Butterfly Farm Solar DNS

Wrexham

Baseline and Preliminary Water Framework Directive Compliance Assessment

September 2025



Waterco

Assessment | Modelling | Design

Project Information	
Project:	Butterfly Farm Solar DNS
Report Title:	Baseline and Preliminary WFD Compliance Assessment
Client:	Axis P.E.D Ltd
Instruction:	The instruction was received from Laura Mackey on behalf of the Client.
File Ref:	14825-WFD-05

Approval Record	
Author:	Bethan Lloyd Jones BSc (Hons) MCIWEM C.WEM
Checker:	Megan Williams BSc (Hons) MSc MCIWEM
Approver:	Nigel Jones BEng (Hons) CEng MICE

Document History		
Revision	**Date**	**Comment**
01	30/06/2025	First issue
02	04/07/2025	Second issue – Updated with Water Features Plan
03	17/07/2025	Third issue – Updated following Client review
04	14/08/2025	Fourth issue – Updated with revised site boundary
05	09/09/2025	Fifth issue - Updated following Client review

The copyright in this document (including its electronic form) shall remain vested in Waterco Limited (Waterco) but the Client shall have a licence to copy and use the document for the purpose for which it was provided. Waterco shall not be liable for the use by any person of the document for any purpose other than that for which the same was provided by Waterco. This document shall not be reproduced in whole or in part or relied upon by third parties for any use whatsoever without the express written authority of Waterco.

This report will remain valid for a period of twelve months (from the date of last issue) after which the source data should be reviewed in order to reassess the findings and conclusions on the basis of latest available information.

Contents

Introduction 1
Assumptions and Limitations 1
Policy Context 2
Site Setting 4
Scheme Proposals.....8
WFD Screening (Stage 1) 8
WFD Scoping (Stage 2) 17
WFD Impact Assessment (Stage 3).....24
Conclusions and Recommendations 28

Appendices

Appendix A Location Plan and Aerial Image
Appendix B Topographical Data
Appendix C Historical BGS Borehole Records
Appendix D Water Features Plan
Appendix E DCWW Sewer Records
Appendix F NRW Flood Maps
Appendix G Designations Map
Appendix H Proposed Scheme Plans
Appendix I Zone of Influence Plan
Appendix J Background to Surface Water and Groundwater Body Status
Appendix K Pollution Control Measures

Tables

Table 1 – Dee - Chester Weir to Ceiriog River Catchment 10
Table 2 -Black Brook (Clywedog) WFD Classifications.....12
Table 3 - Clywedog - Gwenfro to Black Brook Waterbody Classifications 14
Table 4 – Dee Carboniferous Coal Measures WFD Groundwater body Catchment Classifications.....16
Table 5 - Potential Effects on Hydromorphology 17
Table 6 – Potential Effects on Biology.....19
Table 7 – Potential Effects on Water Quality 21
Table 8 – Potential Effects on INNS.....23
Table 9 - Pollution Hazard Indices 27
Table 10 – Permeable Surfaces Mitigation Indices 27

Introduction

This Preliminary Water Framework Directive (WFD) Assessment has been prepared by Waterco Ltd on behalf of Axis P.E.D Ltd in respect of a proposed solar farm development located on land to the north of the B5426, Wrexham.

Development will include in-field solar arrays with associated access tracks, substation and battery energy storage system (BESS) and cable route to the grid connection point. As part of the Proposed Development, works include the construction of multiple spanned watercourse crossings to facilitate access to land parcels within the solar farm development. The site covers 146 hectares (ha) and is split into 3no. land parcels, namely the Western Array Area, Central Array Area and Eastern Array Area. The 3no. land parcels are centred at National Grid Reference (NGR): 331692, 346263 (western), NGR: 333959, 345629 (central), NGR: 336679, 346129 (eastern) respectively. A location plan and an aerial image are included in Appendix A.

For the purposes of the WFD assessment, a zone of influence of 1km around the site has been assessed. Within this report, this is referred to as the 'Study Area'. The 1km zone of influence includes all watercourses within and adjacent to the site, and hydraulically linked downstream waterbodies including the Black Brook, River Dee, River Clywedog and the underlying Dee Carboniferous Coal Measures Groundwater body and Dee Permo-Triassic Sandstone groundwater catchment. No relevant receptors (watercourses) are identified upstream of the site.

The aim of this Preliminary WFD Assessment is to assist the regulator in understanding the impact the outlined activities may have on the immediate water body and any linked water bodies.

This report should be read in conjunction with the Waterco FCA & Drainage Strategy (report reference: 14825-FCA&Drainage Strategy-04).

Assumptions and Limitations

All third-party published information and data is assumed to be correct, up to date and based on verified and accurate records, for example, Natural Resources Wales (NRW) flood mapping and British Geological Survey (BGS) geological mapping.

It is assumed that all required permits and formal agreements will be sought with relevant consultees.

It is assumed that the site is not contaminated. No monitoring or investigation has been undertaken by Waterco Ltd.

Policy Context

Legislation

Water Framework Directive 2000/60/EC

Published in December 2000, the Directive aims to preserve, restore and improve the water environment. It is a legal requirement within England and Wales, originally transposed into law through the Water Environment (Water Framework Directive) (England and Wales) (2003) to record data within River Basin Management Plans. River Basin Planning is managed in six-year cycles.

The environmental objectives of the WFD for surface waters include:

1. Prevent deterioration in the status of aquatic ecosystems, protect and improve the ecological condition of waters;
2. Aim to achieve 'good' status for all waterbodies by 2015. Where this is not possible and subject to the criteria set out in the Directive, aim to achieve good status by 2021 or 2027;
3. Meet the requirement of the WFD Protected Areas;
4. Promote sustainable use of water as a natural resource;
5. Conserve habitats and species that depend directly on water;
6. Reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment;
7. Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants; and
8. Contribute to the mitigating effects on floods and droughts.

Directive on Environmental Quality Standards (EQSD) 2008/105/EC

This Directive establishes the environmental quality standards (EQS) for priority substances and certain other pollutants in surface waters.

With reference to the WFD, good chemical status is achieved when a water body complies with the EQS for all the priority substances and certain other pollutants listed in the EQSD.

Water Act 2014 and Water Resources Act 1991

This Act governs the control of water abstraction, discharge to water bodies, water impoundment, conservation and drought provision.

Flood and Water Management Act 2010

This Act provides details on the management of risks associated with flooding and coastal erosion.

Environmental Protection Act 1990

This Act provides details for identifying and dealing with waste, emissions, contaminated land and water resources.

The Land Drainage Act 1991

This Act establishes the regulation of ordinary watercourses by Local Authorities and Internal Drainage Boards. It outlines that a watercourse should be maintained by its riparian owner so that the flow of water is not impeded. The riparian owner must accept the natural flow from upstream but does not need to carry out works to cater for increased flows which may result from works carried out upstream.

The Groundwater (Water Framework Directive) (Wales) Direction 2016

This Directive is on the protection of groundwater against pollution and deterioration from hazardous substances and non-hazardous pollutants.

The Groundwater (England and Wales) Regulations 2009

This Regulation transposes 2006/118/EC into law in England and Wales.

Environmental Permitting (England and Wales) Regulations 2016

This Regulation provides a consolidated system of environmental permitting including the discharge of water and groundwater activities.

The Environmental Damage (Prevention and Remediation) (Wales) Regulations 2009

This Regulation aims to prevent and remedy damage to a protected species, natural habitat, a site of special scientific interest, water or land.

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

This Regulation transposes 2000/60/EC into law in England and Wales and revokes the WFD (England and Wales) Regulations 2003.

The Environment (Wales) Act 2016

The Environment (Wales) Act puts in place a delivery framework for the sustainable management of natural resources and introduces some simple principles to underpin the way we all work.

Well-being of Future Generations (Wales) Act 2015

This act asks 44 Public Bodies in Wales to work in a sustainable way and think about the impact our work can have for people living in Wales, now and in the future.

Dee River Basin Management Plan 2021 – 2027

This report outlines the current baseline classification of waterbodies in the Dee River basin district, the objectives and targets for water quality within waterbodies of the area, challenges / issues within the catchment which have impacts on water quality and how the objectives / targets will be achieved in future.

Site Setting

Hydrological Setting

Western Array Area

The Western Array Area is intersected by 2no. ditches (ordinary watercourses) which flow in an easterly direction through the site, and are shown on the location plan in Appendix A. The ditches join Black Brook (WFD waterbody) which is located approximately 165m east of the Western Array Area at its nearest point. Black Brook flows in a northerly direction in this location.

Central Array Area

The Central Array Area is intersected by several ditches (ordinary watercourses). The ditches generally flow in an easterly direction and are shown on the location plan in Appendix A. Other watercourses in the area include Gefeiliau Brook which is located approximately 175m west of the Central Array Area.

Eastern Array Area

The Eastern Array Area is intersected by a ditch (ordinary watercourses). The ditch generally flows in a south-easterly direction and is shown on the location plan in Appendix A. Sesswick Brook (watercourse) is located 520m south-east of the Eastern Array Area and flows east to join the River Dee (WFD waterbody) approximately 1.4km east of the Eastern Array Area.

Cable route

The cable route crosses several unnamed watercourses, as well as named watercourses including Pentre Bychan Brook, Gefeiliau Brook. However, the cable will be installed within the road, avoiding any direct excavation under the watercourses.

Topography

A topographical survey has been undertaken by Tir 3D Surveys Ltd in June 2022. The topographical survey shows that the Western Array Area slopes from 99.95 metres Above Ordnance Datum (m AOD) in the centre to approximately 90.63m AOD in the south-east.

The Central Array Area generally slopes from west to east with a level of 94.2m AOD in the west and a low point of 54.6m AOD in the north-east. However, the gradient is not uniform and there are a series of undulations and valleys surrounding watercourse corridors within and adjacent to the site.

The Eastern Array Area slopes in a south-easterly direction, with a topographical high point of 50.7m AOD identified in the western extent and a low point of 30m AOD in the south-east.

Topographic levels to m AOD have also been derived from a 1m resolution NRW composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). The LiDAR data generally corroborates the topographical survey.

Topographical information is provided as Appendix B.

Geological & Hydrogeological Setting

The British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the Western, Central and Eastern Array Areas are underlain by superficial deposits of Devensian Till, generally comprising Diamicton.

The cable route appears to be underlain by Devensian Till, generally comprising Diamicton for the majority of its length. It is underlain by Glaciofluvial Deposits and River Terrace Deposits comprising sand and gravel north-west of the Western Array Area.

The superficial deposits are identified as being underlain by the Etruria Formation consisting of mudstone in the Western Array Area, the Salop Formation comprising mudstone, sandstone and conglomerate in the Central Array Area and the north-western portion of the Eastern Array Area, and the Kinnerton Sandstone Formation for the remainder of the Eastern Array Area. The cable route north-west of the Western Array Area is partly underlain by Cefn Rock comprising sandstone and partly underlain by Pennine Lower Coal Measures Formation and Pennine Middle Coal Measures Formation (Undifferentiated) consisting of mudstone, siltstone and sandstone.

The geological mapping is available at a scale of 1:50,000 and as such may not be accurate on a site-specific basis.

Historical BGS borehole record SJ34NW545 is located in the Western Array Area at NGR: 331590, 346380. The borehole record identified topsoil from ground level to approximately 0.37metres below ground level (m.bgl). The topsoil is underlain by stiff brown silty sandy clay with occasional gravel up to 3.66m.bgl. Brown silty sand with coarse medium and fine gravel is observed between 3.66m.bgl to the end of the borehole at 5.18m.bgl. Water was encountered at 3.81m.bgl.

Historical BGS borehole record SJ34NW40 is located in the Central Array Area at NGR: 333800, 345980. The borehole record identifies clayey soil with rare stones from ground level to 0.4m.bgl. Red-brown, stiff, slightly sandy clay, with rare stones is recorded between 0.4m.bgl and 18m.bgl. No water was encountered within the borehole.

Historical BGS borehole record SJ34NE24) is located approximately 335m south of the Eastern Array Area at NGR: 337320, 345560. The borehole record identifies very sandy soil from ground level to 0.3m.bgl. Gravel consisting of coarse to fine, subrounded grey mudstone, and greywacke with quartzite and igneous rock and sand consisting of coarse, mostly subangular quartzite with minor quartz and sandstone, medium quartz an quartzite is identified between 0.3m.bgl and 5.3m.bgl. This is underlain by silty and sandy, soft, red-brown clay up to 7.5m.bgl. Very clayey sand is observed up to 13m.bgl, with it becoming mainly fine up to 17m.bgl. Between 17m.bgl and the end of the borehole (19.2m.bgl) very sandy, mainly soft, red-brown clay with coal fragments are identified. Water was encountered at 14m.bgl.

Borehole records together with a borehole location plan are included as Appendix C.

According to NRW's Aquifer Designation data, obtained from the BGS GeoIndex online mapping [accessed August 2025], the Devensian Till deposits are classified as a Secondary Undifferentiated Aquifer, which are assigned in *'cases where it has not been possible to attribute either category A or B to a rock type. In most*

cases, this means that the layer in question has previously been designated as both minor and non aquifer in different locations due to the variable characteristics of the rock type'.

The Etruria and Salop Formations are classified as Secondary A Aquifer. Secondary A Aquifers are *'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers'.*

The Kinnerton Sandstone Formation bedrock is classified as a Principal Aquifer, which is defined as layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

The Cranfield University 'Soilscapes' map [accessed August 2025] indicates that the Western, Central and Eastern Array Areas are underlain by '*Slowly permeable seasonally wet loamy and clayey soils'*.

The NRW 'Source Protection Zones' data, obtained from the Welsh Government 'Data Map Wales' website [accessed August 2025], indicates that the Eastern Array Parcel of the site is located within Source Protection Zone III. This is the area around a supply source within which all the groundwater ends up at the abstraction point. This is the point from where the water is taken. This could extend some distance from the source point.

Water Features Survey

A water features plan, identifying all watercourses, waterbodies, proposed watercourse crossings, water wells and water abstractions is included as Appendix D.

Abstractions >20m³ per day are registered with Natural Resources Wales (NRW). Data provided by NRW reveals there is 4no. abstraction licenses within 1km of the site. The nearest abstraction licence is located approximately 830m east of the Western Array Area (NGR: SJ 30711 45771) (170m south of the cable route) and is registered to Hafod Quarry Landfill site and used for industrial, commercial, and public services.

Unlicensed abstractions are those with a volume of less than 20m³ per day. Data provided by Wrexham Council indicates 1no. private borehole water supply within a 1km radius of the site boundary, located at approximately NGR: 333082, 346271.The record is PWS Sontley Hall Supply.

The BGS maintains records of water wells within 1km of the site, which have been used historically or currently for water supply, monitoring or investigation. There are several (>10no.) within 1km of the site.

No abstractions/ water supply boreholes are located within 50m of the site (including the cable route). No springs are recorded within 1km of the site.

Local Drainage Setting

Public sewer records have been obtained from Dwr Cymru Welsh Water (DCWW) and are included in Appendix E. The DCWW sewer records show that there is a 675mm public combined sewer crossing the Western Array Area flowing north-east. There is also a 110mm public foul rising main and 300mm public foul gravity sewer connecting into the combined sewer. There are no public sewers crossing the Central and

Eastern Array Areas.

A minimum 3m undeveloped easement will be required from the centreline of the public sewers and rising main crossing the site.

Flood Risk

The NRW 'Flood Map for Planning' (Appendix F) shows that the site is located within an area outside of the extreme flood extent (Flood Zone 1), meaning it has a less than 0.1% annual probability of flooding, including the effects of climate change.

The cable route is shown to be within Flood Zone 2 and 3 where it crosses Black Brook and Gefeiliau Brook. The cable route will be installed within the existing road. Flood Zone 3 is defined as having a greater than 1% annual probability of flooding from rivers, including the effects of climate change. Flood Zone 2 is defined as having between a 1% and 0.1% annual probability of flooding from rivers, including the effects of climate change.

The NRW 'Flood Risk from Surface Water and Small Watercourses' map shows that the majority of the Western Array Area is at very low risk of surface water flooding, meaning it has a less than 0.1% annual probability of flooding. There are areas directly adjacent to the ditches on site shown to be within surface water Flood Zone 2 and 3. Flood Zone 2 is defined as having between a 0.1% to 1% (1 in 1000 to 1 in 100) chance of flooding from surface water and/or small watercourses in a given year, including the effects of climate change. Flood Zone 3 is defined as areas with a greater than 1% (1 in 100) chance of flooding from surface water and/or small watercourses in a given year, including the effects of climate change.

The majority of the Central Array Area is at very low risk of surface water flooding, meaning it has a less than 0.1% annual probability of flooding. There are areas shown to be within surface water Flood Zones 2 and 3, generally constrained to the locations of the ditches. All developable areas are outside of the flood extents associated with surface water and small watercourses. There are no distinct flow routes in the area which would direct any potential surface water flooding towards the developable areas of the site.

The majority of the Eastern Array Area is at very low risk of surface water flooding, meaning it has a less than 0.1% annual probability of flooding. There are areas shown to be within surface water Flood Zones 2 and 3, generally constrained to the locations of ditches.

The site is situated at a minimum of approximately 30m AOD and is significantly above sea level. The site is therefore not at risk of tidal flooding.

The NRW online 'Risk of Flooding from Reservoirs' map shows that site is not at risk of flooding from reservoirs.

The NRW 'Recorded Flood Extents' map shows that the site is located outside of the historical flood extent.

NRW Flood Maps are included in Appendix F.

Other Designations and Considerations

According to DataMap Wales (accessed June 2025) there are several designated sites within 1km of the site.

Stryt Las a'r Hafod Site of Special Scientific Interest (SSSI) located approximately 270m west of the Western Array Area at its nearest point. The cable route appears to intersect this SSSI. This site is also part of the Johnstown Special Area of Conservation (SAC), primarily due to its populations of rare amphibians, especially Great Crested Newts.

The Afon Dyfrdwy (River Dee) SSSI is located 1.4m south-east of the Eastern Array Parcel. This site is also designated as a SAC, and is ecologically important for fish otters, aquatic plants and its diverse riverine habitat.

There are also several ancient woodlands within 1km of the site.

There are no Areas of Outstanding Natural Beauty within 1km.

The designations are indicated on the Designation Plan, provided as Appendix G.

Scheme Proposals

The proposed development is for a solar farm development, comprising in-field solar arrays with associated on-site Battery Energy Storage System, access tracks, and a substation. The proposed development also includes infrastructure for a connection to the Legacy National Grid substation. The development is separated into 3no. land parcels; the Eastern, Central and Western Array Areas. The substation grid compound is located in the Western Array Area.

To facilitate the development, access crossings will need to be constructed over the watercourses. No new main river crossings are proposed. All new crossing points are proposed over ordinary watercourses. The new crossings will be in the form of an open span bridge structure which will not impact on the channel profile.

The majority of the site will remain permeable, with land beneath the solar panels retained as grassland. Access tracks will be formed from permeable material (compacted stone). The proposed substation compound will cover an area of approximately 0.24ha and will be formally drained. Each individual hybrid-inverter battery station container will cover an area of approximately 235m^2 (0.0235ha) and will be formally drained.

Proposed development plans are included in Appendix H.

WFD Screening (Stage 1)

The purpose of screening is to identify the extent to which the Proposed Development is likely to affect WFD water bodies within the zone of influence (ZoI) (up to 1km at its furthest point). A buffer zone plan to establish

the zone of influence, key features and all relevant WFD waterbodies on a map or plan is included in Appendix I.

This Zone of Influence includes the relevant WFD waterbodies for this site.

Western Array Area

The 2no. ditches (ordinary watercourses) which intersect the site flow in an easterly direction to join Black Brook (WFD waterbody). The Black Brook which is located approximately 165m east of the Western Array Area at its nearest point.

The WFD designation for the Black Brook is Black Brook (Clywedog) waterbody (Waterbody ID: GB111067051700) which has a length of 5.2km.

Central Array Area

The unnamed watercourses on site generally flow in an easterly direction. Other watercourses in the area include Gefeiliau Brook which is located approximately 175m west of the Central Array Area. Gefeiliau Brook flows in a northerly direction to form a confluence with the River Clywedog at approximate NGR: 334058, 348490, approximately 2.15km north of the site.

The WFD designation for the River Clywedog at this location is the Clywedog - Gwenfro to Black Brook waterbody (Waterbody ID: GB111067051690) which has a length of 2.77km. Although the WFD waterbody lies beyond the 1km ZoI, its hydrological connectivity to Gefeiliau Brook warrants its screening for further assessment.

Eastern Array Area

Sesswick Brook is located 520m south-east of the Eastern Array Area. The ditch on site has connectivity with Sesswick Brook and therefore Sesswick Brook has the potential to be affected by works undertaken as part of the proposed scheme. Sesswick Brook flows south-east to join the River Dee (WFD waterbody) approximately 1.4km east of the Eastern Array Area.

The WFD designation for the River Dee is the Dee - Chester Weir to Ceiriog waterbody (Waterbody ID: GB111067057080) which has a length of 65.1km.

The western array area and central array area is located within a WFD designated groundwater body, namely the Dee Carboniferous Coal Measures groundwater catchment (Water body reference: GB41102G204800) and therefore this catchment has the potential to be impacted by the proposed works. This catchment has an area of 1184.528km^2.

The eastern array area is located within a WFD groundwater body, namely the Dee Permo-Triassic Sandstone groundwater catchment (Water body reference: GB41101G202400) and therefore this catchment has the potential to be impacted by the proposed works. This catchment has an area of 1374578.6km^2.

Local WFD Water Bodies

The Black Brook (Clywedog) waterbody, Clywedog - Gwenfro to Black Brook waterbody, Dee - Chester Weir

to Ceiriog waterbody are considered to be of importance for the purposes of this assessment. These waterbodies are identified as part of WFD River Catchment Cycle 3.

The Dee Carboniferous Coal Measures and Dee Permo-Triassic Sandstone WFD Groundwater bodies are also considered to be of importance for the purposes of this assessment and is identified as part of the WFD Groundwater Cycle 3. Classifications for these waterbodies have been obtained from the NRW and are included in Tables below. Background information on the ecological and chemical parameters for surface water and groundwater bodies is included in Appendix J.

No data is available for the Dee Permo-Triassic Sandstone WFD groundwater catchment.

Table 1 – Dee - Chester Weir to Ceiriog River Catchment

Water Body			Dee - Chester Weir to Ceiriog
Water body ID			GB111067057080
Length			108.2267km
Overall Ecological Classification			Moderate
Overall Chemical Classification			Moderate
Hydromorphological Designation			Heavily Modified
Parameter			**2021**
Ecological	Biological quality elements		
		Fish	-
		Invertebrates	High
		Macrophyte and phytobenhos combined	Good
		Macrophyte Sub element	Poor
		Phytobenthos sub element	Good
	Physio-chemical quality elements		
		Ammonia	High
		Dissolved Oxygen	High
		Biological Oxygen Demand (BOD)	High
		Temperature	Moderate
		Morphology	-
		pH	High
		Phosphate (P)	Good
	Supporting elements (Surface Water)		
		Mitigation Measures Assessment	Moderate
	Specific pollutants		
		Arsenic	High
		Copper	High
		Chromium (VI)	High
		Dimethoate	High
		Glyphosate	High
		Iron	High
		Linuron	High
		Manganese	High
		Mecoprop	High
		Permethrin	-
		Phenol	High
		Phenol 2,4	High
		Toluene	High

		Triclosan	High
		Zinc	High
	Priority Hazardous Substances		
		Anthracene	High
		Brominated diphenylether (BDPE)	Moderate
		Cadmium and Its Compounds	High
		Dioxins and dioxin-like compounds	High
		Endosulfan	High
		Hexabromocyclododecane (HBCDD)	High
		Heptachlor and heptachlor epoxide	High
		Hexachlorobenzene	High
		Hexachlorobutadiene	High
		Mercury and its Compounds	Moderate
		Noyphenol	High
		Pentachlorobenzene	High
		Perfluorooctane sulphonate (PFOS)	-
		Polyaromatic hydrocarbons (PAH)	High
		Tributyltin Compounds	High
		Triflurali	High
	Priority substances		
		Aclonifen	High
		Alachlor	High
		Atrazine	High
		Benzene	High
		Cypermethrin (Priority hazardous)	High
		1,2-dichloroethane	High
		Dichloromethane	High
		Dichlorvos	High
		Diuron	High
		Fluoranthene	High
		Isoproton	High
		Lead and Its Compounds	High
		Napthalene	High
		Nickel and Its Compounds	High
		Octylphenol	High
		Pentachlorophenol	High
		Simazine	High
		Trichlorobenzenes	High
		Trichloromethane	High
	Other pollutants		
		Carbon Tetrachloride	High
		DDT	High
		Aldrin, Dieldrin, Endrin & Isodrin	High
		Para – para DDT	High
		Tetrachloroethylene	High
		Trichloroethylene	-

Table 2 -Black Brook (Clywedog) WFD Classifications

Water Body			Black Brook (Clywedog)
Water body ID			GB111067051700
Length			8.675km
Overall Ecological Classification			Moderate
Overall Chemical Classification			High
Hydromorphological Designation			Natural
Parameter			**2021**
Ecological	Biological quality elements		
		Fish	-
		Invertebrates	High
		Macrophyte and phytobenhos combined	High
		Macrophyte Sub element	High
		Phytobenthos sub element	-
	Physio-chemical quality elements		
		Ammonia	High
		Dissolved Oxygen	High
		Biological Oxygen Demand (BOD)	High
		Temperature	Moderate
		Morphology	Not High
		pH	High
		Phosphate (P)	High
	Supporting elements (Surface Water)		
		Mitigation Measures Assessment	-
	Specific pollutants		
		Arsenic	High
		Copper	High
		Chromium (VI)	-
		Dimethoate	-
		Glyphosate	-
		Iron	-
		Linuron	-
		Manganese	-
		Mecoprop	-
		Permethrin	-
		Phenol	-
		Phenol 2,4	-
		Toluene	-
		Triclosan	-
		Zinc	Moderate
	Priority Hazardous Substances		
		Anthracene	-
		Brominated diphenylether (BDPE)	-
		Cadmium and Its Compounds	High
		Dioxins and dioxin-like compounds	-
		Endosulfan	-
		Hexabromocyclododecane (HBCDD)	-
		Heptachlor and heptachlor epoxide	-
		Hexachlorobenzene	-
		Hexachlorobutadiene	-

		Mercury and its Compounds	-
		Noyphenol	-
		Pentachlorobenzene	-
		Perfluorooctane sulphonate (PFOS)	-
		Polyaromatic hydrocarbons (PAH)	-
		Tributyltin Compounds	-
		Triflurali	-
	Priority substances		
		Aclonifen	-
		Alachlor	-
		Atrazine	-
		Benzene	-
		Cypermethrin (Priority hazardous)	-
		1,2-dichloroethane	-
		Dichloromethane	-
		Dichlorvos	-
		Diuron	-
		Fluoranthene	-
		Isoproton	-
		Lead and Its Compounds	High
		Napthalene	High
		Nickel and Its Compounds	High
		Octylphenol	High
		Pentachlorophenol	-
		Simazine	-
		Trichlorobenzenes	-
		Trichloromethane	-
	Other pollutants		
		Carbon Tetrachloride	-
		DDT	-
		Aldrin, Dieldrin, Endrin & Isodrin	-
		Para – para DDT	-
		Tetrachloroethylene	High
		Trichloroethylene	-

Table 3 - Clywedog - Gwenfro to Black Brook Waterbody Classifications

Water Body			Clywedog - Gwenfro to Black Brook
Water body ID			GB111067051690
Catchment Area			25.26km2
Length			4.6km
Overall Ecological Classification			Good
Overall Chemical Classification			High
Hydromorphological Designation			Natural
Parameter			**2021**
Ecological	Biological quality elements		
		Fish	Good
		Invertebrates	Good
		Macrophyte and phytobenhos combined	Good
		Macrophyte Sub element	Good
		Phytobenthos sub element	-
	Physio-chemical quality elements		
		Ammonia	High
		Dissolved Oxygen	High
		Biological Oxygen Demand (BOD)	-
		Temperature	High
		Morphology	Not High
		pH	High
		Phosphate (P)	High
	Supporting elements (Surface Water)		
		Mitigation Measures Assessment	
	Specific pollutants		
		Arsenic	-
		Copper	-
		Chromium (VI)	-
		Dimethoate	-
		Glyphosate	-
		Iron	-
		Linuron	-
		Manganese	-
		Mecoprop	-
		Permethrin	-
		Phenol	-
		Phenol 2,4	-
		Toluene	-
		Triclosan	-
		Zinc	Moderate
	Priority Hazardous Substances		
		Anthracene	-
		Brominated diphenylether (BDPE)	-
		Cadmium and Its Compounds	-
		Dioxins and dioxin-like compounds	-
		Endosulfan	-
		Hexabromocyclododecane (HBCDD)	-
		Heptachlor and heptachlor epoxide	-
		Hexachlorobenzene	-
		Hexachlorobutadiene	-

		Mercury and its Compounds	-
		Noyphenol	-
		Pentachlorobenzene	-
		Perfluorooctane sulphonate (PFOS)	-
		Polyaromatic hydrocarbons (PAH)	-
		Tributyltin Compounds	-
		Triflurali	-
	Priority substances		
		Aclonifen	-
		Alachlor	-
		Atrazine	-
		Benzene	-
		Cypermethrin (Priority hazardous)	-
		1,2-dichloroethane	-
		Dichloromethane	-
		Dichlorvos	-
		Diuron	-
		Fluoranthene	-
		Isoproton	-
		Lead and Its Compounds	-
		Napthalene	-
		Nickel and Its Compounds	-
		Octylphenol	-
		Pentachlorophenol	-
		Simazine	-
		Trichlorobenzenes	-
		Trichloromethane	-
	Other pollutants		
		Carbon Tetrachloride	-
		DDT	-
		Aldrin, Dieldrin, Endrin & Isodrin	-
		Para – para DDT	-
		Tetrachloroethylene	-
		Trichloroethylene	-

Table 4 – Dee Carboniferous Coal Measures WFD Groundwater body Catchment Classifications

Water Body			Dee Carboniferous Coal Measures
Water Body ID			GB41102G204800
Surface Area			1184.528km^2
Overall Status			Poor
Overall Quantitative Classification			Good
Overall Chemical Classification			Poor
Parameter			**2021**
Quantitative	Quantitative Status element		
		Quantitative Dependent Surface Water Body Status	Good
		Quantitative GWDTEs test	Good
		Quantitative Saline Intrusion	Good
		Quantitative Water Balance	Good
Chemical	Chemical Status element		
		Chemical Dependent Surface Water Body Status	Good
		Chemical Drinking Water Protected Area	Good
		Chemical GWDTEs test	Good
		Chemical Saline Intrusion	Good
		General Chemical Test	Poor
	Supporting elements (Groundwater)		
		Trend Assessment	Moderate

WFD Scoping (Stage 2)

The purpose of scoping stage is to identify the risks (effects) from the Proposed Development's activities to receptors based on the identified WFD waterbodies. The WFD Scoping (Stage 2) considers the potential risks during both the construction phase of the scheme and during its operation. Where risks have been considered, but the potential effect is considered to be negligible, this has been stated. Risks to the following aspects of the WFD waterbodies have been considered in this section:

- Hydromorphology
- Biology
- Water Quality
- Invasive Non-Native Species

The decommissioning stage is likely to have comparable potential impacts to those anticipated during the construction phase. Consequently, a separate assessment of the decommissioning stage has not been included. However, new baseline surveys should be undertaken prior to decommissioning to ensure that any changes in environmental conditions are appropriately considered and addressed.

Risks to Hydromorphology

The hydromorphology of a watercourse / water body / groundwater can be impacted by the proposed Scheme. Table 5 outlines the potential hydromorphological effects of the Proposed Scheme on The Black Brook (Clywedog) waterbody, Clywedog - Gwenfro to Black Brook waterbody, Dee - Chester Weir to Ceiriog waterbody and the underlying groundwater catchments.

Table 5 - Potential Effects on Hydromorphology

Construction or Operational Phase	Source of Effect	Potential Effects
Construction	**Suspended Solids** Increased fine sediment supply to watercourses is likely to occur during construction works. This may result from: • Runoff from vegetation free surfaces • Plant and vehicle washing • Works to span watercourses with new access road crossings. • Cable installation • Piling activities Any additional Earthworks.	A possible short-term increase in turbidity and siltation may occur. Increased sediment delivery may affect any sites of ecological importance located downstream. A reduction in diversity of the channel bed due to smothering by fine sediment as a result of increased fine sediment supply.

Construction	**Vegetation Clearance** Vegetation clearance during construction may reduce the stability of the river channels, increasing the potential for erosion and associated sediment release. Sediment release is likely to be greatest where vegetation clearance is required on slopes.	A temporary /short-term increase in supply of fine sediment through bank instability, especially during the winter months is likely. Reduced morphological diversity due to loss of tree roots and/or woody debris. Woody debris within the channel can encourage the formation of different geomorphological features such as riffles, deposits and pools. In addition, smothering of the bed by silt as a result of increased fine sediment supply can cause a loss in the morphological diversity of the bed. Increased sediment delivery may affect any sites of ecological importance located downstream.
Operational	**Runoff Rates** Increase in runoff rates due to the installation of PV arrays and associated infrastructure (including hybrid-inverter battery stations).	The installation of PV Arrays do not have the potential to significantly increase surface water runoff rates compared to the baseline scenario as vegetation under the panels acts to slow the transfer of run-off. Furthermore, the level gradient of the site reduces the risk of overland flow routes occurring. As vegetation becomes established under the PV Arrays there is likely to be a decrease in surface water runoff rates and a reduction in the potential for sediment and agricultural chemicals (e.g., phosphates and nitrates) to transfer into the wider hydrological catchment compared to the baseline scenario. Areas of hardstanding (i.e. hybrid-inverter battery stations) will be served by a drainage system which incorporates Sustainable Drainage Systems (SuDS) mechanisms to prevent an increase in surface water runoff.

Operational	**Temporary damming and pumping** A 'dry construction' method for the construction of access road crossings.	A potential temporary change in sediment transport patterns, which can result in changes to channel morphology and bed stability.
Operational	**Access crossings** The new crossings will be in the form of an open span prefabricated bridge structure which will not impact on the channel profile.	The impact on hydromorphology would be negligible.

Risks to Biology

The biological habitats and fish and other species within the zone of influence can be impacted by the Proposed Scheme. Table 6 outlines the potential biological effects of the Proposed Scheme on The Black Brook (Clywedog) waterbody, Clywedog - Gwenfro to Black Brook waterbody, Dee - Chester Weir to Ceiriog waterbody and the underlying groundwater catchments.

Table 6 – Potential Effects on Biology

Construction or Operational Phase	Source of Effect	Potential Effects
Construction	**Suspended Solids** Increased fine sediment supply to watercourses is likely to occur during construction works. This may result from: ▪ Runoff from vegetation free surfaces ▪ Plant and vehicle washing ▪ Works to span watercourses with new access road crossings. ▪ Cable installation ▪ Piling activities Any additional Earthworks.	Fine sediment has the potential to smother benthic organisms (removing prey from the food chain), increase turbidity (reducing light penetration for plant growth) and clog fish gills and spawning habitats (increasing mortality and reducing spawning success). Suspension of silt and changes to the hydrology in the channel during construction can affect the ecology downstream. It can take time for habitats to recover for example for silt deposited to be washed out of sensitive habitats. Many macro-invertebrates are sensitive to sedimentation; sediment deposition in areas usually free of sediment can affect the composition and abundance of macro-invertebrate species present.
Construction	**Vegetation Clearance** Vegetation clearance during construction may reduce the stability of the river channels, increasing the potential for erosion and sediment release. Sediment release is likely to be greatest where	The loss of vegetation from riparian areas and in channel habitats reduces the complexities of habitats required by biological receptors.

	vegetation clearance is required on slopes.	
Construction	**Pollutants from construction vehicles and machinery** The use of machinery and vehicles on or within the vicinity of the Scheme Area during the construction phase has the potential to allow uncontrolled releases of pollutants such as fuel, cement dust, solvents and oils.	If not properly maintained and managed, pollutants from construction vehicles and machinery have the potential to harm aquatic life.
Construction	**Incorrect disposal of waste materials** Uncontrolled release of waste materials (e.g. plastic packaging etc) from the construction phase could be incorrectly "disposed" of along the banks of the unnamed watercourse.	Incorrect disposal of waste materials has the potential to harm aquatic vegetation and organisms.
Construction	**Noise & Vibration from Piling activities or trenching for cable installation** Many aquatic species are sensitive to noise and vibrations generated by piling activities and cable installation.	Noise can propagate over long distances underwater, negatively affecting fish and other aquatic species. For species with strong reliance on sound, this can lead to disorientation and altered behavioural changes. Vibration can disturb sediment in riverbeds, causing potential disruption to spawning grounds.
Construction	**Temporary damming and pumping** A 'dry construction' method for the construction of access road crossings.	Significant changes in flow patterns can have potential impact on the habitat suitability for aquatic species, by disrupting spawning areas and sheltering habitats. Changes to sediment transport processes can occur, thus leading to potential for smothering of benthic habitats.
Operational	**Release of pollutants from the schemes surface water drainage system (hybrid-inverter battery station)** Pollutants such as suspended solids or contaminated fire water (in the event of a fire) could be released to the watercourses on site if no mitigation is in place.	Potential to harm aquatic vegetation and organisms due to toxicity from chemicals, oxygen depletion and habitat smothering from sediment.
Operational	**Electromagnetic impacts from electrical wires beneath watercourses** Electromagnetic fields may negatively affect the behaviour of aquatic organisms.	Cables will be routed via the open span bridges crossings therefore the impact on aquatic biology would be negligible.

Risk to Water Quality

There is potential for the Proposed Scheme to impact on the water quality of a watercourse / water body. Table 7 outlines the potential water quality effects of the Proposed Scheme on the Black Brook (Clywedog) waterbody, Clywedog - Gwenfro to Black Brook waterbody, Dee - Chester Weir to Ceiriog waterbody and the underlying groundwater catchments.

Table 7 – Potential Effects on Water Quality

Construction or Operational Phase	Source of Effect	Potential Effects
Construction	**Pollutants from construction vehicles and machinery** The use of machinery and vehicles on or within the vicinity of the Scheme Area during the construction phase has the potential to allow uncontrolled releases of pollutants such as fuel, cement dust, solvents and oils.	Accidental leakages and spillages during the construction phase can have short to medium term effect on the unnamed watercourse and underlying groundwater. As the surface water may be in hydraulic continuity with the underlying groundwater aquifers, relatively significant pollution events may have an effect on the groundwater.
Construction	**Incorrect disposal of waste materials** Uncontrolled release of waste materials (e.g. plastic packaging etc) from the construction phase could be incorrectly "disposed" of along the banks of the unnamed watercourse.	
Construction	**Suspended Solids** Increased fine sediment supply to watercourses is likely to occur during construction works. This may result from: ▪ Runoff from vegetation free surfaces ▪ Plant and vehicle washing ▪ Works to span watercourses with new access road crossings. ▪ Cable installation ▪ Piling activities Any additional Earthworks.	Increased turbidity as a result of sedimentation can degrade water quality by reducing light penetration, smothering habitats, and also water temperature.

Operational	**Release of pollutants from the schemes surface water drainage system (hybrid-inverter battery stations)** Pollutants such as suspended solids or contaminated fire water (in the event of a fire) could be released to the watercourses on site if no mitigation is in place.	High level of pollutants in firewater can deplete dissolved oxygen levels, leading to 'dead zones'. Potential increased turbidity and potential shifts in pH levels.
Operational	**Reduced use of chemical fertilizer and pesticides / herbicides** Change in land use from arable land to solar farm development.	The risk of agricultural diffuse pollution would be reduced from the change in land use, as the application of chemical fertilisers and pesticides / herbicides will no longer take place.
Operational	**Pollution from damaged PV Modules / leakages from the PV Modules** Due to the composition of the PV module surfaces, they are likely to remain intact both at the surface and underside near the racking system, even in the event of damage.	The impact on the water environment would be negligible.

Potential Effects of Invasive Non-Native Species (INNS)

The effects of INNS on a watercourse / water body can be impacted by the proposed scheme. Table 8 outlines the potential effects of the proposed scheme on the Black Brook (Clywedog) waterbody, Clywedog - Gwenfro to Black Brook waterbody, Dee - Chester Weir to Ceiriog waterbody and the underlying groundwater catchments.

Table 8 – Potential Effects on INNS

Construction or Operational Phase	Source of Effect	Potential Effects
Construction	Non-native invasive species may be unintentionally transferred from the site to other areas, if they are present, or introduced to the Scheme Area, through contaminated equipment.	The spread of non-native invasive species may lead to colonisation of the site other areas, and downstream of the site, and can adversely affect native habitats.
Operational	From a review of the available information, no vulnerable receptors have been identified as part of the operational phase of the Scheme.	Therefore, the proposals are considered to have a negligible impact on INNS during the operational phase.

WFD Impact Assessment (Stage 3)

Impacts of the Proposed Scheme on WFD Compliance

Following the identification of potential impacts during the scoping stage, this section assesses the likelihood and significance of these effects on the unnamed watercourses on site and subsequent Black Brook (Clywedog) waterbody, Clywedog - Gwenfro to Black Brook waterbody, Dee - Chester Weir to Ceiriog waterbody and the underlying groundwater catchments.

Providing the mitigation measures identified below are implemented the Proposed Scheme will have a negligible effect on the identified water bodies during both the construction and operational phases.

Construction Phase Mitigation

In order to minimise the risk of deleterious effects of the Proposed Scheme on the unnamed watercourses on site and subsequent Black Brook (Clywedog) waterbody, Clywedog - Gwenfro to Black Brook waterbody, Dee - Chester Weir to Ceiriog waterbody and the underlying groundwater catchments, and to ensure that the Proposed Scheme is WFD compliant, the following mitigation measures are recommended during the construction phase.

Sediment

To prevent fine sediment entering the watercourse, construction activities should occur away from the watercourses where possible. When construction activities, including stock piling and storage of materials, occur in close proximity to a watercourse they should be separated from the watercourse with barriers (e.g. sediment fences) to prevent surface water runoff from these sites entering the watercourse. Where practicable, consideration should be given to installing geotextile-material silt fences to filter suspended solids from runoff.



Figure 1 - Silt Fence (source siltbuster.co.uk)

The extent of vegetation clearance should be limited to only the areas necessary to facilitate the construction

of the Proposed Scheme. This would reduce the amount of sediment released during clearance and the potential release of sediment from bare ground following clearance.

Timing of works must be carefully considered. If possible, the construction should be carried out during periods of low flow and rainfall to reduce the risk of scour and erosion around structures and reduce runoff from the construction area. It should be noted however that minimal flow was observed within the watercourse channels on site therefore scour and erosion risk is considered to be minimal.

The risk of sedimentation to watercourses will be reduced through the design of the watercourse access road crossings. By installing open span structures (as opposed to culverts) during construction, no longitudinal or latitudinal modifications will be made to the channel. All cable crossings would be integrated within bridge crossing locations and existing roads.

A 'dry construction' method should be used to construct the crossings. Flows upstream and downstream of the crossing point would be dammed and over pumped, to allow the open span structure i.e bridges to be constructed. This involves temporarily damming the ditch upstream and downstream of the crossing, typically using sandbags or straw bales, and pumping water out of the section where the cables are to cross. To mitigate the effects of siltation, temporary sediment traps installed to hold any sediment that may be dislodged during pumping, preventing it from being deposited unnaturally downstream. Silt netting will also be implemented within the channel to help capture any residual sediment. Most of the watercourses on site exhibited low flow conditions, and as such the impact is not anticipated to be significant. During construction, the footings should be positioned away from the bank edge to mitigate potential bank erosion.

Contamination

Potential contamination risks can be mitigated by ensuring that a suitably experienced and competent contractor is employed to undertake the works. The contractor should ensure that all method statements are prepared with due consideration to minimising the release of potentially contaminative materials / compounds such as fuel, oils and chemicals, which could have a significant impact in the vicinity and downstream of the construction site. Contractors should also provide / implement the necessary measures needed to be in place to prevent the accidental release of pollutants into the watercourse and onto surrounding land.

Appendix K details some of the pollution prevention measures which should be put in place.

Further guidance on good practice is provided in the documents below:

- CIRIA Report C741 (January 2015) Environmental Good Practice on site guide (fourth edition);
- Guidance for Pollution Prevention (GPP), the most relevant being:
    - GPP 1 – Understanding your environmental responsibilities – good environmental practices (June 2021);
    - GPP 3 – Use and design of oil separators in surface water drainage systems (March 2022);

- GPP 5 – Works and Maintenance in or near Water (February 2018);
- GPP 13 – Vehicle Washing and Cleaning (April 2017);
- GPP 21 - Pollution incident response planning (June 2021);
- GPP 22 – Dealing with spills (October 2018)

Aquatic Ecology

A Preliminary Ecological Appraisal should be undertaken for the site.

Invasive Non-Native Species

Where invasive species are identified, their removal should be undertaken by a suitably qualified and experienced person. Appropriately experienced vegetation clearance contractors should be appointed to ensure that suitable measures are put in place to prevent further distribution of invasive plants in the local area. Removal and disposal should take place in accordance with the EA guidance document Treatment and Disposal of Invasive Non-native Plants: RPS 178 (April 2019). Where invasive non-native species are identified, efforts should be made not to spread these species within the site or to accidentally spread them to other sites. Relevant biosecurity measures should be implemented to reduce this risk and to reduce the risk of introducing invasive non-native species to the site.

Construction Phase Residual Risks

Implementing the measures detailed above will ensure the residual effects of the construction of the Proposed Scheme in the context of the WFD are negligible.

Where contamination is suspected, a suitably experienced operative should be appointed to undertake appropriate mitigation works.

Operational Phase Mitigation

The preparation of a regular maintenance plan will ensure the development is having no impact on the hydrological flows of WFD waterbodies downstream.

Runoff

The proposed solar arrays will not create any significant change to the current surface water drainage regime and the vast majority of the site will remain permeable.

Surface water runoff from the substation compound and hybrid-inverter battery stations will discharge to an adjacent watercourse at a limited greenfield discharge rate. Attenuation will be provided in the sub-grade of the compound's stone surfacing and will be sized to accommodate the 1 in 100 year plus 40% CC event. The Flood Risk Assessment & Drainage Strategy [14825-FCA & Drainage Strategy-04] provides further detail and drainage calculations for the surface water management.

Sediment

The risk of sedimentation will be minimised in the design i.e. through use of spanned structures as opposed

to culverts on watercourse access road crossings. This will minimise disturbance to the watercourse and minimise erosion and scour risks in the operational phase.

Ground beneath the solar panels will be grassed and vehicular movements on grassed areas will be minimal. This will reduce the risk of soil compaction and erosion.

Contamination

In accordance with the CIRIA C753 publication 'The SuDS Manual' (2015), other roofs (applicable to the substation compound & hybrid-inverter battery stations) have a 'low' pollution hazard level, with low traffic roads (applicable to access roads) also classified as having a 'low' pollution hazard level. Table 9 shows the pollution hazard indices for each land use.

Table 9 - Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Other Roofs	Low	0.3	0.2	0.05
Low Traffic Roads	Low	0.5	0.4	0.4

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.2

* Indices values range from 0-1

The substation compound, hybrid-inverter battery stations and the site access road will be formed from permeable stone surfacing. Table 10 demonstrates that permeable surfacing will provide sufficient treatment.

Table 10 – Permeable Surfaces Mitigation Indices

	Mitigation Indices		
Type of SUDS	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Permeable Surfaces	0.7	0.6	0.7

Mitigation measures to address contaminated fire water will be included within the Battery Management Plan.

Operational Phase Residual Risks

Implementing the measures detailed above will ensure the residual effects of the operation of the Proposed Scheme in the context of the WFD are negligible.

Conclusions and Recommendations

Impact of the Proposed Scheme on WFD Compliance

The Proposed Scheme will have some local effects on the hydromorphological, biological and chemical status of the unnamed watercourses on site and subsequently the Black Brook (Clywedog) WFD waterbody, Clywedog - Gwenfro to Black Brook WFD waterbody and Dee - Chester Weir to Ceiriog WFD waterbody primarily during the construction phase. The works also have the potential to impact the underlying Dee Carboniferous Coal Measures and Dee Permo-Triassic Sandstone WFD groundwater catchments. The effects will be negligible if a competent and experienced contractor is employed and work is undertaken in accordance with relevant pollution prevention guidance and construction best practice.

Overall, the works as proposed are expected to result in small improvements to the ecological diversity of the site.

Recommendations

It is recommended that all contractors prepare method statements which include the necessary pollution prevention and construction good practice requirements for the Proposed Scheme. These can be collated in a Construction Environmental Management Plan (CEMP) or similar style document that would ensure that all stakeholders during the construction stage are working towards the same standard.

It would be prudent to undertake some surface water sampling and analysis so that a water quality baseline can be established prior to the construction works commencing. It would also be prudent to confirm water quality data immediately following completion of the works, to highlight that the construction phase has not had a detrimental effect on water quality.

It would be prudent to ensure there is a maintenance schedule which ensures regular inspection and clearance of the culverts, inlets and outlets is undertaken as and when required.

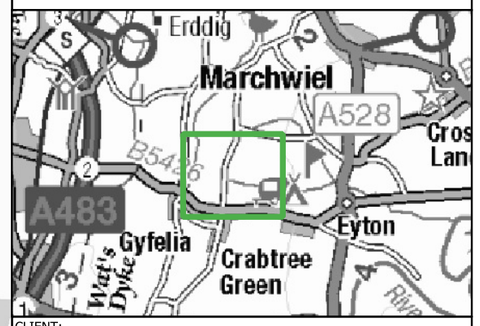
It is recommended that all mitigation measures (both during the construction and operational phases of the development) outlined within this report are implemented to ensure the risks to controlled waters is negligible.

Appendix A Location Plan and Aerial Image

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- Watercourses
- Waterbodies



Gefeiliau Brook

SONLLI / SONTLEY ROAD

RHOSROBIN LANE

Woodlands Cottage

Well Wood

Yorke's Dingles

Oak Wood

B5426

Education Facility

0 100 200 300 400 m

CONTAINS OS DATA © CROWN COPYRIGHT (2025)

CLIENT:
Axis P.E.D Ltd

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
Location Plan- Central Array Area

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5000

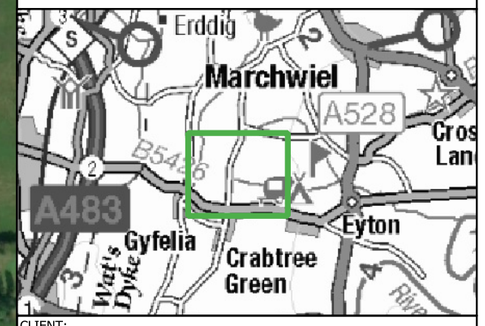
PLOT NAME:	REVISION:
14825_Location_Plan	-



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

Site Boundary



CLIENT:

Axis P.E.D Ltd

waterco
www.waterco.co.uk

SCHEME:

Butterfly Farm Solar DNS

PLOT TITLE:

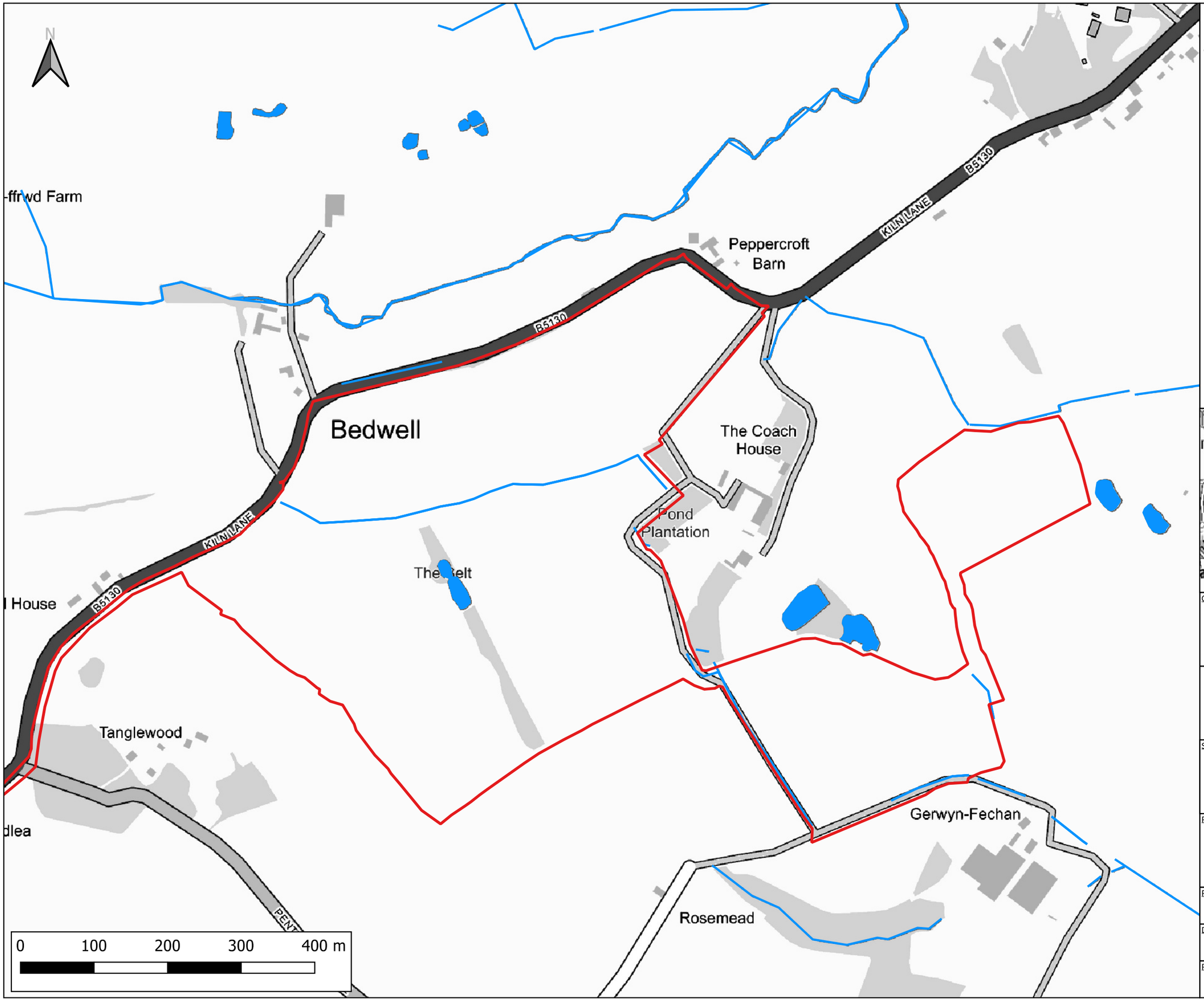
Aerial Plan- Central Array Area

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5000

PLOT NAME:	REVISION:
14825_Aerial_Plan	-

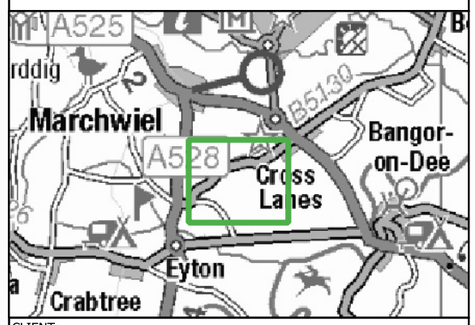
CONTAINS OS DATA © CROWN COPYRIGHT (2025)
BASEMAP: WORLD IMAGERY. SOURCES: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, GIS USER COMMUNITY



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- Watercourses
- Waterbodies



CLIENT:
Axis P.E.D Ltd

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
Location Plan- Eastern Array Area

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5000

PLOT NAME:	REVISION:
14825_Location_Plan	-

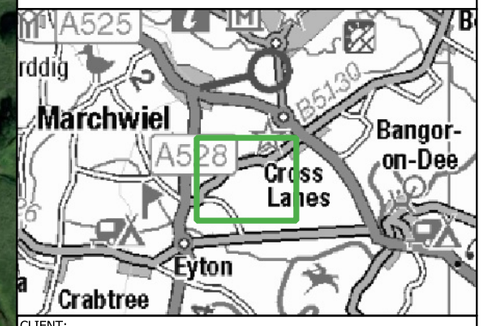
CONTAINS OS DATA © CROWN COPYRIGHT (2025)



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

Site Boundary



CLIENT:
Axis P.E.D Ltd

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
Aerial Plan- Eastern Array Area

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5000

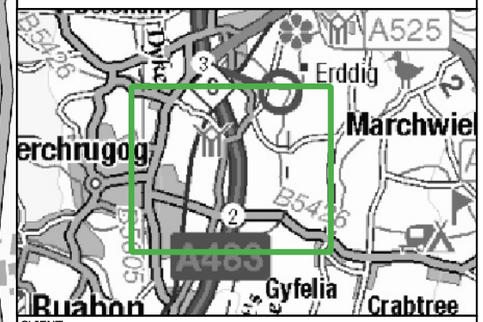
PLOT NAME:	REVISION:
14825_Aerial_Plan	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
BASEMAP: WORLD IMAGERY. SOURCES: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, GIS USER COMMUNITY

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- Watercourses
- Waterbodies



CLIENT:	Axis P.E.D Ltd
	www.waterco.co.uk
SCHEME:	Butterfly Farm Solar DNS
PLOT TITLE:	Location Plan - Western Array Area
PLOT STATUS: FINAL	DATE: 09-09-2025
DRAWN: HW / CHECKED: AW / APPROVED: NJ	PLOT SCALE AT A3: 1:10000
PLOT NAME: 14825_Location_Plan	REVISION: -

0 200 400 600 800 m

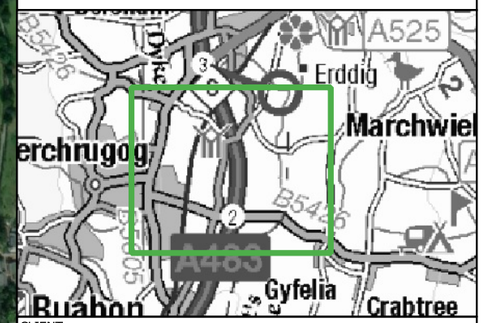
CONTAINS OS DATA © CROWN COPYRIGHT (2025)



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

Site Boundary



CLIENT:
Axis P.E.D Ltd

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
Aerial Plan- Western Array Area

PLOT STATUS:	DATE:
FINAL	09-09-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:10000

PLOT NAME:	REVISION:
14825_Aerial_Plan	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
BASEMAP: WORLD IMAGERY. SOURCES: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, GIS USER COMMUNITY

Appendix B Topographical Data

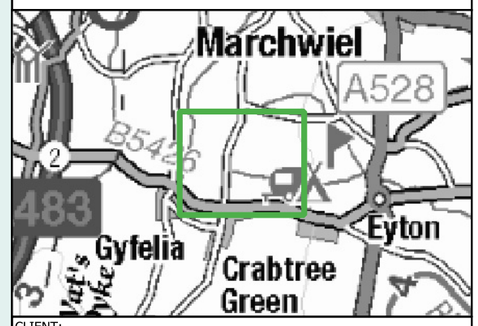
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site boundary
- 5m Contour
- Site levels (m AOD)

Ground Elevations (m AOD)

- <= 60.0
- 60.0 - 70.0
- 70.0 - 80.0
- 80.0 - 90.0
- > 90.0



CLIENT:	Axis P.E.D Ltd
	waterco www.waterco.co.uk
SCHEME:	Butterfly Farm Solar DNS
PLOT TITLE:	LiDAR Plan - Central Array Area 1m Resolution Data from Natural Resources Wales
PLOT STATUS: FINAL	DATE: 13-08-2025
DRAWN: MJW / CHECKED: AW / APPROVED: NJ	PLOT SCALE AT A3: 1:5000
PLOT NAME: 14825_LiDAR_Plan	REVISION: -

CONTAINS OS DATA © CROWN COPYRIGHT (2025)

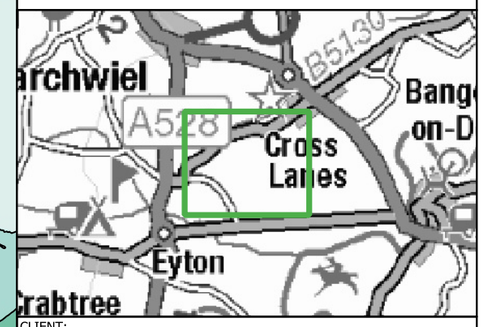
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site boundary
- 5m Contour
- Site Levels (m AOD)

Ground Elevations (m AOD)

- 0.0 - 25.0
- 25.0 - 30.0
- 30.0 - 35.0
- 35.0 - 40.0
- 40.0 - 45.0
- 45.0 - 50.0
- > 50.0



CLIENT:
Axis P.E.D Ltd

waterco
www.waterco.co.uk

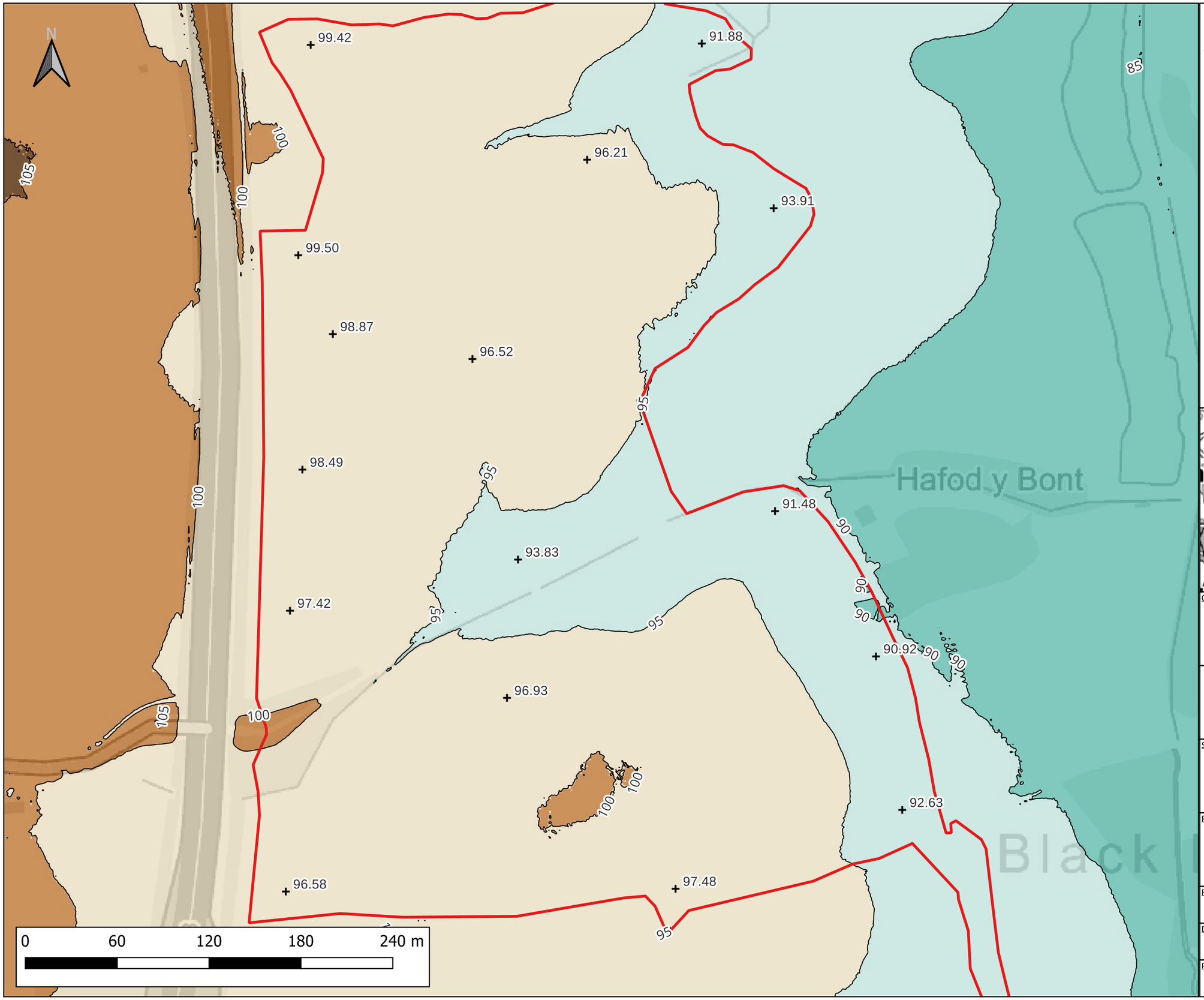
SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
LiDAR Plan - Eastern Array Area
1m Resolution
Data from Natural Resources Wales

PLOT STATUS:			DATE:
FINAL			13-08-2025
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MJW	AW	NJ	1:5000

PLOT NAME:	REVISION:
14825_LiDAR_Plan	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)



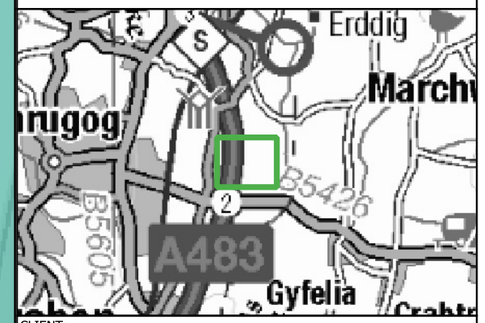
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site boundary
- 5m Contour
- Site Levels (m AOD)

Ground Elevations (m AOD)

- <= 90.0
- 90.0 - 95.0
- 95.0 - 100.0
- 100.0 - 105.0
- > 105.0



CLIENT:
Axis P.E.D Ltd

www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

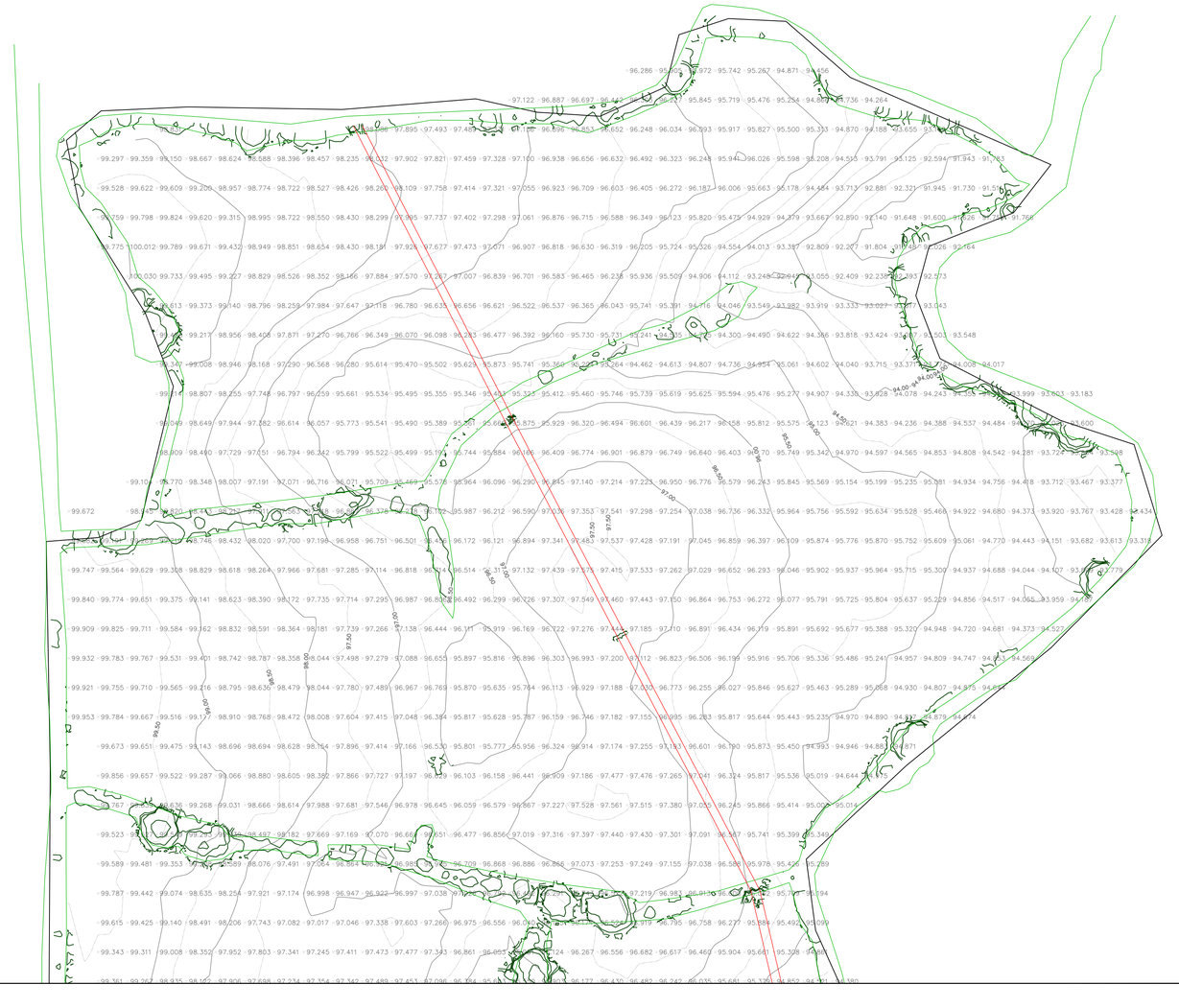
PLOT TITLE:
LiDAR Plan - Western Array Area
1m Resolution
Data from Natural Resources Wales

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MJW	AW	NJ	1:2400

PLOT NAME:	REVISION:
14825_LiDAR_Plan	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)



Legend - Water / Drainage

WBL	Water Bed Level
WTL	Water level
WAT	Water Edge
POND	Pond
WEIR	Weir
WELL	Well
ACO	Aco Drain
GL	Long gully
GU	Gully
MH	Manhole Cover (Square)
MH	Manhole Cover (Round)

Legend - Roads - Rail

RD	Road Carriageway
RC	Road Centre
	Road Markings White
	Road Markings Yellow
CUL	Culvert
DTC	Ditch
KT	Kerb Top
KB	Kerb Bottom
KBAC	Kerb Back
BS	Bus Stop
SR	Speed Ramp
TRK	Tracks
VE	Verge
RTRK	Rail Track
RS	Road Sign
	Bollard

Legend - Roads Markings

SWLD	Single White Line Dashed
SWL	Single White Line
SYLD	Single Yellow Line Dashed
SYL	Single Yellow Line
DWLD	Double White Line Dashed
DWL	Double White Line
DYLD	Double Yellow Line Dashed
DYL	Double Yellow Line
YB	Yellow Box

Legend - Buildings / Structures

BGF	Building Footprint
BGL	Building Line
	Apex
RI	Ridge
	Eaves
	Parapet
SOF	Soffit
FON	Foundations
CAN	Canopy - Overhead Features
	Container
PF	Prefab - Building
	Ruins
GH	Greenhouse
	Shed
	Steps
	Door
WIN	Windows
CEL	Cellars
CAB	Cabin
COL	Column
BRG	Bridge
LDR	Ladder
	Tank
	Platform
MONU	Monument

Legend - Ground Features

	Gate
FE	Fences
	Pillars
WL	Wall
WT	Walls top
RLG	Railing
BT	Bank Top
BB	Bank Bottom
RWB	Retaining Wall Base
RWT	Retaining Wall Top
PATH	Pathway
HR	Handrail
RAMP	Ramps, loading bays
BR	Barrier
	Armco Barrier
	Rock
SC	Surface Change
	Tarmac
	Trench
CH	Channel
CHAM	Chamber
LDR	Ladder
	Cattle Grid
CONC	Concrete
	Bench / Seat
	Survey Station
	Contours (Major)
	Contours (Minor)

Legend -Vegetation

GRASS	Grass partitions
HE	Hedges
VL	Vegetation Line
	Tree Stump
	Tree

Legend - Services

OHC	Overhead Cables
	Pipe
	Power Inspection Cover
	Power Pole
	Stay
ESB	ESB Box (Pylon)
	Fire Hydrant
	Flower box
GV	Gas Valve
	Lamp Post
	Litter Bin
	Mast / Pylon
	Post Box
Telecom	Telecom Control Panel (Pillar)
Telecom	Telecom Cover
	Telecom Pole
	Traffic Lights
	Telephone box
IC	Cable TV Inspection Cover
	Water Valve
	Water Meter
AJ	Armstrong Junction

Legend - Services - Underground

CODE	
UA	Underground Anomaly
UCOM	Underground Combined
UF	Underground Foul
UG	Underground Gas
UP	Underground Power
US	Underground Storm
UT	Underground Telecom

Co-ordinate system is Irish Transverse Mercator (ITM)
Levels are GPS Derived Malin Hd. Datum on the 2015 Geoid

KEY PLAN



SCALE: NTS

Tír 3D
the Survey people

Head Office: **www.tir3d.ie**
The Survey Studio, Ceaderwood Lodge, Moone, Co.Kildare. R14 RF67

Tel: +353 (0)59 97 23337 **Email:** info@tir3d.ie

REVISION	DESCRIPTION	DATE

Client:	JBM Solar
Location:	Legacy Farm
Job:	Topographical Survey
Drawing Number: 22104-A	Scale: 1:1,000 / A1
Surveyed By: LiDAR	Drawn By: JH
Date: Issue 20 06 22	Checked By: JH



Legend - Water / Drainage

- WBL — Water Bed Level
- WTL — Water level
- WAT — Water Edge
- POND — Pond
- WEIR — Weir
- WELL — Well
- ACO — Aco Drain
- GL — Long gully
- GU — Gully
- MC — Manhole Cover (Square)
- MR — Manhole Cover (Round)

Legend - Roads - Rail

- RD — Road Carriageway
- RC — Road Centre
- Road Markings White
- Road Markings Yellow
- CUL — Culvert
- DTC — Ditch
- KT — Kerb Top
- KB — Kerb Bottom
- KBAC — Kerb Back
- BS — Bus Stop
- SR — Speed Ramp
- TRK — Tracks
- VE — Verge
- RTRK — Rail Track
- RS — Road Sign
- Bollard

Legend - Roads Markings

- SWLD — Single White Line Dashed
- SWL — Single White Line
- SYLD — Single Yellow Line Dashed
- SYL — Single Yellow Line
- DWLD — Double White Line Dashed
- DWL — Double White Line
- DYLD — Double Yellow Line Dashed
- DYL — Double Yellow Line
- YB — Yellow Box

Legend - Buildings / Structures

- BGF — Building Footprint
- BGL — Building Line
- Apex
- RI — Ridge
- Eaves
- Parapet
- SOF — Soffit
- FON — Foundations
- CAN — Canopy - Overhead Features
- Container
- PF — Prefab - Building
- Ruins
- GH — Greenhouse
- Shed
- Steps
- Door
- WIN — Windows
- CEL — Cellars
- CAB — Cabin
- COL — Column
- BRG — Bridge
- LDR — Ladder
- Tank
- Platform
- MONU — Monument

Legend - Ground Features

- Gate
- FE — Fences
- Pillars
- WL — Wall
- WT — Walls top
- RLG — Railing
- BT — Bank Top
- BB — Bank Bottom
- RWB — Retaining Wall Base
- RWT — Retaining Wall Top
- PATH — Pathway
- HR — Handrail
- RAMP — Ramps, loading bays
- BR — Barrier
- Armco Barrier
- Rock
- SC — Surface Change
- Tarmac
- Trench
- CH — Channel
- CHAM — Chamber
- LDR — Ladder
- Cattle Grid
- CONC — Concrete
- Bench / Seat
- Survey Station
- Contours (Major)
- Contours (Minor)

Legend -Vegetation

- GRASS — Grass partitions
- HE — Hedges
- VL — Vegetation Line
- Tree Stump
- Tree

Legend - Services

- OHC — Overhead Cables
- Pipe
- Power Inspection Cover
- Power Pole
- Stay
- ESB — ESB Box (Pylon)
- Fire Hydrant
- Flower box
- GV — Gas Valve
- Lamp Post
- Litter Bin
- Mast / Pylon
- Post Box
- Telecom — Telecom Control Panel (Pillar)
- Telecom Cover
- Telecom Pole
- Traffic Lights
- Telephone box
- IC — Cable TV Inspection Cover
- Water Valve
- Water Meter
- AJ — Armstrong Junction

Legend - Services - Underground

- CODE
- UA — Underground Anomaly
- UCOM — Underground Combined
- UF — Underground Foul
- UG — Underground Gas
- UP — Underground Power
- US — Underground Storm
- UT — Underground Telecom

Co-ordinate system is Irish Transverse Mercator (ITM)
Levels are GPS Derived Malin Hd. Datum on the 2015 Geoid

KEY PLAN



SCALE: NTS

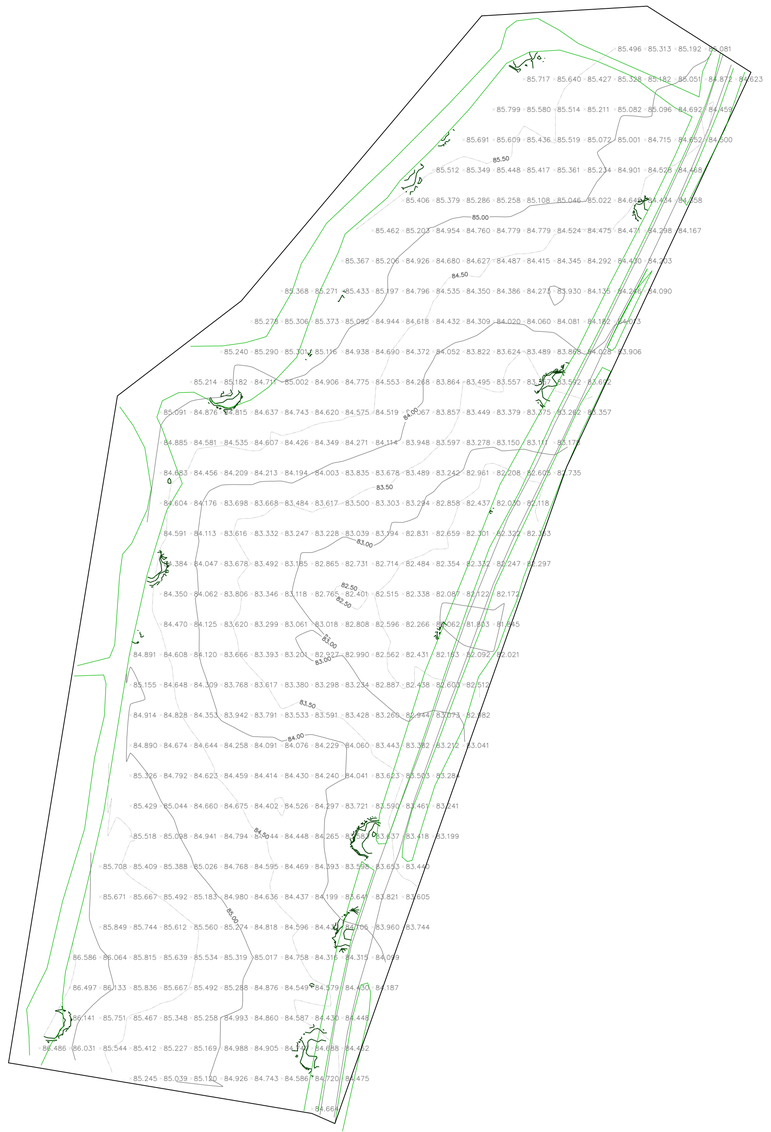
Tír3D
the Survey people

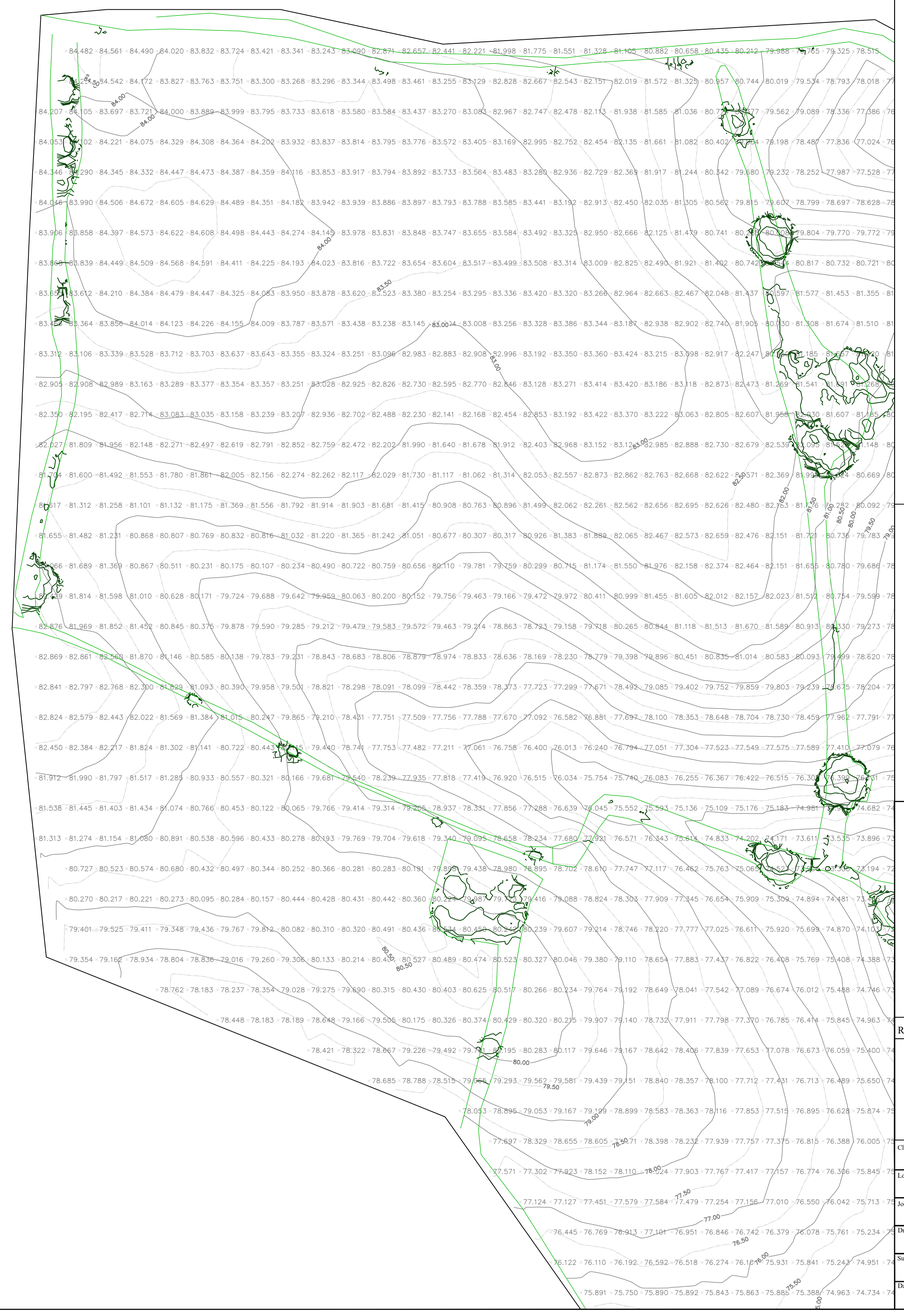
Head Office: **www.tir3d.ie**
The Survey Studio, Ceaderwood Lodge, Moone,
Co.Kildare. R14 RF67

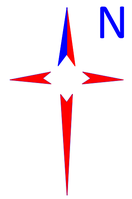
Tel: +353 (0)59 97 23337 **Email:** info@tir3d.ie

REVISION	DESCRIPTION	DATE

Client:	JBM Solar
Location:	Legacy Farm
Job:	Topographical Survey
Drawing Number: 22104-B	Scale: 1:1,000 / A1
Surveyed By: LiDAR	Drawn By: JH
Date: Issue 20 06 22	Checked By: JH







Legend - Water / Drainage

WBL	Water Bed Level
WTL	Water level
WAT	Water Edge
POND	Pond
WEIR	Weir
WELL	Well
ACO	Aco Drain
GL	Long gully
GU	Gully
MH	Manhole Cover (Square)
MH	Manhole Cover (Round)

Legend - Roads - Rail

RD	Road Carriageway
RC	Road Centre
	Road Markings White
	Road Markings Yellow
CUL	Culvert
DTC	Ditch
KT	Kerb Top
KB	Kerb Bottom
KBAC	Kerb Back
BS	Bus Stop
SR	Speed Ramp
TRK	Tracks
VE	Verge
RTRK	Rail Track
RS	Road Sign
	Bollard

Legend - Roads Markings

SWLD	Single White Line Dashed
SWL	Single White Line
SYLD	Single Yellow Line Dashed
SYL	Single Yellow Line
DWLD	Double White Line Dashed
DWL	Double White Line
DYLD	Double Yellow Line Dashed
DYL	Double Yellow Line
YB	Yellow Box

Legend - Buildings / Structures

BGF	Building Footprint
BGL	Building Line
	Apex
	Ridge
RI	Eaves
	Parapet
SOF	Soffit
FON	Foundations
CAN	Canopy - Overhead Features
	Container
PF	Prefab - Building
	Ruins
GH	Greenhouse
	Shed
	Steps
	Door
WIN	Windows
CEL	Cellars
CAB	Cabin
COL	Column
BRG	Bridge
LDR	Ladder
	Tank
	Platform
MONU	Monument

Legend - Ground Features

	Gate
FE	Fences
	Pillars
WL	Wall
WT	Walls top
RLG	Railing
BT	Bank Top
BB	Bank Bottom
RWB	Retaining Wall Base
RWT	Retaining Wall Top
PATH	Pathway
HR	Handrail
RAMP	Ramps, loading bays
BR	Barrier
	Armco Barrier
	Rock
SC	Surface Change
	Tarmac
	Trench
CH	Channel
CHAM	Chamber
LDR	Ladder
	Cattle Grid
CONC	Concrete
	Bench / Seat
	Survey Station
	Contours (Major)
	Contours (Minor)

Legend -Vegetation

GRASS	Grass partitions
HE	Hedges
VL	Vegetation Line
	Tree Stump
	Tree

Legend - Services

OHC	Overhead Cables
	Pipe
	Power Inspection Cover
	Power Pole
	Stay
	ESB Box (Pylon)
	Fire Hydrant
	Flower box
GV	Gas Valve
	Lamp Post
	Litter Bin
	Mast / Pylon
	Post Box
Telecom	Telecom Control Panel (Pillar)
	Telecom Cover
	Telecom Pole
	Traffic Lights
	Telephone box
IC	Cable TV Inspection Cover
	Water Valve
	Water Meter
AJ	Armstrong Junction

Legend - Services - Underground

CODE	
UA	Underground Anomaly
UCOM	Underground Combined
UF	Underground Foul
UG	Underground Gas
UP	Underground Power
US	Underground Storm
UT	Underground Telecom

Co-ordinate system is Irish Transverse Mercator (ITM)
Levels are GPS Derived Malin Hd. Datum on the 2015 Geoid

KEY PLAN



SCALE: NTS

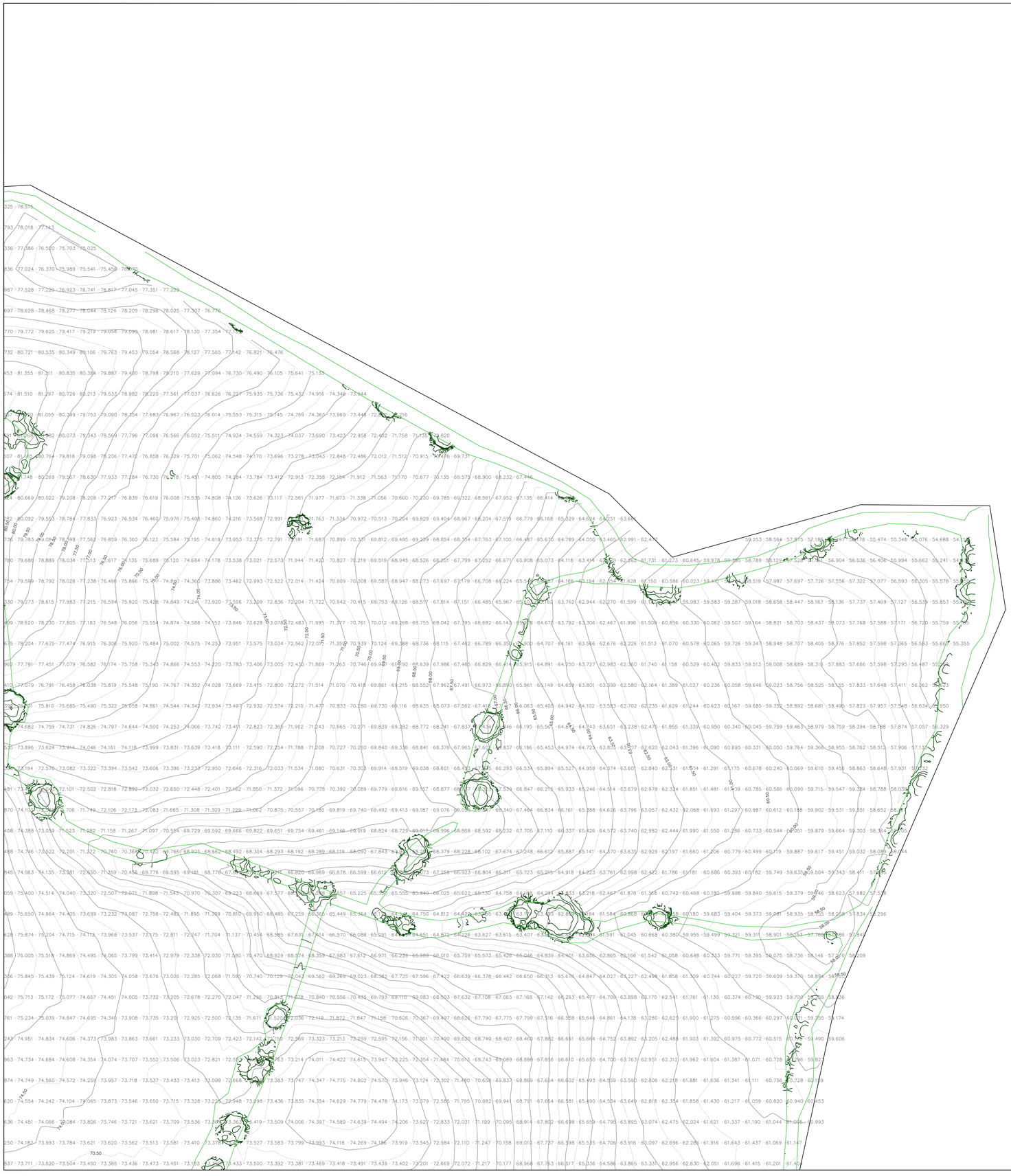
Tír 3D
the Survey people

Head Office: **www.tir3d.ie**
The Survey Studio, Ceaderwood Lodge, Moone, Co.Kildare. R14 RF67

Tel: +353 (0)59 97 23337 **Email:** info@tir3d.ie

REVISION	DESCRIPTION	DATE

Client:	JBM Solar
Location:	Legacy Farm
Job:	Topographical Survey
Drawing Number: 22104-C	Scale: 1:1,000 / A1
Surveyed By: LiDAR	Drawn By: JH
Date: Issue 20 06 22	Checked By: JH



Legend - Water / Drainage

WBL	Water Bed Level
WTL	Water level
WAT	Water Edge
POND	Pond
WEIR	Weir
WELL	Well
ACO	Aco Drain
GL	Long gully
GU	Gully
MH	Manhole Cover (Square)
MH	Manhole Cover (Round)

Legend - Roads - Rail

RD	Road Carriageway
RC	Road Centre
	Road Markings White
	Road Markings Yellow
CUL	Culvert
DTC	Ditch
KT	Kerb Top
KB	Kerb Bottom
KBAC	Kerb Back
BS	Bus Stop
SR	Speed Ramp
TRK	Tracks
VE	Verge
RTRK	Rail Track
RS	Road Sign
	Bollard

Legend - Roads Markings

SWLD	Single White Line Dashed
SWL	Single White Line
SYLD	Single Yellow Line Dashed
SYL	Single Yellow Line
DWLD	Double White Line Dashed
DWL	Double White Line
DYLD	Double Yellow Line Dashed
DYL	Double Yellow Line
YB	Yellow Box

Legend - Buildings / Structures

BGF	Building Footprint
BGL	Building Line
	Apex
RI	Ridge
	Eaves
	Parapet
SOF	Soffit
FON	Foundations
CAN	Canopy - Overhead Features
	Container
PF	Prefab - Building
	Ruins
GH	Greenhouse
	Shed
	Steps
	Door
WIN	Windows
CEL	Cellars
CAB	Cabin
COL	Column
BRG	Bridge
LDR	Ladder
	Tank
	Platform
MONU	Monument

Legend - Ground Features

	Gate
FE	Fences
	Pillars
WL	Wall
WT	Walls top
RLG	Railing
BT	Bank Top
BB	Bank Bottom
RWB	Retaining Wall Base
RWT	Retaining Wall Top
PATH	Pathway
HR	Handrail
RAMP	Ramps, loading bays
BR	Barrier
	Armco Barrier
	Rock
SC	Surface Change
	Tarmac
	Trench
CH	Channel
CHAM	Chamber
LDR	Ladder
	Cattle Grid
CONC	Concrete
	Bench / Seat
	Survey Station
	Contours (Major)
	Contours (Minor)

Legend -Vegetation

GRASS	Grass partitions
HE	Hedges
VL	Vegetation Line
	Tree Stump
	Tree

Legend - Services

OHC	Overhead Cables
	Pipe
	Power Inspection Cover
	Power Pole
	Stay
	ESB Box (Pylon)
	Fire Hydrant
	Flower box
GV	Gas Valve
	Lamp Post
	Litter Bin
	Mast / Pylon
	Post Box
Telecom	Telecom Control Panel (Pillar)
	Telecom Cover
	Telecom Pole
	Traffic Lights
	Telephone box
IC	Cable TV Inspection Cover
	Water Valve
	Water Meter
AJ	Armstrong Junction

Legend - Services - Underground

CODE	
UA	Underground Anomaly
UCOM	Underground Combined
UF	Underground Foul
UG	Underground Gas
UP	Underground Power
US	Underground Storm
UT	Underground Telecom

Co-ordinate system is Irish Transverse Mercator (ITM)
Levels are GPS Derived Malin Hd. Datum on the 2015 Geoid

KEY PLAN



SCALE: NTS

Tír3D
the Survey people

Head Office: **www.tir3d.ie**
The Survey Studio, Ceaderwood Lodge, Moone, Co.Kildare. R14 RF67

Tel: +353 (0)59 97 23337 **Email:** info@tir3d.ie

REVISION	DESCRIPTION	DATE

Client:	JBM Solar
Location:	Legacy Farm
Job:	Topographical Survey
Drawing Number: 22104-D	Scale: 1:1,000 / A1
Surveyed By: LiDAR	Drawn By: JH
Date: Issue 20 06 22	Checked By: JH



Legend - Water / Drainage

- WBL — Water Bed Level
- WTL — Water level
- WAT — Water Edge
- POND — Pond
- WEIR — Weir
- WELL — Well
- ACO — Aco Drain
- GL — Long gully
- GU — Gully
- MH — Manhole Cover (Square)
- MH — Manhole Cover (Round)

Legend - Roads - Rail

- RD — Road Carriageway
- RC — Road Centre
- Road Markings White
- Road Markings Yellow
- CUL — Culvert
- DTC — Ditch
- KT — Kerb Top
- KB — Kerb Bottom
- KBAC — Kerb Back
- BS — Bus Stop
- SR — Speed Ramp
- TRK — Tracks
- VE — Verge
- RTRK — Rail Track
- RS — Road Sign
- Bollard

Legend - Roads Markings

- SWLD — Single White Line Dashed
- SWL — Single White Line
- SYLD — Single Yellow Line Dashed
- SYL — Single Yellow Line
- DWLD — Double White Line Dashed
- DWL — Double White Line
- DYLD — Double Yellow Line Dashed
- DYL — Double Yellow Line
- YB — Yellow Box

Legend - Buildings / Structures

- BGF — Building Footprint
- BGL — Building Line
- Apex
- Ridge
- Eaves
- Parapet
- SOF — Soffit
- FON — Foundations
- CAN — Canopy - Overhead Features
- Container
- PF — Prefab - Building
- Ruins
- GH — Greenhouse
- Shed
- Steps
- Door
- WIN — Windows
- CEL — Cellars
- CAB — Cabin
- COL — Column
- BRG — Bridge
- LDR — Ladder
- Tank
- Platform
- MONU — Monument

Legend - Ground Features

- Gate
- FE — Fences
- Pillars
- WL — Wall
- WT — Walls top
- RLG — Railing
- BT — Bank Top
- BB — Bank Bottom
- RWB — Retaining Wall Base
- RWT — Retaining Wall Top
- PATH — Pathway
- HR — Handrail
- RAMP — Ramps, loading bays
- BR — Barrier
- Armco Barrier
- Rock
- SC — Surface Change
- Tarmac
- Trench
- CH — Channel
- CHAM — Chamber
- LDR — Ladder
- Cattle Grid
- CONC — Concrete
- Bench / Seat
- Survey Station
- Contours (Major)
- Contours (Minor)

Legend -Vegetation

- GRASS — Grass partitions
- HE — Hedges
- VL — Vegetation Line
- Tree Stump
- Tree

Legend - Services

- OHC — Overhead Cables
- Pipe
- Inspection — Power Inspection Cover
- Power Pole
- Stay
- ESB — ESB Box (Pylon)
- Fire Hydrant
- Flower box
- GV — Gas Valve
- Lamp Post
- Litter Bin
- Mast / Pylon
- Post Box
- Telecom — Telecom Control Panel (Pillar)
- Telecom Cover
- Telecom Pole
- Traffic Lights
- Telephone box
- IC — Cable TV Inspection Cover
- Water Valve
- Water Meter
- AJ — Armstrong Junction

Legend - Services - Underground

CODE

- UA — Underground Anomaly
- UCOM — Underground Combined
- UF — Underground Foul
- UG — Underground Gas
- UP — Underground Power
- US — Underground Storm
- UT — Underground Telecom

Co-ordinate system is Irish Transverse Mercator (ITM)
Levels are GPS Derived Malin Hd. Datum on the 2015 Geoid

KEY PLAN



SCALE: NTS

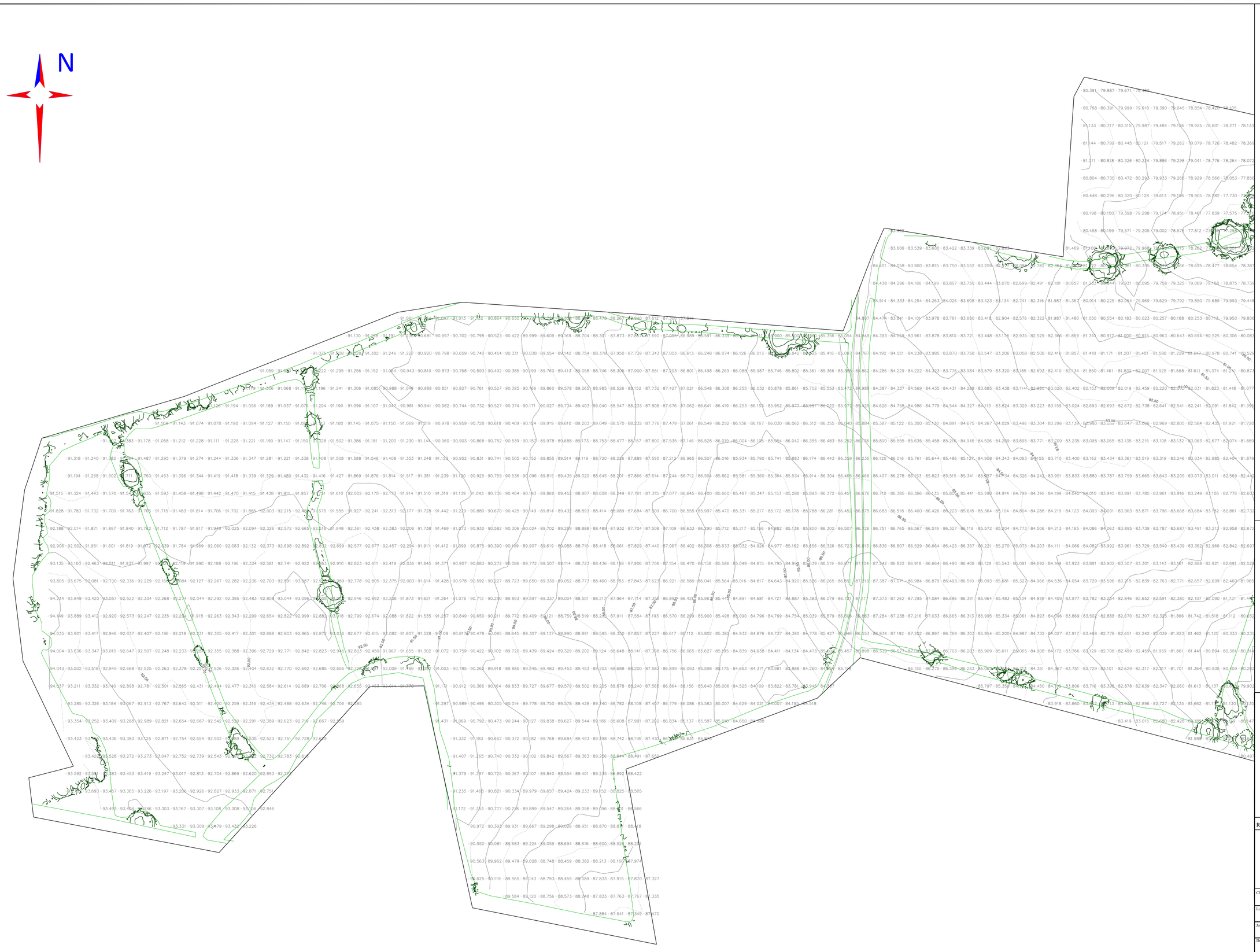
Tír3D
the Survey people

Head Office: **www.tir3d.ie**
The Survey Studio, Ceaderwood Lodge, Moone,
Co.Kildare. R14 RF67

Tel: +353 (0)59 97 23337 **Email:** info@tir3d.ie

REVISION	DESCRIPTION	DATE

Client:	JBM Solar
Location:	Legacy Farm
Job:	Topographical Survey
Drawing Number: 22104-E	Scale: 1:1,000 / A1
Surveyed By: LiDAR	Drawn By: JH
Date: Issue 20 06 22	Checked By: JH



Legend - Water / Drainage

WBL	Water Bed Level
WTL	Water level
WAT	Water Edge
POND	Pond
WEIR	Weir
WELL	Well
ACO	Aco Drain
GL	Long gully
GU	Gully
MH	Manhole Cover (Square)
MH	Manhole Cover (Round)

Legend - Roads - Rail

RD	Road Carriageway
RC	Road Centre
	Road Markings White
	Road Markings Yellow
CUL	Culvert
DTC	Ditch
KT	Kerb Top
KB	Kerb Bottom
KBAC	Kerb Back
BS	Bus Stop
SR	Speed Ramp
TRK	Tracks
VE	Verge
RTRK	Rail Track
RS	Road Sign
	Bollard

Legend - Roads Markings

SWLD	Single White Line Dashed
SWL	Single White Line
SYLD	Single Yellow Line Dashed
SYL	Single Yellow Line
DWLD	Double White Line Dashed
DWL	Double White Line
DYLD	Double Yellow Line Dashed
DYL	Double Yellow Line
YB	Yellow Box

Legend - Buildings / Structures

BGF	Building Footprint
BGL	Building Line
	Apex
	Ridge
RI	Eaves
	Parapet
SOF	Soffit
FON	Foundations
CAN	Canopy - Overhead Features
	Container
PF	Prefab - Building
	Ruins
GH	Greenhouse
	Shed
	Steps
	Door
WIN	Windows
CEL	Cellars
CAB	Cabin
COL	Column
BRG	Bridge
LDR	Ladder
	Tank
	Platform
MONU	Monument

Legend - Ground Features

	Gate
FE	Fences
	Pillars
WL	Wall
WT	Walls top
RLG	Railing
BT	Bank Top
BB	Bank Bottom
RWB	Retaining Wall Base
RWT	Retaining Wall Top
PATH	Pathway
HR	Handrail
RAMP	Ramps, loading bays
BR	Barrier
	Armco Barrier
	Rock
SC	Surface Change
	Tarmac
	Trench
CH	Channel
CHAM	Chamber
LDR	Ladder
	Cattle Grid
CONC	Concrete
	Bench / Seat
	Survey Station
	Contours (Major)
	Contours (Minor)

Legend -Vegetation

GRASS	Grass partitions
HE	Hedges
VL	Vegetation Line
	Tree Stump
	Tree

Legend - Services

OHC	Overhead Cables
	Pipe
	Power Inspection Cover
	Power Pole
	Stay
	ESB Box (Pylon)
	Fire Hydrant
	Flower box
	Gas Valve
	Lamp Post
	Litter Bin
	Mast / Pylon
	Post Box
Telecom	Telecom Control Panel (Pillar)
	Telecom Cover
	Telecom Pole
	Traffic Lights
	Telephone box
IC	Cable TV Inspection Cover
	Water Valve
	Water Meter
AJ	Armstrong Junction

Legend - Services - Underground

CODE	
UA	Underground Anomaly
UCOM	Underground Combined
UF	Underground Foul
UG	Underground Gas
UP	Underground Power
US	Underground Storm
UT	Underground Telecom

Co-ordinate system is Irish Transverse Mercator (ITM)
Levels are GPS Derived Malin Hd. Datum on the 2015 Geoid

KEY PLAN



SCALE: NTS

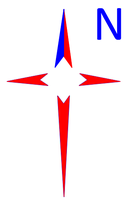
Tír 3D
the Survey people

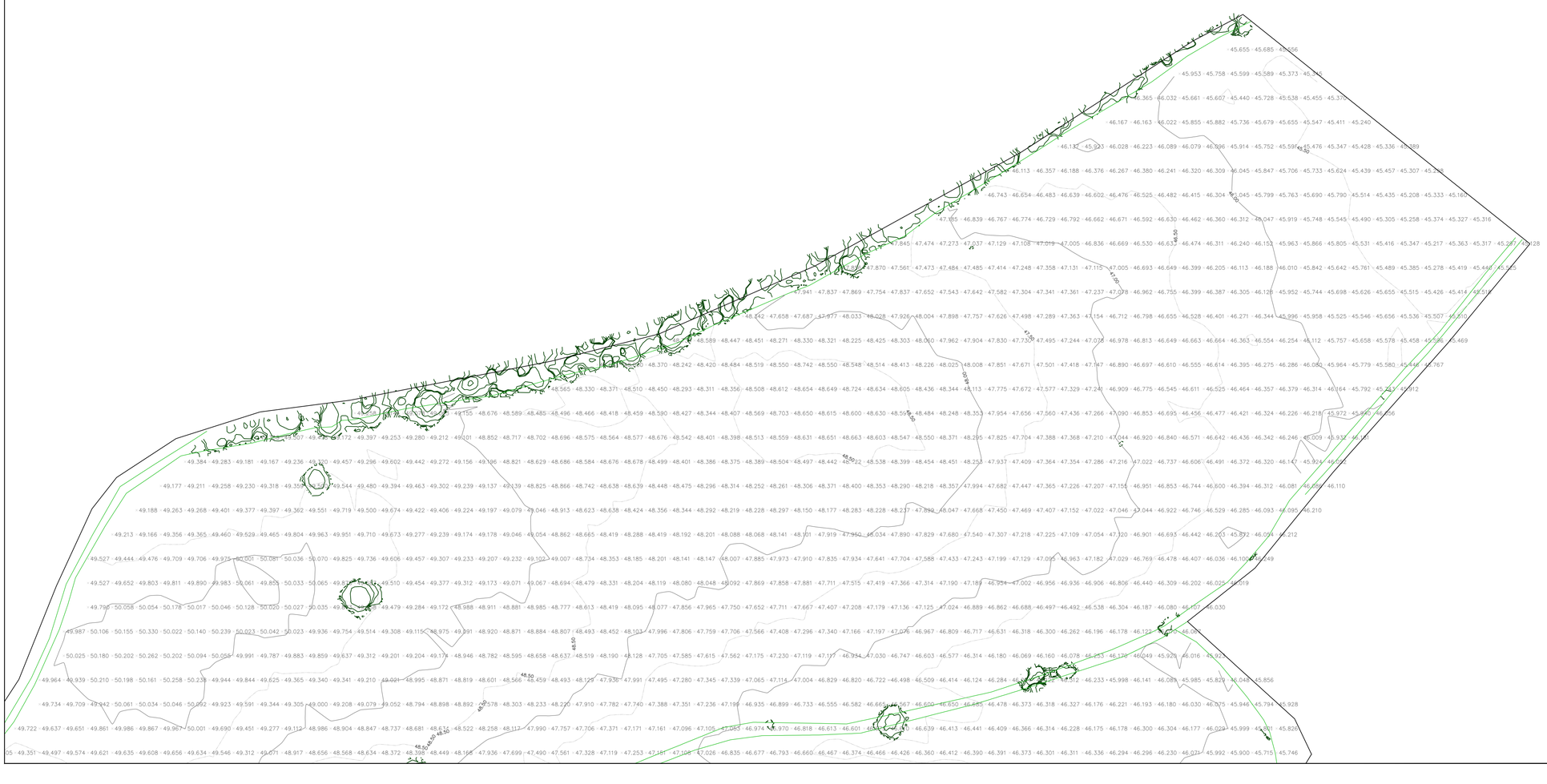
Head Office: **www.tir3d.ie**
The Survey Studio, Ceaderwood Lodge, Moone,
Co.Kildare. R14 RF67

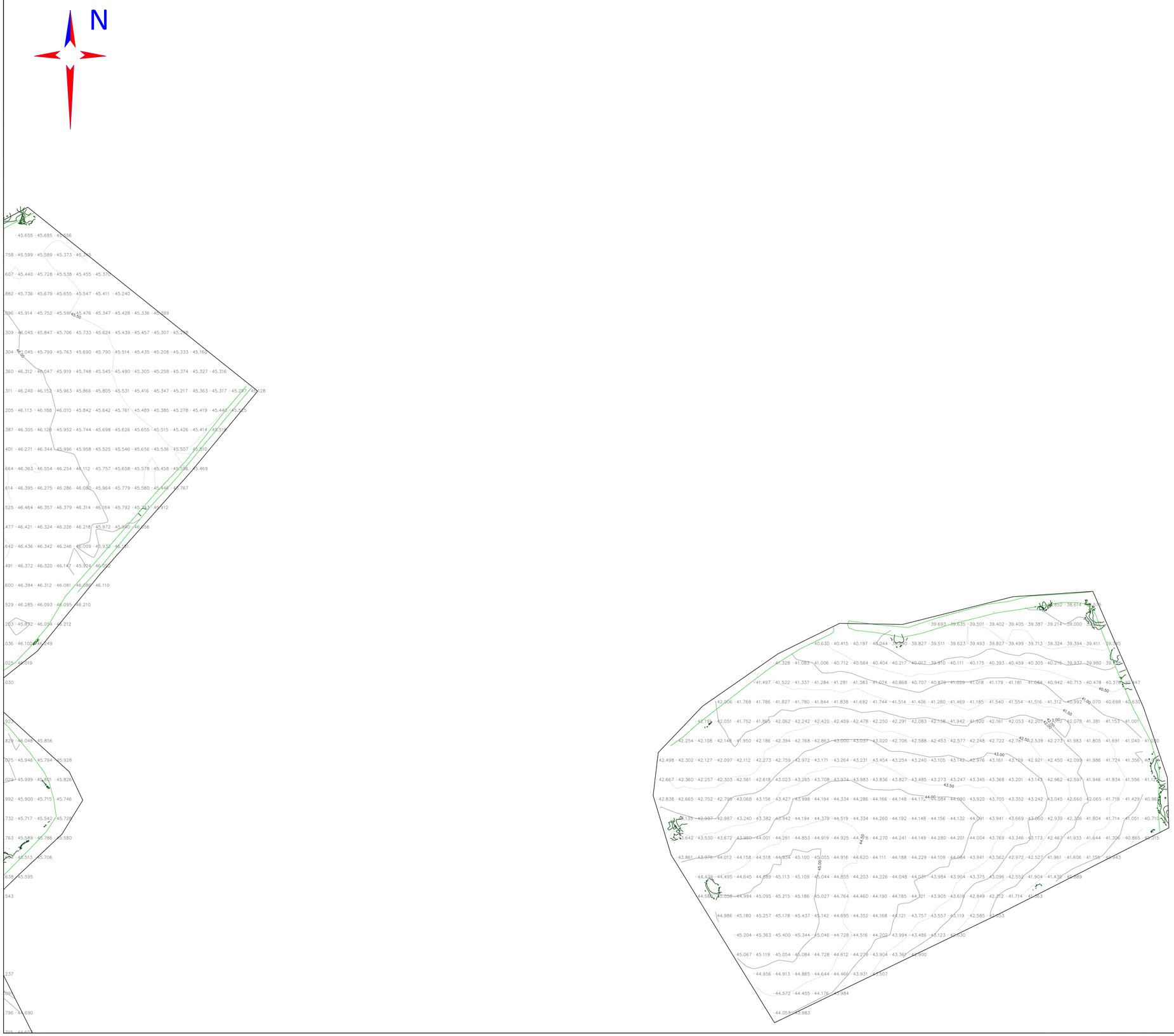
Tel: +353 (0)59 97 23337 **Email:** info@tir3d.ie

REVISION	DESCRIPTION	DATE

Client:	JBM Solar
Location:	Legacy Farm
Job:	Topographical Survey
Drawing Number: 22104-F	Scale: 1:1,000 / A1
Surveyed By: LiDAR	Drawn By: JH
Date: Issue 20 06 22	Checked By: JH




45.655 45.685 45.656
45.953 45.758 45.599 45.589 45.373 45.
46.365 46.032 45.661 45.607 45.440 45.728 45.538 45.455 45.3
46.167 46.163 46.022 45.855 45.882 45.736 45.679 45.655 45.547 45.411 45.240
46.132 45.923 46.028 46.223 46.089 46.079 46.096 45.914 45.752 45.596 45.476 45.347 45.428 45.336
46.113 46.357 46.188 46.376 46.267 46.380 46.241 46.320 46.309 46.045 45.847 45.706 45.733 45.624 45.439 45.457 45.307
46.743 46.654 46.483 46.639 46.602 46.476 46.525 46.482 46.415 46.304 46.045 45.799 45.763 45.690 45.790 45.514 45.435 45.208 45.333
47.165 46.839 46.767 46.774 46.729 46.792 46.662 46.671 46.592 46.630 46.462 46.360 46.312 46.047 45.919 45.748 45.545 45.490 45.305 45.258 45.374 45.327
47.845 47.474 47.273 47.037 47.129 47.108 47.019 47.005 46.836 46.669 46.530 46.633 46.474 46.311 46.240 46.152 45.963 45.866 45.805 45.531 45.416 45.347 45.217 45.363 45.317
47.870 47.561 47.473 47.484 47.485 47.414 47.248 47.358 47.131 47.115 47.005 46.693 46.649 46.399 46.205 46.113 46.188 46.010 45.842 45.642 45.761 45.489 45.385 45.278 45.419
47.941 47.837 47.869 47.754 47.837 47.652 47.543 47.642 47.582 47.304 47.341 47.361 47.237 47.078 46.962 46.755 46.399 46.387 46.305 46.129 45.952 45.744 45.698 45.626 45.655 45.515 45.426
48.242 47.658 47.687 47.977 48.033 48.028 47.926 48.004 47.898 47.757 47.626 47.498 47.289 47.363 47.154 46.712 46.798 46.655 46.528 46.401 46.271 46.344 45.996 45.958 45.525 45.546 45.656 45.536
48.589 48.447 48.451 48.271 48.330 48.321 48.225 48.425 48.303 48.060 47.962 47.904 47.830 47.735 47.495 47.244 47.078 46.978 46.813 46.649 46.663 46.664 46.363 46.554 46.254 46.112 45.757 45.658 45.578 45.458
48.370 48.242 48.420 48.484 48.519 48.550 48.742 48.550 48.548 48.514 48.413 48.226 48.025 48.008 47.851 47.671 47.501 47.418 47.147 46.890 46.697 46.610 46.555 46.614 46.395 46.275 46.286 46.082 45.964 45.779 45.580
48.565 48.330 48.371 48.510 48.450 48.293 48.311 48.356 48.508 48.612 48.654 48.649 48.724 48.634 48.605 48.436 48.344 48.113 47.775 47.672 47.577 47.329 47.241 46.909 46.775 46.545 46.611 46.525 46.464 46.357 46.379 46.314 46.164 45.792
48.676 48.589 48.485 48.496 48.466 48.418 48.459 48.590 48.427 48.344 48.407 48.569 48.703 48.650 48.615 48.600 48.630 48.594 48.484 48.248 48.353 47.954 47.656 47.560 47.436 47.266 47.090 46.853 46.695 46.456 46.477 46.421 46.324 46.226 46.218 45.972
48.707 48.172 48.397 48.253 48.280 48.212 48.101 48.852 48.717 48.702 48.696 48.575 48.564 48.577 48.676 48.542 48.401 48.398 48.513 48.559 48.631 48.651 48.663 48.603 48.547 48.550 48.371 48.295 47.825 47.704 47.388 47.368 47.210 47.044 46.920 46.840 46.571 46.642 46.436 46.342 46.246 46.009
49.384 49.283 49.181 49.167 49.236 49.120 49.457 49.296 49.602 49.442 49.272 49.156 49.106 48.821 48.629 48.686 48.584 48.676 48.678 48.499 48.401 48.386 48.375 48.389 48.504 48.497 48.442 48.522 48.538 48.399 48.454 48.451 48.253 47.937 47.409 47.364 47.354 47.286 47.216 47.022 46.737 46.606 46.491 46.372 46.320 46.147
49.177 49.211 49.258 49.230 49.318 49.358 49.544 49.480 49.394 49.463 49.302 49.239 49.137 49.139 48.825 48.866 48.742 48.638 48.639 48.448 48.475 48.296 48.314 48.252 48.261 48.306 48.371 48.400 48.353 48.290 48.218 48.357 47.994 47.682 47.447 47.365 47.226 47.207 47.155 46.951 46.853 46.744 46.600 46.394 46.312 46.081
49.188 49.263 49.268 49.401 49.377 49.397 49.362 49.551 49.719 49.500 49.674 49.422 49.406 49.224 49.197 49.079 49.046 48.913 48.623 48.638 48.424 48.356 48.344 48.292 48.219 48.228 48.297 48.150 48.177 48.283 48.228 48.237 47.890 48.047 47.668 47.450 47.469 47.407 47.152 47.022 47.046 47.044 46.922 46.746 46.529 46.285 46.093
49.213 49.166 49.356 49.365 49.460 49.529 49.465 49.804 49.963 49.951 49.710 49.673 49.277 49.239 49.174 49.178 49.046 49.054 48.862 48.665 48.419 48.288 48.419 48.192 48.201 48.088 48.068 48.141 48.101 47.919 47.950 48.034 47.890 47.829 47.680 47.540 47.307 47.218 47.225 47.109 47.054 47.120 46.901 46.693 46.442 46.203 45.972
49.527 49.444 49.476 49.709 49.706 49.975 50.001 50.081 50.036 50.070 49.825 49.736 49.606 49.457 49.307 49.233 49.207 49.232 49.102 49.007 48.734 48.353 48.185 48.201 48.141 48.147 48.007 47.885 47.973 47.910 47.835 47.934 47.641 47.704 47.588 47.433 47.243 47.199 47.129 47.095 46.963 47.182 47.029 46.769 46.478 46.407 46.036
49.527 49.652 49.803 49.811 49.890 49.983 50.061 49.855 50.033 50.065 49.
49.796 50.058 50.054 50.178 50.017 50.046 50.128 50.020 50.027 50.035 49.
49.987 50.106 50.155 50.330 50.022 50.140 50.239 50.023 50.042 50.023 49.936 49.754 49.514 49.308 49.115 48.975 48.891 48.920 48.871 48.884 48.807 48.493 48.452 48.103 47.996 47.806 47.759 47.706 47.566 47.408 47.296 47.340 47.166 47.197 47.076 46.967 46.809 46.717 46.631 46.318 46.300 46.262 46.196 46.178
50.025 50.180 50.202 50.262 50.202 50.094 50.058 49.991 49.787 49.883 49.859 49.637 49.312 49.201 49.204 49.174 48.946 48.782 48.595 48.658 48.637 48.519 48.190 48.128 47.705 47.585 47.615 47.562 47.175 47.230 47.119 47.177 46.954 47.030 46.747 46.603 46.577 46.314 46.180 46.069 46.160 46.078 46.253 46.176 46.049 45.926 46.016 45.922
49.964 49.939 50.210 50.198 50.161 50.258 50.235 49.944 49.844 49.625 49.365 49.340 49.341 49.210 49.021 48.995 48.871 48.819 48.601 48.566 48.459 48.493 48.129 47.936 47.991 47.495 47.280 47.345 47.339 47.065 47.114 47.004 46.829 46.820 46.722 46.498 46.509 46.414 46.124 46.284 46.233 45.998 46.141 46.089 45.985 45.829 46.048 45.856
49.734 49.709 49.942 50.061 50.034 50.046 50.092 49.923 49.591 49.344 49.305 49.000 49.208 49.079 49.052 48.794 48.898 48.892 48.578 48.303 48.233 48.220 47.910 47.782 47.740 47.388 47.351 47.236 47.198 46.935 46.899 46.733 46.555 46.582 46.666 46.567 46.650 46.665 46.478 46.373 46.318 46.327 46.176 46.221 46.193 46.180 46.030 46.075 45.946 45.794 45.928
49.722 49.637 49.651 49.861 49.986 49.867 49.967 50.001 49.690 49.451 49.277 49.112 48.986 48.904 48.847 48.737 48.681 48.616 48.522 48.258 48.112 47.990 47.757 47.706 47.371 47.171 47.161 47.096 47.105 47.065 46.974 46.970 46.818 46.613 46.601 46.
49.351 49.497 49.574 49.621 49.635 49.608 49.656 49.634 49.546 49.312 49.071 48.917 48.656 48.568 48.634 48.372 48.398 48.449 48.165 47.936 47.699 47.490 47.561 47.328 47.119 47.253 47.161 47.108 47.026 46.835 46.677 46.793 46.660 46.467 46.374 46.466 46.426 46.360 46.412 46.390 46.391 46.373 46.301 46.311 46.336 46.294 46.296 46.230 46.021 45.992 45.900 45.715 45.746
48.50 48.50 48.50



Legend - Water / Drainage

WBL	Water Bed Level
WTL	Water level
WAT	Water Edge
POND	Pond
WEIR	Weir
WELL	Well
ACO	Aco Drain
GL	Long gully
GU	Gully
MH	Manhole Cover (Square)
MH	Manhole Cover (Round)

Legend - Roads - Rail

RD	Road Carriageway
RC	Road Centre
	Road Markings White
	Road Markings Yellow
CUL	Culvert
DTC	Ditch
KT	Kerb Top
KB	Kerb Bottom
KBAC	Kerb Back
BS	Bus Stop
SR	Speed Ramp
TRK	Tracks
VE	Verge
RTRK	Rail Track
RS	Road Sign
	Bollard

Legend - Roads Markings

SWLD	Single White Line Dashed
SWL	Single White Line
SYLD	Single Yellow Line Dashed
SYL	Single Yellow Line
DWLD	Double White Line Dashed
DWL	Double White Line
DYLD	Double Yellow Line Dashed
DYL	Double Yellow Line
YB	Yellow Box

Legend - Buildings / Structures

BGF	Building Footprint
BGL	Building Line
	Apex
RI	Ridge
	Eaves
	Parapet
SOF	Soffit
FON	Foundations
CAN	Canopy - Overhead Features
	Container
PF	Prefab - Building
	Ruins
GH	Greenhouse
	Shed
	Steps
	Door
WIN	Windows
CEL	Cellars
CAB	Cabin
COL	Column
BRG	Bridge
LDR	Ladder
	Tank
	Platform
MONU	Monument

Legend - Ground Features

	Gate
FE	Fences
	Pillars
WL	Wall
WT	Walls top
RLG	Railing
BT	Bank Top
BB	Bank Bottom
RWB	Retaining Wall Base
RWT	Retaining Wall Top
PATH	Pathway
HR	Handrail
RAMP	Ramps, loading bays
BR	Barrier
	Armco Barrier
	Rock
SC	Surface Change
	Tarmac
	Trench
CH	Channel
CHAM	Chamber
LDR	Ladder
	Cattle Grid
CONC	Concrete
	Bench / Seat
	Survey Station
	Contours (Major)
	Contours (Minor)

Legend -Vegetation

GRASS	Grass partitions
HE	Hedges
VL	Vegetation Line
	Tree Stump
	Tree

Legend - Services

OHC	Overhead Cables
	Pipe
	Power Inspection Cover
	Power Pole
	Stay
	ESB Box (Pylon)
	Fire Hydrant
	Flower box
GV	Gas Valve
	Lamp Post
	Litter Bin
	Mast / Pylon
	Post Box
Telecom	Telecom Control Panel (Pillar)
Telecom	Telecom Cover
	Telecom Pole
	Traffic Lights
	Telephone box
IC	Cable TV Inspection Cover
	Water Valve
	Water Meter
AJ	Armstrong Junction

Legend - Services - Underground

CODE	
UA	Underground Anomaly
UCOM	Underground Combined
UF	Underground Foul
UG	Underground Gas
UP	Underground Power
US	Underground Storm
UT	Underground Telecom

Co-ordinate system is Irish Transverse Mercator (ITM)
Levels are GPS Derived Malin Hd. Datum on the 2015 Geoid

KEY PLAN



SCALE: NTS

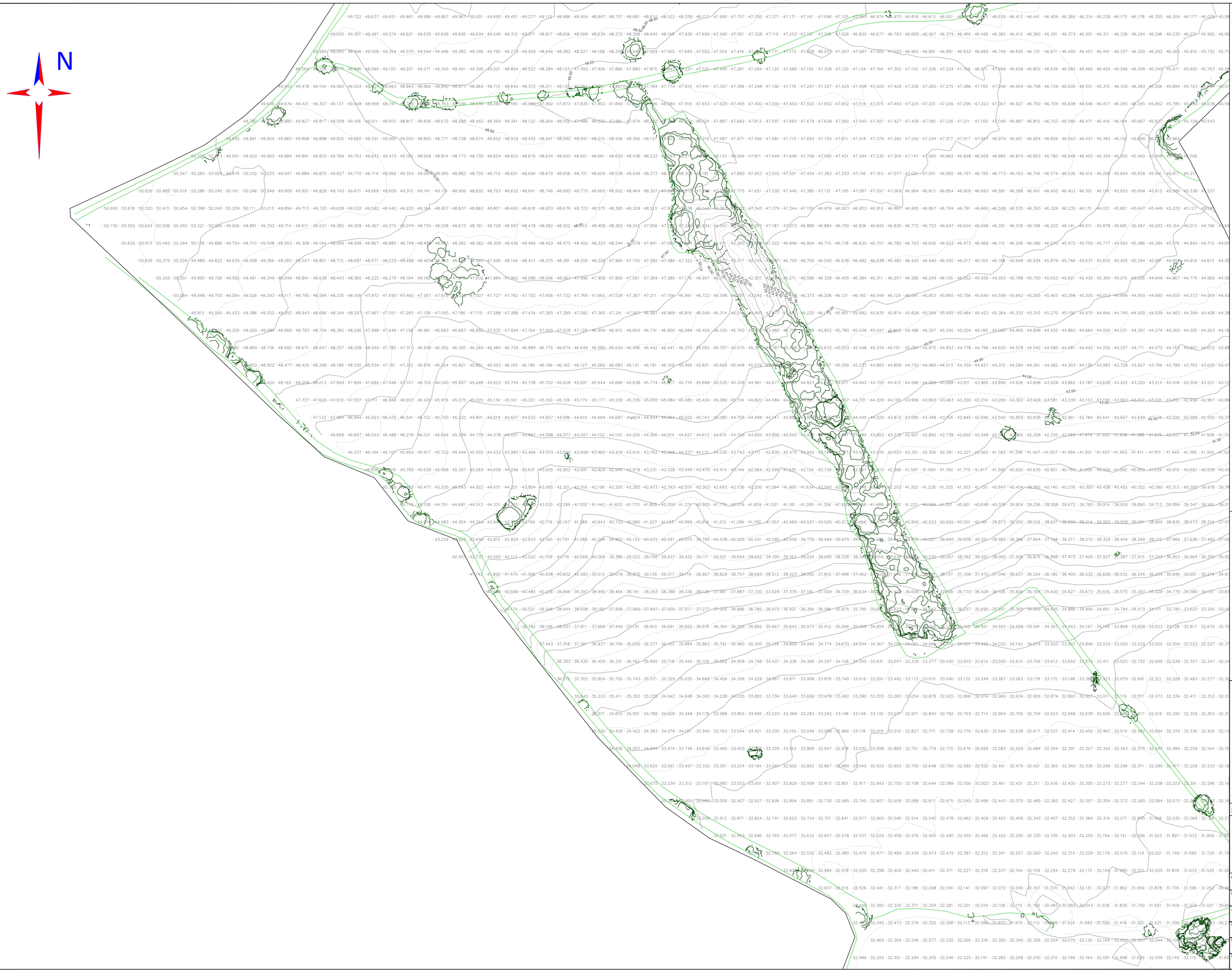
Tír 3D
the Survey people

Head Office: **www.tir3d.ie**
The Survey Studio, Ceaderwood Lodge, Moone, Co.Kildare. R14 RF67

Tel: +353 (0)59 97 23337 **Email:** info@tir3d.ie

REVISION	DESCRIPTION	DATE

Client:	JBM Solar
Location:	Legacy Farm
Job:	Topographical Survey
Drawing Number: 22104-H	Scale: 1:1,000 / A1
Surveyed By: LiDAR	Drawn By: JH
Date: Issue 20 06 22	Checked By: JH



Legend - Water / Drainage

- WBL — Water Bed Level
- WTL — Water level
- WAT — Water Edge
- POND — Pond
- WEIR — Weir
- WELL — Well
- ACO — Aco Drain
- GL — Long gully
- GU — Gully
- MH — Manhole Cover (Square)
- MH — Manhole Cover (Round)

Legend - Roads - Rail

- RD — Road Carriageway
- RC — Road Centre
- Road Markings White
- Road Markings Yellow
- CUL — Culvert
- DTC — Ditch
- KT — Kerb Top
- KB — Kerb Bottom
- KBAC — Kerb Back
- BS — Bus Stop
- SR — Speed Ramp
- TRK — Tracks
- VE — Verge
- RTRK — Rail Track
- RS — Road Sign
- Bollard

Legend - Roads Markings

- SWLD — Single White Line Dashed
- SWL — Single White Line
- SYLD — Single Yellow Line Dashed
- SYL — Single Yellow Line
- DWLD — Double White Line Dashed
- DWL — Double White Line
- DYLD — Double Yellow Line Dashed
- DYL — Double Yellow Line
- YB — Yellow Box

Legend - Buildings / Structures

- BGF — Building Footprint
- BGL — Building Line
- Apex
- RI — Ridge
- Eaves
- Parapet
- SOF — Soffit
- FON — Foundations
- CAN — Canopy - Overhead Features
- Container
- PF — Prefab - Building
- Ruins
- GH — Greenhouse
- Shed
- Steps
- Door
- WIN — Windows
- CEL — Cellars
- CAB — Cabin
- COL — Column
- BRG — Bridge
- LDR — Ladder
- Tank
- Platform
- MONU — Monument

Legend - Ground Features

- Gate
- FE — Fences
- Pillars
- WL — Wall
- WT — Walls top
- RLG — Railing
- BT — Bank Top
- BB — Bank Bottom
- RWB — Retaining Wall Base
- RWT — Retaining Wall Top
- PATH — Pathway
- HR — Handrail
- RAMP — Ramps, loading bays
- BR — Barrier
- Armco Barrier
- Rock
- SC — Surface Change
- Tarmac
- Trench
- CH — Channel
- CHAM — Chamber
- LDR — Ladder
- Cattle Grid
- CONC — Concrete
- SR — Bench / Seat
- Survey Station
- Contours (Major)
- Contours (Minor)

Legend -Vegetation

- GRASS — Grass partitions
- HE — Hedges
- VL — Vegetation Line
- Tree Stump
- Tree

Legend - Services

- OHC — Overhead Cables
- Pipe
- Elec — Power Inspection Cover
- Power Pole
- Stay
- Elec — ESB Box (Pylon)
- Fire Hydrant
- Flower box
- Gas — Gas Valve
- Lamp Post
- Litter Bin
- Mast / Pylon
- Post Box
- Telecom — Telecom Control Panel (Pillar)
- Telecom — Telecom Cover
- Telecom Pole
- Traffic Lights
- Telephone box
- IC — Cable TV Inspection Cover
- Water Valve
- Water Meter
- AJ — Armstrong Junction

Legend - Services - Underground

- CODE
- UA — Underground Anomaly
- UCOM — Underground Combined
- UF — Underground Foul
- UG — Underground Gas
- UP — Underground Power
- US — Underground Storm
- UT — Underground Telecom

Co-ordinate system is Irish Transverse Mercator (ITM)
Levels are GPS Derived Malin Hd. Datum on the 2015 Geoid

KEY PLAN

SCALE: NTS



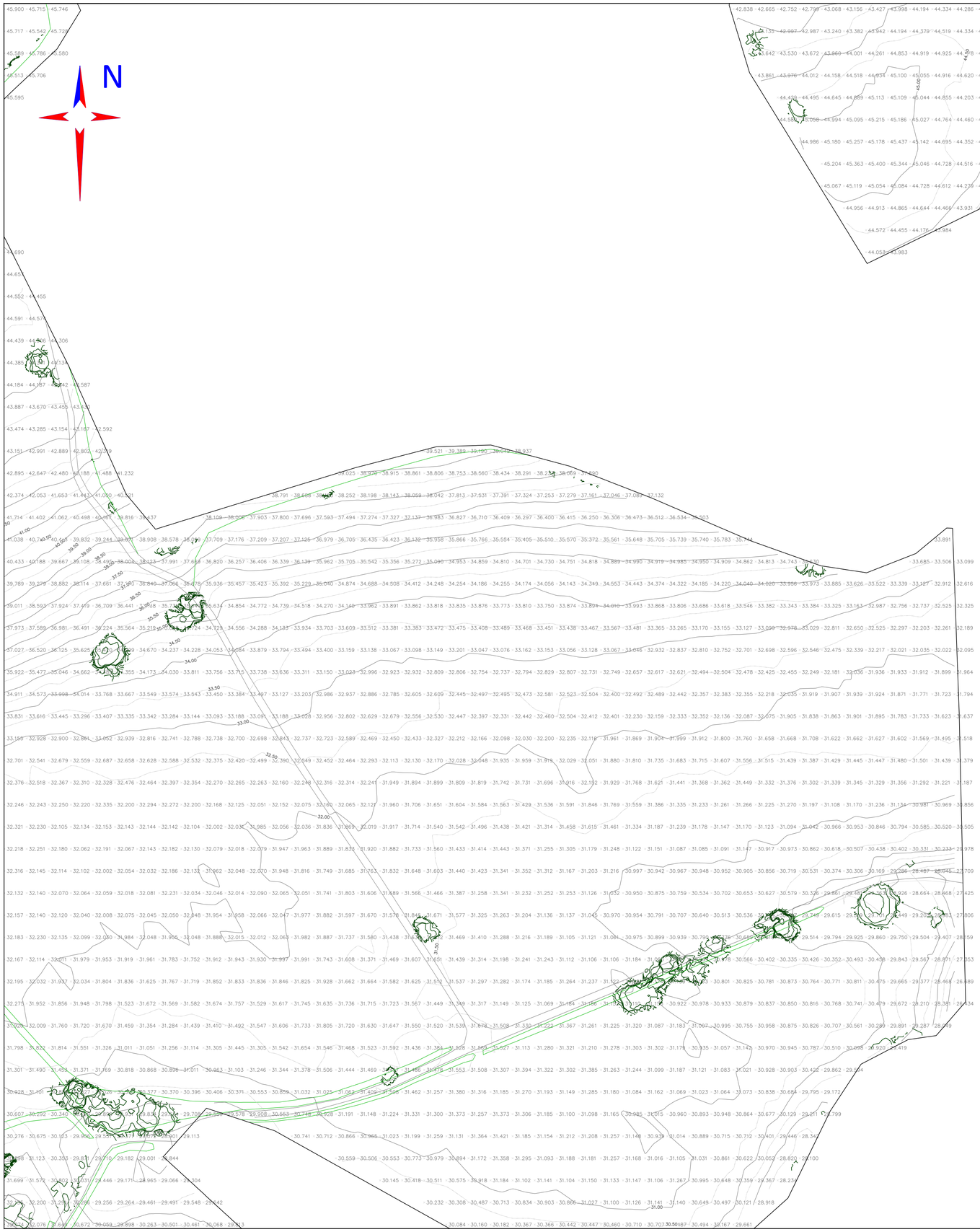
Tír 3D
the Survey people

Head Office: **www.tir3d.ie**
The Survey Studio, Ceaderwood Lodge, Moone,
Co.Kildare. R14 RF67

Tel: +353 (0)59 97 23337 **Email:** info@tir3d.ie

REVISION	DESCRIPTION	DATE

Client:	JBM Solar
Location:	Legacy Farm
Job:	Topographical Survey
Drawing Number: 22104-I	Scale: 1:1,000 / A1
Surveyed By: LiDAR	Drawn By: JH
Date: Issue 20 06 22	Checked By: JH



Legend - Water / Drainage

WBL	Water Bed Level
WTL	Water level
WAT	Water Edge
POND	Pond
WEIR	Weir
WELL	Well
ACO	Aco Drain
GL	Long gully
GU	Gully
MH	Manhole Cover (Square)
MC	Manhole Cover (Round)

Legend - Roads - Rail

RD	Road Carriageway
RC	Road Centre
	Road Markings White
	Road Markings Yellow
CUL	Culvert
DTC	Ditch
KT	Kerb Top
KB	Kerb Bottom
KBAC	Kerb Back
BS	Bus Stop
SR	Speed Ramp
TRK	Tracks
VE	Verge
RTRK	Rail Track
RS	Road Sign
	Bollard

Legend - Roads Markings

SWLD	Single White Line Dashed
SWL	Single White Line
SYLD	Single Yellow Line Dashed
SYL	Single Yellow Line
DWLD	Double White Line Dashed
DWL	Double White Line
DYLD	Double Yellow Line Dashed
DYL	Double Yellow Line
YB	Yellow Box

Legend - Buildings / Structures

BGF	Building Footprint
BGL	Building Line
	Apex
RI	Ridge
	Eaves
	Parapet
SOF	Soffit
FON	Foundations
CAN	Canopy - Overhead Features
	Container
PF	Prefab - Building
	Ruins
GH	Greenhouse
	Shed
	Steps
	Door
WIN	Windows
CEL	Cellars
CAB	Cabin
COL	Column
BRG	Bridge
LDR	Ladder
	Tank
	Platform
MONU	Monument

Legend - Ground Features

	Gate
FE	Fences
	Pillars
WL	Wall
WT	Walls top
RLG	Railing
BT	Bank Top
BB	Bank Bottom
RWB	Retaining Wall Base
RWT	Retaining Wall Top
PATH	Pathway
HR	Handrail
RAMP	Ramps, loading bays
BR	Barrier
	Armco Barrier
	Rock
SC	Surface Change
	Tarmac
	Trench
CH	Channel
CHAM	Chamber
LDR	Ladder
	Cattle Grid
CONC	Concrete
	Bench / Seat
	Survey Station
	Contours (Major)
	Contours (Minor)

Legend -Vegetation

GRASS	Grass partitions
HE	Hedges
VL	Vegetation Line
	Tree Stump
	Tree

Legend - Services

OHC	Overhead Cables
	Pipe
	Power Inspection Cover
	Power Pole
	Stay
ESBn	ESB Box (Pylon)
	Fire Hydrant
	Flower box
GV	Gas Valve
	Lamp Post
	Litter Bin
	Mast / Pylon
	Post Box
Telecom	Telecom Control Panel (Pillar)
	Telecom Cover
	Telecom Pole
	Traffic Lights
	Telephone box
IC	Cable TV Inspection Cover
	Water Valve
	Water Meter
AJ	Armstrong Junction

Legend - Services - Underground

CODE	
UA	Underground Anomaly
UCOM	Underground Combined
UF	Underground Foul
UG	Underground Gas
UP	Underground Power
US	Underground Storm
UT	Underground Telecom

Co-ordinate system is Irish Transverse Mercator (ITM)
Levels are GPS Derived Malin Hd. Datum on the 2015 Geoid

KEY PLAN

SCALE: NTS



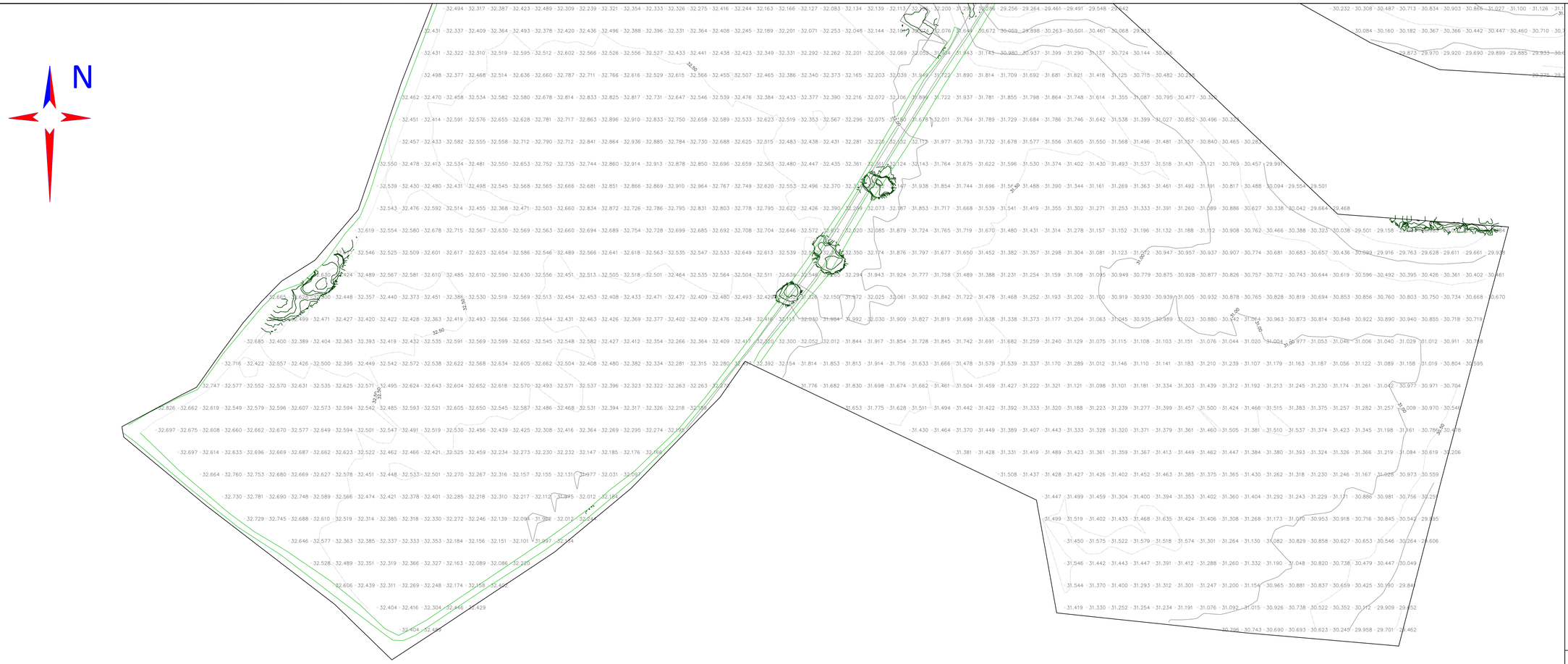
Tír3D
the Survey people

Head Office: **www.tir3d.ie**
The Survey Studio, Ceaderwood Lodge, Moone,
Co.Kildare. R14 RF67

Tel: +353 (0)59 97 23337 **Email:** info@tir3d.ie

REVISION	DESCRIPTION	DATE

Client:	JBM Solar
Location:	Legacy Farm
Job:	Topographical Survey
Drawing Number: 22104-J	Scale: 1:1,000 / A1
Surveyed By: LiDAR	Drawn By: JH
Date: Issue 20 06 22	Checked By: JH



Legend - Water / Drainage

WBL	Water Bed Level
WTL	Water level
WAT	Water Edge
POND	Pond
WEIR	Weir
WELL	Well
ACO	Aco Drain
GL	Long gully
GU	Gully
MH	Manhole Cover (Square)
MH	Manhole Cover (Round)

Legend - Roads - Rail

RD	Road Carriageway
RC	Road Centre
	Road Markings White
	Road Markings Yellow
CUL	Culvert
DTC	Ditch
KT	Kerb Top
KB	Kerb Bottom
KBAC	Kerb Back
BS	Bus Stop
SR	Speed Ramp
TRK	Tracks
VE	Verge
RTRK	Rail Track
RS	Road Sign
	Bollard

Legend - Roads Markings

SWLD	Single White Line Dashed
SWL	Single White Line
SYLD	Single Yellow Line Dashed
SYL	Single Yellow Line
DWLD	Double White Line Dashed
DWL	Double White Line
DYLD	Double Yellow Line Dashed
DYL	Double Yellow Line
YB	Yellow Box

Legend - Buildings / Structures

BGF	Building Footprint
BGL	Building Line
	Apex
RI	Ridge
	Eaves
	Parapet
SOF	Soffit
FON	Foundations
CAN	Canopy - Overhead Features
	Container
PF	Prefab - Building
	Ruins
GH	Greenhouse
	Shed
	Steps
	Door
WIN	Windows
CEL	Cellars
CAB	Cabin
COL	Column
BRG	Bridge
LDR	Ladder
	Tank
	Platform
MONU	Monument

Legend - Ground Features

	Gate
FE	Fences
	Pillars
WL	Wall
WT	Walls top
RLG	Railing
BT	Bank Top
BB	Bank Bottom
RWB	Retaining Wall Base
RWT	Retaining Wall Top
PATH	Pathway
HR	Handrail
RAMP	Ramps, loading bays
BR	Barrier
	Armco Barrier
	Rock
SC	Surface Change
	Tarmac
	Trench
CH	Channel
CHAM	Chamber
LDR	Ladder
	Cattle Grid
CONC	Concrete
	Bench / Seat
	Survey Station
	Contours (Major)
	Contours (Minor)

Legend -Vegetation

GRASS	Grass partitions
HE	Hedges
VL	Vegetation Line
	Tree Stump
	Tree

Legend - Services

OHC	Overhead Cables
	Pipe
	Power Inspection Cover
	Power Pole
	Stay
	ESB Box (Pylon)
	Fire Hydrant
	Flower box
GV	Gas Valve
	Lamp Post
	Litter Bin
	Mast / Pylon
	Post Box
	Telecom Control Panel (Pillar)
	Telecom Cover
	Telecom Pole
	Traffic Lights
	Telephone box
IC	Cable TV Inspection Cover
	Water Valve
	Water Meter
AJ	Armstrong Junction

Legend - Services - Underground

CODE	
UA	Underground Anomaly
UCOM	Underground Combined
UF	Underground Foul
UG	Underground Gas
UP	Underground Power
US	Underground Storm
UT	Underground Telecom

Co-ordinate system is Irish Transverse Mercator (ITM)
Levels are GPS Derived Malin Hd. Datum on the 2015 Geoid

KEY PLAN

SCALE: NTS



Tír3D
the Survey people

Head Office:
The Survey Studio, Ceaderwood Lodge, Moone, Co.Kildare. R14 RF67

www.tir3d.ie

Tel: +353 (0)59 97 23337 **Email:** info@tir3d.ie

REVISION	DESCRIPTION	DATE

Client:	JBM Solar
Location:	Legacy Farm
Job:	Topographical Survey
Drawing Number: 22104-K	Scale: 1:1,000 / A1
Surveyed By: LiDAR	Drawn By: JH
Date: Issue 20 06 22	Checked By: JH

Appendix C Historical BGS Borehole Records

British Geological Survey

BGS ID: 153130 : BGS Reference: SJ34NE24
British National Grid (27700) : 337320,345560

SJ 34 NE 24 **3732 4556** **Gerwynfechan, Sesswick** **Block C**

Surface level +17.2 m
Water struck at +14.0 m
Shell and auger 152 mm diameter
September 1977

Overburden	0.3 m
Mineral	5.0 m
Waste	2.2 m
Mineral	9.5 m
Waste	2.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, very sandy	0.3	0.3
River Terrace Deposits	a Gravel Gravel: coarse to fine, subrounded, grey mudstone and greywacke with quartzite and igneous rock Sand: coarse, mostly subangular quartzite with minor quartz and sandstone; medium quartz and quartzite	5.0	5.3
	Clay, silty and sandy, soft, red-brown	2.2	7.5
Glacial Sand and Gravel	b Sand, 'very clayey' to 13.0 m; mainly fine	9.5	17.0
Boulder Clay	Clay, very sandy, mainly soft, red-brown, coal fragments	2.2+	19.2

SJ 34 NE 24

GRADING

	Mean for deposit percentages			Depth below surface (m)	percentages						
	Fines	Sand	Gravel		Fines	Sand			Gravel		
					−1/16	+1/16 −1/4	+1/4 −1	+1 −4	+4 −16	+16 −64	+64 mm
a	3	28	69	0.3–1.3	1	0	4	11	25	59	0
				1.3–2.3	3	5	15	23	25	29	0
				2.3–3.3	4	4	12	15	29	36	0
				3.3–4.3	3	1	11	15	33	37	0
				4.3–5.3	2	10	10	7	30	41	0
				Mean	3	4	10	14	28	41	0
b	21	77	2	7.5–13.0	30	44	22	1	2	1	0
				13.0–14.0	8	62	29	1	0	0	0
				14.0–15.0	8	74	17	1	0	0	0
				15.0–17.0	7	75	18	0	0	0	0
				Mean	21	55	21	1	1	1	0
a+b	14	61	25	Mean	14	38	18	5	11	14	0

COMPOSITION

	Depth below surface (m)	percentages by weight in +8 mm fraction						
		Quartzite	Sandstone	Limestone	Siltstone/ Greywacke	Igneous Rock	Quartz	Chert/ Flint
a	0.3–2.3	25	1	0	51	19	4	trace
	2.3–5.3	36	1	0	45	15	3	0

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 153130 : BGS Reference: SJ34NE24
British National Grid (27700) : 337320,345560

Institute of Geological Sciences

MAU Sand and Gravel Borehole Log Form

SJ 34 NE/24

SJ34 NE 24	3732 4556	GERWYNFECHAN	SESSWICK	Block A

Surface level + 17·2m

Water struck at + 14·0m

Shell and auger 152mm diameter

September 1977

Overburden	0·3	
Mineral	5·0	
Waste	2·2	
Mineral	9·5	
Waste	2·2+	

LOG

Geological Classification	Lithology	Thickness m	Thickness ft	Depth m	Depth ft
	Soil, very sandy	0·3		0·3	
River Terrace Deposits	a Gravel, Gravel: coarse to fine, subrounded grey mudstone and greywacke with quartzite and igneous, mostly coarse in upper metre. Sand: coarse to fine, coarse is mostly grey subangular quartzite with minor quartz and sandstone, medium has equal quartz and quartzite.	5·0		5·3	
	Clay, soft, silty, sandy, red-brown, 5YR 4/5, becoming sandier with depth	2·2		7·5	
Glacial Sand	b 'Very clayey' sand, very clayey to 13·0m, fine to medium, becoming finer with depth.	9·5		17·0	
Boulder Clay	Clay, soft, very sandy with coal fragments.	2·1		19·1	
	Clay, stiff, red-brown, sandy, stoney, poorly sorted.	0·1		19·2	

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 153130 : BGS Reference: SJ34NE24
British National Grid (27700) : 337320,345560

...logical ... Mineral Assessment Unit

BOREHOLE RECORD SHEET

6 in. quarter sheet Accn. No. Sheet

SJ34NE 24

Temp No. SJ34NE 6

orehole diam. 152 mm.

ater struck Perched Level at 3.02 m.b.g.l.

emarks: DRILLING STOPPED AT 19.2 m, 0.1m INTO BOULDER CLAY DUE TO WATER ENTERING B.H. FROM OVERLYING RUNNING SAND.

NGR 3732 4556

Classification	Thickness (m)	Lithology
OVERBURDEN	0.3	SOIL
MINERAL	5.2	SANDY GRAVEL
WASTE	2.0	SANDY CLAY
MINERAL	9.5	SAND
WASTE	2.2+	CLAY + SAND

Lithostrat. Code	Description	Thickn (m)	Depth to base(m)	Sample No.
SOIL	SOIL - DRY, VERY SANDY.	0.3	0.3	
RTSG	SANDY GRAVEL - TERRACE DEPOSIT. SLIGHTLY CLAYEY. GRAVEL - 2/3's COARSE. MOSTLY TABULAR, ESP. COARSE FRACTION. SUB-ROUNDED QTZITES & VOLCS. SAND - MOSTLY COARSE SA/SR. 60-30-10	1.0	1.3	WS 35 0.3-1.3
	CLAYEY GRAVEL - LIGHT GREY. SOME CLAY WASHED OUT IN BAILING. GRAVEL - 2/3's COARSE SA/SR. MOSTLY QTZITES & VOLCS. WITH SOME VEIN QTZ. SAND - COARSE, ANGULAR. 60-25-15	1.0	2.3	WS 36 1.3-2.3
	CLAYEY GRAVEL - DARK GREY CLAY. GRAVEL - AS ABOVE. SAND - AS ABOVE. 50-30-20	1.0	3.3	WSS 14 WS 37 2.3-3.3
	SANDY GRAVEL GRAVEL - ½ COARSE. MOSTLY SR/ROUNDED. QTZITE & QTZ. SAND - COARSE, ANGULAR. 60-35-5	1.0	4.3	WS 38 3.3-4.3

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

SJ 34 NE 24

Strat. Code	Description	Thick^{n} (m)	Depth to base(m)	Sampl No.
RTSG	CLAYEY GRAVEL - COMPOSITION OF GRAVEL AS PREVIOUS. WITH RED/BROWN CLAY MATRIX. 40-40-20	1.0	4.3 5.3	WS 39 4·3-5·3
	CLAYEY GRAVEL - AS ABOVE	0.2	5.5	
FGD	SILTY SANDY CLAY - SOFT. RED-BROWN 5YR 4/5 BECOMING SANDIER WITH DEPTH TO CLAYEY SAND AFTER ABOUT 2 METRES. NO PEBBLES. PRODUCED AS A SLURRY. BELOW WATER TABLE.	2.0	7.5	WSS 15 5·8m
FGD	CLAYEY SAND - LIGHT BROWN - RUNNING. SAND IS FINE/MED. WELL-ROUNDED & SUB-ROUNDED. NO PEBBLES. VERY UNIFORM OVER SAMPLE DEPTH RANGE	5.5	13.0	WS 40 7·5-13·
	SAND - MED./COARSE GRAIN. LOW CLAY CONTENT. COAL FRAGS. PRESENT. NO PEBBLES.	1.0	14.0	WSS 13·0 WS 41
	SAND - SLIGHTLY CLAYEY. BLOWING 3M INSIDE CASING. COAL FRAGS. SAND IS FINE/MED. FINE - SUB-ROUNDED. MED. ARE WELL-ROUNDED MILKY QTZ. LIGHT BROWN	1.0	15.0	WS 42
	SAND - AS ABOVE	2.0	17.0	WS 43
FGD	CLAYEY SAND - NON-MINERAL. HIGH CLAY CONTENT. COAL FRAGS.	2.1	19.1	
BOC	PEBBLY CLAY - BOULDER CLAY. ANGULAR VOLCANICS IN RED-BROWN SANDY CLAY MATRIX. BADLY-SORTED.	0.1	19.2	WSS 17
	T.D. 19.2m. 23/9/74. DRILLING UNABLE TO PROCEED FURTHER DUE TO WATER ENTERING BH. FROM OVERLYING SAND AS CASING COULD NOT SEAL OFF PROPERLY.			

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

SJ 34 NW 40 **3380 4598** **The Grove, Marchwiel** **Block B**

Surface level +83.5 m
Water not encountered
Shell and auger 203 mm diameter
February 1978

Waste 18.0 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil, clayey, rare stones	0.4	0.4
Boulder Clay	Clay, stiff, slightly sandy, red-brown, rare stones	17.6+	18.0

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 153431 : BGS Reference: SJ34NW40
British National Grid (27700) : 333800,345980

Institute of Geological Sciences

Industrial Minerals Assessment Unit

BOREHOLE RECORD SHEET

Registration Number

6 in. quarter sheet: SJ34NW (6) | Accn. no.: 40 (10) | Suffix: (14)

Temp. No. 12

Borehole diam. 203 mm.

Water struck Not struck, but some water seepage into hole over weekend.

Remarks:

NGR 3380 4598

Classification	Thickness (m)	Lithology
WASTE	0-4	SOIL
WASTE	8-1	TILL
WASTE	9-5	CLAY

Lithostrat. Code	Description	Thickn (m)	Depth to base (m)	Sample No
SOIL	Top soil - dark brown clay with a few pebbles.	0-4	0-4	
	Till - very light yellow brown clay with ochreous patches. very sparse pebbles which include SR volcanics.		0-5	WSS 135
	Becoming light orange brown at 0-6. traces of coal.			
	Darker in colour more reddish brown at 0-8 metres medium stiff		1-0	WSS 136
	Tiny intercalations of reddish sand in the clay at 1-1 metres.			
	Soft slightly sandy silty red brown clay at 1-3 metres		1-5	WSS 13

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 153431 : BGS Reference: SJ34NW40
British National Grid (27700) : 333800,345980

Lithostrat. Code	Description SJ 34 NW/40	Thick^{n} (m)	Depth to base (m)	Sa
	Deepened at 1-7 metres			
	Red-brown silty clay with calcareous nodules and swirls. mainly 1-9 metres.			
	Less reddish with grey silty non calcareous nodules within calcareous clay. Reduction nodules. Shell fragments		2·6	WSS 13
	in the clay. occasional SR-R grey			
	stones		6·1	WSS 14
	At 7·3 metres silty reddish brown - grey brown clay. Less silty at 8·0		7·5	WSS 14
	metres		8·3	WSS 14
	Reddish brown clay with intercalations of silt and sand down to 8·5 metres		8·5	WSS 14
	Appears to be a transition zone between overlying till and underlying clay.		8·5	
	More homogeneous light chocolate brown silty clay. Slightly reddish		9·0	WSS 14
	in places with silty partings			
	Traces of coal SR pieces.			
	occasional R-SR sandstone pebbles (red)		11·3	WSS 14
	clay is calcareous. Would appear			
	to be a lake clay. Very plastic			
	clay Pebbles SR relatively sparse			
	generally small. Though some larger			
	red sst pebbles. Reddish brown streaks			
	in places.		17·0	WSS 14
			18·0	

IGS 2008 1000 9/77

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 153431 : BGS Reference: SJ34NW40
British National Grid (27700) : 333800,345980

Institute of Geological Sciences

IMAU Sand and Gravel Borehole Log Form

SJ 34 NW/40

SJ 34 NW 40	3380 4598	THE GROVES	MARCHWIEL

Surface level	+ 83·5 M
Water not struck	
Shell and auger 203mm diameter	
February 1978	

Waste	18·0+	

LOG

Geological Classification	Lithology	Thickness m	Thickness ft	Depth m	Depth ft
	Soil, clay, rare stones	0·4		0·4	
Boulder clay	Clay, stiff, yellow-brown, becoming red-brown at 1m, slightly sandy, rare stones.	17·6+		18·0	

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 17087493 : BGS Reference: SJ34NW545
British National Grid (27700) : 331590,346380

RECORD OF BOREHOLE No: 18

Location : WREXHAM SEWERAGE
Contract No. : P69/336
Type of Boring : Shell and Auger
Date (started) : 28th November, 1968.

Borehole Dia : 6 ins.
Casing : 6 ins. to 17ft.
Ground Level : 322.0 ft. A.O.D.

Depth of Casing	Water Level	SAMPLES Depth	Type	No.	STRATA Legend	Depth	Thickness	DESCRIPTION OF STRATA
						0'-0"		
						1'-3"	1'-3"	TOPSOIL.
		2'-6"	D	1				
		5'-0"	D	2			10'-9"	Stiff brown silty sandy CLAY with occasional GRAVEL.
		7'-6"	D	3				
		10'-0"	D	4				
		12'-6"	D	5		12'-0"		
		15'-0"	D	6			5'-0"	Brown silty SAND with coarse, medium and fine GRAVEL.
		17'-0"	D W	7		17'-0"		
						End of Borehole.		

REMARKS:

Water first encountered at 12ft. 6 ins.

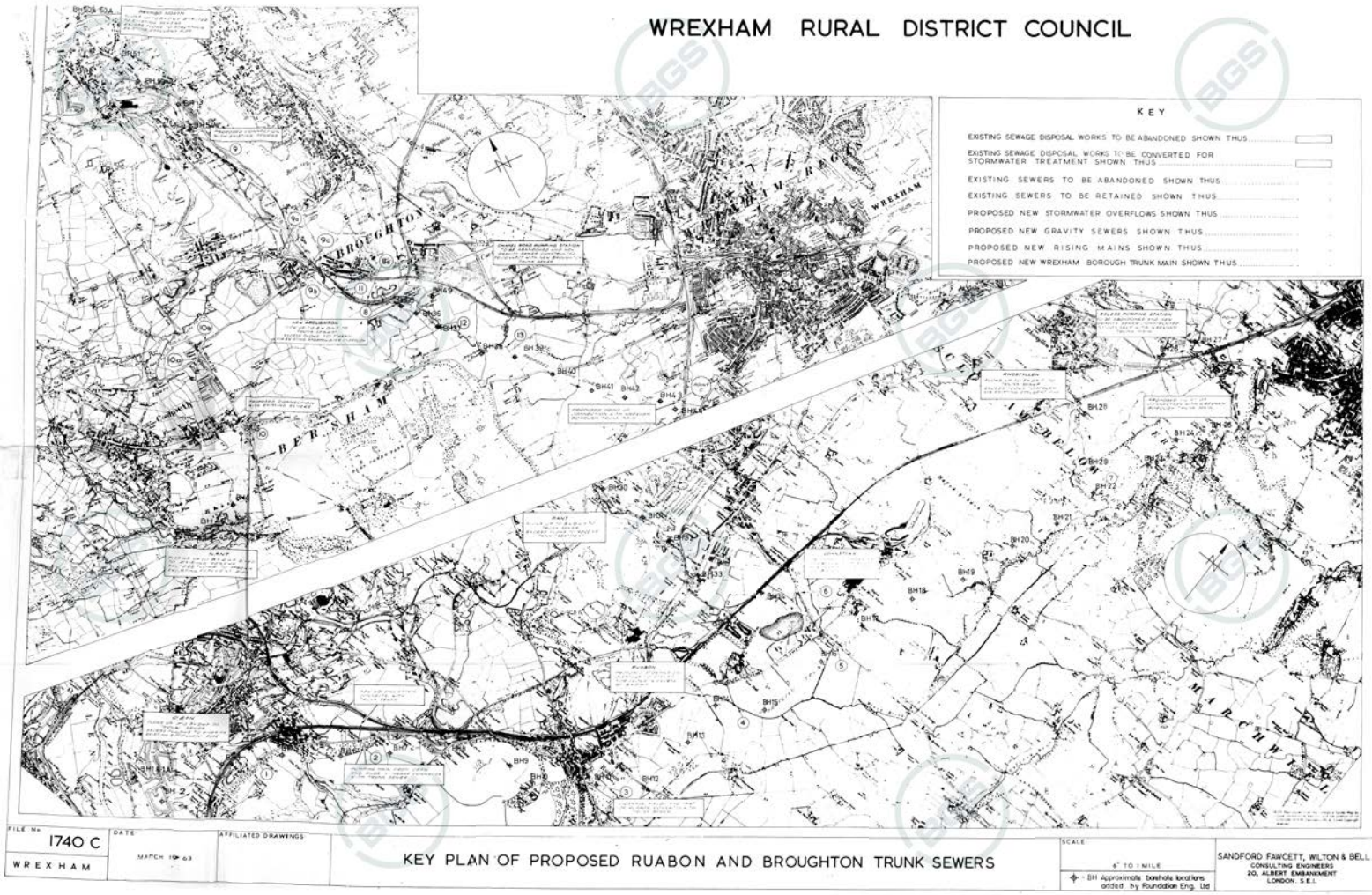
SCALE 1" 5'

Foundation Engineering Ltd.

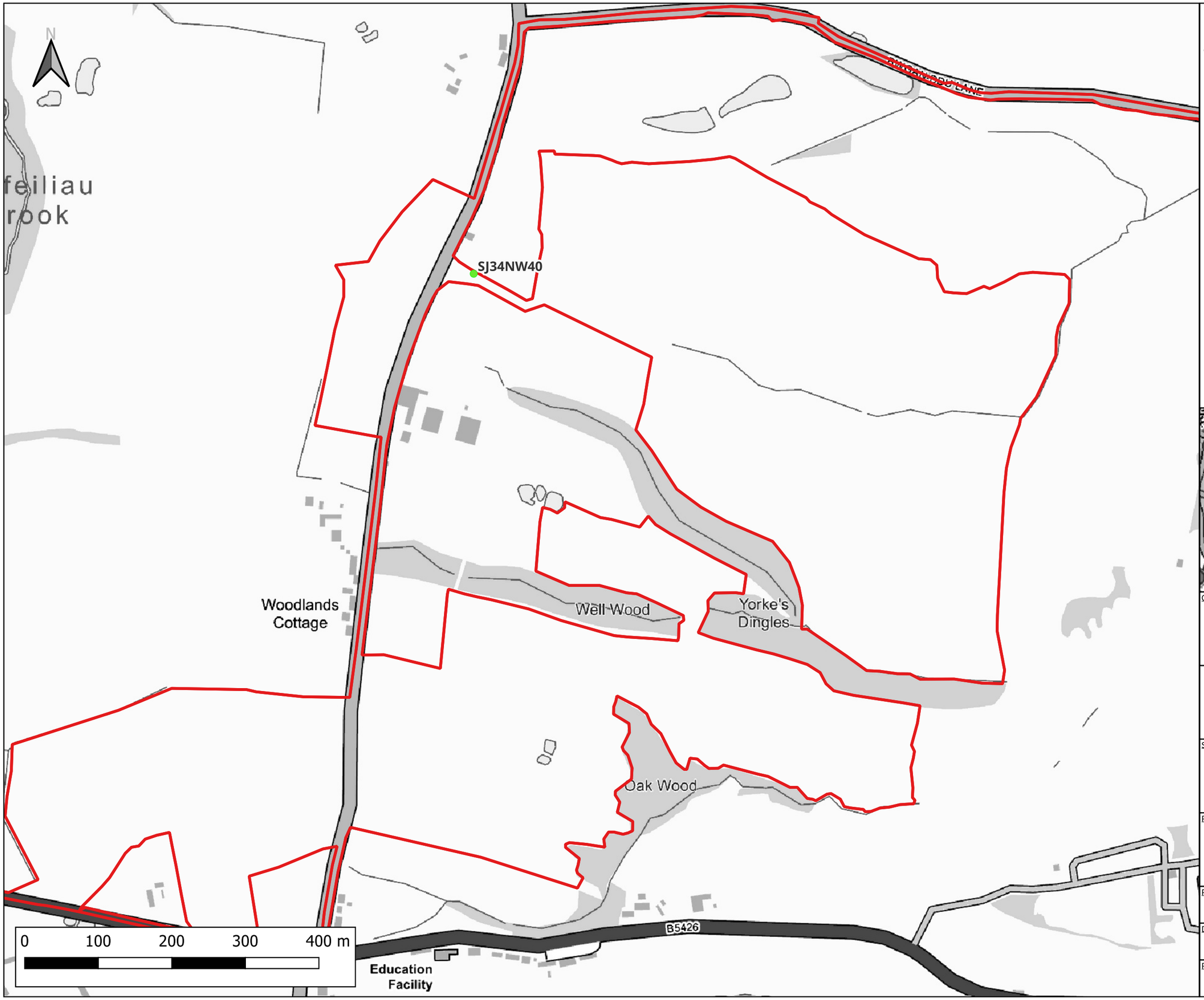
Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 17087493 : BGS Reference: SJ34NW545
British National Grid (27700) : 331590,346380



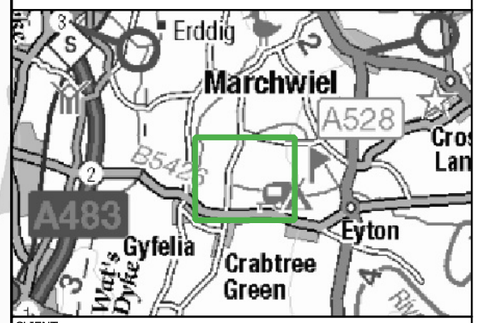
Contact BGS: ngdc@bgs.ac.uk



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

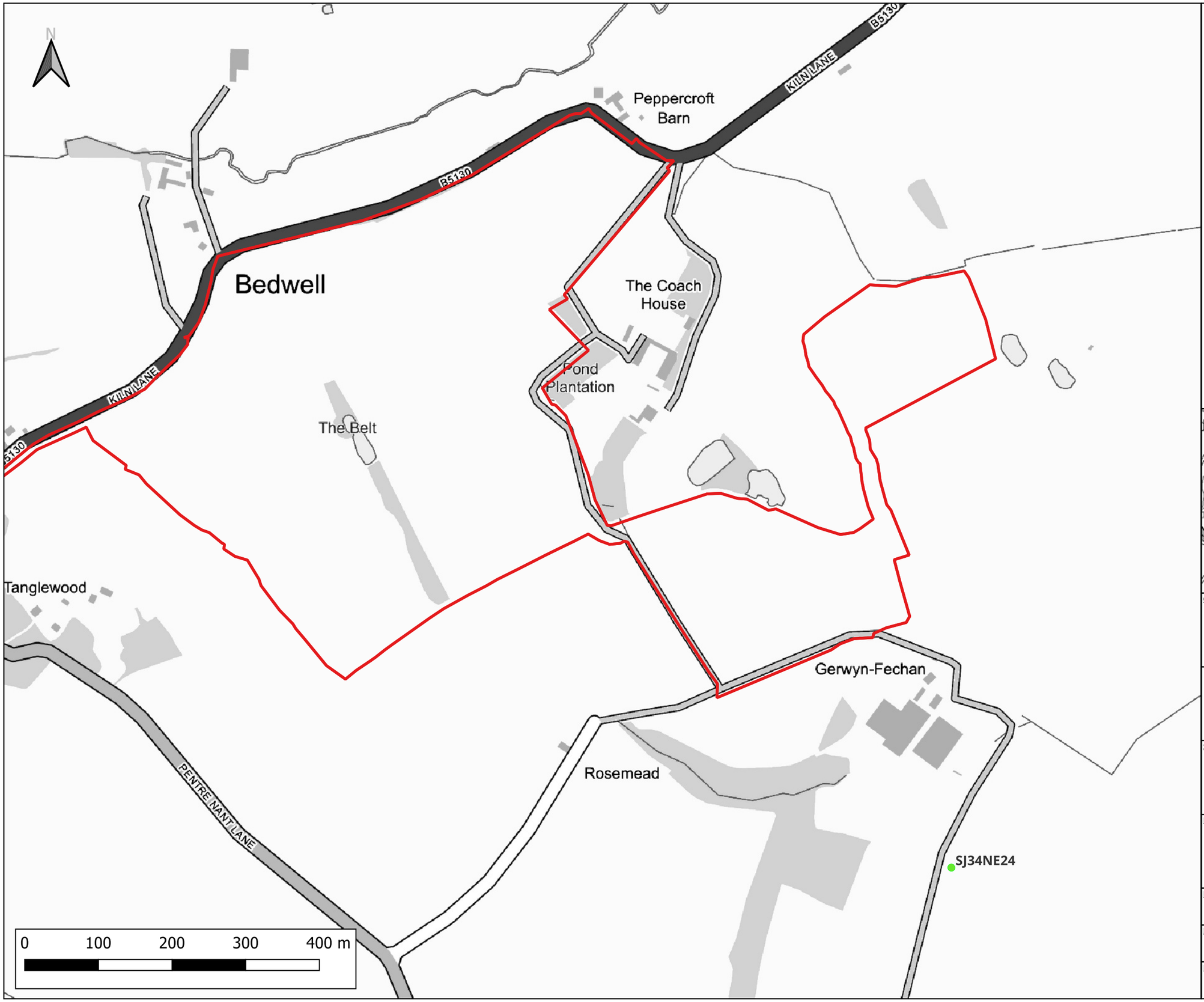
LEGEND

- Site boundary
- BGS Historical Borehole Record



CLIENT:	Axis P.E.D Ltd
	www.waterco.co.uk
SCHEME:	Legacy Farm Solar DNS
PLOT TITLE:	Historical BGS Borehole Location Plan Data from British Geological Survey (BGS) Central Array Area
PLOT STATUS:	FINAL
DATE:	13-08-2025
DRAWN:	MJW
CHECKED:	AW
APPROVED:	NJ
PLOT SCALE AT A3:	1:5000
PLOT NAME:	14825_BGS_Borehole_Location_Plan
REVISION:	-

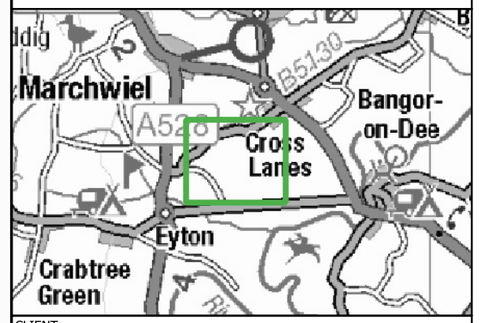
CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS BRITISH GEOLOGICAL SURVEY MATERIALS © UKRI (2025).



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site boundary
- BGS Historical Borehole Record



CLIENT:
Axis P.E.D Ltd

www.waterco.co.uk

SCHEME:
Legacy Farm Solar DNS

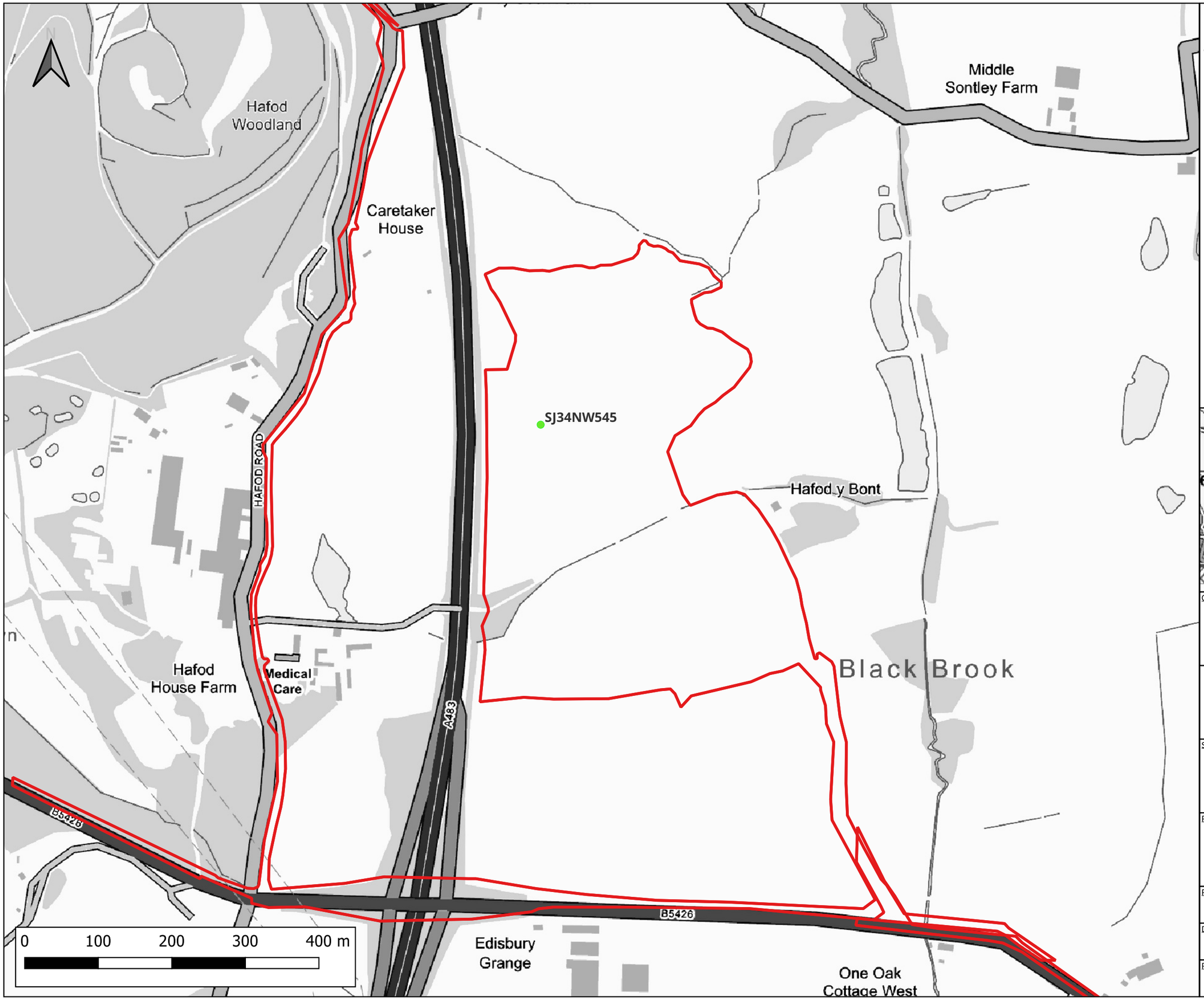
PLOT TITLE:
Historical BGS Borehole Location Plan
Data from British Geological Survey (BGS)
Eastern Array Area

PLOT STATUS:	DATE:
FINAL	14-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MJW	AW	NJ	1:5000

PLOT NAME:	REVISION:
14825_BGS_Borehole_Location_Plan	-

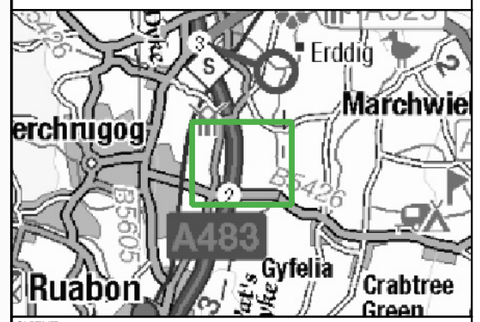
CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS BRITISH GEOLOGICAL SURVEY MATERIALS © UKRI (2025).



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site boundary
- BGS Historical Borehole Record



CLIENT:
Axis P.E.D Ltd

waterco
www.waterco.co.uk

SCHEME:
Legacy Farm Solar DNS

PLOT TITLE:
Historical BGS Borehole Location Plan
Data from British Geological Survey (BGS)
Western Array Area

PLOT STATUS:	DATE:
FINAL	14-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MJW	AW	NJ	1:5000

PLOT NAME:	REVISION:
14825_BGS_Borehole_Location_Plan	-

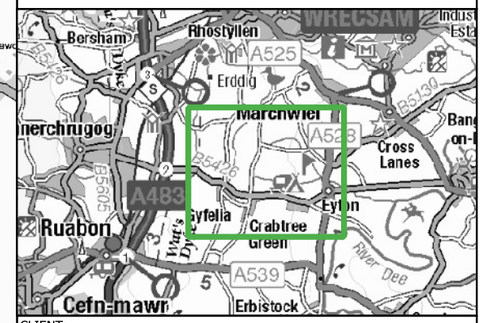
CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS BRITISH GEOLOGICAL SURVEY MATERIALS © UKRI (2025).

Appendix D Water Features Plan

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise
2) No springs located within the 1km buffer zone

LEGEND

- 1km Buffer Zone
- Site Boundary
- Watercourses
- Waterbodies
- BGS Water Wells
- Water Abstractions
- Watercourse Crossing



CLIENT:
Axis P.E.D Ltd

www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
Water Features Plan
Central Array Area

PLOT STATUS:	DATE:
FINAL	14-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
BLJ	MEG	AW	1:12500

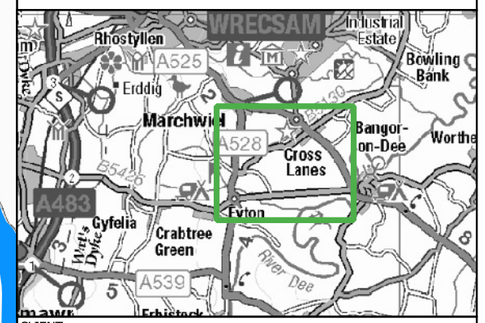
PLOT NAME:	REVISION:
14825_Water_Features_Plan_Central	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise
2) No springs located within the 1km buffer zone

LEGEND

- 1km Buffer Zone
- Site Boundary
- Watercourses
- Waterbodies
- BGS Water Wells
- Water Abstractions
- Watercourse Crossing



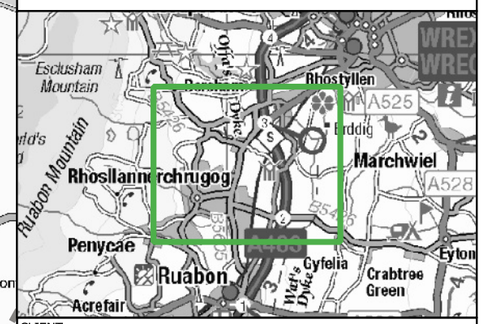
CLIENT:	Axis P.E.D Ltd
	www.waterco.co.uk
SCHEME:	Butterfly Farm Solar DNS
PLOT TITLE:	Water Features Plan Eastern Array Area
PLOT STATUS: FINAL	DATE: 14-08-2025
DRAWN: BLJ / CHECKED: MEG / APPROVED: AW / PLOT SCALE AT A3: 1:11000	
PLOT NAME: 14825_Water_Features_Plan_Eastern	REVISION: -

CONTAINS OS DATA © CROWN COPYRIGHT (2025)

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise
2) No springs located within the 1km buffer zone

LEGEND

- 1km Buffer Zone
- Site Boundary
- Watercourses
- Waterbodies
- BGS Water Wells
- Water Abstractions
- Watercourse Crossing



CLIENT:
Axis P.E.D Ltd

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
Water Features Plan
Western Array Area

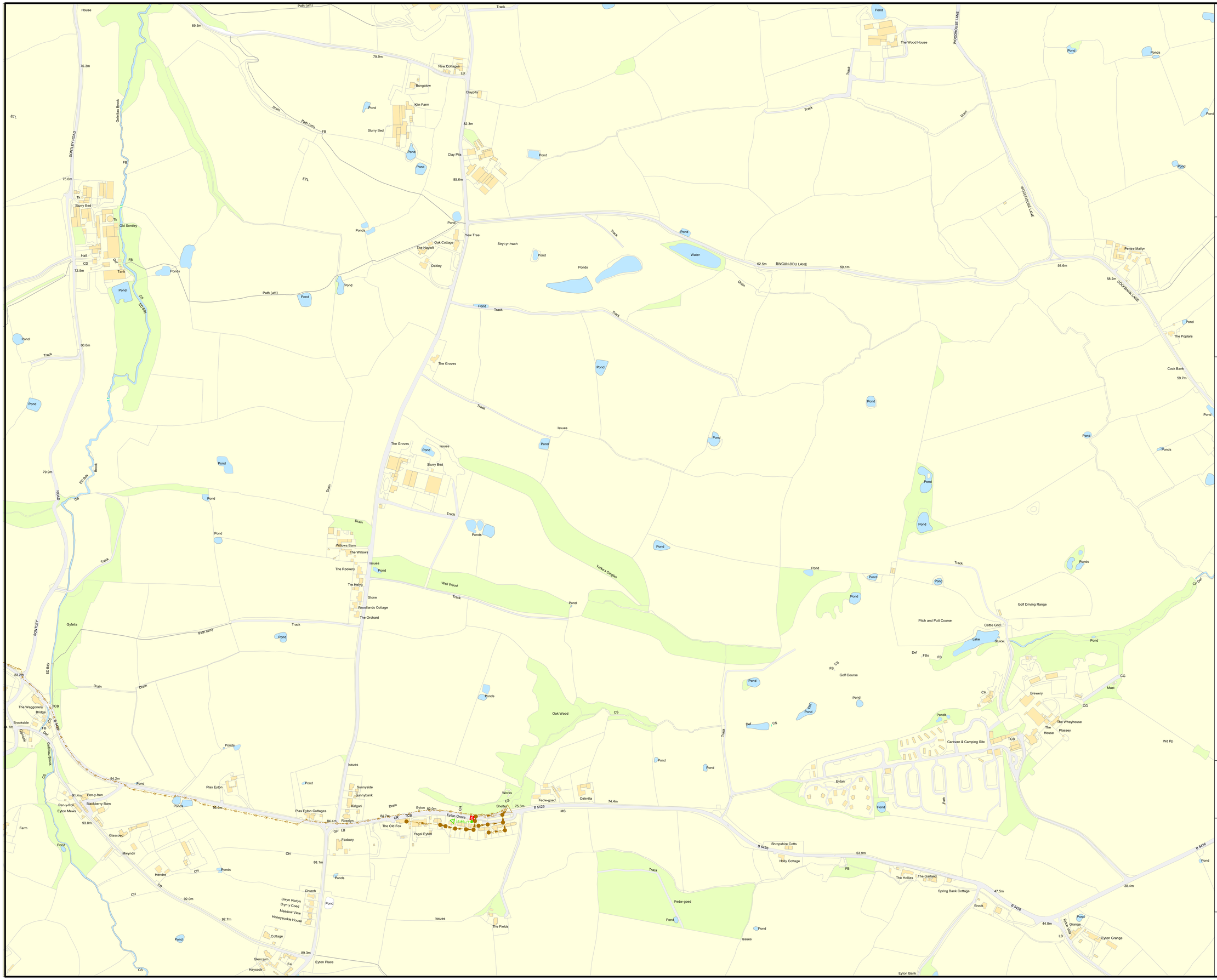
PLOT STATUS:	DATE:
FINAL	09-09-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
BLJ	MEG	AW	1:15000

PLOT NAME:	REVISION:
14825_Water_Features_Plan_Western	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)

Appendix E DCWW Sewer Records



Dŵr Cymru
Welsh Water

14825 - Butterfly Farm Solar DNS, Marchwiel
LL13 0AY

N
W E
S

LEGEND(Representative of most common features)

Waste network:

- Foul chamber
- Surface water chamber
- Combined chamber
- Combined sewer overflow
- Special purpose chamber
- Treatment works
- Pumping station
- Outfall
- Lamphole (LH)
- Storm Overflow
- Rising main
- Gravity sewer
- Private sewer
- Private sewer subject to Sect. 104 adoption agreement (S 104)
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

NB: Sewer symbol colour indicates the type.

RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former 524 sewers (for indicative purposes only)

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases, pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF) . It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dŵr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

Reproduced by permission of the Ordinance Survey on behalf of HMSO. © Crown copyright and database rights right 2017. All rights reserved. Ordnance Survey Licence number 100019534

Map Ref:	334158,345758
Map scale:	1:2500
Printed by:	Emily Marsden
Printed on:	19 Feb 2025

Dŵr Cymru
Welsh Water

14825 - Butterfly Farm Solar DNS, Marchwiel
LL13 0AY

N
W E
S

LEGEND(Representative of most common features)

Waste network:

- Foul chamber
- Surface water chamber
- Combined chamber
- Combined sewer overflow
- Special purpose chamber
- Treatment works
- Pumping station
- Outfall
- Lamphole
- Storm Overflow
- Rising main
- Gravity sewer
- Private sewer
- Private sewer subject to Sect. 104 adoption agreement
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

NB: Sewer symbol colour indicates the type.
RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former 524 sewers (for indicative purposes only)

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases, pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF) . It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dŵr Cymru Cyfyngedig ("the Company") gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, their actual position thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

Reproduced by permission of the Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2017.
All rights reserved.
Ordnance Survey Licence number 100019534

Map Ref:	336818,346351
Map scale:	1:2500
Printed by:	Emily Marsden
Printed on:	17 Feb 2025

Dŵr Cymru
Welsh Water

14825 - Butterfly Farm Solar DNS, Marchwiel
LL13 0AY

N
W E
S

LEGEND(Representative of most common features)

Waste network:

- Foul chamber
- Surface water chamber
- Combined chamber
- Combined sewer overflow
- Special purpose chamber
- Treatment works
- Pumping station
- Outfall
- Lamphole (LH)
- Storm Overflow
- Rising main
- Gravity sewer
- Private sewer
- Private sewer subject to Sect. 104 adoption agreement (S 104)
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

NB: Sewer symbol colour indicates the type.
RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former 524 sewers (for indicative purposes only)

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases, pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF) . It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dŵr Cymru Cyfyngedig ("the Company") gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it does not include the location of any water mains, service pipes, sewers, lateral drains or disposal mains, water mains, service pipe, sewer, lateral drains or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

Reproduced by permission of the Ordinance Survey on behalf of HMSO. © Crown copyright and database right 2017. All rights reserved. Ordinance Survey Licence number 100019534

Map Ref:	331692,346292
Map scale:	1:2500
Printed by:	Emily Marsden
Printed on:	17 Feb 2025

Appendix F NRW Flood Maps

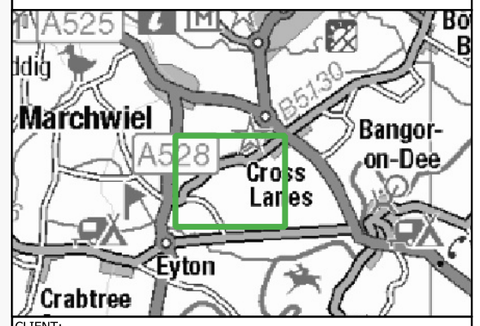
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise
2) Flood Zone 3 displays the extent of flooding from rivers with a 1% AEP or greater of flooding in a given year including and allowance for climate change and the sea with a 0.5% AEP or greater of flooding in a given year including and allowance for climate change
3) Flood Zone 2 displays the extent of flooding from rivers with a less than 1% AEP but greater than or equal to 0.1% AEP of flooding in a given year including and allowance for climate change and the sea with a less than 0.5% AEP but greater than or equal to 0.1% AEP of flooding in a given year including an allowance for climate change

LEGEND

- Site Boundary
- TAN15 Defended Zones

Flood Map for Planning

- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



CLIENT:
Axis P.E.D

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
NRW Flood Map for Planning (Rivers and Sea)
Eastern Array Area
Data published May 2025

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

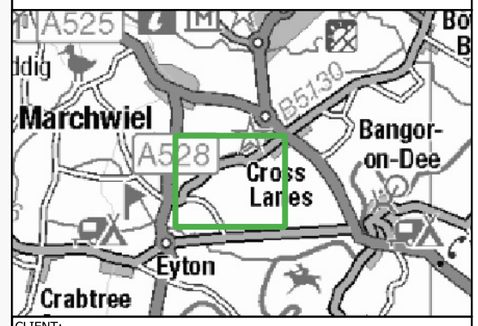
PLOT NAME:	REVISION:
14825_NRW_FMfP	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- Flood Zones - Rivers
- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



CLIENT:
Axis P.E.D

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
NRW Flood Zones - Rivers
Eastern Array Area
Data published May 2025

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

PLOT NAME:	REVISION:
14825_NRW_Flood_Zones_Rivers	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

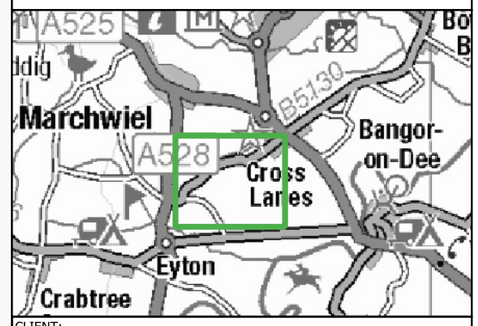
Site Boundary

Flood Zones - Surface Water & Small Watercourses

Flood Zone 1

Flood Zone 2

Flood Zone 3



CLIENT:

Axis P.E.D

www.waterco.co.uk

SCHEME:

Butterfly Farm Solar DNS

PLOT TITLE:

NRW Flood Zones - Surface Water & Small Watercourses
Eastern Array Area
Data published May 2025

PLOT STATUS:			DATE:
FINAL			13-08-2025
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

PLOT NAME: 14825_NRW_Flood_Zones_Surface_Water

REVISION: -

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.

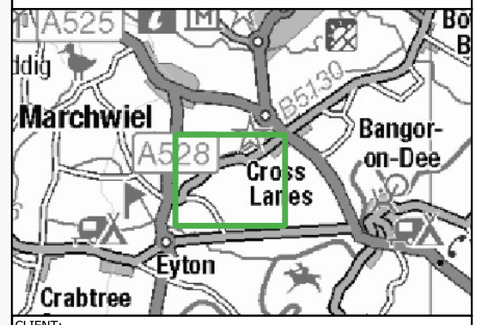
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary

Flood Zones - Sea

- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



CLIENT:

Axis P.E.D

waterco

www.waterco.co.uk

SCHEME:

Butterfly Farm Solar DNS

PLOT TITLE:

NRW Flood Risk from the Sea
Eastern Array Area
Data published May 2025

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

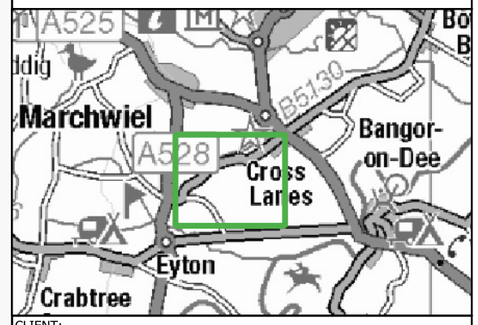
PLOT NAME:	REVISION:
14825_NRW_Flood_Zones_Sea	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- NRW Recorded Flood Extents



CLIENT:
Axis P.E.D

www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

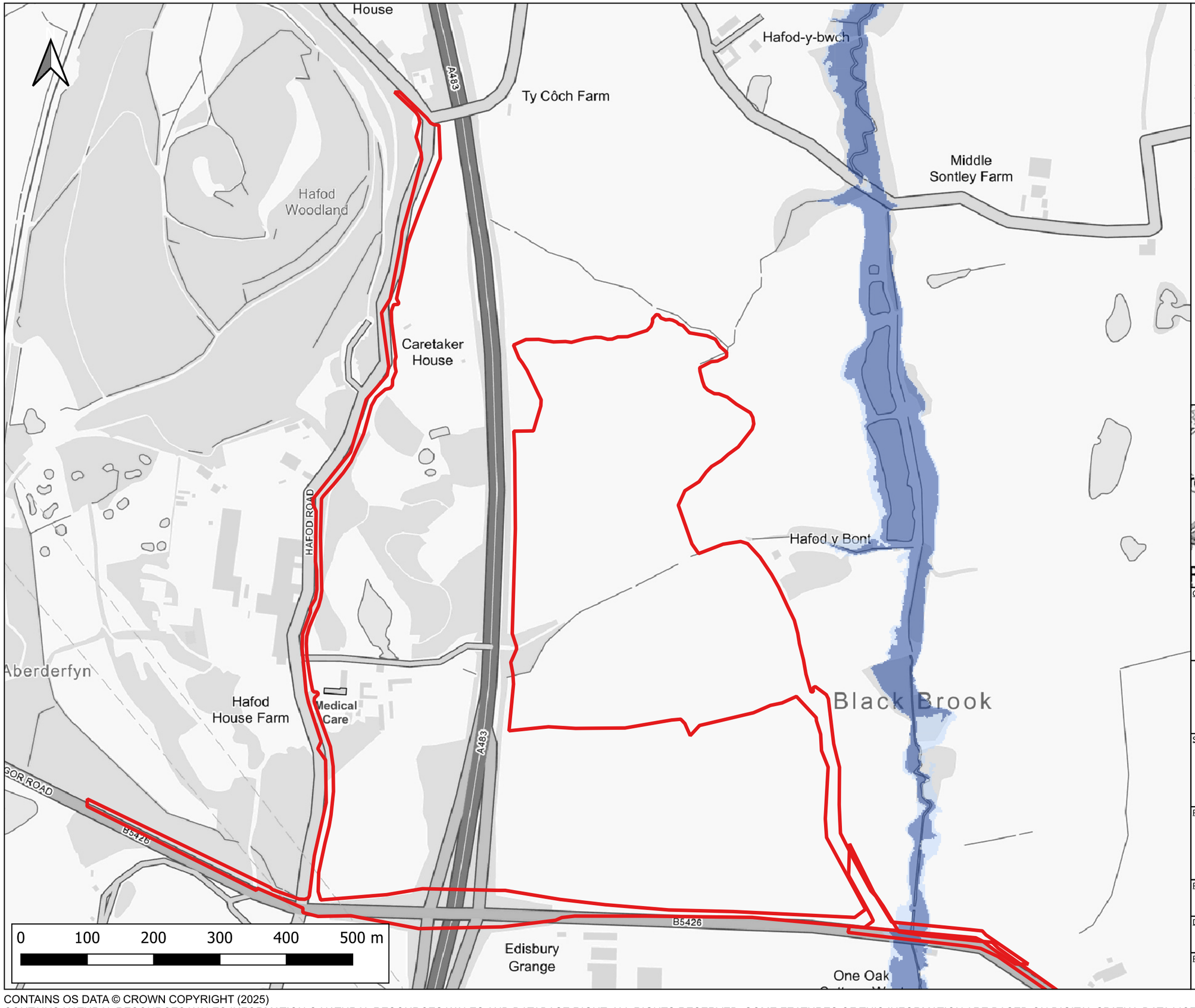
PLOT TITLE:
NRW Recorded Flood Extents
Eastern Array Area
Data published May 2025

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

PLOT NAME:	REVISION:
14825_NRW_Recorded_Flood_Extents	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED.



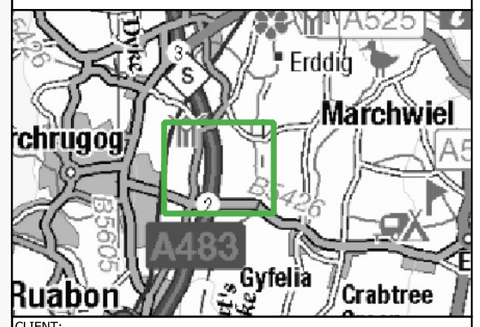
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise
2) Flood Zone 3 displays the extent of flooding from rivers with a 1% AEP or greater of flooding in a given year including and allowance for climate change and the sea with a 0.5% AEP or greater of flooding in a given year including and allowance for climate change
3) Flood Zone 2 displays the extent of flooding from rivers with a less than 1% AEP but greater than or equal to 0.1% AEP of flooding in a given year including and allowance for climate change and the sea with a less than 0.5% AEP but greater than or equal to 0.1% AEP of flooding in a given year including an allowance for climate change

LEGEND

- Site Boundary
- TAN15 Defended Zones

Flood Map for Planning

- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



CLIENT:
Axis P.E.D

waterco
www.waterco.co.uk

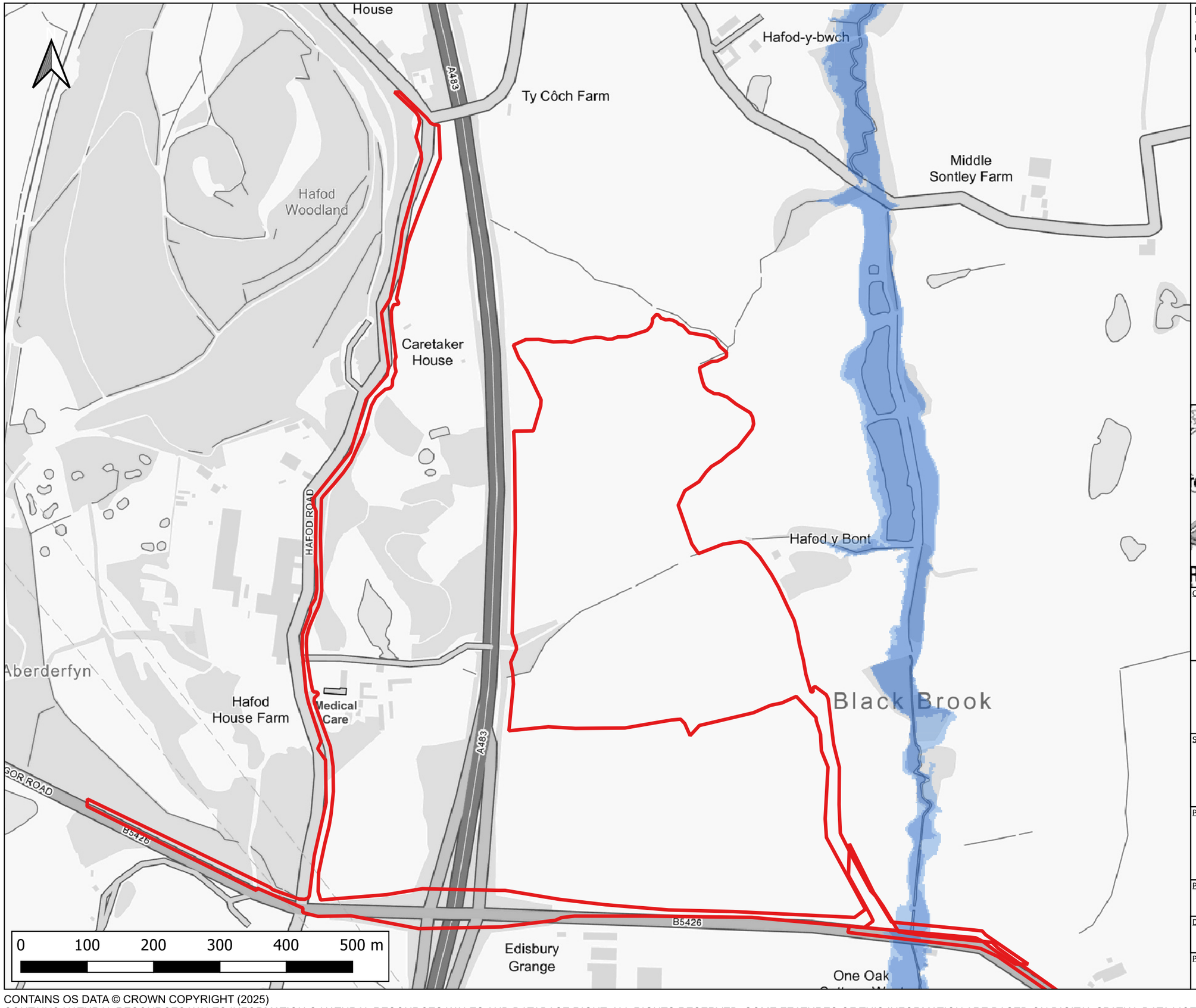
SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
NRW Flood Map for Planning (Rivers and Sea)
Western Array Area
Data published May 2025

PLOT STATUS:			DATE:
FINAL			13-08-2025
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

PLOT NAME:	REVISION:
14825_NRW_FMfP	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.



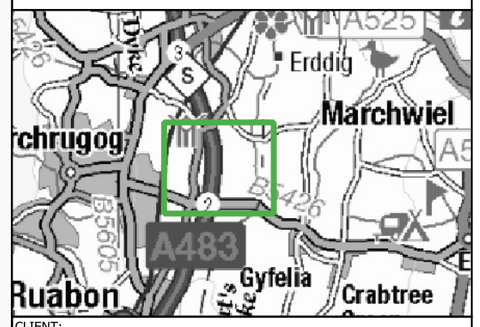
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary

Flood Zones - Rivers

- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



CLIENT:
Axis P.E.D

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

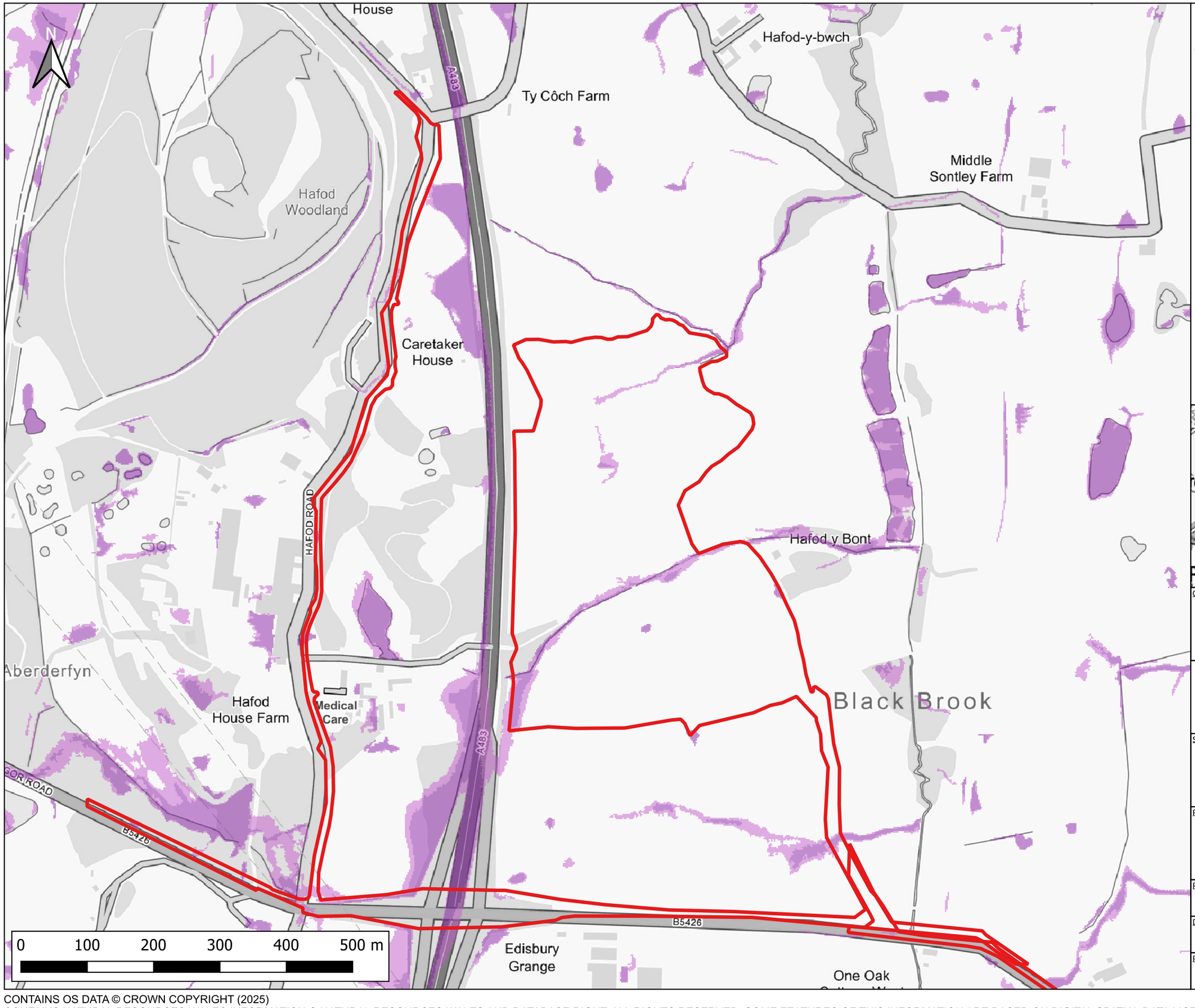
PLOT TITLE:
NRW Flood Zones - Rivers
Western Array Area
Data published May 2025

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

PLOT NAME:	REVISION:
14825_NRW_Flood_Zones_Rivers	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.



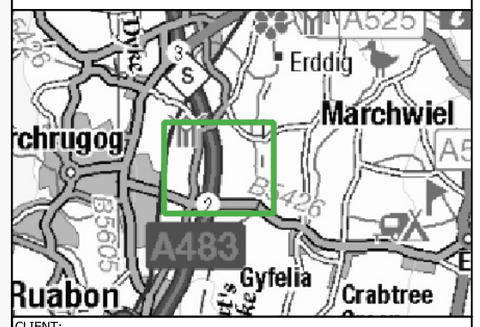
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary

Flood Zones - Surface Water & Small Watercourses

- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



CLIENT:
Axis P.E.D

waterco
www.waterco.co.uk

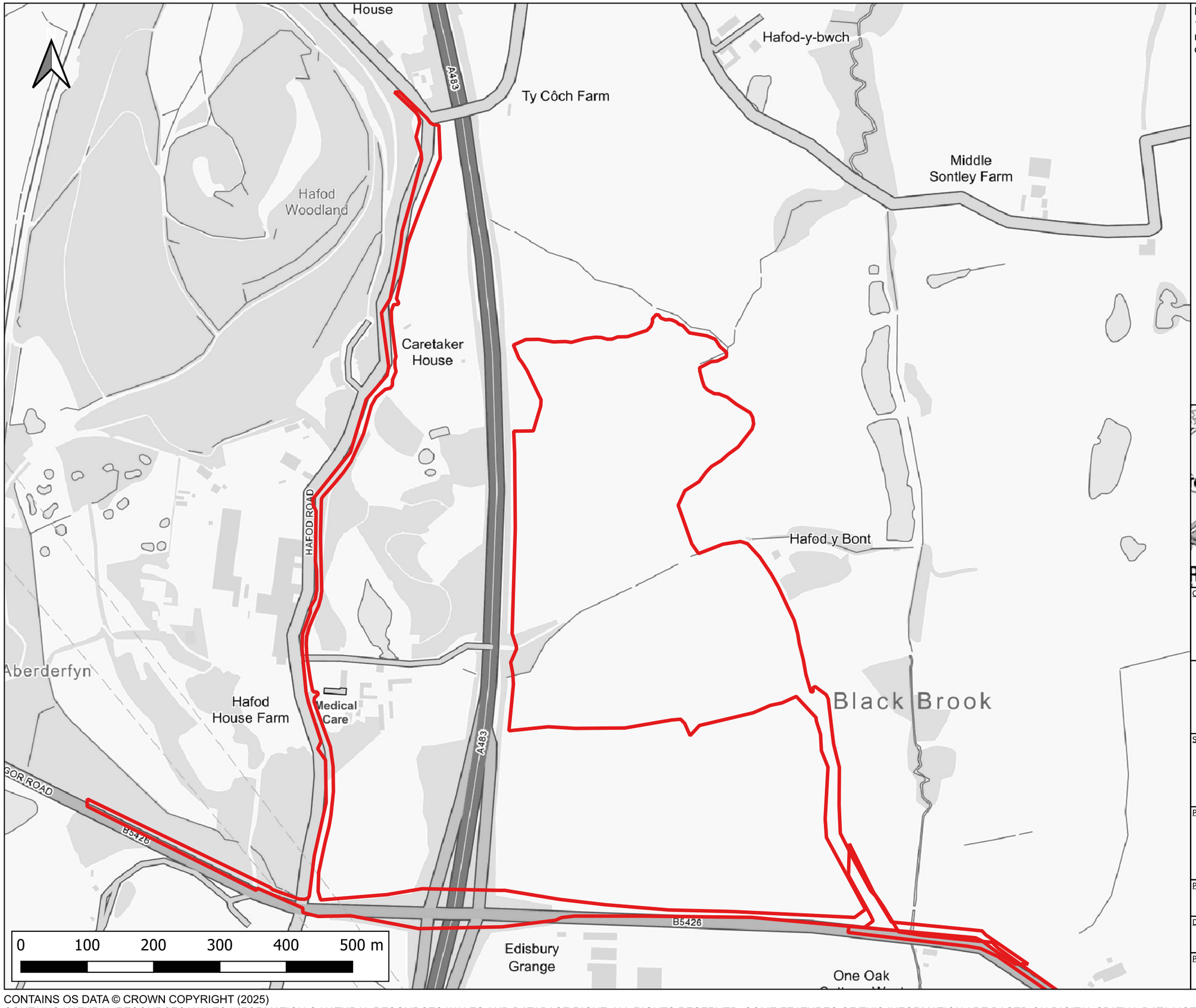
SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
NRW Flood Zones - Surface Water & Small Watercourses
Western Array Area
Data published May 2025

PLOT STATUS:			DATE:
FINAL			13-08-2025
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

PLOT NAME: 14825_NRW_Flood_Zones_Surface_Water
REVISION: -

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.



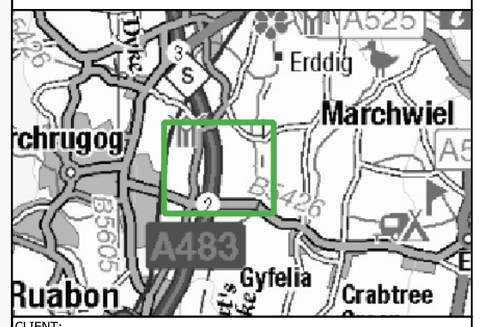
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary

Flood Zones - Sea

- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



CLIENT:
Axis P.E.D

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
NRW Flood Risk from the Sea
Western Array Area
Data published May 2025

PLOT STATUS:			DATE:
FINAL			13-08-2025
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

PLOT NAME:	REVISION:
14825_NRW_Flood_Zones_Sea	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.

House

Hafod-y-bwch

A483

Ty Côch Farm

Middle
Sontley Farm

Hafod
Woodland

Caretaker
House

HAFOD ROAD

Hafod y Bont

Aberderfyn

Hafod
House Farm

Medical
Care

Black Brook

A483

GOR ROAD

B5426

B5426

Edisbury
Grange

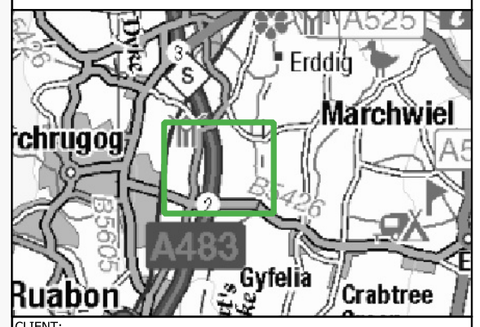
One Oak

0 100 200 300 400 500 m

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- NRW Recorded Flood Extents



CLIENT:
Axis P.E.D

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
NRW Recorded Flood Extents
Western Array Area
Data published May 2025

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

PLOT NAME:	REVISION:
14825_NRW_Recorded_Flood_Extents	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED.

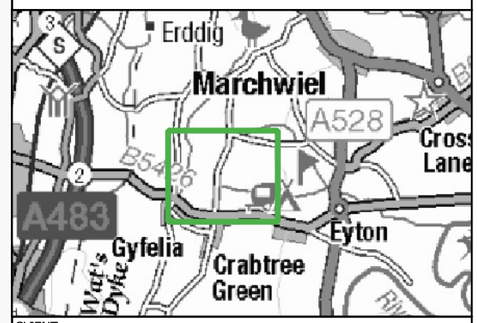
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise
2) Flood Zone 3 displays the extent of flooding from rivers with a 1% AEP or greater of flooding in a given year including and allowance for climate change and the sea with a 0.5% AEP or greater of flooding in a given year including and allowance for climate change
3) Flood Zone 2 displays the extent of flooding from rivers with a less than 1% AEP but greater than or equal to 0.1% AEP of flooding in a given year including and allowance for climate change and the sea with a less than 0.5% AEP but greater than or equal to 0.1% AEP of flooding in a given year including an allowance for climate change

LEGEND

- Site Boundary
- TAN15 Defended Zones

Flood Map for Planning

- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



CLIENT:
Axis P.E.D

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

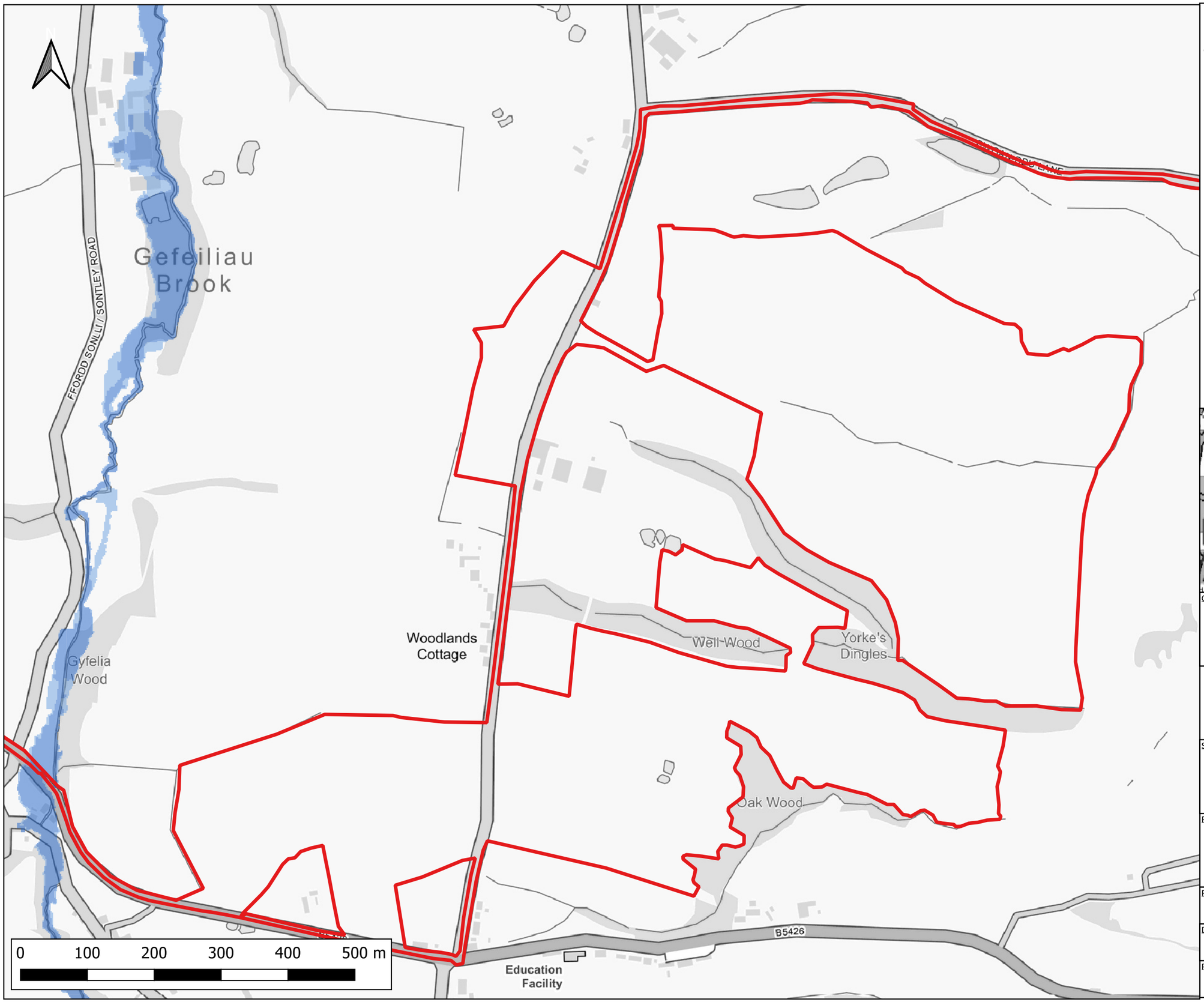
PLOT TITLE:
NRW Flood Map for Planning (Rivers and Sea)
Central Array Area
Data published May 2025

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

PLOT NAME:	REVISION:
14825_NRW_FMfP	-

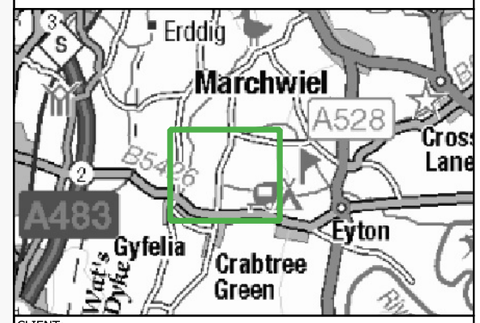
CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- Flood Zones - Rivers
  - Flood Zone 1
  - Flood Zone 2
  - Flood Zone 3



CLIENT:
Axis P.E.D

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

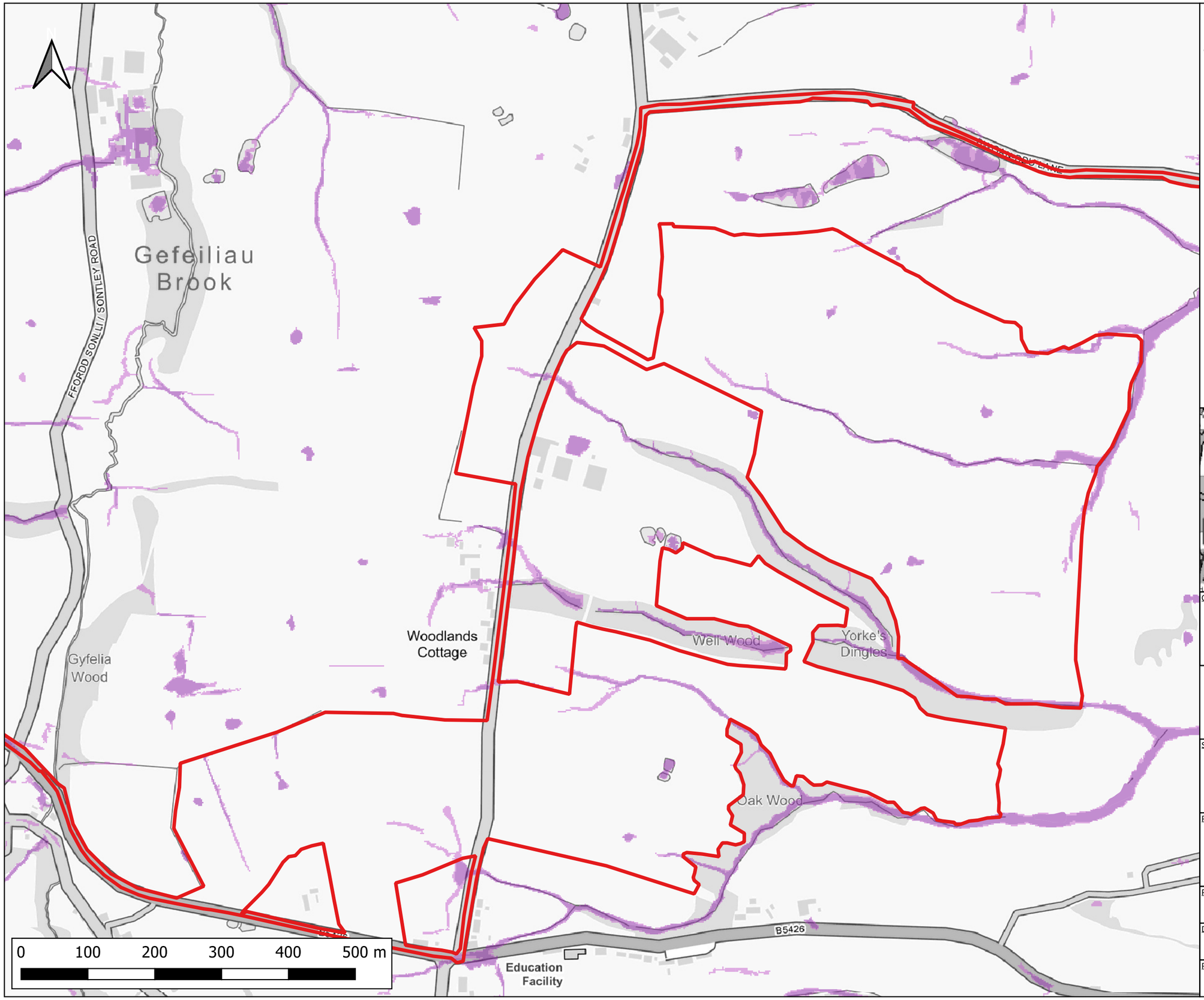
PLOT TITLE:
NRW Flood Zones - Rivers
Central Array Area
Data published May 2025

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

PLOT NAME:	REVISION:
14825_NRW_Flood_Zones_Rivers	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.



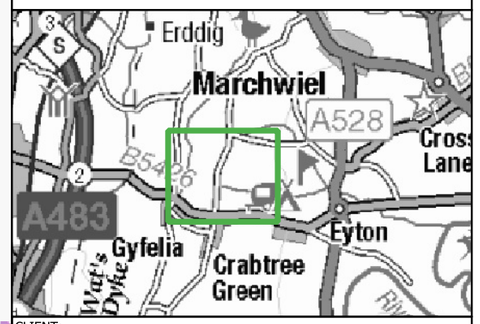
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary

Flood Zones - Surface Water & Small Watercourses

- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



CLIENT:
Axis P.E.D

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
NRW Flood Zones - Surface Water & Small Watercourses
Central Array Area
Data published May 2025

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

PLOT NAME:	REVISION:
14825_NRW_Flood_Zones_Surface_Water	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.

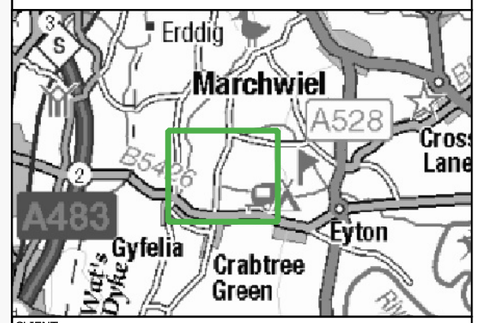
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary

Flood Zones - Sea

- Flood Zone 1
- Flood Zone 2
- Flood Zone 3



CLIENT:

Axis P.E.D

waterco

www.waterco.co.uk

SCHEME:

Butterfly Farm Solar DNS

PLOT TITLE:

NRW Flood Risk from the Sea
Central Array Area
Data published May 2025

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

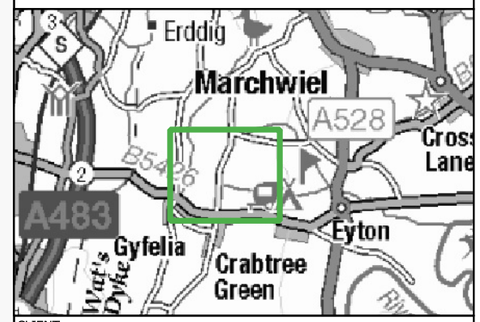
PLOT NAME:	REVISION:
14825_NRW_Flood_Zones_Sea	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED. SOME FEATURES OF THIS INFORMATION ARE BASED ON DIGITAL SPATIAL DATA LICENSED FROM THE UK CENTRE FOR ECOLOGY & HYDROLOGY © UKCEH. DEFRA, MET OFFICE AND DARD RIVERS AGENCY © CROWN COPYRIGHT. © CRANFIELD UNIVERSITY. © JAMES HUTTON INSTITUTE. CONTAINS OS DATA © CROWN COPYRIGHT AND DATABASE RIGHT.

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- NRW Recorded Flood Extents



CLIENT:
Axis P.E.D

waterco
www.waterco.co.uk

SCHEME:
Butterfly Farm Solar DNS

PLOT TITLE:
NRW Recorded Flood Extents
Central Array Area
Data published May 2025

PLOT STATUS:	DATE:
FINAL	13-08-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:5500

PLOT NAME:	REVISION:
14825_NRW_Recorded_Flood_Extents	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS NATURAL RESOURCES WALES INFORMATION © NATURAL RESOURCES WALES AND DATABASE RIGHT. ALL RIGHTS RESERVED.

Appendix G Designations Map

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise.

LEGEND

- Site boundary
- Proposed Cable Route
- 1km Buffer Zone
- AONB
- Ancient Woodland
- SAC
- SSSI



CLIENT:

Axis P.E.D Ltd

waterco

www.waterco.co.uk

SCHEME:

Legacy Farm Solar DNS

PLOT TITLE:

Designation Plan
Data from Natural Resources Wales (NRW) DataMapWales

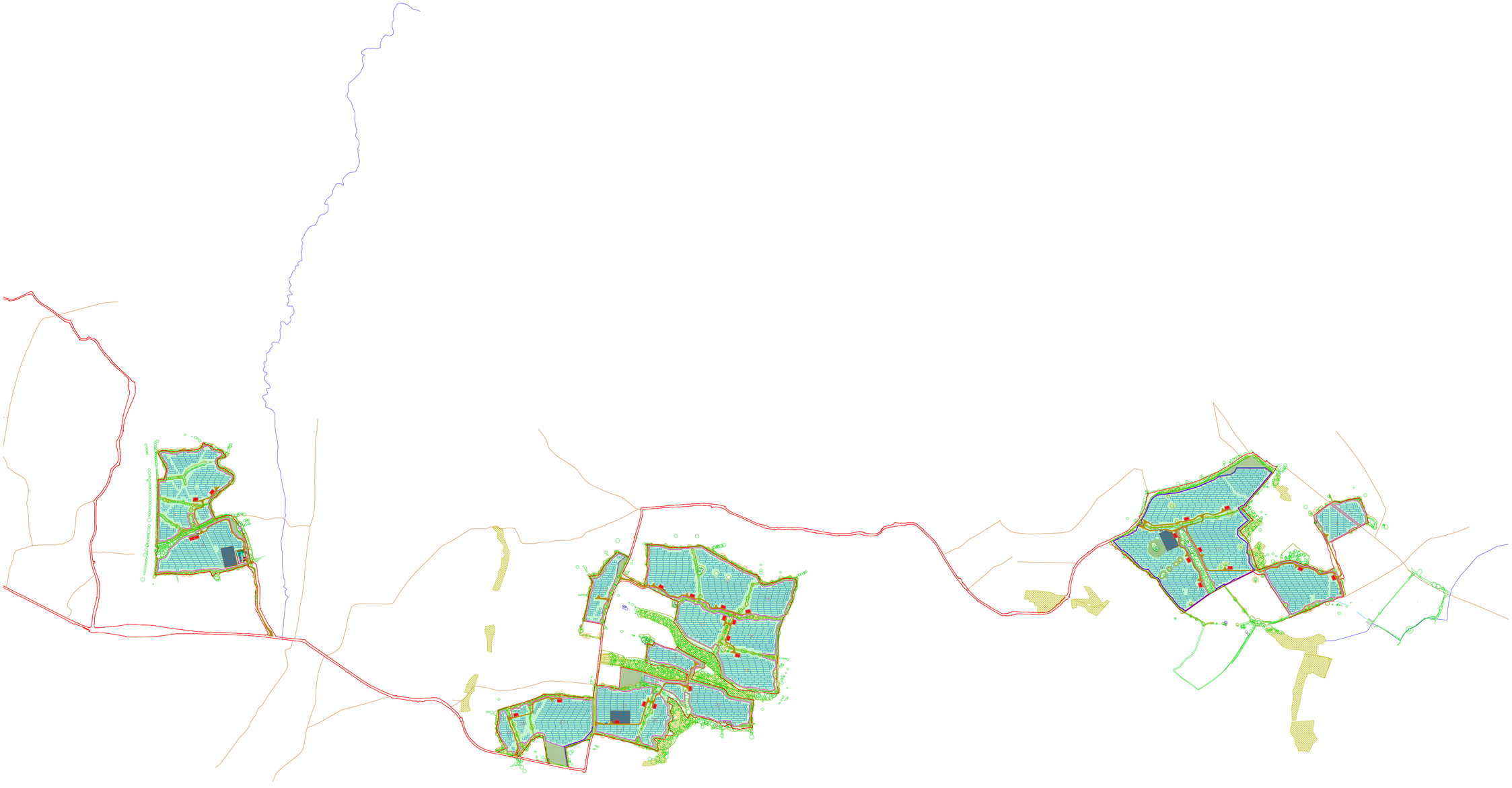
PLOT STATUS:	DATE:
FINAL	09-09-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MJW	AW	NJ	1:32500

PLOT NAME:	REVISION:
14825_Designation_Plan	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
CONTAINS BRITISH GEOLOGICAL SURVEY MATERIALS © UKRI (2025).

Appendix H Proposed Scheme Plans



NOTES

1. All details are indicative only.
2. Dimensions are in metres unless stated otherwise.
3. Refer to HSE document "Avoiding danger from overhead power lines – Guidance Note GS6" to ensure safe operation of machinery in proximity to overhead power lines.

LEGEND

- Planning Red Line
- Road
- No-dig Road
- Solar panels
- Fence
- Hedges
- Trees
- Ancient Woodland
- Hybrid Inverter Container
- Spares Container
- Customer Switch Gear Container
- Indicative CCTV Locations
- Access Gate
- Construction compound
- Rivers/Ponds
- Public Rights Of Way
- Permissive Path
- Acoustic Fencing
- Grassland
- Wildflower Meadow
- Tree Belt

REF. NORTH

0 300m 600m

1:10000

RWE

DETAILS

TITLE	Gloyn Byw Solar Farm – General Layout – Clean
LOCATION	Near LL13 0YA
DATE	7 August 2025
CONFIGURATION	Typical fixed design
REVISION	12

Appendix I Zone of Influence Plan

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

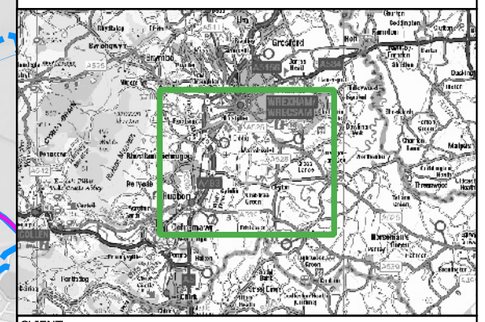
- Site Boundary
- Watercourses
- Waterbodies
- WFD Rivers
- 1km Buffer Zone

Clywedog - Dee to Gwenfroo

Black Brook (Clywedog)

Dee - Chester Weir to Ceiriog

0 1 2 km



CLIENT: Axis P.E.D Ltd

Waterco
www.waterco.co.uk

SCHEME: Butterfly Farm Solar DNS

PLOT TITLE: ZoI Plan

PLOT STATUS:	DATE:
FINAL	09-09-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
HW	AW	NJ	1:35000

PLOT NAME:	REVISION:
14825_ZoI_Plan	-

CONTAINS OS DATA © CROWN COPYRIGHT (2025)
IMAGERY ©2025 AIRBUS, BLUESKY, INFOTERRA LTD & COWI A/S, MAXAR TECHNOLOGIES, MAP DATA ©2025

Appendix J Background to Surface Water and Groundwater Body Status

Background to Surface Water Body Status

Chemical Status

Chemical status is defined by compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances, in accordance with the Environmental Quality Standards Directive (2008/105/EC). This is categorised as either good or fail. Surface waterbodies are monitored for priority substances only when there are known discharges of these pollutants; otherwise they are classified as having good status.

Ecological Status

Ecological status is defined as the overall health of the waterbody. It reflects the extent to which the biological chemical and physical characteristics of a waterbody deviate from a natural or undisturbed state. Ecological status is assigned on a scale of High, Good, Moderate, Poor and Bad, and is determined based on the following four main classification elements:

- Biological: Assesses the condition of aquatic flora and fauna including fish populations, phytoplankton, macroalgae and angiosperms.
- Hydromorphological: Assesses the physical structure and elements such as flow condition, sediment composition and movement and river continuity. If the hydromorphological elements do not support High status, then the maximum achieve ecological status of the water body is limited to Good.
- Physio-Chemical: Assesses chemical and physical parameters that support biological communities including nutrient levels, dissolved oxygen and temperature. This element can only influence a waterbody's overall status from Moderate to High.
- Specific Pollutants: Assesses the concentration of specific pollutants not covered under chemical status but that may affect aquatic systems. The specific pollutant assessment can only impact an overall water body status from Moderate through to High

Background to Groundwater Body Status

Quantitative Status

Quantitative status is determined by the amount of groundwater available as baseflow to rivers and water dependent ecosystems, as well as the volume of groundwater accessible for human activities such as drinking water agriculture and industry.

This is classified as either Good or Poor, based on the following elements:

- Saline Intrusion: This assesses the extent to which the groundwater body is affected by saline water intrusion from groundwater abstraction activities.

- Surface water status: This assesses how groundwater abstraction affects the connected surface waterbodies, ensuring groundwater use does not harm their ecological status.

- Groundwater-dependent terrestrial ecosystems (GWDTEs): This assesses whether groundwater levels and availability are sufficient to support ecosystems that rely on groundwater for their survival.

- Water balance: This assesses the balance between groundwater recharge and discharge, ensuring that extraction does not exceed the rate at which the groundwater body replenishes itself.

Chemical Status

Chemical status is defined by the concentration of specific pollutants, the quality of groundwater feeding into watercourses and abstracted for its designated uses e.g. drinking water. This is classified as either Good or Poor, based on the following elements:

- Saline Intrusion: This assesses the extent to which the groundwater body is affected by saline intrusion from groundwater abstraction activities.

- Surface water status: This assesses how groundwater abstraction affects the connected surface waterbodies, ensuring groundwater use does not harm their chemical status.

- Groundwater-dependent terrestrial ecosystems (GWDTEs): This assesses whether the chemical quality of the groundwater is adequate to support ecosystems that rely on groundwater for their survival.

- Drinking Water Protected Areas (DrWPAs): This assesses whether the groundwater body fails to meet the DrWPA objectives defined in Article 7 of the WFD or is at risk of failing in the future.

- General Chemical Test: This assesses whether contamination or pollution has reached levels that has or will compromise the strategic use of groundwater.

Appendix K Pollution Control Measures

Typical pollution control measures to be considered during the construction phase; the list below is best practice, is not exhaustive and reference to the appropriate and relevant guidance should also be undertaken on more complex schemes:

- Potentially contaminating materials should be stored correctly. Minimise the potential for accidental release but protecting from the elements (wind & rain) and from vandalism and theft.
- Potentially contaminating liquids, such as oils and fuel, should be stored in a suitably bunded contained if present in a bulk container. Smaller container volumes should be stored on a drip tray or in a closed storage unit when not in use.
- Equipment should be regularly checked to ensure that leakage from hydraulic lines and engines does not occur.
- Bank excavation /restoration where possible should carried out operating from the bank rather than the watercourse
- Spill kits should be available on site at all times and operatives should be trained in how to use them.
- Any soils contaminated during the course of the works should be excavated and disposed of correctly in accordance with current waste disposal legislation. Where gross contamination occurs, professional advice should be sought immediately.
- Bins should be provided on site for debris.
- Cleaning of tools /equipment will be carried out in water not draining directly to the watercourse.
- In any event of expected heavy rain pouring concrete and other activities which increase the risk of contaminating runoff and should not be undertaken.