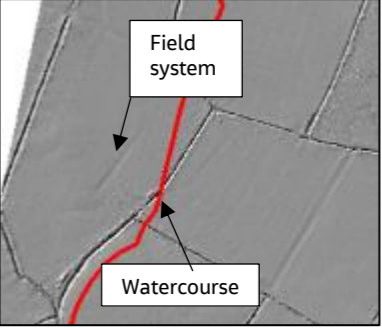
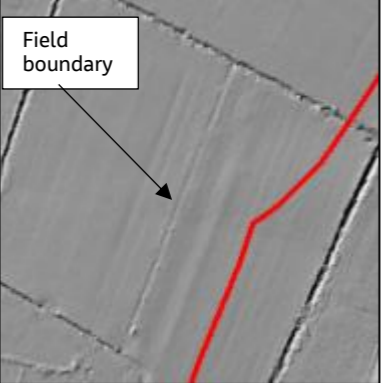
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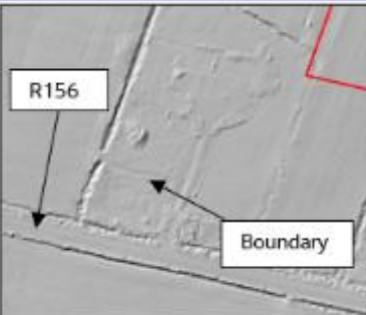
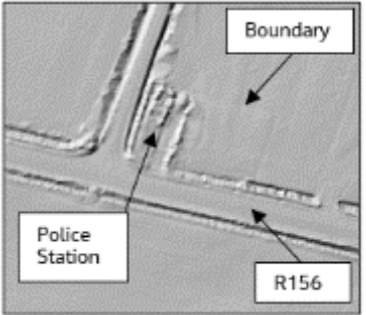

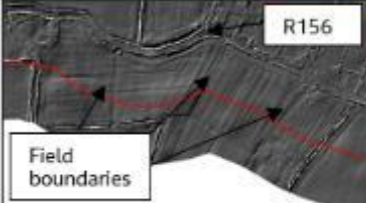
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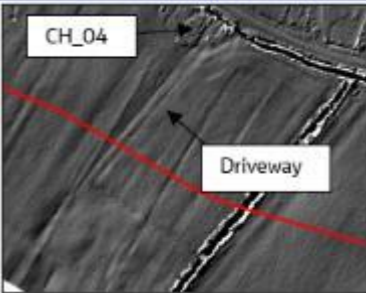
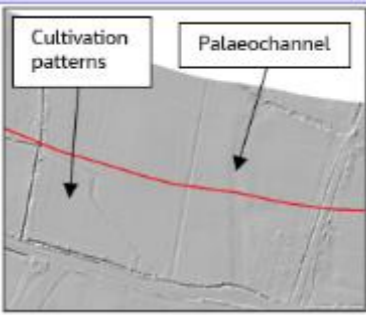
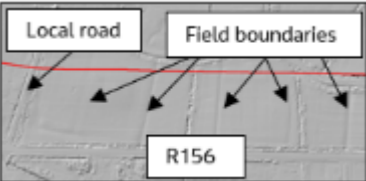
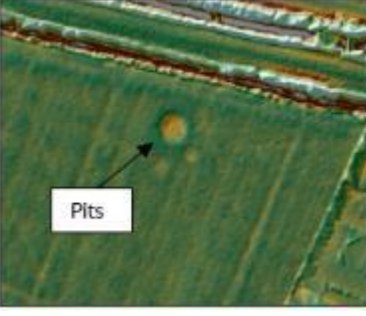
Appendix A. Inventory of Archaeological Constraints

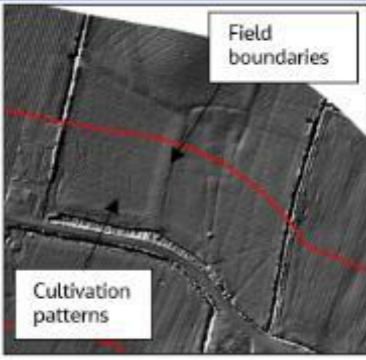
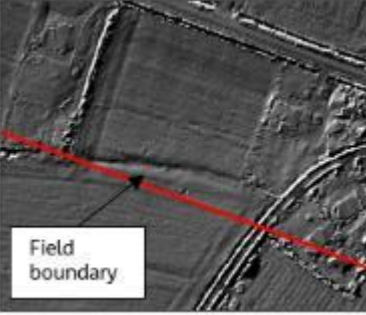
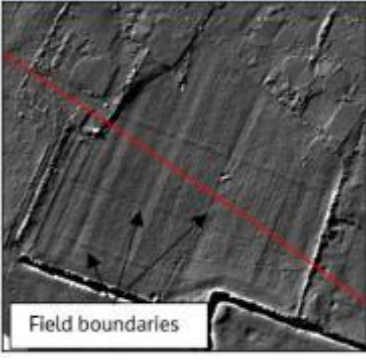
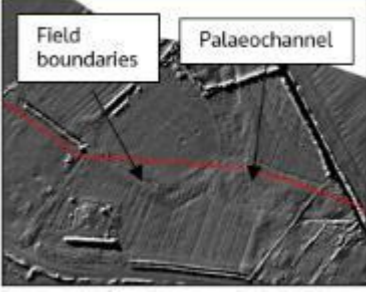
Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LI_01	694807 / 747856	Woodland	Boundary	<ul style="list-style-type: none"> - Negative linear features forming a rectilinear area, c.80m x 48m, abutting a field boundary to the north-east. Area within boundary disturbed. - Corresponds with a farmstead including a 'U'-shaped cluster of buildings within a sub-rectangular plot, depicted on historic Ordnance Survey mapping (1837, 1911). - Faintly perceptible on aerial imagery. - Interpreted as the boundary of a post-medieval farmstead. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 180° and altitude 45°.</p>
LI_02	694585 / 747832	Woodland	Field Boundary	<ul style="list-style-type: none"> - Shallow negative linear feature, c.73m in length, orientated approximately north-south abutting townland boundary (to south) and an extant field boundary to the north. - Perceptible on aerial imagery. - Corresponds with a field boundary on historic Ordnance Survey mapping (1837, 1911). - Interpreted as a post-medieval field boundary. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 35°.</p>
LI_03	694814 / 747782	Woodland	Field Boundary	<ul style="list-style-type: none"> - An ephemeral negative linear feature, c.107m in length, orientated approximately north-south abutting extant field boundaries (to north and south). - Corresponds with a field boundary on historic Ordnance Survey mapping (1837, 1911). - Associated with (LI_002). - Interpreted as a post-medieval field boundary. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 35°.</p>
LI_04	694485 / 747791	Hayestown	Field system	<ul style="list-style-type: none"> - A network of narrow negative linear features immediately to the south of a townland boundary. A number of more pronounced linear features, orientated approximately north-south, with more ephemeral linear features running perpendicular across the area. Smaller subdivisions are also apparent. - Visible on aerial imagery. - No corresponding features on historic Ordnance Survey mapping although area boundaries are depicted on historic Ordnance Survey mapping (1837, 1911). - Northern and eastern boundaries are a small watercourse (townland boundary). - Interpreted as field boundaries and field drains forming a field system of unknown date. 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 35°.</p>

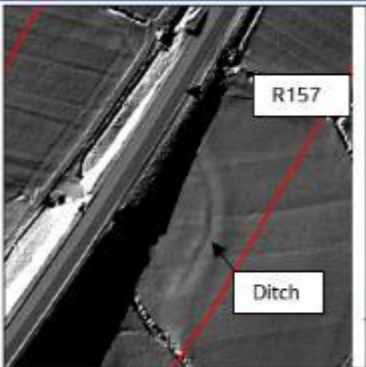
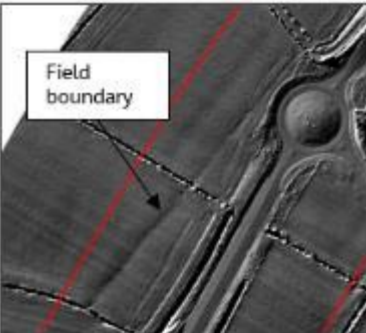
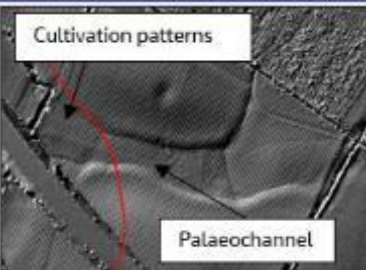
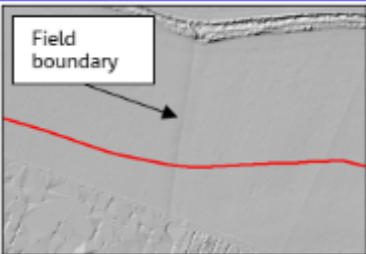
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LI_05	694445 / 747206	Gaulstown; Culcommon	Field system	<ul style="list-style-type: none"> - A network of negative linear features and cultivation patterns. - Some linear features correspond with field boundaries on historic Ordnance Survey mapping (1837, 1911). - Some field boundaries remain extant as hedgerows and others are visible as cropmarks on aerial imagery. - Interpreted as a post-medieval field system. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 35°.</p>
LI_06	694531 / 746903	Culcommon	Field Boundary	<ul style="list-style-type: none"> - An ephemeral linear feature orientated approximately east-west, measuring c.140m in length. Runs between an extant field boundary and townland boundary. - Corresponds with a field boundary on historic Ordnance Survey mapping (1837, 1911). - Interpreted as a post-medieval field boundary. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 35°.</p>
LI_07	694570 / 746304	Culcommon	Field System	<ul style="list-style-type: none"> - A network of ephemeral negative linear features, located between two townland boundaries, including a pair of north-south orientated linear features, a triangular area, and irregular southern boundary. Appear to be overlain by later uniform cultivation patterns. A number of circular features were also noted (likely the result of the wear pattern around modern animal feeding stations). - Some features correspond with historic Ordnance Survey mapping (1911). - Northern boundary is a minor watercourse. - The location of a large circular enclosure (ME050-001), identified as a 'Fort' on historic Ordnance Survey mapping, is c.600m to the south-east. - Tentatively interpreted as field boundaries and field drains forming part of a field system of pre-19th century date. Later agricultural activity is also noted. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 35°.</p>
LI_08	694329 / 746085	Cullendragh	Buildings	<ul style="list-style-type: none"> - Three positive rectangular features: 1) c.8mx6m, 2) c.9mx4m, and 3) c.12mx6m between a negative linear feature and townland boundary. - North of a possible field system (LI_015). - No corresponding features on historic Ordnance Survey mapping and not visible on aerial imagery. - Interpreted as the site of a group of buildings (likely agricultural) of unknown date. 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 35°.</p>

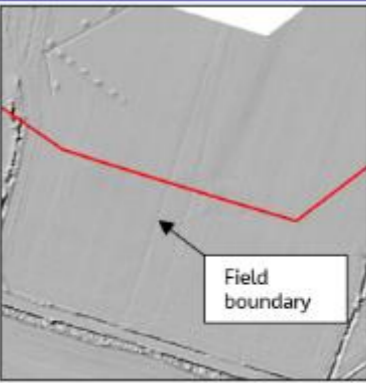
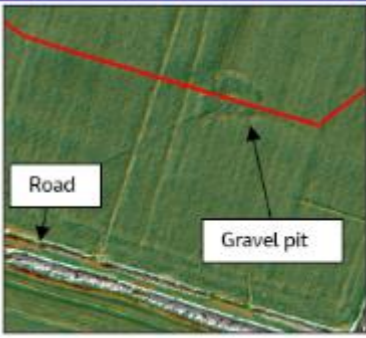
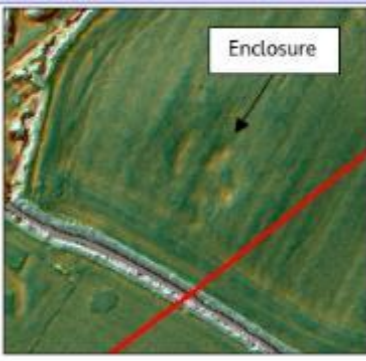
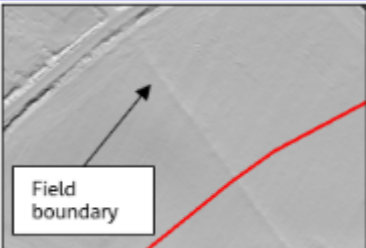
Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LI_09	694186 / 746004	Cullendragh	Field System	<ul style="list-style-type: none"> - A network of negative linear features between two existing field boundaries and a townland boundary. Majority orientated approximately north-south (including one parallel to townland boundary); however, some run perpendicular forming small irregular enclosures. - Possible associated buildings to the north (LI_014). - No corresponding features on historic Ordnance Survey mapping, although the area outline is depicted on historic Ordnance Survey mapping (1911). - Interpreted as a field system of unknown date. 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 35°.</p>
LI_10	694403 / 745767	Culcommon	Field System	<ul style="list-style-type: none"> - A network of negative linear features, forming irregular fields within a larger area. - Linear features to the south correspond with field boundaries depicted on historic Ordnance Survey mapping (1837). Only triangular area of trees depicted on later Ordnance Survey mapping (1911). - Some linear features perceptible on aerial imagery as well as triangular area of trees. - Interpreted as part of a post-medieval field system. 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 35°.</p>
LI_11	694096 / 745609	Cullendragh	Field system	<ul style="list-style-type: none"> - A network of negative linear features and cultivation patterns. Some parallel and evenly spaced straight features. - Some linear features correspond with field boundaries on historic Ordnance Survey mapping. - Vaguely perceptible on aerial imagery. - Minor watercourse runs through the centre. - Interpreted as a field system of unknown date, including field drainage. 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 35°.</p>
LI_12	694223 / 745325	Cullendragh	Field Boundary	<ul style="list-style-type: none"> - A negative linear feature, orientated approximately north-south, running between two extant field boundaries, c. 124m in length. - Corresponds with a field boundary on later Ordnance Survey mapping (1911). - Aerial imagery shows a small number of trees along this alignment. - Interpreted as a post-medieval field boundary. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 35°.</p>

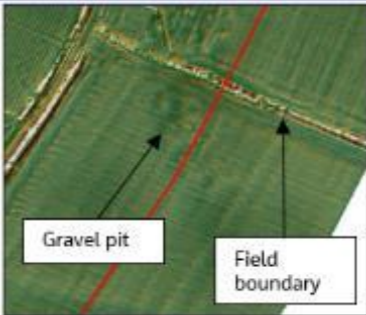
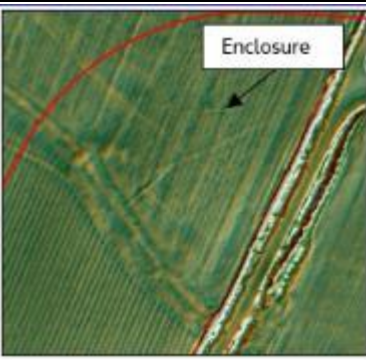
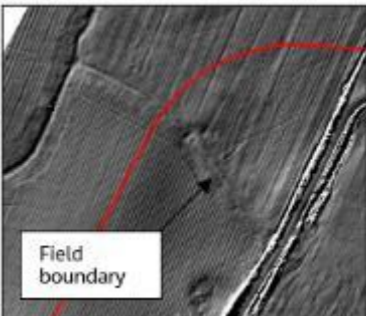

Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LL_13	694123 / 745200	Culcommon	Boundary	<ul style="list-style-type: none"> - A linear feature measuring approximately 39m in length, running roughly east-west. - Vaguely perceptible on aerial imagery (GoogleEarth, 03/2022) in a private garden to the north of the R156. - Possibly the remains of a former boundary feature depicted on historic Ordnance Survey mapping (1837, 1911) surrounding a small group of roadside buildings. 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 45°.</p>
LL_14	694356 / 745131	Culcommon	Police Station	<ul style="list-style-type: none"> - A rectangular feature measuring approximately 12m by 6m set back from the R156, with a larger former boundary feature also noted. - Visible on aerial imagery (GoogleEarth, various) as an overgrown rectangular area at the junction between the R156 and a local road. - Corresponds with the location of a building set back from the road on historic Ordnance Survey mapping, including First Edition 6" (1837) which identifies the building as a 'Police Station'. 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 45°.</p>
LL_15	695646 / 744405	Blackhall Big	Boundary	<ul style="list-style-type: none"> - An ephemeral sub-rectangular feature measuring approximately 32m in with to the south of the R156. Other linear features were noted adjacent to the feature. - Not visible on aerial imagery. - A small group of roadside buildings and a boundary feature are depicted on historic Ordnance Survey mapping in this location (1837). The buildings and boundaries are not depicted on later mapping (1911). - Interpreted as a post-medieval boundary. 	-	Medium	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LL_16	696120 / 744277	Staffordstown Little	Field system	<ul style="list-style-type: none"> - A network of linear features, defining a large area, with some ephemeral linear features within. - Visible on aerial imagery (GoogleEarth 03/2022) to the south of the R156. - Correspond with field boundaries depicted on historic Ordnance Survey mapping (1837, 1911). - Interpreted as former field boundaries forming part of a post-medieval field system. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>


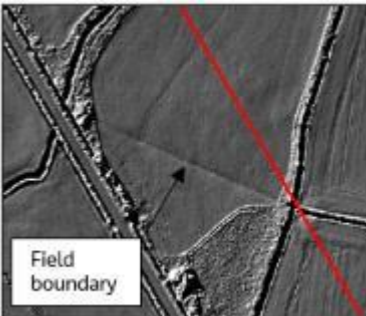
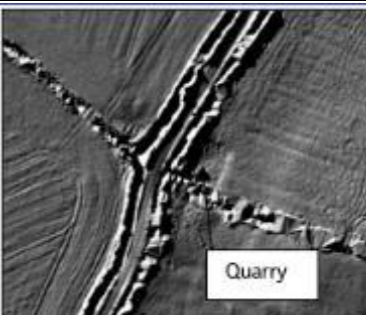
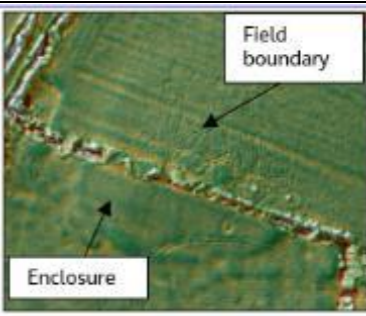
Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LI_17	696327 / 744186	Staffordstown Little	Driveway	<ul style="list-style-type: none"> - A pair of ephemeral parallel linear features, orientated roughly north-south running from a roadside building (CH_04) to the south. - Visible on aerial imagery (GoogleEarth, 03/2022). - Corresponds with a driveway leading to a pair of rectangular buildings (located outside the Study Area; no longer extant) depicted on historic Ordnance Survey mapping (1837), and later mapping depicts the driveway connected to the roadside building plot (1911). 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_18	696942 / 744183	Hartlockstown	Field system / palaeochannel	<ul style="list-style-type: none"> - A network of linear features, including two orientated north-south (extending outside the Study Area) with cultivation patterns and possible drainage. A wide (approximately 12m) channel, orientated north-south was also identified as a possible palaeochannel. - Not depicted on historic Ordnance Survey mapping. - Visible on aerial imagery. - Interpreted as a possible field boundaries forming a field system of unknown date. 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 45°.</p>
LI_19	697281 / 744100	Hartlockstown	Field boundaries	<ul style="list-style-type: none"> - Five negative linear features orientated north-south, running between a local road to the R156. - Visible on aerial imagery (GoogleEarth, various). - Some of the linear features correspond with field boundaries depicted on historic Ordnance Survey mapping (1837, 1911). - Interpreted as post-medieval former field boundaries. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 45°.</p>
LI_20	698650 / 743467	Baytownpark	Pit	<ul style="list-style-type: none"> - A circular feature measuring approximately 7m in diameter, with two small circular features adjacent (c.3m in diameter each). - Visible on aerial imagery (GoogleEarth, 10/2009, 06/2020, 04/2021). - No corresponding features on historic Ordnance Survey mapping. - Tentatively interpreted as a possible pits of unknown date; however, equally could be the location of a modern animal feeder. 	-	Low	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>

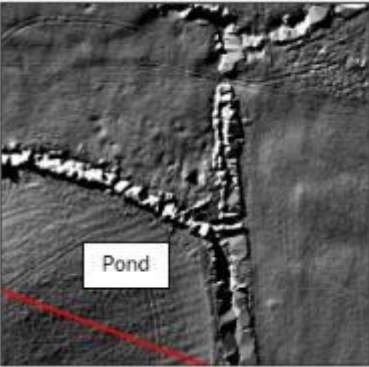
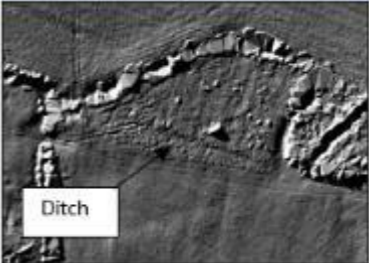


Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LI_21	698953 / 743499	Baytownpark	Field system	<ul style="list-style-type: none"> - A network of linear features forming a series of possible fields, including cultivation patterns. Drainage (likely later in date) was also noted. - No corresponding features are depicted on historic Ordnance Survey mapping. - Visible on aerial imagery (GoogleEarth, 03/2022). - Interpreted as a possible field system of unknown date. 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_22	699510 / 743064	Cushinstown	Field Boundary	<ul style="list-style-type: none"> - A linear feature measuring approximately 100m in length, orientated east-west. - Visible on aerial imagery (GoogleEarth, various). - Corresponds with a former field boundary depicted on historic Ordnance Survey mapping (1843, 1911). 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_23	699979 / 742741	Colliersland North	Field boundary	<ul style="list-style-type: none"> - A series of linear features, oriented east-west, and one roughly north-south, within an agricultural field. - Not depicted on historic Ordnance Survey mapping. - Visible on aerial imagery. - Interpreted as former field boundaries of unknown date (possibly modern). 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_24	700255 / 742872	Dunboyne	Field system / palaeochannel	<ul style="list-style-type: none"> - A series of linear features forming fields, with cultivation patterning, and a wide (approximately 23m) channel. - Not depicted on historic Ordnance Survey mapping. - Visible on aerial imagery. - Interpreted as possible field system of unknown date and possible palaeochannel. 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>

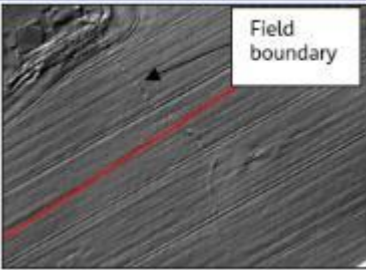
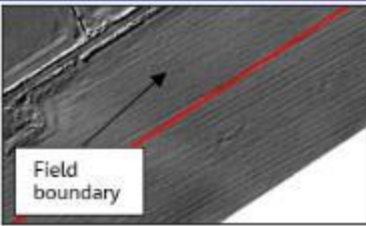
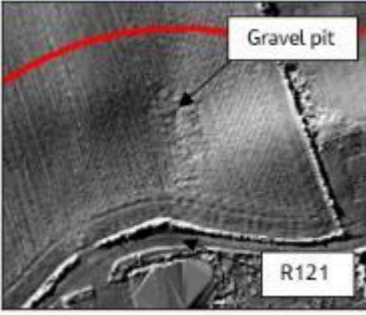

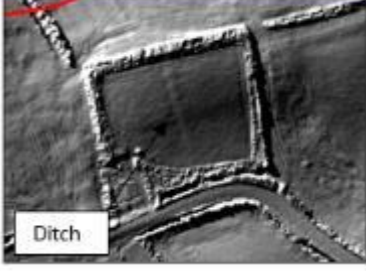
Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LI_25	701300 / 743510	Dunboyne	Ditch	<ul style="list-style-type: none"> - A curvi-linear feature measuring approximately 118m in length, extends from south-north before turning west - possibly truncated by the R157 (may continue in fields to the north). - Vaguely perceptible on aerial imagery (GoogleEarth, 01/2017, 03/2021). - No corresponding features are depicted on historic Ordnance Survey mapping (1837, 1911). - Tentatively interpreted as a possible ditch of unknown date and function. 	-	Low	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_26	701312 / 743773	Bennettstown	Field boundary	<ul style="list-style-type: none"> - A linear feature measuring approximately 276m in length and orientated rough north-south between two extant field boundaries. - A field boundary is depicted on historic Ordnance Survey mapping in this location. - Visible on aerial imagery. - Interpreted as a post-medieval former field boundary. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_27	701933 / 744352	Pace	Palaeochannel	<ul style="list-style-type: none"> - A curvilinear channel measuring up to approximately 50m in width. Cultivation patterns noted overlying the feature. - Located near a late bronze age site (http://excavations.ie/report/2005/Meath/0014235/) and a circular feature is located outside Study Area on a more elevated location near channel which may evidence early human activity. - Visible on aerial imagery. - Not depicted on historic Ordnance Survey mapping. - Field known as 'Slang' and 'Big Field'. Three Archaeological sites (one minor, second thought to be a site for butchering and skinning near the stream, third - old farmhouse brick, cobbled yard, small sheds mid 1700's). Pace - pass or route between soft ground via glacial ridges, long before field ditches were dug. See field 20 for notes on laneway. The lake here is more of a pond. (Meath Field Names Project, 2019). - Located near a channel of alluvium (Geological Survey of Ireland, n.d.) - Tentatively interpreted as a possible palaeochannel (possibly a former tributary of the River Tolka). 	-	Low	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_28	702086 / 744592	Pace	Field boundary	<ul style="list-style-type: none"> - A linear feature measuring approximately 157m (extending outside the Study Area) and orientated north-south in an agricultural field to the south of the L5026. - Field known as 'Burns Field' (Meath Field Names Project, 2019). - Visible on aerial imagery. - Corresponds with a field boundary depicted on historic Ordnance Survey mapping (1837). - Interpreted as a section of former field boundary. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 45°.</p>

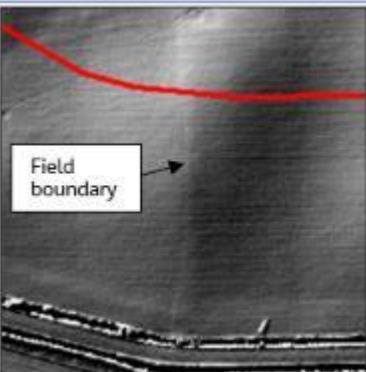
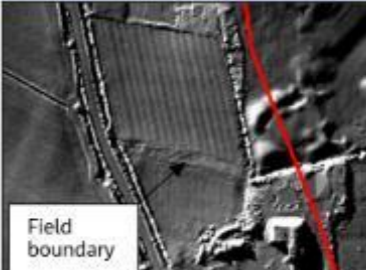


Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LI_29	703060 / 744617	Stokestown	Field boundary	<ul style="list-style-type: none"> - A linear feature measuring approximately 198m in length (extends outside the Study Area), orientated north-south, extending from the road to an extant field boundary. - Visible on aerial imagery (GoogleEarth, 01/2017). - Field known as 'Daisy Field' (Meath Field Names Project, 2019). - Corresponds with a former field boundary depicted on later historic Ordnance Survey mapping (1911). 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 45°.</p>
LI_30	703082 / 744602	Stokestown	Gravel pit	<ul style="list-style-type: none"> - An irregular area measuring approximately 32m across, with narrow linear features running from it. Located in a pasture field to the north of the road through Stokestown. - Not depicted on historic Ordnance Survey mapping. - Field known as 'Daisy Field' (Meath Field Names Project, 2019). - Visible on aerial imagery. - Tentatively interpreted as a possible gravel pit of unknown date; however, could equally be the result of modern disturbance or drainage. 	-	Low	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_31	703318 / 744520	Kinoristown	Enclosure	<ul style="list-style-type: none"> - An ephemeral circular area approximately 30m in diameter, defined by a portion of sub-circular enclosing ditch to the south and west with possible interior features. - Not depicted on historic mapping (1837, 1911). - Field known as 'Pillar Field' (Meath Field Names Project, 2019). - Visible on aerial imagery as a circular feature within a pasture field adjacent to the road (e.g. GoogleEarth, 06/2020). - Tentatively interpreted as a possible enclosure of unknown date. 	-	Low	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_32	703386 / 744557	Kinoristown	Field boundary	<ul style="list-style-type: none"> - A linear feature measuring approximately 147m in length orientated roughly north-west to south-east. - Visible on aerial imagery (GoogleEarth, various). - Field known as 'Pillar Field' (Meath Field Names Project, 2019). - Corresponds with a former field boundary depicted on historic Ordnance Survey mapping (1837), with later mapping showing the feature as a drainage ditch. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 180° and altitude 45°.</p>

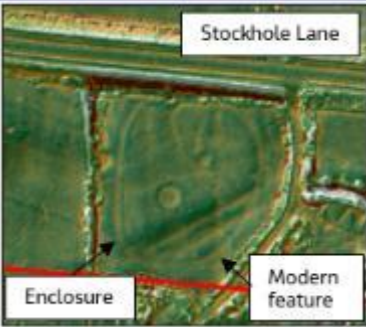
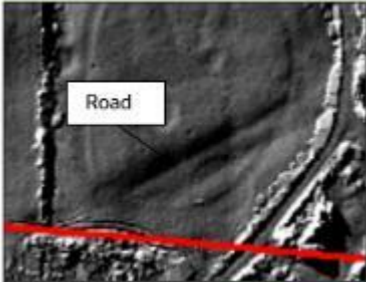
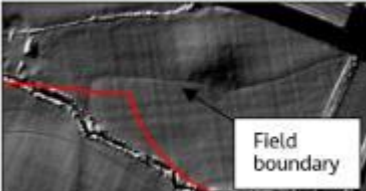
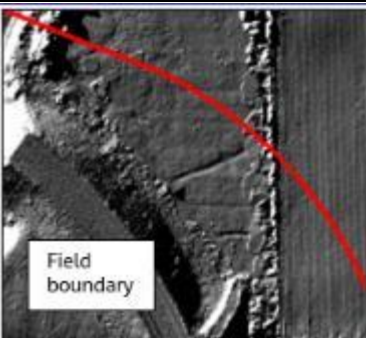
Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LI_33	703647 / 744789	Kinoristown	Gravel pit	<ul style="list-style-type: none"> - A large irregular area measuring approximately 90m across located in an agricultural field adjacent to an extant field boundary. - Vaguely perceptible on aerial imagery. - Extractive activity is depicted in this location on historic Ordnance Survey mapping (1911). 	-	High	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_34	703612 / 745032	Stokestown	Enclosure	<ul style="list-style-type: none"> - A curvi-linear feature measuring approximately 41m in diameter. Truncated by a later drainage ditch. - Vaguely perceptible on aerial imagery. - Not depicted on historic Ordnance Survey mapping. - Tentatively interpreted as part of a circular enclosure; however, could equally be modern disturbance. 	-	Low	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_35	703570 / 745029	Stokestown	Field boundary	<ul style="list-style-type: none"> - A curvi-linear feature measuring approximately 164m in length (extends beyond the Study Area). Cultivation patterns and ephemeral linear features running parallel interpreted as drainage were also noted. - Visible on aerial imagery (GoogleEarth, various). - Corresponds with a field boundary depicted on historic Ordnance Survey mapping (1837, 1911). 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_36	704173 / 745029	Nuttstown	Palaeochannel	<ul style="list-style-type: none"> - A meandering linear feature located in a pasture field to the north of an extant watercourse (Pinkeen River). - Not depicted on historic Ordnance Survey mapping; however located in an area adjacent to the current channel of the Pinkeen River. - Located near a channel of alluvium (Geological Survey of Ireland, n.d.). - Visible on aerial imagery. - Tentatively interpreted as a possible palaeochannel, or river terrace, associated with the Pinkeen River. 	-	Low	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>


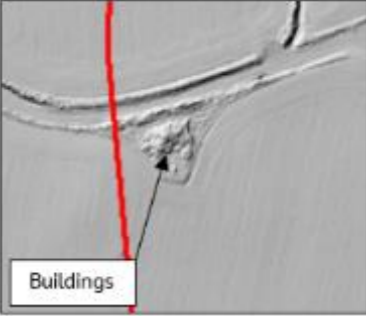
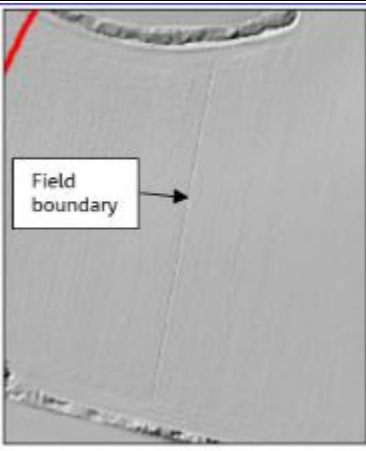
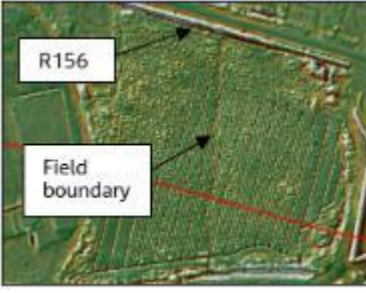
Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LI_37	705675 / 745507	Priest Town	Gravel pit	<ul style="list-style-type: none"> - An irregular area on a localised mound within an area of established woodland. - The area is depicted as woodland, 'Crockanee', on historic Ordnance Survey mapping on the southern boundary of the Priest Town House demesne (DL_04). A track is shown into the woodland from the road to the south. To the north-east, an area of woodland is the location of a gravel pit. Later mapping shows this area as mixed woodland. - Not visible on aerial imagery. - Located adjacent to the Ward River, in an area of till derived from limestones. - Interpreted as a possible post-medieval gravel pit. 	DL_04	Medium	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_38	707407 / 744527	Court	Field boundary	<ul style="list-style-type: none"> - A linear feature measuring approximately 134m in length and orientated roughly north-west to south-east. - Visible on aerial imagery located within a small irregular field between a watercourse and an extant field boundary. - Corresponds with a former field boundary depicted on historic Ordnance Survey mapping (1843, 1908). 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_39	708436 / 743900	Irishtown	Quarry	<ul style="list-style-type: none"> - A small rectangular area measuring approximately 16m by 12m to the east of a local road. - Not depicted on historic Ordnance Survey mapping; however, located opposite a quarry identified on earlier editions (1843). - Vaguely perceptible on aerial imagery as a small area of disturbance in the corner of a pasture field. - Tentatively interpreted as a possible quarry of unknown date; however, could equally be modern disturbance. 	-	Low	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_40	708484 / 743851	Irishtown	Enclosure	<ul style="list-style-type: none"> - A curved feature measuring approximately 88m in diameter, located in an agricultural field with an extant field boundary running across it from west-east and track. Comprises a raised interior with a sub-circular enclosing ditch (continuing into the field to the north, north-eastern portion not perceptible) and very ephemeral interior bank. A circular wear pattern around a modern animal feeder is also visible within the enclosure. - Not depicted on historic Ordnance Survey mapping. - Vaguely perceptible on aerial imagery (GoogleEarth, 01/2017, 02/2021). - Tentatively interpreted as a possible large enclosure of unknown date; however could equally be a natural rise or modern disturbance. 	-	Low	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>

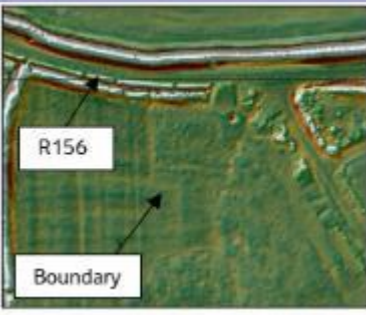


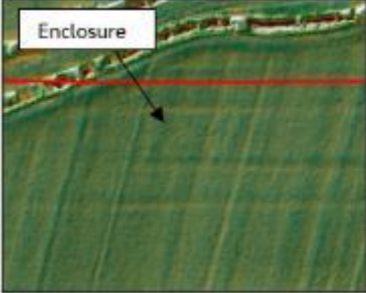
Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LI_41	708541 / 743797	Irishtown	Designed Landscape Feature	<ul style="list-style-type: none"> - A irregular area measuring approximately 15m across. - Not visible on aerial imagery. - Corresponds with the location on a 'pond' within the Hollywoodrath demesne (DL_05) depicted on historic Ordnance Survey mapping (1843, 1909). - Interpreted as an infilled pond; however, could equally be modern disturbance. 	DL_05	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_42	708615 / 743823	Spicklestown	Ditch	<ul style="list-style-type: none"> - A linear feature measuring approximately 60m in length orientated roughly east-west within an area of trees. A number of extant drainage ditches are located in this area. - No corresponding feature is depicted on historic Ordnance Survey mapping; however, an area of woodland is depicted on later editions. - Not visible on aerial imagery. - Tentatively interpreted as a ditch of unknown date. 	DL_05	Low	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_43	709651 / 744836	Ward Lower	Church	<ul style="list-style-type: none"> - A sub-circular area, truncated by the R121 to the south-east, measuring approximately 60m by 45m across. Includes a church building (in ruins) and monuments laid out in rows across the church yard. - Depicted on historic Ordnance Survey mapping as 'Church' and 'Grave Yd.', with the church identified as 'in ruins' on later editions. - Visible on aerial imagery. 	AY_23, AY_24, AH_06 (DU011-039001, DU011-039002 and RPS 660)	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_44	710297 / 745265	Ward Lower	Buildings	<ul style="list-style-type: none"> - A rectangular feature measuring approximately 14m by 18m located in the corner of an agricultural field adjacent to the R121. - Two buildings and a number of boundary features are depicted in this location on historic Ordnance Survey mapping (1843); however, these are no longer shown on later editions (1908). - Vaguely perceptible on aerial imagery. - Tentatively interpreted as the site of two demolished post-medieval buildings; however, could equally likely be modern disturbance. 	-	Low	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>


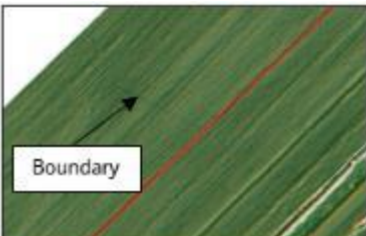
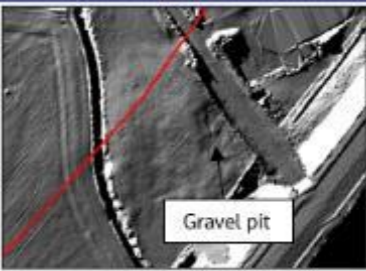
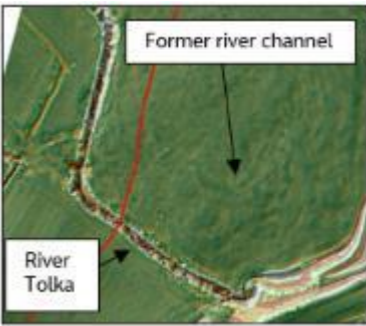
Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LI_45	710545 / 745302	Newpark	Field boundary	<ul style="list-style-type: none"> - An irregular linear feature orientated roughly north-south, measuring approximately 110m (extends outside the Study Area). - Visible on aerial imagery. - Corresponds with a field boundary depicted on historic Ordnance Survey mapping. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_46	710680 / 745350	Newpark	Field boundary	<ul style="list-style-type: none"> - An irregular linear feature orientated roughly north-south, measuring approximately >195m (extends outside the Study Area and extent of LiDAR data coverage). - Visible on aerial imagery. - Corresponds with a field boundary depicted on historic Ordnance Survey mapping. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_47	711033 / 745741	Newpark	Gravel pit	<ul style="list-style-type: none"> - An irregular area measuring approximately 60m across located in an agricultural field to the north of the R121. - No corresponding features on historic Ordnance Survey mapping; however, areas of extraction are depicted on later editions (1908) to the north-east. - Located in an area identified as 'gravels' (Geological Survey of Ireland, n.d.). - Interpreted as a possible gravel pit of unknown date. 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_48	711649 / 745855	Shallon	Field boundary	<ul style="list-style-type: none"> - A curvi-linear feature measuring approximately 70m in length, extending from the Ward River (to the north) before curving to the east. - Depicted on historic Ordnance Survey mapping bounding an area of trees. - Visible on aerial imagery. - Interpreted as a former post-medieval field boundary. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_49	711925 / 745900	Corrstown	Ditch	<ul style="list-style-type: none"> - A very ephemeral negative linear feature with possible bank, measuring approximately 46m in length, and orientated roughly north-south. - No corresponding features are depicted on historic Ordnance Survey mapping. - Faintly perceptible on aerial photography. - Tentatively interpreted as a possible bank and ditch of unknown date. 	-	Low	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>



Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LI_50	712144 / 745847	Corrstown	Field boundary	<ul style="list-style-type: none"> - A linear feature that extends outside the Study Area, measuring approximately 122m before turning east and north. - Visible on aerial imagery (GoogleEarth, 05/2017). - Corresponds with a field boundary depicted on historic Ordnance Survey mapping (1843; 1908). 	-	High	 <p>Field boundary</p> <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_51	712584 / 745451	Skephubble	Field boundary	<ul style="list-style-type: none"> - A curvi-linear feature measuring approximately 78m in length extending between two extant field boundaries. - Visible on aerial imagery. - Corresponds with a field boundary on historic Ordnance Survey mapping (1843), and later editions depicted the feature as a ditch (1908). The boundary has been removed by the last edition (1941). 	-	High	 <p>Field boundary</p> <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_52	715306 / 744689	Forest Great	Ringfort	<ul style="list-style-type: none"> - A circular feature measuring approximately 80m in diameter, truncated by a roundabout on the R108. - Corresponds with a ringfort identified on the RMP (AY_41; DU011-043). - The 'fort' is depicted on historic Ordnance Survey mapping (1843, 1908). - This feature is also visible on aerial imagery (GoogleEarth, various; https://ncap.org.uk/frame/11-1-2-76-41, https://ncap.org.uk/frame/11-1-2-76-42). 	AY_41 (DU011-043)	High	 <p>Ringfort</p> <p>R108</p> <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_53	715459 / 744655	Forest Great	Enclosure	<ul style="list-style-type: none"> - A sub-circular area of rough ground measuring approximately 30m across south of Naul Road. A possible section of bank is located to the north and west. Appears to have been truncated to the south. - Not depicted on historic Ordnance Survey mapping. - Visible on aerial imagery (and Google Street View) as a slightly raised area of rough ground. - Tentatively interpreted as a possible enclosure of unknown date and function. 	-	Low	 <p>Bank</p> <p>Naul Road</p> <p>Enclosure</p> <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>

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LI_54	718228 / 743875	Cloghran	Enclosure	<ul style="list-style-type: none"> - A group of features including a large sub-circular enclosing feature measuring approximately 76m by 64m and a circular feature measuring approximately 10m in diameter, in a pasture field to the south of Stockhole Lane. A more recent circular feature is also located to the south-east overlying the enclosing feature. - Visible on aerial imagery. - Not depicted on historic Ordnance Survey mapping. - Tentatively interpreted as a possible large enclosure with internal feature; however, could equally be a modern animal exercising arena and associated disturbance. 	-	Low	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_55	718232 / 743855	Cloghran	Road	<ul style="list-style-type: none"> - A linear feature measuring approximately 80m in length running through an agricultural field from an extant driveway to an area of rough ground. - The alignment of the road is depicted in this location on historic Ordnance Survey mapping (1843) in this location through Glebe House and farm. The alignment of the road is depicted as straightened on later mapping (1909). - Visible on aerial imagery. - Interpreted as the former alignment of the road. 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_56	718467 / 743815	Cloghran	Field boundary	<ul style="list-style-type: none"> - A linear feature measuring approximately 230m located within an agricultural field to the south of Stockhole Lane and west of the M1 motorway. Cultivation patterns and possible disturbance was also noted. - Visible on aerial imagery. - Corresponds with a former field drain depicted on historic Ordnance Survey mapping (1843). 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_57	718741 / 743816	Cloghran	Field boundary	<ul style="list-style-type: none"> - A linear feature measuring approximately 40m located within an area of rough ground to the east of the M1 motorway. Appears to be a continuation of LI_084. - Visible on aerial imagery. - Corresponds with a former field drain depicted on historic Ordnance Survey mapping (1843). 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>

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LI_58	719099 / 743483	Cloghran	Paleochannel	<ul style="list-style-type: none"> - A 43m wide channel located within a narrow pasture field north of a watercourse. - Visible on aerial imagery. - Not depicted on historic Ordnance Survey mapping; however, a stream is depicted on later editions (1909) as a field boundary. - Tentatively interpreted as a possible palaeochannel or river terraces. 	-	Low	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_59	718989 / 742342	Middleton	Farm	<ul style="list-style-type: none"> - An irregular area of disturbance to the south of the road measuring approximately 45m by 33m. - Visible as an overgrown area adjacent to the road on aerial imagery. - 'Upper Middleton' farm (CH_34) is depicted in this location on historic Ordnance Survey mapping (1843); however, is reduced to one building (1909) on later editions. - Interpreted as the location of Upper Middle farm buildings. 	CH_34	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 45°.</p>
LI_60	719034 / 742029	Clonshaugh	Field boundary	<ul style="list-style-type: none"> - A narrow linear feature measuring approximately 150m in length and orientated north-south located within an agricultural field, running between two extant field boundaries. - Visible on aerial imagery (GoogleEarth, 06/2018). - Corresponds with a field boundary depicted on historic Ordnance Survey mapping (1837; 1911). 	-	High	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 45°.</p>
LI_61	694594 / 744981	Lynaghstown	Field boundary	<ul style="list-style-type: none"> - A linear feature measuring approximately 118m in length and orientated north-south located within a field currently in use for plantation, south of the R156. - Visible on aerial imagery. - Corresponds with a field boundary depicted on historic Ordnance Survey mapping (1837; 1911). 	-	High	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>

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LI_62	695757 / 744397	Blackhall Big	Boundary	<ul style="list-style-type: none"> - A negative rectangular feature measuring approximately 31m by 28m located within a field, south of the R156. - Faintly perceptible on aerial imagery (GoogleEarth, 10/2009, 05/2017). - Corresponds with a boundary depicted on historic Ordnance Survey mapping (1837; 1911). 	-	High	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_63	696778 / 744130	Harlockstown	Enclosure	<ul style="list-style-type: none"> - A negative rectangular feature measuring approximately 18m by 10m located within a field, north of the R156. Two adjoining linear features are visible extending from the corners of the enclosure suggesting it may be part of a larger complex. - Visible on aerial imagery. - No corresponding features on historic Ordnance Survey mapping. - Tentatively interpreted as a small rectangular enclosure of unknown date. 	-	Low	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_64	697200 / 743953	Waynestown	Building	<ul style="list-style-type: none"> - A small sub-rectangular feature, orientated roughly north-south, measuring approximately 14m by 5m. - Vaguely perceptible on aerial imagery (GoogleEarth, 06/2018). - No corresponding features on historic Ordnance Survey mapping. - Tentatively interpreted as a possible building of unknown date; however, could equally be modern disturbance. 	-	Low	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_65	697728 / 744108	Vesingtown	Enclosure	<ul style="list-style-type: none"> - An ephemeral circular feature measuring approximately 17m in diameter, located within an agricultural field to the north of the R156. - Not visible on aerial imagery. - No corresponding features on historic Ordnance Survey mapping. - Tentatively interpreted as a possible enclosure of unknown date. 	-	Low	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>

Unique Reference Number	Easting / Northing	Townland	Site Type	Summary Description	Constraint Reference Number (if applicable)	Confidence Rating	Figure
LI_66	699779 / 743165	Cushinstown	Track	<ul style="list-style-type: none"> - A pair of parallel linear features measuring approximately 180m in length, orientated roughly north-south located within an agricultural field. - Visible on aerial imagery. - No corresponding features on historic Ordnance Survey mapping. - Interpreted as a possible track of unknown date. 	-	Medium	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_67	700753 / 743052	Dunboyne	Boundary	<ul style="list-style-type: none"> - A pair of parallel linear features measuring approximately >185m in length (extending outside the Study Area), orientated roughly north-west to south-east located within an agricultural field. - Field known as 'Weld Fields / Wild Fields' (Meath Field Names Project, 2019). - Visible on aerial imagery. - Correspond with a boundary feature on historic Ordnance Survey mapping (1837), with later mapping showing the boundary as a belt of trees (1911). 	-	High	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_68	701057 / 743391	Dunboyne	Gravel pit	<ul style="list-style-type: none"> - An irregular area measuring approximately 16m across located in an area of rough ground south of Kennedy Road. - A possible gravel pit is depicted on historic Ordnance Survey mapping (1837, 1911). - Interpreted as a possible post-medieval gravel pit. 	-	Medium	 <p>Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_69	701568 / 744101	Pace	Palaeochannel	<ul style="list-style-type: none"> - A narrow sinuous curvi-linear feature within an area of rough ground north-east of the River Tolka. - Not visible on aerial imagery. - Located within an area of alluvium (Geological Survey of Ireland, n.d.). - The meandering course of the river is depicted on historic Ordnance Survey mapping (1837), then later shown as straightened (1911) with the former channel still depicted. - Interpreted as the former channel of the River Tolka. 	-	High	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>

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LI_70	708628 / 743753	Spicklestown	Ditch	<ul style="list-style-type: none"> - A negative curvi-linear feature measuring approximately 103m in length, within an agricultural field in DL_05. - Visible on aerial imagery. - No corresponding features on historic Ordnance Survey mapping. - Tentatively interpreted as a possible ditch of unknown date. 	-	Low	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>
LI_71	712750 / 745244	Ballystrahan	Enclosure	<ul style="list-style-type: none"> - A circular area with possible enclosing ditch to north-east. Measuring approximately 27m in diameter, within an agricultural field. - Not visible on aerial imagery. - No corresponding features on historic Ordnance Survey mapping. - Tentatively interpreted as a possible enclosure of unknown date. 	-	Low	 <p>Simple Local Relief Model (50% transparency) over Single Direction Hillshade Model: DTM azimuth 315° and altitude 10°.</p>