

APPENDIX 13.1 SUMMARY OF RELEVANT LEGISLATION, STANDARDS, AND GUIDELINES

National Monuments Legislation (1930-2004)

The National Monument Act, 1930 (as amended) provides the formal legal mechanism to protect monuments in Ireland. Protection of a monument is provided via:

- Record of Monuments and Places (RMP);
- National Monument in the ownership or guardianship of the Minister for Arts, Heritage, Regional, Rural & Gaeltacht Affairs or a Local Authority;
- National Monument subject to a Preservation Order (or temporary Preservation Order);
- Register of Historic Monuments (RHM).

The definition of a monument is specified as:

any artificial or partly artificial building, structure or erection or group of such buildings, structures or erections;

any artificial cave, stone or natural product, whether forming part of the ground, that has been artificially carved, sculptured or worked upon or which (where it does not form part of the place where it is) appears to have been purposely put or arranged in position;

any, or any part of any, prehistoric or ancient tomb, grave or burial deposit, or (ii) ritual, industrial or habitation site; and

any place comprising the remains or traces of any such building, structure or erection, any cave, stone or natural product or any such tomb, grave, burial deposit or ritual, industrial or habitation site.

Under Section 14 of the Principal Act (1930):

It shall be unlawful...

to demolish or remove wholly or in part or to dislodge, deface, alter, or in any manner injure or interfere with any such national monument without or otherwise than in accordance with the consent hereinafter mentioned (a licence issued by the Office of Public Works National Monuments Branch),

or

to excavate, dig, plough or otherwise disturb the ground within, around, or in the proximity to any such national monument without or otherwise than in accordance...

Under Amendment to Section 23 of the Principal Act (1930):

A person who finds an archaeological object shall, within four days after the finding, make a report of it to a member of the Garda Síochána...or the Director of the National Museum...

The latter is of relevance to any finds made during a watching brief.

In the 1994 Amendment of Section 12 of the Principal Act (1930), all the sites and 'places' recorded by the Sites and Monuments Record of the Office of Public Works are provided with a new status in law. This new status provides a level of protection to the listed sites that is equivalent to that accorded to 'registered' sites [Section 8(1), National Monuments Amendment Act 1954] as follows:

The Commissioners shall establish and maintain a record of monuments and places where they believe there are monuments and the record shall be comprised of a list of monuments and such places and a map or maps showing each monument and such place in respect of each county in the State.

The Commissioners shall cause to be exhibited in a prescribed manner in each county the list and map or maps of the county drawn up and publish in a prescribed manner information about when and where the lists and maps may be consulted.

In addition, when the owner or occupier (not being the Commissioners) of a monument or place which has been recorded, or any person proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such monument or place, he shall give notice in writing of his proposal to carry out the work to the Commissioners and shall not, except in the case of urgent necessity and with the consent of the Commissioners, commence the work for a period of two months after having given the notice.

The National Monuments Amendment Act enacted in 2004 provides clarification in relation to the division of responsibilities between the Minister of Environment, Heritage and Local Government, Finance and Arts, Sports and Tourism together with the Commissioners of Public Works. The Minister of Environment, Heritage and Local Government will issue directions relating to archaeological works and will be advised by the National Monuments Section and the National Museum of Ireland. The Act gives discretion to the Minister of Environment, Heritage and Local Government to grant consent or issue directions in relation to road developments (Section 49 and 51) approved by An Bord Pleanála and/or in relation to the discovery of National Monuments.

14A. (1) The consent of the Minister under section 14 of this Act and any further consent or licence under any other provision of the National Monuments Acts 1930 to 2004 shall not be required where the works involved are connected with an approved road development.

14A. (2) Any works of an archaeological nature that are carried out in respect of an approved road development shall be carried out in accordance with the directions of the Minister, which directions shall be issued following consultation by the minister with the Director of the National Museum of Ireland.

Subsection 14A (4) Where a national monument has been discovered to which subsection (3) of this section relates, then the road authority carrying out the road development shall report the discovery to the Minister subject to subsection (7) of this section, and pending any directions by the Minister under paragraph (d) of this subsection, no works which would interfere with the monument shall be carried out, except works urgently required to secure its preservation carried out in accordance with such measures as may be specified by the Minister.

The Minister will consult with the Director of the National Museum of Ireland for a period not longer than 14 days before issuing further directions in relation to the national monument.

The Minister will not be restricted to archaeological considerations alone, but will also consider the wider public interest.

Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999

This Act provides for the establishment of a national inventory of architectural heritage and historic monuments.

Section 1 of the act defines “architectural heritage” as:

- (a) all structures and buildings together with their settings and attendant grounds, fixtures and fittings,
- (b) groups of such structures and buildings, and,
- (c) sites

which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

Section 2 of the Act states that the Minister (for Arts, Heritage, Gaeltacht and the Islands) shall establish the NIAH, determining its form and content, defining the categories of architectural heritage, and specifying to which category each entry belongs. The information contained within the inventory will be made available to planning authorities, having regard to the security and privacy of both property and persons involved.

Section 3 of the Act states that the Minister may appoint officers, who may in turn request access to premises listed in the inventory from the occupiers of these buildings. The officer is required to inform the occupier of the building why entry is necessary, and in the event of a refusal, can apply for a warrant to enter the premises.

Section 4 of the Act states that obstruction of an officer or a refusal to comply with requirements of entry will result in the owner or occupier being guilty of an offence.

Section 5 of the Act states that sanitary authorities who carry out works on a monument covered by this Act will as far as possible preserve the monument with the proviso that its condition is not a danger to any person or property, and that the sanitation authority will inform the Minister that the works have been carried out.

The provisions in the Act are in addition to and not a substitution for provisions of the National Monument Act (1930–94), and the protection of monuments in the National Monuments Act is extended to the monuments covered by the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act (1999).

Standards and Guidelines

The following legislation, standards and guidelines were consulted:

- National Monuments (Amendments) Acts, 1930-2014;

- The Planning and Development Act 2000, as amended;
- Heritage Act, 1995;
- The UNESCO World Heritage Convention, 1972;
- ICOMOS Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas, 2005;
- Council of Europe Convention for the Protection of the Architectural Heritage of Europe (Granada) 1985, ratified by Ireland in 1991;
- Council of Europe European Convention on the Protection of the Archaeological Heritage (Valletta) 1992, ratified by Ireland in 1997;
- The Burra Charter, the Australia ICOMOS Charter for Places of Cultural Significance 2013;
- The European Landscape Convention (ELC), ratified by Ireland 2002 European Landscapes Convention 2010. (The Department of the Environment, Heritage and Local Government 'Landscape and Landscape Assessment Guidelines' have been in draft form since 2000, however the Draft National Landscape Strategy (NLS) was launched in July 2014);
- Guidance on Heritage Impact Assessments for Cultural World Heritage Properties – A publication of the International Council on Monuments and Sites, January 2011;
- Guidelines on the information to be contained in Environmental Impact Statements, 2002, EPA;
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2003, EPA;
- EPA: Draft Revised Guidelines on The Information to be Contained in Environmental Impact Statements, September 2015;
- EPA: Advice Notes for Preparing Environmental Impact Statements, Draft, September 2015;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht and Islands;
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Planning and Development Act 2000;
- Code of Practice between the National Roads Authority (NRA) and the Minister for Arts, Heritage and the Gaeltacht, June 2000;
- Guidelines for the Assessment of Architectural Heritage Impact of National Road Schemes, 2006, NRA;
- Guidelines for the Assessment of Archaeological Heritage Impact of National Road Schemes, 2006, NRA;
- Guidelines for the Testing and Mitigation of the Wetland Archaeological Heritage for National Road Schemes, 2006, NRA; and
- National Landscape Strategy for Ireland 2015-2025, Department of Arts, Heritage and the Gaeltacht.
- Historic England (July 2015), Historic Environment Good Practice Advice in Planning, Note 3: The Setting of Heritage Assets;
- Historic Scotland (October 2010), Managing Change in the Historic Environment;
- The Heritage Council (2010), Proposals for Irelands Landscapes; and International Council on Monuments and Sites (2011), Guidance on Heritage Impact Assessments for Cultural World Heritage Properties.

APPENDIX 13.2 SUMMARY OF RECORDED ARCHAEOLOGICAL SITES AND FINDS WITHIN 1KM OF PROPOSED DEVELOPMENT SITE

RMP / SMR sites within 1km of proposed development lands

RMP:	WX006-060
Class:	Enclosure
Townland:	Kilnahue
Description:	From Michael Moore's RMP file notes (uploaded 2012); Marked only on the 1940 ed. of the OS 6-inch map where it is described as 'Tumulus', and situated towards the bottom of a north facing slope in the valley of a southeast/northwest stream that joins the north/ south River Lask c. 750m to the northwest, and close to its source. It is also in full view of Kilnahue House, c. 70m to the west This is a circular overgrown area (diameter 8m) with some trees defined by a low earthen bank (Wth 1.5-1.6m; int. H 0.6m; ext. H 0.7m) with an external stone facing. There is an entrance (Wth 1.5m) at S. Kilnahue church (WX007-061001) is c. 100m to the southeast. It may be a landscape feature.
Refs:	'Archaeological Inventory of County Wexford' (Dublin: Stationery Office, 1996).
Distance:	600m to the northwest of the boundary of the proposed development.
RMP:	WX006-061001
Class:	Church
Townland:	Kilnahue
Description:	From Michael Moore's RMP file notes (uploaded 2012); Situated towards the bottom of a north-facing slope in the valley of a southwest/ northeast stream that joins the north/ south River Lask c. 750m to the northwest, and close to its source. This is the parish church of Kilnahue within an oval graveyard (dimensions. 50m east/ west; 44m north/ south) defined by stone-revetted earthen bank. The overgrown remains of a stone building oriented east/ west (dimensions. 20m east/ west; 6.5m north/ south) but with no architectural features are at the centre of the graveyard. There is a cross-base lying loose just north of the church. This is an irregularly-shaped, flat-topped stone (dimensions. 0.8m x 0.4m; H 0.4m) with a rectangular mortice (dims. 0.26m; x 0.1m; D 0.1m). Souterrain (WX006-061004) is outside the graveyard, c. 25m N of the church, and enclosure (WX006-060) is c. 100m to the west. The above description is derived from the published 'Archaeological Inventory of County Wexford' (Dublin: Stationery Office, 1996). In certain instances the entries have been revised and updated in the light of recent research.
Refs:	'Archaeological Inventory of County Wexford' (Dublin: Stationery Office, 1996).
Distance:	600m to the northwest of the boundary of the proposed development.
RMP:	WX006-061002
Class:	Graveyard
Townland:	Kilnahue
Description:	From Michael Moore's RMP file notes (uploaded 2012); Situated towards the bottom of a north-facing slope in the valley of a southeast/ northwest stream that joins the north/ south River Lask c. 750m to the northwest, and close to its source. The parish church of Kilnahue (WX006-061001-) is within an oval graveyard (dimensions 50m east/ west; 44m north/ south) defined by a stone-revetted earthen bank. There is a cross-base (WX006-061003-), lying loose just north of the church. Souterrain (WX006-061004-) is outside the graveyard, c. 25m north of the church.
Refs:	'Archaeological Inventory of County Wexford' (Dublin: Stationery Office, 1996).
Distance:	600m to the northwest of the boundary of the proposed development.
RMP:	WX006-061003
Class:	Cross
Townland:	Kilnahue
Description:	From Michael Moore's RMP file notes (uploaded 2012); River Lask c. 750m to the northwest, and close to its source. The parish church of Kilnahue (WX006-061001) is within an oval graveyard (WX007-061002) defined by stone-revetted earthen bank. There is a cross-base, an irregularly-shaped, flat-topped stone (dimensions. 0.8m x 0.4m; height 0.4m) with a rectangular mortice (dimensions. 0.26m; x 0.1m; depth 0.1m) lying loose just north of the church, and souterrain (WX006-061004) is outside the graveyard, c. 25m north.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT - APPENDICES

Kilnahue & Gorey Hill, Carnev Road & Kilnahue Lane, Gorey, Co. Wexford

Refs:	'Archaeological Inventory of County Wexford' (Dublin: Stationery Office, 1996).
Distance:	600m to the northwest of the boundary of the proposed development.
RMP:	WX006-061004
Class:	Souterrain
Townland:	Kilnahue
Description:	From Michael Moore's RMP file notes (uploaded 2012); River Lask c. 750m to the northwest, and close to its source. The collapsed chamber of a souterrain with drystone walling is c. 10m outside the graveyard (WX006-061002) of Kilnahue parish church (WX006-061001) at north. Corbelling was visible in an opening (diameter 1m).
Refs:	'Archaeological Inventory of County Wexford' (Dublin: Stationery Office, 1996).
Distance:	600m to the northwest of the boundary of the proposed development.
RMP:	WX006-062
Class:	Ritual site – holy well
Townland:	Kilnahue
Description:	From Michael Moore's RMP file notes (uploaded 2012) - located in a natural hollow towards the bottom of a southeast facing slope, with a slight hill rising c. 400m to the southeast. The holy well known as Toberchrist - Christ's Well - had a pattern on St. John's Eve, the 28th June, until c. 1820, according to John O'Donovan writing c. 1840 (O'Flanagan 1933, 13). This is a natural spring and the source of a stream that runs off to the south, but there is no evidence of veneration.
Refs:	(O'Flanagan 1933, 13).
Distance:	20m to the east of the boundary of the proposed development.
RMP:	WX006-090
Class:	Designed Landscape
Townland:	Creagh Upper
Description:	From Michael Moore's RMP file notes (uploaded 2012); Description: Located on the summit of Creagh Hill, which is a designed landscape. A small copse (diameter. c. 60m) is depicted on the 1839 and later eds of the OS 6-inch map. This is separated by a berm (Wth c. 15m) from a surrounding field bank that connects to a north northeast/ south southwest passage spanning the hill. This in turn connects to a path between field banks (Wth c. 20-30m) call ed 'The Sweep Walk' around the base of the hill. At the summit of the hill an arcing section (c. 80m) of the outer bank survives as a field bank (Wth c. 1m; H c. 1.5m) and hedge west southwest/ north northeast.
Distance:	150m to the north of the proposed development.
RMP:	WX006-093
Class:	Burnt mound
Townland:	Goreyhill
Description:	From Michael Moore's RMP file notes (uploaded 2012); Description: Situated towards the head of a southwest/ northeast valley. Archaeological testing (08E0415) uncovered two small areas of burnt mound material (diam. 0.6m; 1.2m) located 2m apart. (O'Hara 2008; 20011)
Refs:	O'Hara, R. 2008 Archaeological assessment. Gorey Hill, Gorey. Unpublished report. Archaeological Consultancy Services. O'Hara, R. 2011 Gorey Hill. Burnt mound spreads. In I. Bennett. Excavations 2008: summary accounts of archaeological excavations in Ireland, P 373, No. 1283. Wordwell, Dublin.
Distance:	220m to the west of the proposed development.

Stray finds from the topographical files of the National Museum of Ireland

Townland	NMI reg. no.	Description	Distance
Gorey	10990:32, IA/68/474/09	Fragments of an "old Irish Urn" / earthenware vessel, found in an unspecified location near Gorey in 1887. The fragments were presented to the museum by A. A Wyatt, Templenew, Belleck, Co. Fermanagh. It contained a unique Irish herringbone design of the middle Bronze Age period (1,900BC- 900BC).	Unspecified location, at least 700m.
Gorey	2268:W29	Stone lamp with a concave base. Was very well formed, measured 5inches across and 2 3/8inches high, was hollowed on both sides, and was noted to have an urn-like shape. Donated to NMI.	Unspecified location, at least 700m.

APPENDIX 13.3 ASSESSMENT METHODOLOGY

1. Glossary of Impacts

Potential impacts on the receiving archaeological and cultural heritage environment can be described as direct physical impacts, indirect physical impacts, and impacts on setting (i.e. the surroundings in which an archaeological/cultural heritage asset can be experienced; Historic England 2017).

Direct physical impacts are those development activities that directly cause damage to the fabric of an archaeological/cultural heritage asset. Typically, these activities are related to construction works; e.g. they could include excavation of foundations, earthmoving/site preparation creation of access roads, cycle paths, and the excavation of service trenches.

Indirect physical impacts are those processes, triggered by development activity, that lead to the degradation of archaeological/cultural heritage assets.

Impacts on the setting of archaeological/cultural heritage assets describe how the presence of a development changes the surroundings of an asset in such a way that it affects (positively or negatively) the heritage significance of that asset. Visual impacts are most commonly encountered. Such impacts may be encountered at all stages in the life cycle of a development, but they are only likely to be considered significant during the prolonged operational life of the development.

Types of impact, as defined by the Draft EPA Guidelines on Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2017):

- *Cumulative Impact* - The addition of many small impacts to create one larger, more significant, impact.
- *Do Nothing Impact* - The environment as it would be in the future should no development of any kind be carried out.
- *Indeterminable Impact* - When the full consequences of a change in the environment cannot be described.
- *Irreversible Impact* - When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
- *Residual Impact* - The degree of environmental change that will occur after the proposed mitigation measures have taken impact.
- *'Worst case' Impact* - The impacts arising from a development in the case where mitigation measures substantially fail.
- *Indirect or Secondary Impacts* - Impacts that arise off-site or are caused by other parties that are not under the control of the developer. Impacts which are caused by the interaction of impacts, or by associated or off-site projects.

Quality of Impacts

Impacts on the archaeological and cultural heritage environment are assessed in terms of their quality, i.e. positive, negative, neutral:

- Negative Impact: A change that will detract from or permanently remove an archaeological monument / cultural heritage asset from the landscape;
- Neutral Impact: A change that does not affect archaeological and cultural heritage heritage; and
- Positive Impact: A change that improves or enhances the setting of an archaeological / cultural heritage asset.

Duration of Impacts

The duration of an impact can be as follows:

Temporary Impact	Impact lasting for one year or less;
Short-term Impacts	Impact lasting one to seven years;
Medium-term Impact	Impact lasting seven to fifteen years;
Long-term Impact	Impact lasting fifteen to sixty years; and
Permanent Impact	Impact lasting over sixty years.

2. Assessment of Impacts

Introduction

This assessment methodology has regard to the EPA assessment criteria (EPA 2017) and to the National Roads Authority (NRA) Guidelines for the Assessment of Archaeological Heritage Impact of National Road Schemes (hereafter referred to as the NRA Guidelines) (NRA 2005).

Archaeological and cultural heritage sites are a non-renewable resource and such assets are generally considered to be location sensitive. In this context, any change to their environment, such as construction activity and ground disturbance works, could adversely affect these sites.

Significance / Sensitivity Criteria

In accordance with EPA Guidelines (EPA 2017), the context, character, significance and sensitivity of each archaeological / cultural heritage asset requires evaluation, and the significance of the impact is then determined by considering the significance / sensitivity of the asset and the predicted magnitude of the impact.

In accordance with the NRA Guidelines (NRA 2005), the significance criteria used to evaluate an archaeological site, monument or complex take into account the character and integrity of the asset and any available data regarding it. This can be ascertained by looking at the following criteria cited in the NRA Guidelines (NRA 2005): the existing status (level of protection), condition or preservation, documentation or historical significance, group value, rarity, visibility in the landscape, fragility or vulnerability, and amenity value (Table 1). While these criteria contribute to the significance of a feature they should not be treated as definitive. These criteria are indicators which contribute to a wider judgement based on the individual circumstances of these archaeological/cultural heritage assets.

Table 1. Explanation of Archaeology and Cultural Heritage Asset Assessment Criteria

Criteria	Explanation
Existing Status	The level of protection associated with an archaeological / cultural heritage asset is an important consideration.
Condition/ Preservation/ Integrity	The survival of an archaeological / cultural heritage asset’s archaeological potential both above and below ground is an important consideration and should be assessed in relation to its present condition and surviving features. Well-preserved sites should be highlighted, this assessment can only be based on a field inspection.
Documentation / Data	The significance of a an archaeological / cultural heritage asset may be enhanced by the existence of records of previous investigations or contemporary documentation supported by written evidence or historic maps. Sites with a definite historical association or an example of a notable event or person should be highlighted.
Group Value/ Character	The value of a single an archaeological / cultural heritage asset may be greatly enhanced by its association with related contemporary monuments or with monuments from different periods indicating an extended time presence in any specific area. In some cases it may be preferable to protect the complete group, including associated and adjacent land, rather than to protect isolated monuments within that group.
Rarity/ Character	The rarity of some an archaeological / cultural heritage asset types can be a central factor affecting response strategies for development, whatever the condition of the individual feature. It is important to recognise sites that have a limited distribution.
Visibility in the landscape/ Character/ Integrity	Archaeological / cultural heritage assets that are highly visible in the landscape have a heightened physical presence. The inter-visibility between monuments may also be explored in this category.
Fragility/ Vulnerability/ Integrity	It is important to assess the level of threat to an archaeological / cultural heritage asset from erosion, natural degradation, agricultural activity, land clearance, neglect, careless treatment or development.
Amenity Value / Character	Regard should be taken of the existing and potential amenity value of a an archaeological / cultural heritage asset.

An evaluation of the significance / sensitivity of archaeological / cultural heritage assets is based on their designation and on the extent to which these assets contribute to the archaeological or cultural heritage environment, though their individual or group qualities, either directly or potentially. Table 2 presents the scale of significance / sensitivity together with criteria. It has been compiled by Courtney Deery Heritage Consultancy Ltd, based on standard authorities and guidelines as listed in Section 12.2.1 of this chapter. Undesignated archaeological or cultural heritage sites can be assigned a low, medium or high sensitivity value, taking into consideration the criteria cited in Table 1 (e.g. condition, character, integrity or preservation, data, group value, rarity, visibility in the landscape, fragility or vulnerability, and amenity value).

Table 2: Significance / Sensitivity Criteria

Sensitivity/ Significance	Criteria
High	Sites of international significance: World Heritage Sites. National Monuments. Protected Structures (assessed by the NIAH to be of international and national importance), where these are also National Monuments. Undesignated archaeological and cultural heritage sites.
Medium	Recorded Monuments (RMP sites & SMR sites scheduled for inclusion in the next revision of the RMP) Protected Structures / NIAH sites (assessed by the NIAH to be of regional importance), where these are also Recorded Monuments. Newly identified archaeological sites, confirmed through archaeological investigation, to be added to the SMR Undesignated archaeological and cultural heritage sites.
Low	Industrial heritage sites and National Inventory of Architectural Heritage (NIAH) sites for which there are no upstanding remains or where they are of local significance only. Undisturbed greenfield areas and riverine environs, which have an inherent archaeological potential. Undesignated archaeological and cultural heritage sites.
Negligible	Assets with very little or no surviving archaeological and / or cultural heritage interest.

National Monument

The National Monuments Act (1930, Section 2) defines a ‘National Monument’ as

‘a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto’.

The National Monuments legislation legally protects access to and the visual amenity associated with National Monuments and requires consent from the Minister for invasive works in their vicinity.

The defences / town walls of medieval Dublin are a National Monument in accordance with national policy on town defences (Department of Environment, Heritage and Local Government 2008).

Recorded Monuments

The primary source of information for archaeology is the Record of Monuments and Places (RMP) maintained by the Department of Housing, Local Government and Heritage (DHLGH). The RMP documents known upstanding archaeological monuments, their original location (in cases of destroyed monuments) and the position of possible sites in rural areas identified as cropmarks on vertical aerial photographs dating to before 1700 AD (with some later ones also being included). It is

based on a comprehensive range of published and publicly available documentary and cartographic sources.

For the purpose of the assessment, the Sites and Monument Record (SMR) data and mapping as updated by the Archaeological Survey of Ireland (www.archaeology.ie) was examined so it could be used within an interactive identification and mapping system developed for Proposed Project.

Zones of Archaeological Potential

Zones of archaeological potential (ZAP) can be defined as areas within the urban and rural landscape that possess the potential to contain archaeological remains due to the settlement history of a place and or to the presence of topographical features such as rivers, lakes and high, defensible ground.

Non-Designated Sites

Newly identified archaeological sites that have been confirmed through archaeological investigation (monitoring, testing, excavation, geophysical survey) are considered to be of medium importance. Such sites are undesignated as they have yet to be added to the SMR.

Potential or undesignated archaeological sites identified through aerial photography, historic mapping, stray finds are considered to be of low sensitivity, as they have yet to be ground-truthed through archaeological investigation. Similarly, undisturbed greenfield areas and riverine environs, which have an inherent but as yet unproven archaeological potential are considered to be of low sensitivity.

Magnitude of Impact

When assessing the impact magnitude, the following criteria need to be considered:

Extent – size, scale and spatial distributions of the impact;

Duration – period of time over which the impact will occur;

Frequency – how often the impact will occur; and

Context – how will the extent, duration and frequency contrast with the accepted baseline conditions (see Table 1)

Table 3: Magnitude of Impact Criteria

Impact Magnitude	Criteria
High	These impacts arise where an archaeological / cultural heritage asset is completely and irreversibly destroyed by a proposed development. A change such that the value of the asset is totally altered or destroyed, leading to a complete loss of character, integrity and data about the site.
Medium	An impact which, by its magnitude, duration or intensity alters an important / significant aspect of the environment. An impact like this would be where an archaeological / cultural heritage asset would be impacted upon leading to a significant loss of character, integrity and data about the site.

Impact Magnitude	Criteria
	<p>Or an impact which by its magnitude results in the partial loss of a historic structure (including fabric loss or alteration) or grounds including the part removal of buildings or features or part removal of demesne land (e.g. severance, visual intrusion or degradation of setting and amenity).</p> <p>A permanent positive impact that enhances or restores the character and / or setting of a cultural heritage site or upstanding archaeological heritage site in a clearly noticeable manner.</p>
Low	<p>A low impact arises where a change to the site is proposed which though noticeable is not such that the archaeological / cultural heritage character / integrity of the site is significantly compromised, and where there is no significant loss of data about the site.</p> <p>A positive impact that results in partial enhancement of the character and / or setting of a cultural heritage site or upstanding archaeological heritage site in the medium to long-term.</p>
Negligible	<p>An impact which causes very minor changes in the character of the environment and does not directly impact an archaeological / cultural heritage asset, or affect the appreciation or significance of the asset. There would be very minor changes to the character and integrity of the asset and no loss of data about the site.</p>

Significance of Impact

The Draft EPA Revised Guidelines on the Information to be Contained in Environmental Impact Statements (EIS) (EPA 2015) added the two additional levels of significance of impact: Very Significant and Not Significant (Table 4 and Image 1).

Table 4: Significance of Impacts (EPA 2015)

Significance of Impact	Description
Very Significant	An impact which by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment, for example in this case a monument
Not Significant	An impact which causes noticeable changes in the character of the environment but without noticeable consequences.

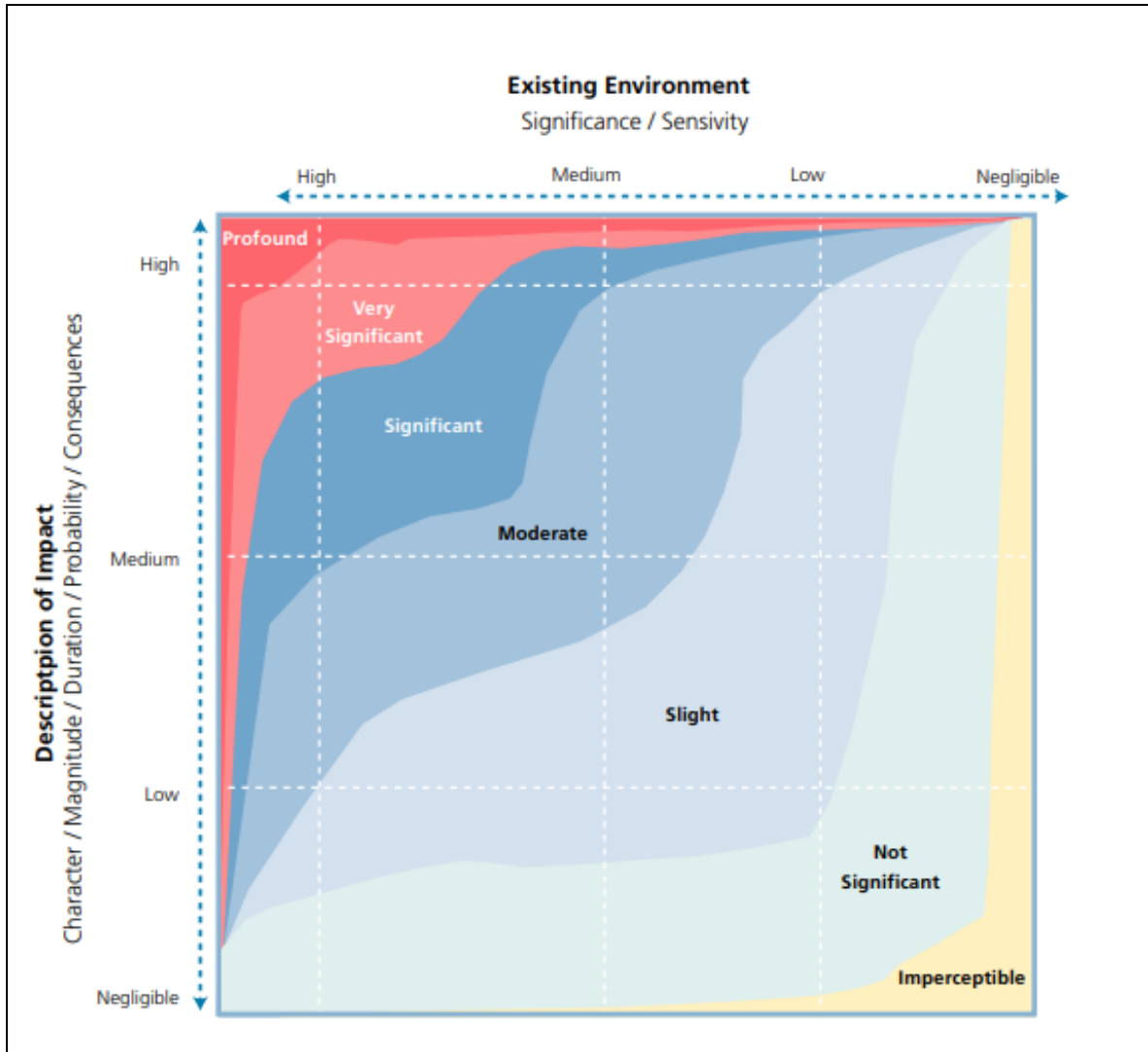


Image 1: Image 3.5 Description of Impacts from the Draft EPA Revised Guidelines on Information to be Contained in EIS (EPA 2015)

The likely significance of impacts is determined by considering the baseline rating or sensitivity value of the asset upon which the impact has an impact and the magnitude of the impact (Image 1). The impact significance is defined as Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant, or Profound (Table 5).

Table 5: Defining Significance of Impacts

Impact	Definition
Imperceptible	An impact capable of measurement but without noticeable consequences.
Not Significant	An impact which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An impact which causes minor changes in the character of the environment and does not affect an archaeological / cultural heritage asset in a moderate or significant manner.
Moderate	A moderate impact arises where a change to the site is proposed which though noticeable, does not lead to a significant loss of character, integrity and data about the archaeological / cultural heritage asset.

Impact	Definition
Significant	An impact which, by its magnitude, duration or intensity, alters an important aspect of the environment. An impact like this would be where part or all of a site would be permanently impacted upon, leading to a significant loss of character, integrity and data about the archaeological / cultural heritage asset.
Very Significant	An impact which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound	Applies where mitigation would be unlikely to remove adverse impacts. Reserved for adverse, negative impacts only. These impacts arise where an archaeological / cultural heritage asset is completely and irreversibly destroyed by a proposed development.

APPENDIX 13.4 GEOPHYSICAL SURVEY REPORT (NICHOLLS 2018)

Geophysical Survey Report
**Lands at Kilnahue,
Gorey,
Co. Wexford**

Detection License
18R0031

Client
Gerard Gannon Properties

Date
May 2018

Project
TAG1800IE14



TARGET REPORT 1800IE14

LANDS AT KILNAHUE, GOREY, CO. WEXFORD

PROJECT BACKGROUND

Geophysical survey was undertaken in Kilnahue townland, on the south-western outskirts of Gorey town (County Wexford), in connection with proposed residential development of lands situated between Kilnahue Lane to the N and the R725 Carnew Road to the S/SE. The site of proposed development lies 1.65km SW of Gorey Town centre, and extends over a total 15ha of land comprising 4 adjacent arable and pasture fields. A total 13.2ha of high resolution magnetic gradiometer survey was conducted examining all available lands within the site boundary.

This survey was commissioned by Gerard Gannon Properties. The survey objective was to identify the location, form and extent of buried archaeological remains, where present within the site boundary, and to advise further archaeological works in connection with the proposed development.

ITM Coordinate	713541 659353
Townland	Kilnahue
County	County Wexford
Landuse	Mixed arable and pasture land
Landscape, soils geology	SE facing arable and pasture land occupied by fine loamy soils of the Clonroche association (1100a) overlying drift with siliceous stones. Bedrock comprises green, red-purple, buff and occasionally grey slates, usually interbanded with siltstones (Irish National Soils Map, 1:250,000k, V1b, 2014; Geological Survey Ireland Spatial Resources, Public Data Viewer Series).
Archaeology	No recorded monuments and places (RMPs) are situated within the proposed development. However, RMP WX006-062 (ritual site – holy well), lies just beyond the site boundary to the N-NE. Details relating to WX006-062 and further RMPs located within a 0.75km radius of the site boundary are provided below:

SMR NO.	CLASS	TOWNLAND	ITM COORDINATES
WX006-060----	Enclosure	Kilnahue	712810, 659854
WX006-061001-	Church	Kilnahue	712894, 659781
WX006-061002-	Graveyard	Kilnahue	712895, 659775
WX006-061003-	Cross	Kilnahue	712895, 659775
WX006-061004-	Souterrain	Kilnahue	712878, 659812
WX006-062----	Ritual site - holy well	Kilnahue	713746, 659462
WX006-090----	Designed landscape feature	Creagh Upper	713647, 660104
WX006-093----	Burnt mound	Goreyhill	713956, 659393

Fieldwork	4th-5th May 2018
Report issue	15th May 2018
Author	John Nicholls MSc
Detection license	18R0031
Client	Gerard Gannon Properties
Archaeologists	Courtney Deery Heritage Consultancy Ltd.
Technique	High resolution magnetic gradiometry

1 TECHNICAL SURVEY INFORMATION

1.1 Survey methodology

1.1.1 High resolution magnetic gradiometer survey was conducted across all available lands situated within the site boundary, undertaking a total 13.2ha of survey in 4 areas (M1-M4). The survey employed an advanced multichannel fluxgate gradiometer system combined with survey grade GPS. Magnetic gradiometer and GPS data were recorded simultaneously at rates of 75Hz and 1Hz respectively, conducting parallel instrument traverses 3.5m in width across the site, with the instrumentation towed using an ATV.

1.2 Geophysical instrumentation

1.2.1 Details of the instrumentation employed during this survey are provided below:

Technique(s)	Sensor spacing	Sample rate	Instrumentation	Sensitivity/precision
Fluxgate gradiometry (magnetometry) towed using an ATV	0.5m	75Hz (1) or 30Hz (2)	8 x Foerster Ferex Con650 (Archaeology) gradiometers combined with a 10-channel data logger	<35pT/VHz at 1Hz (650mm baseline)
GPS	4.0m	1Hz	Trimble R4 GLONASS GPS system operating in VRS mode	<0.1m (vertical & horizontal)

1.3 Data processing

1.3.1 Survey data were processed using in-house, open-source and commercial software. Following GPS and fluxgate gradiometer measurements on site all data was processed as follows:

Process	Description
1	Drift & zero median correction to balance data from entire sensor array
2	Gridding of corrected data via nearest neighbour interpolation
3	Greyscale generation at optimum range & export to tiff-format (.tiff & .wld)

1.3.2 To assure integrity of the processed data and maintain close correlation with the original raw on-site measurements no additional smoothing, low or high pass filters were applied proceeding steps 1-3.

2 GENERAL CONSIDERATIONS & COMPLICATING FACTORS

2.1 Access & ground conditions

2.1.1 Site access and ground conditions were generally good throughout M1-M4, the majority of the investigation area comprising level arable and pasture land with few obstructions present to impede the progress of survey. 2 small sections of land situated to the NW and SE were excluded from survey due to dense vegetation (NW), and the proximity of private housing and the R725 Carnew Rd (SE).

2.2 Modern interference

2.2.1 Numerous small-scale ferrous responses are evident throughout the results from survey in M1-M4. Ferrous responses are a common occurrence in magnetic survey data, and in most cases represent modern metal debris contained within the topsoil. Broad zones of ferrous, evident mostly at the perimeter of M1-M4, derive from survey in proximity to metal debris and modern surfaces such as metal wire fencing and gates.

2.2.2 100kV overhead power cables traverse the proposed development NE-SW. The effects on instrumentation due to survey in proximity to these cables is apparent as a band of strong magnetic disturbance extending NE-SW across M3-M4. Where archaeological remains may be situated within this band of magnetic disturbance they will remain beyond detection due to the range of interference encountered.

2.3 Responses from recent landuse

2.3.1 Remnants of former cultivation are apparent throughout M1-M4 and visible as closely spaced parallel linear responses aligned both NW-SE and NE-SW.

2.4 Responses from natural soil/geological variation

2.4.1 Zones of natural soil/geological variation are also evident in the results from survey, to the N, E and SW in M1; to the E and S in M2; and to the SW in M3.

3 MAGNETOMETIC GRADIOMETRY RESULTS

3.1 M1

- 3.1.1 No responses of definite archaeological character are indicated by the results from survey in M1. Patterns of former cultivation have been recorded throughout with zones of strong magnetic variation indicative of natural soil/geological variation evident to the N, E and SW. Weak linear trends of mainly NE-SW orientation are also visible in the results, and are expected to represent further natural soil/geological variations.
- 3.1.2 A linear response (1) extending NW-SE across the north-eastern extremity of M1 may be of potential interest. However, given the absence of any definitive archaeological patterns in the results, response 1 is expected to represent a possible former land division or plough share. The locations of 2 former land divisions are also indicated N and S of survey centre extending NE/SW.
- 3.1.3 Small-scale positive responses are also visible in the results from M1. These include responses 2, 3 & 4 to the NW, at survey centre, and to the SE. Whilst a potential archaeological origin for these anomalies should not be dismissed, the results suggest they most likely represent a combination of soil/geological variation, effects from recent landuse and/or modern ferrous.

3.2 M2

- 3.2.1 No responses of definite archaeological character are indicated by the results from survey in M2. The results from this location are dominated by patterns of former cultivation on NW-SE and NE-SW alignments, with further zones of natural soil/geological variation to the S and SE.
- 3.2.2 Remains of former land divisions have also been recorded extending mainly NW-SE across the centre of M2.
- 3.2.3 Isolated positives, similar to those recorded in M1, are also apparent in the results from survey in M2, notably responses 5 and 6 to the W and SE. These anomalies are expected to be of limited archaeological potential and likely derive from a combination of natural/soil geological variation, effects from recent landuse and/or modern ferrous.
- 3.2.4 The potential significance of weak linear trend (7) W of survey centre should not be dismissed.

3.3 M3

- 3.3.1 No responses of definite archaeological character are indicated by the results from survey in M3. The results highlight patterns of former cultivation continuing across much of M3, with levelled land divisions and natural soil/geological variations also recorded.
- 3.3.2 Small-scale positive responses and weak trends, similar to those noted in M1-M2, have been recorded in M3 to the N/NW of survey centre (8-9), and to the S/SW (10-11). Whilst an archaeological interpretation for these anomalies should not be dismissed, the absence of any clear archaeological patterns in the data suggests a natural/soil geological, recent landuse and/or modern ferrous origin more likely.

3.4 M4

- 3.4.1 The results from survey in M4 display responses which are similar in form to those recorded from survey in M1-M3, and highlight remains of former cultivation on NW-SE and NE-SW alignments, remnants of past land divisions, with further small-scale positive anomalies at survey centre (12), and to the S (13). The archaeological significance of the latter should not be ignored. However, given the lack of any clear archaeological context in the results a natural soil/geological, recent landuse or modern ferrous origin is expected for the majority.

4 CONCLUSION

- 4.1 The results from survey within the proposed development boundary highlight responses which are indicative of former cultivation, disused land divisions, and natural soil/geological variation. No definitive patterns of archaeological settlement, enclosure remains or concentrations of archaeological activity have been recorded from this survey.
- 4.2 The potential archaeological significance of a linear response (1) recorded to the NE in M1 should not be dismissed, although it is suggested this anomaly may relate to a former land division or plough share. A number of small-scale positive responses are also evident in the results from survey. Given the absence of any characteristic archaeological patterns in M1-M4 these poorly defined small-scale responses are expected to be of limited significance, and a natural soil/geological, recent landuse or modern ferrous origin is expected for the majority.
- 4.3 A band of magnetic disturbance deriving from 100kV overhead power cables extends NE-SW across the site. The potential that this magnetic disturbance has masked subtle responses from buried archaeological remains, where present within the site boundary, should not be dismissed.

*** This conclusion must be read in conjunction with the detailed discussion of the results included in the main section of this report.**

BIBLIOGRAPHY

English Heritage 2008, Geophysical survey in archaeological field evaluation, Research & Professional Guideline, No. 1.

Geological Survey Ireland Spatial Resources, Public Data Viewer Series

<https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aac3c228>

GRASS Development Team, 2018. Geographic Resources Analysis Support System (GRASS) Software, Version 6.4.3. Open Source Geospatial Foundation. <http://grass.osgeo.org>.

Irish National Soils Map, 1:250,000k, V1b(2014).Teagasc, Cranfield University.Jointly funded by the EPA STRIVE Research Programme 2007-2013 and Teagasc.

QGIS Development Team, 2018. QGIS Geographic Information System. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>

Schmidt A, Linford P, Linford N, David A, Gaffney C, Sarris A, Fassbinder J, 2015, EAC Guidelines for the Use of Geophysics in Archaeology: Questions to Ask and Points to Consider, Europae Archaeologia Consilium (EAC).

LIST OF FIGURES

Fig. 1	Site location	1:5000
Fig. 2	Greyscales M1-M4	1:2500
Fig. 3	Greyscales M1-M4 North	1:1500
Fig. 4	Greyscales M1-M4 South	1:1500
Fig. 5	Interpretations M1-M4	1:2500
Fig. 6	Interpretations M1-M4 North	1:1500
Fig. 7	Interpretations M1-M4 South	1:1500

APPENDIX

Technical Information

APPENDIX 1: TECHNICAL INFORMATION

INSTRUMENTATION

GPR/Ground Penetrating Radar: GPR systems comprise a configuration/data acquisition unit, a transmitting/receiving antenna (250-500mhz), and a cart with an odometer or integrated GPS. The technique is used for identifying remains of buried foundations, structures and cavities. GPR systems transmit a continuous electromagnetic wave of energy into the ground and record reflections of that energy as it interacts with the stratigraphy and structures below the surface. Data is acquired along parallel transects, 0.5m or 1m apart, and recorded as a function of the elapsed time for the energy wave to travel from transmitter to reflector and back to the surface. The strength of reflections recorded from GPR survey is proportional to the conductive and dielectric properties of the buried objects with which the transmitted energy is incident.

Gradiometry/Magnetometry (6 sensor gradiometer system combined with GPS): Gradiometry is the most widely applied technique in archaeological prospection, and is regularly used on sites 1-100ha in size to locate and characterize buried remains of enclosure ditches, pits, hearths, furnaces and kilns. These remains often produce magnetic contrasts above localized soil/geological variation due to enhancement from burning activity and organic enrichment of the soil during archaeological settlement. Mapping of these contrasts is undertaken using an array of either caesium or fluxgate magnetometer sensors for measurement of the earth's total field or variations in its vertical component. Target uses a 6 sensor gradiometer system combined with cm precision GPS to measure magnetic anomalies from buried archaeological remains in detail, collecting data along parallel lines 0.5m or 0.75m apart, at 10-12cm intervals along each line.

Electrical Resistivity: Electrical resistivity is generally used to map locations of buried structures, including foundation remains, walls, burial cairns, and existing earthworks. Using an array of electrodes mounted on a portable frame a small electrical current is passed through the ground at regular intervals via *current* emitting probes. Variations in resistance to the flow of this electrical current as it passes through the ground are measured by *potential* probes. Single or parallel twin arrays use 1 or 2 pairs of current and potential probes fixed to a mobile frame, with 1 remote *current* and 1 *potential* probe maintained stationary 20m from the survey limit. Resistivity surveys are normally conducted at 0.5m x 1m or 1m x 1m intervals.

EMI/Electromagnetic Induction (EMI sled system combined with GPS): EMI is suitable for detection of buried remains including foundations, enclosures, ditches, pits, and kilns. The technique measures variations in both the electrical conductivity and magnetic susceptibility of the soil. EMI systems comprises of 1 transmitting and 2-4 receiving coils, providing 2-8 data sets from below surface. The transmitting coil generates a time varying primary magnetic field which propagates above and below ground, generating alternating (eddy) currents within the soil and the objects it contains. These create a secondary magnetic field proportional to the rate of change of the magnetic field, which is measured by receiving coils 0.5m and 1m from the transmitting coil. Target's EMI sled system is used to survey in vertical or horizontal modes along 0.5m, 0.75m or 1m spaced lines at 10-12cm intervals along each line.

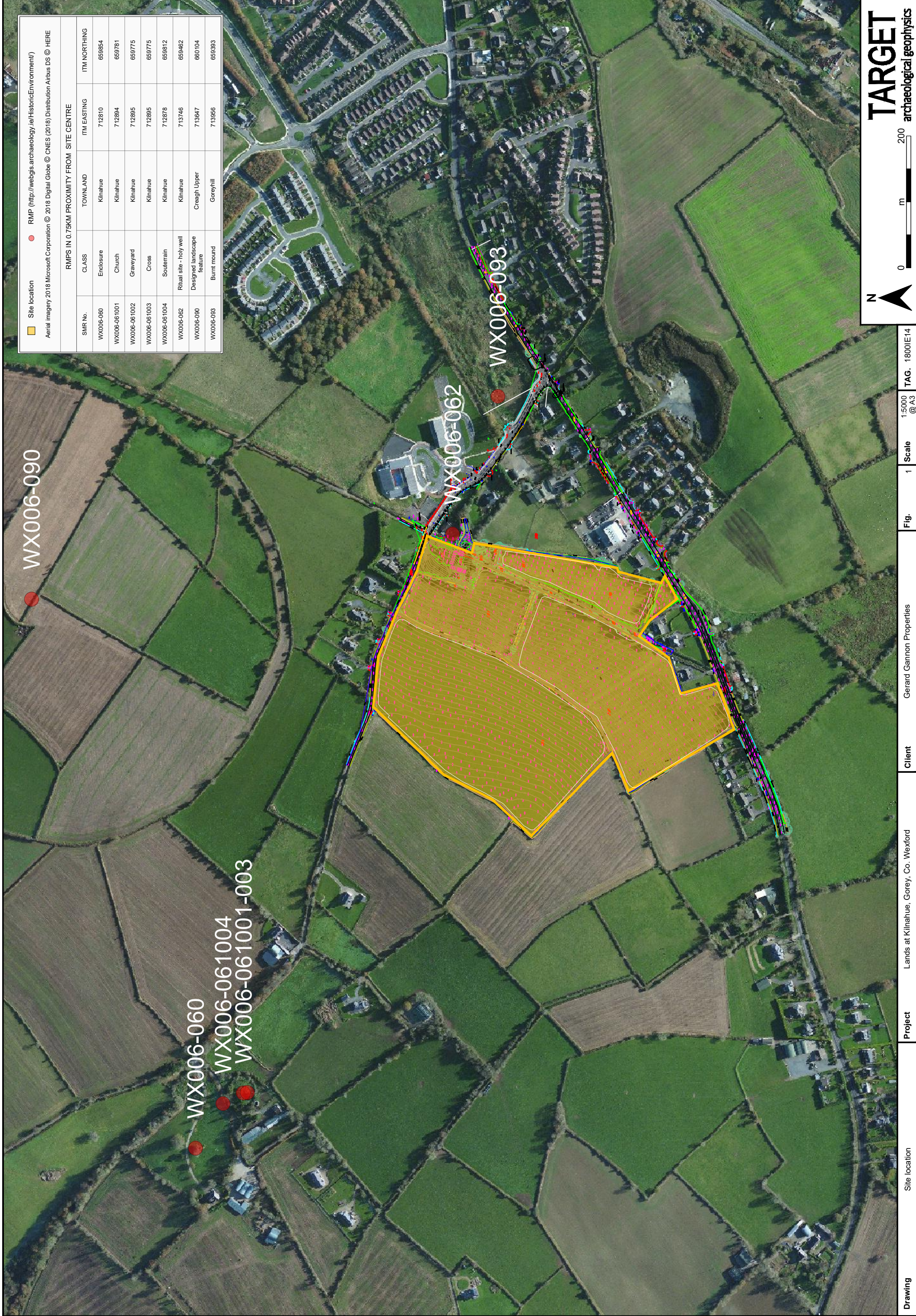
DISPLAY

Greyscale: The greyscale format assigns a cell to each datum according to its location on the grid. The display of each data point is conducted at very fine increments, allowing the full range of values to be displayed within a given data set. This display method also enables the identification of discrete responses barely above localized soil/geological variations.

Colour Plot: Colour plots comprising RGB values linearly interpolated between a user-specified range of values can provide further insight into the varying anomalies within a given data set. Colour plots are particularly useful for EMI data where presentation of results within a confined range of values is not always feasible with other formats.

XY Trace: XY Trace displays provide a near-perspective representation of responses recorded along each instrument traverse. The format is used mainly for locating responses from modern ferrous, but can assist in identifying magnetically strong anomalies relating to hearth, kiln and furnace remains. Ferrous anomalies can also be identified via a search of the attribute table in a GIS extracting readings beyond a specified range (e.g. where $z \leq -15$ and where $z \geq 15$), and then combining this layer with other display formats for interpretation.

Time-slice: Radargrams collected from grid based survey or parallel transects can be compiled as a 3D volume, then re-sampled to produce a series of 2D plans at incremental depth/time offsets. A series of Time-slice displays at 25-50cm offsets permits analysis of the pattern and depth of reflections within a given GPR survey area.



■ Site location ● RMP (<http://webgis.archaeology.ie/HistoricEnvironment/>)
 Aerial Imagery 2018 Microsoft Corporation © 2018 Digital Globe © CNES (2018) Distribution Airbus DS © HERE

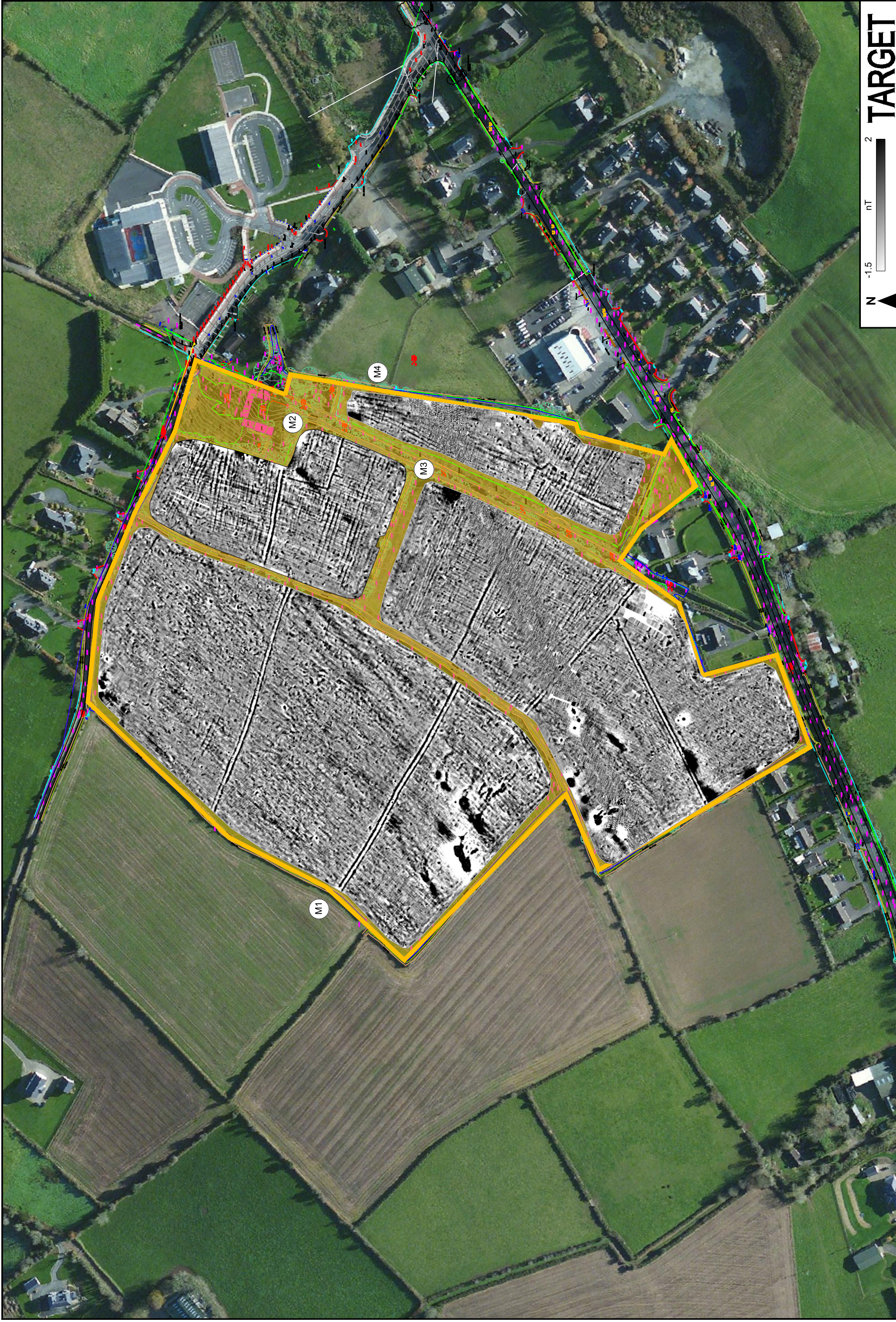
RMPs IN 0.75KM PROXIMITY FROM SITE CENTRE

SMR No.	CLASS	TOWNLAND	ITM EASTING	ITM NORTHING
WX006-060	Enclosure	Kilnahue	712810	659854
WX006-061001	Church	Kilnahue	712894	659781
WX006-061002	Graveyard	Kilnahue	712895	659775
WX006-061003	Cross	Kilnahue	712895	659775
WX006-061004	Southern	Kilnahue	712878	659812
WX006-062	Ritual site - holy well	Kilnahue	713746	659462
WX006-090	Designed landscape feature	Creagh Upper	713647	660104
WX006-093	Burnt mound	Goreyhill	713956	659393

TARGET
 archaeological geophysics

0 100 200
 m

N



Drawing

Greyscales, M1-M4

Project

Lands at Klinahue, Gorey, Co. Wexford

Client

Gerard Gannon Properties

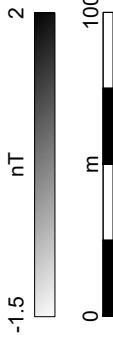
Fig.

2

Scale

1:2500
@ A3

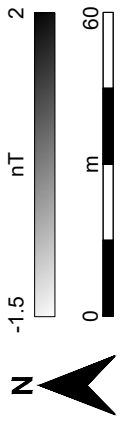
TAG. 1800E14



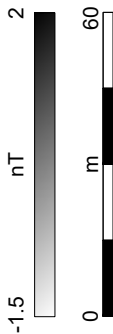
TARGET
archaeological geophysics



TARGET
archaeological geophysics



Drawing Greyscales M1-M4 North
Project Lands at Klinahue, Gorey, Co. Wexford
Client Gerard Gannon Properties
Fig. 3
Scale 1:1500 @ A3
TAG. 1800E14



TARGET
archaeological geophysics

Drawing

Greyscales, M1-M4 South

Project

Lands at Klinahue, Gorey, Co. Wexford

Client

Gerard Gannon Properties

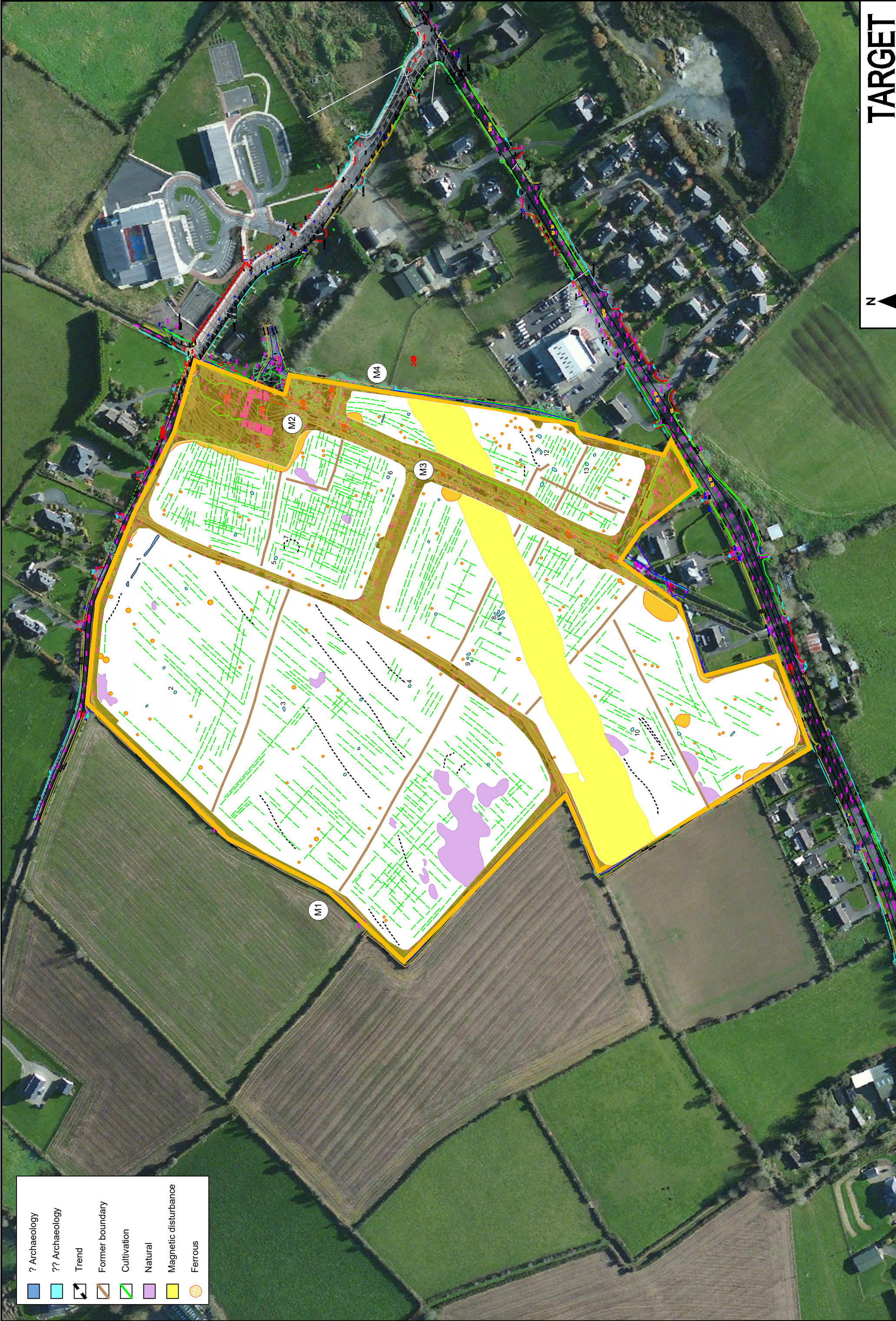
Fig.

4

Scale

1:1500
@A3

TAG. 1800IE14



- ? Archaeology
- ?? Archaeology
- Trend
- Former boundary
- Cultivation
- Natural
- Magnetic disturbance
- Ferrous



TARGET
archaeological geophysics

Drawing

Interpretations M1-M4

Project

Lands at Klinahue, Gorey, Co. Wexford

Client

Gerard Gannon Properties

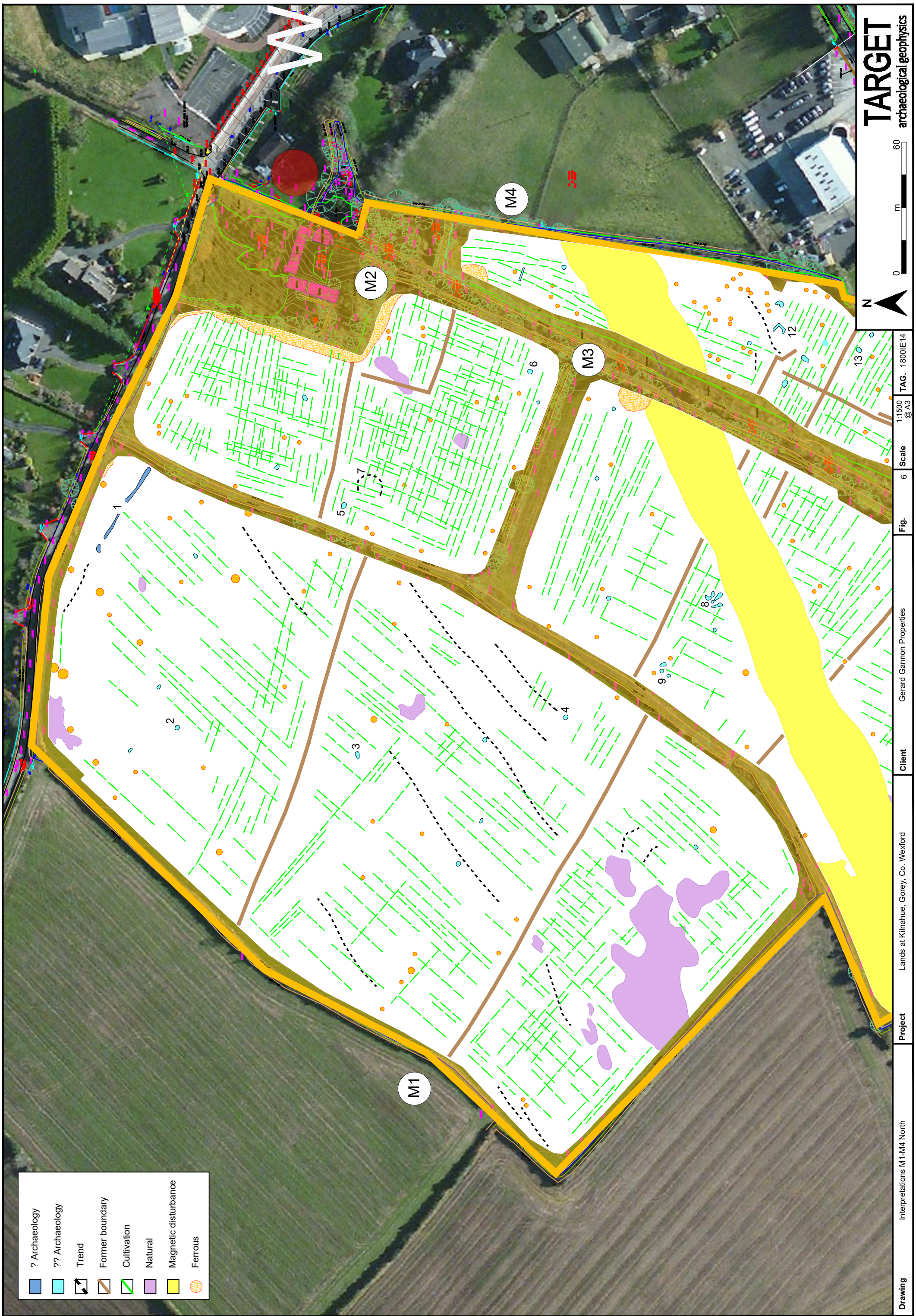
Fig.

5

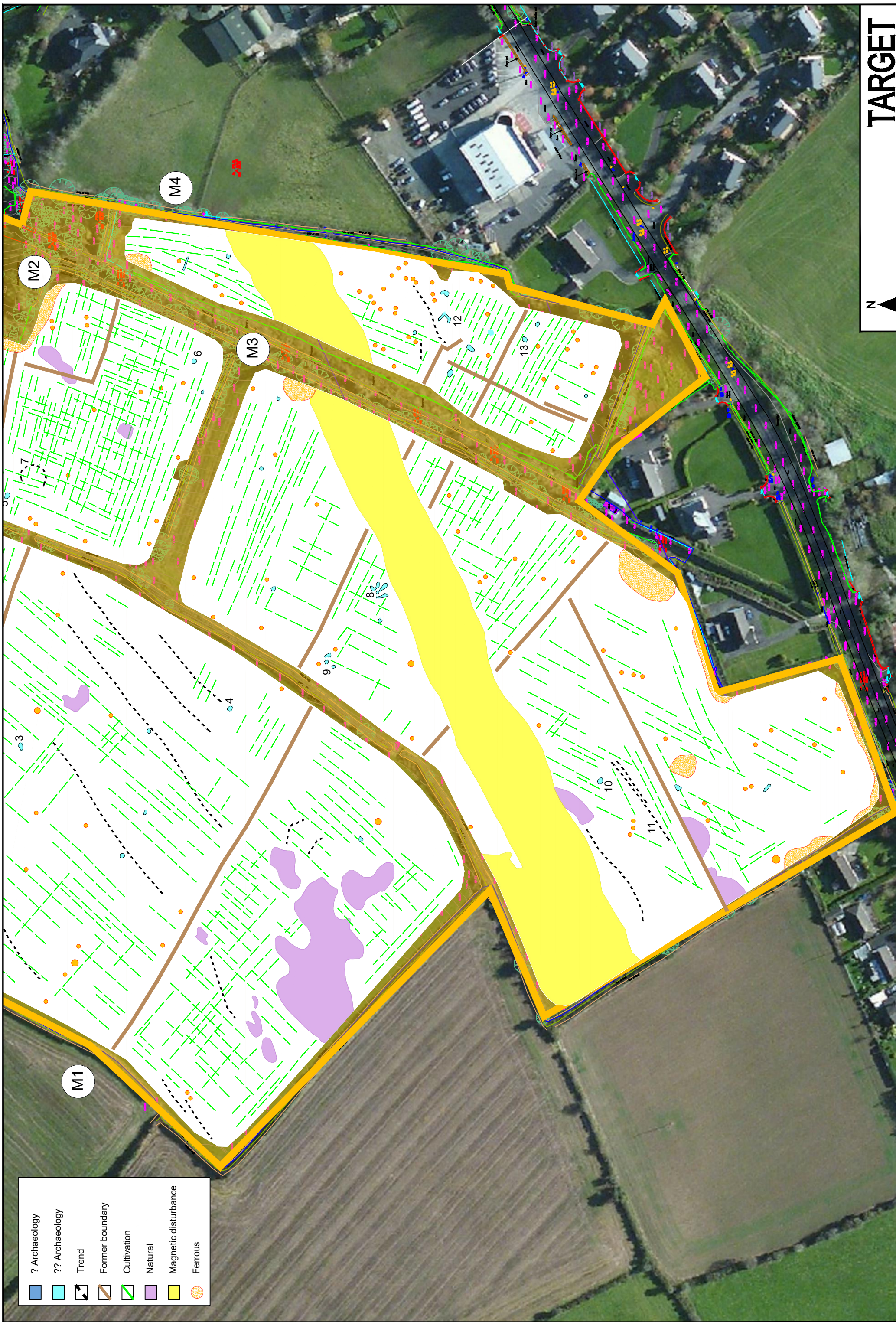
Scale

1:2500 @ A3

TAG. 1800IE14



- ? Archaeology
- ?? Archaeology
- Trend
- Former boundary
- Cultivation
- Natural
- Magnetic disturbance
- Ferrous



- ? Archaeology
- ?? Archaeology
- Trend
- Former boundary
- Cultivation
- Natural
- Magnetic disturbance
- Ferrous



TARGET
archaeological geophysics

TARGET

archaeological geophysics

survey@targetgeophysics.com
www.targetgeophysics.com

Holsbeeksesteenweg 10, 3010 Kessel-Lo, Belgium

+32 (0) 483504280 / +353 (0) 878580112

Registered Business in Belgium (0845.688.362) & Ireland (No. 257414)