

EPA STRIVE Programme 2007-2013

**Interim classification and rationalisation of soil
series in Ireland**

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ISIS Final Technical Report 2

Prepared for the Environmental Protection Agency
by
Teagasc and Cranfield University

Authors:

Jones, R J A, Hannam, J A, Palmer R C, Truckell I G, Creamer, R E, McDonald, E

ENVIRONMENTAL PROTECTION AGENCY

An Ghníomhaireacht um Chaomhnú Comhshaoil
PO Box 3000, Johnstown Castle, Co.Wexford, Ireland

Telephone: +353 53 916 0600 Fax: +353 53 916 0699

Email: info@epa.ie Website: www.epa.ie

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The EPA STRIVE Programme addresses the need for research in Ireland to inform policymakers and other stakeholders on a range of questions in relation to environmental protection. These reports are intended as contributions to the necessary debate on the protection of the environment.

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Details of Project Partners

Teagasc - Environment, Soils and Land-use Centre,
Johnstown Castle, Wexford, County Wexford, Ireland.

Tel.: +353 (0)53 9171200

E-mail: rachel.creamer@teagasc.ie

Teagasc – Spatial Analysis Group, Rural Economy and Development Programme.

Ashtown, Dublin 15, Ireland.

Tel.: +353 (0)1 8059953

E-mail: reamonn.fealy@teagasc.ie

Cranfield University - National Soil Resources Institute

Cranfield Campus, Cranfield, Bedfordshire, MK43 0AL, UK

Tel.: +44 (0)1234 750111

Email: t.mayr@cranfield.ac.uk

University College Dublin

School of Biosystems Engineering, Agriculture and Food Science,
Belfield, Dublin 4, Ireland.

Tel.: +353 (0)1 7162808

Email: nick.holden@ucd.ie

Executive Summary

The Irish Soil Information System (ISIS) project was established in 2008, following a comprehensive inventory of Irish soil data compiled by Daly and Fealy (2007) which highlighted that soil data coverage of Ireland was incomplete in both detail and extent. The ISIS project is funded under the Environmental Protection Agency STRIVE Research Programme 2007-2013 and co-funded by Teagasc. It was led by Teagasc with the participation of researchers from Cranfield University (UK) and University College Dublin. The overall objective of the ISIS project was to conduct a programme of structured research into the national distribution of soil types and construct a soil map, at 1:250,000 scale, which will identify and describe the soils according to a harmonised national legend. This map is now available in digital format and forms the basis of a new soil information system for Ireland (<http://isis.teagasc.ie>).

The ISIS project has utilised existing data and maps from the previous National Soil Survey (NSS) conducted by An Foras Talúntais (forerunner organisation to Teagasc). The NSS produced: mapping at 1:126,720 scale for 44% of the country; a General Soil Map of Ireland and a National Peatland map, both at 1:575,000 scale and other miscellaneous large scale mapping of experimental farms. In addition, more recent map products have been included such as the Indicative Soil and Subsoil mapping (Fealy and Green, 2009) with national coverage using GIS and remote sensing techniques.

Comparison of soil information at European scale has led to the requirement for the harmonisation and coordination of soil data across Europe, and, in light of the demands for soil protection on a regional basis within member states there is a growing need to support policy with a harmonised soil information system. The European Soil Bureau Network (ESBN) Technical Working Group dealing with Soil Monitoring and Harmonisation recommended a soil map of Europe at a scale of 1:250,000 as an economically feasible intermediate scale that can identify specific problems at regional scale (Montanarella and Jones, 1999).

The ISIS project adopted a combined methodology of utilising novel predicted mapping techniques in tandem with traditional soil survey applications. This unique combination at a national scale has resulted in the development of a new national soil map for Ireland. Building upon the detailed work carried out by the An Foras Talúntais (AFT) survey (known as *Terra Cognita*), the ISIS project generated soil-landscape models at a generalised scale of 1:250,000 for the counties of Carlow, Clare, Kildare, Laois, Leitrim, Limerick, Meath, Offaly, Tipperary South, Waterford, Westmeath, Wexford, West Cork, West Mayo and West Donegal. These soil-landscape models (also referred to as soilscape) were used as the baseline data for statistical models (random forests, Bayesian belief networks and neural networks) to predict soil map units in counties where there was no map available (referred to as *Terra Incognita*). To validate the methodology, this work was supported by a 2.5 year field survey, in which 11,000 locations were evaluated for soil type, using an auger bore survey approach. These data were used to check the predicted soil mapping units (associations) for counties: Cavan, Dublin, East Cork, East Donegal, East Mayo, Galway, Kerry, Kilkenny, Louth, Monaghan, Roscommon, Sligo, Tipperary South and Wicklow, where a detailed soil

survey map was not available. Where new soil information was generated, due to previously unknown combinations of soil-landscape units, profile pits were selected at representative locations across the country. These 225 pits were described and sampled in detail and were used to generate a new soil classification system for the country. The final product is a unique combination of new and traditional methodologies and soils data from both the AFT and the ISIS project. The final, soil association map of Ireland consists of 58 associations (excluding areas of alluvium, peat, urban, rock or marsh) that are made up from 213 soil series. Associated representative profile information is available in the online soil information system.

A key component of the ISIS project has been the development of a soil and land information system and associated public web site. This system has been designed to hold the complete set of information deriving both from the ISIS field programme and modelling activity, as well as the previously existing legacy soils information available for Ireland. Drawing on this information system, the web site is designed to hold and disseminate this information online both in cartographic and tabular form to stakeholders. Prior to this development, there has been no harmonised computerised system in place to hold and manipulate national Irish soils data. The information system therefore addresses the pressing need and requirement for a publicly-accessible, integrated IT framework based upon contemporary informatics standards to serve the many and varied stakeholders having an interest in soils information in Ireland.

Technical Note on Soil Classification

Two Irish soil classification systems were developed during the ISIS project. An **Interim Soil Classification** was developed in the early stages of the project to enable the harmonisation and generalisation of the county soil maps published by An Foras Talúntais (AFT) and the rationalisation of the original AFT soil series. The **Interim Soil Classification** was used during the development of Work Packages (WP): WP1 and WP2, to produce the training data for the predictive mapping and for most of the field programme in WP3. In 2013/4, **the Interim Soil Classification** was modified following a World Reference Base style hierarchical approach that recognises Great Soil Groups and defines sub-groups by supplementary diagnostic horizons. The **Final Soil Classification** System was developed to provide a more user-friendly classification system that adopts the approach of a hierarchical key for recognition of Great Soil Groups and diagnostic horizons to define the sub-groups.

The **Final Soil Classification** System was subsequently implemented during the description of representative soil profiles, final map production and is included in the updated soil profile handbook, and national soil series list. This modified system is the **Final Soil Classification** system for Ireland that appears in the map and associated information system on the ISIS website.

This Final Technical Report was developed using the **Interim Soil Classification**, and describes a significant contribution to the production of the final New Soil Map of Ireland. Table B below details the differences between the **Interim** and the **Final Soil Classification** Systems.

The **Final Soil Classification** System for Ireland has 3 hierarchical levels:

1. Great Soil Groups:

The classification criteria for the Great Soil Groups (GSG) were based on recognisable features used by An Foras Talúntais (National Soil Survey of Ireland) to classify the soils of Ireland at Great Soil Group level. Table A provides an overview of the key criteria for recognizing the Great Soil Groups. The sequence follows World Reference Base (WRB) principles.

2. Soil Sub-groups:

The Irish Soil Classification of soil sub-groups (SSG) is based on the recognition of diagnostic horizons, properties and materials which, where possible, should be observed and measured in the field. The selection of diagnostic characteristics takes into account their relationship with soil forming processes. Diagnostic features are selected that are significant to soil management. Subgroups are named with a maximum of two diagnostic features that represent the most important processes occurring in the soil profile. Table B provides a look-up table between the interim and the modified classification systems, listing the Great Soil Groups and Sub-groups.

3. Soil Series

The classification of series is based on the same principles as the interim classification system. Within a sub-group a series is further defined by the nature of the soil texture and parent material.

4. Soil Associations

For mapping purposes, the soil series are combined to form soil associations that are identified by the most frequently occurring soil series and combinations of ancillary series. Each association is named after the key (lead) soil series, which is the most extensive soil in the association, e.g. Kilrush series is the dominant component in the Kilrush Association. To facilitate mapping, each soil association based on the Interim Classification is assigned an alphanumeric code that comprises the soil subgroup code (numeric) concatenated with a single alphabetic character, e.g. 711b for Kilrush Association. In the Final Soil Classification, the Kilrush Association is assigned the code 0700b in accordance with Tables A and B. With respect to classification terminology, the reports (3, 4, 5, 11 & 12) describing the predictive mapping programme refer only to soil association codes that relate to the Interim Soil Classification. However, the ISIS Soil Information System contains a translation table that links the interim soil association codes to the codes that relate to the Final Soil Classification. Thus the results of the predictive mapping can be linked to the final version of the New Soil Map of Ireland.

Table A: Sequencing of the Great Soil Groups (GSG) in the Final Irish Soil Classification

Criteria	GSG code	Great Soil Group (GSG)
Soils with thick organic layers	1	OMBROTROPHIC PEAT
	2	MINEROTROPHIC PEAT
Shallow or extremely gravelly soils	3	RENDZINAS
	4	LITHOSOLS
Soils influenced by water	5	ALLUVIAL SOILS
	6	GROUNDWATER GLEYS
	7	SURFACE-WATER GLEYS
Soils affected by Fe/Al chemistry increase	8	PODZOLS
	9	BROWN PODZOLICS
Soils with clay enriched subsoil	10	LUVISOLS
Relatively young or soils with limited profile development	11	BROWN EARTHS

For more details of the finalised Irish Soil Classification System please refer to the following documents:

ISIS Final Technical Report 10: Simo et al. (2014). The Irish Field Handbook for Soil Profile Descriptions. Available from <http://erc.epa.ie.safer/reports>

ISIS Final Technical Report 13: Simo et al. (2014). The Irish Soil Information System Map and Legend. Available from <http://erc.epa.ie.safer/reports>

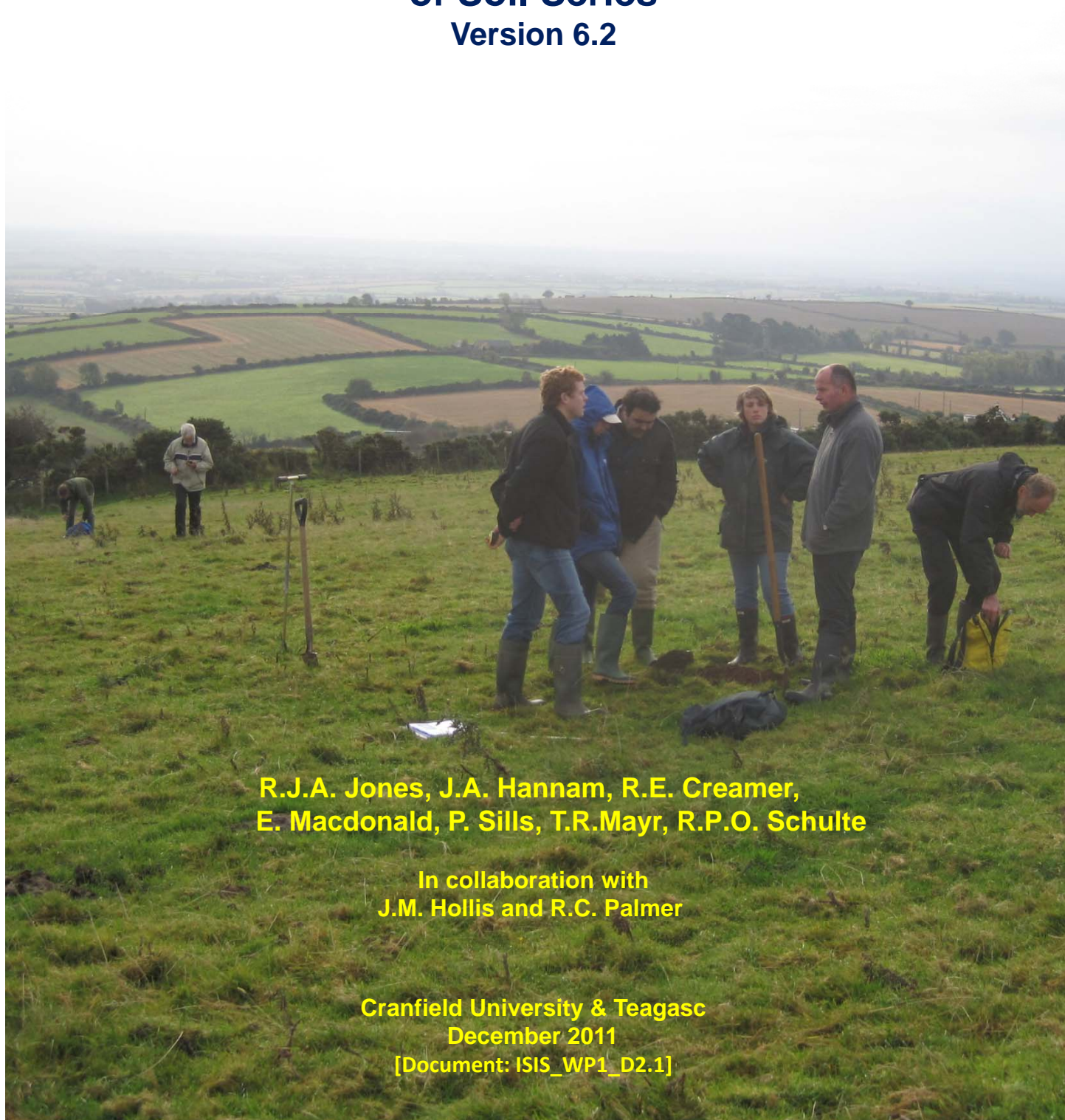
ISIS Final Technical Report 9: Creamer et al. (2014). The Irish Soil Information System National Soil Series - Description and Classification of Representative Profiles. Available from <http://erc.epa.ie.safer/reports>

Table B Linkage between the Interim and Final Irish Soil Classifications for Soil Subgroups

Interim SSG_code	Interim Soil Subgroup (SSG)	SSG code	Soil Subgroup (SSG)
911	Raw Ombrotrophic Peat Soils	110	Natural Ombrotrophic Peat Soils
912	Earthy Ombrotrophic Peat Soils	170	Drained Ombrotrophic Peat Soils
913	Cut-over Ombrotrophic Peat Soils	180	Cut-over Ombrotrophic Peat Soils
914	Industrial Ombrotrophic Peat Soils	190	Industrial Ombrotrophic Peat Soils
921	Raw Minerotrophic Peat Soils	210	Natural Minerotrophic Peat Soils
922	Earthy Minerotrophic Peat Soils	270	Drained Minerotrophic Peat Soils
		280	Cut-over Minerotrophic Peat Soils
211	Typical Rendzinas	300	Typical Rendzinas
215	Histic Rendzinas	310	Histic Rendzinas
213	Humic Rendzinas	360	Humic Rendzinas
214	Stagnic Rendzinas		
212	Gleyic Rendzinas		
111	Typical Lithosols	400	Typical Lithosols
113	Histic Lithosols	410	Histic Lithosols
112	Humic Lithosols	460	Humic Lithosols
821	Typical Alluvial Gleys	500	Typical Alluvial Gley Soils
		510	Histic Alluvial Gley Soils
823	Typical Calcareous Alluvial Gleys	550	Typical Calcareous Alluvial Gley Soils
		551	Histic Calcareous Alluvial Gley Soils
824	Humic Calcareous Alluvial Gleys	556	Humic Calcareous Alluvial Gley Soils
822	Humic Alluvial Gleys	560	Humic Alluvial Gley Soils
811	Typical Brown Alluvial Soils	570	Typical Alluvial Soils
812	Gleyic Brown Alluvial Soils	572	Gleyic Alluvial Soils
813	Humic Brown Alluvial Soils	576	Humic Alluvial Soils
721	Typical Groundwater Gleys	600	Typical Groundwater Gleys
		610	Histic Groundwater Gleys
723	Calcareous Groundwater Gleys	650	Calcareous Groundwater Gleys
		651	Histic Calcareous Groundwater Gleys
724	Humic Calcareous Groundwater Gleys	656	Humic Calcareous Groundwater Gleys
722	Humic Groundwater Gleys	660	Humic Groundwater Gleys
		690	Anthropic Groundwater Gleys
711	Typical Surface-water Gleys	700	Typical Surface-water Gleys
712	Humic Surface-water Gleys	760	Humic Surface-water Gleys
		790	Anthropic Surface-water Gleys
611	Ferric Podzols	800	Typical Podzols
621	Typical Gley Podzols	820	Gleyic Podzols
622	Stagno-Gley Podzols	830	Stagnic Podzols
632	Iron-pan Stagno Podzols	843	Stagnic Iron-pan Podzols
612	HumoFerric Podzols	860	Humic Podzols
		890	Anthropic Podzols
631	Ferric Stagno Podzols		
511	Typical Brown Podzolics	900	Typical Brown Podzolics
512	Gleyic Brown Podzolics	920	Gleyic Brown Podzolics
514	Stagnic Brown Podzolics	930	Stagnic Brown Podzolics
		936	Humi-Stagnic Brown Podzolics
513	Humic Brown Podzolics	960	Humic Brown Podzolics
		990	Anthropic Brown Podzolics
411	Typical Luvisols	1000	Typical Luvisols
412	Gleyic Luvisols	1020	Gleyic Luvisols
		1026	Humi-Gleyic Luvisols
414	Stagnic Luvisols	1030	Stagnic Luvisols
		1036	Humi-Stagnic Luvisols
413	Humic Luvisols	1060	Humic Luvisols
1020	Technosols	1090	Anthropic Luvisols
311	Typical Brown Earths	1100	Typical Brown Earths
312	Gleyic Brown Earths	1120	Gleyic Brown Earths
		1126	Humi-Gleyic Brown Earths
314	Stagnic Brown Earths	1130	Stagnic Brown Earths
315	Humi-stagnic Brown Earths	1136	Humi-Stagnic Brown Earths
321	Typical Calcareous Brown Earths	1150	Typical Calcareous Brown Earths
322	Gleyic Calcareous Brown Earths	1152	Gleyic Calcareous Brown Earths
323	Stagnic Calcareous Brown Earths	1153	Stagnic Calcareous Brown Earths
		1156	Humic Calcareous Brown Earths
		1159	Anthropic Calcareous Brown Earths
313	Humic Brown Earths	1160	Humic Brown Earths
		1190	Anthropic Brown Earths
		1196	Humi-Anthropic Brown Earths

IRELAND SOIL INFORMATION SYSTEM (ISIS)

Classification & Rationalisation of Soil Series Version 6.2



**R.J.A. Jones, J.A. Hannam, R.E. Creamer,
E. Macdonald, P. Sills, T.R. Mayr, R.P.O. Schulte**

**In collaboration with
J.M. Hollis and R.C. Palmer**

**Cranfield University & Teagasc
December 2011
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IRELAND SOIL INFORMATION SYSTEM (ISIS)

Classification & Rationalisation of Soil Series

Version 6.2

R.J.A. Jones¹, J.A. Hannam¹, R.E. Creamer²,
E. Macdonald², P. Sills², T.R.Mayr¹, R. Schulte²

In collaboration with
J.M. Hollis¹ and R.C. Palmer¹

1 National Soil Resources Institute
School of Applied Sciences
Cranfield University
Cranfield MK43 0AL, UK

2 Teagasc
Agriculture and Food Research Agency
Johnstown Castle
Wexford, Ireland

Cranfield University & Teagasc

December 2011

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Preface

This Monograph has been compiled by soil survey staff from the National Soil Resources Institute (NSRI), Cranfield University and Teagasc, Johnstown Castle, for the development of an Ireland Soil Information System (ISIS). Approximately 44 per cent of the country was mapped at a scale of 1:126,720 in the 1960s, 1970s and 1980s. The resulting soil maps cover all or part of 14 Counties and depict soil series, and complexes (where the pattern of soil series is too intricate to represent at 1:126,720 scale.) The soil series are described in detail in the accompanying County Map Bulletins, which also contain representative (also called modal) soil profile descriptions together with analytical data. In addition,

However, the soil series are identified and described on a county by county basis and the criteria defining these series are broad and vary between counties. This is understandable because no previous soil surveys had been made and correlation and rationalisation of soil series ceased when budgets were cut in the 1980s. Early attempts by the ISIS Project to capture the soil series data revealed the lack of comprehensive harmonised documentation that could be used as a basis for rationalising the previously mapped soil series and provide a platform for completing national soil coverage at 1:126,720 scale.

Hence the compilation of this guide (v 4) that adopts criteria and definitions extracted from:

1. Bulletins of An Foras Talúntais (AFT, the former National Soil Survey of Ireland);
2. Technical Monographs on Soil Classification for England and Wales (Avery, 1980), and Criteria for Differentiating Soil Series (Clayden and Hollis, 1984);
3. Soil Survey Field handbook (Hodgson, 1976. 1997);
4. New Zealand Handbook for the Field Study of Soils (Taylor and Pohlen, 1962);
5. Unpublished guidelines held in the Teagasc soil archives at Johnstown Castle, Wexford, Ireland.

The guide is work in progress that will be finalised during the last phase of the ISIS Project.

Processes of soil development in Ireland, and the soil series identified there, are closely related to soil processes operating in western Britain (Wales, north-west England and Scotland), and to a lesser extent elsewhere in north west Europe. Hence the use of some criteria and definitions described in the documents cited above, but for inclusion here the criteria have been reviewed in the light of their relevance to soil conditions in Ireland and proposed for use in ISIS.

Soils in Ireland are classified into soil series on the basis of soil texture, colour, structure, stoniness, organic matter content, whether calcareous or not, presence of diagnostic horizons and type of substrate, within a specified vertical section.

Noel Culleton
Teagasc, Johnstown Castle

Mark Kibblewhite
Cranfield University

March 2012

The sections (in black text) in this document [ISIS_WP1_D2.1], describing the soil classification and the definitions of the terms used in the field survey of soils, are reproduced in the Field Guide (v6.2) – Document ISIS_WP1_D3.1.

Text in **red** is additional to the text in the Field Guide, with the exception of the text marked in **red** in Annexes IV & VII, which, with the text in **blue & green**, identifies the latest changes made to the National Soil Series list and Legend.

As ISIS Technical Monograph No.1, this is a project reference document, whereas the Field Guide is an operational document issued to all the field staff, and periodically updated as the National Soil Series list and National Legend are updated, from information collected during the on-going field survey programme.

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Proposed criteria for classification and differentiation of soil series in Ireland

The original classification of soil series used by the National Soil Survey of Ireland (An Foras Talúntais – AFT) was confined to placing soils into Great Soil Groups and then into soil series. The term Great Soil Group has been retained but two levels of classification below Great Soil Group have been introduced - Soil Group and Soil Subgroup - to provide a sound basis for defining soil associations (grouping of soil series) that can be mapped at national scale. This provides a level of classification intermediate between Great Soil Group and soil series as described and delineated on the county soil maps of Ireland produced by AFT.

In order to classify the soils of Ireland into soil series and delineate soil mapping units at any scale, it is necessary to define the vertical section of the soil material upon which such differentiation can be made. The texture, colour, structure, stoniness, organic matter content, whether calcareous or not, presence of diagnostic horizons are all used to define soil series within a specified vertical section – termed the Reference Section.

The compilation of a National Soil Map and database for Ireland requires precise definition of soil series initially on the basis of substrate type (parent material), texture, drainage status, and presence of certain diagnostic features or horizons. To this end, existing soil series that have been identified as of National importance are defined in Appendix I. The vertical sections of soil material upon which differentiation is made, termed Reference Sections, are described first, followed by substrate type, texture, Key features and diagnostic horizons.

The sections that follow describe the Reference Section, substrate types and textural distinctions employed for compiling the National Soil Map of Ireland.

Reference Section

Textural characteristics are defined using criteria applied to each soil horizon within a vertical section of specified depth – called the *Reference Section* – its thickness varying according to the soil parent material or substrate type.

Depths must be specified within a standard vertical section of the soil that can be realistically inspected using a hand auger or spade to excavate a shallow pit at the base of which the soil can be examined using an auger. Reference Sections for the broad parent material types recognised are described below.

Soils in thick drift, Gravelly soils and Soils with a soft pre-Quaternary substrate all have a *Reference Section* that extends from the mineral soil surface to 80 cm depth.

Soils in peat have a *Reference Section* that extends from 40 to 90 cm below the surface where the lower boundary of organic material is deeper than 90 cm or starts progressively nearer to the surface where a mineral substratum is shallower than 90 cm (see Figure 1).

Soils over bedrock or Lithoskeletal soils have a *Reference Section* restricted to the upper 30 cm of the profile.

Soils over lithoskeletal material have a *Reference Section* that extends from the mineral soil surface to the upper surface of a skeletal layer or to bedrock which ever is at shallowest depth.

Soils in peat

These soils are predominantly composed of organic material (see Figure 1) derived for the most part from partially decomposed plant remains that accumulated under waterlogged conditions, either as autochthonous peat in the position of growth or as constituents of sub-aquatic sediments such as organic lake muds.

Early on in soil survey in Ireland, 30 cm was taken as the minimum thickness of organic material for soil to be defined as Peat. Later the definition of peat on the basis of thickness of organic material was modified as follows: for land to be classed as 'Peatland', the depth of organic soil material, excluding the thickness of the plant layer (L and F horizons), must be at least 45cm on undrained land and 30 cm on drained land.

Therefore, Peat soils as mapped in previous surveys in Ireland meet *both* of the following criteria:

- (i) >45 cm of organic material within the upper 80 cm of the profile in artificially undrained land, or more than 30 cm of organic material in artificially drained land, or where organic material rests directly on bedrock or skeletal material.
- (ii) No superficial non-humose mineral horizons with a colour value of 4 or more that extend below 30 cm depth.

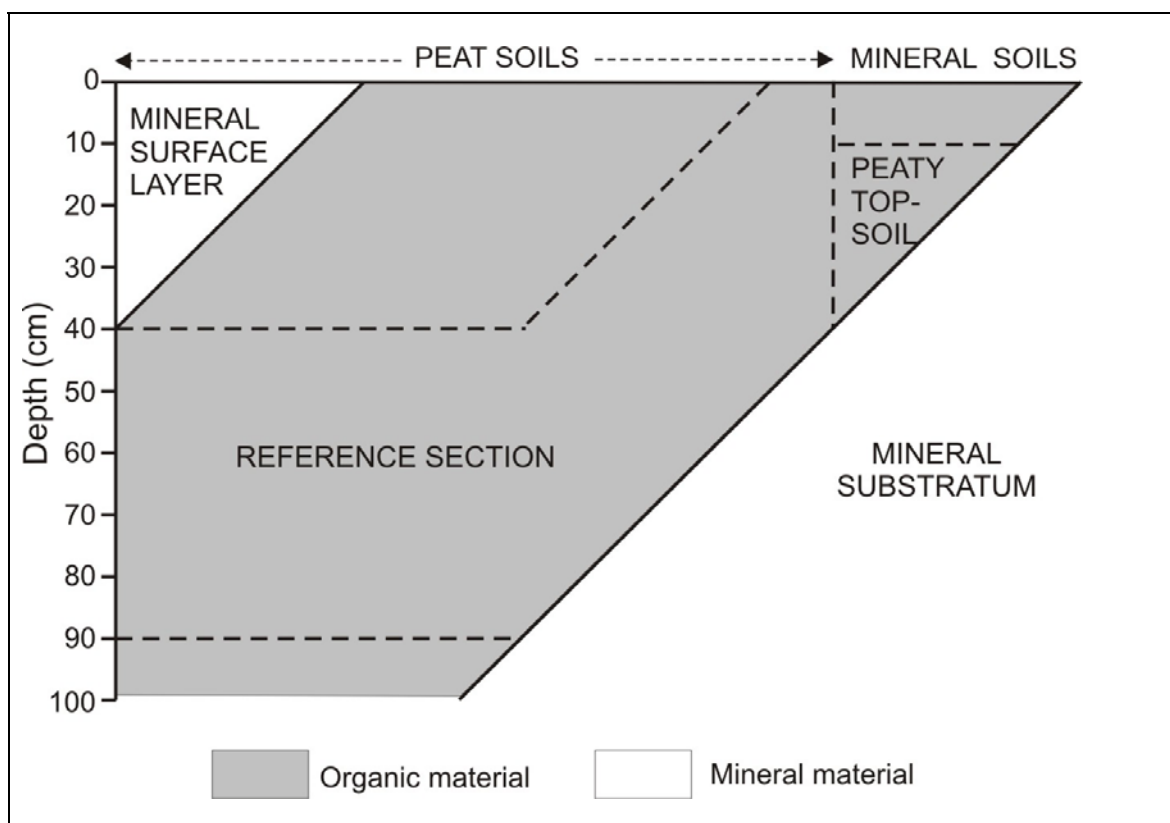


Figure 1. Reference Section for Peat soils (after Clayden and Hollis, 1984, p.13).

For practical purposes, a control section of 160 cm for describing peat soils of moss origin, and 130 cm for other types, was adopted for soil survey in Ireland. This differs from the Reference Section shown in Figure 1.

A thickness of 40cm or more of peat is required to classify Peat Soils, which corresponds directly with the definition of Histosols in WRB (IUSS Working Group WRB, 2006).

Soils over bedrock or lithoskeletal substrate

These soils comprise mineral material distinguished by the presence of a layer of coherent bedrock, or its skeletal products of weathering, that is at least 15 cm thick and begins above and extends below 80 cm depth. Most are formed in layers of angular residual or very locally transported rock fragments, which merge downwards into hard, coherent bedrock.

However, this broad parent material group contains other soils that directly overlie the bedrock, with no transitional skeletal layers, and some soils that occur in thick scree or very stony head deposits of local origin. Thus no attempt is proposed to distinguish bedrock from skeletal substrates but, where this distinction can be consistently identified, 'bedrock' and 'skeletal' phases can be separated.

This distinction is not usually necessary within soils on hard rocks, where any skeletal layers consist mainly of hard coarse fragments that do not add significantly to the exploitable soil volume.

This group also includes soils where thin drift overlies bedrock the bedrock occurring within 80 cm depth. Further parent material differentiation is based upon the lithology of the stones in the skeletal layers or of the bedrock, definitive lithologies being given in Table 1.

Two parent material subtypes are proposed to differentiate soil series with a lithoskeletal substrate:

- (i) *Lithoskeletal soils* are those in which bedrock or angular skeletal material occupies at least half of the upper 80 cm of the profile. In addition they have no surface layer > 30 cm thick that contains < 15% v/v stones. Lithoskeletal soils are developed mainly in fragmented material transitional to coherent bedrock and most are rankers or rendzinas.
- (ii) *Soils over lithoskeletal material* have one of the following types of surface layer:
 - (a) At least 30 cm of material containing common (< 15% v/v) stones.
 - (b) At least 40 cm of material containing many or fewer (< 40% v/v) stones.

Most are lithosols, brown calcareous earths, brown earths, brown podzolic soils or podzols developed in rock, scree, thin drift or drift and residuum. Alluvial or colluvial soils are defined as over lithoskeletal where they overlie bedrock or lithoskeletal material within 80 cm depth.

Soils in thin drift over bedrock

Soils with thin superficial drift where bedrock appears within 80 cm are defined as bedrock (or lithoskeletal) soils. Evidence of minor drift contamination in the upper parts of the profile, particularly the presence of sub-rounded stones, is discounted unless it is of sufficient extent to give texturally (Table 3) or mineralogically contrasting layers.

Only where the superficial drift can be recognised as significantly different from the substrate should it be identified separately. This is usually determined by a textural contrast. There should also be clear evidence of drift contamination, such as the presence of different matrix colours, erratic stones or loessial additions in the upper horizons. Where such evidence is lacking a contrast in texture can also be attributed to pedological processes or to lithological variation in the parent material.

Gravelly soils and soils over gravel

Gravelly soils are defined as:

- a) Mineral soils in which gravelly material extends from within 40 cm of the soil surface to at least 80 cm depth and;
- b) having no loamy or clayey surface layers more than 30 cm thick, that contain < 16% stones by volume.

Soils over gravel are defined as having:

- a) gravelly layer more than 15 cm thick that starts above and extends below 80 cm depth and;
- b) either at least 40 cm of superficial loamy or clayey material with < 40% v/v stones, or more than 30 cm of superficial loamy or clayey material with < 16% v/v stones.

The gravelly layers comprise rounded or sub-rounded stones that may overlies bedrock at depths greater than 80 cm, but are not transitional in that they contain few fragments derived from it. Skeletal layers transitional to bedrock, characteristic of lithoskeletal substrates, are not present within 80 cm depth.

Thus all loamy and clayey soils with a texturally contrasting gravelly substrate are grouped together except for sandy soils because sandy material is not normally considered to be texturally contrasting with gravelly layers (Clayden and Hollis, 1984, p.28). A gravelly substrate in sandy soils is not used to separate from otherwise similar soils that have no gravelly layers present.

Subdivision of the gravelly substrate according to stone lithology is not considered necessary except by differentiation on the basis of whether the gravelly layers are calcareous or non-calcareous:

- (a) Non- or slightly calcareous gravelly layers have < 2% w/w CaCO₃ in the fine earth fraction.
- (b) Calcareous gravelly layers have at least 2% w/w CaCO₃ in the fine earth fraction.

Soils over gravel in Ireland are most likely to be fluvic or gleyic brown earths beneath floodplains or on river terraces, or ground-water gleys in glacial outwash deposits. It is likely that most gravelly soils in Ireland will be formed on fluvioglacial sand and gravel deposits. Interpretation of legacy data suggests most soils with gravel in Ireland will be *Soils over gravel* rather than *Gravelly soils*.

Soils in thick drift

Mineral soils in thick Quaternary deposits comprise this group:

- (i) Soil materials is at least 80 cm thick and the drift deposits extend below 80 cm depth.
- (ii) There is no lithoskeletal or texturally contrasting gravelly layers starting within and extending below 80 cm depth and hence exclude soils developed in thin drift deposits over lithoskeletal substrate or bedrock.
- (iii) Some mineral soils in thin drift are included but only where drift deposits overlies organic layers (e.g. buried peat material that begin above and extend below 80 cm depth).
- (iv) Soft pre-Quaternary material that is relatively uncontaminated by drift is not present in the upper 80 cm of the profile.

Differentiation of soils in thick drift in Ireland based on the presumed origin of their parent material is not considered necessary (Clayden and Hollis, 1984, p.7), except in recent alluvium and colluvium. Characterising other types of drift according to lithological properties is questionable because of their varied nature. Furthermore, it is not justifiable to differentiate soils on the basis of stone type in drift materials in which stone abundance varies between 2 and 40% v/v, as stones in these amounts do not impart significant mineralogical influence in the resulting soils.

However, many drifts in Ireland are local in origin and, for example in local drifts surrounding outcrops of igneous rock, soils developed therein exhibit a close relationship between stone lithology and fine earth mineralogy. This recognition is also embodied in the Scottish soil classification (Soil Survey of Scotland, 1984)). Conversely, there is little justification for basing separations on the presence of resistant (e.g. hard siliceous) stones that are unrelated to the soil matrix, as is the case in many glacial tills (boulder clays).

The following drift substrate types are recognised:

- (i) **Recent alluvium** includes all thick drifts in which loamy or clayey marine, fluvial, or lacustrine sediments of Holocene (Recent) age (Avery 1980, p.35) extend below 30 cm depth of which three types are used to define soil series:

- (a) River alluvium
- (b) Marine and estuarine alluvium
- (c) Lake marl or tufa

However, the distinction between each type is not always clear because intrinsic properties such as structure, porosity, pH, CaCO₃ content, exchangeable cations and colour do not provide a consistent means of identification. Most lake marl or tufa deposits have CaCO₃ contents in excess of 70% w/w, bulk densities < 1 t m⁻³ and dry colour values of at least 7, but where extremely calcareous river alluvium occurs, the distinction is difficult and in places the deposits grade into each other.

Salinity, strong acidity and the presence of jarosite (soft yellowish concretions or mottles of the sulphate mineral jarosite) are indicative of marine deposits but in the absence of these properties the distinction between marine and river alluvium is based on physiographic position. Thus river alluvium is identified in valleys with well defined lateral margins or enclosed washlands of non-tidal rivers in broad plains, and marine alluvium is recognized on coastal flats and in estuaries. Soils in which thin alluvium overlies gravelly, lithoskeletal or soft pre-Quaternary substrates are defined using terms appropriate to the respective parent material types.

- (ii) **Recent colluvium** includes all thick drifts in which loamy or clayey colluvium of Holocene age (Avery 1980, p.36) extends below 40 cm depth. Further separation is made according to whether the colluvium is predominantly *calcareous* or *non-calcareous*. Calcareous colluvium contains at least 2 % CaCO₃ in the fine earth whereas non-calcareous colluvium has < 2% CaCO₃.
- (iii) **Stoneless drift soils:**
 - (a) contain few ($\leq 2\%$ v/v) stones throughout more than half the upper 80 cm and
 - (b) have no superficial layers extending below 30 cm depth that contain > 5% stones.
 - (c) include thin superficial stoneless deposits that overlie stony drifts below 40 cm depth;
 - (d) include thicker, originally stoneless deposits into which a few stones have been incorporated by periglacial, fluvial or colluvial processes.
 - (e) include blown sand and most glaciolacustrine, loessial and sandy alluvial or colluvial deposits (,no series distinctions based on these differences in origin)
- (iv) **Drift with limestones:**

Soils developed in drift with limestones have either, calcareous material within 80 cm depth in which the predominant stone type is limestone, or a non-calcareous B horizon within 80 cm depth that passes conformably within 120 cm into calcareous material in which the predominant stone lithology is limestone. Much of the soil material developed in this substrate type in Ireland is derived from Carboniferous or Permian rocks. Other soils are developed in stony terrace or glacial outwash deposits transitional to gravels, and in Head deposits down slope from limestone outcrops. Tills conforming to this drift type also occur locally over Carboniferous Limestone.

The following rules should be applied for differentiating the substrate type 'drift with limestones' from 'drift with siliceous stones' in the field:

- a. if drift matrix material is moderately calcareous (> 2% CaCO₃) but coarse fragments (stones > 2mm esd) are mainly siliceous stones, then the substrate type should be classified as 'drift with limestones'.
- b. if drift matrix material is slightly or non-calcareous (< 2% CaCO₃) but coarse fragments are mainly limestone, the substrate type should be classified as 'drift with limestones'.
- c. if drift matrix material is slightly or non-calcareous (< 2% CaCO₃) and coarse material is mainly siliceous stones, the material should be classified as 'drift with siliceous stones'.

- d. if drift matrix material is slightly or non-calcareous (< 2% CaCO₃) and coarse material is mainly siliceous stones with occasional limestones, the material should be still be classified as 'drift with siliceous stones'.
- (v) **Drift with igneous and metamorphic stones** include local drift deposits where igneous or metamorphic stones constitute the dominant lithology of stones.
- (vi) **Drift with siliceous stones** encompasses all thick drift parent materials that do not qualify for the other drift types defined above. These deposits include drift dominated by sandstone, slate, shale or chert stones. Most soils in *drift with siliceous stones* are non-calcareous to at least 120 cm, but profiles with calcareous material above 120 cm may occur. Use of such a broadly defined category means that several soil series previously defined in drifts of different type or stratigraphical age in Ireland are now amalgamated.

Solid shales

Where calcareous shales are found, the soils thereon should be classified with soils on non-calcareous shales, unless the soil material above 40cm depth is moderately calcareous (> 2% CaCO₃) where upon such soils should be classified in a calcareous subgroup of the appropriate Soil Group/Great Group.

Soils with a soft pre-Quaternary substrate

Soils developed in this substrate are characterised by the presence within 80 cm depth of:

- (i) little altered soft pre-Quaternary material or
- (ii) a non-skeletal B horizon that passes conformably into pre-Quaternary material.

The conformable relationship is identified by a combination of characteristics including colour, mineralogy, absence of foreign stones, and, particularly in sandy material, the continuity of bedding or laminations. Coherent bedrock (R or Cr horizons) may occur below 80 cm but is not present within this depth.

Unconsolidated clays and sands, weakly consolidated sediments such as soft 'blocky' mudstones (marls), the residual products of weathered soft rocks and the non-skeletal residual products of deeply weathered hard rocks are included. However, soils developed in thin drift passing to soft pre-Quaternary material have not been identified during detailed soil survey in Ireland.

Definitions of Skeletal and Gravelly

Soil horizons containing extremely abundant (> 80% v/v) stones are defined as skeletal if, or if they contain abundant stones (40–80%), are defined as *sandy-skeletal*, *loamy-skeletal* or *clayey-skeletal* depending on the texture of the fine earth fraction (Clayden and Hollis, 1984). The term gravelly is substituted for skeletal when the stones are mainly rounded or subrounded. This supersedes the use of gravelly to describe stones of particular size (Hodgson, 1997). It should be noted that gravelly, sandy gravelly, loamy gravelly and clayey gravelly textures are not used to define soils over gravel because in this type of parent material, gravelly horizons are excluded from the reference section (Clayden and Hollis, 1984, p.24).

Substrate types

Soil series are now defined on the basis of a relatively small number of parent material or substrate types, depending on the presence within specified depths of mineral substrates or organic material. These are listed below in Table 1, which shows significant change from the past whereby some differentiation into soil series on the basis of lithology of stones present in glacial drifts has been removed, allowing some amalgamation of series.

Table 1 Substrate types used to define soil series in Ireland

Major substrate type	Substrate sub-group	Rock types
Peat (PT)	Blanket and Raised Bog (BOG) Fen (FEN) Cutover(CUT)& Industrial(IND)	
Bedrock (RK)	Basic Igneous (IGB) Acid Igneous (IGA) Limestone (LIM) Sandstone (SAN) Shale/slate (SHL) Sandstone and Shales Gneiss and schist	Basalt (BA), gabbro (GA), Granite (GR), rhyolite (RH) Limestone (LIM) Old Red Sandstone (ORS), millstone grit (MG), quartzite (QZ), chert (CH) Shale (SH), slate (SL), calcareous shale (CSH) Interbedded sandstone (SAN) and shales (SH) Mica schist (MS)
Drift (DR) (Till or Fluvioglacial sediments)	with siliceous stones (SIL) with limestones LIM) with igneous and metamorphic stones IGM) stoneless (NON) non-calcareous gravels (GRN) calcareous gravels (GRC)	Sandstones (SAN), shale (SH), slate (SL), quartzite (QZ), chert (CH) Limestone (LIM) Basalt (BA), gabbro GA), granite (GR), gneiss (GN), schist (SC) Aeolian, glaciolacustrine
Alluvium (AL)	River (RIV) Marine (MAR) Lake marl (LAK) Estuarine (EST)	
Anthropogenic (T)	Made ground (MAD)	

For example, 'drift with siliceous stones' includes material containing sandstones, shale, slate, quartzite and chert. However, this does not mean that recognition of soil series in past surveys, particularly of the counties, is invalidated, rather that some previous differentiation is not now deemed appropriate at national scale (1:250,000).

Texture characteristics

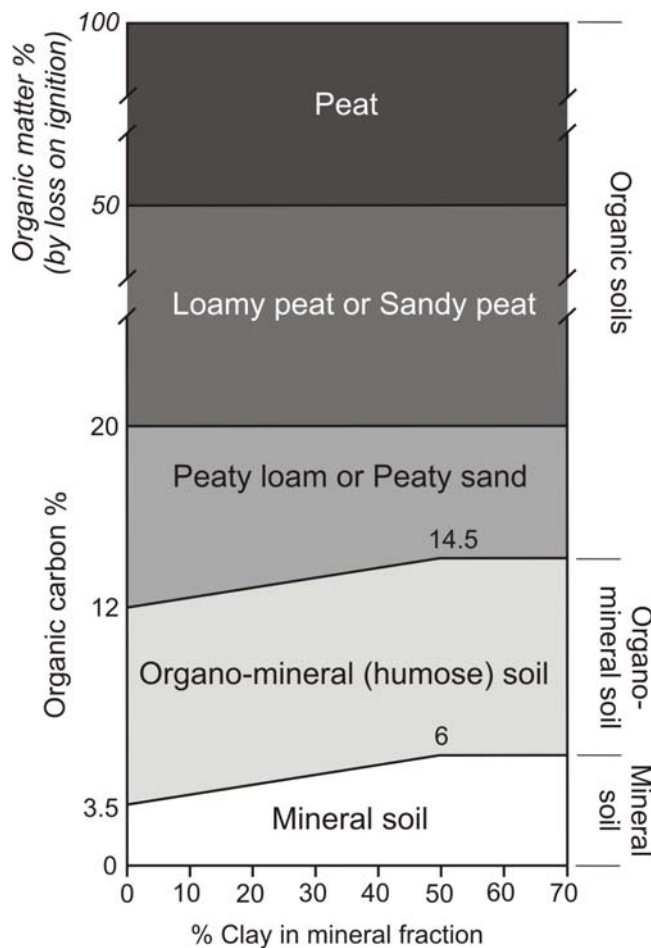
Textural characteristics for soil series are defined according to three criteria:

- (i) Organic matter content
- (ii) CaCO₃ content
- (iii) Mineral particle-size distribution

Textural criteria for peat soils

Peat soils have a Reference Section consisting entirely or almost entirely of organic material in which the particle-size distribution of the mineral fraction exerts little effect on the 'feel' of the soil material. Three broadly defined categories are used to describe the horizons of peat soils and these are defined (in Figure 2) as:

- Peat - > 50% w/w organic matter (OM) calculated from loss on ignition
- Sandy Peat – 50% > OM > 20% w/w, Sand > 50% w/w
- Loamy Peat – 50% > OM > 20% w/w, Sand < 50% w/w



After Hodgson (1997, p23)

Figure 2 Limiting proportions of organic carbon (or organic matter) and clay content in organic and humose (organo-mineral) soils.

The lower limit for *peat* is determined by loss on ignition (50% organic matter); the limits of other classes are determined by organic carbon analysis. [See Table 2 for numerical limits].

Soils with OM < 20% w/w are defined as:

Peaty sand where OM > 12%, Sand > 50% and Clay = 0%;

Peaty loam where OM > 14.5% and Clay => 50% w/w.

Mineral soils that underlie peat and start at 90 cm depth are excluded from the Reference Section and not used to differentiate soil series.

Table 2 Organic carbon (% w/w) limits for Humose, Peaty loam, Peaty sand materials:

Clay %	Humose	Peaty Loam, Peaty Sand
	OC %	OC %
0	3.50	12.00
1	3.55	12.05
2	3.60	12.10
3	3.65	12.15
4	3.70	12.20
5	3.75	12.25
6	3.80	12.30
7	3.85	12.35
8	3.90	12.40
9	3.95	12.45
10	4.00	12.50
11	4.05	12.55
12	4.10	12.60
13	4.15	12.65
14	4.20	12.70
15	4.25	12.75
16	4.30	12.80
17	4.35	12.85
18	4.40	12.90
19	4.45	12.95
20	4.50	13.00
21	4.55	13.05
22	4.60	13.10
23	4.65	13.15
24	4.70	13.20
25	4.75	13.25
26	4.80	13.30
27	4.85	13.35
28	4.90	13.40
29	4.95	13.45
30	5.00	13.50
31	5.05	13.55
32	5.10	13.60
33	5.15	13.65
34	5.20	13.70
35	5.25	13.75
36	5.30	13.80
37	5.35	13.85
38	5.40	13.90
39	5.45	13.95
40	5.50	14.00
41	5.55	14.05
42	5.60	14.10
43	5.65	14.15
44	5.70	14.20
45	5.75	14.25
46	5.80	14.30
47	5.85	14.35
48	5.90	14.40
49	5.95	14.45
50	6.00	14.50

Textural criteria for lithomorphous soils in soft extremely calcareous material

These soils with > 40% w/w CaCO₃ in the fine earth fraction are described as *extremely calcareous*, with < 40% v/v stones.

Textural criteria for carbonatic materials

Soils in which soft material with > 40 % CaCO₃ in the fine earth fraction and ≤40 % v/v stones extends from immediately below the topsoil, or within 30 cm depth, to at least 80 cm are described as carbonatic. Only broad textural groups are defined:

- Carbonatic-clayey, where the soil meets the above criteria and the clay fraction is > 40 %
- Carbonatic-loamy, where the soil meets the above criteria and the sand sized fraction comprises ≤ 50 % and the clay fraction ≤ 40 % of the mineral fine earth fraction.
- Carbonatic-sandy, where the soil meets the above criteria and the sand sized fraction comprises 50 % or more and the clay fraction ≤ 40 % of the mineral fine earth fraction.

Textural criteria for all other soils

The particle-size distribution of mineral soil horizons is described in terms of particle-size classes based on the proportions of sand (2mm-50µm), silt (50-2µm), and clay (<2µm) sized particles in the inorganic fine earth (<2mm) fraction (these differ from classes described in the FAO handbook, but this survey applies the particle size grades adopted by the USDA). Four broad particle-size groupings – sandy (Sy), loamy (Ly), silty (Zy) and clayey (Cey) – are used for differentiating soil series based on textural class and clay contents.

Coarse loamy and fine loamy in series definitions

For agriculturally important soils, the loamy and silty groups are further subdivided into coarse and fine categories. The particle size classes that constitute these groups defined by the USDA are shown in Figure 3. To define the soil as either coarse (cLy) or fine loamy (fLy), the following procedures are applied:

- (i) In loamy soils, where there are coarse and fine loamy components in the profile, the dominant texture within 80 cm should be used to define the broad textural class of the description.
- (ii) if topsoil ≥ 40 cm cLy thick over fLy, classify soil as cLy
- (iii) if topsoil < 40 cm fLy thick over cLy, classify soil as cLy
- (iv) if topsoil < 40 cm cLy thick over fLy, classify soil as fLy
- (v) if topsoil ≥ 40 cm fLy thick over fLy, classify soil as fLy

In the Podzol and Lithosol Great Soil Groups, no distinction is made between coarse and fine loamy and soil series are described as Sandy, Loamy or Clayey (in Lithosols only).

Luvisols by definition are likely to have fine loamy or finer textured subsoils due to clay eluviation. For mapping purposes the thickness criteria for the upper horizons are relaxed slightly and the following criteria can be applied in the field to define Luvisol series textures:

- (i) if topsoil ≥ 40 cm cLy then define soil as cLy
- (ii) if 35 cm < cLy < 40 cm then define soil as cLy (particularly if surrounding soils also have cLy upper horizons)
- (iii) if 35cm < cLy < 40cm then classify as fLy (particularly if surrounding soils also have fLy upper horizons).

Texturally contrasting layers in series definitions

The broad particle-size (texture) groups are used to characterise each mineral horizon; soil materials with > 40% v/v stones are difficult to texture by hand and to sample for analysis. However, soil materials with abundant (40-80 %) stones are classified as *sandy-skeletal*, *loamy-skeletal* or *clayey-skeletal* depending on the broad textural class of the fine earth..

Where the Reference Section contains horizons of different texture that give significant changes in pore-size distribution, which affect the movement or retention of water, it is said to be texturally contrasting . Where soils meet the texturally contrasting criteria (Table 3) two textures are used to define soil series (e.g. fine loamy over clayey). Texturally contrasting layers must start within 80 cm depth. The lower layer must be > 15 cm thick and the overlying layer must be > 30 cm thick.

Texturally complex profiles with a Reference Section containing at least three layers of different texture and at least one contrasting layer are difficult to define, but in most an upper and a lower zone of broadly contrasting textures can be separated. Identification of soils with contrasting textures as listed in Table 3 proved problematic during the study of legacy data but combinations are included here for reference in the field.

When comparing textures within the Reference Section, the following principles should be applied:

- (i) Gravelly and skeletal horizons are only considered contrasting where they form upper layers starting within 30 cm depth.
- (ii) Gravelly or skeletal lower horizons extending below 80 cm depth are excluded from the reference section, and those that form layers less than 40 cm thick within a less stony Reference Section are considered non-contrasting.

Peaty lower layers in mineral soils contrast with any overlying mineral layer but are not texturally subdivided as they are for peat soils. Peaty upper layers are used to distinguish humic (Avery, 1980) and histic soil sub-groups but are not differentiating at series level, although peaty and humose topsoil phases can be identified if required.

Silty (Zy) lower layers are not separated into coarse and fine subgroups unless the overlying layer is clayey, in which case only coarse silty layers are considered to be texturally contrasting.

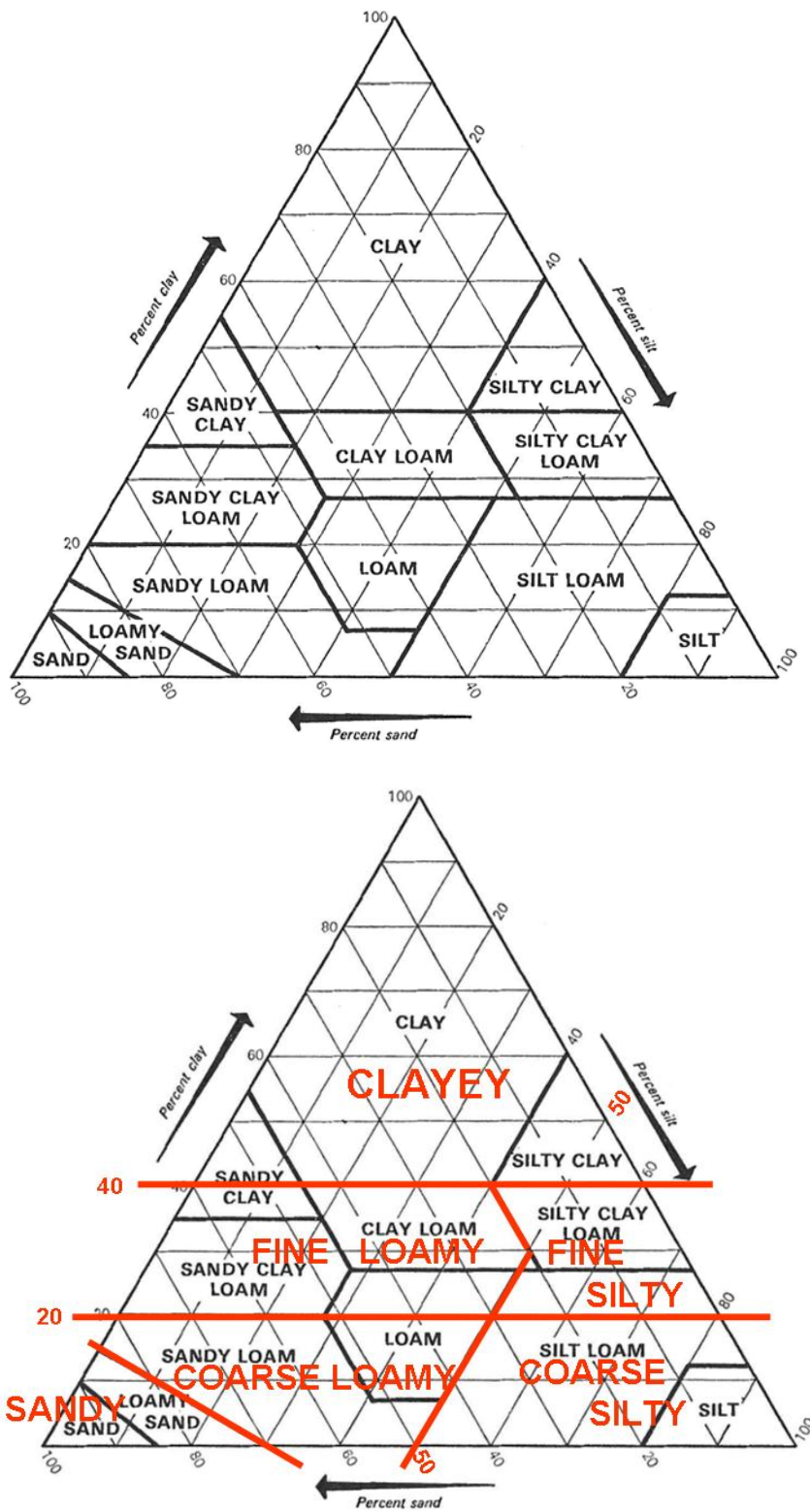


Figure 3 Soil Particle-size classes and broad groups for series differentiation

Diagnostic features and horizons

Diagnostic horizons are defined according to Avery (1980, p28-35), and modified where appropriate by criteria (unpublished) used by the National Soil Survey of Ireland - An Foras Talúntais.

Surface horizons

Peaty topsoil

This is a peaty (**O**) horizon 7.5-40 cm thick, overlying mineral soil or rock. It normally occurs at the surface or beneath a thin layer of more or less decomposed litter (L, F) not qualifying as O, and may be divisible into distinct sub-horizons, including Oh or Op. It may also be buried beneath a non-organic surface layer up to 30 cm thick.

In an uncultivated soil, the peaty horizon should be thick enough and contain enough organic matter to give an Op horizon if the soil is mixed to a depth of 15 cm. In uncultivated soils O horizons can be difficult to distinguish from relatively well aerated F or H horizons, particularly where the superficial organic horizons are relatively thin. A peaty topsoil under grassy or heath vegetation normally includes an Oh horizon that is denser and more plastic than H horizons of similar composition and breaks into firm angular blocks when dried.

This diagnostic horizon is conceptually equivalent to the histic epipedon (Soil Survey Staff 1999, p22-3) or istic horizon in WRB (IUSS Working Group WRB 2006, p.23) but is permitted to be thinner.

Earthy topsoil

This is a ripened peaty surface layer (**Op** or **Oh**) that is at least 20 cm thick (see p.39) and contains less than 15% w/w visible plant remains (fibres) other than resistant woody fragments. It normally overlies an organic subsurface horizon and usually has a distinct granular or subangular blocky structure.

An earthy topsoil normally occurs in peat soils that have been drained, or drained and cultivated. Where the soil has not been cultivated, it can underlie a less decomposed F horizon and consistent identification demands particular care in distinguishing living roots from un-decomposed or partially decomposed plant residues.

Earthy topsoil can comprise loamy peat, sandy peat, peaty loam and peaty sand or some combination of these soil materials (see Figure 2).

Humose topsoil

This is an A horizon or a sequence of **H** or **Oh** and **Ah** horizons that meets the following requirements over a thickness of more than 15 cm or 10-15 cm if directly over bedrock (R or Cr):

1. Moist rubbed colour with value and chroma of 3 or less
2. Humose or partly humose and partly organic (< 7.5 cm thick).

The requirements apply to the soil as it exists in the field not after mixing to a depth of 15 cm. When a peaty topsoil is cultivated, it is commonly transformed into a humose topsoil as a result of admixing with underlying mineral material, increased mineralization of organic matter, or both. Similarly, reduction of organic-matter content under continuous cultivation also causes humose topsoils to be transformed into distinct topsoils (see below).

Humose topsoil comprises organo-mineral materials according to organic carbon and clay limits listed in Table 2.

As a guideline in the field, humose soil materials generally have moist rubbed colour value of 3 or less and chroma of 2 or less but in addition the soil should also feel soapy and slippery due to the organic matter, the presence of which is more difficult to detect in silty soils because organic and silty materials have a similar feel. However, dark colours may also be inherited from parent materials and it is essential to validate and calibrate the humose field assessments periodically by taking samples and analysing for organic carbon or loss on ignition (LOI).

A humose topsoil usually qualifies as a mollic or umbric epipedon (Soil Survey Staff 1999, p23-5, p26-8) or a mollic horizon if high base saturation (FAO, 2006, p.25) or umbric horizon in WRB if base depleted (IUSS Working Group WRB 2006, p.38). Soils with humose A, H, and Oh horizons are classified in Humic subgroups.

Distinct topsoil

This is a surface horizon or sequence of horizons that does not qualify as a peaty or humose topsoil or as a thick anthropogenic A horizon, but meets the following requirements:

1. Comprises an **F, H, Oh, Ah, Ap**, or some combination of these horizons.
2. At least 5 cm thick (excluding fresh litter), and enough organic matter to give an Ap containing at least 0.6% w/w organic carbon (1% w/w. organic matter) if the soil is mixed to a depth of 15 cm.

A distinct topsoil can be up to 40 cm thick and may qualify as mollic, umbric, or anthric (IUSS Working Group WRB 2006, p.25,38,12).

Mollic A horizon

The following criteria have been applied for identifying Mollic A horizons in Ireland (AFT, unpublished):

1. > 50 % base saturation (NH_4AOc)
2. > 0.58 % w/w organic carbon
3. C/N ratio is 17 or less if virgin and 13 or less if cultivated
4. < 250 ppm P_2O_5 (soluble in citric acid)
5. At least 25 cm thick on unconsolidated material
6. At least 10 cm thick if resting on rock
7. A colour value < 3.5 when moist and < 3.5 when dry
8. A colour chroma < 4
9. Consistence must be soft when dry

Thick anthropogenic A horizon

This is a dark A horizon at least 40 cm thick, that evidently results from addition of earth-containing manure, incorporation of waste materials originating from former human occupation, or unusually deep cultivation of soil rich in organic matter. It has a colour value of 4 or less and contains at least 0.6% w/w organic carbon throughout its depth. Organic matter is intimately mixed with the mineral fraction in all subhorizons, and artefacts such as pieces of brick or pottery are commonly present.

This diagnostic horizon corresponds to the thick A1 horizon of De Bakker and Schelling (1966), and includes plaggen epipedons and some anthropic epipedons (Soil Survey Staff 1999, p22), anthric and plaggic horizons in WRB (IUSS Working Group WRB 2006, p12, 32). Naturally formed A horizons > 40 cm thick are evidently rare in Ireland but may be found locally in 'receiving' sites where incorporation of organic matter *in situ* has kept pace with slow sedimentation, or where topsoil material has accumulated as a result of accelerated erosion and colluviation. Horizons of the latter type are not classed as thick anthropogenic (man-made) A horizons, although they may result indirectly from human activity; some plaggen soils in Ireland may have anthric, plaggic or terric horizons.

Terric horizon

A terric horizon (from Latin terra, earth) is a human-induced surface horizon. It meets the following requirements:

1. Qualifies as a **T** horizon
2. Has a thickness of 40 cm or more.

It develops through addition of earthy manures, compost, beach sands, calcareous sands and shells or mud over a long period time. It builds up gradually and may contain stones, randomly sorted and distributed. It commonly contains artefacts such as pottery fragments, cultural debris and refuse, which are typically very small (< 1 cm in diameter) and much abraded and occupy < 20 % v.

Subsurface horizons: Indicative of leaching, eluviation, weathering & cementation

Albic E horizon

This is an E horizon (**Ea**, **Eag** or **Eg**) at least 5 cm thick, in which coats on mineral particles are absent, very thin or discontinuous, to the extent that the colour of the horizon is mainly determined by the colours of uncoated particles. Clay and free iron have been removed. The moist colour value is 4 or more, a dry value of 5 or more, or both. If the moist value is 5 or more, or if the parent material has a hue of 5 YR or redder, the moist chroma is 3 or less; otherwise it is less than 3.

An albic E horizon (albic horizon in Soil Taxonomy (Soil Survey Staff 1999, p29) & albic horizon in WRB (FAO, 2006, p.11) normally overlies an argillic B horizon, containing more iron + aluminium and a smaller proportion of quartz and other resistant minerals in the sand and silt fractions, or podzolic B horizon. An albic horizon can, however, contain more silicate clay than the horizon below as a result of increased weathering of clay-forming minerals or rock fragments in coarser size grades. If the underlying horizon is podzolic B rather than argillic, there is usually greater removal of iron.

Podzolic B horizon

This is a B horizon in which amorphous materials containing organic matter and aluminium, iron, or both, have accumulated, either by illuviation or by biochemical weathering *in situ*. It meets the following requirements (Avery (1980, p.28-9; An Foras Talúntais, unpublished):

1. Qualifies as **Bh**, **Bs** or **Bf**, or comprises some combination of these in vertical succession.
2. The moist chroma is greater than 3, or the value is 3 or less.
3. Starts within 120 cm depth; underlies an E, A, H or O horizon, and extends below 15 cm depth, excluding fresh or partially decomposed litter (L, F).
4. At least 10 cm thick if there is no overlying albic E horizon and it consists only of a Bs horizon; at least 2.5 cm thick if it consists only of a Bh horizon below an albic E horizon.
5. >0.29% organic carbon or 1% free sesquioxides, and C:N ratio of 14:1 (An Foras Talúntais, unpublished).
6. No clay skins or significant structural development (An Foras Talúntais, unpublished)
7. SiO_2/Al_2O_3 of clay fraction < in E or A2 horizon (An Foras Talúntais, unpublished).

To aid identification, the following guidelines should prove helpful.

- (i) generally the colour for a Bs should be: Hue 5YR or 7.5YR with value of 4 or more and chroma 6 and more; or 10YR in hue with value 5 or more and chroma 6 or more.
- (ii) normally the Bs horizon *sensu stricto* has < 30% clay, because with $\geq 30\%$ clay, a Bs is unlikely to be permeable enough to allow the necessary leaching of Fe compounds. In such heavy textured material ($\geq 30\%$ clay) bright subsoil colours are more likely to be inherited from the parent material
- (iii) Furthermore, soils with such a texture are unlikely to be acid enough to permit the necessary movement of Fe and Al. Therefore, it is important to test the pH of such soils in the field and the investigator should be finding a pH of 5.5 or lower value, except where it is known or likely that the soil has been recently limed.

This diagnostic horizon is conceptually equivalent to the spodic horizon (Soil Survey Staff 1999, p49-52; FAO 2006, p.35-6) but is defined in less restrictive terms and so includes some Bs horizons classed as cambic in the Soil Taxonomy (Soil Survey Staff 1999, p35-8).

Argillic B horizon

This is an illuvial clay enriched **Bt** or **Btg** horizon, or a succession of such horizons, that meet the following requirements (Avery 1980, An Foras Talúntais, unpublished):

1. At least 5 cm thick as a single horizon, or at least 15 cm thick if it occurs as a succession of bands (as in certain sandy soils), each of which should be at least 1 cm thick.
2. Extends below 30 cm or starts within 1.20 m depth.
3. Immediately underlies an A, E or podzolic B horizon and contains more clay than an overlying horizon.
4. No overlying layer of recent colluvium or alluvium 40 cm or more thick.
5. Clay requirements:
 - a. If eluvial (E) horizon < 15% w/w clay, the argillic B horizon must contain at least 3% w/w more clay, e.g. if E horizon contains 10 % w/w clay, Bt horizon must contain 13 % w/w or more clay.
 - b. If eluvial horizon > 15% and ≤ 40% w/w clay, the argillic B horizon must have a ratio of 1.2 times or more clay (e.g. if E horizon contains 25 % w/w clay, Bt horizon must contain 30 % w/w or more clay).
 - c. Where an argillic B is overlain directly by an Ap horizon the requirements for clay increase are as specified in a) and b) above.

In cultivated soils, where an Ap horizon lies directly above the argillic B, it is most likely that the eluvial (E) horizon has been mixed with the topsoil to create a thicker A horizon than previously existed.

In addition to the requirements specified above, clay skins may be observed in the argillic B. In massive soil the clay skins bridge one particle from another or if peds are present clay skins may be observed on both vertical and horizontal faces.

This diagnostic horizon is essentially equivalent to the argillic horizon in the Soil Taxonomy (Soil Survey Staff 1999, p29-34), but is defined in slightly modified terms.

Weathered B (Cambic) horizon

This is a **Bw** horizon with hue 10YR or redder, moist value 3-4 and chroma 3 or more, or moist value 5 and chroma 4 or more, that meets the following requirements:

1. At least 5 cm thick and extends below 30 cm depth.
2. No underlying Bt or Btg horizon unless it contains less clay than an overlying horizon or the Bw is in recent colluvium or alluvium more than 40 cm thick.

Weathered B (Cambic) horizons show weak evidence of alteration by weathering, leaching and/or structural reorganisation but do not qualify as Bt, Bh, Bs or Bf horizons.

Weathered B (Cambic) horizons lack accumulation of sesquioxides, show other evidence of alteration (e.g. formation of clay), contain weatherable minerals, have uniform $\text{SiO}_2/\text{Al}_2\text{O}_3$ in clay fraction, include ungleyed cambic horizons (Soil Survey Staff 1979, p35-8) and lack the pellets diagnostic of podzolic B horizons. Others that fail to qualify as cambic either because they are sandy or because they fail to meet other requirements are considered to be weathered B horizons. These weakly expressed B horizons occur mainly in recent alluvium or colluvium, derived from pre-existing soil horizons, or in older deposits that are stratified or reddish; some are differentiated from the underlying horizon only by structure, e.g. in brownish or reddish, non-calcareous river alluvium.

Fragic properties (Fragipan)

A horizon with fragipan characteristics is compact but uncemented with high bulk density compared with the overlying horizon. It is normally loamy and underlies an E or B horizon, but can occur directly below an A horizon in eroded soils. It has the following properties:

1. Very firm or stronger consistence when dry, and distinctly brittle when moist (a 3 cm specimen cube fractures suddenly when pressure is applied rather than deforming gradually).
2. Slow permeability; if the overlying horizon is periodically wet, the pan appears relatively dry.
3. Coarse prismatic, massive or platy structure. Most fragipans have a roughly polygonal pattern of vertical cracks surrounding coarse or very coarse prisms, within which the structure is massive or platy. They are usually mottled, with grey or greyish colours on the prism faces and most have clay coats (argillans) lining cracks or in pores.
4. Low organic matter and few roots, except in widely spaced cracks.
5. An upper boundary that is usually abrupt or clear and is between 25 and 100 cm depth. The horizon is from 10 cm to more than 1 m thick, with a gradual or diffuse lower boundary.
6. Clay film requirements
 1. If massive soil, there should be clay bridging from one particle to the other
 2. If peds are present there should be clay films on both vertical and horizontal faces

Subsurface horizons: Indicative of wetness and waterlogging

Soil affected by seasonal or continuous waterlogging are defined by a number of characteristic subsurface gleyed horizons and features. The presence of manganese (Mn) concretions or Fe/Mn nodules can be indicative of wetness but such deposits are insufficient alone to define soil horizons as gleyed or (g) without some mottling and/or evidence of greyish colours on ped faces.

Gleyed subsurface horizon

This is a subsurface horizon that has greyish or mottled colours attributable to reduction or reduction and segregation or removal of iron in the presence of organic matter. It is wet for significant periods in most years or formed under wet conditions and meets the following requirements:

1. Qualifies as **Eag, Eg, Bg, Btg, BCg, Cg** or **CG** within 40 cm depth and lacks fragipan characteristics.
2. At least 5 cm thick and extends below 30 cm depth.

A gleyed subsurface horizon (from Russian gley, mucky soil mass) may also qualify as an argillic B horizon (Btg) or as a cambic horizon (Soil Survey Staff 1975). A gleyed cambic horizon directly underlies an A or O horizon; is finer than loamy fine sand; extends below 25 cm depth; has soil structure or lacks rock structure in at least half the volume; lacks fragipan characteristics; and has colours that meet criteria 1 or 2 for a Bg horizon and do not change on exposure to air. It also has one or more of the following:

1. A regular decrease in organic-carbon content with depth and less than 0.2%, organic carbon at 1.25 m depth or immediately above a sandy-skeletal substratum at ≤ 1.25 m.
2. Cracks that open and close in most years and are 1 cm or more wide at 50 cm depth.
3. An overlying histic epipedon consisting of mineral soil material, or a mollic or umbric epipedon (Soil Survey Staff 1999, p22-8).

Thus, a loamy or clayey Eag, Eg, Bg or Cg horizon, or some combination of these, can qualify as cambic, but most gleyed subsurface horizons in recent alluvium are excluded because they fail to meet requirement 1.

Gleyic features

A soil without a gleyed subsurface horizon is described as having gleyic features if it meets one or both of the following requirements:

1. An Eg, Bg, Btg, BCg or Cg horizon starting between 40 and 80 cm depth.
2. One or more of the following, starting within 60 cm depth,
 - a. Common or many ochreous mottles or segregations unaccompanied by ped-face or matrix colours of low chroma as specified for a Bg horizon, as in certain Bw (g), Bt(g), Bgf and Cgf horizons.
 - b. Matrix hue of 5YR or redder and chroma of 4 or more derived from reddish parent material and faint to distinct mottles or ped-face colours at least 1 unit lower in chroma, 2.5 units yellower in hue, or both, than the matrix.
 - c. In other horizons with dominant chroma of 4 or more, distinct to prominent mottles, or similarly contrasting ped-face colours, lower in chroma & yellower in hue than the matrix.
 - d. Ochreous mottles in extremely calcareous materials.

Horizons meeting requirements 2b or 2c are usually slowly permeable (saturated hydraulic conductivity < 10 cm day⁻¹). As well as resulting from reduction and segregation of iron within the rooting zone, ochreous or pale-coloured mottles may be inherited unchanged from a pre-Quaternary rock, result from irregular oxidation of iron bearing minerals under well aerated conditions, or reflect the juxtaposition of strongly oriented clay bodies and zones depleted of clay, as in Eb & Bt horizons.

Soils with mottled subsurface horizons attributable to one of these modes of origin are not considered to have gleyic features unless there is also evidence of current or former wetness.

Gleyic colour pattern Soil materials develop a gleyic colour pattern if they are saturated with groundwater, unless drained, for a period that allows reducing conditions to occur and show a gleyic colour pattern. A gleyic colour pattern in the lower part of the soil and/or inside the peds leads to the absence of colours with a hue redder than 2.5YR. Oxidised Fe and Mn compounds are concentrated on ped surfaces or in biopores (rusty root channels).

In general the lower subsoil horizons will have grey matrix colours:

- (i) Hue 7.5YR chroma =1;
- (ii) Hue 10YR or yellower chroma ≤ 2 ;
- (iii) or greyish (Hue N, GY), greenish (Hue GY,G) and bluish (Hue BG, B) hues

Slowly permeable subsurface horizon

This is a subsurface horizon that is at least 15 cm thick, starts within 80 cm depth, and acts as a significant barrier to water movement when the soil is saturated. It is defined in precise terms as having a horizontal saturated hydraulic conductivity (K_s) less than 10 cm day^{-1} . In the absence of measured K_s values, it is identified by the following properties:

1. Massive, platy or prismatic structure, or angular blocky structure that is coarse, weakly developed, or both.
1. Moderately firm or firmer soil or ped strength when moist.
2. Few ($< 0.5\%$) or widely spaced visible macropores (Hodgson 1976, p.45). Fissures which may be present when the horizon is dried close more or less completely when it is wet.
3. Greyish or mottled colours attributable to gleying in and/or immediately above the horizon. If peds are present, they usually have greyish faces and ochreous mottles internally (Bg, Btg or BCg horizon), though these features may be absent in slowly permeable subsurface horizons derived from reddish parent materials. If the horizon is massive or platy, greyer colours are typically associated with widely spaced fissures or surfaces of stones.
4. High packing density (Hodgson 1976, p.39), very small ($< 5\%$ w/w) air capacity (Thomasson 1975), or both.

Slowly permeable subsurface horizons that are loamy usually have fragipan characteristics, or meet all requirements of a fragipan except brittleness. The above physical and morphological properties can be induced in surface and sub-plough layers by inappropriate cultivations or other practices. Soils in which the upper part of a B horizon has been compacted in this way are not considered to have a slowly permeable subsurface horizon if underlying horizons are relatively permeable.

Stagnic properties

Stagnic properties are the expression of gley features in the presence of a slowly permeable sub-surface horizon. Soils with stagnic properties have:

1. A slowly permeable horizon ((saturated hydraulic conductivity $< 10 \text{ cm day}^{-1}$) *and*
2. An Eg, Bg, Btg, BCg or Cg horizon starting between 40 and 80 cm depth *or*
3. One or more of the following, starting within 60 cm depth,
 - (a) Common or many ochreous mottles or segregations unaccompanied by ped-face or matrix colours of low chroma as specified for a Bg horizon as in certain Bw (g), Bt(g), Bgf and Cgf horizons.
 - (b) Matrix hue of 5YR or redder and chroma of 4 or more derived from reddish parent material and faint to distinct mottles or ped-face colours at least 1 unit lower in chroma, 2.5 units yellower in hue, or both, than the matrix.
 - (c) In other horizons with dominant chroma of 4 or more, distinct to prominent mottles, or similarly contrasting ped-face colours, lower in chroma and yellower in hue than the matrix.
 - (d) Ochreous mottles in extremely calcareous materials.

Stagnic colour pattern

Soil material has a stagnic colour pattern (from Latin stagnare, to stagnate) if at least it is temporarily, saturated with surface water, unless drained, for a period long enough to allow reducing conditions to occur. A stagnic colour pattern shows mottling in such a way that the surfaces of the peds (or parts of the soil matrix) are lighter (at least one Munsell value unit more) and paler (at least one chroma unit less), and the interiors of the peds (or parts of the soil matrix) are more reddish (at least one hue unit) and brighter (at least one chroma unit more) than the non-redoximorphic parts of the layer, or than the mixed average of the interior and surface parts.

Classification of soils in Ireland

These criteria are developed from those used by An Foras Talúntais (National Soil Survey of Ireland) to classify Ireland's soils at Great Soil Group level. The original criteria have been extracted from unpublished documents held in the archives of Johnstown Castle, Wexford. Further development of the criteria by the project team used information collated from the soil profile descriptions and data in the published County Bulletins.

Table 4 shows the structure of the classification.

A Great Soil Group '0 Raw Soils' maybe introduced in due course to include non-calcareous dune and wind-blown sands, tidal marsh sediments etc.

Table 4 Classification of Soils in Ireland

GSG_ Code	Great Soil Group (GSG)	SG code	Soil Group (SG)	SSG code	Soil Subgroup (SSG)
1	Lithosols	1.1	Lithosols	1.11	Typical Lithosols
				1.12	Humic Lithosols
				1.13	Histic Lithosols
2	Rendzinas	2.1	Rendzinas	2.11	Typical Rendzinas
				2.12	Gleyic Rendzinas
				2.13	Humic Rendzinas
				2.14	Stagnic Rendzinas
				2.15	Histic Rendzinas
3	Brown Earths	3.1	Non-calcareous Brown Earths	3.11	Typical Brown Earths
				3.12	Gleyic Brown Earths
				3.13	Humic Brown Earths
				3.14	Stagnic Brown Earths
				3.15	Humi-stagnic Brown Earths
		3.2	Calcareous Brown Earths	3.21	Typical Calcareous Brown Earths
				3.22	Gleyic Calcareous Brown Earths
		3.23	Stagnic Calcareous Brown Earths		
4	Luvisols	4.1	Luvisols	4.11	Typical Luvisols
				4.12	Gleyic Luvisols
				4.13	Humic Luvisols
				4.14	Stagnic Luvisols
5	Brown Podzolics	5.1	Brown Podzolics	5.11	Typical Brown Podzolics
				5.12	Gleyic Brown Podzolics
				5.13	Humic Brown Podzolics
				5.14	Stagnic Brown Podzolics
6	Podzols	6.1	Non-Gley Podzols	6.11	Ferric Podzols
				6.12	HumoFerric Podzols
		6.2	Gley Podzols	6.21	Typical Gley Podzols
				6.22	Stagno-Gley Podzols
		6.3	Stagno-Podzols	6.31	Ferric Stagno-Podzols
				6.32	Iron-pan Stagno-Podzols

GSG Code	Great Soil Group (GSG)	SG code	Soil Group (SG)	SSG code	Soil Subgroup (SSG)		
7	Gleys	7.1	Surface-water Gleys	7.11	Typical Surface-water Gleys		
				7.12	Humic Surface-water Gleys		
		7.2	Ground-water Gleys	7.21	Typical Groundwater Gleys		
				7.22	Humic Groundwater Gleys		
				7.23	Calcareous Groundwater Gleys		
				7.24	Humic Calcareous Groundwater Gleys		
		7.3	Undifferentiated Gleys	7.31	Typical Undifferentiated Gleys		
		8	Alluvial soils	8.1	Brown Alluvial Soils	8.11	Typical Brown Alluvial Soils
						8.12	Gleyic Brown Alluvial Soils
8.13	Humic Brown Alluvial Soils						
8.2	Alluvial Gleys			8.21	Typical Alluvial Gleys		
				8.22	Humic Alluvial Gleys		
				8.23	Typical Calcareous Alluvial Gleys		
				8.24	Humic Calcareous Alluvial Gleys		
9	Peat soils	9.1	Ombrotrophic Peat Soils	9.11	Raw Ombrotrophic Peat Soils		
				9.12	Earthy Ombrotrophic Peat Soils		
				9.13	Cut-over Ombrotrophic Peat Soils		
				9.14	Industrial Ombrotrophic Peat Soils		
		9.2	Minerotrophic Peat Soils	9.21	Raw Minerotrophic Peat Soils		
				9.22	Earthy Minerotrophic Peat Soils		
10	Anthropogenic soils	10.1	Anthrosols	10.11	Terric Anthrosols		
				10.12	Stagni-terrific Anthrosols		
		10.2	Technosols				

Note: Where no further distinctions are made in the Group, the Group maintains the Great Soil Group or Soil Group name.

1. Lithosols

These are shallow non-calcareous soils with little altered substrate (normally C or R), commonly hard rock or skeletal material comprising > 80% coarse fragments (> 2 mm esd) at or above 30 cm. They tend to be skeletal stony soils associated with frequent rock outcrops and correlate with the Leptosol Reference Soil Group of WRB (FAO, ISRIC & ISSS 1998, IUSS Working Group WRB 2006a).

1.1 Lithosols

Lithosols are recognised where the A horizon overlies hard rock or skeletal material and lack an E, or a weathered or otherwise altered B horizon.

1.11 Typical lithosols

Typical lithosols have a distinct topsoil.

1.12 Humic Lithosols

Humic Lithosols have an organo-mineral topsoil that qualifies as humose mineral material, Peaty loam or Peaty sand, containing < 20% organic carbon (< 30% organic matter).

1.13 Histic Lithosols

Histic Lithosols have a peat surface horizon (> 20% organic carbon) less than 40 cm thick.

2. Rendzinas

Rendzinas are shallow calcareous (> 2% CaCO₃) soils with hard rock (R) or skeletal material comprising > 80% coarse fragments at or above 30 cm. These soils correlate with the Leptosol Reference Soil Group of WRB (FAO, ISRIC & ISSS 1998, IUSS Working Group WRB 2006), developed in/on calcareous bedrock.

2.1 Rendzinas

Rendzinas can have a thin B horizon over calcareous parent material.

2.11 Typical Rendzinas

Typical Rendzinas have a distinct topsoil.

2.12 Gleyic Rendzinas

Gleyic Rendzinas have gleyic features derived from a shallow fluctuating water table.

2.13 Humic Rendzinas

Humic Rendzinas have a humose topsoil.

2.14 Stagnic Rendzinas

Stagnic Rendzinas have stagnic properties derived from a slowly permeable substrate such as extremely calcareous mudstone or compacted calcareous till.

2.15 Histic Rendzinas

Histic Rendzinas have a peat surface horizon (> 20% organic carbon) less than 40 cm thick.

3. Brown Earths

Brown Earths are well drained soils possessing rather uniform profiles with little differentiation into horizons. They have a Bw horizon with a colour (10YR or redder, moist value 3-4 and chroma 3 or more, or moist value 5 and chroma 4 or more) or structural change compared with lower horizons. They have not been extensively leached or degraded (i.e. they lack argillic (Bt) or podzolic B (Bs, Bh) horizons) although some leaching has resulted in the translocation of calcium and magnesium. These soils possess a cambic B horizon, and correlate closest with the Cambisol Reference Soil Group of WRB (FAO, ISRIC & ISSS 1998, IUSS Working Group WRB 2006).

3.1 Non-calcareous Brown Earths

Non-calcareous Brown Earths have a non-calcareous cambic B horizon and are formed in or on non-calcareous substrates.

3.11 Typical Brown Earths

Typical Brown Earths have a distinct topsoil.

3.12 Gleyic Brown Earths

Gleyic Brown Earths have gleyic features derived from a shallow fluctuating water table.

3.13 Humic Brown Earths

Humic Brown Earths have a humose topsoil.

3.14 Stagnic Brown Earths

Stagnic Brown Earths have stagnic properties derived from a slowly permeable subsurface horizon.

3.15 Humi-stagnic Brown Earths

Humi-stagnic Brown Earths have stagnic properties and a humose topsoil.

3.2 Calcareous Brown Earths

Calcareous Brown Earths are calcareous within 40 cm and have a calcareous cambic B horizon and are formed in calcareous parent materials.

3.21 Typical Calcareous Brown Earths

Typical Calcareous Brown Earths have a distinct topsoil.

3.22 Gleyic Calcareous Brown Earths

Gleyic Calcareous Brown Earths have gleyic features derived from a shallow fluctuating water table

3.23 Stagnic Calcareous Brown Earths

Stagnic Calcareous Brown Earths have stagnic properties derived from a slowly permeable subsurface horizon.

4. Luvisols

The development of these soils is associated with clay eluviation and Luvisols have a B horizon with significant accumulation of clay (argillic B horizon) compared with the overlying horizons. Base saturation is > 35% w/w and an albic E horizon, with a light colour and low organic matter or iron content, may be present between the A and argillic B horizons. These soils show evidence of clay movement by eluviation and are decalcified, thus soils that are calcareous do not have argillic B horizons. They correlate closest with the Luvisol Reference Soil Group of WRB (FAO, ISRIC & ISSS 1998, IUSS Working Group WRB 2006).

4.1 Luvisols

Four subgroups are recognised.

4.11 Typical Luvisols

Typical Luvisols have a distinct topsoil.

4.12 Gleyic Luvisols

Gleyic Luvisols show gleyic features as a result of the presence of a shallow fluctuating groundwater table.

4.13 Humic Luvisols

Humic Luvisols have a humose topsoil.

4.14 Stagnic Luvisols

Stagnic Luvisols show stagnic properties caused by a slowly permeable subsurface horizon.

5. Brown Podzolics

Brown Podzolics show features of incipient podzolic processes but are not sufficiently expressed to classify them as Podzols. They have a podzolic B horizon (Bs) but lack an albic (E) horizon. The podzolic B has a moist chroma > 3. Degraded Podzols, primarily through cultivation or land improvement, are also included and in these cases there may also be a thin discontinuous iron pan present.

5.1 Brown Podzolics

Four subgroups are recognised.

5.11 Typical Brown Podzolics

Typical Brown Podzolics have a distinct topsoil.

5.12 Gleyic Brown Podzolics

Gleyic Brown Podzolics show gleyic features as a result of the presence of a shallow fluctuating groundwater table.

5.13 Humic Brown Podzolics

Humic Brown Podzolics have a humose topsoil.

5.14 Stagnic Brown Podzolics

Stagnic Brown Podzolics show stagnic properties as a result of the presence of a slowly permeable sub surface horizon.

6. Podzols

Podzols have a dark, humose or peaty surface horizon and an albic horizon (E) overlying a podzolic B horizon (Bs). If the topsoil is peaty it should be < 40 cm thick. The albic horizon has a moist colour value > 4. An iron pan may be present and if the topsoil is peaty a Bh horizon may also develop. Gleying can also occur within the profile. As defined here, these soils correlate with the Podzol Reference Soil Group of WRB (FAO, ISRIC & ISSS 1998, IUSS Working Group WRB 2006).

6.1 Non-gley Podzols

Non-gley Podzols are freely drained Podzols with an albic horizon above a Bs or Bh horizon and lack a well cemented iron pan.

6.11 Ferric Podzols

Ferric Podzols have a Bs horizon. A Bh horizon is absent or incipient (< 2.5 cm thick).

6.12 HumoFerric Podzols

Humoferric Podzols have a Bh horizon (at least 2.5 cm thick) that overlies a Bs horizon.

6.2 Gley Podzols

Gley Podzols have a gleyed subsurface horizon, an albic horizon, a prominent Bh that is commonly iron deficient and lack a well cemented iron pan.

6.21 Typical Gley Podzols

Gley Podzols have a gleyed subsurface horizon (Bg) below the Bs derived from a shallow fluctuating groundwater table in low lying sites. Typical Gley Podzols have an iron deficient Bh, no Bs and lack evidence of a slowly permeable layer at depth.

6.22 Stagno-Gley Podzols

On raised sites, a slowly permeable fine textured subsurface layer at depth impedes drainage below the Bs that commonly qualifies as a B2tg. Stagno-Gley Podzols have a slowly permeable layer below the Bs.

6.3 Stagno-Podzols

Stagno-Podzols have evidence of gleying typically in the albic horizon (Eg), or within the upper parts of the underlying Bs, but tend to lack a Bh horizon.

6.31 Ferric Stagno-Podzols

Ferric Stagno-Podzols lack an iron pan and have an Eg horizon above a Bs horizon

6.32 Iron-pan Stagno-Podzols

Iron-pan Stagno-Podzols have a peaty topsoil above a gleyed albic horizon (Eg) that rests directly on a cemented, continuous thin iron pan that impedes vertical water movement. A Bh horizon is commonly absent or very thin (< 2.5 cm thick).

7. Gleys

Gley soils are poorly drained soils that have developed under permanent or intermittent waterlogged conditions, caused by a high ground water table or a perched water table. The perched water table is caused by a slowly permeable sub-surface horizon associated with impervious subsoil or parent materials. However, both conditions may be evident in some situations. The subsurface horizons are gleyed within 40 cm depth. Surface water gleys correlate with soils in the Stagnosol WRB Reference Soil Group and Ground water Gleys with the Gleysol WRB Reference Soil Group (IUSS Working Group WRB, 2006, p56, 59, 80-81, 95).

7.1 Surface water gleys

Surface water gleys have a gleyed subsurface horizon and a slowly permeable sub surface horizon. The slowly permeable subsurface horizon impedes vertical water movement from in situ precipitation and/or lateral run off from upslope positions resulting in seasonal waterlogging. The slowly permeable subsurface horizon is usually a gleyed argillic B horizon (Btg). These soils show prominently mottling above 40 cm.

7.11 Typical Surface-water Gleys

Typical Surface-water Gleys have a distinct topsoil.

7.12 Humic Surface-water Gleys

Humic Surface-water Gleys have a humose topsoil.

7.2 Ground water gleys

Ground water gleys have gleyed sub surface horizons and have prominent mottling or uniformly grey subsoils within 40 cm depth. The gleying is caused by periodic waterlogging resulting from a shallow fluctuating groundwater table. The gleyed subsurface horizons and the substratum are permeable. The grey Bg usually passes to a permeable gleyed grey C horizon (Cg). In Ground-water gley soils, lower subsoil horizons generally have grey matrix colours, for example:

- (i) Hue 7.5YR chroma =1;
- (ii) Hue 10YR or yellower chroma \leq 2;
- (iii) or greyish (Hue N, GY), greenish (Hue GY,G) and bluish (Hue BG, B) hues

7.21 Typical Groundwater Gleys

Typical Groundwater Gleys have a distinct topsoil.

7.22 Humic Groundwater Gleys

Humic Groundwater Gleys have a humose topsoil.

7.23 Calcareous Groundwater Gleys

Calcareous Groundwater Gleys have a distinct topsoil and a calcareous sub surface horizon starting within 40 cm.

7.24 Humic Calcareous Groundwater Gleys

Humic Calcareous Groundwater Gleys have a humose topsoil and a calcareous horizon starting within 40 cm.

7.3 Undifferentiated Gleys

Undifferentiated gleys show evidence of surface water and groundwater gley characteristics in same profile pit. They commonly have slowly permeable subsurface horizons causing gleying in the upper profile from a perched water table and a relatively permeable gleyed lower horizon affected by a fluctuating ground water table.

7.31 Typical Undifferentiated Gleys

Typical Undifferentiated Gleys have a distinct topsoil.

[Where a humose topsoil may be found a 7.32 Humic Undifferentiated Gleys subgroup would be established].

8 Alluvial soils

Alluvial soils are formed in deposits of fluvial, lacustrine and marine alluvium. Fluvial alluviums tend to be associated with Recent (or Holocene Epoch, which spans the last 12,000 years) rivers and streams, and lacustrine alluvium in Ireland mostly found in depressions occupied by former glacial or post-glacial lakes. Alluvial Soils that show gleying above 40 cm depth, indicative of poor drainage, are classified as Alluvial Gleys. In many cases there is little pedogenic development and the alluvial substrates tend to be stoneless.

8.1 Brown Alluvial soils

Brown Alluvial soils are formed on alluvial deposits and are well-to-imperfectly drained. They can have loamy or clayey B horizons that may overlie coarser substratum.

8.11 Typical Brown Alluvial Soils

Typical Brown Alluvial Soils have a distinct topsoil.

8.12 Gleyic Brown Alluvial Soils

Gleyic Brown Alluvial Soils have gleyic features.

8.12 Humic Brown Alluvial Soils

Humic Brown Alluvial Soils have a humose topsoil.

8.2 Alluvial Gleys

Alluvial gleys are formed in alluvial deposits and are poorly drained due to the influence of shallow ground water. Alluvial Gleys can have loamy or clayey B horizons that may overlie coarser substratum. They can have varied textures quite often within the same profile.. Recent river alluvium may overlie peat at depth.

8.21 Typical Alluvial Gleys

Typical Alluvial Gleys have a distinct topsoil.

8.22 Humic Alluvial Gleys

Humic Alluvial Gleys have a humose topsoil.

8.23 Typical Calcareous Alluvial Gleys

Typical Calcareous Alluvial Gleys have a distinct topsoil and a calcareous subsurface horizon starting at or within 40 cm.

8.24 Humic Calcareous Alluvial Gleys

Humic Calcareous Alluvial Gleys have a humose topsoil and a calcareous subsurface horizon starting at or within 40 cm.

9 Peat soils

Peat soils are organic-rich soils with an O horizon of more than 40 cm within the upper 80 cm. Three basic peat types are recognized in Ireland:

- 1) Raised Bogs of the Central Plain
- 2) Blanket Bogs of the Western seaboard and the upland regions
- 3) Fen Peats.

Their genesis has been influenced by drainage, climate, hydrology, geomorphology, nutrient status, and glacial geology, but over the centuries these deposits have been drastically altered by man's activities.

Peat soil materials are defined by Hammond (1981, p21) as: "Organic soil materials that are saturated with water for prolonged periods, or are artificially drained, and have 30% or more organic matter if the mineral fraction is 50% clay or more, or 20% or more organic matter if the mineral fraction has no clay, or proportional intermediate organic matter contents if the clay content is intermediate." (after Soil Survey Staff, 1975).

The definition of peat on the basis of thickness of organic material, for land to be classed as peatland, the depth of organic soil material, excluding the thickness of the plant layer (L & F horizons), must be at least 40 cm.

The following soil groups and subgroups are recognised:

9.1 Ombrotrophic peat soils

Ombrotrophic peat soils are rain-fed peat soils in lowland (raised bog) and upland positions (blanket peat). They are oligotrophic with a pH < 4.0 (in CaCl₂ 1:2.5 undried, equivalent to pH 4.5 in 1:2.5 H₂O) throughout the reference section.

9.11 Raw Ombrotrophic Peat Soils

Raw Ombrotrophic Peat Soils have fibrous (Of), semi-fibrous (Om) or humified peat (Oh) horizons.

9.12 Earthy Ombrotrophic Peat Soils

Earthy Ombrotrophic Peat Soils have earthy topsoils due to management practices, such as draining and cultivation /fertilisation.

9.13 Cut-over Ombrotrophic Peat Soils

Cut-over Ombrotrophic Peat Soils have had the surface peat removed by hand cutting methods but the peat thickness still meets the criteria for peat soils.

9.14 Industrial Ombrotrophic Peat Soils

Industrial Ombrotrophic Peat Soils have had the surface peat removed by industrial methods such as machine sod removal and milling but the peat thickness still meets the criteria for peat soils. Fuel production removes the greater part of the profile sequence leaving behind a variable depth of fen peat materials depending on the topography of the underlying bog floor.

9.2 Minerotrophic Peat Soils

Minerotrophic Peat soils are ground water-fed peat systems occurring in river valleys, inter-drumlin hollows and on the periphery of raised bogs. They are eutrophic and have a pH > 4.0 (in CaCl₂ 1:2.5 undried, equivalent to pH 4.5 in 1:2.5 H₂O) in at least some part of the reference section.

9.21 Raw Minerotrophic Peat Soils

Raw Minerotrophic Peat Soils have upper well-humified, amorphous Oh horizons, fibrous (Of) or semi-fibrous (Om) horizons.

9.22 Earthy Minerotrophic Peat Soils

Earthy Minerotrophic Peat Soils have an earthy topsoil.

10 Anthropogenic soils

Anthropogenic soils can be formed by distinct land management practices that have produced thick man-made topsoils by allochthonous (organic and/or mineral) additions and the disturbance and displacement of soil material as a result of mining or excavation.

10.1 Anthrosols

Anthrosols have a thick, dark anthropogenic humose A horizon, where the evidence of anthropogenic activity extends at least 40 cm. These tend to occur in areas subject to repeated application of manures or nutrients, such as seaweed, calcareous sands and shells, and occupation residues. These include soils described as Plaggen soils in Ireland.

10.11 Terric Anthrosols

Terric Anthrosols have a terric horizon.

10.12 Stagni-terrific Anthrosols

Stagni-terrific Anthrosols soils have a terric horizon and stagic properties.

These soils correlate with the Anthrosol Reference Soil Group of the WRB (IUSS Working Group WRB 2006). [Note for an Anthrosol, the Terric horizon needs to be 50 cm thick but this is within a reference section of 100 cm]

10.2 Technosols

Technosols tend to include artefacts of industrial waste (e.g. mine spoil, dredging, rubble) in addition to pre-existing soil horizons that have been rearranged *in situ* or displaced from elsewhere.

These soils correlate with the Technosol Reference Soil Group of the WRB (IUSS Working Group WRB 2006).

Peat soils

Classification of Peat soils

The development of a classification of Peat soils in Ireland has followed that of the US taxonomy system (Soil Survey Staff, 1975). Moving from an initial classification by botanical composition to that of a system defined by nutrient status and altitudinal position, Peat soils are “Organic soil materials that are saturated with water for prolonged periods, or are artificially drained, and have 30% or more organic matter if the mineral fraction is 50% clay or more, or 20% or more organic matter if the mineral fraction has no clay, or proportional intermediate organic matter if the clay content is intermediate.” Hammond, 1981).

Other national classifications of relevance define peat soils as described below.

Avery (1980): “Following the Dutch classification (De Bakker and Schelling 1966), a primary division is made at group level into *raw* and *earthy* peat soils. The latter are characterized by a ripened (earthy) topsoil and thus include almost all the lowland peat soils that have been drained, or drained and cultivated. Subgroups are based on the degree of decomposition and pH of organic horizons within a reference section that extends from 30 to 90 cm below the surface where the lower boundary of the organic layer is deeper than 90 cm and starts progressively nearer or at the surface where the mineral substratum is shallower than 90 cm (see Figure 1)”.

Soil Survey of Scotland (1984) define a major soil group: “Peat is an organic soil which contains more than 60 per cent of organic matter and exceeds 50 cm in thickness. It can develop in areas of moderate to high rainfall, low mean annual temperatures and high relative humidity and under the influence of ground-water in depressions or basins”. Four subgroups are defined, three: eutrophic-, mesotrophic-, and dystrophic-flushed peat depending on the supply of mineral plant nutrients in the seepage waters and the fourth dystrophic peat not affected by flushing water. The Soil Survey of Northern Ireland adopted in part the Soil Major Groups defined by Avery (1980), including peat soils, but further classification is not elaborated (Cruickshank, 1997, p.11-17).

Table 5 Fundamental mire (bog) types (Hammond, 1981 p.8)

Ombrogenous		Topogenous	
Mire type	Nutrient supply	Mire type	Nutrient supply
Blanket Bog	Precipitation	Basin bog	Ground water
Raised Bog ^a	Precipitation	Paludification bog	Ground water
		Spring bogs	Ground water

In redefining a classification of peat soils appropriate for interpretation of legacy data and further reconnaissance mapping, a classification of peat soils that provides a sound basis for evaluating the ‘ultimate use of peatlands’ is needed.

Peatlands of Ireland

The classification of Irish peatlands (blanket bog, raised bog and fen) is derived from their nutrient status (defined by surface vegetation) and altitudinal position (Table 5). However, this can only be applied to those peatlands that are *in situ* and that have not been modified by human activity as a result of past and present usage of peat bogs for fuel production (hand and industrial) and increased utilisation for agriculture and forestry (Hammond, 1981).

For practical purposes Hammond assigned the classification of peats into two broad groups:

- (a) ombrogenous mires (raised and blanket bogs) where development is due to the influence of precipitation;
- (b) topogenous mires (fen peats) where development is controlled by topography and the ground water table. In addition, Hammond identifies the influence of cut-over and industrial extraction of peat and this is considered within the classification system.

The degree of decomposition or humification, which is also used as a criterion for peat classification is based on the method developed by the Swedish peat scientist Lennert von Post in the 1920s. The scale is based on values 1-10 (>number >decomposition). Three separations are made in this scale giving the categories shown in Table 6. The van Post scale in addition with botanical composition aids identification in the field and provides an estimation of permeability, water holding capacity, bulk density (Db) and fibrosity. However, these soil properties are altered by human activity, for example drainage of organic soils will accelerate the degree and rate of decomposition, increase bulk density and decrease fibrosity. The rates of alteration, especially in surface horizons, will be increased by the addition of mineral materials ('marling') and fertilisers (Hammond, 1981). However, the validity of a classification based on botanical composition depends on how well the plants forming the peat can be classified into a few large homogenous groups so that the residues of a few plant groups are similar. The degree to which peat forming plants were preserved depends on past climatic and edaphic conditions. Identification of plant species from more or less decomposed residues can be difficult.

Table 6 Degree of decomposition or humification according to the Von Post scale

Colour of liquid	von Post class
Light -> yellowish-brown	H 1 - 3
Dark -> muddy	H 4 - 6
Black	H 7 - 10

See Annex II

Conclusions

The classification of peat soils in Ireland follows the simple system devised by Hammond, which separates Ombrotrophic from Minerotrophic categories, based on nutrient status and altitudinal position. This distinction has been captured within this proposed system. The addition of 'raw' and 'earthy' categories as defined by Avery (1980) allows the differentiation of managed peat soils within the original classification system (Table 7).

The Raw peat soils essentially occur in undrained sites under semi-natural bog or fen vegetation where peat is still accumulating, and in others where it has ceased to accumulate but where superficial humification has been inhibited by unfavourable moisture or temperature conditions, very low nutrient status or both. Blanket and raised bogs, which have not been reclaimed for agriculture or intensively drained, normally support Raw peat soils, including truncated or disturbed variants where the original surface has been disrupted by peat cutting.

Earthy peat soils occur in drained peatlands used for agriculture and are also found in semi-natural vegetation where the upper horizons are relatively well aerated or calcium-rich. Most of these soils have formed from fen or fen-carr (woody) peat, but variants in oligotrophic raised bogs and blanket bogs do occur.

The addition of a sub-group for industrially extracted peat soils within the Ombrotrophic peat soils group allows for the peat soils found within the Midland region which are subject to sod-extraction either by machine or milled methods.

Table 7 Proposed classification of Peat Soils in Ireland.

Group	Sub group	General Description	Series
9.1 Ombrotrophic Peat Soils	9.11 Raw Ombrotrophic Peat Soils	Raw peat- lowland raised bog in (oligotrophic)	Allen
		Raw peat- upland blanket bog (oligotrophic)	Aughty Knockmealdown (peat over rock)
	9.12 Earthy Ombrotrophic Peat Soils	Earthy ombrotrophic lowland raised bog	Garrynamona
	9.13 Cut over Ombrotrophic Peat Soils	Cut over raw peat	Turbary Aughty cutover Gortnamona
	9.14 Industrial Ombrotrophic Peat Soils	Industrial/mechanically removed peats	Clonsast Boora
9.2 Minerotrophic Peat Soils	9.21 Raw Minerotrophic Peat Soils	Raw lowland fen peat (eutrophic)	Pollardstown Kilbarry (peat over river alluvium)
	9.22 Earthy minerotrophic Peat Soils	Earthy lowland Fen peat (eutrophic)	Banagher

Horizon definitions

The horizon nomenclature used by soil surveyors of An Foras Talúntais (AFT, the Agricultural Institute), in the published Soil Survey County Bulletins, is that described by Taylor and Pohlen (1962) of the New Zealand Soil Bureau. This section defines a selection of specific horizon notation, which follows the more modern terminology for soil description in part that of Avery (1980), USDA (Soil Survey Staff, 1993) and FAO (2006), and which forms part of the definitions of the diagnostic horizons described above. The horizon notation defined below is proposed in order to maintain uniformity with nomenclature that is widely understood in other parts of the world (e.g for WRB (FAO, ISRIC & ISSS 1998, FAO 2006)). The equivalent terminology of Taylor and Pohlen (1962) is introduced to clarify situations where original soil profile descriptions of AFT are important information sources, thus maintaining consistency with legacy data.

Organic horizons

- L** Fresh litter deposited during the previous annual cycle. It is normally loose and the original plant structures are little altered.
- F, H** Organic horizons originating as litter deposited or accumulated at the surface and seldom saturated with water for more than a month at a time.
 - F** Partly decomposed or comminuted litter, remaining from earlier years, in which some of the original plant structures are visible to the naked eye.
 - H** Well decomposed litter, often mixed with mineral matter, in which the original plant structures cannot be seen.
- O** Peaty horizons accumulated under wet conditions. They are saturated with water for at least 30 consecutive days in most years, or have been artificially drained, and include fibrous, semi-fibrous and amorphous peat.
 - Of** Horizon composed of mainly fibrous peat. Of horizons normally qualify as H1-3 in the Von Post (1924) scale.
 - Omf** Horizon composed of mainly semi-fibrous peat. Omf horizons normally qualify as H4-6 in the Von Post (1924) scale
 - Oh** Uncultivated O horizon (humified peat) consisting of strongly decomposed organic material with up to 70% mineral matter by mass (w/w) and few or no identifiable plant remains other than resistant woody fragments > 2 cm that cannot be reduced to fibres by crushing and shredding between the fingers. It is normally black to very dark brown or very dark grey and the colour changes little on drying. The fibre content is less than 15% after rubbing and the pyrophosphate extract on white chromatographic paper has a colour value of 5 or less. Wet samples from undrained (unripened) Oh horizons normally qualify as H7-10 in the Von Post (1924) scale: those that have been drained have generally lost water irreversibly, with the result that a sample may not squeeze easily between the fingers, even when saturated.
 - Op** Peaty surface horizon mixed by cultivation, in which the organic fraction is normally amorphous.

Mineral horizons

- A** Mineral horizon formed at or near the surface, and characterized by incorporation of humified organic matter, disturbance by cultivation, or both. Incorporation of organic matter is presumed to result from biological activity or artificial mixing rather than from downward movement of peptized material.
- Ah** Uncultivated A horizon. It has a moist colour value and/or chroma less than those of the horizon below, and contains at least 0.6% w/w organic carbon (1% Organic matter).
- Ap** Surface mineral horizon evidently mixed by cultivation. It normally has an abrupt or clear lower boundary, and may contain material derived from pre-existing Ah, E, B or C horizons.
- Ahg** A horizon with dominant moist chroma of 2 or less
- Apg** A horizon with common or many ferruginous mottles, or if less mottled dominant chroma of 1 or less, attributable to reduction and segregation of iron caused by periodic saturation with water. Mottles are normally associated with root channels.
- Although surface mineral horizons usually have properties of E or B horizons as well as of A, the designation A is normally given preference.
- AB** The designation AB is applied to subsurface horizons of transitional character in which properties of A are subordinate to or mask those of B.
- AC** The designation AC is used only for an horizon, transitional between an overlying A and an underlying C, that lacks the characteristics of E or B.
- E** Subsurface mineral horizon that contains less organic matter and/or dithionite-extractable iron and/or silicate clay than the immediately underlying horizon, presumably as a result of removal of one or more of these constituents. The moist colour value is 4 or more, the dry colour value 5 or more, or both. An E horizon is differentiated from an overlying A or organic horizon by higher colour value and smaller organic-matter content, and from an underlying B by higher colour value (especially when dry), lower chroma, smaller clay content, weakly developed structure, or normally, some combination of these. It consists mostly of uncoated sand or silt grains, with few or no strongly oriented clay bodies.
- Ea** E horizon without ferruginous mottles or nodules, in which coats on sand and silt particles are absent, very thin or discontinuous, so that the colour of the horizon is mainly determined by the colours of uncoated grains. It usually overlies a Bh horizon, but can also overlie a Bt horizon.
- Eb** E horizon containing enough evenly distributed 'free iron oxide' to give a dominant brownish colour with chroma of 3 or more when moist. It normally overlies a Bt horizon containing significantly more clay, and may otherwise resemble a Bw horizon of similar composition. Where the lower boundary is a lithological discontinuity and there is no clear evidence of an eluvial-illuvial relationship with the underlying (2B) horizon, the notation Eb/Bw can be used (see Bt horizon below). An Eb horizon with mottles or other evidence of gleying too slight to qualify as Eg is designated Eb (g).
- Eg** E horizon with a greyish colour and ferruginous or ferrimanganiferous mottles or nodules attributable to reduction and segregation of iron caused by periodic saturation with water in the presence of organic matter. It has a dominant moist chroma less than 3, or a chroma of 3 or 4 and distinctly higher value (for example 5/3, 6/4) and yellower hue than the main colour of the underlying horizon. An Eg horizon usually overlies a relatively impervious Bg or Btg horizon containing significantly more clay, dithionite extractable iron, or both.

Eag E horizon with a dominant chroma of 2 or less and few or no ferruginous mottles, attributable to reduction and removal of iron. It normally underlies an O horizon and overlies a Bg (or Btg), Bs or Bf horizon that contains more dithionite extractable iron, but may or may not contain more clay.

B Mineral subsurface horizon without rock structure (including fine stratification in soft sediments), characterized by one or both of the following:

1. Illuvial concentration of silicate clay, iron, aluminium or humus, normally in some combination.
2. Alteration of the original material involving solution and removal of carbonates; formation, liberation or residual accumulation of silicate clays or oxides; formation of granular, blocky or prismatic peds; or (normally) some combination of these.

Bf Sharply defined, black to reddish brown, brittle or cemented B horizon less than 10 mm thick (thin iron-pan) enriched in pyrophosphate-extractable iron and carbon. It normally lies between an Ah, Bh or Eag horizon and an ungleyed B or C horizon.

Bg B horizon with dominant colours, on ped faces or throughout, attributable to reduction and segregation of iron caused by periodic saturation with water in the presence of organic matter. Ferruginous segregations occur mainly as mottles within peds rather than as coats on skeletal grains or bordering voids or as tubules associated with root channels. A Bg horizon lacks fragipan characteristics; has blocky or prismatic peds, more clay and/or less CaCO₃ than the underlying horizon, or both; and meets one of the following colour requirements:

1. Moist chroma 1 or less dominant on ped faces, or in the matrix if peds are absent, with or without mottles.
2. Moist chroma 2 or less dominant on ped faces, or in the matrix if peds are absent, accompanied by distinct or prominent mottles of higher chroma and/or redder hue. (If ped faces have organic coats with values of 4 or less, there must be greyish mottles or matrix colours within peds) .
3. Moist value 5 and chroma 3, or moist value 6 or more and chroma 4 or less, dominant on ped faces or in the matrix as above. if either :
 - a. there are common or many prominent mottles, or
 - b. the horizon has a dominant hue of 5YR or redder inherited from reddish (haematitic) parent material and there are common or many, distinct or prominent, greyish or brownish mottles.

Bh B horizon containing translocated organic matter, associated with aluminium, or iron and aluminium, in coats on sand and silt particles or in sand or silt-size pellet-like aggregates. It is darker and has more organic matter than an overlying Ea horizon (if present), contains more pyrophosphate extractable Fe+Al than an overlying E or A horizon, and may be cemented. A Bh horizon is required to contain at least 0.6 per cent. organic carbon, and may or may not contain significant amounts of iron. Those with more than 0.3% dithionite-extractable iron are required to have value and chroma of 3 or less.

Bs B horizon enriched in amorphous material, chiefly aluminium and iron complexed with organic matter, as a result of illuviation and/or biochemical weathering of silicates in situ. It has a moist value and/or chroma of 4 or more and contains more than 0.3% Pyrophosphate extractable Fe+Al, amounting to at least 5 per cent. of the measured clay content. It normally reacts positively to the sodium fluoride test for reactive hydroxy-aluminium (Hodgson 1976, p.94) and contains sand or silt-size pellet like aggregates, sesquioxidic coats on mineral grains, or both. A loamy Bs horizon normally has a redder hue and/or stronger chroma than a Bw horizon in similar material, lacks moderately or strongly developed blocky peds, and has a weak consistence when moist or dry. When very moist the soil material feels greasy or smeary, and has low plasticity in relation to clay content, which is seldom fully evaluated by conventional particle-size analysis using alkaline sodium hexametaphosphate for dispersion. A Bs horizon with mottles indicative of gleying is designated Bs(g).

- Bt** B horizon containing translocated silicate clay, normally shown by the presence of strongly oriented clay-size material in coats (argillans) or intrapedal concentrations (pore fillings, papules or disrupted argillans). It usually underlies an E or Ap horizon, but can also occur in a lower sequum or buried beneath a younger deposit as part of a pre-existing profile. In either case it meets the following requirements:
1. If an overlying E horizon is present and there is no evidence of a lithological discontinuity at its base, the B horizon contains more clay than the E horizon as follows:
 - a. The clay increase takes place within a vertical distance of 30 cm.
 - b. If any part of the E horizon contains less than 15% w/w clay, the B contains at least 3 % w/w more clay; e.g. if E horizon has 10 % w/w clay, the Bt horizon must contain 13 % w/w or more clay.
 - c. If the E horizon contains more than 15 % w/w clay, the ratio of the clay percentage in the B horizon to that in the E is 1.2 or more; e.g. if E horizon has 25 % w/w clay, the Bt horizon must contain 30 % w/w or more clay.
 2. If an Ap directly overlies a Bt then the requirements for clay increase are the same as for 1) above.

If peds are absent, as in most sandy loam or coarser materials, a Bt horizon may have strongly oriented clay coating and bridging of the sand grains and in some pores. If peds are present, a Bt horizon usually has one or both of the following:

- a. Clay skins on ped faces or in pores, either throughout or in the lower part where peds and fissures are most stable.
- b. Evidence of pressures caused by swelling (i.e. stress-oriented skins or slickensides) accompanied by uncoated sand or silt grains on ped faces in the overlying horizon.

If there is a lithological discontinuity between E and B horizons, the difference in clay contents is difficult to ascribe to illuvial processes and hence a Bt horizon need only meet requirements for clay skins or bridges specified above. A Bt horizon with mottles or other evidence of gleying too slight to qualify for the suffix g is designated Bt(g).

Btg Horizon that qualifies as Bt and as Bg.

Bw B horizon that shows evidence of alteration (by weathering, leaching and/or structural re-organization *in situ*) under well aerated conditions, but does not qualify as Bt, Bh, Bs or Bf. It usually lies between an A horizon and an underlying less altered BC or C, but can also overlie a Bg, a buried profile or an E' horizon in a lower sequum. In either case it is differentiated by colour (as in sandy material), structure (as in clay loam or fincr materials), or both, and is usually but not necessarily brown or reddish with chroma of 3 or more and value 4-5. It lacks fragipan characteristics and has blocky or prismatic peds if the clay content is large enough to cause volume changes on wetting and drying. To qualify as Bw rather than BC or C, it must lack rock structure and meet one or more of the following requirements:

1. Less than 40% w/w CaCO₃ equivalent (< 2 mm fraction) and evidence of either partial or complete decalcification, i.e. less CaCO₃ than the underlying horizon, which may contain redeposited (secondary) carbonates.
2. Stronger chroma, redder hue or higher clay content than the underlying horizon.
3. Brownish or reddish colour with hue 10YR or redder, moist value 3-4 and chroma 3 or more, or moist value 5 and chroma 4 or more, and either:
 - a. Granular, blocky or prismatic structure differing from that of the underlying horizon, or
 - b. Sand grains with iron-containing coats or fine intergranular aggregates giving the horizon a colour differing from that of the underlying horizon.

If the horizon is extremely calcareous, or apedal (as in sandy materials), it must meet requirement (3). A Bw horizon with mottles or other evidence of gleying too slight to qualify for the suffix g is designated Bw(g).

Bx Horizon with fragic characteristics. This is a compact but uncemented horizon with high bulk density compared with the overlying horizon. It is normally loamy and underlies an E or B horizon, but can occur directly below an A horizon in eroded soils. It has the following properties:

1. Very firm or stronger consistence when dry, and distinctly brittle when moist (a 3 cm specimen cube fractures suddenly when pressure is applied rather than deforming gradually).
2. Slow permeability; if the overlying horizon is periodically wet, the pan appears relatively dry.
3. Coarse prismatic, massive or platy structure. Most fragipans have a roughly polygonal pattern of vertical cracks surrounding coarse or very coarse prisms, within which the structure is massive or platy. They are usually mottled, with grey or greyish colours on the prism faces, and most have clay coats (argillans) lining cracks or in pores.
4. Low organic matter and few roots, except in widely spaced cracks.
5. An upper boundary that is usually abrupt or clear and is between 25 and 100 cm depth. The horizon is from 10 cm to more than 1 m thick, with a gradual or diffuse lower boundary.

Horizons that have fragipan features, meet the definition of Bt, and contain significantly more clay than an overlying E or A horizon, are designated Btx (or Btgx if the horizon also meets the specification of Bg). Others with clay coats are designated BCtx or BCtgx, and those without as BCx, BCgx or Cx, depending on the degree of gleying and/or other evidence of alteration, in comparison with horizons above and below.

BC A BC horizon is transitional in character (structure, degree of weathering, etc.) between a B and a C horizon and usually lies below a B (Bw, Bg, Bs or Bt) horizon. The same designation is also applied to morphologically similar subsurface horizons in profiles without a B horizon, or in which a B horizon is only intermittently developed. A BC horizon may show features, including greyish colours accompanied by ochreous mottles (BCg), accumulation of secondary carbonate (BCk), or fragipan characteristics (BCx), absent in an overlying B horizon. An horizon containing translocated clay may also be designated BC (i.e. BCt) if it lies above a less altered C horizon and immediately below an horizon that contains more clay and otherwise qualifies as Bw.

C Unconsolidated or weakly consolidated mineral horizon that retains rock structure or otherwise lacks properties characteristic of overlying A, E and B horizons (whichever is present). A C horizon may have been modified by:

1. Gleying and other processes caused by saturation with water.
2. Accumulation of carbonates or more soluble salts.
3. Development of brittleness and associated properties of fragipans.

Cu Unconsolidated C horizon without evidence of strong gleying, accumulation of carbonates or more soluble salts, or fragipan properties. It is normally apedal and may show stratification.

Cr A weakly consolidated, little altered substratum that is dense and/or coherent enough to prevent penetration by roots, except along cracks with an average horizontal spacing of at least 10 cm. Soft rocks (Hodgson 1976, p. 70; Soil Survey Staff, 1993, p.124) such as shale, siltstone or chalk, and some exceptionally hard and dense glacial tills are included. The coherent material is continuous or coarsely fractured *in situ* without significant displacement of the pieces. It can normally be dug with difficulty with a spade when moist, and pieces of 2 cm diameter or less disintegrate to some extent when shaken overnight in alkaline sodium hexametaphosphate solution.

- Ck** C horizon containing secondary CaCO_3 as concretions or nodules, coats, tubular formations or soft concentrations, occupying at least 1 per cent. of the volume of the horizon. (Significant amounts of secondary carbonates occasionally occur in horizons qualifying as B, and commonly in those that are transitional in colour and structure between an overlying B and an underlying C. The latter are designated BCK).
- Cg** C horizon with a dominantly greyish, greenish or bluish colour attributable to reduction or reduction and segregation or removal of iron caused by saturation with water in the presence of organic matter. It normally has a dominant chroma of 2 or less or a colour due to uncoated sand grains. Peds are absent or very weakly developed, and ferruginous segregations, if present, occur wholly or partly as coats on skeletal grains or bordering voids, or as tubules associated with root channels. Cg horizons are typically developed in recent alluvium, in sands, and in other deposits which contain appreciable amounts of organic matter and are or were saturated with water for much of the time. Grey, little altered sediments with no evidence of wetness are designated Cu or Cr, and very slowly permeable mottled horizons transitional in colour and structure between an overlying Bg or Btg and an underlying unmottled C (as in originally grey argillaceous Pleistocene and pre-Pleistocene sediments) are designated ECg rather than Cg.
- CG** Intensely gleyed (reduced) horizon with chroma of 1 or less in yellowish, greenish or bluish hues that change on exposure to air, indicating the presence of readily oxidizable ferrous compounds, usually pyrite or vivianite (ferrous phosphate). Colour changes are commonly visible within a few minutes and can be identified by exposing a wet piece of soil and then breaking it to compare the interior and exterior colours.
- Ferrous compounds can accumulate in any horizon where water stagnates and organic matter is decomposing under anaerobic conditions (for example at the base of seasonally waterlogged Ap horizons), but are rapidly oxidized when aerobic conditions supervene, so that any reduced horizon formed is ephemeral. Actively reducing conditions persist only where stagnant ground water permanently saturates the soil.
- CG horizons are found chiefly in unripened or partly ripened (De Bakker and Schelling 1966) Holocene sediments that contain appreciable amounts of organic matter and have remained waterlogged since they were deposited. Oxidation of pyritic CG horizons yields sulphuric acid, with the result that the soil becomes extremely acid if it does not also contain enough carbonates to neutralize the acid formed (giving gypsum). Segregations of straw coloured jarosite are usually associated with this condition.
- R** Hard or very hard bedrock that is continuous, except for cracks with an average horizontal spacing of at least 10 cm, and without significant displacement of the rock. It has a hardness of 3 or more (Moh's scale) and is too hard to dig with a spade when moist, although the softest kinds may be chipped or scraped with a spade. Pieces of 2 cm diameter or less are unaffected by overnight shaking in sodium hexametaphosphate solution.
- T** A terric horizon is a human-induced mineral surface horizon that develops through the addition of earthy manures, compost, beach sands, shells or mud over a long period of time. It commonly contains artefacts such as pottery, cultural debris and refuse. It is often inhomogeneous and can have irregular textural differentiation. It meets the following requirements:
1. It contains < 20% artefacts (by volume).
 2. It has a base saturation of 50 % or more.
 3. It has a thickness of 40 cm or more.

Annex I Carbonates

Small amounts of calcium carbonate can be estimated in the field by observing the reaction when a few drops of 10 per cent hydrochloric acid are applied (Table 8).

Field assessment of dolomite is less reliable. The field test gives no further guide to the content in soils with more than 10 per cent calcium carbonate.

The CaCO_3 equivalent content of a sample can be expressed numerically as a percentage, or as g kg^{-1} , where 1% is equivalent to 10 g kg^{-1} .

Table 8. Estimating calcium carbonate content (FAO, 2006)

Classification of carbonate reaction in the soil matrix			
	%		
N	0	Non-calcareous	No detectable visible or audible effervescence.
SL	≈ 0–2	Slightly calcareous	Audible effervescence but not visible.
MO	≈ 2–10	Moderately calcareous	Visible effervescence.
ST	≈ 10–25	Strongly calcareous	Strong visible effervescence. Bubbles form a low foam.
EX	≈ > 25	Extremely calcareous	Extremely strong reaction. Thick foam forms quickly.

Warning: eye protection should be worn against acid spray during effervescence.

Soil is assessed as calcareous or non calcareous if field tests show that the < 2 mm fraction contains $\geq 2.0 \text{ \% CaCO}_3$, and non-calcareous if it contains $< 2.0 \text{ \% CaCO}_3$. In the UK, the threshold for defining a soil as calcareous is reduced to 1.0 \% CaCO_3 (Avery, 1980, p10).

Annex II von Post scale

In this field test a sample of wet peat is squeezed in the closed hand and the colour of the liquid that is expressed between the fingers, the proportion of the original sample that is extruded and the nature of the plant residues are observed.

Table 9. Modified version of von Post (1924) scale for assessing the degree of decomposition of peat.

<i>Degree of decomposition</i>	<i>Nature of liquid expressed on squeezing</i>	<i>Proportion of peat extruded between fingers</i>	<i>Nature of plant residues</i>	<i>Description</i>
H1	Clear, colourless	None	Plant structure unaltered; fibrous, elastic	Undecomposed
H2	Almost clear, yellow-brown	None	Plant structure distinct; almost unaltered	Almost undecomposed
H3	Slightly turbid, brown	None	Plant structure distinct; most remains easily identifiable	Very weakly decomposed
H4	Strongly turbid, brown	None	Plant structure distinct; most remains identifiable	Weakly decomposed
H5	Strongly turbid, contains a little peat in suspension	Very little	Plant structure clear but becoming indistinct; most remains difficult to identify	Moderately decomposed
H6	Muddy, much peat in suspension	One-third	Plant structure indistinct but clearer in the squeezed residue than in undisturbed peat; most remains unidentifiable	Well decomposed
H7	Strongly muddy	One-half	Plant structure indistinct but recognisable; few remains identifiable	Strongly decomposed
H8	Thick mud, little free water	Two-thirds	Plant structure very indistinct; only resistant remains such as root fibres and wood identifiable	Very strongly decomposed
H9	No free water	Nearly all	Plant structure almost unrecognisable; practically no identifiable remains	Almost completely decomposed
H10	No free water	All	Plant structure unrecognisable; completely amorphous	Completely decomposed

Annex III Identification and mapping of Podzols and some Gley soils

Notes for field guidance by R.C. Palmer (NSRI)

Podzols

The classification of podzols, especially allocation of soils in which an ironpan is present but not obviously continuous, requires careful excavation of an inspection pit to at least 40cm depth. The following observations need to be made:

1. If there is a continuous iron pan with mottling within the bleached layer (which can be subtle) then the soil is best classified as a Stagno-Podzol. If the iron pan is discontinuous then the soil developed thereon should be classified as a Ferric or Humo-ferric Podzol (both Non-Gley Podzols, i.e. well drained). This distinction is difficult to make solely on the evidence from an auger-borehole.
2. Humo-ferric Podzols (6.12) are distinguished from Ferric Podzols (6.11) by the presence of a Bh (subsurface) horizon; both normally have a topsoil that contains sufficient organic to be classified as 'organo-mineral (humose) – (Figure 2, p15), which is organic-rich because of acidity and slow decomposition of organic matter.
3. Typical Gley Podzols (6.21) are permeable and, similar to GWG soils, have groundwater in the subsoil at some time of year, the subsoil becoming wetter downwards.
4. Stagno-Gley Podzols (6.22) and Stagno-Podzols (6.3) have presence within the profile of a layer that causes wetness in the upper horizons.
5. Stagno-Podzols (6.3) become drier with depth, which may be caused by a continuous iron-pan restricting downward percolation of water – Iron-pan Stagno-Podzols (6.32) – or clay-rich subsoil - Ferric Stagno-Podzols (6.31) - or a mixture of both. Excavation below an iron-pan, or into dense clay-rich subsoil that is slowly permeable, should confirm that the soil is becoming drier with depth thus identifying the cause of wetness.
6. If an iron-pan is present but the horizons above are not gleyed, then the iron-pan is unlikely to be continuous.
7. When mapping Podzols it is important to remember that such soils form part of a *continuum* and there will be intergrades between two types.
8. Probably the most difficult distinction to make is between Stagno-Gley Podzols (6.22) and Ferric Stagno-Podzols (6.31).

Gley soils in mountain fringes

Identifying the cause of wetness in gley soils during routine soil survey requires careful excavation of an inspection pit to at least 40cm depth because, especially in coarse loamy materials, mottle colours are very difficult to measure and interpret on an auger borehole sample.

The following need to be taken into consideration:

1. If the soil is permeable (cLy textures) throughout to below 80cm depth, and has a gleyed horizon above 40 cm depth, then it cannot be classified as a surface water gley (SWG) soil (7.1). A SWG requires a slowly permeable layer starting above and extending below 80cm, in which the clay content is greater than 27 % (as a rule of thumb), to arrest the downward percolation of surplus water.
2. SWG soils have strongly mottled subsoils (often exhibiting stagnic properties) between 30-65 cm, but mottle intensity decreases in the slowly permeable subsoil, where parent material colours start to dominate (from about 80cm downwards).
3. Flush sites (around springs), which typically support ground water gley (GWG) soils (7.2) are often found on sloping sites in upland areas in contrast to the flattish sites that are normally associated with GWG soils found close to streams.
4. Such GWG soils are the result of an underlying slowly permeable layer, which in these cases is an underlying less permeable bedrock rather than a layer with higher clay content. Large volumes of water running down from upslope positions cause temporary waterlogging near the bottom of slopes despite the fact that permeable material predominates. If bedrock occurs within 80 cm depth and it is effectively acting as a slowly permeable layer ie the rock itself is not saturated (in which case it would be a GWG) then soils developed thereon should be classified as SWG soils *over bedrock*.
5. If water is moving laterally downslope within permeable subsoil layers, and these layers are seasonally waterlogged, with no slowly permeable layer occurring within 80 cm depth, then the soil should be classified as a GWG.
6. Undifferentiated gley soils occur where there is a slowly permeable layer within 80cm depth which causes surface wetness, but this layer is not sufficiently thick to continue ≥ 80 cm, and at this depth permeable material is affected by a fluctuating water table; wetness due to both surface and groundwater is occurring within a single profile (1 m^3).

Annex IV National Soil Series, Soil Legend and Classification Schema for Ireland

The use of the 'Loamy' broad texture class in the definition of soil series originates from classification of the legacy data (County soil surveys at scale 1:126,720) for series that included both cLy and fLy horizons. For some soil series defined as Loamy, e.g. Patrickswell, the upper and lower profile textures are commonly USDA loam class with clay contents straddling the 20% clay boundary, see p.19.

No distinction is made between coarse and fine loamy soil materials in defining soil series in the Podzol Great Soil Group. This is because the most distinctive features are the organic-rich topsoil, the Ea and Bs horizons (and iron-pan if present) such that a division of the 'Loamy' broad particle-size class is not necessary.

The tables that follow list the National Soil Series in Ireland as defined in version 9 of the National Soil Series List. The UNnamed series have been identified based on soil properties, e.g. texture, mottling (indicating wetness), substrate type, estimated in the field. These series will only be named and incorporated in the final list of National Soil Series when representative soil profile pits have been excavated and sampled, with the results of laboratory analyses confirming the definitions presented here.

In addition to its name, each soil series is identified by a unique code made by concatenating the Subgroup code and a code based on the series name; for example, Ballylanders is a Typical Brown Earth (311) and has a map code 'BY', hence the unique full series code is '311BY'. This should be used where possible on field maps.

Text in red, blue and green indicate where changes have been made, during the period Feb-Aug 2011, to the previous versions of the Field Guide (v.5.0) and National Legend (v4.0, and 5.0)

National Series	Subgs Code	Modern Definition
UNnamed_01	111 UN01	Loamy over lithoskeletal basic igneous rock
UNnamed_14	111 UN14	Loamy over shale bedrock
UNnamed_51	111 UN51	Loamy over sandstone bedrock
Knockeyon	112 KY	Loamy over lithoskeletal sandstone
Knockshigowna	112 KW	Loamy over lithoskeletal shale or slate bedrock
Rineanna	112 RN	Loamy over lithoskeletal limestone
UNnamed_02	112 UN02	Loamy over lithoskeletal gneiss or schist
Bantry	113 BA	Peat over sandstone and shale bedrock
Carrigvahanagh	113 CV	Peat over lithoskeletal acid igneous rock
Seafield	211 SE	Sandy stoneless drift
UNnamed_15	211 UN15	Loamy over limestone bedrock
Carney	212 CY	Carbonatic-clayey lake marl
Burren	213 BU	Fine loamy over limestone bedrock
Crush	213 CS	Coarse loamy over calcareous gravels
Kilcolgan	213 KC	Fine loamy drift with limestones
Aille	311 AL	Coarse loamy over limestone bedrock
Ballyglass	311 BG	Coarse loamy over sandstone bedrock
Ballylanders	311 BY	Fine loamy over shale or slate bedrock
Ballyvorheen	311 BV	Sandy drift with siliceous stones
Borris	311 BO	Coarse loamy drift with igneous and metamorphic stones
Broomhill	311 BL	Fine loamy over sandstone bedrock
Broughillstown	311 BR	Coarse loamy over calcareous gravels
Clashmore	311 CM	Coarse loamy drift with siliceous stones
Clonroche	311 CL	Fine loamy drift with siliceous stones
Dooyork	311 DY	Sandy stoneless drift
Dovea	311 DO	Fine silty drift with limestones
Kells	311 KE	Coarse loamy over hard shale bedrock
Kennycourt	311 KC	Fine loamy drift with limestones
Kill	311 KI	Fine loamy drift with igneous and metamorphic stones
Kill lithic phase	311 KIL	Fine loamy over acid igneous bedrock
Kinvarra	311 KV	Fine loamy over clayey drift with limestones
Knocksquire	311 KN	Coarse loamy over acid igneous bedrock
Ladestown	311 LA	Fine loamy over calcareous gravels
Randallsmill	311 RM	Coarse loamy stoneless drift
UNnamed_03	311 UN03	Fine loamy over non-calcareous gravels
UNnamed_65	311 UN65	Coarse loamy drift with limestones
Broadway	312 BY	Coarse loamy drift with siliceous stones
UNnamed_16	312 UN16	Fine loamy drift with siliceous stones
Ashgrove	313 AS	Fine loamy drift with siliceous stones
Bantry Bay	313 BB	Coarse loamy dense blue-grey drift with siliceous stones
Carrigogunnel	313 CG	Coarse loamy over lithoskeletal basic igneous rock
Schull	313 SH	Coarse loamy drift with siliceous stones
UNnamed_04	313 UN04	Fine loamy over shale bedrock
Wonderhill	313 WO	Fine loamy over lithoskeletal basic igneous rock
Loughmuirran	314 LO	Clayey drift with siliceous stones (colluvium)
Moord	314 MO	Fine loamy drift with siliceous stones
UNnamed_18	314 UN18	Fine loamy over sandstone bedrock
UNnamed_19	314 UN19	Fine loamy over shale bedrock
UNnamed_52	314 UN52	Coarse loamy drift with limestones
UNnamed_53	314 UN53	Coarse loamy drift with siliceous stones

National Series	Subg. Code	Modern Definition
Baggotstown	321 BG	Coarse loamy over calcareous gravels
Ballincurra	321 BC	Fine loamy over limestone bedrock
Cullahill	321 CH	Fine loamy drift with limestones
Kilfenora	321 KF	Clayey drift over limestone bedrock
UNnamed_05	321 UN05	Fine loamy over calcareous gravels
UNnamed_20	321 UN20	Fine loamy drift with limestones
UNnamed_54	323 UN54	Fine loamy drift with limestones
Athy	411 AT	Coarse loamy over calcareous gravels
Ballynamona	411 BY	Fine loamy drift with igneous and metamorphic stones
Dunboyne	411 DB	Fine loamy drift with siliceous stones
Dungarvan	411 DG	Coarse loamy drift with siliceous stones
Elton	411 ET	Fine loamy drift with limestones
Kellistown	411 KL	Coarse loamy drift with igneous and metamorphic stones
Mortarstown	411 MT	Fine loamy over clayey drift with limestones
Patrickswell	411 PW	Loamy drift with limestones
Patrickswell lithic p	411 PWL	Fine loamy over limestone bedrock
UNnamed_22	411 UN22	Fine loamy over sandstone bedrock
UNnamed_23	411 UN23	Fine loamy over shale bedrock
UNnamed_24	411 UN24	Fine loamy over clayey drift with siliceous stones
Crossabeg	412 CB	Fine loamy drift with siliceous stones
Johnstown	412 JH	Coarse loamy drift with siliceous stones
UNnamed_25	412 UN25	Fine loamy drift with limestones
UNnamed_26	412 UN26	Fine loamy drift with siliceous stones
Crosstown	414 CO	Coarse loamy drift with siliceous stones
Fethard	414 FE	Fine loamy drift with siliceous stones
Rathowen	414 RA	Fine loamy drift with limestones
UNnamed_27	414 UN27	Fine loamy over shale bedrock
UNnamed_28	414 UN28	Fine loamy over clayey drift with siliceous stones
UNnamed_56	414 UN56	Fine loamy over clayey drift with limestones
UNnamed_57	414 UN57	Fine silty drift with siliceous stones
Carne	511 CA	Coarse loamy stoneless drift
Clonin	511 CN	Coarse loamy over sandstone bedrock
Cooga	511 C0	Coarse loamy drift with siliceous stones
Cupidstownhill	511 CU	Fine loamy over shale bedrock
Kiltealy	511 KY	Sandy drift with igneous and metamorphic stones
Ross Carbery	511 RO	Coarse loamy compact drift with siliceous stones
Screen	511 SN	Sandy stoneless drift
UNnamed_06	511 UN06	Coarse loamy over non-calcareous gravels
UNnamed_29	511 UN29	Fine loamy drift with siliceous stones
UNnamed_31	511 UN31	Fine loamy over sandstone bedrock
Clonegall	512 CG	Coarse loamy drift with siliceous stones
Tomard	512 TO	Fine loamy over shale or slate bedrock
Borrisoleigh	513 BE	Fine loamy over mudstone, shale or slate
Crossmolina	513 CM	Coarse loamy drift with limestones
Knockaceol	513 KC	Coarse loamy over sandstone bedrock
Knockboy	513 KB	Coarse loamy drift with siliceous stones
Rathkenny	513 RK	Fine loamy drift with siliceous stones
UNnamed_32	513 UN32	Fine loamy over sandstone bedrock
Corriga	514 CR	Fine loamy drift with siliceous stones
UNnamed_33	514 UN33	Coarse loamy over sandstone bedrock

National Series	Subs	Code	Modern Definition
Ballycondon	611	BN	Loamy drift with siliceous stones
Ballyscanlon	611	BS	Loamy over acid igneous rock
Black Rock Mounta	611	BR	Loamy over gneiss and schist bedrock
Drumslig	611	DS	Loamy over sandstone bedrock
Slievebeag	611	SG	Loamy over shale bedrock
Stonepark	611	SP	Loamy drift with igneous and metamorphic stones
Carrickbyrne	612	CB	Loamy over acid and basic igneous bedrock
Portlaw	612	PO	Loamy drift with siliceous stones
UNnamed_38	612	UN38	Sandy drift with siliceous stones
UNnamed_58	612	UN58	Loamy over sandstone bedrock
Ahuan	621	AH	Loamy drift with siliceous stones
Killadoon	631	KD	Loamy drift with siliceous stones
UNnamed_36	631	UN36	Loamy over sandstone bedrock
UNnamed_37	631	UN37	Sandy drift with siliceous stones
Blackstairs	632	BL	Sandy over granite bedrock
Drumsleed	632	DS	Sandy drift with siliceous stones
Forth Commons	632	FC	Loamy over sandstone bedrock
Glenary	632	BL	Loamy drift with siliceous stones
Killinga	632	KA	Loamy drift with siliceous stones
Knockastanna	632	KS	Loamy over shale bedrock
Monavullagh	632	MV	Sandy over sandstone bedrock (conglomerate)
Clohernagh	711	CH	Fine loamy fragic drift with siliceous stones
Drumkeeran	711	DK	Clayey drift with siliceous stones
Kilrush	711	KR	Fine loamy drift with siliceous stones
Macamore	711	MC	Fine loamy over clayey drift with limestones
Newport	711	NW	Coarse loamy drift with limestones
Straffan	711	ST	Fine loamy drift with limestones
Tramore	711	TR	Coarse loamy drift with igneous and metamorphic stones
UNnamed_08	711	UN08	Clayey over soft shale/slate bedrock
UNnamed_09	711	UN09	Fine loamy over clayey drift with siliceous stones
UNnamed_39	711	UN39	Clayey Stoneless drift
UNnamed_40	711	UN40	Fine loamy over shale bedrock
UNnamed_41	711	UN41	Fine silty shale bedrock
UNnamed_59	711	UN59	Fine loamy over clayey over shale bedrock
UNnamed_60	711	UN60	Fine silty drift with siliceous stones
Ballinamoor	712	BN	Fine loamy drift with limestones
Ballyhaise lithic pha	712	BL	Fine loamy over sandstone or shale bedrock
Cluggin	712	CG	Clayey drift with siliceous stones
Driminidy	712	DY	Coarse loamy drift with siliceous stones
Gortaclareen	712	GN	Fine loamy drift with siliceous stones
Howardstown	712	HN	Clayey limestone drift

National_Series	Subj _s _Code	Modern_Definition
Belmullet	721 BM	Sandy stoneless drift
Kilpierce	721 KP	Fine loamy drift with siliceous stones
Knockroe	721 KO	Coarse loamy drift with siliceous stones
UNnamed_10	721 UN10	Loamy over lithoskeletal shale or slate bedrock
UNnamed_42	721 UN42	Fine loamy drift with limestones
UNnamed_43	721 UN43	Fine loamy stoneless drift
Ballyknockan	722 BK	Sandy stoneless drift
Ballywilliam	722 BW	Coarse loamy drift with igneous and metamorphic stones
Newtown	722 NT	Coarse loamy drift with igneous and metamorphic stones
Puckane	722 PU	Coarse loamy drift with siliceous stones
Slieve Bloom	722 SB	Coarse loamy drift with siliceous stones
Tourmakeady	722 TK	Fine loamy drift with siliceous stones
UNnamed_61	722 UN61	Fine silty drift with siliceous stones
Clonaslee	723 CS	Coarse loamy over calcareous gravels
Mylerstown	723 MT	Fine loamy drift with limestones
UNnamed_45	723 UN45	Coarse loamy drift with limestones
UNnamed_46	723 UN46	Fine loamy over calcareous gravels
Ballintemple	724 BT	Coarse loamy drift with limestones
Ballyshear	724 BS	Fine loamy drift with limestones
Greename	731 GE	Loamy drift with siliceous stones
UNnamed_47	731 UN47	Fine loamy drift with siliceous stones
Aherlow	811 AH	Sandy river alluvium
Clohamon	811 CN	Coarse loamy river alluvium
Finisk	811 FI	Fine silty over non-calcareous gravels
Ilen	811 IL	Loamy river alluvium over gravels
Suir	811 SU	Fine silty river alluvium
UNnamed_11	811 UN11	Coarse loamy river alluvium
UNnamed_12	811 UN12	Silty river alluvium
Rearymore	812 RY	Fine loamy river alluvium
UNnamed_13	812 UN13	Silty river alluvium
UNnamed_62	812 UN62	Carbonatic-loamy lake alluvium
Milltownpass	813 MP	Sandy stoneless drift

National_Series	Subgs	Code	Modern_Definition
Boyne	821	BO	Silty river alluvium
Feale	821	FA	Fine loamy river alluvium
Kilgory	821	KG	Sandy river alluvium
Kilmannock	821	KK	Silty estuarine alluvium
Lyre	821	LY	Coarse loamy river alluvium
UNnamed_48	821	UN48	Fine loamy lake alluvium
UNnamed_63	821	UN63	Fine silty lake alluvium
Vicarstown	821	VI	Clayey river alluvium
Camoge	822	CA	Clayey river alluvium
Coolalough	822	CL	Clayey lake alluvium
Coolfin	822	CF	Fine silty river alluvium
Griston	822	GR	Sandy lake alluvium
Millquarter	822	MQ	Fine silty lake alluvium
Shannon	822	SH	Fine silty estuarine alluvium
UNnamed_49	822	UN49	Coarse loamy river alluvium
UNnamed_50	822	UN50	Coarse loamy over calcareous gravels
Wexford slob	822	WS	Silty marine alluvium
Dunsany	823	DU	Carbonatic-clayey lake marl
Kilmore Slob	823	KS	Sandy marine alluvium
Kilmore slob varian	823	KSV	Clayey marine alluvium
Coolanick	824	CN	Silty lake alluvium
Drombanny	824	DR	Carbonatic-loamy lake marl
Allen	911	AE	Peat (Raised Bog {moss})
Aughty	911	AT	Peat (Blanket Bog)
Knockmealdown	911	KM	Peat over rock
Garrynamona	912	GN	Peat (Raised Bog)
Aughty cutover	913	ATC	Peat (Blanket Bog)
Gortnamona	913	GM	Peat (Raised Bog)
Turbary	913	TB	Peat (Raised Bog, undrained, hand-cut)
Clonsast	914	CS	Peat (Raised Bog, Industrial milled and machined)
Kilbarry	921	KR	Peat over river alluvium
Pollardstown	921	PT	Peat (Fen, undrained)
Banagher	922	BR	Peat (Fen)
Ardmore	1011	AR	Coarse loamy drift with siliceous stones
Curragh	1011	CU	Coarse loamy stoneless drift (calcareous sand)
Monatray	1011	MT	Loamy drift with siliceous stones
Schull Plaggen	1011	SHP	Coarse loamy drift with siliceous stones
	Feb	Jly	}
		Sep	}Changes, additions made in 2011
			}
		Dec	

SITE INFORMATION	
Reference number	Unique identifier for observation point comprised of 7 digit unique ID of MAPNUMBER-OBSERVERINITIALS-SEQUENTIAL NUMBER [e.g. T14ED01]
Grid reference	OSI grid reference read from 1:50 000 discovery map in absence of GPS reading
Map sheet	Code for 10 x 10 km map sheet [T14]
Latitude/Longitude	Degrees minutes decimal seconds [dd mm ss.ssss]. WGS 84.
Picture reference	Picture numbers displayed on camera of pictures taken at the site
Sub group	Numerical code for soil sub group [refer to field guide]
Series	Series name [refer to field guide]
Definition	Series definition [coarse loamy drift with siliceous stones]
Clay %	Estimated clay content from hand texture

Landform			Slope position		Slope degree	Aspect	Form	Elevation		
MO	Mountain	CP	Coastal plain	CR	Crest	Measure slope in degrees by clinometer	By compass. e.g. NNE	S C V X T	Straight Concave Convex Complex Terraced	From GPS reading
HI	Hill	CB	Beach ridge	UP	Upper slope					
VA	Valley	CF	Tidal flats	MS	Middle slope	Flat =0 deg	No aspect when slope= 0		No slope form when degree is 0	
UN	Undulating	PL	Lacustrine plain	LS	Lower slope					
BA	Basin	KA	Kame and kettle	TS	Toe slope					
PN	Plain	DR	Drumlins	BO	Bottom					
PU	Plateau									
AP	Alluvial plain									
AF	Alluvial floodplain									
AT	Alluvial terrace									

Land use type (up to 2 types can be entered)		Land use class (up to 3 classes can be entered)				Human influence (up to 3 classes can be entered)	
AR	Arable	CE	[Cereals]	OI	[Oilcrops]	HN	No influence
GI	Grassland improved	CESB	Spring Barley	OIRA	Oilseed rape		
GU	Grassland unimproved	CEWB	Winter Barley	FR	[Fruits]	NK	Not known
HO	Horticulture	CEMA	Maize	FRTF	Top fruit (apples, pears, plums)	PL	Ploughing
FO	Forestry	CEOA	Oats	FRSF	Soft Fruit (strawberries, blackcurrants)	TE	Terracing
WM	Woodland managed	CERY	Rye			MS	Sand additions
WN	Woodland native	CEWW	Winter wheat	VE	[Vegetables]	PO	Pollution
SC	Scrub	GR	[Grass]	VEGE	Brassicas, carrots, peas, beans	CL	Clearing
BO	Blanket bog	GRGR	Grass grazed			SC	Surface compaction
FN	Fen	GRCO	Grass conserved (hay/silage)	ST	[Stock]	MO	Organic additions
HW	Heath wet	GRCL	Clover	STDY	Diary	SL	Slurry applications
HD	Heath dry	GRMI	Miscanthus	STSU	Sucklers	FE	Fertilizer application
MS	Salt marsh	RO	[Root crops]	STDR	Dry stock	AD	Artificial drainage
MH	Marsh	ROPO	Potatoes	STSH	Sheep	DI	Ditching
		ROBE	Sugar Beet	STHO	Horses	LV	Levelling
		ROFB	Fodder Beet	STDE	Deer	MP	Plaggen
		ROSW	Swedes				

Vegetation class (up to 2 classes can be entered)				VU species	Status	Weather				
EV	Evergreen	HR	Heather	Up to 3 vegetation species can be entered. Derive a 3 letter code for each spp. e.g RHD = Rhododendron	A	Auger Cutting Mini pit	SU	Sunny/clear	SL	Sleet Snow
CO	Coniferous	GR	Grassland		C		PC	Partly cloudy		
MX	Mixed	RU	Rushes		M		OV	Overcast		
DE	Deciduous	BR	Bracken				RA	Rain		

PSC/Peat (first 2 boxes)		PSC/Peat (last 3 boxes)				Humose?	PS Modifier			
VF	For sand Very fine	S	Sand	SCL	Sandy clay loam	P	Peat	0= no 1= yes	FLY	Fine loamy
F	Fine	LS	Loamy sand	ZCL	Silty clay loam				SP	Sandy peat
M	Medium	SL	Sandy loam	CL	Clay loam	LP	Loamy peat	LY	Loamy	
C	Coarse	Z	Silt	SC	Sandy clay	PS	Peaty sand	SY	Sandy	
		ZL	Silt loam	ZC	Silty clay	PL	Peaty loam	CZY	Coarse silty	
FB	For peat Fibrous peat	L	Loam	C	clay			FZY	Fine silty	
SF	Semi-fibr. peat							CEY	Clayey	
AM	Amorphous									

Enter first 2 boxes for PSC/Peat only if a distinction can be made

Substrate type (first 2 boxes)		Substrate sub group (last 3 boxes)		Rock outcrops and surface stoniness			WT
PT	Peat	BOG	Blanket bog	N	0 %	None	Enter depth of water table (WT) if found within auger depth.
		FEN	Fen	V	0-2 %	Very few	
		CUT	Cutover	F	2-5 %	Few	
RK	Bedrock	IBG	Igneous basic	C	5-15 %	Common	Enter N if not observed within borehole.
		IGA	Igneous acid	M	15-40 %	Many	
		LIM	Limestone	A	40-80 %	Abundant	
		SAN	Sandstone	D	> 80 %	Dominant	
		SHL	Shale/slate				
		SSH	Sandstones and shales				
		GNS	Gneiss and schist				
DR	Drift	SIL	With siliceous stones				
		LIM	With limestones				
		IGM	With igneous + metamorphic stones				
		NON	Stoneless				
		GRN	Gravels non-calcareous				
	GRC	Gravels calcareous					
AL	Alluvium	RIV	River				
		MAR	Marine				
		LAK	Lake marl				
		EST	Estuarine				
AE	Aeolian	DUN	Sand dunes (wind-blown sand)				
DI	Disturbed	MAD	Made ground				

Matrix / mottle 1/ mottle 2	Mottle abundance			Mottle contrast		CaCO ₃			Fe/Mn abundance	
Enter Munsell colour	N	None	None	F	Faint	N	0	No reaction	N	None
	VF	Very few	0-2 %	D	Distinct	SL	0-2%	Audible but not visible	VF	0-2 %
	F	Few	2-5 %	P	Prominent	MO	2-5 %	Visible	F	2-5 %
	C	Common	5-15 %			ST	5-15 %	Strongly visible	C	5-15 %
	M	Many	15-40 %			EX	> 25 %	Extremely strong (thick foam)	M	15-40 %
	A	Abundant	> 40 %						A	> 40 %

Stone abundance			Stone Size			Shape		Type (detailed) up to 2 types can be entered			Type (general)	
N	None	None	F	Fine gravels	2-6mm	PL	Flat/platy	BA	Basalt	SIL	Siliceous stones	
VF	Very few	0-2 %	M	Medium gravels	6mm -2cm	AN	Angular	GA	Gabbro	LIM	Limestones	
F	Few	2-5 %	C	Coarse gravels	2-6cm	SA	Sub angular	GR	Granite			
C	Common	5-15 %	S	Stones	6-20cm	SR	Sub rounded	RH	Rhyolite	IGM	Igneous and metamorphic	
M	Many	15-40 %	B	Boulders	20-60cm	R	Rounded	SCH	Schist			
A	Abundant	40-80 %	LB	Large boulders	> 60 cm	O		LIM	Limestone			
D	Dominant	> 80 %						ORS	Old Red sandstone			
								SAN	Sandstone			
								MG	Millstone grit			
								QZ	Quartzite			
								CH	Chert			
								GN	Gneiss			
								SH	Shale			
								SL	Slate			

Roots (box 1)	Root size (boxes 2 and 3)			Field pH (first 3 boxes)	Field pH (last box)
0= absent 1= present	VF	Very fine	<0.5 mm	Enter pH value e.g. 50 for 5.0; 55 for 5.5	P Field measurement with pH probe I Field measurement with indicator solution L Laboratory measurement of field sample
	F	Fine	0.5-2 mm		
	M	Medium	2-5 mm		
	C	Coarse	> 5 mm		

National_assoc_code	Association_Name	Texture_Substrate type	Ancillary1_code	Ancillary1_name	Ancillary2_code	Ancillary2_name	Ancillary3_code	Ancillary3_name	Ancillary4_code	Ancillary4_name	Ancillary5_code	Ancillary5_name
112a	Rineanna	Loamy over lithoskeletal limestone	321	Ballincurra	411	Elton						
112b	Crumpaun	Loamy over lithoskeletal limestone	314	Loughmuirran	711	unnamed (Clayey/shale)						
112c	Knockeyon_1	Loamy over lithoskeletal sandstone	632	Forth Commons								
112d	Knockeyon_2	Loamy over lithoskeletal sandstone		Rock	911	Aughty						
112d	Knockshigowna	Loamy over lithoskeletal slate and shale	311	Clonroche	513	Borrisoleigh						
113a	Carrigvahanagh	peat over lithoskeletal acid igneous rock		Rock	632	Blackstairs	722	Ballywilliam	911	Aughty		
113b	Bantry	Peat over lithoskeletal sandstone and shale		Rock	911	Aughty						
211a	Seafield	Sandy stoneless drift	311	Dooyork	722	Ballyknockan						
211b	Kilcolgan	Fine loamy drift with limestones	211	Kilcolgan bouldery phase	321	Kinvarra						
213a	Burren	Fine loamy over limestone bedrock		Rock	111	unnamed (loamy/lithosk 1st)	321	Ballincurra	213	Kilcolgan		
213b	Burren rocky phase	limestone pavement	211	Burren								
311a	Clonroche	fine loamy drift with siliceous stones	311	Baunreagh Steep Phase	513	Borrisoleigh	712	Gortaclareen			711	Kilrush
311b	Kill_1	fine loamy drift with igneous & metamorphic stones	311	Kill lithic phase	313	Carrigogunnel						
311c	Clashmore_1	Coarse loamy drift with siliceous stones	312	Broadway	722	Puckane						
311d	Ballyvorheen	Sandy drift with siliceous stones	311	Clashmore	612	Portlaw						
311e	Kells	Coarse loamy drift over hard shale	513	Rathkenny	711	Kilrush						
311f	Ballylanders	Fine loamy over slate or shale bedrock	513	Cupidstownhill	313	Ridge	311	Clonroche				
311g	Knocksquire	Coarse loamy over acid igneous bedrock		Rock								
311h	Borris	Coarse loamy drift with igneous and metamorphic stones	722	Ballywilliam								
311i	Broomhill	fine loamy drift over sandstone bedrock	311	Clashmore	1011	Monatray						
311j	Randallsmill	Coarse loamy stoneless drift										
311k	Broughillstown	coarse loamy over calcareous gravels	321	Baggotstown								
311l	Kennycourt	loamy drift with limestones	311	Clonroche	311	Ballylanders						
311m	Kill_2	coarse loamy drift with igneous & metamorphic stones	721	Tramore	611	Ballyscanlon						
311n	Clashmore_2	Coarse loamy drift with siliceous stones	711	Kilrush	411	Dungarvan						
311o	Dovea	Fine silty drift with limestones	321	Ballincurra	712	Howardstown						
311p	Dooyork	Sandy stoneless drift										
311q	UN15 (cLy_Rk-LIM)	Coarse loamy over limestone bedrock	213	Burren	311	cLy over DR-LIM	213	Crush	513	Crossmolina		

National_assoc_code	Association_Name	Texture_Substrate type	Ancillary1_code	Ancillary1_name	Ancillary2_code	Ancillary2_name	Ancillary3_code	Ancillary3_name	Ancillary4_code	Ancillary4_name	Ancillary5_code	Ancillary5_name
313a	Ashgrove	Fine loamy drift with siliceous stones	811	Clohamon	711	Kilrush						
313b	Wonderhill	Fine loamy over lithoskeletal basic igneous rock	111	UN01 (Ly/basic igneous)	112	Carrigvahanagh						
313c	Schull	Coarse loamy drift with siliceous stones	1011	Ardmore (Schull plaggen)	712	Driminidy	511	Ross Carbery				
313d	Bantry Bay	Coarse loamy dnse blue-grey drift with siliceous stones										
314a	Moord	fine loamy drift with sillceous stones	712	Gortaclareen	711	Kilrush						
321a	Baggotstown	Coarse loamy over calcareous gravels	321	unnamed fine loamy/calc gravels	213	Crush	411	Patrickswell/Elton				
321b	Ballincurra	Fine loamy over limestone bedrock	112	Rineanna	411	Elton	321	Kilfenora				
321c	Kinvarra	Fine loamy over clayey drift with limestones	321	Kilfenora	313	Kilfergus						
411a	Patrickswell_1	loamy drift with limestones	321	Baggotstown	311	Ladestown	411	Elton				
411b	Patrickswell_2	loamy drift with limestones	411	Patrickswell lithic phase	321	Ballincurra						
411c	Patrickswell_3	loamy drift with limestones	724	Mylerstown	411	Patrickswell lithic phase	922	Banagher	724	Ballyshear		
411d	Kellistown	Coarse loamy drift with igneous and metamorphic stones	722	Puckane	722	Newtown						
411e	Mortarstown_1	fine loamy over clayey drift with limestones	414	Rathowen	411	Patrickswell						
411f	Dunboyne	fine loamy drift with siliceous stones	711	Kilrush	414	Rathowen	311	Ladestown				
411g	Mortarstown_2	Fine loamy over clayey drift with limestones	411	Rathowen	311	Kinvarra						
411h	Athy	Coarse loamy over calcareous gravels	321	Baggotstown	723	Athy poorly drained component						
411x	Elton_1	Fine loamy drift with limestones	321	Baggotstown	711	Kilrush	822	Camoge	411	Patrickswell	213	Burren-Ballincurra complex
414a	Crosstown	Coarse loamy drift with siliceous stones	412	Crossabeg	412	Johnstown	411	Elton				
414b	Rathowen_1	Fine loamy drift with limestones	311	Ladestown	711	Kilrush						
414c	Rathowen_2	Fine loamy drift with limestones	311	Ladestown	922	Banagher						
414d	Fethard	fine loamy drift with sillceous stones	721	Ballinruan								

National_assoc_code	Association_Name	Texture_Substrate type	Ancillary1_code	Ancillary1_name	Ancillary2_code	Ancillary2_name	Ancillary3_code	Ancillary3_name	Ancillary4_code	Ancillary4_name	Ancillary5_code	Ancillary5_name
511a	Cooga_1	Coarse loamy drift with siliceous stones	511	UN06 (cLy_DR/GRN)	311	Clashmore	513	Knockboy	722	Puckane		
511b	Kiltealy	Sandy drift with igneous and metamorphic stones	512	Tomard (Cullion)	722	Ballywilliam	313	Carrigogunnel				
511c	Screen	Sandy stoneless drift	722	Ballyknockan	511	Carne						
511d	Cupidstownhill	Loamy over shale bedrock	112	Knockshigowna								
511e	Ross Carbery	Coarse loamy drift with siliceous stones	511	Cooga	722	Puckane (Glasheenahielan)	811	Ilen				
511f	Cooga_2	Coarse loamy drift with siliceous stones	632	Killinga	911	Aughty						
512a	Clonegall	coarse loamy drift with siliceous stones	722	Puckane								
512b	Tomard	Loamy over slate or shale bedrock										
513a	Knockboy	Coarse loamy drift with siliceous stones	513	Knockaceol	712	Puckane	311	Ballyvorheen				
513b	Rathkenny	fine loamy drift with siliceous stones	311	Kells	511	UN31 (Ly/San)	712	Gortaclareen				
513c	Borrisoleigh	Fine loamy over mudstone, shale or slate bedrock	311	Clonroche	112	Knockshigowna	612	Carrickbyrne	711	Kilrush		
513d	Knockaceol	Coarse loamy over sandstone bedrock	112	Knockeyon	513	Knockboy	632	Forth Commons				
513e	Knockboy	Coarse loamy drift with siliceous stones	611	Ballycondon	711	Newport	722	Slieve Bloom				
514a	Corriga	fine loamy drift with siliceous stones	611	Meline	711	Kilrush						
611a	Black Rock Mountain	Loamy over gneiss and schist bedrock	611	Stonepark	112	UN02 (Ly/GN&SC)		Rock				
611b	Slievebeag	Loamy over shale bedrock										
612a	Portlaw	Loamy drift with siliceous stones	513	Borrisoleigh	513	Knockboy	611	Ballycondon				
621a	Ahuan	Loamy drift with siliceous stones	712	Gortaclareen	611	Drumslig						
631a	Kiladoon	Loamy drift with siliceous stones	513	Knockboy	511	Cooga	911	Aughty				
632a	Blackstairs	Sandy over granite bedrock	112	Carrigvahanagh		Rock						
632b	Knockastanna	Loamy over shale bedrock	511	Cupidstownhill	911	Aughty	112	Knockeyon	712	Gortaclareen		
632c	Forth Commons	Loamy over sandstone bedrock	911	Aughty		Rock						
632d	Monavullagh	Sandy over sandstone bedrock (conglomerate)	632	Glenary								
632e	Killinga	Loamy drift with siliceous stones (fine grained sstone till)	511	Ross Carbery	513	Knockboy	911	Aughty	511	Cooga		
632f	Drumsleed	Sandy drift with siliceous stones	722	Puckane	911	Aughty	632	Killinga	113	UN		

National_assoc_code	Association_Name	Texture_Substrate type	Ancillary1_code	Ancillary1_name	Ancillary2_code	Ancillary2_name	Ancillary3_code	Ancillary3_name	Ancillary4_code	Ancillary4_name	Ancillary5_code	Ancillary5_name
711a	Macamore	Fine loamy over clayey drift with limestones	721	Kilpierce	711	UN09 (fLy over Cey/DR_SIL)						
711b	Kilrush	Fine loamy drift with siliceous stones	712	Gortaclareen	922	Banagher	311	Ladestown	513	Borrisoileigh	911	Aughty
711c	Drumkeeran	Clayey drift with siliceous stones	712	Cluggin								
711d	Straffan	Fine loamy drift with limestones	723	Mylerstown	411	Elton						
711e	Clohernagh	Fine loamy drift with siliceous stones (fragic)	311	Clonroche								
711f	Newport	Coarse loamy drift with siliceous stones	722	Slieve Bloom	513	Knockboy						
711g	Tramore	Coarse loamy drift with igneous and metamorphic stones	311	Clashmore	311	Kill						
712a	Gortaclareen_1	Fine loamy drift with siliceous stones	722	Newtown?	822	Camoge	911	Allen	513	Knockboy		
712b	Cluggin	Clayey drift with siliceous stones	414	Crosstown								
712c	Howardstown_1	Clayey drift with limestones	724	Ballyshear	411	Patrickswell	922	Banagher				
712d	Gortaclareen_2	Fine loamy drift with siliceous stones	514	Corriga	711	Ballyhaise lithic phase						
712e	Ballinamoor	Fine loamy drift with limestones	711	Straffan	911	Allen						
712f	Driminidy	Coarse loamy stoneless drift	911	Aughty	913	Turbury	511	Ross Carbery	913	Turbary	313	Schull
712g	Gortaclareen_3	Fine loamy drift with siliceous stones	414	Crosstown	312	Broadway						
721a	Kilpierce	Fine loamy drift with siliceous stones	721	UN10 (Ly over lithoskeletal SH & SL)	711	UN09 (fLy/Cey DR_SIL)	711	Kilrush	A	Undifferentiated alluvium		
721b	Knockroe	coarse loamy drift with siliceous stones										
722a	Newtown	coarse loamy drift with igneous and metamorphic stones	722	Puckane	411	Kellistown	731	Greenane				
722b	Puckane_1	Coarse loamy drift with siliceous stones	721	Kilpierce	712	Gortaclareen	911	Allen				
722c	Puckane_2	Coarse loamy drift with siliceous stones	112	Knockeyon	311	Clashmore	513	Knockboy				
722d	Slieve Bloom	Coarse loamy (upland) drift with siliceous stones	632	Knockastanna	511	Cooga	911	Aughty	722	Slieve Bloom undulating phase		
722e	Ballywilliam	Coarse loamy drift with igneous and metamorphic stones	712	Tramore	913	Aughty cut-over						
722f	Puckane3	Coarse loamy drift with siliceous stones	712	Gortaclareen	311	Clashmore						
723a	Mylerstown	Fine loamy drift with limestones	911	Allen	411	Patrickswell	724	Ballyshear				
724a	Ballyshear	Fine loamy drift with limestones	724	Ballintemple	723	Mylerstown	411					

National_assoc_code	Association_Name	Texture_Substrate_type	Ancillary1_code	Ancillary1_name	Ancillary2_code	Ancillary2_name	Ancillary3_code	Ancillary3_name	Ancillary4_code	Ancillary4_name	Ancillary5_code	Ancillary5_name
811a	Clohamon	Coarse loamy river alluvium	821	Lyre	812	Rearymore	821	Vicarstown				
812a	Rearymore	Fine loamy river alluvium	812	UN12 (Zy RIV ALL)	811	UN12 (Zy RIV ALL)	821	Kilmannock var	811	Clohamon		
813a	Milltownpass	Sandy stoneless drift	811	Clohamon								
820a	Finnery	alluvium										
821x	River Burren	variable texture river alluvium										
821a	Kilmannock	silty estuarine alluvium										
821b	Vicarstown	Clayey river alluvium	821	Feale	821	Kilmannock var						
821c	Feale	Fine loamy river alluvium	821	Boyne	821	Vicarstown						
821d	Kilgory	Sandy river alluvium	811	Aherlow								
821e	Boyne	Silty river alluvium	822	UN49_cLy_RIV-ALL	811	Clohamon	311	UN03 fLy_GRN				
821f	Lyre	Coarse loamy river alluvium	811	Clohamon	822	UN49						
822a	Coolalough	clayey lacustrine alluvium	824	Coolanick								
822b	Millquarter	Fine silty lacustrine alluvium										
822c	Griston	Sandy lacustrine alluvium										
822d	Wexford slob	Silty marine alluvium										
822e	Shannon	Fine silty estuarine alluvium	821	Vicarstown	922	Banagher	824	Drombanny				
822f	Camoge	Clayey river alluvium	822	Cooffin	822	UN50 (cLy over calc GR)	813	Milltownpass				
822g	Cooffin	Fine silty river alluvium	811	Suir	921	Kilbarry	811	Finisk				
823a	Kilmore Slob	Sandy marine alluvium	823	Kilmore Slob variant								
824a	Drombanny	Carbonatic-loamy lake marl	823	Dunsany	212	Carney						

National_assoc_code	Association_Name	Texture_Substrate type	Ancillary1_code	Ancillary1_name	Ancillary2_code	Ancillary2_name	Ancillary3_code	Ancillary3_name	Ancillary4_code	Ancillary4_name	Ancillary5_code	Ancillary5_name
911a	Allen	peat	913	Turbary	922	Banagher	912	Garrynamona				
911b	Aughty_1	peat	913	Aughty cutover	913	Turbary						
911c	Knockmealdown	peat over rock	632	Glenary	113	Carrigvahanagh						
911d	Aughty_2	peat	113	Bantry	632	Killinga	632	Drumsleed peaty phase		Rock		
921a	Pollardstown	peat	922	Banagher	913	Gortnamona						
913a	Turbary	peat	911	Allen	913	Gortnamona	912	Garrynamona	921	Pollardstown	913	Aughty Cut-over
913b	Aughty_Cutover	peat (cutover	113	Carrigvahanagh								
922a	Banagher_1	peat	913	Turbary	911	Allen						
922b	Banagher_2	peat & peaty alluvium	922	Ardrum								
914a	Clonsast	peat	913	Turbary	913	Gortnamona	911	Allen				
1011a	Monatray	loamy drift with siliceous stones	1012	Ardmore	1011	Curragh	1011	Schull plaggen				

Changes in red made Mar-Apr 2011

Changes in blue made Jun-Jly2011

Changes in Green made Aug-Sep 2011

More Changes made Dec 2011

Soil Classification schema

Parameter	Options	Field Guide v5.0 (p)	Great Soil Group	Soil Group	Soil Subgroup	Major substrate	Substrate Type	Lithology
Texture_1 <40cm	Sdy, cLy, fLy, cZy, fZy, Cey or PT	19				Field Guide p.12		
Texture_2 40-80cm	Sdy, cLy, fLy, cZy, fZy, Cey or PT	19				Peat	Blanket and Raised Bog Fen Blanket and Raised Bog Cutover and Industrial	
Organic matter	Peat => 40cm Humose =>15cm Mineral	15,21,31,38-9,41-3,45 15-16, 21-22 15-19	Peat Soils					
Gley features	None or >80cm 40-80cm <40cm				Other e.g. Typical Gleyic or stagnic	Drift (Till or Fluvioglacial sediments)	with siliceous stones with limestones with igneous & metamorphic rocks stoneless over non-calcareous gravels over calcareous gravels	sandstone,shale, slate,quartzite limestone Basalt, gabbro,granite gneiss and schist Aeolian,glaciolacustrine
Argillic B	Clay increase	23-24, 48	Luvissols	Surface-water Gleys	Stagnic			
Podzolic B	OM, Fe, Al accumulation	23, 47	Podzols Brown Podzolics			Bedrock	Basic Igneous Acid Igneous Limestone Sandstone Shale & slate Sandstone & shales Gneiss and schist	Basalt, gabbro Granite, rhyolite Limestone Old Red Sandstone, millstone grit,quartzite, chert Mica schist
Bedrock	<40cm depth 40-80cm depth	8,9 8,9	Lithosols Rendzinas Brown Earths Brown Podzolics Podzols					
Stones	Stoneless Skeletal	11 9	Alluvial Soils Blown Sand Lithosols Rendzinas			Alluvium	River Marine Lake marl Estuarine	
Calcareous	<40cm depth	51	Rendzinas	Calcareous	Calcareous			
Iron Pan		47			Iron-pan Podzols	Anthropogenic	made ground	

Annex V Soil mapping designations used by the National Soil Survey of Ireland (AFT)

The following tables list the codes and symbols used on the field sheets, compiled during the original survey work, and on county soil maps published at 1:126,720 scale

Soil no.	Texture	Drainage	Profile dev.	Slope	Phase
1- 400	A – M	1 -6	a – z	0-4	-

Soil numbers

Limestone	1 – 10
Other carboniferous (coal measures etc.)	11 -20
Predom. Limestone drift	21 – 50
Cambrian	51 – 60
Schists and Gneisses	61 – 70
Silurian – Ordovician	71 – 80
Devonian and Old Red Sandstone drift	81 - 110
Permian – Triassic	111 - 120
Granite and acid igneous	121 - 130
Pred. Granite and acid igneous drift	131 - 140
Basic igneous and drift derived from them	141 - 150
Lake alluvials	151 - 170
River alluvials	171 – 300
Drumlins and other drift deposits	301 - 400

Texture classes

A	SAND
B	LOAMY SAND
C	SANDY LOAM
D	LOAM
E	SILT LOAM
F	SILT
G	SANDY CLAY LOAM
H	CLAY LOAM
J	SILTY CLAY LOAM
K	SANDY CLAY
L	SILTY CLAY
M	CLAY

Drainage categories

1	Excessively drained
2	Well drained
3	Moderately well drained
4	Imperfectly well drained
5	Poorly drained
6	Very poorly drained

Profile development

a	G.B.P. (minimal) – incipient textural B
b	G.B.P. (medial-maximal) – significant textural B
c	Brown forest soils – structure or colour B
d	Brown Podzolics
e	Iron Podzol
f	Iron pan podzol
g	Iron humus podzol
h	Acid brown Earths (Sols Bruns Acide)
j	Intermediate B. Earths
k	Rendzina-like soils
l	Gray-wooded soils
m	Regosols
n	Lithosols
o	Brown Earths of high base status
q	Gleys
r	Low humic gleys
s	Humic gleys
t	Blanket peats
u	Hochmoor peats
v	
w	
x	
y	
z	Anthropic soils

Definition of drainage categories

1. Excessively drained	Mostly coarse textured (sandy), skeletal soils on porous parent materials, in upland positions. (Screen profile – Wexford)
2. Well drained	No obvious signs of impeded drainage (mottling etc.) throughout the solum. Exception where under pasture, sparse mottling may occur in the topsoil (Castlefarm profile – Limerick)
3. Moderately well drained	Background colour of entire profile as for 2 (natural colour for well drained variety) with limited faint mottling allowable above 18 inches (45 cm), more distinct common mottling below 18 inches (45 cm).
4. Imperfectly well drained	General background colour below 12 inches (30 cm) partly reduced (grey colour with some grey brown and brown), with mottling. Above 12 inches (30 cm) natural colours (grey brown and brown) with or without mottling
5. Poorly drained	General background colour throughout profile a reduced grey with many prominent mottles to the surface, <u>or</u> a definite reduced layer at any depth below 12 inches (30cm) and mottling to the surface.
6. Very poorly drained	Background colour of entire profile a reduced grey or grey-blue throughout with few mottles allowable, with or without organic surface layer. (Some lake Alluvials- Limerick)

Slope categories

0	0-2°	Flat areas
1	2-8°	Cultivation easy
2	8-15°	Cultivation difficult to impossible
3	15-30°	Cultivation impossible
4	> 30°	Impossible for most projects

Soil phase annotations

Alluvium	All
Bouldery	B
Cherty	Ch
Cutover	Cv
Gravelly	Gv
Imperfectly drained	Id
Lithic	L
Moderately well drained	Md
Poorly drained	Pd
Peaty	P
Non-Peaty	nP
Rocky	R
Stony	So
Sandy	Sd
Shallow	Sh
Slope	Sl
Steep	St
Shaley	Sy
Slumping	Sm
Undulating	U
Very poorly drained	Vpd
Well drained	Wd

Soil phase symbols used on 1/2 inch (1:126,720 scale soil maps)

Bouldery	B
Cherty	Ch
Gravelly	Gv
Lithic	L
Peaty	P
Rocky	R
Stony	St
Sandy	Sd
Shallow	Sh
Slope	Sl
Steep	Sp
Shaley	Sy

Annex VI Horizon designation used by the National Soil Survey of Ireland (AFT)

The horizon designation used by the National Soil Survey of Ireland, An Foras Talúntais (AFT), is based on the The Soil Survey Method of the New Zealand Department of Scientific and Industrial Research (DSIR). The definitions that follow are reproduced from the New Zealand Handbook for the Field Study of Soils. By Taylor and Pohlen (1962).

Horizon Designation

As illustrated in Figure 7, soil profiles are made up of master horizons (O, A, B, and C). In turn, the master horizons are made up of subhorizons designated by subscript Arabic numerals: subscript ₂ is used to indicate a maximum expression of eluviation in the A horizon and of illuviation or other development in the B; subscripts ₁ and ₂ are used with a transitional connotation.

O Horizon

The O horizon is a master horizon of organic material above the surface of the mineral soil. It is divided into the organic subhorizons O₁ and O₂* or L, F, and H as follows:

- O₁ { L Horizon - Consisting of relatively fresh leaves, twigs and other plant debris
which do not show visual evidence of decomposition.
- O₂ { F Horizon - Consisting of partially decomposed litter with I recognisable plant remains.
H Horizon - consisting of decomposed organic matter with incomplete or almost
complete loss of original botanical structure.

Depths of these horizons are referred to the surface of the mineral soil (for example, 11-7 in., 7-0 in.).

A Horizon

The A horizon is a master horizon consisting of surface mineral horizons with maximum organic accumulation; or of surface or subsurface horizons that are lighter in colour than the underlying horizon and have lost clay minerals, iron, and aluminium, with consequent concentration of the more resistant minerals; or of horizons belonging to both of these categories. When the A horizon is used without subscript numbers, it refers collectively to all the sub-horizons within it.

The subhorizons are:

A₁ Horizon-This is a surface mineral horizon having a relatively high content of organic matter mixed with mineral matter, and usually dark in colour. It may or may not be a horizon of eluviation. In nearly all soils it is the mineral horizon of maximum biological activity and subject to the greatest changes in temperature and moisture. Measurements of depth for all horizons are referred to the top of the A₁ or, where absent, of the uppermost mineral horizon.

A₂ Horizon-This surface or subsurface horizon is a horizon of eluviation - of leaching of materials out in solution and suspension. It is usually lighter in colour than the underlying horizon, has lost clay minerals, iron, or aluminium, or all three, with the resultant concentration of the more resistant minerals. Much of the dissolved and dispersed material, including clay, moves completely out of the solum, not simply into the B horizon.

A₃ Horizon-This is a horizon transitional to the B but more like the A than the B (if a transitional horizon between A and B is not a clear gradation, and especially where it is thin, it may be designated AB).

A_p Horizon-This is a ploughed or otherwise mixed surface horizon including more than the original A₁ horizon. The subscript letter . indicates disturbance, usually by cultivation. Where the plough layer is entirely within the A₁ horizon, it is designated as A_{1p}.

B Horizon

The B horizon is a master horizon of altered material characterised by more or less block-like or prism-like structure together with other characteristics, such as stronger colours, which differ from those of the A horizon above or the C horizon below; or by an accumulation of clay, iron, or aluminium, with accessory organic material; or by characteristics of both these categories. Actually the accumulation of clay and the development of blocky or prismatic structure are covariant in many soils, but not in all of them.

The sub-horizons are:

B₁ Horizon-This horizon is transitional to the A above, but more like the B than A.

B₂ Horizon -This is the horizon of maximum development of subsoil structure (block-like or prism-like); or of maximum accumulation of silicate clay minerals or iron and organic material; or of both these characteristics. In B₂ horizons having both these features, but separated, the horizons need to be subdivided into B₂₁ and B₂₂, as appropriate.

B₃ Horizon -The B₃ horizon is transitional to the C horizon, but more like the B than C. A colour B or structural B horizon without accumulation of clay or other material is commonly designated (B).

C Horizon and Underlying Layers

The C horizon is a master horizon embracing the parent material and the parent rock. Where it comprises weathered layer above the parent rock, it is divided into two sub-horizons as follows:

C₁ Horizon-A layer of unconsolidated material relatively affected by the influence of organisms and evidently similar in chemical, physical, and mineralogical composition to the material from which a significant part of the overlying solum, has developed. It differs from the C₂ horizon below in being distinctly weathered

C₂ Horizon -The relatively unweathered parent rock of the soil from which the C₁ horizon or (where there is no C₁ horizon) the solum itself has evidently developed.

Any layers that lie under the C horizon (or the solum where no C horizon is present) are designated D layers. Where a D layer is closely similar in composition to the parent rock of the soil, it is termed the *proximate* parent rock and is labelled D_i; where it is not related it is labelled D_n.

G Horizon

The G horizon is commonly formed in wet soils. It is a layer of intense reduction, characterised by the presence of ferrous iron and neutral grey colours that commonly change to brown upon exposure to the air. It is a characteristic horizon developed wholly or partly by gleying, which normally involves saturation of the soil with water for long periods in the presence of organic matter. As with other horizons, it may be divided into G₁ and G₂. No conventional standards have been adopted for these subdivisions but, in soils with a fluctuating water table, G₁ is commonly applied to the upper mottled horizon, and G₂ to the lower, more intensively gleyed horizon. Besides the G, other horizons may be somewhat gleyed; this is indicated by the subscript _g, for example B_g. Intergrades between B and G and between C and G may be indicated as BG and CG more strongly gleyed than indicated by B_g and C_g.

Additional Symbols Qualifying Horizon Designations

Letter subscripts may be helpful in indicating processes that have been active within a horizon or layer, but they are not a substitute for a proper description. Several suggested ones follow:

- G:** Gleyed horizon
- x:** Subscript for hardened horizons composed mainly of silicate minerals, such as fragipans, which are much harder than horizons normally having the principal horizon designation given, as C, in yellow-grey earths.
- ca:** Accumulation of calcium carbonate, as in B_{3ca}
- cs:** Accumulation of calcium sulphate (gypsum), as in D_{cs}
- sa:** Accumulation of soluble salts, other than calcium carbonate or calcium sulphate.
- h:** Accumulation of decomposed organic matter, outstanding for the horizon, as in the B₂ of a humus podzol which is designated B_{2h}
- cy:** Outstanding accumulation of clay for the horizon, as in the B₂ horizon of podzolic soil richer in clay than the B₂ horizon of the associated normal soil, which is designated B_{3cy}
- fe:** Outstanding accumulation of finely disseminated iron compounds for the horizon, as in the B₂ of an "iron" podzol, which is designated B_{3fc}.
- ir:** iron pan that neither roots nor percolating water can penetrate
- c:** With concretions. If rich in iron - fec, manganese - mnc, aluminium - alc, calcium carbonate - cac, etc.
- e:** Eluvial-, generally applied to a subsoil horizon where eluvial features are unusual.
- r:** Applied to a C layer closely similar in composition to the parent rock of the soil.
- n:** Applied to a C layer dissimilar in composition to the parent rock of the soil.
- p:** Indicates disturbance by ploughing or other cause, especially of the A horizon.

Annex VII All Soil Series mapped in Ireland by AFT

Live	National Series	Subgr. Code	Num	Modern Definition	Modern Correlative
DEAD	Abbeyfeale	711 AF	62	Fine loamy drift with siliceous stones	Kilrush
DEAD	Abbeyfeale peaty phase	712 AFP		Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Abbeyfeale Undulating phase	711 AFU		Fine loamy drift with siliceous stones	Kilrush
DEAD	Acaun	311 AU	93	Coarse loamy drift with siliceous stones	Clashmore
DEAD	Accony	511 AY		Coarse loamy drift with siliceous stones	Cooga
DEAD	Aglish	712 AG		Fine loamy drift with siliceous stones	Gortaclareen
LIVE	Aherlow	811 AH	81	Sandy river alluvium	Aherlow
LIVE	Ahuan	621 AH		Loamy drift with siliceous stones	Ahuan
LIVE	Aille	311 AL		Coarse loamy over limestone bedrock	Aille
LIVE	Allen	911 AE	900	Peat (Raised Bog (moss))	Allen
DEAD	Allenwood Complex	723 AX	131	Fine loamy drift with limestones	Mylerstown
DEAD	Ambrosetown	314 AM		Fine loamy drift with siliceous stones	Moord
LIVE	Ardmore	1011 AR		Coarse loamy drift with siliceous stones	Ardmore
DEAD	Ardrum	922 AD	1P	Peat (Fen)	Banagher
DEAD	Ashbourne	711 AB		Fine loamy drift with siliceous stones	Kilrush
LIVE	Ashgrove	313 AS		Fine loamy drift with siliceous stones	Ashgrove
LIVE	Athy	411 AT	117	Coarse loamy over calcareous gravels	Athy
DEAD	Athy Poorly Drained	723 AP		Coarse loamy over calcareous gravels	Clonastlee
DEAD	Attyquin	724 AQ		Fine loamy drift with limestones	Ballyshear
LIVE	Aughty	911 AT	903	Peat (Blanket Bog)	Aughty
LIVE	Aughty cutover	913 ATC		Peat (Blanket Bog)	Aughty cutover
DEAD	Aughty shallow phase	911 ATH		Peat (Blanket Bog)	Aughty
DEAD	Aughty slumping phase	911 ATL		Peat (Blanket Bog)	Aughty
LIVE	Baggotstown	321 BG	42	Coarse loamy over calcareous gravels	Baggotstown
DEAD	Baldwinstown	311 BA		Fine loamy drift with siliceous stones	Clonroche
DEAD	Ballinabranagh	414 BG	88	Loamy drift with siliceous stones	Crosstown
DEAD	Ballinagilky	611 BY	109	Loamy drift with igneous and metamorphic stones	Stonepark
DEAD	Ballinakill	411 BK		Fine loamy drift with limestones	Elton
LIVE	Ballinamoor	712 BN		Fine loamy drift with limestones	Ballinamoor
LIVE	Ballincurra	321 BC	43	Fine loamy over limestone bedrock	Ballincurra
DEAD	Ballindaggan	311 BD	15	Fine loamy over shale or slate bedrock	Ballylanders
DEAD	Ballinruan	721 BN		Fine loamy drift with siliceous stones	Kilpierce
DEAD	Ballinrush	722 BU	103	Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
LIVE	Ballintemple	724 BT		Coarse loamy drift with limestones	Ballintemple
DEAD	Ballybrood	513 BR	53	Fine loamy drift with siliceous stones	Rathkenny
DEAD	Ballycastle	411 BC		Fine loamy drift with siliceous stones	Dunboyne
LIVE	Ballycondon	611 BN		Loamy drift with siliceous stones	Ballycondon
DEAD	Ballydoole	414 BD		Coarse loamy drift with siliceous stones	Crosstown
LIVE	Ballyglass	311 BG		Coarse loamy over sandstone bedrock	Ballyglass
DEAD	Ballyhaise	711 BH		Fine loamy drift with siliceous stones	Kilrush
DEAD	Ballyhaise	712 BH		Fine loamy drift with siliceous stones	Gortaclareen
LIVE	Ballyhaise lithic phase	712 BL		Fine loamy over sandstone or shale bedrock	Ballyhaise lithic phase
DEAD	Ballyknock	721 BC		Coarse loamy over sandstone bedrock	Kilpierce
LIVE	Ballyknockan	722 BK		Sandy stoneless drift	Ballyknockan
LIVE	Ballylanders	311 BY	45	Fine loamy over shale or slate bedrock	Ballylanders
DEAD	Ballymacart	722 BM		Coarse loamy drift with siliceous stones	Puckane
DEAD	Ballynabola	822 BB		Fine silty river alluvium	Cooffin
DEAD	Ballynalacken	311 BC	49	Fine loamy drift with siliceous stones	Clonroche
LIVE	Ballynamona	411 BY	58	Fine loamy drift with igneous and metamorphic stones	Ballynamona
LIVE	Ballyscanlon	611 BS		Loamy over acid igneous rock	Ballyscanlon
LIVE	Ballyshear	724 BS	201	Fine loamy drift with limestones	Ballyshear
DEAD	Ballytarsna	311 BT	94	Coarse loamy over acid igneous bedrock	Knocksquire
LIVE	Ballyvorheen	311 BV	46	Sandy drift with siliceous stones	Ballyvorheen
LIVE	Ballywilliam	722 BW	23	Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
LIVE	Banagher	922 BR	905	Peat (Fen)	Banagher
DEAD	Bannow	1011 BA		Loamy drift with siliceous stones	Monatray
LIVE	Bantry	113 BA		Peat over sandstone and shale bedrock	Bantry
LIVE	Bantry Bay	313 BB		Coarse loamy dense blue-grey drift with siliceous stones	Bantry Bay
DEAD	Baunreagh	311 BN		Fine loamy drift with siliceous stones	Clonroche
DEAD	Baunreagh steep phase	311 BNS		Fine loamy over shale bedrock	Ballylanders
DEAD	Bawnrush	722 BH		Loamy drift with siliceous stones	Slieve Bloom
DEAD	Belmont	722 BO	104	Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
LIVE	Belmullet	721 BM		Sandy stoneless drift	Belmullet
DEAD	Beltra	612 BE		Loamy drift with siliceous stones	Portlaw
DEAD	Black Rock Mountain	632 BRC	17	Loamy over shale bedrock	Knockastanna
LIVE	Black Rock Mountain	611 BR		Loamy over gneiss and schist bedrock	Black Rock Mountain
LIVE	Blackstairs	632 BL	24	Sandy over granite bedrock	Blackstairs
LIVE	Borris	311 BO	95	Coarse loamy drift with igneous and metamorphic stones	Borris
LIVE	Borrisoleigh	513 BE	261	Fine loamy over mudstone, shale or slate	Borrisoleigh
LIVE	Boyne	821 BO		Silty river alluvium	Boyne

Live	National Series	Subgr. Code	Num	Modern Definition	Modern Correlative
LIVE	Broomhill	311	BL	Fine loamy over sandstone bedrock	Broomhill
LIVE	Broughillstown	311	BR	Coarse loamy over calcareous gravels	Broughillstown
DEAD	Broughillstown Shallow Phase	311	BRS	Coarse loamy over calcareous gravels	Baggotstown
DEAD	Bunalunn	712	BN	Coarse loamy stoneless drift	Driminidy
LIVE	Burren	213	BU	140 Fine loamy over limestone bedrock	Burren
DEAD	Burren very rocky phase	213	BUR	140Y Loamy over limestone bedrock	Burren
DEAD	Callaghane	511	CH	Coarse loamy drift with siliceous stones; locally over gravel?	Cooga
LIVE	Camoge	822	CA	63 Clayey river alluvium	Camoge
LIVE	Carne	511	CA	Coarse loamy stoneless drift	Carne
LIVE	Carney	212	CY	148 Carbonatic-clayey lake marl	Carney
LIVE	Carrickbyrne	612	CB	Loamy over acid and basic igneous bedrock	Carrickbyrne
LIVE	Carrigogunnel	313	CG	50 Coarse loamy over lithoskeletal basic igneous rock	Carrigogunnel
LIVE	Carrigvahanagh	113	CV	102 Peat over lithoskeletal acid igneous rock	Carrigvahanagh
DEAD	Castlebar	312	CT	Coarse loamy drift with siliceous stones	Broadway
DEAD	Castlecomer	712	CC	105 Fine loamy drift with siliceous stones	Gortaclareen
LIVE	Clashmore	311	CM	Coarse loamy drift with siliceous stones	Clashmore
LIVE	Clohamon	811	CN	39 Coarse loamy river alluvium	Clohamon
LIVE	Clohernagh	711	CH	Fine loamy fragic drift with siliceous stones	Clohernagh
LIVE	Clonaslee	723	CS	Coarse loamy over calcareous gravels	Clonaslee
LIVE	Clonegall	512	CG	97 Coarse loamy drift with siliceous stones	Clonegall
LIVE	Clonin	511	CN	54 Coarse loamy over sandstone bedrock	Clonin
DEAD	Clonlisk	723	CK	Fine loamy drift with limestones	Mylerstown
LIVE	Clonroche	311	CL	Fine loamy drift with siliceous stones	Clonroche
LIVE	Clonsast	914	CS	907 Peat (Raised Bog, Industrial milled and machined)	Clonsast
DEAD	Cloverfield	313	CV	47 Fine loamy drift with siliceous stones	Ashgrove
DEAD	Clowater	722	CW	108 Coarse loamy drift with siliceous stones	Puckane
LIVE	Cluggin	712	CG	64 Clayey drift with siliceous stones	Cluggin
DEAD	Conlawn	612	CL	Loamy drift with siliceous stones	Portlaw
LIVE	Cooga	511	CO	Coarse loamy drift with siliceous stones	Cooga
LIVE	Coolalough	822	CL	65 Clayey lake alluvium	Coolalough
LIVE	Coolanick	824	CN	Silty lake alluvium	Coolanick
LIVE	Coolfin	822	CF	Fine silty river alluvium	Coolfin
DEAD	Coolnakisha	712	CK	107 Fine loamy drift with limestones	Ballinamoore
LIVE	Corriga	514	CR	Fine loamy drift with siliceous stones	Corriga
LIVE	Crossabeg	412	CB	Fine loamy drift with siliceous stones	Crossabeg
LIVE	Crossmolina	513	CM	Coarse loamy drift with limestones	Crossmolina
LIVE	Crosstown	414	CO	Coarse loamy drift with siliceous stones	Crosstown
DEAD	Crumpau	112	CP	Loamy over lithoskeletal limestone	Rineanna
LIVE	Crush	213	CS	Coarse loamy over calcareous gravels	Crush
LIVE	Cullahill	321	CH	Fine loamy drift with limestones	Cullahill
LIVE	Cupidstownhill	511	CU	124 Fine loamy over shale bedrock	Cupidstownhill
LIVE	Curragh	1011	CU	Coarse loamy stoneless drift (calcareous sand)	Curragh
DEAD	Darkisland	822	DI	66 Fine silty river alluvium	Cooftin
DEAD	Derk	311	DK	Fine loamy drift with igneous and metamorphic stones	Kill
DEAD	Derrygarren	722	DG	250 Coarse loamy drift with siliceous stones	Puckane
DEAD	Dodard	712	DD	Coarse loamy drift with siliceous stones	Slieve Bloom
DEAD	Donaghcumper	414	DC	119 Fine loamy drift with limestones	Rathowen
DEAD	Dooncarton	632	DO	Loamy drift with siliceous stones	Killinga
DEAD	Doonglara	513	DL	56 Coarse loamy drift with siliceous stones	Knockboy
LIVE	Dooyork	311	DY	Sandy stoneless drift	Dooyork
LIVE	Dovea	311	DO	249 Fine silty drift with limestones	Dovea
LIVE	Driminidy	712	DY	Coarse loamy drift with siliceous stones	Driminidy
DEAD	Drimoleague	511	DM	Coarse loamy drift with siliceous stones; locally over gravel?	Cooga
LIVE	Drombanny	824	DR	67 Carbonatic-loamy lake marl	Drombanny
LIVE	Drumkeeran	711	DK	Clayey drift with siliceous stones	Drumkeeran
DEAD	Drummin	511	DR	Coarse loamy over sandstone bedrock	UNamed 07
LIVE	Drumsleed	632	DS	Sandy drift with siliceous stones	Drumsleed
LIVE	Drumslig	611	DS	Loamy over sandstone bedrock	Drumslig
LIVE	Dunboyne	411	DB	Fine loamy drift with siliceous stones	Dunboyne
LIVE	Dungarvan	411	DG	Coarse loamy drift with siliceous stones	Dungarvan
DEAD	Dungavan	311	DA	Coarse loamy drift with siliceous stones	Clashmore
DEAD	Dunnstown	723	DW	126 Fine loamy drift with limestones	Mylerstown
LIVE	Dunsany	823	DU	Carbonatic-clayey lake marl	Dunsany
LIVE	Elton	411	ET	59 Fine loamy drift with limestones	Elton
DEAD	Fahy	414	FH	Coarse loamy drift with siliceous stones	Crosstown
LIVE	Feale	821	FA	82 Fine loamy river alluvium	Feale
LIVE	Fethard	414	FE	Fine loamy drift with siliceous stones	Fethard
LIVE	Finisk	811	FI	Fine silty over non-calcareous gravels	Finisk
DEAD	Finnery	824	FNK	Carbonatic-loamy lake marl	Drombanny
DEAD	Finnery	820	FN	132 River alluvium	Finnery - River Burren
DEAD	Fontstown	411	FT	120 Loamy drift with limestones	Patrickswell
LIVE	Forth Commons	632	FC	Loamy over sandstone bedrock	Forth Commons
DEAD	Garristown	711	GS	127 Fine loamy drift with siliceous stones	Kilrush
LIVE	Garrynamona	912	GN	Peat (Raised Bog)	Garrynamona
DEAD	Glan	712	GL	Coarse loamy drift with siliceous stones	Driminidy
DEAD	Glasheenahielan	722	GH	Coarse loamy drift with siliceous stones (compact sandy till)	Puckane

Live	National_Series	Subgr. Code	Num	Modern_Definition	Modern_Correlative
LIVE	Glenary	632	BL	Loamy drift with siliceous stones	Glenary
DEAD	Glenomra	821	GL	142 Coarse loamy river alluvium	Lyre
LIVE	Gortaclareen	712	GN	Fine loamy drift with siliceous stones	Gortaclareen
LIVE	Gortnamona	913	GM	913 Peat (Raised Bog)	Gortnamona
DEAD	Graceswood	411	GW	Coarse loamy over calcareous fluvioglacial gravels	Baggotstown
DEAD	Grange	411	GA	121 Loamy drift with limestones	Elton
LIVE	Greename	731	GE	108 Loamy drift with siliceous stones	Greename
LIVE	Griston	822	GR	69 Sandy lake alluvium	Griston
DEAD	Hook Head	411	HH	Loamy drift with limestones	Patrickswell
LIVE	Howardstown	712	HN	70 Clayey limestone drift	Howardstown
DEAD	Hughstown	311	HT	123 Fine loamy over shale or slate bedrock	Ballylanders
LIVE	Ilen	811	IL	Loamy river alluvium over gravels	Ilen
LIVE	Johnstown	412	JH	Coarse loamy drift with siliceous stones	Johnstown
DEAD	Keeloge	311	KL	96 Coarse loamy drift over hard shale	Kells
LIVE	Kellistown	411	KL	89 Coarse loamy drift with igneous and metamorphic stones	Kellistown
LIVE	Kells	311	KE	Coarse loamy over hard shale bedrock	Kells
LIVE	Kennycourt	311	KC	122 Fine loamy drift with limestones	Kennycourt
LIVE	Kilbarry	921	KR	Peat over river alluvium	Kilbarry
DEAD	Kilbeheny	311	KH	48 Sandy drift with siliceous stones	Ballyvorheen
LIVE	Kilcolgan	213	KC	141 Fine loamy drift with limestones	Kilcolgan
DEAD	Kilcommon	711	KC	251 Fine loamy drift with siliceous stones	Kilrush
DEAD	Kilcommon peaty phase	712	KCP	Fine loamy drift with siliceous stones	Gortaclareen
LIVE	Kilfenora	321	KF	134 Clayey drift over limestone bedrock	Kilfenora
DEAD	Kilfergus	311	KE	51 Coarse loamy drift with siliceous stones	Clashmore
LIVE	Kilgory	821	KG	144 Sandy river alluvium	Kilgory
LIVE	Kill	311	KI	Fine loamy drift with igneous and metamorphic stones	Kill
LIVE	Kill lithic phase	311	KIL	Fine loamy over acid igneous bedrock	Kill lithic phase
DEAD	Killadangan	711	KD	Fine loamy drift with siliceous stones	Kilrush
LIVE	Killadoon	631	KD	Loamy drift with siliceous stones	Killadoon
LIVE	Killinga	632	KA	Loamy drift with siliceous stones	Killinga
DEAD	Killinick	311	KN	Coarse loamy drift with siliceous stones	Clashmore
LIVE	Kilmannock	821	KK	35 Silty estuarine alluvium	Kilmannock
DEAD	Kilmeaden	411	KM	Fine loamy drift with siliceous stones	Dunboyne
LIVE	Kilmore Slob	823	KS	Sandy marine alluvium	Kilmore Slob
LIVE	Kilmore slob variant	823	KSV	Clayey marine alluvium	Kilmore Slob variant
DEAD	Kilnageer	513	KA	Coarse loamy drift with siliceous stones	Knockboy
DEAD	Kilnageer	511	KG	Sandy drift with igneous and metamorphic stones	Kiltealy
DEAD	Kilpatrick	723	KL	128 Fine loamy drift with limestones	Myerstown
LIVE	Kilpierce	721	KP	Fine loamy drift with siliceous stones	Kilpierce
LIVE	Kilrush	711	KR	71 Fine loamy drift with siliceous stones	Kilrush
DEAD	Kiltclogher	711	KT	Fine loamy drift with siliceous stones	Kilrush
LIVE	Kiltealy	511	KY	22 Sandy drift with igneous and metamorphic stones	Kiltealy
DEAD	Kinvarra	311	KVW	Coarse loamy over limestone bedrock	UNNamed_65
LIVE	Kinvarra	311	KV	135 Fine loamy over clayey drift with limestones	Kinvarra
LIVE	Knockaceol	513	KC	77 Coarse loamy over sandstone bedrock	Knockaceol
DEAD	Knockanattin	632	KT	139 Loamy drift with siliceous stones	Killinga
DEAD	Knockanimpaha	632	KI	78 Loamy over shale bedrock	Knockastanna
DEAD	Knockaskeha	311	KH	136 Coarse loamy drift with siliceous stones	Clashmore
DEAD	Knockastanna	511	KSB	Fine loamy over shale bedrock	Cupidstownhill
LIVE	Knockastanna	632	KS	79 Loamy over shale bedrock	Knockastanna
DEAD	Knockbeg	411	KB	Loamy drift with limestones	Patrickswell
LIVE	Knockboy	513	KB	Coarse loamy drift with siliceous stones	Knockboy
DEAD	Knockcommane	612	KE	Loamy drift with siliceous stones	Portlaw
LIVE	Knockeyon	112	KY	204 Loamy over lithoskeletal sandstone	Knockeyon
LIVE	Knockmealdown	911	KM	Peat over rock	Knockmealdown
DEAD	Knockmullgurry	722	KM	109 Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
DEAD	Knocknaskeha	311	KH	Coarse loamy drift with siliceous stones	Clashmore
LIVE	Knockroe	721	KO	Coarse loamy drift with siliceous stones	Knockroe
LIVE	Knockshigowna	112	KW	Loamy over lithoskeletal shale or slate bedrock	Knockshigowna
LIVE	Knocksquire	311	KN	98 Coarse loamy over acid igneous bedrock	Knocksquire
DEAD	Knockstanna peaty phase	632	KSP	Loamy over shale bedrock	Knockastanna
LIVE	Ladestown	311	LA	199 Fine loamy over calcareous gravels	Ladestown
DEAD	Letter	722	LT	Coarse loamy drift with siliceous stones	Puckane
DEAD	Letterbrock	632	LB	Loamy drift with siliceous stones	Killinga
DEAD	Lickey	712	LC	Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Liffey	811	LF	125 Coarse loamy river alluvium	Clohamon
LIVE	Loughmuirran	314	LO	Clayey drift with siliceous stones (colluvium)	Loughmuirran
LIVE	Lyre	821	LY	72 Coarse loamy river alluvium	Lyre
LIVE	Macamore	711	MC	Fine loamy over clayey drift with limestones	Macamore
DEAD	Madore	511	MD	Coarse loamy drift with siliceous stones	Cooga
DEAD	Manch	811	MH	Loamy river alluvium over gravels	Ilen
DEAD	Massbrock	611	MB	Loamy drift with igneous and metamorphic stones	Stonepark
DEAD	Mealagh	811	ML	Loamy river alluvium over gravels	Ilen
LIVE	Millquarter	822	MQ	38 Fine silty lake alluvium	Millquarter

Live	National Series	Subgr. Code	Num	Modern Definition	Modern Correlative
DEAD	Moanduff	712 MN	110	Fine loamy drift with limestones	Ballinamoor
LIVE	Monatray	1011 MT		Loamy drift with siliceous stones	Monatray
LIVE	Monavullagh	632 MV		Sandy over sandstone bedrock (conglomerate)	Monavullagh
LIVE	Moord	314 MO		Fine loamy drift with siliceous stones	Moord
LIVE	Mortarstown	411 MT	90	Fine loamy over clayey drift with limestones	Mortarstown
DEAD	Mothel	712 ME		Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Mountcollins	513 MS	55	Fine loamy over mudstone, shale or slate	Borrisoleigh
DEAD	Mountminnett	712 MM	73	Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Mulkear	811 MK	83	Coarse loamy river alluvium	Clohamon
LIVE	Mylerstown	723 MT	129	Fine loamy drift with limestones	Mylerstown
LIVE	Newport	711 NW		Coarse loamy drift with limestones	Newport
LIVE	Newtown	722 NT	111	Coarse loamy drift with igneous and metamorphic stones	Newtown
DEAD	Old Ross	311 OR		Coarse loamy drift with siliceous stones	Clashmore
DEAD	Oulartleigh	722 OL		Coarse loamy drift with siliceous stones	Puckane
DEAD	Parknakle	711 PN		Fine loamy drift with siliceous stones	Kilrush
LIVE	Patrickswell	411 PW	60	Loamy drift with limestones	Patrickswell
LIVE	Patrickswell lithic phase	411 PWL		Fine loamy over limestone bedrock	Patrickswell lithic phase
DEAD	Paulstown	411 PU	91	Fine loamy over clayey drift with limestones	Mortarstown
LIVE	Pollardstown	921 PT	908	Peat (Fen, undrained)	Pollardstown
LIVE	Portlaw	612 PO		Loamy drift with siliceous stones	Portlaw
LIVE	Puckane	722 PU	74	Coarse loamy drift with siliceous stones	Puckane
DEAD	Raheen	911 RH		Peat (Raised Bog (moss))	Allen
DEAD	Raheenduff	712 RD		Fine loamy drift with limestones	Ballinamoor
DEAD	Raheenleigh	722 RL	113	Coarse loamy drift with siliceous stones	Puckane
DEAD	Rakestreet	213 RE		Sandy drift with calcareous gravels	Crush
LIVE	Randallsmill	311 RM		Coarse loamy stoneless drift	Randallsmill
DEAD	Rathangan	711 RO		Fine loamy drift with siliceous stones	Kilrush
DEAD	Rathbornev	822 RB	145	Clayey river alluvium	Camoge
DEAD	Rathcannon	411 RC	61	Fine loamy drift with limestones	Mortarstown
LIVE	Rathkenny	513 RK		Fine loamy drift with siliceous stones	Rathkenny
LIVE	Rathowen	414 RA	200	Fine loamy drift with limestones	Rathowen
DEAD	Rathvinden	411 RV	92	Coarse loamy drift with siliceous stones	Dungarvan
DEAD	Reanascreena	513 RE		Coarse loamy drift with siliceous stones	Knockboy
LIVE	Rearymore	812 RY		Fine loamy river alluvium	Rearymore
DEAD	Ridge	513 RG		Fine loamy over mudstone, shale or slate	Borrisoleigh
DEAD	Ridge	311 RG	99	Fine loamy over shale or slate bedrock	Ballylanders
LIVE	Rineanna	112 RN	84	Loamy over lithoskeletal limestone	Rineanna
DEAD	Rinnagowna	711 RG		Fine loamy drift with siliceous stones	Kilrush
DEAD	River Burren	821 RB	115	River alluvium (variable texture)	Finner - River Burren
DEAD	Rooskagh	811 RS		Coarse loamy river alluvium	Clohamon
DEAD	Rootiagh	712 RT	75	Fine loamy drift with igneous and metamorphic stones	Gortaclareen variant
LIVE	Ross Carbery	511 RO		Coarse loamy compact drift with siliceous stones	Ross Carbery
DEAD	Ross Carbery Broken phase	511 ROB		Coarse loamy compact drift with siliceous stones	Ross Carbery
DEAD	Ross Carbery Plaggen	511 ROP		Coarse loamy compact drift with siliceous stones	Ross Carbery
DEAD	Ross Carbery Rocky phase	112 ROR		Coarse loamy compact drift with siliceous stones	Bantry
DEAD	Ross Carbery variant	1011 ROV		Coarse loamy compact drift with siliceous stones	Schull Plaggen
DEAD	Rossmore	632 RM		Loamy drift with siliceous stones	Killinga
DEAD	Sawyerswood	712 SW	130	Clayey limestone drift	Howardstown
LIVE	Schull	313 SH		Coarse loamy drift with siliceous stones	Schull
LIVE	Schull Plaggen	1011 SHP		Coarse loamy drift with siliceous stones	Schull Plaggen
DEAD	Schull Rocky phase	112 SHR		Peat over sandstone and shale bedrock	Bantry
DEAD	Schull Rocky Variant	313 SHY		Coarse loamy drift with siliceous stones	Schull
DEAD	Schull variant	1011 SHV		Coarse loamy drift with siliceous stones	Schull Plaggen
LIVE	Screen	511 SN		Sandy stoneless drift	Screen
LIVE	Seafield	211 SE	146	Sandy stoneless drift	Seafield
DEAD	Seefin	632 SF	80	Loamy over sandstone bedrock	Forth Commons
DEAD	Sellernaun	721 SN	143	Coarse loamy drift with siliceous stones	Knockroe
DEAD	Seskinrea	712 SK	114	Fine loamy drift with siliceous stones	Gortaclareen
LIVE	Shannon	822 SH	76	Fine silty estuarine alluvium	Shannon
LIVE	Slieve Bloom	722 SB		Coarse loamy drift with siliceous stones	Slieve Bloom
LIVE	Slievebeag	611 SG		Loamy over shale bedrock	Slievebeag
DEAD	Slievecoilta	513 SC		Fine loamy over mudstone, shale or slate	Borrisoleigh
DEAD	Slievereahg	112 SR	85	Loamy over lithoskeletal sandstone	Knockeyon
DEAD	Slob	821 SB		Silty estuarine alluvium	Kilmannock
DEAD	Srah	511 SH		Coarse loamy drift with siliceous stones	Cooga
LIVE	Stonepark	611 SP		Loamy drift with igneous and metamorphic stones	Stonepark
DEAD	Stradbally	411 SY		Loamy drift with limestones	Patrickswell
LIVE	Straffan	711 ST	133	Fine loamy drift with limestones	Straffan
DEAD	Street	711 SR	202	Fine loamy drift with siliceous stones	Kilrush
LIVE	Suir	811 SU		Fine silty river alluvium	Suir
DEAD	Tallavbaun	722 TV		Coarse loamy drift with siliceous stones	Puckane

Live	National_Series	Subgr. Code	Num	Modern Definition	Modern Correlative
DEAD	Templeshanbo	722	TS	Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
DEAD	Toberbride	722	TB	115 Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
LIVE	Tomard	512	TO	101 Fine loamy over shale or slate bedrock	Tomard
LIVE	Tourmakeady	722	TK	Fine loamy drift with siliceous stones	Tourmakeady
LIVE	Tramore	711	TR	Coarse loamy drift with igneous and metamorphic stones	Tramore
DEAD	Trean	721	TN	Coarse loamy drift with siliceous stones	Kilpierce
DEAD	Tullig	314	TU	137 Fine loamy drift with siliceous stones	Moord
LIVE	Turbary	913	TB	914 Peat (Raised Bog, undrained, hand-cut)	Turbary
LIVE	UNnamed_01	111	UN01	Loamy over lithoskeletal basic igneous rock	UNnamed_01
LIVE	UNnamed_02	112	UN02	Loamy over lithoskeletal gneiss or schist	UNnamed_02
LIVE	UNnamed_03	311	UN03	Fine loamy over non-calcareous gravels	UNnamed_03
LIVE	UNnamed_04	313	UN04	Fine loamy over shale bedrock	UNnamed_04
LIVE	UNnamed_05	321	UN05	Fine loamy over calcareous gravels	UNnamed_05
LIVE	UNnamed_06	511	UN06	Coarse loamy over non-calcareous gravels	UNnamed_06
DEAD	UNnamed_07	511	UN07	Coarse loamy over sandstone bedrock	Clonin
LIVE	UNnamed_08	711	UN08	Clayey over soft shale/slate bedrock	UNnamed_08
LIVE	UNnamed_09	711	UN09	Fine loamy over clayey drift with siliceous stones	UNnamed_09
LIVE	UNnamed_10	721	UN10	Loamy over lithoskeletal shale or slate bedrock	UNnamed_10
LIVE	UNnamed_11	811	UN11	Coarse loamy river alluvium	UNnamed_11
LIVE	UNnamed_12	811	UN12	Silty river alluvium	UNnamed_12
LIVE	UNnamed_13	812	UN13	Silty river alluvium	UNnamed_13
LIVE	UNnamed_14	111	UN14	Loamy over shale bedrock	UNnamed_14
LIVE	UNnamed_15	211	UN15	Loamy over limestone bedrock	UNnamed_15
LIVE	UNnamed_16	312	UN16	Fine loamy drift with siliceous stones	UNnamed_16
DEAD	UNnamed_17	314	UN17	Fine loamy drift with siliceous stones	Moord
LIVE	UNnamed_18	314	UN18	Fine loamy over sandstone bedrock	UNnamed_18
LIVE	UNnamed_19	314	UN19	Fine loamy over shale bedrock	UNnamed_19
LIVE	UNnamed_20	321	UN20	Fine loamy drift with limestones	UNnamed_20
DEAD	UNnamed_21	411	UN21	Fine loamy over calcareous gravels	Ballynamona
LIVE	UNnamed_22	411	UN22	Fine loamy over sandstone bedrock	UNnamed_22
LIVE	UNnamed_23	411	UN23	Fine loamy over shale bedrock	UNnamed_23
LIVE	UNnamed_24	411	UN24	Fine loamy over clayey drift with siliceous stones	UNnamed_24
LIVE	UNnamed_25	412	UN25	Fine loamy drift with limestones	UNnamed_25
LIVE	UNnamed_26	412	UN26	Fine loamy drift with siliceous stones	UNnamed_26
LIVE	UNnamed_27	414	UN27	Fine loamy over shale bedrock	UNnamed_27
LIVE	UNnamed_28	414	UN28	Fine loamy over clayey drift with siliceous stones	UNnamed_28
LIVE	UNnamed_29	511	UN29	Fine loamy drift with siliceous stones	UNnamed_29
DEAD	UNnamed_30	511	UN30	Fine loamy over shale bedrock	Cupidstownhill
LIVE	UNnamed_31	511	UN31	Fine loamy over sandstone bedrock	UNnamed_31
LIVE	UNnamed_32	513	UN32	Fine loamy over sandstone bedrock	UNnamed_32
LIVE	UNnamed_33	514	UN33	Coarse loamy over sandstone bedrock	UNnamed_33
DEAD	UNnamed_34	611	UN34	Loamy over shale bedrock	Slievebeag
DEAD	UNnamed_35	631	UN35	Loamy drift with siliceous stones	Killadoon
LIVE	UNnamed_36	631	UN36	Loamy over sandstone bedrock	UNnamed_36
LIVE	UNnamed_37	631	UN37	Sandy drift with siliceous stones	UNnamed_37
LIVE	UNnamed_38	612	UN38	Sandy drift with siliceous stones	UNnamed_38
LIVE	UNnamed_39	711	UN39	Clayey Stoneless drift	UNnamed_39
LIVE	UNnamed_40	711	UN40	Fine loamy over shale bedrock	UNnamed_40
LIVE	UNnamed_41	711	UN41	Fine silty shale bedrock	UNnamed_41
LIVE	UNnamed_42	721	UN42	Fine loamy drift with limestones	UNnamed_42
LIVE	UNnamed_43	721	UN43	Fine loamy stoneless drift	UNnamed_43
DEAD	UNnamed_44	722	UN44	Fine loamy drift with siliceous stones	Tourmakeady
LIVE	UNnamed_45	723	UN45	Coarse loamy drift with limestones	UNnamed_45
LIVE	UNnamed_46	723	UN46	Fine loamy over calcareous gravels	UNnamed_46
LIVE	UNnamed_47	731	UN47	Fine loamy drift with siliceous stones	UNnamed_47
LIVE	UNnamed_48	821	UN48	Fine loamy lake alluvium	UNnamed_48
LIVE	UNnamed_49	822	UN49	Coarse loamy river alluvium	UNnamed_49
LIVE	UNnamed_50	822	UN50	Coarse loamy over calcareous gravels	UNnamed_50

Live	National_Series	Subgr. Code	Num	Modern_Definition	Modern_Correlative
LIVE	UNnamed_51	111	UN51	Loamy over sandstone bedrock	UNnamed_51
LIVE	UNnamed_52	314	UN52	Coarse loamy drift with limestones	UNnamed_52
LIVE	UNnamed_53	314	UN53	Coarse loamy drift with siliceous stones	UNnamed_53
LIVE	UNnamed_54	323	UN54	Fine loamy drift with limestones	UNnamed_54
LIVE	UNnamed_56	414	UN56	Fine loamy over clayey drift with limestones	UNnamed_56
LIVE	UNnamed_57	414	UN57	Fine silty drift with siliceous stones	UNnamed_57
LIVE	UNnamed_58	612	UN58	Loamy over sandstone bedrock	UNnamed_58
LIVE	UNnamed_59	711	UN59	Fine loamy over clayey over shale bedrock	UNnamed_59
LIVE	UNnamed_60	711	UN60	Fine silty drift with siliceous stones	UNnamed_60
LIVE	UNnamed_61	722	UN61	Fine silty drift with siliceous stones	UNnamed_61
LIVE	UNnamed_62	812	UN62	Carbonatic-loamy lake alluvium	UNnamed_62
LIVE	UNnamed_63	821	UN63	Fine silty lake alluvium	UNnamed_63
DEAD	UNnamed_64	411	UN64	Coarse loamy drift with siliceous stones	Dungarvan
LIVE	UNnamed_65	311	UN65	Coarse loamy drift with limestones	UNnamed_65
DEAD	UNnamed_66	632	UN66	Loamy over shale bedrock	Knockastanna
LIVE	Vicarstown	821	VI	Clayey river alluvium	Vicarstown
DEAD	Wardhouse	511	WH	Coarse loamy drift with siliceous stones; locally over gravel?	Cooga
DEAD	Waterford	711	WF	Fine loamy drift with siliceous stones	Kilrush
DEAD	Waterpark	311	WP	138 Coarse loamy over shale bedrock	Kells
LIVE	Wexford slob	822	WS	Silty marine alluvium	Wexford slob
LIVE	Wonderhill	313	WO	52 Fine loamy over lithoskeletal basic igneous rock	Wonderhill
<div style="display: flex; justify-content: space-around; align-items: center;"> Feb Jly Sep </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 5px;"> <div style="width: 20px; height: 15px; background-color: red; border: 1px solid black;"></div> <div style="width: 20px; height: 15px; background-color: blue; border: 1px solid black;"></div> <div style="width: 20px; height: 15px; background-color: green; border: 1px solid black;"></div> </div> <div style="margin-left: 100px;">)Changes, additions made in 2011</div> <div style="margin-left: 100px;">Dec</div>					

Annex VII (cont) All Soil Series mapped in Ireland by AFT: Subgroup order

Live	National Series	Subgr. Code	Num	Modern Definition	Modern Correlative
LIVE	UNnamed_01	111 UN01		Loamy over lithoskeletal basic igneous rock	UNnamed_01
LIVE	UNnamed_14	111 UN14		Loamy over shale bedrock	UNnamed_14
LIVE	UNnamed_51	111 UN51		Loamy over sandstone bedrock	UNnamed_51
DEAD	Crumpaun	112 CP		Loamy over lithoskeletal limestone	Rineanna
LIVE	Knockkeyon	112 KY	204	Loamy over lithoskeletal sandstone	Knockkeyon
LIVE	Knockshigowna	112 KW		Loamy over lithoskeletal shale or slate bedrock	Knockshigowna
LIVE	Rineanna	112 RN	84	Loamy over lithoskeletal limestone	Rineanna
DEAD	Ross Carbery Rocky phase	112 ROR		Coarse loamy compact drift with siliceous stones	Bantry
DEAD	Schull Rocky phase	112 SHR		Peat over sandstone and shale bedrock	Bantry
DEAD	Slievareagh	112 SR	85	Loamy over lithoskeletal sandstone	Knockkeyon
LIVE	UNnamed_02	112 UN02		Loamy over lithoskeletal gneiss or schist	UNnamed_02
LIVE	Bantry	113 BA		Peat over sandstone and shale bedrock	Bantry
LIVE	Carrigvahanagh	113 CV	102	Peat over lithoskeletal acid igneous rock	Carrigvahanagh
LIVE	Seafield	211 SE	146	Sandy stoneless drift	Seafield
LIVE	UNnamed_15	211 UN15		Loamy over limestone bedrock	UNnamed_15
LIVE	Carney	212 CY	148	Carbonatic-clayey lake marl	Carney
LIVE	Burren	213 BU	140	Fine loamy over limestone bedrock	Burren
DEAD	Burren very rocky phase	213 BUR	140Y	Loamy over limestone bedrock	Burren
LIVE	Crush	213 CS		Coarse loamy over calcareous gravels	Crush
LIVE	Kilcolgan	213 KC	141	Fine loamy drift with limestones	Kilcolgan
DEAD	Rakestreet	213 RE		Sandy drift with calcareous gravels	Crush
DEAD	Acaun	311 AU	93	Coarse loamy drift with siliceous stones	Clashmore
LIVE	Aille	311 AL		Coarse loamy over limestone bedrock	Aille
DEAD	Baldwinstown	311 BA		Fine loamy drift with siliceous stones	Clonroche
DEAD	Ballindaggan	311 BD	15	Fine loamy over shale or slate bedrock	Ballylanders
LIVE	Ballyglass	311 BG		Coarse loamy over sandstone bedrock	Ballyglass
LIVE	Ballylanders	311 BY	45	Fine loamy over shale or slate bedrock	Ballylanders
DEAD	Ballynalacken	311 BC	49	Fine loamy drift with siliceous stones	Clonroche
DEAD	Ballytarsna	311 BT	94	Coarse loamy over acid igneous bedrock	Knocksquire
LIVE	Ballyvorheen	311 BV	46	Sandy drift with siliceous stones	Ballyvorheen
DEAD	Baunreagh	311 BN		Fine loamy drift with siliceous stones	Clonroche
DEAD	Baunreagh steep phase	311 BNS		Fine loamy over shale bedrock	Ballylanders
LIVE	Borris	311 BO	95	Coarse loamy drift with igneous and metamorphic stones	Borris
LIVE	Broomhill	311 BL		Fine loamy over sandstone bedrock	Broomhill
LIVE	Broughillstown	311 BR		Coarse loamy over calcareous gravels	Broughillstown
DEAD	Broughillstown Shallow Phase	311 BRS		Coarse loamy over calcareous gravels	Baggotstown
LIVE	Clashmore	311 CM		Coarse loamy drift with siliceous stones	Clashmore
LIVE	Clonroche	311 CL		Fine loamy drift with siliceous stones	Clonroche
DEAD	Derk	311 DK		Fine loamy drift with igneous and metamorphic stones	Kill
LIVE	Dooyork	311 DY		Sandy stoneless drift	Dooyork
LIVE	Dovea	311 DO	249	Fine silty drift with limestones	Dovea
DEAD	Dungavan	311 DA		Coarse loamy drift with siliceous stones	Clashmore
DEAD	Hughstown	311 HT	123	Fine loamy over shale or slate bedrock	Ballylanders
DEAD	Keeloge	311 KL	96	Coarse loamy drift over hard shale	Kells
LIVE	Kells	311 KE		Coarse loamy over hard shale bedrock	Kells
LIVE	Kennycourt	311 KC	122	Fine loamy drift with limestones	Kennycourt
DEAD	Kilbeheny	311 KH	48	Sandy drift with siliceous stones	Ballyvorheen
DEAD	Kilfergus	311 KE	51	Coarse loamy drift with siliceous stones	Clashmore
LIVE	Kill	311 KI		Fine loamy drift with igneous and metamorphic stones	Kill
LIVE	Kill lithic phase	311 KIL		Fine loamy over acid igneous bedrock	Kill lithic phase
DEAD	Killinick	311 KN		Coarse loamy drift with siliceous stones	Clashmore
DEAD	Kinvarra	311 KVW		Coarse loamy over limestone bedrock	UNnamed_65
LIVE	Kinvarra	311 KV	135	Fine loamy over clayey drift with limestones	Kinvarra
DEAD	Knockaskeha	311 KH	136	Coarse loamy drift with siliceous stones	Clashmore
DEAD	Knocknaskeha	311 KH		Coarse loamy drift with siliceous stones	Clashmore
LIVE	Knocksquire	311 KN	98	Coarse loamy over acid igneous bedrock	Knocksquire
LIVE	Ladestown	311 LA	199	Fine loamy over calcareous gravels	Ladestown
DEAD	Old Ross	311 OR		Coarse loamy drift with siliceous stones	Clashmore
LIVE	Randallsmill	311 RM		Coarse loamy stoneless drift	Randallsmill
DEAD	Ridge	311 RG	99	Fine loamy over shale or slate bedrock	Ballylanders
LIVE	UNnamed_03	311 UN03		Fine loamy over non-calcareous gravels	UNnamed_03
LIVE	UNnamed_65	311 UN65		Coarse loamy drift with limestones	UNnamed_65
DEAD	Waterpark	311 WP	138	Coarse loamy over shale bedrock	Kells
LIVE	Broadway	312 BY		Coarse loamy drift with siliceous stones	Broadway
DEAD	Castlebar	312 CT		Coarse loamy drift with siliceous stones	Broadway
LIVE	UNnamed_16	312 UN16		Fine loamy drift with siliceous stones	UNnamed_16
LIVE	Ashgrove	313 AS		Fine loamy drift with siliceous stones	Ashgrove
LIVE	Bantry Bay	313 BB		Coarse loamy dense blue-grey drift with siliceous stones	Bantry Bay
LIVE	Carrigogunnel	313 CG	50	Coarse loamy over lithoskeletal basic igneous rock	Carrigogunnel
DEAD	Cloverfield	313 CV	47	Fine loamy drift with siliceous stones	Ashgrove

Live	National_Series	Subgr. Code	Num	Modern_Definition	Modern_Correlative
LIVE	Schull	313	SH	Coarse loamy drift with siliceous stones	Schull
DEAD	Schull Rocky Variant	313	SHY	Coarse loamy drift with siliceous stones	Schull
LIVE	UNnamed_04	313	UN04	Fine loamy over shale bedrock	UNnamed_04
LIVE	Wonderhill	313	WO	52 Fine loamy over lithoskeletal basic igneous rock	Wonderhill
DEAD	Ambrosetown	314	AM	Fine loamy drift with siliceous stones	Moord
LIVE	Loughmuirran	314	LO	Clayey drift with siliceous stones (colluvium)	Loughmuirran
LIVE	Moord	314	MO	Fine loamy drift with siliceous stones	Moord
DEAD	Tullig	314	TU	137 Fine loamy drift with siliceous stones	Moord
DEAD	UNnamed_17	314	UN17	Fine loamy drift with siliceous stones	Moord
LIVE	UNnamed_18	314	UN18	Fine loamy over sandstone bedrock	UNnamed_18
LIVE	UNnamed_19	314	UN19	Fine loamy over shale bedrock	UNnamed_19
LIVE	UNnamed_52	314	UN52	Coarse loamy drift with limestones	UNnamed_52
LIVE	UNnamed_53	314	UN53	Coarse loamy drift with siliceous stones	UNnamed_53
LIVE	Baggotstown	321	BG	42 Coarse loamy over calcareous gravels	Baggotstown
LIVE	Ballincurra	321	BC	43 Fine loamy over limestone bedrock	Ballincurra
LIVE	Cullahill	321	CH	Fine loamy drift with limestones	Cullahill
LIVE	Kilfenora	321	KF	134 Clayey drift over limestone bedrock	Kilfenora
LIVE	UNnamed_05	321	UN05	Fine loamy over calcareous gravels	UNnamed_05
LIVE	UNnamed_20	321	UN20	Fine loamy drift with limestones	UNnamed_20
LIVE	UNnamed_54	323	UN54	Fine loamy drift with limestones	UNnamed_54
LIVE	Athy	411	AT	117 Coarse loamy over calcareous gravels	Athy
DEAD	Ballinakill	411	BK	Fine loamy drift with limestones	Elton
DEAD	Ballycastle	411	BC	Fine loamy drift with siliceous stones	Dunboyne
LIVE	Ballynamona	411	BY	58 Fine loamy drift with igneous and metamorphic stones	Ballynamona
LIVE	Dunboyne	411	DB	Fine loamy drift with siliceous stones	Dunboyne
LIVE	Dungarvan	411	DG	Coarse loamy drift with siliceous stones	Dungarvan
LIVE	Elton	411	ET	59 Fine loamy drift with limestones	Elton
DEAD	Fontstown	411	FT	120 Loamy drift with limestones	Patrickswell
DEAD	Graceswood	411	GW	Coarse loamy over calcareous fluvioglacial gravels	Baggotstown
DEAD	Grange	411	GA	121 Loamy drift with limestones	Elton
DEAD	Hook Head	411	HH	Loamy drift with limestones	Patrickswell
LIVE	Kellistown	411	KL	89 Coarse loamy drift with igneous and metamorphic stones	Kellistown
DEAD	Kilmeaden	411	KM	Fine loamy drift with siliceous stones	Dunboyne
DEAD	Knockbeg	411	KB	Loamy drift with limestones	Patrickswell
LIVE	Mortarstown	411	MT	90 Fine loamy over clayey drift with limestones	Mortarstown
LIVE	Patrickswell	411	PW	60 Loamy drift with limestones	Patrickswell
LIVE	Patrickswell lithic phase	411	PWL	Fine loamy over limestone bedrock	Patrickswell lithic phase
DEAD	Paulstown	411	PU	91 Fine loamy over clayey drift with limestones	Mortarstown
DEAD	Rathcannon	411	RC	61 Fine loamy drift with limestones	Mortarstown
DEAD	Rathvinden	411	RV	92 Coarse loamy drift with siliceous stones	Dungarvan
DEAD	Stradbally	411	SY	Loamy drift with limestones	Patrickswell
DEAD	UNnamed_21	411	UN21	Fine loamy over calcareous gravels	Ballynamona
LIVE	UNnamed_22	411	UN22	Fine loamy over sandstone bedrock	UNnamed_22
LIVE	UNnamed_23	411	UN23	Fine loamy over shale bedrock	UNnamed_23
LIVE	UNnamed_24	411	UN24	Fine loamy over clayey drift with siliceous stones	UNnamed_24
DEAD	UNnamed_64	411	UN64	Coarse loamy drift with siliceous stones	Dungarvan
LIVE	Crossabeg	412	CB	Fine loamy drift with siliceous stones	Crossabeg
LIVE	Johnstown	412	JH	Coarse loamy drift with siliceous stones	Johnstown
LIVE	UNnamed_25	412	UN25	Fine loamy drift with limestones	UNnamed_25
LIVE	UNnamed_26	412	UN26	Fine loamy drift with siliceous stones	UNnamed_26
DEAD	Ballinabranagh	414	BG	88 Loamy drift with siliceous stones	Crosstown
DEAD	Ballydoole	414	BD	Coarse loamy drift with siliceous stones	Crosstown
LIVE	Crosstown	414	CO	Coarse loamy drift with siliceous stones	Crosstown
DEAD	Donaghcumper	414	DC	119 Fine loamy drift with limestones	Rathowen
DEAD	Fahy	414	FH	Coarse loamy drift with siliceous stones	Crosstown
LIVE	Fethard	414	FE	Fine loamy drift with siliceous stones	Fethard
LIVE	Rathowen	414	RA	200 Fine loamy drift with limestones	Rathowen
LIVE	UNnamed_27	414	UN27	Fine loamy over shale bedrock	UNnamed_27
LIVE	UNnamed_28	414	UN28	Fine loamy over clayey drift with siliceous stones	UNnamed_28
LIVE	UNnamed_56	414	UN56	Fine loamy over clayey drift with limestones	UNnamed_56
LIVE	UNnamed_57	414	UN57	Fine silty drift with siliceous stones	UNnamed_57
DEAD	Accony	511	AY	Coarse loamy drift with siliceous stones	Cooga
DEAD	Callaghane	511	CH	Coarse loamy drift with siliceous stones; locally over gravel?	Cooga
LIVE	Carne	511	CA	Coarse loamy stoneless drift	Carne
LIVE	Clonin	511	CN	54 Coarse loamy over sandstone bedrock	Clonin
LIVE	Cooga	511	C0	Coarse loamy drift with siliceous stones	Cooga
LIVE	Cupidstownhill	511	CU	124 Fine loamy over shale bedrock	Cupidstownhill
DEAD	Drimoleague	511	DM	Coarse loamy drift with siliceous stones; locally over gravel?	Cooga
DEAD	Drummin	511	DR	Coarse loamy over sandstone bedrock	UNnamed_07
DEAD	Kilnageer	511	KG	Sandy drift with igneous and metamorphic stones	Kiltealy
LIVE	Kiltealy	511	KY	22 Sandy drift with igneous and metamorphic stones	Kiltealy
DEAD	Knockastanna	511	KSB	Fine loamy over shale bedrock	Cupidstownhill

Live	National_Series	Subgr. Code_Num	Modern_Definition	Modern_Correlative
LIVE	Ross Carbery	511 RO	Coarse loamy compact drift with siliceous stones	Ross Carbery
DEAD	Ross Carbery Broken phase	511 ROB	Coarse loamy compact drift with siliceous stones	Ross Carbery
DEAD	Ross Carbery Plaggen	511 ROP	Coarse loamy compact drift with siliceous stones	Ross Carbery
LIVE	Screen	511 SN	Sandy stoneless drift	Screen
DEAD	Srah	511 SH	Coarse loamy drift with siliceous stones	Cooga
LIVE	UNNamed_06	511 UN06	Coarse loamy over non-calcareous gravels	UNNamed_06
DEAD	UNNamed_07	511 UN07	Coarse loamy over sandstone bedrock	Clonin
LIVE	UNNamed_29	511 UN29	Fine loamy drift with siliceous stones	UNNamed_29
DEAD	UNNamed_30	511 UN30	Fine loamy over shale bedrock	Cupidstownhill
LIVE	UNNamed_31	511 UN31	Fine loamy over sandstone bedrock	UNNamed_31
DEAD	Wardhouse	511 WH	Coarse loamy drift with siliceous stones; locally over gravel?	Cooga
LIVE	Clonegall	512 CG	97 Coarse loamy drift with siliceous stones	Clonegall
LIVE	Tomard	512 TO	101 Fine loamy over shale or slate bedrock	Tomard
DEAD	Ballybrood	513 BR	53 Fine loamy drift with siliceous stones	Rathkenny
LIVE	Borrisoleigh	513 BE	261 Fine loamy over mudstone, shale or slate	Borrisoleigh
LIVE	Crossmolina	513 CM	Coarse loamy drift with limestones	Crossmolina
DEAD	Doonglara	513 DL	56 Coarse loamy drift with siliceous stones	Knockboy
DEAD	Kilnageer	513 KA	Coarse loamy drift with siliceous stones	Knockboy
LIVE	Knockaceol	513 KC	77 Coarse loamy over sandstone bedrock	Knockaceol
LIVE	Knockboy	513 KB	Coarse loamy drift with siliceous stones	Knockboy
DEAD	Mountcollins	513 MS	55 Fine loamy over mudstone, shale or slate	Borrisoleigh
LIVE	Rathkenny	513 RK	Fine loamy drift with siliceous stones	Rathkenny
DEAD	Reanascreena	513 RE	Coarse loamy drift with siliceous stones	Knockboy
DEAD	Ridge	513 RG	Fine loamy over mudstone, shale or slate	Borrisoleigh
DEAD	Slievecoilta	513 SC	Fine loamy over mudstone, shale or slate	Borrisoleigh
LIVE	UNNamed_32	513 UN32	Fine loamy over sandstone bedrock	UNNamed_32
LIVE	Corriga	514 CR	Fine loamy drift with siliceous stones	Corriga
LIVE	UNNamed_33	514 UN33	Coarse loamy over sandstone bedrock	UNNamed_33
DEAD	Ballinagilly	611 BY	109 Loamy drift with igneous and metamorphic stones	Stonepark
LIVE	Ballycondon	611 BN	Loamy drift with siliceous stones	Ballycondon
LIVE	Ballyscanlon	611 BS	Loamy over acid igneous rock	Ballyscanlon
LIVE	Black Rock Mountain	611 BR	Loamy over gneiss and schist bedrock	Black Rock Mountain
LIVE	Drumslig	611 DS	Loamy over sandstone bedrock	Drumslig
DEAD	Massbrock	611 MB	Loamy drift with igneous and metamorphic stones	Stonepark
LIVE	Slievebeag	611 SG	Loamy over shale bedrock	Slievebeag
LIVE	Stonepark	611 SP	Loamy drift with igneous and metamorphic stones	Stonepark
DEAD	UNNamed_34	611 UN34	Loamy over shale bedrock	Slievebeag
DEAD	Beltra	612 BE	Loamy drift with siliceous stones	Portlaw
LIVE	Carrickbyrne	612 CB	Loamy over acid and basic igneous bedrock	Carrickbyrne
DEAD	Conlawn	612 CL	Loamy drift with siliceous stones	Portlaw
DEAD	Knockcommane	612 KE	Loamy drift with siliceous stones	Portlaw
LIVE	Portlaw	612 PO	Loamy drift with siliceous stones	Portlaw
LIVE	UNNamed_38	612 UN38	Sandy drift with siliceous stones	UNNamed_38
LIVE	UNNamed_58	612 UN58	Loamy over sandstone bedrock	UNNamed_58
LIVE	Ahuan	621 AH	Loamy drift with siliceous stones	Ahuan
LIVE	Killadoon	631 KD	Loamy drift with siliceous stones	Killadoon
DEAD	UNNamed_35	631 UN35	Loamy drift with siliceous stones	Killadoon
LIVE	UNNamed_36	631 UN36	Loamy over sandstone bedrock	UNNamed_36
LIVE	UNNamed_37	631 UN37	Sandy drift with siliceous stones	UNNamed_37
DEAD	Black Rock Mountain	632 BRC	17 Loamy over shale bedrock	Knockastanna
LIVE	Blackstairs	632 BL	24 Sandy over granite bedrock	Blackstairs
DEAD	Dooncarton	632 DO	Loamy drift with siliceous stones	Killinga
LIVE	Drumsleed	632 DS	Sandy drift with siliceous stones	Drumsleed
LIVE	Forth Commons	632 FC	Loamy over sandstone bedrock	Forth Commons
LIVE	Glenary	632 BL	Loamy drift with siliceous stones	Glenary
LIVE	Killinga	632 KA	Loamy drift with siliceous stones	Killinga
DEAD	Knockanattin	632 KT	139 Loamy drift with siliceous stones	Killinga
DEAD	Knockanimpaha	632 KI	78 Loamy over shale bedrock	Knockastanna
LIVE	Knockastanna	632 KS	79 Loamy over shale bedrock	Knockastanna
DEAD	Knockstanna peaty phase	632 KSP	Loamy over shale bedrock	Knockastanna
DEAD	Letterbrock	632 LB	Loamy drift with siliceous stones	Killinga
LIVE	Monavullagh	632 MV	Sandy over sandstone bedrock (conglomerate)	Monavullagh
DEAD	Rossmore	632 RM	Loamy drift with siliceous stones	Killinga
DEAD	Seefin	632 SF	80 Loamy over sandstone bedrock	Forth Commons
DEAD	UNNamed_66	632 UN66	Loamy over shale bedrock	Knockastanna
DEAD	Abbeyfeale	711 AF	62 Fine loamy drift with siliceous stones	Kilrush
DEAD	Abbeyfeale Undulating phase	711 AFU	Fine loamy drift with siliceous stones	Kilrush
DEAD	Ashbourne	711 AB	Fine loamy drift with siliceous stones	Kilrush
DEAD	Ballyhaise	711 BH	Fine loamy drift with siliceous stones	Kilrush
LIVE	Clohernagh	711 CH	Fine loamy fragile drift with siliceous stones	Clohernagh
LIVE	Drumkeeran	711 DK	Clayey drift with siliceous stones	Drumkeeran
DEAD	Garristown	711 GS	127 Fine loamy drift with siliceous stones	Kilrush
DEAD	Kilcommon	711 KC	251 Fine loamy drift with siliceous stones	Kilrush
DEAD	Killadangan	711 KD	Fine loamy drift with siliceous stones	Kilrush
LIVE	Kilrush	711 KR	71 Fine loamy drift with siliceous stones	Kilrush
DEAD	Kiltlogher	711 KT	Fine loamy drift with siliceous stones	Kilrush

Live	National_Series	Subgr. Code	Num	Modern_Definition	Modern_Correlative
LIVE	Macamore	711	MC	Fine loamy over clayey drift with limestones	Macamore
LIVE	Newport	711	NW	Coarse loamy drift with limestones	Newport
DEAD	Parknakle	711	PN	Fine loamy drift with siliceous stones	Kilrush
DEAD	Rathangan	711	RO	Fine loamy drift with siliceous stones	Kilrush
DEAD	Rinnagowna	711	RG	Fine loamy drift with siliceous stones	Kilrush
LIVE	Straffan	711	ST	133 Fine loamy drift with limestones	Straffan
DEAD	Street	711	SR	202 Fine loamy drift with siliceous stones	Kilrush
LIVE	Tramore	711	TR	Coarse loamy drift with igneous and metamorphic stones	Tramore
LIVE	UNnamed_08	711	UN08	Clayey over soft shale/slate bedrock	UNnamed_08
LIVE	UNnamed_09	711	UN09	Fine loamy over clayey drift with siliceous stones	UNnamed_09
LIVE	UNnamed_39	711	UN39	Clayey Stoneless drift	UNnamed_39
LIVE	UNnamed_40	711	UN40	Fine loamy over shale bedrock	UNnamed_40
LIVE	UNnamed_41	711	UN41	Fine silty shale bedrock	UNnamed_41
LIVE	UNnamed_59	711	UN59	Fine loamy over clayey over shale bedrock	UNnamed_59
LIVE	UNnamed_60	711	UN60	Fine silty drift with siliceous stones	UNnamed_60
DEAD	Waterford	711	WF	Fine loamy drift with siliceous stones	Kilrush
DEAD	Abbeyfeale peaty phase	712	AFP	Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Aglisli	712	AG	Fine loamy drift with siliceous stones	Gortaclareen
LIVE	Ballinamoor	712	BN	Fine loamy drift with limestones	Ballinamoor
DEAD	Ballyhaise	712	BH	Fine loamy drift with siliceous stones	Gortaclareen
LIVE	Ballyhaise lithic phase	712	BL	Fine loamy over sandstone or shale bedrock	Ballyhaise lithic phase
DEAD	Bunalunn	712	BN	Coarse loamy stoneless drift	Driminidy
DEAD	Castlecomer	712	CC	105 Fine loamy drift with siliceous stones	Gortaclareen
LIVE	Cluggin	712	CG	64 Clayey drift with siliceous stones	Cluggin
DEAD	Coolnakisha	712	CK	107 Fine loamy drift with limestones	Ballinamoor
DEAD	Dodard	712	DD	Coarse loamy drift with siliceous stones	Slieve Bloom
LIVE	Driminidy	712	DY	Coarse loamy drift with siliceous stones	Driminidy
DEAD	Glan	712	GL	Coarse loamy drift with siliceous stones	Driminidy
LIVE	Gortaclareen	712	GN	68 Fine loamy drift with siliceous stones	Gortaclareen
LIVE	Howardstown	712	HN	70 Clayey limestone drift	Howardstown
DEAD	Kilcommon peaty phase	712	KCP	Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Lickey	712	LC	Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Moanduff	712	MN	110 Fine loamy drift with limestones	Ballinamoor
DEAD	Mothel	712	ME	Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Mountminnett	712	MM	73 Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Raheenduff	712	RD	Fine loamy drift with limestones	Ballinamoor
DEAD	Rootiagh	712	RT	75 Fine loamy drift with igneous and metamorphic stones	Gortaclareen variant
DEAD	Sawyerswood	712	SW	130 Clayey limestone drift	Howardstown
DEAD	Seskinrea	712	SK	114 Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Ballinruan	721	BN	Fine loamy drift with siliceous stones	Kilperce
DEAD	Ballyknock	721	BC	Coarse loamy over sandstone bedrock	Kilperce
LIVE	Belmullet	721	BM	Sandy stoneless drift	Belmullet
LIVE	Kilperce	721	KP	Fine loamy drift with siliceous stones	Kilperce
LIVE	Knockroe	721	KO	Coarse loamy drift with siliceous stones	Knockroe
DEAD	Sellernaun	721	SN	143 Coarse loamy drift with siliceous stones	Knockroe
DEAD	Trean	721	TN	Coarse loamy drift with siliceous stones	Kilperce
LIVE	UNnamed_10	721	UN10	Loamy over lithoskeletal shale or slate bedrock	UNnamed_10
LIVE	UNnamed_42	721	UN42	Fine loamy drift with limestones	UNnamed_42
LIVE	UNnamed_43	721	UN43	Fine loamy stoneless drift	UNnamed_43
DEAD	Ballinrush	722	BU	103 Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
LIVE	Ballyknockan	722	BK	Sandy stoneless drift	Ballyknockan
DEAD	Ballymacart	722	BM	Coarse loamy drift with siliceous stones	Puckane
LIVE	Ballywilliam	722	BW	23 Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
DEAD	Bawnrush	722	BH	Loamy drift with siliceous stones	Slieve Bloom
DEAD	Belmont	722	BO	104 Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
DEAD	Clowater	722	CW	108 Coarse loamy drift with siliceous stones	Puckane
DEAD	Derrygarren	722	DG	250 Coarse loamy drift with siliceous stones	Puckane
DEAD	Glassheenahielan	722	GH	Coarse loamy drift with siliceous stones (compact sandy till)	Puckane
DEAD	Knockmullgurry	722	KM	109 Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
DEAD	Letter	722	LT	Coarse loamy drift with siliceous stones	Puckane
LIVE	Newtown	722	NT	111 Coarse loamy drift with igneous and metamorphic stones	Newtown
DEAD	Oulartleigh	722	OL	Coarse loamy drift with siliceous stones	Puckane
LIVE	Puckane	722	PU	74 Coarse loamy drift with siliceous stones	Puckane
DEAD	Raheenleigh	722	RL	113 Coarse loamy drift with siliceous stones	Puckane
LIVE	Slieve Bloom	722	SB	Coarse loamy drift with siliceous stones	Slieve Bloom
DEAD	Tallavbaun	722	TV	Coarse loamy drift with siliceous stones	Puckane
DEAD	Templeshanbo	722	TS	Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
DEAD	Toberbride	722	TB	115 Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
LIVE	Tourmakeady	722	TK	Fine loamy drift with siliceous stones	Tourmakeady
DEAD	UNnamed_44	722	UN44	Fine loamy drift with siliceous stones	Tourmakeady
LIVE	UNnamed_61	722	UN61	Fine silty drift with siliceous stones	UNnamed_61
DEAD	Allenwood Complex	723	AX	131 Fine loamy drift with limestones	Mylerstown
DEAD	Athy Poorly Drained	723	AP	Coarse loamy over calcareous gravels	Clonaslee

Live	National_Series	Subgr. Code	Num	Modern_Definition	Modern_Correlative
LIVE	Clonaslee	723	CS	Coarse loamy over calcareous gravels	Clonaslee
DEAD	Clonlisk	723	CK	Fine loamy drift with limestones	Mylerstown
DEAD	Dunnstown	723	DW	126 Fine loamy drift with limestones	Mylerstown
DEAD	Kilpatrick	723	KL	128 Fine loamy drift with limestones	Mylerstown
LIVE	Mylerstown	723	MT	129 Fine loamy drift with limestones	Mylerstown
LIVE	UNnamed_45	723	UN45	Coarse loamy drift with limestones	UNnamed_45
LIVE	UNnamed_46	723	UN46	Fine loamy over calcareous gravels	UNnamed_46
DEAD	Attyquin	724	AQ	Fine loamy drift with limestones	Ballyshear
LIVE	Ballintemple	724	BT	Coarse loamy drift with limestones	Ballintemple
LIVE	Ballyshear	724	BS	201 Fine loamy drift with limestones	Ballyshear
LIVE	Greename	731	GE	108 Loamy drift with siliceous stones	Greename
LIVE	UNnamed_47	731	UN47	Fine loamy drift with siliceous stones	UNnamed_47
LIVE	Aherlow	811	AH	81 Sandy river alluvium	Aherlow
LIVE	Clohamon	811	CN	39 Coarse loamy river alluvium	Clohamon
LIVE	Finisk	811	FI	Fine silty over non-calcareous gravels	Finisk
LIVE	Ilen	811	IL	Loamy river alluvium over gravels	Ilen
DEAD	Liffey	811	LF	125 Coarse loamy river alluvium	Clohamon
DEAD	Manch	811	MH	Loamy river alluvium over gravels	Ilen
DEAD	Mealagh	811	ML	Loamy river alluvium over gravels	Ilen
DEAD	Mulkear	811	MK	83 Coarse loamy river alluvium	Clohamon
DEAD	Rooskagh	811	RS	Coarse loamy river alluvium	Clohamon
LIVE	Suir	811	SU	Fine silty river alluvium	Suir
LIVE	UNnamed_11	811	UN11	Coarse loamy river alluvium	UNnamed_11
LIVE	UNnamed_12	811	UN12	Silty river alluvium	UNnamed_12
LIVE	Rearymore	812	RY	Fine loamy river alluvium	Rearymore
LIVE	UNnamed_13	812	UN13	Silty river alluvium	UNnamed_13
LIVE	UNnamed_62	812	UN62	Carbonatic-loamy lake alluvium	UNnamed_62
LIVE	Milltownpass	813	MP	207 Sandy stoneless drift	Milltownpass
DEAD	Finnery	820	FN	132 River alluvium	Finnery - River Burren
LIVE	Boyne	821	BO	Silty river alluvium	Boyne
LIVE	Feale	821	FA	82 Fine loamy river alluvium	Feale
DEAD	Glennomra	821	GL	142 Coarse loamy river alluvium	Lyre
LIVE	Kilgory	821	KG	144 Sandy river alluvium	Kilgory
LIVE	Kilmannock	821	KK	35 Silty estuarine alluvium	Kilmannock
LIVE	Lyre	821	LY	72 Coarse loamy river alluvium	Lyre
DEAD	River Burren	821	RB	115 River alluvium (variable texture)	Finner - River Burren
DEAD	Slob	821	SB	Silty estuarine alluvium	Kilmannock
LIVE	UNnamed_48	821	UN48	Fine loamy lake alluvium	UNnamed_48
LIVE	UNnamed_63	821	UN63	Fine silty lake alluvium	UNnamed_63
LIVE	Vicarstown	821	VI	Clayey river alluvium	Vicarstown
DEAD	Ballynabola	822	BB	Fine silty river alluvium	Coolfin
LIVE	Camoge	822	CA	63 Clayey river alluvium	Camoge
LIVE	Coolalough	822	CL	65 Clayey lake alluvium	Coolalough
LIVE	Coolfin	822	CF	Fine silty river alluvium	Coolfin
DEAD	Darkisland	822	DI	66 Fine silty river alluvium	Coolfin
LIVE	Griston	822	GR	69 Sandy lake alluvium	Griston
LIVE	Millquarter	822	MQ	38 Fine silty lake alluvium	Millquarter
DEAD	Rathborne	822	RB	145 Clayey river alluvium	Camoge
LIVE	Shannon	822	SH	76 Fine silty estuarine alluvium	Shannon
LIVE	UNnamed_49	822	UN49	Coarse loamy river alluvium	UNnamed_49
LIVE	UNnamed_50	822	UN50	Coarse loamy over calcareous gravels	UNnamed_50
LIVE	Wexford slob	822	WS	Silty marine alluvium	Wexford slob
LIVE	Dunsany	823	DU	Carbonatic-clayey lake marl	Dunsany
LIVE	Kilmore Slob	823	KS	Sandy marine alluvium	Kilmore Slob
LIVE	Kilmore slob variant	823	KSV	Clayey marine alluvium	Kilmore Slob variant
LIVE	Coolanick	824	CN	Silty lake alluvium	Coolanick
LIVE	Drombanny	824	DR	67 Carbonatic-loamy lake marl	Drombanny
DEAD	Finnery	824	FNK	Carbonatic-loamy lake marl	Drombanny

Live	National_Series	Subgr.	Code_Num	Modern_Definition	Modern_Correlative
LIVE	Allen	911	AE	900 Peat (Raised Bog {moss})	Allen
LIVE	Aughty	911	AT	903 Peat (Blanket Bog)	Aughty
DEAD	Aughty shallow phase	911	ATH	Peat (Blanket Bog)	Aughty
DEAD	Aughty slumping phase	911	ATL	Peat (Blanket Bog)	Aughty
LIVE	Knockmealdown	911	KM	Peat over rock	Knockmealdown
DEAD	Raheen	911	RH	Peat (Raised Bog {moss})	Allen
LIVE	Garrynamona	912	GN	Peat (Raised Bog)	Garrynamona
LIVE	Aughty cutover	913	ATC	Peat (Blanket Bog)	Aughty cutover
LIVE	Gortnamona	913	GM	913 Peat (Raised Bog)	Gortnamona
LIVE	Turbary	913	TB	914 Peat (Raised Bog, undrained, hand-cut)	Turbary
LIVE	Clonsast	914	CS	907 Peat (Raised Bog, Industrial milled and machined)	Clonsast
LIVE	Kilbarry	921	KR	Peat over river alluvium	Kilbarry
LIVE	Pollardstown	921	PT	908 Peat (Fen, undrained)	Pollardstown
DEAD	Ardrum	922	AD	1P Peat (Fen)	Banagher
LIVE	Banagher	922	BR	905 Peat (Fen)	Banagher
LIVE	Ardmore	1011	AR	Coarse loamy drift with siliceous stones	Ardmore
DEAD	Bannow	1011	BA	Loamy drift with siliceous stones	Monatray
LIVE	Curragh	1011	CU	Coarse loamy stoneless drift (calcareous sand)	Curragh
LIVE	Monatray	1011	MT	Loamy drift with siliceous stones	Monatray
DEAD	Ross Carbery variant	1011	ROV	Coarse loamy compact drift with siliceous stones	Schull Plaggen
LIVE	Schull Plaggen	1011	SHP	Coarse loamy drift with siliceous stones	Schull Plaggen
DEAD	Schull variant	1011	SHV	Coarse loamy drift with siliceous stones	Schull Plaggen
		Feb	Jly	Sep	
					}Changes, additions made in 2011
					Dec

Annex VII (cont) All Soil Series mapped in Ireland: Texture & Substrate order

Live	National Series	Subgr Code	Num	Modern Definition	Modern Correlative
LIVE	Carney	212	CY 148	Carbonatic-clayey lake marl	Carney
LIVE	Dunsany	823	DU	Carbonatic-clayey lake marl	Dunsany
LIVE	UNnamed_62	812	UN62	Carbonatic-loamy lake alluvium	UNnamed_62
LIVE	Drombanny	824	DR 67	Carbonatic-loamy lake marl	Drombanny
DEAD	Finnery	824	FNK	Carbonatic-loamy lake marl	Drombanny
LIVE	Kilfenora	321	KF 134	Clayey drift over limestone bedrock	Kilfenora
LIVE	Cluggin	712	CG 64	Clayey drift with siliceous stones	Cluggin
LIVE	Drumkeeran	711	DK	Clayey drift with siliceous stones	Drumkeeran
LIVE	Loughmuirran	314	LO	Clayey drift with siliceous stones (colluvium)	Loughmuirran
LIVE	Coolalough	822	CL 65	Clayey lake alluvium	Coolalough
LIVE	Howardstown	712	HN 70	Clayey limestone drift	Howardstown
DEAD	Sawyerswood	712	SW 130	Clayey limestone drift	Howardstown
LIVE	Kilmore slob variant	823	KSV	Clayey marine alluvium	Kilmore Slob variant
LIVE	UNnamed_08	711	UN08	Clayey over soft shale/slate bedrock	UNnamed_08
LIVE	Camoge	822	CA 63	Clayey river alluvium	Camoge
DEAD	Rathborney	822	RB 145	Clayey river alluvium	Camoge
LIVE	Vicarstown	821	VI	Clayey river alluvium	Vicarstown
LIVE	UNnamed_39	711	UN39	Clayey Stoneless drift	UNnamed_39
LIVE	Ross Carbery	511	RO	Coarse loamy compact drift with siliceous stones	Ross Carbery
DEAD	Ross Carbery Broken phase	511	ROB	Coarse loamy compact drift with siliceous stones	Ross Carbery
DEAD	Ross Carbery Plaggen	511	ROP	Coarse loamy compact drift with siliceous stones	Ross Carbery
DEAD	Ross Carbery Rocky phase	112	ROR	Coarse loamy compact drift with siliceous stones	Bantry
DEAD	Ross Carbery variant	1011	ROV	Coarse loamy compact drift with siliceous stones	Schull Plaggen
LIVE	Bantry Bay	313	BB	Coarse loamy dense blue-grey drift with siliceous stones	Bantry Bay
DEAD	Keeloge	311	KL 96	Coarse loamy drift over hard shale	Kells
DEAD	Ballinrush	722	BU 103	Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
LIVE	Ballywilliam	722	BW 23	Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
DEAD	Belmont	722	BO 104	Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
LIVE	Borris	311	BO 95	Coarse loamy drift with igneous and metamorphic stones	Borris
LIVE	Kellistown	411	KL 89	Coarse loamy drift with igneous and metamorphic stones	Kellistown
DEAD	Knockmullgurry	722	KM 109	Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
LIVE	Newtown	722	NT 111	Coarse loamy drift with igneous and metamorphic stones	Newtown
DEAD	Templeshanbo	722	TS	Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
DEAD	Toberbride	722	TB 115	Coarse loamy drift with igneous and metamorphic stones	Ballywilliam
LIVE	Tramore	711	TR	Coarse loamy drift with igneous and metamorphic stones	Tramore
LIVE	Ballintemple	724	BT	Coarse loamy drift with limestones	Ballintemple
LIVE	Crossmolina	513	CM	Coarse loamy drift with limestones	Crossmolina
LIVE	Newport	711	NWP	Coarse loamy drift with limestones	Newport
LIVE	UNnamed_45	723	UN45	Coarse loamy drift with limestones	UNnamed_45
LIVE	UNnamed_52	314	UN52	Coarse loamy drift with limestones	UNnamed_52
LIVE	UNnamed_65	311	UN65	Coarse loamy drift with limestones	UNnamed_65
DEAD	Acaun	311	AU 93	Coarse loamy drift with siliceous stones	Clashmore
DEAD	Accony	511	AY	Coarse loamy drift with siliceous stones	Cooga
LIVE	Ardmore	1011	AR	Coarse loamy drift with siliceous stones	Ardmore
DEAD	Ballydoole	414	BD	Coarse loamy drift with siliceous stones	Crosstown
DEAD	Ballymacart	722	BM	Coarse loamy drift with siliceous stones	Puckane
LIVE	Broadway	312	BY	Coarse loamy drift with siliceous stones	Broadway
DEAD	Castlebar	312	CT	Coarse loamy drift with siliceous stones	Broadway
LIVE	Clashmore	311	CM	Coarse loamy drift with siliceous stones	Clashmore
LIVE	Clonegall	512	CG 97	Coarse loamy drift with siliceous stones	Clonegall
DEAD	Clowater	722	CW 108	Coarse loamy drift with siliceous stones	Puckane
LIVE	Cooga	511	CO	Coarse loamy drift with siliceous stones	Cooga
LIVE	Crosstown	414	CO	Coarse loamy drift with siliceous stones	Crosstown
DEAD	Derrygarren	722	DG 250	Coarse loamy drift with siliceous stones	Puckane
DEAD	Dodard	712	DD	Coarse loamy drift with siliceous stones	Slieve Bloom
DEAD	Doonglara	513	DL 56	Coarse loamy drift with siliceous stones	Knockboy
LIVE	Driminidy	712	DY	Coarse loamy drift with siliceous stones	Driminidy
LIVE	Dungarvan	411	DG	Coarse loamy drift with siliceous stones	Dungarvan
DEAD	Dungavan	311	DA	Coarse loamy drift with siliceous stones	Clashmore
DEAD	Fahy	414	FH	Coarse loamy drift with siliceous stones	Crosstown
DEAD	Glan	712	GL	Coarse loamy drift with siliceous stones	Driminidy
LIVE	Johnstown	412	JH	Coarse loamy drift with siliceous stones	Johnstown
DEAD	Kilfergus	311	KE 51	Coarse loamy drift with siliceous stones	Clashmore
DEAD	Killinick	311	KN	Coarse loamy drift with siliceous stones	Clashmore
DEAD	Kilnageer	513	KA	Coarse loamy drift with siliceous stones	Knockboy
DEAD	Knockaskeha	311	KH 136	Coarse loamy drift with siliceous stones	Clashmore
LIVE	Knockboy	513	KB	Coarse loamy drift with siliceous stones	Knockboy
DEAD	Knocknaskeha	311	KH	Coarse loamy drift with siliceous stones	Clashmore

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LIVE	Knockroe	721	KO	Coarse loamy drift with siliceous stones	Knockroe
DEAD	Letter	722	LT	Coarse loamy drift with siliceous stones	Puckane
DEAD	Madore	511	MD	Coarse loamy drift with siliceous stones	Cooga
DEAD	Old Ross	311	OR	Coarse loamy drift with siliceous stones	Clashmore
DEAD	Oulartleigh	722	OL	Coarse loamy drift with siliceous stones	Puckane
LIVE	Puckane	722	PU	74 Coarse loamy drift with siliceous stones	Puckane
DEAD	Raheenleigh	722	RL	113 Coarse loamy drift with siliceous stones	Puckane
DEAD	Rathvinden	411	RV	92 Coarse loamy drift with siliceous stones	Dungarvan
DEAD	Reanascreena	513	RE	Coarse loamy drift with siliceous stones	Knockboy
LIVE	Schull	313	SH	Coarse loamy drift with siliceous stones	Schull
LIVE	Schull Plaggen	1011	SHP	Coarse loamy drift with siliceous stones	Schull Plaggen
DEAD	Schull Rocky Variant	313	SHY	Coarse loamy drift with siliceous stones	Schull
DEAD	Schull variant	1011	SHV	Coarse loamy drift with siliceous stones	Schull Plaggen
DEAD	Sellernaun	721	SN	143 Coarse loamy drift with siliceous stones	Knockroe
LIVE	Slieve Bloom	722	SB	Coarse loamy drift with siliceous stones	Slieve Bloom
DEAD	Srah	511	SH	Coarse loamy drift with siliceous stones	Cooga
DEAD	Tallavbaun	722	TV	Coarse loamy drift with siliceous stones	Puckane
DEAD	Trean	721	TN	Coarse loamy drift with siliceous stones	Kilpierce
LIVE	UNnamed_53	314	UN53	Coarse loamy drift with siliceous stones	UNnamed_53
DEAD	UNnamed_64	411	UN64	Coarse loamy drift with siliceous stones	Dungarvan
DEAD	Glassheenahielan	722	GH	Coarse loamy drift with siliceous stones (compact sandy till)	Puckane
DEAD	Callaghane	511	CH	Coarse loamy drift with siliceous stones; locally over gravel?	Cooga
DEAD	Drimoleague	511	DM	Coarse loamy drift with siliceous stones; locally over gravel?	Cooga
DEAD	Wardhouse	511	WH	Coarse loamy drift with siliceous stones; locally over gravel?	Cooga
DEAD	Ballytarsna	311	BT	94 Coarse loamy over acid igneous bedrock	Knocksquire
LIVE	Knocksquire	311	KN	98 Coarse loamy over acid igneous bedrock	Knocksquire
DEAD	Graceswood	411	GW	Coarse loamy over calcareous fluvioglacial gravels	Baggotstown
LIVE	Athy	411	AT	117 Coarse loamy over calcareous gravels	Athy
LIVE	Baggotstown	321	BG	42 Coarse loamy over calcareous gravels	Baggotstown
LIVE	Broughillstown	311	BR	Coarse loamy over calcareous gravels	Broughillstown
DEAD	Broughillstown Shallow Phase	311	BRS	Coarse loamy over calcareous gravels	Baggotstown
LIVE	Clonaslee	723	CS	Coarse loamy over calcareous gravels	Clonaslee
LIVE	Crush	213	CS	Coarse loamy over calcareous gravels	Crush
LIVE	UNnamed_50	822	UN50	Coarse loamy over calcareous gravels	UNnamed_50
DEAD	Athy Poorly Drained	723	AP	Coarse loamy over calcareous gravels	Clonaslee
LIVE	Kells	311	KE	Coarse loamy over hard shale bedrock	Kells
LIVE	Aille	311	AL	Coarse loamy over limestone bedrock	Aille
DEAD	Kinvarra	311	KVW	Coarse loamy over limestone bedrock	UNnamed_65
LIVE	Carrigogunnel	313	CG	50 Coarse loamy over lithoskeletal basic igneous rock	Carrigogunnel
LIVE	UNnamed_06	511	UN06	Coarse loamy over non-calcareous gravels	UNnamed_06
LIVE	Ballyglass	311	BG	Coarse loamy over sandstone bedrock	Ballyglass
DEAD	Ballyknock	721	BC	Coarse loamy over sandstone bedrock	Kilpierce
LIVE	Clonin	511	CN	54 Coarse loamy over sandstone bedrock	Clonin
DEAD	Drummin	511	DR	Coarse loamy over sandstone bedrock	UNnamed_07
LIVE	Knockaceol	513	KC	77 Coarse loamy over sandstone bedrock	Knockaceol
DEAD	UNnamed_07	511	UN07	Coarse loamy over sandstone bedrock	Clonin
LIVE	UNnamed_33	514	UN33	Coarse loamy over sandstone bedrock	UNnamed_33
DEAD	Waterpark	311	WP	138 Coarse loamy over shale bedrock	Kells
DEAD	Glenomra	821	GL	142 Coarse loamy river alluvium	Lyre
LIVE	Lyre	821	LY	72 Coarse loamy river alluvium	Lyre
LIVE	UNnamed_11	811	UN11	Coarse loamy river alluvium	UNnamed_11
LIVE	UNnamed_49	822	UN49	Coarse loamy river alluvium	UNnamed_49
LIVE	Clohamon	811	CN	39 Coarse loamy river alluvium	Clohamon
DEAD	Liffey	811	LF	125 Coarse loamy river alluvium	Clohamon
DEAD	Mulkear	811	MK	83 Coarse loamy river alluvium	Clohamon
DEAD	Rooskagh	811	RS	Coarse loamy river alluvium	Clohamon
LIVE	Carne	511	CA	Coarse loamy stoneless drift	Carne
LIVE	Randallsmill	311	RM	Coarse loamy stoneless drift	Randallsmill
DEAD	Bunalunn	712	BN	Coarse loamy stoneless drift	Driminidy
LIVE	Curragh	1011	CU	Coarse loamy stoneless drift (calcareous sand)	Curragh
DEAD	Tullig	314	TU	137 Fine loamy drift with siliceous stones	Moord
LIVE	Ballynamona	411	BY	58 Fine loamy drift with igneous and metamorphic stones	Ballynamona
DEAD	Derk	311	DK	Fine loamy drift with igneous and metamorphic stones	Kill
LIVE	Kill	311	KI	Fine loamy drift with igneous and metamorphic stones	Kill
DEAD	Rootiagh	712	RT	75 Fine loamy drift with igneous and metamorphic stones	Gortaclareen variant
DEAD	Allenwood Complex	723	AX	131 Fine loamy drift with limestones	Mylerstown
DEAD	Attyquin	724	AQ	Fine loamy drift with limestones	Ballyshear
DEAD	Ballinakill	411	BK	Fine loamy drift with limestones	Elton
LIVE	Ballinamoore	712	BN	Fine loamy drift with limestones	Ballinamoore
LIVE	Ballyshear	724	BS	201 Fine loamy drift with limestones	Ballyshear
DEAD	Clonlisk	723	CK	Fine loamy drift with limestones	Mylerstown

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DEAD	Coolnakisha	712	CK	107	Fine loamy drift with limestones	Ballinamoor
LIVE	Cullahill	321	CH		Fine loamy drift with limestones	Cullahill
DEAD	Donaghcumper	414	DC	119	Fine loamy drift with limestones	Rathowen
DEAD	Dunnstown	723	DW	126	Fine loamy drift with limestones	Mylerstown
LIVE	Elton	411	ET	59	Fine loamy drift with limestones	Elton
LIVE	Kennycourt	311	KC	122	Fine loamy drift with limestones	Kennycourt
LIVE	Kilcolgan	213	KC	141	Fine loamy drift with limestones	Kilcolgan
DEAD	Kilpatrick	723	KL	128	Fine loamy drift with limestones	Mylerstown
DEAD	Moanduff	712	MN	110	Fine loamy drift with limestones	Ballinamoor
LIVE	Mylerstown	723	MT	129	Fine loamy drift with limestones	Mylerstown
DEAD	Raheenduff	712	RD		Fine loamy drift with limestones	Ballinamoor
DEAD	Rathcannon	411	RC	61	Fine loamy drift with limestones	Mortarstown
LIVE	Rathowen	414	RA	200	Fine loamy drift with limestones	Rathowen
LIVE	Traffan	711	ST	133	Fine loamy drift with limestones	Traffan
LIVE	UNnamed_20	321	UN20		Fine loamy drift with limestones	UNnamed_20
LIVE	UNnamed_25	412	UN25		Fine loamy drift with limestones	UNnamed_25
LIVE	UNnamed_42	721	UN42		Fine loamy drift with limestones	UNnamed_42
LIVE	UNnamed_54	323	UN54		Fine loamy drift with limestones	UNnamed_54
DEAD	Abbeylea	711	AF	62	Fine loamy drift with siliceous stones	Kilrush
DEAD	Abbeylea peaty phase	712	AFP		Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Abbeylea Undulating phase	711	AFU		Fine loamy drift with siliceous stones	Kilrush
DEAD	Aglish	712	AG		Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Ambrosetown	314	AM		Fine loamy drift with siliceous stones	Moord
DEAD	Ashbourne	711	AB		Fine loamy drift with siliceous stones	Kilrush
LIVE	Ashgrove	313	AS		Fine loamy drift with siliceous stones	Ashgrove
DEAD	Baldwinstown	311	BA		Fine loamy drift with siliceous stones	Clonroche
DEAD	Ballinruan	721	BN		Fine loamy drift with siliceous stones	Kilperce
DEAD	Ballybrood	513	BR	53	Fine loamy drift with siliceous stones	Rathkenny
DEAD	Ballycastle	411	BC		Fine loamy drift with siliceous stones	Dunboyne
DEAD	Ballyhaise	711	BH		Fine loamy drift with siliceous stones	Kilrush
DEAD	Ballyhaise	712	BH		Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Ballynalacken	311	BC	49	Fine loamy drift with siliceous stones	Clonroche
DEAD	Baunreagh	311	BN		Fine loamy drift with siliceous stones	Clonroche
DEAD	Castlecomer	712	CC	105	Fine loamy drift with siliceous stones	Gortaclareen
LIVE	Clonroche	311	CL		Fine loamy drift with siliceous stones	Clonroche
DEAD	Cloverfield	313	CV	47	Fine loamy drift with siliceous stones	Ashgrove
LIVE	Corriga	514	CR		Fine loamy drift with siliceous stones	Corriga
LIVE	Crossabeg	412	CB		Fine loamy drift with siliceous stones	Crossabeg
LIVE	Dunboyne	411	DB		Fine loamy drift with siliceous stones	Dunboyne
LIVE	Fethard	414	FE		Fine loamy drift with siliceous stones	Fethard
DEAD	Garristown	711	GS	127	Fine loamy drift with siliceous stones	Kilrush
LIVE	Gortaclareen	712	GN	68	Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Kilcommon	711	KC	251	Fine loamy drift with siliceous stones	Kilrush
DEAD	Kilcommon peaty phase	712	KCP		Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Killadangan	711	KD		Fine loamy drift with siliceous stones	Kilrush
DEAD	Kilmeaden	411	KM		Fine loamy drift with siliceous stones	Dunboyne
LIVE	Kilperce	721	KP		Fine loamy drift with siliceous stones	Kilperce
LIVE	Kilrush	711	KR	71	Fine loamy drift with siliceous stones	Kilrush
DEAD	Kiltclogher	711	KT		Fine loamy drift with siliceous stones	Kilrush
DEAD	Lickey	712	LC		Fine loamy drift with siliceous stones	Gortaclareen
LIVE	Moord	314	MO		Fine loamy drift with siliceous stones	Moord
DEAD	Mothel	712	ME		Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Mountminnett	712	MM	73	Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Parknakle	711	PN		Fine loamy drift with siliceous stones	Kilrush
DEAD	Rathangan	711	RO		Fine loamy drift with siliceous stones	Kilrush
LIVE	Rathkenny	513	RK		Fine loamy drift with siliceous stones	Rathkenny
DEAD	Rinnagowna	711	RG		Fine loamy drift with siliceous stones	Kilrush
DEAD	Seskinrea	712	SK	114	Fine loamy drift with siliceous stones	Gortaclareen
DEAD	Street	711	SR	202	Fine loamy drift with siliceous stones	Kilrush
LIVE	Tourmakeady	722	TK		Fine loamy drift with siliceous stones	Tourmakeady
LIVE	UNnamed_16	312	UN16		Fine loamy drift with siliceous stones	UNnamed_16
DEAD	UNnamed_17	314	UN17		Fine loamy drift with siliceous stones	Moord
LIVE	UNnamed_26	412	UN26		Fine loamy drift with siliceous stones	UNnamed_26
LIVE	UNnamed_29	511	UN29		Fine loamy drift with siliceous stones	UNnamed_29
DEAD	UNnamed_44	722	UN44		Fine loamy drift with siliceous stones	Tourmakeady
LIVE	UNnamed_47	731	UN47		Fine loamy drift with siliceous stones	UNnamed_47
DEAD	Waterford	711	WF		Fine loamy drift with siliceous stones	Kilrush
LIVE	Clohernagh	711	CH		Fine loamy fragic drift with siliceous stones	Clohernagh
LIVE	UNnamed_48	821	UN48		Fine loamy lake alluvium	UNnamed_48
LIVE	Kill lithic phase	311	KIL		Fine loamy over acid igneous bedrock	Kill lithic phase

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LIVE	Ladestown	311 LA	199	Fine loamy over calcareous gravels	Ladestown
LIVE	UNnamed_05	321 UN05		Fine loamy over calcareous gravels	UNnamed_05
DEAD	UNnamed_21	411 UN21		Fine loamy over calcareous gravels	Ballynamona
LIVE	UNnamed_46	723 UN46		Fine loamy over calcareous gravels	UNnamed_46
LIVE	Kinvarra	311 KV	135	Fine loamy over clayey drift with limestones	Kinvarra
LIVE	Macamore	711 MC		Fine loamy over clayey drift with limestones	Macamore
LIVE	Mortarstown	411 MT	90	Fine loamy over clayey drift with limestones	Mortarstown
DEAD	Paulstown	411 PU	91	Fine loamy over clayey drift with limestones	Mortarstown
LIVE	UNnamed_56	414 UN56		Fine loamy over clayey drift with limestones	UNnamed_56
LIVE	UNnamed_09	711 UN09		Fine loamy over clayey drift with siliceous stones	UNnamed_09
LIVE	UNnamed_24	411 UN24		Fine loamy over clayey drift with siliceous stones	UNnamed_24
LIVE	UNnamed_28	414 UN28		Fine loamy over clayey drift with siliceous stones	UNnamed_28
LIVE	UNnamed_59	711 UN59		Fine loamy over clayey over shale bedrock	UNnamed_59
LIVE	Ballincurra	321 BC	43	Fine loamy over limestone bedrock	Ballincurra
LIVE	Burren	213 BU	140	Fine loamy over limestone bedrock	Burren
LIVE	Patrickswell lithic phase	411 PWL		Fine loamy over limestone bedrock	Patrickswell lithic phase
LIVE	Wonderhill	313 WO	52	Fine loamy over lithoskeletal basic igneous rock	Wonderhill
LIVE	Borrisoleigh	513 BE	261	Fine loamy over mudstone, shale or slate	Borrisoleigh
DEAD	Mountcollins	513 MS	55	Fine loamy over mudstone, shale or slate	Borrisoleigh
DEAD	Ridge	513 RG		Fine loamy over mudstone, shale or slate	Borrisoleigh
DEAD	Slievecoilta	513 SC		Fine loamy over mudstone, shale or slate	Borrisoleigh
LIVE	UNnamed_03	311 UN03		Fine loamy over non-calcareous gravels	UNnamed_03
LIVE	Broomhill	311 BL		Fine loamy over sandstone bedrock	Broomhill
LIVE	UNnamed_18	314 UN18		Fine loamy over sandstone bedrock	UNnamed_18
LIVE	UNnamed_22	411 UN22		Fine loamy over sandstone bedrock	UNnamed_22
LIVE	UNnamed_31	511 UN31		Fine loamy over sandstone bedrock	UNnamed_31
LIVE	UNnamed_32	513 UN32		Fine loamy over sandstone bedrock	UNnamed_32
LIVE	Ballyhaise lithic phase	712 BL		Fine loamy over sandstone or shale bedrock	Ballyhaise lithic phase
DEAD	Baunreagh steep phase	311 BNS		Fine loamy over shale bedrock	Ballylanders
LIVE	Cupidstownhill	511 CU	124	Fine loamy over shale bedrock	Cupidstownhill
DEAD	Knockastanna	511 KSB		Fine loamy over shale bedrock	Cupidstownhill
LIVE	UNnamed_04	313 UN04		Fine loamy over shale bedrock	UNnamed_04
LIVE	UNnamed_19	314 UN19		Fine loamy over shale bedrock	UNnamed_19
LIVE	UNnamed_23	411 UN23		Fine loamy over shale bedrock	UNnamed_23
LIVE	UNnamed_27	414 UN27		Fine loamy over shale bedrock	UNnamed_27
DEAD	UNnamed_30	511 UN30		Fine loamy over shale bedrock	Cupidstownhill
LIVE	UNnamed_40	711 UN40		Fine loamy over shale bedrock	UNnamed_40
DEAD	Ballindaggan	311 BD	15	Fine loamy over shale or slate bedrock	Ballylanders
LIVE	Ballylanders	311 BY	45	Fine loamy over shale or slate bedrock	Ballylanders
DEAD	Hughstown	311 HT	123	Fine loamy over shale or slate bedrock	Ballylanders
DEAD	Ridge	311 RG	99	Fine loamy over shale or slate bedrock	Ballylanders
LIVE	Tomard	512 TO	101	Fine loamy over shale or slate bedrock	Tomard
LIVE	Feale	821 FA	82	Fine loamy river alluvium	Feale
LIVE	Rearymore	812 RY		Fine loamy river alluvium	Rearymore
LIVE	UNnamed_43	721 UN43		Fine loamy stoneless drift	UNnamed_43
LIVE	Dovea	311 DO	249	Fine silty drift with limestones	Dovea
LIVE	UNnamed_57	414 UN57		Fine silty drift with siliceous stones	UNnamed_57
LIVE	UNnamed_60	711 UN60		Fine silty drift with siliceous stones	UNnamed_60
LIVE	UNnamed_61	722 UN61		Fine silty drift with siliceous stones	UNnamed_61
LIVE	Shannon	822 SH	76	Fine silty estuarine alluvium	Shannon
LIVE	Millquarter	822 MQ	38	Fine silty lake alluvium	Millquarter
LIVE	UNnamed_63	821 UN63		Fine silty lake alluvium	UNnamed_63
LIVE	Finisk	811 FI		Fine silty over non-calcareous gravels	Finisk
DEAD	Ballynabola	822 BB		Fine silty river alluvium	Coofin
LIVE	Coofin	822 CF		Fine silty river alluvium	Coofin
DEAD	Darkisland	822 DI	66	Fine silty river alluvium	Coofin
LIVE	Suir	811 SU		Fine silty river alluvium	Suir
LIVE	UNnamed_41	711 UN41		Fine silty shale bedrock	UNnamed_41
DEAD	Ballinagilky	611 BY	109	Loamy drift with igneous and metamorphic stones	Stonepark
DEAD	Massbrock	611 MB		Loamy drift with igneous and metamorphic stones	Stonepark
LIVE	Stonepark	611 SP		Loamy drift with igneous and metamorphic stones	Stonepark
DEAD	Fontstown	411 FT	120	Loamy drift with limestones	Patrickswell
DEAD	Grange	411 GA	121	Loamy drift with limestones	Elton
DEAD	Hook Head	411 HH		Loamy drift with limestones	Patrickswell
DEAD	Knockbeg	411 KB		Loamy drift with limestones	Patrickswell
LIVE	Patrickswell	411 PW	60	Loamy drift with limestones	Patrickswell
DEAD	Stradbally	411 SY		Loamy drift with limestones	Patrickswell
LIVE	Ahuan	621 AH		Loamy drift with siliceous stones	Ahuan
DEAD	Ballinabranagh	414 BG	88	Loamy drift with siliceous stones	Crosstown
LIVE	Ballycondon	611 BN		Loamy drift with siliceous stones	Ballycondon

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DEAD	Bannow	1011	BA	Loamy drift with siliceous stones	Monatray
DEAD	Bawnrush	722	BH	Loamy drift with siliceous stones	Slieve Bloom
DEAD	Beltra	612	BE	Loamy drift with siliceous stones	Portlaw
DEAD	Conlawn	612	CL	Loamy drift with siliceous stones	Portlaw
DEAD	Dooncarton	632	DO	Loamy drift with siliceous stones	Killinga
LIVE	Glenary	632	BL	Loamy drift with siliceous stones	Glenary
LIVE	Greename	731	GE	108 Loamy drift with siliceous stones	Greename
LIVE	Killadoon	631	KD	Loamy drift with siliceous stones	Killadoon
DEAD	Knockanattin	632	KT	139 Loamy drift with siliceous stones	Killinga
DEAD	Knockcommane	612	KE	Loamy drift with siliceous stones	Portlaw
DEAD	Letterbrock	632	LB	Loamy drift with siliceous stones	Killinga
LIVE	Monatray	1011	MT	Loamy drift with siliceous stones	Monatray
LIVE	Portlaw	612	PO	Loamy drift with siliceous stones	Portlaw
DEAD	Rossmore	632	RM	Loamy drift with siliceous stones	Killinga
DEAD	UNnamed_35	631	UN35	Loamy drift with siliceous stones	Killadoon
LIVE	Killinga	632	KA	Loamy drift with siliceous stones	Killinga
LIVE	Carrickbyrne	612	CB	Loamy over acid and basic igneous bedrock	Carrickbyrne
LIVE	Ballyscanlon	611	BS	Loamy over acid igneous rock	Ballyscanlon
LIVE	Black Rock Mountain	611	BR	Loamy over gneiss and schist bedrock	Black Rock Mountain
DEAD	Burren very rocky phase	213	BUR 140Y	Loamy over limestone bedrock	Burren
LIVE	UNnamed_15	211	UN15	Loamy over limestone bedrock	UNnamed_15
LIVE	UNnamed_01	111	UN01	Loamy over lithoskeletal basic igneous rock	UNnamed_01
LIVE	UNnamed_02	112	UN02	Loamy over lithoskeletal gneiss or schist	UNnamed_02
DEAD	Crumpaun	112	CP	Loamy over lithoskeletal limestone	Rineanna
LIVE	Rineanna	112	RN	84 Loamy over lithoskeletal limestone	Rineanna
LIVE	Knockeyon	112	KY	204 Loamy over lithoskeletal sandstone	Knockeyon
DEAD	Slievereah	112	SR	85 Loamy over lithoskeletal sandstone	Knockeyon
LIVE	Knockshigowna	112	KW	Loamy over lithoskeletal shale or slate bedrock	Knockshigowna
LIVE	UNnamed_10	721	UN10	Loamy over lithoskeletal shale or slate bedrock	UNnamed_10
LIVE	Drumslig	611	DS	Loamy over sandstone bedrock	Drumslig
LIVE	Forth Commons	632	FC	Loamy over sandstone bedrock	Forth Commons
DEAD	Seefin	632	SF	80 Loamy over sandstone bedrock	Forth Commons
LIVE	UNnamed_36	631	UN36	Loamy over sandstone bedrock	UNnamed_36
LIVE	UNnamed_51	111	UN51	Loamy over sandstone bedrock	UNnamed_51
LIVE	UNnamed_58	612	UN58	Loamy over sandstone bedrock	UNnamed_58
DEAD	Black Rock Mountain	632	BRC	17 Loamy over shale bedrock	Knockastanna
DEAD	Knockanimpaha	632	KI	78 Loamy over shale bedrock	Knockastanna
LIVE	Knockastanna	632	KS	79 Loamy over shale bedrock	Knockastanna
DEAD	Knockastanna peaty phase	632	KSP	Loamy over shale bedrock	Knockastanna
LIVE	Slievebeag	611	SG	Loamy over shale bedrock	Slievebeag
LIVE	UNnamed_14	111	UN14	Loamy over shale bedrock	UNnamed_14
DEAD	UNnamed_34	611	UN34	Loamy over shale bedrock	Slievebeag
DEAD	UNnamed_66	632	UN66	Loamy over shale bedrock	Knockastanna
LIVE	Ilen	811	IL	Loamy river alluvium over gravels	Ilen
DEAD	Manch	811	MH	Loamy river alluvium over gravels	Ilen
DEAD	Mealagh	811	ML	Loamy river alluvium over gravels	Ilen
LIVE	Aughty	911	AT	903 Peat (Blanket Bog)	Aughty
LIVE	Aughty cutover	913	ATC	Peat (Blanket Bog)	Aughty cutover
DEAD	Aughty shallow phase	911	ATH	Peat (Blanket Bog)	Aughty
DEAD	Aughty slumping phase	911	ATL	Peat (Blanket Bog)	Aughty
DEAD	Ardrum	922	AD	1P Peat (Fen)	Banagher
LIVE	Banagher	922	BR	905 Peat (Fen)	Banagher
LIVE	Pollardstown	921	PT	908 Peat (Fen, undrained)	Pollardstown
LIVE	Allen	911	AE	900 Peat (Raised Bog {moss})	Allen
DEAD	Raheen	911	RH	Peat (Raised Bog {moss})	Allen
LIVE	Garrynamona	912	GN	Peat (Raised Bog)	Garrynamona
LIVE	Gortnamona	913	GM	913 Peat (Raised Bog)	Gortnamona
LIVE	Clonsast	914	CS	907 Peaty (Raised Bog, Industrial milled and machined)	Clonsast
LIVE	Turbary	913	TB	914 Peat (Raised Bog, undrained, hand-cut)	Turbary
LIVE	Carrigvahanagh	113	CV	102 Peat over lithoskeletal acid igneous rock	Carrigvahanagh
LIVE	Kilbarry	921	KR	Peat over river alluvium	Kilbarry
LIVE	Knockmealdown	911	KM	Peat over rock	Knockmealdown
LIVE	Bantry	113	BA	Peat over sandstone and shale bedrock	Bantry
DEAD	Schull Rocky phase	112	SHR	Peat over sandstone and shale bedrock	Bantry
DEAD	Finnery	820	FN	132 River alluvium	Finnery - River Burren
DEAD	River Burren	821	RB	115 River alluvium (variable texture)	Finner - River Burren
DEAD	Rakestreet	213	RE	Sandy drift with calcareous gravels	Crush
DEAD	Kilnageer	511	KG	Sandy drift with igneous and metamorphic stones	Kiltealy
LIVE	Kiltealy	511	KY	22 Sandy drift with igneous and metamorphic stones	Kiltealy
LIVE	Ballyvorheen	311	BV	46 Sandy drift with siliceous stones	Ballyvorheen

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