



ABERGELLI POWER PROJECT
PRELIMINARY ENVIRONMENTAL
INFORMATION REPORT -
APPENDICES

Abergelli Power Ltd

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Appendix 4.1 - Consultation Responses

Environmental Statement Structure

Organisation (Ref)	Comment	Applicant's Response
SoS (Scoping Opinion, para.3.21)	The SoS recommends that the ES should include a description of how waste generated by the proposed development will be dealt with.	See Section 2.9 of the PEIR.
SoS (Scoping Opinion, para.3.21)	The SoS also recommends that the potential impacts of electric and magnetic fields are addressed within the ES.	See Section 2.10 of the PEIR.
Public Health England (PHE) (letter dated 23rd July, page 3)	PHE will only consider information contained or referenced in a separate section of the ES summarising the impact of the proposed development on public health: summarising risk assessments, proposed mitigation measures, and residual impacts.	These separate sections will be identified in the PEIR (see Section 6.6 and 10.6) and ES. Consultation with PHE will be carried out.

Project Description

Organisation (Ref)	Comment	Applicant's Response
SoS (Scoping Opinion, para.2.43)	The SoS would expect the ES to include a section that summarises the site and surroundings. This would identify the context of the proposed development, any relevant designations and sensitive receptors. This section should identify land that could be directly or indirectly affected by the proposed development and any auxiliary facilities, landscaping areas and potential off site mitigation or compensation schemes.	Will be included in ES
SoS (Scoping Opinion, para.2.44)	The ES should include a clear description of the application site which is to be the subject of the DCO, including detailed land levels, existing vegetation species, hard surfaces and the location of existing buildings. The ES should confirm if the application site has been previously developed, and if so, whether it has been subject to any remediation works.	Will be included in ES
SoS (Scoping Opinion, para.2.46)	The applicant should be aware however, that the description of the development in the ES must be sufficiently certain to meet the requirements of paragraph 17 of Schedule 4 Part 1 of the EIA Regulations and there should therefore be more certainty by the time the ES is	Noted. A table will be included in the ES which demonstrates compliance with Regulations.

Organisation (Ref)	Comment	Applicant's Response
	submitted with the DCO.	
SoS (Scoping Opinion, para.2.47)	The applicant should clearly define what elements of the proposed development are integral to the NSIP and which is 'associated development' under the Planning Act 2008 (PA 2008) or is an ancillary matter.	The Power Generation Plant, Electrical Connection and Gas Connection are all considered to form an integral part of The Project and are all considered to be essential to the functioning of the Project. Full detail will be provided in the explanatory memorandum which will accompany the draft DCO, forming part of the proposed application.
SoS (Scoping Opinion, para.3.49)	The SoS recommends that the ES should include a clear description of all aspects of the proposed development, at the construction, operation and decommissioning stages, and include: land use requirements; site preparation; construction processes and methods; transport routes; operational requirements including the main characteristics or the production process and the nature and quantity of material used; transport routes; maintenance activities including any potential environmental impacts; emissions - water, air and soil pollution, noise, vibration, light, heat, radiation.	Will be included in ES
SoS (Scoping Opinion, para.2.50)	The environmental effects of all wastes to be processed and removed from the site should be addressed. The ES will need to identify and describe the control processes and mitigation procedures for storing and transporting waste off site. All waste types should be quantified and classified.	Will be included in ES
SoS (Scoping Opinion, para.2.52)	The ES should ensure to provide clearly distinguishable colours/symbols on all maps and figures, in order to ensure that specific features can be easily identified.	Noted
SoS (Scoping Opinion, para.2.53)	The SoS welcomes the consideration of alternative technology choices included in the Scoping Report (paragraph 3.6.4) and recommends these details are included in the ES. In addition, the ES should also provide details of other locations considered for the Power Generation Plant.	Will be included in ES
SoS (Scoping Opinion, para.2.55)	The SoS notes, from the comments in paragraph 3.3.14 of the Scoping Report, that the detailed design and location of the powerstation is still being developed. The applicant should make every attempt to narrow the range of options and explain clearly in the ES which elements of the scheme have yet to be	Reduced red line boundary will be in shown in all of the figures in the PEIR.

Organisation (Ref)	Comment	Applicant's Response
	finalised and provide the reasons. At the time of application, any proposed scheme parameters should not be so wide ranging as to represent effectively different schemes.	
SoS (Scoping Opinion, para.3.1)	The SoS recommends that the applicant provides justification for this choice of simple cycle gas turbine within the ES and directs the applicant to the comments of NRW indicating that this turbine choice is not considered to represent Best Available Technique (BAT).	Will be included in ES.

Flexibility

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.2.55)	The scheme parameters will need to be clearly defined in the draft DCO and therefore in the accompanying ES. It is a matter for the applicant, in preparing an ES, to consider whether it is possible to robustly assess a range of impacts resulting from a large number of undecided parameters. The description of the proposed development in the ES must not be so wide that it is insufficiently certain to comply with the requirements of paragraph 17 of Schedule 4 Part 1 of the EIA Regulations.	Will be included in ES.
SoS (Scoping Opinion, para.2.56)	It should be noted that if the proposed development changes substantially during the EIA process, prior to application submission, the applicant may wish to consider the need to request a new scoping opinion.	Noted. Not likely to be required.

Proposed Access, Construction, Operation and Maintenance, and Decommissioning

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.2.57)	The ES should detail the proposed access routes for both construction and operational traffic.	One route will be identified in ES but two options will be shown in PEIR (see Figure 1.1).
SoS (Scoping Opinion, para.2.58)	The Secretary of State notes that no information has been provided in the Scoping Request regarding the size and exact location of the temporary laydown area. Whilst it is appreciated that this information may not be available at this	Will be included in ES.

Organisation	Comment	Applicant's Response
	stage in the evolution of the project, applicants are reminded that this information will be required in the ES.	
SoS (Scoping Opinion, para.2.59)	The SoS considers that information on construction including: phasing of programme; construction methods and activities associated with each phase; siting of construction compounds (including on and off site); lighting equipment/requirements; and number, movements and parking of construction vehicles (both HGVs and staff) should be clearly indicated in the ES.	Will be included in ES.
SoS (Scoping Opinion, para.2.60)	Information on the operation and maintenance of the proposed development should be included in the ES and should cover but not be limited to such matters as: the number of full/part-time jobs; the operational hours and if appropriate, shift patterns; the operational stage.	Will be included in ES.
SoS (Scoping Opinion, para.2.61)	The process and methods of decommissioning should be considered and options presented in the ES. The SoS encourages consideration of such matters in the ES.	Will be included in ES.
SoS (Scoping Opinion, para.2.62)	The SoS recommends that the EIA covers the life span of the proposed development, including construction, operation and decommissioning.	Will be included in ES.

Approach

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.3.4)	The SoS would suggest that the applicant ensures that appropriate consultation is undertaken with the relevant consultees in order to agree wherever possible the timing and relevance of survey work as well as the methodologies to be used.	Consultation was carried out prior to the issue of the PEIR where required.
SoS (Scoping Opinion, para.3.5)	The SoS recommends that the physical scope of the study areas should be identified under all the environmental topics and should be sufficiently robust in order to undertake the assessment. The extent of the study areas should be on the basis of recognised professional guidance, whenever such guidance is available. The study areas should also be agreed with the relevant consultees and, where this is not possible, this should be stated clearly in the ES and a	See Section 2 ('Approach') of each of the topic chapters in the PEIR.

Organisation	Comment	Applicant's Response
	<p>reasoned justification given. The scope should also cover the breadth of the topic area and the temporal scope, and these aspects should be described and justified.</p>	
<p>SoS (Scoping Opinion, para.3.8)</p>	<p>It is stated within the Scoping Report that it is not intended to include the operational air quality emissions of the gas and electrical connections as these sections of the proposed development would not produce any significant emissions during the operational phase of the development; the SoS agrees that these impacts can be scoped out of the assessment.</p>	<p>Noted</p>
<p>SoS (Scoping Opinion, para.3.9)</p>	<p>Within the Scoping Report it is stated that it is not intended to include the operational noise or vibration impacts of the gas connection as this aspect of the proposed development would not produce any significant noise or vibration emissions during the operational phase; the SoS agrees that these impacts can be scoped out of the assessment.</p>	<p>Noted</p>
<p>SoS (Scoping Opinion, para.3.10)</p>	<p>It is stated within the Scoping Report that it is not intended to include the operational noise impacts of the electrical connection as this aspect of the proposed development would not produce any significant noise emissions during the operational phase. The SoS recommends that further justification be provided by the applicant for scoping out these potential effects, the SoS draws the attention of the applicant to the comments made by NRW in this respect.</p>	<p>See Section 7.2 of the PEIR.</p>
<p>SoS (Scoping Opinion, para.3.11)</p>	<p>The SoS agrees that providing NRW indicates that no Water Framework Directive Report will be required for this development the provision of this report can be scoped out of the assessment.</p>	<p>Noted</p>
<p>SoS (Scoping Opinion, para.3.12)</p>	<p>It is stated within the applicants scoping report that any impact on drainage or water quality caused by the gas or electrical connections during the operational and the development will be scoped out of the assessment, as no decommissioning phases of significant drainage or water quality impacts are predicted to occur as a result of the presence of the connections during these phases of the proposed development. The SoS recommends that the applicant provides further information regarding the potential for any below ground connections to form</p>	<p>See Chapter 9 of the PEIR.</p>

Organisation	Comment	Applicant's Response
	pathways for the transport of pollutants which may result from previous use of the land. NRW noted that at least part of the site was previously used as landfill.	
SoS (Scoping Opinion, para.3.13)	The SoS expects that the ES should contain confirmation that the stacks required as part of the development, which will be up to 60m in height, will not be visible from the AONB.	A further stack height sensitivity test has concluded that the stack will be between 35 and 40 m in height. The Zone of Theoretical Visibility confirms that the Power Generation Plant will not be visible from the AONB (see Figure 11.1).
SoS (Scoping Opinion, para.3.15)	In order to demonstrate that topics have not simply been overlooked, where topics are scoped out prior to submission of the DCO application, the ES should still explain the reasoning and justify the approach taken.	Will be included in the ES.

National Policy Statements

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.3.17)	When undertaking the EIA, the applicant must have regard to both the generic and technology-specific impacts and identify how these impacts have been assessed in the ES.	Will be included in the ES.

Air Quality

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.3.22)	The SoS considers that adverse change to air quality should be assessed in relation to compliance with European air quality limit values and any impact upon AQMAs.	The assessment will make reference to the Swansea AQMA and the potential impacts of the project on the AQMA in the ES.
SoS (Scoping Opinion, para.3.23)	Within 10 km of the site there are twenty SSSI's, 1 SPA, 2 SAC's, 1 National Nature Reserve and 23 SINC's, the potential impacts on which should be carefully assessed. There is the need to consider potential related effects due to an increase in airborne pollution including fugitive dust especially during site preparation, demolition and construction.	The full EIA will consider potential impacts on European, national and local designated ecological sites during operations through air dispersion modelling. Potential impacts from fugitive dust during site preparation, demolition and construction will be assessed qualitatively using the IAQM Guidance on the assessment of dust from demolition and construction.
SoS (Scoping Opinion, para.3.24)	The ES should also include an assessment of potential air quality impacts on the Lower Lliw Reservoir as a result of both deposition and affected rainfall.	The ES will make reference to potential impacts on the Lower Lliw Reservoir, which is an emergency reservoir.
SoS (Scoping	The assessment should take account of	In line with IAQM and EPUK guidance

Organisation	Comment	Applicant's Response
Opinion, para.3.26)	the air emissions from the proposed development and emissions related to vehicular movements associated with the proposal. The SoS recommends that the implications of stack height and dispersion of the discharge be clearly explained within the ES.	documents, the direct impacts of operational and construction traffic have been scoped out of the assessment due to the low number of daily vehicle movements. A preliminary stack sensitivity assessment is presented in at Appendix 8.1. It will be finalised in the ES.
SoS (Scoping Opinion, para.3.27)	The SoS recommends that the applicant agrees all modelling receptor locations with the City and County of Swansea and also that the applicant consults the City and County of Swansea regarding the proposed data inputs for the air quality model.	The modelling receptor locations will be agreed with CCS.
SoS (Scoping Opinion, para.3.28)	The SoS recommends that the applicant agrees which pollutants are to be modelled and the meteorological data to be used with the City and County of Swansea.	The modelled pollutants will be agreed with CCS.
SoS (Scoping Opinion, para.3.29)	There are a number of residential receptors within 1 km of the project site and suitable receptor locations for modelling purposes should be agreed with the relevant local authority and NRW. This may need to extend to densely populated areas just outside of the proposed study area.	See Section 6.2 of the PEIR.
SoS (Scoping Opinion, para.3.30)	The SoS recommends that air quality and dust levels are considered not only on site but also off site, including along access roads, local footpaths and other public rights of way. Consideration should also be given to appropriate mitigation measures and to monitoring dust complaints.	The assessment of impacts during construction will consider impacts along access roads, local footpaths and other public right of way by applying the IAQM Guidance on the assessment of dust from demolition and construction.
SoS (Scoping Opinion, para.3.31)	The SoS recommends that the applicant works toward submitting their Environmental Permit application at least six months prior to the submission of their DCO application.	The Environmental Permit application will be submitted 12 months prior to the commencement of commercial operations.
SoS (Scoping Opinion, para.4.15)	The SoS considers that it is a matter for the applicant to decide whether or not to submit a stand-alone Health Impact Assessment (HIA). However, the applicant should have regard to the responses received from the relevant consultees regarding health, and in particular to the comments from Public Health England in relation to emissions to air and the Health and Safety Executive in relation to electrical safety issues.	The ES will consider impacts on human health. It is not anticipated that a stand-alone HIA will be prepared.

Organisation	Comment	Applicant's Response
NRW - letter dated 22nd July (page 3)	The applicant is advised that particular attention should be given to acid and nutrient deposition at sensitive habitat receptors.	The assessment methodology states that nitrogen and acid deposition at sensitive receptors will be considered.
NRW - letter dated 22nd July (page 3)	The applicant should instead use the APIS critical load function tool found at http://www.apis.ac.uk/critical-load-function-tool , in order to calculate acid deposition process contributions/exceedences.	The assessment methodology describes the critical load function and states that it will be used in calculating acid deposition process contribution.
NRW - letter dated 22nd July (page 3)	The scope of the Environmental Impact Assessment should widen to include any impact upon this village (Llangyfelach) in addition to any cumulative impact in relation to air quality arising from other sources of pollution e.g. the M4 motorway, the A48, B4489 and Morrision Crematorium	The assessment will consider impacts on Llangyfelach and it will include it as a receptor in the air dispersion model. It is anticipated that emission sources such as the M4 Motorway, the A48, B4489 and Morrison Crematorium will be reflected in the existing baseline that will be used in the assessment of impacts on the village.
PHE - letter dated 23rd July (Page 3)	PHE's view is that the EIA should appraise and describe the measures that will be used to control both point source and fugitive emissions and demonstrate that standards, guideline values or health-based values will not be exceeded due to emissions from the installation.	The ES will detail measures to be used to control stack and fugitive emissions. It will demonstrate compliance with air quality standards and permit limits prescribed in the IED.
PHE - letter dated 23rd July (Page 5)	When considering a baseline (of existing air quality) and in the assessment and future monitoring of impacts these: <ul style="list-style-type: none"> - should include consideration of impacts on existing areas of poor air quality e.g. existing or proposed local authority AQMAs - should include modelling using appropriate meteorological data (i.e. come from the nearest suitable meteorological station and include a range of years and worst case conditions) - should include modelling taking into account local topography 	The ES will consider the Swansea AQMA. The air dispersion modelling will use appropriate meteorological data, agreed with CCS. Terrain data will be used in the air dispersion model.

Noise and Vibration

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.3.32)	The SoS notes the intention for noise monitoring locations for the baseline assessment to be agreed with the local EHO but draws attention to the comment from NRW that the discussion on noise monitoring also needs to be communicated to NRW with particular	PB has held discussions with Huw Morgan (EHO at CCS) to agree survey methodology (including monitoring locations). NRW has also been included in this consultation process.

	reference to an A1 EPR permit which will include noise conditions.	
SoS (Scoping Opinion, para.3.33)	The SoS draws attention to the comments of NRW regarding the requirements of the Environmental Noise Directive, and the Environmental Noise (Wales) (Amendment) Regulations 2009, which have introduced a 'Noise Action Plan for Wales.' This covers industrial noise sources, impacts on designated Quiet Areas and the impact of creeping background, and should be taken into consideration by the applicant.	Noted. This Local and National Policy is referred to in this study, and will be included in the ES.
SoS (Scoping Opinion, para.3.34)	The SoS recommends that information be provided on the types of vehicles and plant to be used during the construction phase. Noise impacts on people should specifically be addressed and in particular any potential noise disturbance at night and other unsocial hours such as weekends and public holidays.	This will be included in the ES.
SoS (Scoping Opinion, para.3.36)	The SoS recommends that the noise and vibration assessment takes account of traffic movements along access routes during the construction phase.	This will be included in the ES.
SoS (Scoping Opinion, para.3.37)	The noise assessment should accurately identify the proximity of the identified noise sensitive receptors to the proposed development. With regards to the operational noise assessment, this should cover all modes of operation of the proposed development.	This will be included in the ES.
NRW – letter dated 22 nd July (Page 4)	The report does reference the BS4142 standard in assessing noise, which should also consider noise characteristics. This being the case it is recommended that the company also capture the existing noise characteristics. I.e. tonal assessment/third octave baseline data.	Surveys will be undertaken to capture this information. Already discussed with SCC.
NRW – letter dated 22 nd July (Page 4)	Noise mitigation measures on an EPR Installation should be in accordance with our (EA/NRW) Horizontal Guidance Note (H3) Part 2 – Noise Assessment and Control.	Noted
NRW – letter dated 22 nd July (Page 5)	In relation to the design aspects of the plant, we would suggest that the applicant designs the operation with no additional noise load on to background in line with the “Noise Action Plan for Wales”. Noise mitigation measures should also include reference to use of acoustic enclosures and cladding for plant and pipe work or ducting likely to produce noise under all operating conditions including abnormal operation.	This will be addressed in the ES and as part of the detailed design.

Ecology

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.3.38)	The SoS recommends that surveys are thorough, up to date and take account of other development proposed in the vicinity.	Each survey report sets out the methodology used and these will be summarised in the ES.
SoS (Scoping Opinion, para.3.38)	These should include surveys for otter in accordance with the recommendations of NRW.	Otter surveys have been undertaken in line with standard methodology.
SoS (Scoping Opinion, para.3.39)	The SoS recommends that the assessment considers any potential impacts on the nature conservation sites in this area.	This will be addressed in the ES.
SoS (Scoping Opinion, para.3.40)	The SoS notes the comments from NRW welcoming the resurveying of the locally significant habitats in Spring/Summer, and expects there to be discussions with the Planning Ecologist for the local planning authority with regards to sensitive siting of the development to mitigate impacts to nature conservation interests.	CCS and NRW will be consulted further once additional information is available.
SoS (Scoping Opinion, para.3.40)	The SoS recommends that the proposals should fully address the need to protect and enhance biodiversity.	This will be addressed in the ES.
SoS (Scoping Opinion, para.3.40)	The assessment should cover habitats species and processes.	This will be addressed in the ES.
SoS (Scoping Opinion, para.3.41)	The assessment should take into account air quality (including dust) and noise and vibration impacts, and cross reference should be made to these specialist reports.	This will be addressed in the ES.
SoS (Scoping Opinion, para.3.43)	The SoS notes the comments of NRW regarding the presence of peat on site, and expects the ES to contain further clarification about the location of the peat and the impact of the proposed development upon it.	This will be addressed in the ES.
SoS (Scoping Opinion, para.3.44)	The SoS notes the comments of NRW regarding the potential impact to local watercourses and recommends the maintenance of open watercourses with wide buffer strips in the design of the development.	This will be considered by the design team.
SoS (Scoping Opinion, para.4.2)	The SoS notes that Burry Inlet Ramsar Site and SPA, Carmarthen Bay and Estuaries SAC and Crymlyn Bog Ramsar Site and SAC are all located within 10km of the proposed development site. The submitted information should	Habitat Regulation Screening Assessment (Stage 1) will be prepared and the CA will be consulted on the findings of the report.

	be sufficient for the Competent Authority (CA) to make an appropriate assessment (AA) of the implications for the site if required by Regulation 61(1) of the Habitats Regulations. The applicant should note that the CA is the SoS.	
SoS (Scoping Opinion, para.4.5)	Where there may be potential impacts on the SSSIs, the SoS has duties under sections 28(G) and 28(I) of the Wildlife and Countryside Act 1981 (as amended) (the W&C Act).	This will be addressed in the ES.
SoS (Scoping Opinion, para.4.8)	If applicants consider it likely that notification may be necessary under s28(I), they are advised to resolve any issues with the NCB before the DCO application is submitted to the SoS. If, following assessment by applicants, it is considered that operations affecting the SSSI will not lead to damage of the special interest features, applicants should make this clear in the ES. The application documents submitted in accordance with Regulation 5(2)(I) could also provide this information. Applicants should seek to agree with the NCB the DCO requirements which will provide protection for the SSSI before the DCO application is submitted.	This will be addressed in the ES.
SoS (Scoping Opinion, para.4.9)	Where a potential risk to an EPS is identified, and before making a decision to grant development consent, the CA must, amongst other things, address the derogation tests in Regulation 53 of the Habitats Regulations. Therefore the applicant may wish to provide information which will assist the decision maker to meet this duty.	This will be addressed in the ES and additional information will be provided where necessary.
SoS (Scoping Opinion, para.4.10)	If an applicant has concluded that an EPS licence is required the ExA will need to understand whether there is any impediment to the licence being granted.	This will be addressed in the ES and additional information will be provided where necessary. It is currently not known if EPS licence is considered necessary as surveys are still on-going.
SoS (Scoping Opinion, para.4.11)	Applicants are encouraged to consult with NRW and, where required, to agree appropriate requirements to secure necessary mitigation. It would assist the examination if applicants could provide, with the application documents, confirmation from NRW whether any issues have been identified which would prevent the EPS licence being granted.	NRW will be consulted as soon as survey results become available to ensure that all issues are considered and addressed with regards to any potential EPS licence application.

Water Quality and Resources

Organisation	Comment	Applicant's Response
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Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.2.45)	The SoS notes that the ES is to contain a Flood Consequences Document. This document should include a description of which areas are at risk from flooding and the exact locations of all watercourses on site, including springs, streams and drainage ditches.	To be included in the FCA. The FCA will identify the locations of surface water features from OS mapping and topographic survey. At risk areas will be identified based on qualitative assessment and flood risk information available from NRW.
SoS (Scoping Opinion, para.3.45)	The SoS notes the comments of NRW that the Flood Consequences Assessment should include consideration of surface water drainage impacts and options for improving site surface water drainage to prevent localised flooding during extreme rainfall events.	To be included in the FCA. The FCA will include consideration of an outline drainage strategy for the scheme which will follow SUDS principles to mitigate the impacts of the development on surface runoff and localised flooding from extreme rainfall.
SoS (Scoping Opinion, para.3.46)	The SoS recommends that the applicant considers temporary attenuation ponds to allow adequate settlement of site generated run-off during the construction and decommissioning phases of the development. The SoS draws the attention of the applicant to NRW's comments that silt fencing, scour protection and Sedimats alone have been proven ineffective in this catchment due to its flashy nature.	Noted. Appropriate mitigation to be discussed with the design team, summarised in the ES and incorporated into any subsequent CEMP.
SoS (Scoping Opinion, para.3.47)	The SoS recommends that the applicant ensures that it can be demonstrated that the surface water disposal scheme would cause no harm to local watercourses upon discharge.	Detailed assessment to be included in the FCA and ES.
SoS (Scoping Opinion, para.3.49)	The SoS notes the concerns of NRW regarding how sewage and waste waters would be managed at the site, the SoS recommends that details of proposed discharges are provided within the ES.	To be included in the FCA and ES.
SoS (Scoping Opinion, para.3.53)	The SoS notes that NRW would set limits on the quantity of water that is discharged from the Power Generation Plant under an Environmental Permit.	Noted and will be discussed in the FCA and ES.
SoS (Scoping Opinion, para.3.54)	The SoS notes the concerns of NRW regarding cooling water, it should be stated within the ES whether any cooling water would be required and if so where it would be derived from and discharged to.	To be included in the ES. At this stage water cooling is not anticipated. Water requirements are dependent on the adopted technology and will be discussed in full in the ES.
SoS (Scoping Opinion, para.3.55)	The SoS notes the concerns of Dwr Cymru (Welsh Water) regarding the potential impact of the development on water quality within the Lower Lliw Reservoir. It is recommended that the applicant assesses potential impacts on this reservoir including potential impacts	Migration of runoff from the site to the Lower Lliw Reservoir is expected to be limited but will be assessed in the ES. Direction of groundwater flow will be assessed in the Ground Investigation. Impacts of deposition and rainfall to be considered in ES Air Quality Chapter.

Organisation	Comment	Applicant's Response
	from deposition and affected rainfall.	
SoS (Scoping Opinion, para.3.56)	The SoS recommends that the applicant consults Dwr Cymru regarding the 48" strategic water main that crosses the application site.	The design team already in contact with Dwr Cymru. An easement to the water main is included in preliminary design layouts.
NRW (letter dated 23 rd July, page 5)	The Llan in fact discharges to the Loughor Estuary on North Gower via Penllergaer, Fforestfach and Gowerton. Shellfish are harvested in the vicinity and so any impact assessment should also consider any potential for impact upon Designated Shellfisheries.	Noted. The PEIR (Section 2.3) has been updated to reflect discharge route. ES to consider impacts on shellfish.
NRW (letter dated 23 rd July, page 6)	Groundwater contamination should also be a consideration when dealing with the landfill at the location. Although this landfill was operated as an inert landfill, this is not to say that it is exclusively filled with inert wastes. Any disturbance, or excavation, reuse, temporary storage and disposal of this material should not preclude the possibility of it containing non-inert and potentially hazardous substances. An assessment of this element of the scheme may be necessary in the form of trial pits or boreholes in order to determine materials present. NRW should be made aware of any adverse findings.	Unlikely that the landfill will be disturbed. Full assessment will be included in the ES. Ground Investigation will assess contamination along the route which is to be a requirement of the DCO.
PHE (letter dated 23 rd July, page 6)	<p>When considering a baseline (of existing water quality) and in the assessment and future monitoring of impacts these:</p> <ul style="list-style-type: none"> - should include assessment of potential impacts on human health and not focus solely on ecological impacts - should identify and consider all routes by which emissions may lead to population exposure (e.g. surface watercourses; recreational waters; sewers; geological routes etc.) - should assess the potential off-site effects of emissions to groundwater (e.g. on aquifers used for drinking water) and surface water (used for drinking water abstraction) in terms of the potential for population exposure - should include consideration of potential impacts on recreational users (e.g. from fishing, canoeing etc) alongside assessment of potential exposure via drinking water. 	This will be included in the ES.

Geology, Ground Conditions and Hydrogeology

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.3.60)	The SoS welcomes that the foundations of the development will be designed so as not to present a preferential pathway for contaminant migration if present at the project site. The SoS notes that this consideration should be extended to other works forming part of the development, including underground gas and electricity connections.	This will be included in the ES.
SoS (Scoping Opinion, para.3.61)	The SoS draws the attention of the applicant to the comments of the Coal Authority indicating that the site is in a Development High Risk Area, as the site has been subject to past coal mining activity and is located within an area of surface coal resource.	Obtained Coal Authority Report. Findings summarised in Section 10.2 of the PEIR and will be considered in the ES.
SoS (Scoping Opinion, para.3.62)	The SoS recommends that the applicant takes into consideration the location and stability of abandoned mine entries, the extent and stability of shallow mine workings, outcropping coal seams, unrecorded mine workings, hydrogeology, minewater and minegas.	Obtained Coal Authority Report. Findings summarised in Section 10.2 of the PEIR and will be considered in the ES.
SoS (Scoping Opinion, para.3.63)	The SoS recommends that the applicant considers, if surface coal resources are present, whether prior extraction of the mineral resource is practical and viable. The applicant should also consider whether Coal Authority permission is required to intersect, enter, or disturb any coal or coal workings during site investigation or development work.	Obtained Coal Authority Report. Findings summarised in Section 10.2 of the PEIR. There are no surface coal resources present. Coal Authority Permit is required.
NRW (letter dated 22 nd July, page 5)	Site survey work undertaken should take into account current environmental permitting and likely future requirements under the Industrial Emissions Directive (IED) to undertake intrusive works to gather baseline contamination data as part of the environmental permitting process.	This will be identified in the ES as embedded mitigation.
PHE (letter dated 23 rd July, page 6)	We would expect the promoter to provide details of any hazardous contamination present on site (including ground gas) as part of the site condition report.	This will be included in the ES.

Landscape and Visual Impacts

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.3.66)	Within the Scoping Report it is stated that visual impacts of the proposed development on the Gower Area of Outstanding Natural Beauty (AONB) will	Two of the preliminary viewpoints have been selected within the Gower (pVP 12 and pVP13) and will be assessed and reported.

	<p>be scoped out of the assessment as the site is visually separated from the AONB by topography. The SoS expects that the ES should contain confirmation that the stacks required as part of the development, which will be up to 60m in height, will not be visible from the AONB. On the basis of providing such confirmation, the SoS agrees that these impacts may be scoped out of the assessment.</p>	
SoS (Scoping Opinion, para.3.67)	<p>The SoS recommends that the applicant provides a description of existing landscape interests within and in the vicinity of the proposed development site.</p>	<p>This description will be included in the ES and is in the PEIR in Section 11.2.</p>
SoS (Scoping Opinion, para.3.68)	<p>The SoS recommends that lighting impacts be considered in the ES.</p>	<p>A lighting strategy will be drafted.</p>
SoS (Scoping Opinion, para.3.71)	<p>It is recommended that the applicant takes into account any concerns raised by the relevant aerodrome license holders/operators.</p>	<p>The CAA will be consulted.</p>
SoS (Scoping Opinion, para.3.72)	<p>It is recommended that the applicant gives consideration to whether there would be any need for aviation warning lighting.</p>	<p>Noted. This will be included in the design.</p>
SoS (Scoping Opinion, para.3.73)	<p>The applicant should note National Grid's right of access to maintain, repair and inspect their asset, the need to maintain the statutory electrical safety clearances at all times and the requirement that no permanent structures are built directly beneath overhead lines.</p>	<p>This will be included in the design.</p>
SoS (Scoping Opinion, para.3.74)	<p>Plant, machinery, equipment, buildings or scaffolding should not encroach within 5.3 metres of any high voltage conductors when those conductors are in their worst conditions of maximum 'sag' and 'swing'.</p>	<p>This will be included in the design.</p>
SoS (Scoping Opinion, para.3.75)	<p>The SoS recommends that where any landscaping is proposed, only slow and low growing species of trees and scrubs should be planted beneath and adjacent to the existing transmission line. The applicant should note that drilling and excavation work should not be undertaken if it has the potential to disturb or adversely affect the foundations of an existing tower.</p>	<p>This will be identified in the landscape strategy.</p>
SoS (Scoping Opinion, para.3.76)	<p>The applicant should remain aware that National Grid has a Deed of Grant of Easement for each pipeline, preventing the erection of permanent or temporary buildings or structures, changes to</p>	<p>Noted.</p>

	existing ground levels, storage of materials etc.	
SoS (Scoping Opinion, para.3.77)	The SoS recommends that where construction traffic cannot use existing roads it is agreed with National Grid at which locations construction traffic would cross any pipelines. The applicant should also note that written permission is required from National Grid before any works can commence in the National Grid easement strip.	Noted.
SoS (Scoping Opinion, para.3.78)	The SoS recommends that the applicant takes note of National Grids requirements regarding the laying of cables across any pipeline as appropriate.	Noted.
SoS (Scoping Opinion, para.3.79)	The SoS recommends that the applicant has an awareness of the Health and Safety Executive's guidance document HS(G) 47 'Avoiding Danger from Underground Services' and National Grid's specification for Safe Working in the vicinity of National Grid High Pressure gas pipelines and associated installations – requirements for third parties T/SP/SSW22.	Noted.
SoS (Scoping Opinion, para.3.80)	The SoS notes that any excavations within 3m of a National Grid High Pressure Pipeline or within 10m of an above ground installation the exact depth and position of the pipeline will need to be confirmed on site under the supervision of a National Grid representative.	Noted.
SoS (Scoping Opinion, para.3.81)	The SoS notes the comments made by the Health and Safety Executive in relation to electrical safety, it is recommended that it is ensured that the proposed design and future operations are compliant with the Electricity at Work Regulations 1989 and the Electricity, Safety, Continuity and Quality Regulations 2002 as amended.	This will be considered by the design team.
SoS (Scoping Opinion, para.3.82)	Where applicable the applicant will be required to gain property agreements with Network Rail's Easements and Wayleaves Team.	Noted.
CAA (Email dated 30 th June, Page 2)	The EIA must include a description of all the existing landscape interests within and in the vicinity of the proposed development. This should be done using former Countryside Council for Wales' LANDMAP methodology.	This will be included in the ES.

<p>CAA (Email dated 30th June, Page 2)</p>	<p>Such issues should all be addressed in the ES and visual appraisal of the scheme in addition to specific site issues such as:</p> <ul style="list-style-type: none"> • Development infrastructure – including cabling, ancillary buildings, working compounds should all be considered in the assessment, even if ‘temporary’ (i.e. only for the duration of construction works). the removal and disposal of any excavated materials such as soil or rock; • Creation of new access tracks and re-profiling of existing ones; • Transmission route connections to the main power grid; it is important that a landscape assessment of the connection route from the development to the power grid is included for consideration 	<p>This will be included in the ES.</p>
<p>NRW (letter dated 22nd July, page 9)</p>	<p>The EIA must include a description of all the existing landscape interests within and in the vicinity of the proposed development. This should be done using former Countryside Council for Wales’ LANDMAP methodology (www.landmap.ccw.gov.uk).</p>	<p>Summary LANDMAP data has been provided in the baseline information for the PEIR. The ES will contain information on all five LANDMAP aspects for the study area.</p> <p>NRW has been contacted and help received from the LANDMAP team in Bangor.</p>
<p>NRW (letter dated 22nd July, page 9)</p>	<p>Such issues should all be addressed in the ES and visual appraisal of the scheme in addition to specific site issues such as:</p> <ul style="list-style-type: none"> • Development infrastructure – including cabling, ancillary buildings, working compounds should all be considered in the assessment, even if ‘temporary’ (i.e. only for the duration of construction works). • The removal and disposal of any excavated materials such as soil or rock; • Creation of new access tracks and re-profiling of existing ones; • Transmission route connections to the main power grid; it is important that a landscape assessment of the connection route from the development to the power grid is included for consideration 	<p>These issues will be considered in the ES.</p>
<p>NRW (letter dated 22nd July, page 9)</p>	<p>The ES should also consider the presence of any historic landscapes in the area and the potential impact that the proposed development may have on these.</p>	<p>The ES will assess archaeological historical receptors in the Cultural Heritage and Archaeology Chapter. The Landscape Chapter will consider issues related to setting, the historic landscape</p>

		where it contributes to character and any relevant Historic Parks and Gardens.
NRW (letter dated 22nd July, page 9)	The ES should consider protected landscapes in the vicinity of the proposals.	Protected landscape has been considered and the Gower AONB will be further addressed in the ES. The Brecon Beacons National Park is not considered to be affected by a stack of 40 m (refer to ZTV) due to the intervening distance. Preliminary viewpoints have been proposed (with grid references and OS background mapping to help with location) and further consultation will be undertaken.
NRW (letter dated 22nd July, page 9)	We advise that views in photographs and photomontages taken to assist with this process should be representative of that observed from each viewpoint and not partially obscured by structures such as buildings, pylons, telegraph poles, trees etc.	All photos taken will adhere to the Landscape Institute guidelines on photography.

Archaeology and Cultural Heritage

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.3.90)	The SoS notes that the applicant may provide screen planting should the project give rise to any adverse impact on above ground heritage assets.	To be included in the Landscape Strategy.
SoS (Scoping Opinion, para.3.91)	The SoS recommends the inclusion of aerial photographs and LiDAR within search information and draws the applicant's attention to the comments of Cadw in this regard.	Aerial photographs and LiDAR have been ordered and will be considered in the ES.
SoS (Scoping Opinion, para.3.92)	The SoS directs the applicant to Cadw's comment regarding the referenced Standard and Guidance for Archaeological Assessment (2011) being superseded by the Standard and Guidance for historic environment desk-based assessment (2012).	Noted
SoS (Scoping Opinion, para.3.93)	It is recommended that photographs from each asset towards the development be produced and where an adverse impact is thought likely to occur a photomontage should be produced.	Photomontages will be prepared as required and will include views from heritage assets.
SoS (Scoping Opinion, para.3.94)	The SoS directs the applicant to Cadw's comment regarding the reference to Registered Battlefields; as not applicable in Wales this reference should be removed, but the ES should include consideration of potential impacts to Registered Historic	Noted

	Landscapes.	
SoS (Scoping Opinion, para.3.95)	The SoS recommends that tranquillity be added to the list of factors considered relevant when assessing impacts on setting.	Will be included in the PEIR (Table 13.3) and the ES.
Cadw (letter dated 24 th July, page 1)	Searches should include aerial photographs as held by Central Register of Air Photography for Wales and also LIDAR information held by National Resources Wales.	Will be included in the ES.
Cadw (letter dated 24 th July, page 2)	This work should be undertaken by a Member of the Institute for Archaeologists (IfA) and ideally an IfA registered organisation.	This will be complied with.

Traffic, Transport and Access

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.3.87)	The SoS recommends that the applicant consults Network Rail's Asset Protection Engineers if the development could result in abnormal loads using routes that include Network Rail assets such as level crossings/bridges etc.	The rail network will not be affected by the Project. Network Rail will be consulted to confirm this.

Cumulative Effects

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.3.69)	The SoS recommends that the applicant consider the inclusion of the following developments identified by Swansea Council including: Mynydd y Gwair Wind Farm, Felindre Business Park and Brynwhilach Solar Park.	These proposals are listed in the PEIR in Section 4.8.
SoS (Scoping Opinion, para.3.70)	The SoS also recommends that the proposed sustainable urban village at Felindre is considered within the assessment.	Will be included in the ES.

Other Issues

Organisation	Comment	Applicant's Response
SoS (Scoping Opinion, para.4.17)	The SoS recommends that the applicant should state clearly what regulatory areas are addressed in the ES and that the applicant should ensure that all relevant authorisations, licences, permits and consents that are necessary to enable operations to proceed are described in the ES. Also it should be	List or table of other consents required to be included in the CEMP.

	clear that any likely significant effects of the proposed development which may be regulated by other statutory regimes have been properly taken into account in the ES.	
SoS (Scoping Opinion, para.4.21)	The SoS recommends that the ES should identify whether the proposed development has the potential for significant transboundary impacts and if so, what these are and which EEA States would be affected.	See Section 4.10 of the PEIR.
Health and Safety Executive (letter dated 21 st June, page 1)	The developer is advised to consider whether storage of hazardous substances is involved and, if so, whether Hazardous Substances Consent is required.	The Project is not a COMAH site, so a Hazardous Substances Consent is not required.
PHE (letter dated 23 rd July, page 7)	PHE would expect to see information about how the promoter would respond to accidents with potential off-site emissions e.g. flooding or fires, spills, leaks or releases off-site.	The construction phase would be covered by the CEMP and the operational phase will be covered by the APL Operational Procedures.
PHE (letter dated 23 rd July, page 7)	The EIA should include consideration of the COMAH Regulations (Control of Major Accident Hazards) and the Major Accident Off-Site Emergency Plan (Management of Waste from Extractive Industries) (England and Wales) Regulations 2009	The quantities of 'dangerous' substances stored at the plant do not meet the lower thresholds which require implementation of the COMAH Directive; instead the plant is subject only to national legislation (e.g. occupational safety and health regulations).
PHE (letter dated 23 rd July, page 11)	The promoter should consult the local authority, Food Standards Agency Wales and NRW.	The Applicant has contacted SCC and NRW. It will also contact the Food Standards Agency during the S47 consultation.

APPENDIX 6.1: PRELIMINARY STACK SENSITIVITY ASSESSMENT

Introduction

- 1.1.1 This Appendix presents the modelling inputs and results from the preliminary stack sensitivity assessment, undertaken to ensure that the chosen stack height is sufficient to allow adequate dispersion of emissions.
- 1.1.2 The preliminary stack sensitivity assessment has considered a range of stack heights and compared impacts based on the following:
- maximum annual and 1 hour ground level concentrations of NO₂ at off-site locations to assess potential impacts on human receptors; and
 - annual ground level concentration of NO_x and nitrogen deposition at Lletty Morfil Site of Importance for Nature Conservation (SINC) and Ancient Woodland to assess potential impacts on ecological receptors.
- 1.1.3 The stack sensitivity assessment has also considered baseline levels of NO₂ and nitrogen deposition.

Assessment Methodology

Realistic Worst Case Scenario for the Stack Sensitivity Assessment

- 1.1.4 The realistic worst case scenario for the air dispersion modelling utilised the Project parameters set out in Table 1.
- 1.1.5 The ground level impact of an emission to air is determined by various factors including atmospheric conditions and the effective height of the release. For all meteorological conditions, the higher the effective release height, the lower the ground level impacts.
- 1.1.6 The effective height of the release is, in turn, determined by the physical height of the release (the stack height), the height of nearby buildings and the buoyancy of the plume in providing initial plume rise before the exhaust gases become well mixed with the surrounding air.
- 1.1.7 The buoyancy of a plume increases with increasing temperature of the exhaust gases and also with increasing volume flow. Therefore, to ensure a conservative (realistic worst case) assessment of impacts, the stack sensitivity assessment is based on a scenario employing 5 x 60MW generators and, furthermore, it is assumed that the plumes do not merge.
- 1.1.8 The operation of the Power Generation Plant will be limited through the permitting regime to 1500 hours per annum. The assessment is, therefore, based on the operation of the Plant, at full load, for 1500 hours

per annum. Actual operational times are likely to be lower, typically 500 hours of operation in 2 to 3 hour tranches. As a result, the assumed realistic worst case scenario is considered robust.

Table 1 Realistic Worst Case Scenario for Air Quality Impacts

Parameters	Details
Power Generation Plant	
Number of gas turbine units	5 (~ 60 MWe)
Number of stacks	5
Height of Stacks	30m
Unit type	Aero derivative

Dispersion Modelling – Stack Parameters

1.1.9 The stack sensitivity assessment utilised the ADMS model (v5.0) developed by Cambridge Environmental Research Consultants (CERC). The stack parameters have been utilised in the model. The parameters are based on data provided by Pratt and Witney FT4000 SWIFTPAC package.

Table 2 Emission parameters for the Abergelli Power Project. Emissions are provided per generator.

Parameter	Value Per Generator
Type	Simple Cycle Gas Turbine
Number	5
Discharge Location	In a row, oriented approximately northwest-southeast from (265490, 201311) to (265582,201247)
Discharge Heights Tested (m)	15 – 45
Flue Exit Diameter (mm)	4486
Discharge Temperature (°C)	479
Flow Rate (m ³ /s)	395
Flow Rate (Nm ³ /s, dry, reference O ₂ ^a)	132
Exit Velocity (m/s)	25
NO _x Concentration (mg/Nm ³)	50
NO _x Emission Rate (g/s)	6.61
CO Concentration (mg/Nm ³)	100
CO Emission Rate (g/s)	13.23

Actual release: oxygen 15.07% (dry), moisture 6.78%. Reference conditions 15% oxygen, dry

1.1.10 The only pollutants of concern in relation to gas combustion are nitrogen

oxides (NO_x) and carbon monoxide (CO). Gas combustion does not generate significant quantities of particulate matter and sulphur dioxide emissions will be negligible since the sulphur content of natural gas from the NTS will be negligible.

- 1.1.11 The stack sensitivity assessment was therefore based on potential impacts from emissions of NO_x.

Building Downwash

- 1.1.12 The dispersion model takes into account the effects of building downwash¹ of pollutants. The principal buildings in terms of downwash are the turbine housing units. These have been included in all model runs at a height of 10m (above local ground level), with a footprint of 39m x 16m oriented northwest-southeast. Each stack is located at the centre of a turbine unit.

Meteorological Data

- 1.1.13 The model used hourly sequential meteorological data from The Mumbles for five years from 2009 to 2013. The Mumbles lies 15km to the south of the Project Site. The open setting of the Project Site, with relatively sparse urban/light industrial development in the vicinity, is taken into account in the modelling by setting the surface roughness length to 0.2m. This is the value recommended by the model developers for agricultural areas (with short vegetation).
- 1.1.14 The predominant winds are south-westerly in all years. The wind roses for 2009 to 2013 are provided in Appendix 6.2.

Model Domain

- 1.1.15 The stack sensitivity assessment model domain was modelled with a grid with 25m resolution (2.5km x 2.5km). This fine grid is well within the recommended minimum grid spacing of 1.5 times the stack height (1.5 x 30m = 45m).

Terrain

- 1.1.16 Terrain was included in the modelling, with data input at a resolution of 15m over a domain of 2.5km x 2.5km. The terrain grid resolution within the ADMS model was set to 64 x 64. This grid resolution is recommended by Cambridge Environmental Research Consultants (CERC) (the developers of the model) as sufficient for most calculations and showed insignificant differences.

¹ Downwash is the enhanced turbulent mixing of pollutants in the lee of buildings which can result in high pollutant concentrations in the wake of the building.

Atmospheric Chemistry

- 1.1.17 Emissions of nitrogen oxides (NO_x) from combustion sources include both nitrogen dioxide (NO₂) and nitric oxide (NO), with the majority being in the form of NO. In ambient air, NO is oxidised to form NO₂, and it is NO₂ which has the more significant health impacts. For this assessment, the conversion of NO to NO₂ has been estimated using the worst case assumptions set out in Environment Agency guidance², namely that:
- For the assessment of long term (annual mean) impacts, at receptors 70% of NO_x is NO₂;
 - For the assessment of short term (hourly mean) impacts, at receptors 35% of NO_x is NO₂.
- 1.1.18 The oxidation of NO to NO₂ is not, however, an instantaneous process. Where the maximum impacts occur within a few hundred metres of the stacks (as will be shown to be the case for the Project), the Environment Agency worst case assumptions are very conservative.
- 1.1.19 It is anticipated that a sensitivity testing of the impacts under alternative assumptions relating to the oxidation of NO to NO₂ will be undertaken as part of the full assessment. Specifically, the empirical relationship derived by Janssen *et al*³ will be considered. The relationship is derived from concentrations of NO_x observed in power station plumes and provides a lower bound on the realistic potential conversion of NO to NO₂.

Deposition

- 1.1.20 The deposition of nitrogen is modelled using a deposition velocity approach, where the surface flux of pollutants is modelled by multiplying the ground level concentration by a pollutant specific deposition velocity. The velocity used in the assessment of nitrogen deposition from nitrogen dioxide was 1.5mm/s for short vegetation and 3.0mm/s for tall vegetation⁴.
- 1.1.21 For the emissions from the Generating Equipment, only nitrogen deposition need be considered for the stack sensitivity assessment. Impacts due to emissions of sulphur dioxide and, by inference deposition of sulphur, have been scoped out of the assessment since natural gas is an inherently low sulphur fuel. However, background levels of sulphur

² Conversion Ratios for NO_x to NO₂, Air Quality Modelling and Assessment Unit – Environment Agency, <http://www.environment-agency.gov.uk/business/regulation/38791.aspx>

³ Janssen *et al*, A classification of NO oxidation rates in power plant plumes based on atmospheric conditions, Atmospheric Environment Vol 22, No 1, pp43-53, 1988

⁴ Nitrogen oxide, NO, is relatively inert and insoluble and, as such, does not deposit onto surfaces as readily as nitrogen dioxide. The deposition velocity approach is, therefore, applied to modelled concentrations of nitrogen dioxide only.

deposition will be considered in the assessment of acidification as part of the full assessment.

Emission Scenario

- 1.1.22 As previously stated, the Power Generation Plant will operate as a peaking plant, providing a maximum of 1500 hours of output over a year. This operating limit will be set out in the site Environmental Permit to operate and will not be exceeded. As noted previously, typical operating hours for the plant are more likely to be of the order of 500 hours. As a result, the assumed realistic worst case scenario is considered robust.
- 1.1.23 The stack sensitivity assessment takes into account this limited operation of the plant i.e. is based on a realistic worst case. However, since it is not possible to specify which hours of the year the plant will operate, the method by which this is taken into account in the dispersion modelling is dependent on the metric being assessed i.e. annual, daily, eight-hour or hourly mean concentrations.
- 1.1.24 The impacts of the Project on short term (eight hours or less) pollutant concentrations were modelled with the assumed full load operation of all five generators simultaneously and continuously for a whole year. This is appropriate since the UK and EU objectives and limit values for hourly concentrations of NO₂ are based on the 18 highest and highest concentrations respectively over a year and, with 1500 hours of operation, it is near certain that operations will, at times, coincide with examples of the poorest dispersion conditions.
- 1.1.25 In relation to long term (annual mean) concentrations assuming full load operation for the year will be unrealistic. Therefore, long term impacts were estimated by scaling the results for continuous full load operation by the likely operating time i.e. $0.171 (=1500 \text{ (maximum hours of operation)}/8760 \text{ (total hours in a year)})$. This approach is appropriate and is based on the assumption that the range of meteorological conditions under which the generators will operate will, over the 1500 hours, be statistically similar to those experienced over a year.

Assessment Criteria

- 1.1.26 In relation to ambient pollutant concentration, the criteria used for the assessment of operational impacts are the air quality objectives and limit values set out in Section 6.2 of the PEIR. For deposition, no comparable regulated standards exist and the impacts are assessed against critical loads. Critical loads are set for effects due to eutrophication (nitrogen deposition) and acidification (combined action of sulphur and nitrogen deposition). It is reiterated that the critical loads are set at levels below which significant harmful effects do not occur.
- 1.1.27 The critical loads considered in the assessment of Sites of Special

Scientific Interest (SSSI) and Special Area of Conservation (SAC) sites were taken from the Air Pollution Information System (APIS) website, using the facility to extract site-specific relevant critical loads⁵. The critical loads are shown in Table 3. To ensure that the worst case critical load has been considered a critical load of 5 kgN/ha/yr was also included as part of the preliminary stack sensitivity assessment.

Table 3: Critical loads for nitrogen deposition for Lletty Morfil SINC. Data taken from APIS website.

Designated Site	Habitat	APIS Classification	Nitrogen kgN/ha/yr	
			Min	Max
Lletty Morfil SINC	Ancient Woodland	Broadleaved/Mixed/Yew Woodland	10	20
	Meadows	Neutral Grassland	20	30

Significance Criteria

- 1.1.28 The stack sensitivity assessment makes reference to the Environment Agency guidance (H1 Annex f) on screening of significant impacts. To determine the potential significance of the predicted impacts at varying stack heights, two parameters are presented:
- a the Process Contribution (PC) which is the pollutant concentration resulting from the contribution of the Power Generation Plant alone; and
 - b the Predicted Environmental Concentration (PEC) which is the background concentration plus the process contribution.
- 1.1.29 Both metrics are considered as absolute pollutant concentrations and as a percentage of the relevant assessment standard. Based upon the EA's H1 guidance the significance criteria for assessing impacts in the assessment are set out below.
- 1.1.30 The PC can be considered insignificant if:
- the long term process contribution is <1 per cent of the long term air quality standards or guidelines;
 - the short term process contribution is <10 per cent of the short term air quality standards or guidelines.
- 1.1.31 The EA guidance states that detailed modelling of emissions may be useful when:

⁵ <http://www.apis.ac.uk/src/>, data accessed 5th August 2014.

- the long term PEC is >70% of the relevant standard;
- the short term PEC >20% of the relevant standard (assuming short term background is twice the long term background).

1.1.32 Therefore, long and short term impacts will be considered not significant if PEC<70% and <20% respectively.

1.2 Results

1.2.1 Stack height sensitivity testing was undertaken using the emissions data set out in Table 2 and meteorological data from 2009-2013. Initial runs indicated that 2009 was the worst meteorological year for annual and 1-hour concentrations of NO₂ and 2011 for nitrogen deposition at Lletty Morfil SINC.

1.2.2 With exceedences of the critical load for nitrogen deposition in the study area, it was considered that an appropriate metric for determining a suitable stack height was that deposition over the most affected designated site (Lletty Morfil SINC) should not exceed 1% of the critical load whilst also ensuring that the annual mean NO₂ PC was below 1% and/or the PEC is below 70% of the air quality objective. This metric was used to ensure impacts on human health were not significant. It should be noted that impacts on nitrogen deposition or NO₂ concentrations above 1% may not necessarily be perceptible but, a numerical level is set for the purposes of a conservative assessment.

1.2.3 Table 4 and the associated figure (Insert 1) show the results of the stack height sensitivity testing based on an assessment of the PC. Significant benefits are seen as the stack height increases from 15m to 25m, as the impacts of building downwash reduce. Beyond this height, whilst benefits are still seen with increasing stack height, the rate of reduction in impacts progressively decreases.

1.2.4 The closest sensitive habitat is the Lletty Morfil SINC ancient woodland. For this APIS gives a critical load range of 10 – 20kgN/ha/yr. However, to ensure a conservative assessment, a 5kgN/ha/yr critical load has also been applied on a precautionary basis.

1.2.5 By 30m, nitrogen deposition at Lletty Morfil SINC ancient woodland is less than 1% of the upper range critical load and by 35 m it drops below 1% of the lower range of the critical load. At 40 m, nitrogen deposition falls below 1% of the 5kgN/ha/yr critical load. Any impacts arising from an increase in nitrogen deposition of 0.08kgN/ha/yr (35m) or 0.05kgN/ha/yr (40m) (1.5% and 0.9% of the precautionary critical load respectively or 0.8% and 0.5% of the critical load for the qualifying habitat) will be small and imperceptible, both in isolation and in combination with background deposition which exceeds 28kgN/ha/yr.

1.2.6 Table 4 shows that annual mean NO₂ concentrations falls below the 1%

of the air quality objective at 40 m. Hourly mean NO₂ concentrations fall below 10% of the air quality objective at 35 m. Following EA guidance the PEC from the Power Generation Plant for ambient NO₂ is also considered.

1.2.7 Table 5 and the associated figure (Insert 2) show the results of the stack height sensitivity testing based on an assessment of the PEC. The background concentrations used were based on Defra's mapped background data over the Project Site, detailed in Chapter 6 of the PEIR. The PEC for annual mean NO₂ is below 70% of the air quality objective at all stack heights. The PEC for the 1 hour NO₂ is below 20% of the air quality objective at 35 m.

1.2.8 The preliminary stack sensitivity assessment indicates that a minimum stack height of 35 m will be adequate and will ensure that emissions are dispersed and no significant impacts on human and ecological receptors occur.

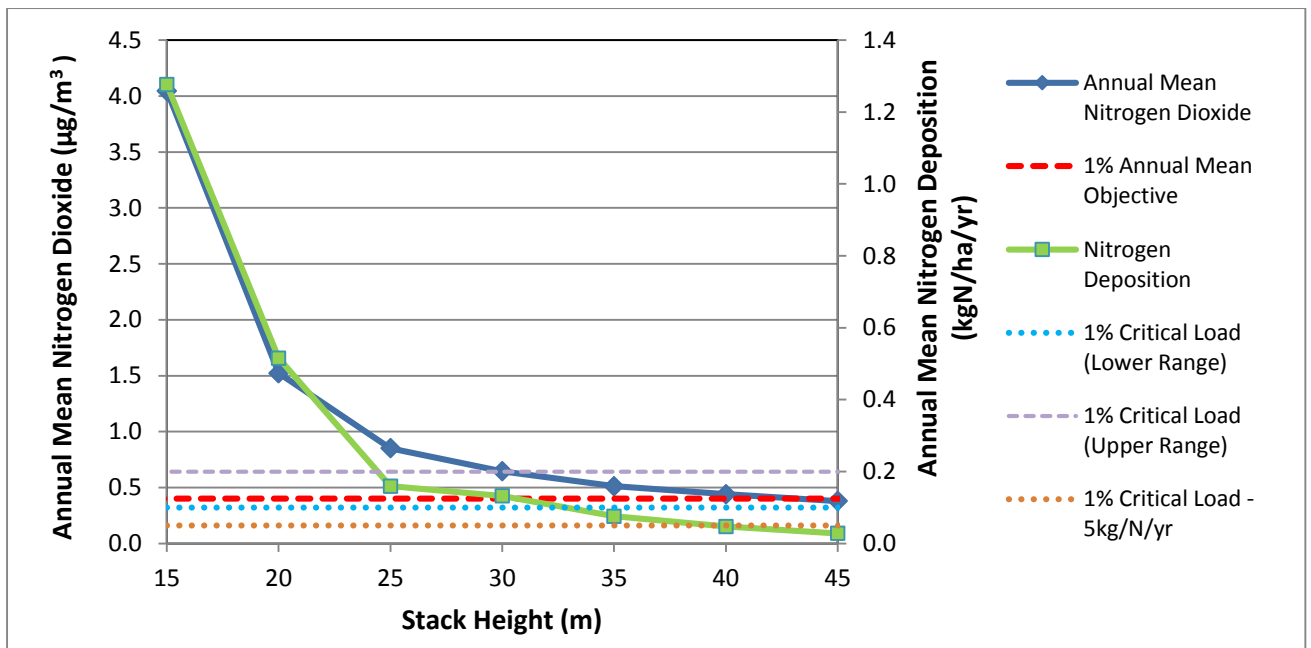
Table 4 Stack height sensitivity testing results based on the PC

Stack Height	Maximum Impacts in Study Area		Maximum Impacts over Designated Site	
	Annual Mean Nitrogen Dioxide	Hourly Mean Nitrogen Dioxide	Annual Mean Nitrogen Oxides	Annual Mean Nitrogen Deposition
Objective	40 µg/m ³	200 µg/m ³	30 µg/m ³	10 kgN/ha/yr
15	6.1	154.6	6.3	1.82
20	1.5	99.7	2.6	0.74
25	0.9	64.8	0.8	0.23
30	0.6	29.2	0.6	0.19
35	0.5	19.1	0.3	0.09
40	0.4	16.0	0.2	0.05
45	0.4	13.6	0.1	0.03

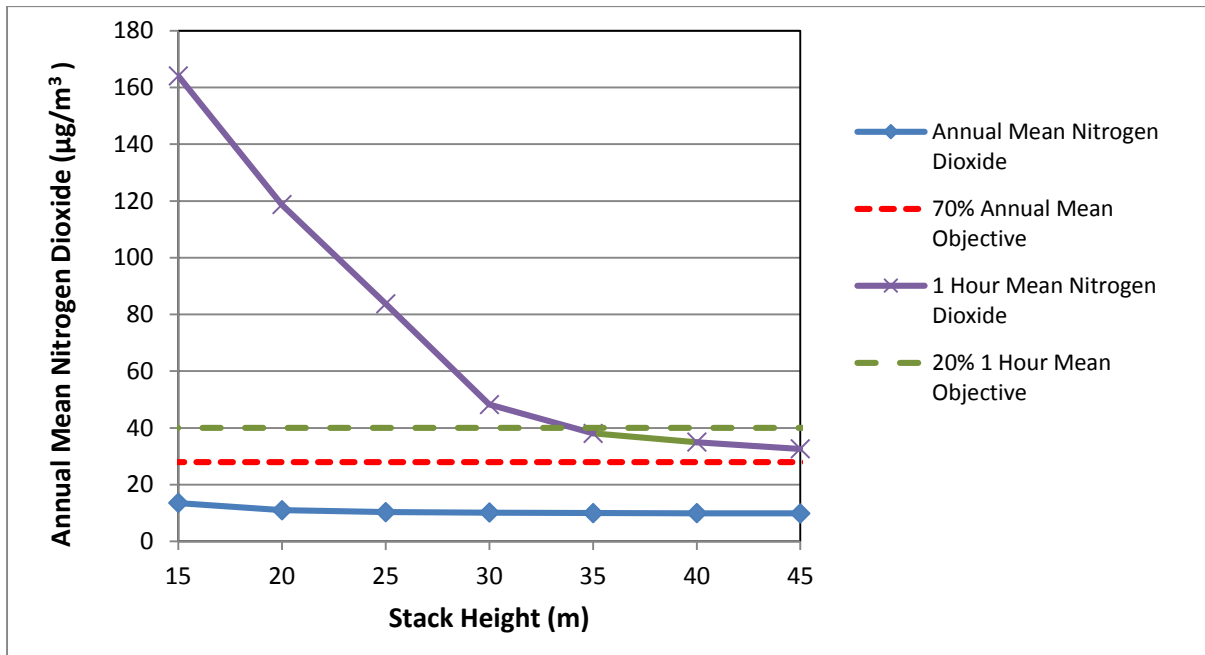
Table 5 Stack height sensitivity testing results based on the PEC

Stack Height	Maximum Impacts in Study Area	
	Annual Mean Nitrogen Dioxide	Hourly Mean Nitrogen Dioxide
Objective	40 µg/m ³	200 µg/m ³
Background	9.5 µg/m ³	19 µg/m ³
15	13.5	164.1
20	11.0	118.7
25	10.4	83.8

Stack Height	Maximum Impacts in Study Area	
	Annual Mean Nitrogen Dioxide	Hourly Mean Nitrogen Dioxide
Objective	40 $\mu\text{g}/\text{m}^3$	200 $\mu\text{g}/\text{m}^3$
Background	9.5 $\mu\text{g}/\text{m}^3$	19 $\mu\text{g}/\text{m}^3$
30	10.1	48.2
35	10.0	38.1
40	9.9	35.0
45	9.9	32.6



Insert 1 (Table 4): Stack height sensitivity testing based on PC

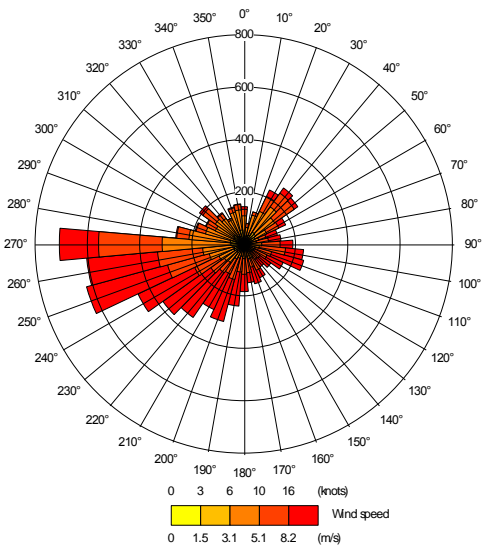


Insert 2 (Table 5): Stack height sensitivity testing based on the PEC

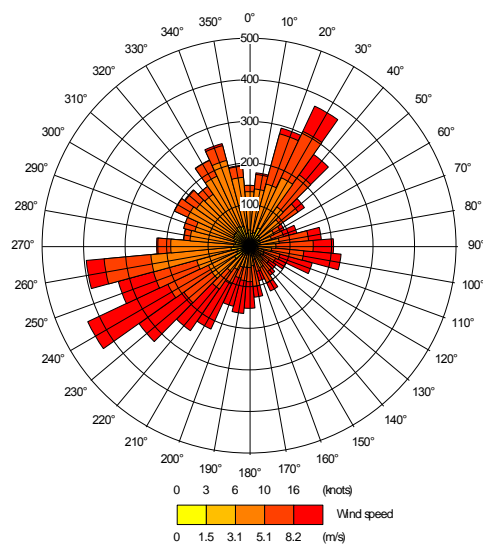
1.3 Summary and Conclusions

- 1.3.1 Dispersion model runs were undertaken for various stack heights between 15m and 45m with a model grid resolution of 25m. The appropriate stack height was determined using the criteria set out in EA's H1 Annex F guidance.
- 1.3.2 The preliminary stack sensitivity assessment indicates that a stack height of over 35 m will be sufficient in ensuring the effective dispersal of emissions. It is noted that this is a preliminary assessment that will be finalised using local meteorological data and refined modelling inputs as part of the ES.

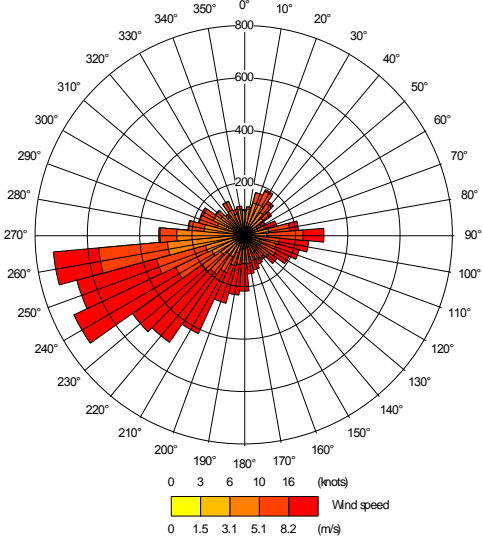
Appendix 6.2: Meteorological Data



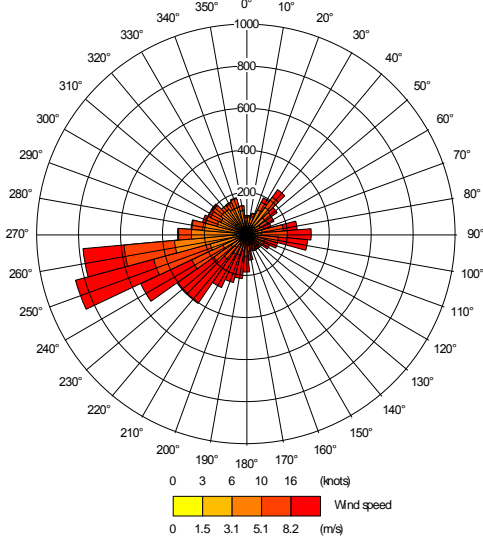
2009



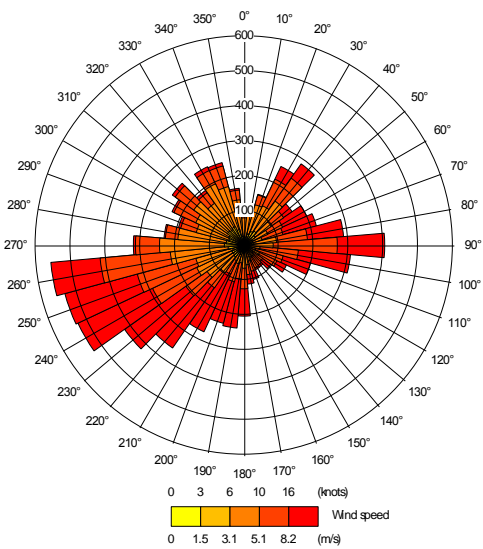
2010



2011



2012



2013

ABERGELLI AMBIENT NOISE SURVEY REPORT

Abergelli Power Ltd

287521A

Issue 1

Abergelli Ambient Noise Survey Report

287521A

Prepared for

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1 INTRODUCTION

1.1 Background

1.1.1 Parsons Brinckerhoff has been commissioned by Abergelli Power Ltd to undertake an assessment of ambient background noise levels at Abergelli Farm, near Swansea in South Wales. The purpose of the survey is to provide baseline noise information, which will be used to inform an Environment Impact Assessment for the proposed Abergelli Power Project.

1.1.2 A glossary of acoustics terminology is provided in Annex A.

1.2 Site Description

1.2.1 The Project Site is situated in a rural area to the south of Abergelli Farm. The site is surrounded by agricultural land and scattered farms in all directions, with small clusters of housing. To the south, at a distance of approximately 1 km, is Morriston General Hospital and the M4 motorway corridor. To the west of the site, at approximately 300 m, is a gas compressor station and an electrical sub-station. To the north at approximately 1.2 km is a large water treatment plant.

1.2.2 Road traffic and noise from farming activities were the predominant contributors to environmental noise in the area.

1.3 Published Guidance

1.3.1 The methodology detailed in British Standard (BS) 7445-1:2003[2] and BS 7445-3:1991[3], was also followed during the surveys undertaken. BS 7445 defines and prescribes best practice during the recording and reporting of environmental noise. This report details the methodology and approach of the attended noise survey and presents the full set of recorded measurements.

1.3.2 Measurements were made using Class 1 Integrating-Averaging Sound Level Meters as defined in International Electrotechnical Commission (IEC) 61672:2003[4].

2 METHODOLOGY

2.1 General

2.1.1 The noise survey was undertaken to quantify the existing noise levels at noise sensitive receptors surrounding the Project Site.

Short-Term Noise Measurements

2.1.2 Short-term sampling measurements were conducted during the daytime, evening and nighttime between 19/08/14 and 20/08/14 in order to capture the existing ambient noise level representative of that particular period. The measurement durations and time periods for each location were as follows:

Daytime (0700 – 1900) – 3 x 5 minutes

Evening (1900 – 2300) – 1 x 5 minutes

Night (2300 – 0700) – 2 x 5 minutes

2.1.3 Noise descriptors including L_{Aeq} , L_{A90} , L_{A10} , L_{Amin} and L_{Amax} were recorded. The Fast time weighting was used.

Long-Term Noise Measurements

2.1.4 Two continuous 24-hour long-term (LT) measurements were taken to quantify ambient background noise. Consecutive five-minute measurements were carried out continuously over a period of seven days between 19/08/14 and 26/08/14.

2.1.5 Two unattended sound level meters (LT1 and LT2) were set up to measure statistical ambient noise levels at the following locations: Abergelli Farm; and the residential property Maes-eglwys.

2.1.6 The attending site engineer was Pete Bushell (MIOA).

2.2 Measurement locations

2.2.1 The measurement locations were selected to capture free-field day, evening and night-time data. They were sited away from facades at a minimum of 1.2m from the ground.

2.2.2 The measurement locations used in the survey are shown in Annex B.

2.3 Instrumentation

2.3.1 Meters were calibrated and checked before and after each measurement period, with no change in level noted.

2.3.2 The calibration certificates for the meters used are provided in Annex C, which also shows the serial numbers of all the equipment used.

2.4 Weather Conditions

2.4.1 Weather conditions on all days were conducive to successful monitoring; with wind speeds between 0-2m/s. Roads were dry for the duration of the survey. The average ambient temperature was between 18°C and 21°C during the daytime, falling to around 13°C during the night-time period.

3 BASELINE RESULTS

3.1 Short Term Sample Noise Measurement Results

3.1.1 The Abergelli Project is proposed to be operational on a 24/7 basis, as such a summary of the lowest measured data is provided. Table 1 shows the lowest short term sample results recorded during any period between 19/08/14 and 26/08/14.

Table 1 - Short Term Sample Results

Location Number	Location	Lowest Measured L _{A90} , dB
1	Cefn-betingau	25
2	Felin Wen Farm	24
3	Llwynhelig	30
4	Maes-eglwys	34
5	Lletty Morfil Farm	26
6	Abergelli Farm	25

3.1.2 It was observed at all locations that background noise levels were very low. Typical audible noise sources at all locations included distant road traffic and operational farm noise during the daytime and evening periods.

3.2 Long Term Noise Measurement Results

3.2.1 Time history graphs for LT 1 and LT 2 are shown in Appendix E.

4 REFERENCES

1. BS 7445-1: 2003 "Description and Measurement of Environmental Noise: Guide to quantities and procedures", BSI
2. BS 7445-3: 1991 "Description and Measurement of Environmental Noise: Guide to application to noise limits ", BSI
3. IEC 61672:2003 "Electroacoustics - sound level meters", BSI

ANNEX A

GLOSSARY OF ACOUSTIC TERMINOLOGY

Glossary of Acoustics Terminology

Decibel (dB) The decibel scale is used in relation to sound because it is a logarithmic rather than a linear scale. The decibel scale compares the level of a sound relative to another. The human ear can detect a wide range of sound pressures, typically between 2×10^{-5} and 200 Pa, so the logarithmic scale is used to quantify these levels using a more manageable range of values.

Sound Pressure Level (SPL) The Sound Pressure Level has units of decibels, and compares the level of a sound to the smallest sound pressure generally perceptible by the human ear, or the reference pressure. It is defined as follows:

$$\text{SPL (dB)} = 20 \text{ Log}_{10}(P/P_{\text{ref}}) \quad \text{where } P = \text{Sound Pressure (in Pa)}$$

$$P_{\text{ref}} = \text{Reference Pressure } 2 \times 10^{-5} \text{ Pa}$$

An SPL of 0dB suggests the Sound Pressure is equal to the reference pressure. This is known as the *threshold of hearing*.

An SPL of 140dB represents the *threshold of pain*.

A-Weighting The human ear can detect a wide range of frequencies, from 20Hz to 20kHz, but it is more sensitive to some frequencies than others. Generally, the ear is most sensitive to frequencies in the range 1 to 4 kHz. The A-weighting is a filter that can be applied to measured results at varying frequencies, to mimic the frequency response of the human ear, and therefore better represent the likely perceived loudness of the sound. SPL readings with the A-weighting applied are represented in dB(A).

L₁₀ or L_{A10} and other percentile measures This represents the SPL which is exceeded 10% of the time, expressed in dB or dB(A). L_{A10} is used to quantify road noise levels. Other percentiles exist and are used for various types of noise assessment. These include L₀₁, L₅₀, L₉₀, L₉₉.

Noise A noise can be described as an unwanted sound. Noise can cause nuisance.

Noise Sensitive Receptors (NSR's) Any identified receptor likely to be affected by noise. These are generally human receptors, which may include residential dwellings, work places, schools, hospitals, and recreational spaces.

ANNEX B

NOISE SURVEY LOCATIONS

Figure 1: Noise Survey Locations



ANNEX C

CALIBRATION CERTIFICATES



CERTIFICATE OF CALIBRATION

Date of Issue: 18 June 2014

Certificate Number: TCRT14/1201

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk

Page 1 of 2 Pages

Approved Signatory

M. Breslin [] K. Mistry [✓]

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Customer Parsons Brinckerhoff Ltd
Amber Court
William Armstrong Drive
Newcastle Business Park
Newcastle upon Tyne
NE4 7YQ

Order No. 83672

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification	Manufacturer	Instrument	Type	Serial No. / Version
	Rion	Sound Level Meter	NA-28	00380778
	Rion	Firmware		1.8
	Rion	Pre Amplifier	NH-23	70703
	Rion	Microphone	UC-59	00940
	Rion	Calibrator	NC-74	35173440
		Calibrator adaptor type if applicable		NC-74-002

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 Yes Approval Number 21.21/07.01

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 13 June 2014

ANV Job No. TRAC14/06106

Date Calibrated 18 June 2014

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	Dated	Certificate No.	Laboratory
	19 June 2012	TCRT12/1069	ANV Measurement Systems

This certificate provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.



CERTIFICATE OF CALIBRATION

Date of Issue: 18 September 2013

Certificate Number: TCRT13/1292

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk

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Approved Signatory


M. Breslin [] K. Mistry []

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Customer Parsons Brinckerhoff Ltd
Amber Court
William Armstrong
Newcastle Business Park
Newcastle upon Tyne
NE4 7YQ

Order No. Warranty
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator
Identification

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	00632043
Rion	Firmware		1.5
Rion	Pre Amplifier	NH-25	32071
Rion	Microphone	UC-59	05210
Brüel & Kjær	Calibrator	4231	3002998
	Calibrator adaptor type if applicable		UC 0210

Performance Class 1
Test Procedure TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.
Type Approved to IEC 61672-1:2002 YES **Approval Number** 21.21 / 13.02
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003
Date Received 17 September 2013 **ANV Job No.** TRAC13/09167
Date Calibrated 18 September 2013

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	Dated	Certificate No.	Laboratory
	Initial Calibration		

This certificate provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.



CERTIFICATE OF CALIBRATION

Date of Issue: 27 January 2014

Certificate Number: TCRT14/1029

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk

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Approved Signatory

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Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Customer Parsons Brinckerhoff Ltd
Amber Court
William Armstrong Drive
Newcastle Business Park
Newcastle upon Tyne
NE4 7YQ

Order No. 83183
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator
Identification

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	00320637
Rion	Firmware		1.5
Rion	Pre Amplifier	NH-25	10645
Rion	Microphone	UC-59	05708
Rion	Calibrator	NC-74	34536109
	Calibrator adaptor type if applicable		NC-74-002

Performance Class 1
Test Procedure TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.
Type Approved to IEC 61672-1:2002 YES **Approval Number** 21.21 / 13.02
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003
Date Received 20 January 2014 **ANV Job No.** TRAC14/01015
Date Calibrated 27 January 2014

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.



Previous Certificate	Dated	Certificate No.	Laboratory
	10 April 2012	CAL041206	ANV Measurement Systems

This certificate provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.



ANNEX E

NOISE MONITORING FORMS



Noise Monitoring Form							PARSONS BRINCKERHOFF									
Project: Abergelli Power Project				Job Number: 287521A												
Location 1: Cefn-betingau																
Equipment: NA28				Engineer: Pete Bushell												
Pre-Calibration Level: 94.0 dB				General Weather Description: Dry / Clear												
Post-Calibration Level: 94.0 dB																
Measurement Period			Weather			Statistical Noise Levels / dB(A)							Description of Audible Noise			
Date	Start Time	Elapsed Minutes	Wind Speed (m/s)	Wind Direction (from)	Temperature (°C)	Lp	Leq	LE	Lmax	Lmin	L1	L10		L50	L90	L95
19/08/2014	14:10	15	0-1	S	21	51.3	50.5	75.3	78.3	40.3	51.5	46.4	44.6	43.2	42.8	Birds in trees, distant road traffic
19/08/2014	17:05	15	0-1	S	21	45.6	46.5	71.3	69.9	38.6	49.6	48.2	43.4	40.6	39.9	Farming activity, distant road traffic
19/08/2014	22:30	10	0-1	S	18	35.3	39.0	55.6	46.9	32.5	43.6	42.4	37.4	34.5	34.0	Wind in trees, distant road traffic
19/08/2014	23:40	5	0-1	S	13	25.9	28.6	46.9	36.5	24.9	31.0	30.6	28.0	26.1	25.6	Wind in trees, distant road traffic
20/08/2014	01:55	5	0-1	S	13	24.7	28.2	43.9	37.4	23.6	29.3	28.3	25.2	24.6	24.9	Wind in trees



Noise Monitoring Form						PARSONS BRINCKERHOFF										
Project: Abergelli Power Project Location 2 Felin Wen Farm			Job Number: 287521A													
Equipment: NA28 Pre-Calibration Level: 94.0 dB Post-Calibration Level: 94.0 dB			Engineer: Pete Bushell General Weather Description: Dry / Clear													
Measurement Period			Weather			Statistical Noise Levels / dB(A)									Description of Audible Noise	
Date	Start Time	Elapsed Minutes	Wind Speed (m/s)	Wind Direction (from)	Temperature (°C)	Lp	Leq	LE	Lmax	Lmin	L1	L10	L50	L90		L95
19/08/2014	14:55	15	0-1	S	21	45.1	56.1	80.9	72.5	38.9	68.6	57.8	44.9	41.2	40.5	Birds in trees, distant road traffic
19/08/2014	17:25	15	0-1	S	21	52.8	42.8	59.6	55.2	29.8	49.1	47.7	37.9	32.7	31.8	Farming activity, distant road traffic
19/08/2014	22:10	10	0-1	S	18	45.7	48.6	66.5	74.3	35.1	46.0	45.1	39.8	36.7	36.4	Wind in trees, distant road traffic
19/08/2014	23:55	5	0-1	S	13	27.6	27.3	44.0	34.0	23.0	31.3	30.1	26.1	23.8	23.6	Wind in trees, distant road traffic
20/08/2014	02:12	5	0-1	S	13	48.6	26.6	42.8	31.2	24.1	28.2	27.7	26.4	25.4	25.2	Wind in trees



Noise Monitoring Form						PARSONS BRINCKERHOFF										
Project: Abergelli Power Project Location 3 Llywynhelig						Job Number: 287521A										
Equipment: NA28 Pre-Calibration Level: 94.0 dB Post-Calibration Level: 94.0 dB						Engineer: Pete Bushell General Weather Description: Dry / Clear										
Measurement Period			Weather			Statistical Noise Levels / dB(A)										Description of Audible Noise
Date	Start Time	Elapsed Minutes	Wind Speed (m/s)	Wind Direction (from)	Temperature (°C)	Lp	Leq	LE	Lmax	Lmin	L1	L10	L50	L90	L95	
19/08/2014	15:20	15	0-1	S	21	43.8	54.6	79.4	76.7	38.3	68.8	52.6	45.9	44.4	43.5	Birds in trees, distant road traffic
19/08/2014	17:45	15	0-1	S	21	51.5	58.7	78.3	72.0	36.0	66.3	62.9	51.4	42.9	41.5	Farming activity, distant road traffic
19/08/2014	21:55	10	0-1	S	18	31.8	48.9	66.0	65.4	29.9	55.8	53.0	39.8	32.2	31.4	Wind in trees, distant road traffic
20/08/2014	00:10	5	0-1	S	13	36.3	35.9	61.7	62.1	27.3	40.1	38.2	33.6	29.8	28.7	Wind in trees, distant road traffic
20/08/2014	02:24	5	0-1	S	13	34.1	38.3	59.9	61.2	29.8	41.6	40.9	35.5	32.1	31.5	Wind in trees


Noise Monitoring Form										PARSONS BRINCKERHOFF						
Project: Abergelli Power Project Location 4: Maes-eglwys					Job Number: 287521A											
Equipment: NA28 Pre-Calibration Level: 94.0 dB Post-Calibration Level: 94.0 dB					Engineer: Pete Bushell General Weather Description: Dry / Clear											
Measurement Period			Weather			Statistical Noise Levels / dB(A)								Description of Audible Noise		
Date	Start Time	Elapsed Minutes	Wind Speed (m/s)	Wind Direction (from)	Temperature (°C)	Lp	Leq	LE	Lmax	Lmin	L1	L10	L50		L90	L95
19/08/2014	15:50	15	0-1	S	21	48.5	45.9	70.7	58.5	41.8	52.9	47.4	45.0	43.6	43.2	Birds in trees, distant road traffic
19/08/2014	18:05	15	0-1	S	21	54.4	56.3	81.1	76.8	33.9	59.0	55.8	37.7	35.5	35.2	Farming activity, distant road traffic
19/08/2014	21:40	10	0-1	S	18	35.0	36.5	52.6	41.7	32.3	39.5	38.6	35.8	33.8	33.2	Wind in trees, distant road traffic
20/08/2014	00:23	5	0-1	S	13	45.7	48.6	66.5	74.3	35.1	46.0	45.1	39.8	36.7	36.4	Wind in trees, distant road traffic
20/08/2014	02:40	5	0-1	S	13	37.9	43.7	63.7	57.5	38.7	49.1	46.4	41.9	38.5	39.6	Wind in trees

Noise Monitoring Form							PARSONS BRINCKERHOFF									
Project: Abergelli Power Project				Job Number: 287521A												
Location 5: Lietty Morfil Farm																
Equipment: NA28				Engineer: Pete Bushell												
Pre-Calibration Level: 94.0 dB				General Weather Description: Dry / Clear												
Post-Calibration Level: 94.0 dB																
Measurement Period			Weather			Statistical Noise Levels / dB(A)									Description of Audible Noise	
Date	Start Time	Elapsed Minutes	Wind Speed (m/s)	Wind Direction (from)	Temperature (°C)	Lp	Leq	LE	Lmax	Lmin	L1	L10	L50	L90		L95
19/08/2014	16:35	15	0-1	S	21	45.4	38.1	62.9	59.5	32.4	42.3	39.7	37.3	34.8	34.2	Birds in trees, distant road traffic
19/08/2014	18:30	15	0-1	S	21	34.1	38.3	59.9	61.2	29.8	41.6	40.9	35.5	32.1	31.5	Farming activity, distant road traffic
19/08/2014	21:25	10	0-1	S	18	40.8	29.0	46.2	39.8	25.1	32.8	30.5	28.0	26.1	25.7	Wind in trees, distant road traffic
20/08/2014	00:35	5	0-1	S	13	41.6	45.3	61.7	65.0	26.5	50.2	45.4	34.5	28.4	27.8	Wind in trees, distant road traffic
20/08/2014	02:55	5	0-1	S	13	29.1	30.4	47.9	48.3	24.4	34.2	32.5	28.1	25.7	25.3	Wind in trees

Noise Monitoring Form						PARSONS BRINCKERHOFF										
Project: Abergelli Power Project			Job Number: 287521A													
Location 6: Abergelli Farm																
Equipment: NA28			Engineer: Pete Bushell													
Pre-Calibration Level: 94.0 dB			General Weather Description: Dry / Clear													
Post-Calibration Level: 94.0 dB																
Measurement Period			Weather			Statistical Noise Levels / dB(A)										Description of Audible Noise
Date	Start Time	Elapsed Minutes	Wind Speed (m/s)	Wind Direction (from)	Temperature (°C)	Lp	Leq	LE	Lmax	Lmin	L1	L10	L50	L90	L95	
19/08/2014	16:50	15	0-1	S	21	41.1	41.3	66.1	57.7	32.7	50.6	45.8	38.4	34.1	33.8	Birds in trees, distant road traffic
19/08/2014	18:55	15	0-1	S	21	35.3	35.9	60.7	61.1	26.3	40.1	38.2	32.6	28.8	27.7	Birds in trees, distant road traffic
19/08/2014	22:50	10	0-1	S	18	27.7	51.4	67.9	76.4	24.5	48.3	39.7	28.0	25.3	25.1	Wind in trees, distant road traffic
20/08/2014	00:50	5	0-1	S	13	25.9	28.6	46.9	36.5	24.9	31.0	30.6	28.0	26.1	25.6	Wind in trees, distant road traffic
20/08/2014	03:11	5	0-1	S	13	24.7	26.2	43.9	37.4	23.6	29.3	28.3	25.2	24.4	24.2	Wind in trees

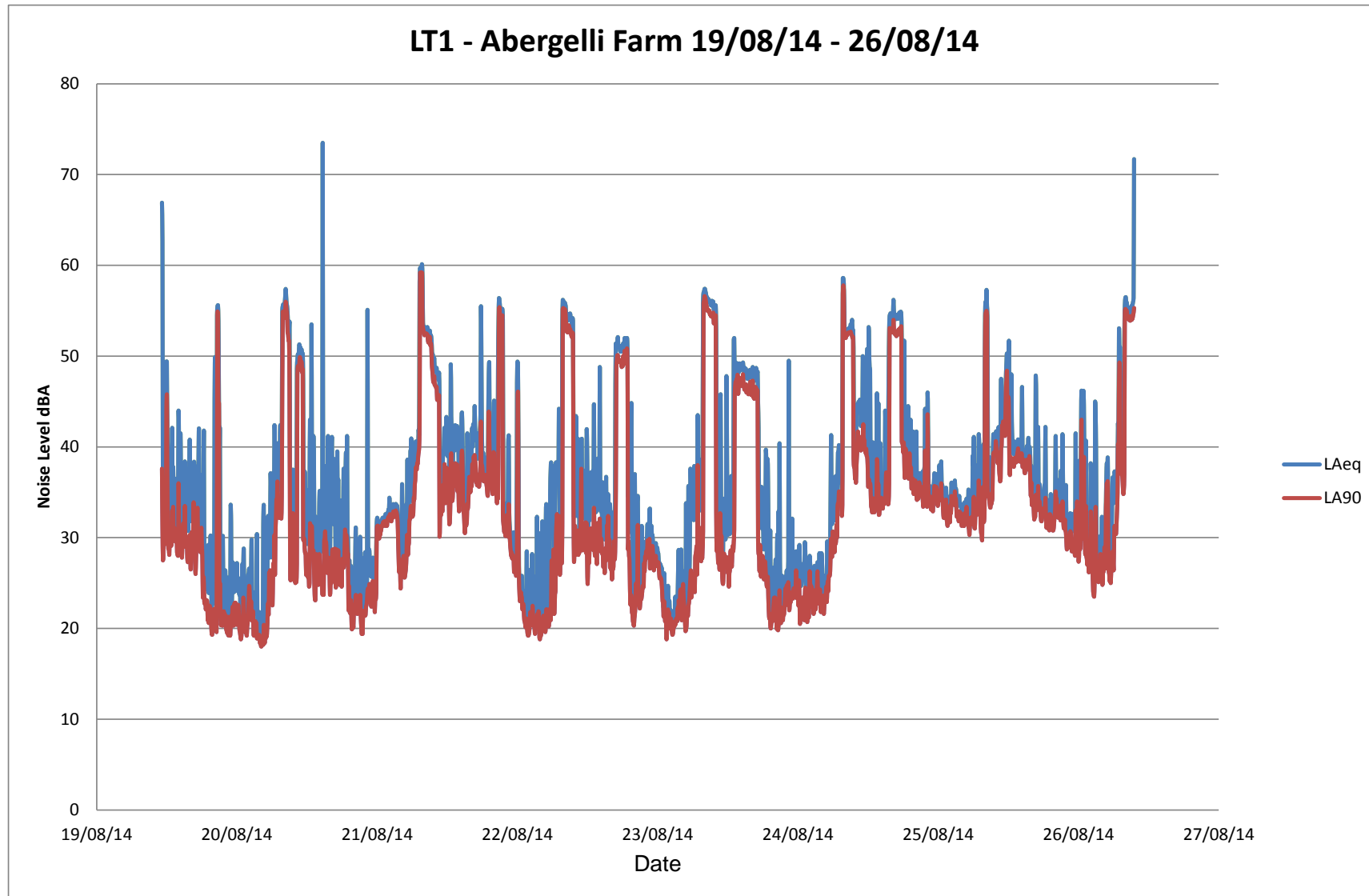


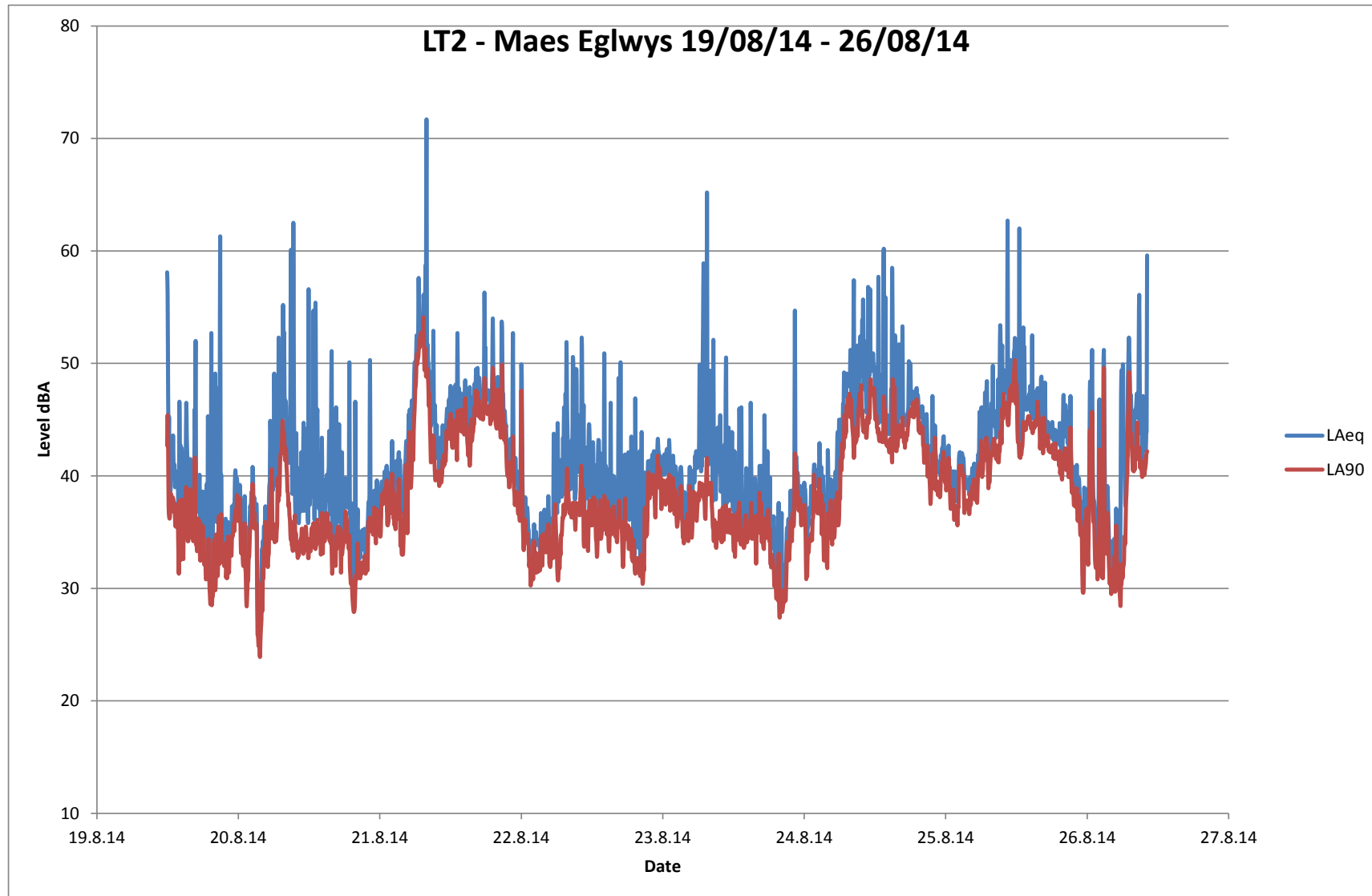
Noise Monitoring Form		PARSONS BRINCKERHOFF	
Project: Long Term Noise Meter	Abergelli Power Project LT1 - Abergelli Farm	Job Number:	287521A
Equipment: Pre-Calibration Level: Post-Calibration Level:	NL52 94.0 dB 94.0 dB	Engineer: General Weather Description:	Pete Bushell
			

Noise Monitoring Form		PARSONS BRINCKERHOFF	
Project: Long Term Noise Meter	Abergelli Power Project LT2 - Maes Eglwys	Job Number:	287521A
Equipment: Pre-Calibration Level: Post-Calibration Level:	NL52 94.0 dB 94.0 dB	Engineer: General Weather Description:	Pete Bushell

ANNEX E

TIME HISTORY GRAPHS





Abergelli

Abergelli Power Project

Preliminary Ecological Appraisal Report

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Client	Stag Energy
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Issued to client	Matthew Hobbs	Principal Ecologist	04 September 2014

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1 Summary

- 1.1 Abergelli Power Limited (APL) is promoting a new Power Generation Plant with its associated Gas and Electricity Connections (the 'Project') on agricultural land within Abergelli Farm north of Swansea in the City and County of Swansea (approximately at National Grid Reference 265284, 201431).
- 1.2 BSG Ecology has been appointed as the ecological consultant to undertake a preliminary ecological appraisal, which includes a desk study and Extended Phase 1 Habitat Survey. This preliminary survey will inform the subsequent need for further, targeted surveys of protected and otherwise notable species and habitats.
- 1.3 The preliminary ecological survey has identified two European designated sites within 10km, five statutory designated sites for ecology (four Sites of Special Scientific Interest (SSSIs) and one Local Nature Reserve (LNR) within 5km, and twenty-three non-statutory designated Sites of Importance for Nature Conservation (SINC) within 2km of the Survey Site boundary. Three of the SINCs are partially within the Survey Site boundary, and a further two are adjacent. Much of the woodland on the Survey Site is also designated as Ancient Woodland. Direct impacts on SINCs and Ancient Woodland within and close to the Survey Site boundary could occur, depending on the final layout of the Power Generation Plant.
- 1.4 Three Section 42¹ habitats ('lowland mixed deciduous woodland', 'purple moor-grass and rush pasture' and 'ponds') are present within the Survey Site.
- 1.5 There is habitat in the Survey Site that has the potential to support European Protected Species (EPS) including bats, great crested newts *Triturus cristatus*, dormouse *Muscardinus avellanarius*, and otter *Lutra lutra*. There are also habitats suitable for nationally protected species such as reptiles and water voles *Arvicola amphibius*. Information on badgers is contained in a confidential version of this report.

¹ Species referred to within The Natural Environment and Rural Communities Act 2006 (NERC 2006) as species of principal importance for the conservation of biodiversity in Wales which are listed on the Natural Resources Wales website. The Welsh Assembly Government must take steps to "further the conservation" of these species under Section 42 of the NERC ACT 2006.

2 Introduction

Site Description

- 2.1 The Survey Site consists of approximately 150 ha of pastoral farmland primarily grazed by horses. The Survey Site is contained within the red line boundary shown in Figure 1 in Appendix 1 and is centred at National Grid Reference 265284, 201431. The nearest settlement is Felindre, which is located approximately 2 km to the north of the Survey Site, with Swansea approximately 5 km to the south.
- 2.2 The Survey Site is largely agriculturally improved pasture with several areas of marshy grassland, particularly in the north, south and north-western ends of the Survey Site. The fields are bounded by fences, running along the line of defunct hedgerows, and often accompanied by ditches. There is a block of broadleaved woodland on the eastern boundary of the Survey Site and areas around the marshy grassland to the west of the Survey Site, and around Felindre Gas Compressor Station and the two National Grid 400kV electrical substations that lie at the south-west end of the Survey Site. The habitats in the surrounding landscape are similar to those within the Survey Site boundary – a mixture of improved and marshy grassland interspersed with occasional patches of woodland.
- 2.3 The Survey Site boundary is shown on Figures 1a and 1b (photographs of the Survey Site are found in Appendix 3).

Description of Project

- 2.4 APL is promoting a new Power Generation Plant within Abergelli Farm. The Power Generation Plant would operate as a Simple Cycle Gas Turbine (SCGT) peaking plant and would be designed to provide an electrical capacity of up to 299 Megawatts (MW). It would be fuelled by natural gas, supplied by a new underground gas pipeline connecting the thermal generating station to the existing National Grid Gas (NGG) National Transmission System (NTS).
- 2.5 BSG Ecology has been appointed as the ecological consultant to undertake a preliminary ecology survey, which includes a desk study and Extended Phase 1 Habitat Survey, as well as a range of Phase 2 surveys. These baseline surveys will be included in an appendix to an ecology chapter of an Environmental Statement, which is intended for submission, in support of the application for Development Consent.

Aims of Study

- 2.6 BSG Ecology was commissioned to undertake a preliminary ecological appraisal of the Survey Site within which the Project would be located. The main aims of this report are to:
- Present the findings of the desk study and site surveys; and
 - Assess the potential for the Survey Site to support protected or otherwise notable species;

3 Methods

Desk Study

- 3.1 Existing ecological information for the Survey Site and its surrounding area was requested from the South East Wales Biodiversity Records Centre (SEWBRc). Information on European designated sites was requested from within 10 km with information on national statutory designated sites was requested covering the Survey Site and land up to 5 km from the Survey Site boundary and information regarding non-statutory designated sites and records of protected² or notable species (particularly those identified as priority or Section 42 species and/or of local conservation importance or LBAP³ species) was requested covering the Survey Site and land up to 2 km from the Survey Site boundary. Information on locally designated Sites of Importance for Nature Conservation (SINC) within 2 km of the Survey Site boundary was requested from the Swansea Council Ecologist. In addition, on-line resources including the Multi Agency Geographic Information for the Countryside (MAGIC, www.magic.gov.uk) website and aerial photography of the area were also reviewed.

Field Survey

Phase 1 Habitat Survey

- 3.2 The initial field survey was undertaken by Anna Gundry MCIEEM and Matthew Hobbs MCIEEM on 24 February 2014. The Project Site boundary and therefore the Survey Site was subsequently extended after a design review, and a second field survey was carried out by Stephanie Boocock MCIEEM on 14 April 2014 of the additional area. The south-west end of the Survey Site could not be surveyed during the April survey, as the land here is under separate ownership and access had not been granted by land owners at the time of survey. The route of the access track (that leads west to the B4489) was also added to the Survey Site boundary after the April survey. Both the land in the south-west end and the access track were subject to a third field survey on 9 July 2014, carried out by Matthew Hobbs and Niall Lusby MCIEEM. Habitats within the Survey Site, and up to 50m from the Survey Site boundary, were identified and described following standard JNCC Phase 1 Habitat Survey methods as detailed in the Phase 1 Habitat Survey Handbook (JNCC, 2010). This uses a system of codes to describe different habitat types based on the dominant vegetation present, which are recorded by means of habitat maps and target notes. All plant names in this report follow The New Flora of British Isles (Stace, 2010).
- 3.3 The survey was extended to give particular consideration to the potential of the habitats present to support protected species or species of local conservation importance; recorded as incidental information as part of the target notes.
- 3.4 It should be noted that species lists derived from the target notes are not necessarily an exhaustive inventory of all species occurring at a site. They are intended to illustrate the character of habitats present, general species richness of a particular area, and draw attention to any species that may be considered uncommon or unusual.
- 3.5 Weather conditions during all surveys were clear and largely dry.

Habitat Suitability Index

- 3.6 During the February field survey a Habitat Suitability Index (HSI) assessment (Oldham *et al.*, 2000) of all ponds/water bodies within a 250m radius of the Survey Site (where access was possible) was undertaken to assess whether any of the ponds are suitable for great crested newts. No further details are provided in this report with full details of the methods and results of this assessment included in the great crested newt survey report.

² Wildlife and Countryside Act 1981 Schedules 1, 5 & 8; Conservation of Habitats and Species Regulations 2010; Protection of Badgers Act.

³ Those listed under Local Biodiversity Action Plans for Swansea.

Assessment of Potential Roosting Structures for Bats

- 3.7 All the trees and buildings on site were examined for their potential to support roosting bats, and graded according to scales provided in the Bat Conservation Trust survey guidelines (Hundt, 2012). No further details are provided in this report with full details of the methods and results of this assessment included in the great crested newt survey report.

Limitations to Methods

- 3.8 Although records secured through the desk study and supplied by third parties provide useful background information for initial ecological assessment, they often comprise individual records supplied by members of the public or are the result of ad hoc surveys. The data trawl information can therefore help to inform the likelihood of a particular species being present in the area, but should not be relied upon to definitively determine presence or absence of individual species.
- 3.9 The first site visit was undertaken at a sub-optimal time of year (February) for a survey of this type, being outside the main growing season, when the greatest variety of plants is in evidence. However the habitats on site are readily identifiable to an experienced botanist, and those that require further survey work in order to confirm their quality have been identified. In addition, a robust assessment of the Survey Site's potential to support protected species could also be made. Therefore, it is considered that the timing of the survey in this instance is not a significant constraint with regard to the findings of this assessment. The second survey on the 14th April was undertaken at a time when most plant species are evident and was less constrained in this respect. The third survey undertaken in July is within the optimal period for botanical survey when most species of plant are in leaf and many are in flower.

4 Results

4.1 In this section the results of the desk study and fieldwork are brought together.

4.2 Figures 1a (the northern part of the site) and 1b (the southern part of the site) illustrate the results of the extended Phase 1 habitat survey. Numbers on the map and in the text below can be cross-referenced with Target Notes (TN) in Appendix 2. Photographs of the site can be found in Appendix 3.

Designated Sites

Statutory

4.3 Carmarthen Bay and the tidal estuaries that extend from it, approximately 7.2 km west of the Survey Site, has been afforded multiple designations and is referred to under the umbrella term European Marine Site (EMS⁴) which includes the Carmarthen Bay area and Estuaries Special Area of Conservation (SAC⁵), and the Burry Inlet Special Protection Area (SPA⁶). This area also contains a Ramsar Wetland of International Importance (Ramsar⁷). The boundaries of each of these sites are not contiguous but all fall within the EMS site. The details of each designation are provided below. There are also four statutory protected Sites of Special Scientific Interest (SSSI) and one Local Nature Reserve (LNR) within 5 km of the Survey Site. These are described in Table 2 below.

Table 2: Statutory designated sites within 5 km of the Survey Site and European sites within 10 km.

Site name	Grid ref.	Distance and direction from site	Reason for Designation
Carmarthen Bay and Estuaries SAC	SS357991	7.2km W	Annex I habitats (primary reason for selection) – ‘Sandbanks which are slightly covered by sea water all the time’, ‘Estuaries’, ‘Mudflats and sandflats not covered by water at low tide’, ‘Large shallow inlets and bays’, ‘ <i>Salicornia</i> and other annuals colonising mud and sand’, ‘Atlantic salt meadows. Annex II species (primary reason for selection) – twaite shad <i>Allosa fallax</i> . Annex II species (qualifying feature) – sea lamprey <i>Petromyzon marinus</i> , river lamprey <i>Lampetra fluviatilis</i> , allis shad <i>Alosa alosa</i> and otter.
Burry Inlet SPA and Ramsar (within the boundary of the SAC above)	As above	9.7km WSW	This area is designated as a SPA and Ramsar site due to its internationally important assemblage of wintering birds with qualifying populations of wintering oystercatcher <i>Haematopus ostralegus</i> , and northern pintail <i>Anas acuta</i> (SPA) and additionally of common redshank <i>Tringa totanus</i> , and red knot <i>Calidris canuta</i> (Ramsar).
Crymlyn Bog SAC and Ramsar (contiguous boundaries)	SS694947	7.3 km SE	Annex I habitats (primary reason for selection) – ‘Transition mires and quaking bogs’, ‘Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> ’, Annex I habitats (qualifying feature) – Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>). The site is selected as Ramsar as it supports a substantial population of the nationally-rare slender cotton-grass <i>Eriophorum gracile</i> , and a rich

⁴ The term ‘European Marine Sites’ (EMS) collectively describes Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) that are covered by tidal waters and protect some of our most important marine and coastal habitats and species of European importance.

⁵ SACs are strictly protected sites designated under the EC Habitats Directive in order to conserve the 189 habitat types and 788 faunal species identified in Annexes I and II of the Directive (as amended). They do not afford protection to birds directly (although are often subject to various other designations that do have an ornithological component and often offer protection to habitats of value to a range of bird species).

⁶ SPAs are internationally important sites classified in accordance with Directive 79/409/EEC on the conservation of wild birds (commonly referred to as the Bird Directive).

⁷ Ramsar sites are wetlands of international importance designated under the Ramsar Convention.

			invertebrate fauna including many rare and highly localised species. The site also supports 199 vascular plant species including 17 regionally-uncommon and one nationally rare species.
Glais Moraine SSSI	SN696005	4 km E	Designated for its geological interest.
Nant Y Crimp SSSI	SN623015	2.5 km W	Designated for its wet pastures, species-rich neutral grasslands and semi-natural woodland, which are host to several uncommon plant species. In addition, there is a colony of marsh fritillary butterfly on site.
Penllergaer Railway Cutting SSSI	SS622998	2.8 km NW	Designated for its geological interest.
Penplas Grasslands SSSI	SS634979	3.2 km NW	Designated for the eight different grassland types that have been identified on the site, including three types of purple moor-grass pasture, two of rush pasture, fen meadow, acid grassland and damp heath. Notable plant species recorded at Penplas include petty whin <i>Genista anglica</i> and royal fern <i>Osmunda regalis</i> .
Cadle Heath LNR	SS627966	4.5 km NW	Designated for wet heath, species-rich grassland, ponds, scrub and woodland. There is also a significant colony of wood bitter vetch.

4.4 Glais Moraine SSSI and Penllergaer Railway Cutting SSSI are both designated for their geological interest, which is unlikely to be impacted upon by the Project and will therefore not be considered further in this report.

Non-statutory

4.5 There are 23 Sites of Interest for Nature Conservation (SINC) within 2 km of the Survey Site. These are described in Table 3 below and their locations are shown on Figure 2. Three SINC lie partially within the Survey Site boundary. Rhyd-Y-Pandy Valley Grasslands is a large SINC, which includes three fields that lie within the north-east corner of the Survey Site. Warn Garn Wen is also an extensive SINC which includes the marshy grassland that lies within the western boundary of the Survey Site. Llety Morfil SINC is a collection of three areas of ancient woodland with some areas of marshy grassland that includes the woodland on the eastern boundary of the site and at the south-west end of the Survey Site.

4.6 There are two SINC located adjacent to the boundary. Rhos Fawr SINC is a block of land immediately to the north of the Site boundary, and Felindre Grasslands SINC lies adjacent to the southern tip of the proposed access route.

4.7 Most of the woodland within the Survey Site is also designated as Ancient Woodland (See Figure 2).

Table 3: Non-statutory sites within 2km of the Survey Site. Citations for some of the SINC sites are not yet available and will be added when they are.

Site name	Grid ref.	Distance and direction from site	Site Description
Waun Garn Wen	SN645012	Onsite	Purple moor grass and rush pasture, wet woodland, scrub and watercourse habitats. Section 42 invertebrates and birds recorded.
Llety –Morfil	SN644006	Onsite	Wet and ancient semi-natural woodland, purple moor grass and rush pasture, and scrub habitats. Section 42 invertebrate species recorded.

Site name	Grid ref.	Distance and direction from site	Site Description
Rhyd-Y-Pandy Valley and Grasslands	SN661022	Onsite	Wet woodland and woodland with assemblage of ancient woodland indicator species, scrub, purple moor grass and rush pasture, lowland meadow, neutral grassland, scrub, reed bed and water course habitats. Section 42 bird species recorded.
Rhos Fawr	SN652029	Adjacent N	Woodland containing assemblage of ancient woodland indicator species, scrub, purple moor grass and rush pasture, neutral grassland habitats. Section 42 bird species recorded.
Felindre Grasslands	SS638998	Adjacent SW	Wet woodland and lowland mixed deciduous woodland, purple moor grass and rush pasture and scrub habitats. Section 42 birds and invertebrates recorded.
Llangefelach Common SINC	SS648994	1.3 km SW	Common cotton grass <i>Eriophorum angustifolium</i> , ragged-robin <i>Lychnis flos-cuculi</i> , western gorse <i>Ulex gallii</i> , various orchid species, tormentil <i>Potentilla erecta</i> and whorled caraway <i>Carum verticillatum</i> are present along with adder, common lizard and slow worm.
Lower and Upper Lliw Reservoirs SINC	SN653035	1 km N	The lower and upper Lliw reservoirs are surrounded by a mosaic of habitats including bracken, scrub, broadleaved woodland and lowland acid grassland. Section 42 and Schedule 1 (peregrine and red kite) birds recorded.
Cwm Nant-Ddu		2 km NW	Ancient woodland, scrub and gorse, neutral grassland, purple moor grass and rush pasture, reedbed, watercourses and bracken, many of which are relatively species-rich. Section 42 and Schedule 1 (red kite) birds recorded.
Middle Lliw		1 km NW & W	Ancient woodland, purple moor grass and rush pasture, bracken, scrub, lowland dry acid grassland, gorse, watercourses and neutral grassland. Section 42 birds recorded.
Cilfaen	SN641021	0.5 km W	Wet woodland and woodland containing ancient woodland assemblage, and purple moor grass and rush pasture habitat.
Cefn Forest Stream	SS635997	1 km SW	Range of woodland types. Lowland meadow, heath and fen. Purple moor grass and rush pasture, ponds and watercourses.
Penllegaer Forest	SS627005	1 km SW	Range of woodland types. Purple moor grass and rush pasture, reedbeds watercourses. Section 42 birds and invertebrates recorded.
Penllegaer to Llangefelch Tunnel and Railway Line	SS632996	1 km S	Range of woodland types. Purple moor grass and rush pasture, scrub and watercourses. Section 42 birds recorded.
M4 Corridor		1.5 km S	Scrub and continuous semi-natural linear vegetation.
Mynydd Bach Common	SS652978	2km S	Woodland scrub and purple moor grass and rush pasture habitats.
Pant Lasau	SN652004	0.25 km S	Woodland, scrub, purple moor grass and rush pasture, and water course habitats

Site name	Grid ref.	Distance and direction from site	Site Description
Middle Llan	SN659009	0.5 km S	Watercourse habitat
Cwm Rhydceinw to Birchgrove Railway		1.5 km SE	Continuous semi-natural linear vegetation.
Mynydd Gelli-wasted	SN677016	1.5 km E	Woodland, scrub, heath, purple moor grass and rush pasture habitats. Section 42 bird species recorded.
Ynysforgan Wood	SN677002	2 km SE	Ancient woodland habitat. Section 42 bird species recorded.
Lougher to Penlleger Railway Line		2 km SW	Ancient woodland, lowland mixed deciduous woodland, purple moor grass and rush pasture, scrub, continuous semi-natural linear vegetation and neutral grassland.
Banc Darren Fawr		2 km N	Ancient woodland, lowland mixed deciduous woodland, purple moor grass and rush pasture, scrub, gorse, upland acid grassland, upland wet heath, lowland dry heath, upland fens, marshes and swamps, lowland fen, blanket bog, watercourse, and bracken. Section 42 bird, invertebrate and amphibian species recorded as well as Schedule 1 birds (merlin <i>Falco columbarius</i> , red kite, barn owl, hen harrier <i>Circus cyaneus</i> , kingfisher <i>Alcedo atthis</i> , Northern goshawk <i>Accipiter gentilis</i>)
Cwm Clydach		2 km NE	Ancient woodland, lowland mixed deciduous woodland, purple moor grass and rush pasture, scrub, neutral grassland, lowland dry acid grassland, watercourse, and bracken. Section 42 bird and invertebrate species recorded as well as Schedule 1 birds (red kite and honey buzzard <i>Pernis apivorus</i>).

Habitats

- 4.8 The Survey Site is roughly an 'L' shape, with the majority of the Survey Site running approximately north-south and the foot of the 'L' branching off to the south-west around either side of Felindre Gas Compressor Station and the two National Grid 400kV electrical substations. The topography drains the land to the south with the highest elevation in the Survey Site along the northern boundary (approximately 140m above ordnance datum (AOD)). The land slopes away to the south and the lowest elevation is around the Felindre Gas Compressor Station and the two National Grid 400kV electrical substations (approximately 80m AOD).
- 4.9 The land is predominantly pastoral farmland, mostly agriculturally improved but with significant areas of marshy grassland. The fields are grazed by horses and sheep and are largely bounded by fences with occasional trees, scrub and one defunct hedgerow. There are numerous water courses on site, mostly in the form of ditches along field boundaries, but also four streams; one which runs along the eastern boundary of the Survey Site; another that runs north-west from the woodland in the eastern part of the site; a stream that runs through the marshy grassland to the west; and another around Felindre Gas Compressor Station and the two National Grid 400kV electrical substations. There is a small woodland on the eastern boundary of the Survey Site and the land around Felindre Gas Compressor Station and the two National Grid 400kV electrical substations is also largely wooded. There are also copses and stands of mature trees around the edges of the marshy grassland in the north-western part of the site, as well as along field boundaries in the northern part of the site.

Improved grassland

- 4.10 The majority of the land on site is agriculturally improved grassland (Photo 1, 2a). This was all grazed short when surveyed, and consists of abundant perennial rye-grass *Lolium perenne*, and varying quantities of common grassland herbs such as white clover *Trifolium repens*, common mouse ear *Cerastium fontanum*, and dandelion *Taraxacum fontanum* agg.

Marshy grassland

- 4.11 Areas of marshy grassland fields are located at TN2, TN11, TN23, TN33 and TN74, and all fit within the same Phase 1 category. The habitats in these fields vary due to stock type and grazing intensity. Typically they support numerous tussocks of soft rush *Juncus effusus* with frequent sedge species. Such as common sedge *Carex nigra* and glaucous sedge *C. flacca*. Other species noted include creeping bent *Agrostis stolonifera*, a cinquefoil *Potentilla* sp., creeping buttercup *Ranunculus repens* and sharp-flowered and/or jointed rush *Juncus acutiflorus* / *J. articulatus*.
- 4.12 The northernmost field at TN2 (Photo 3) was grazed extremely short, when surveyed, to the point where individual species are difficult to distinguish. Soft rush is frequent, along with purple-moor grass *Molinia caerulea*, sheep's fescue *Festuca ovina* and a sedge species (not possible to identify to species level). Heather *Calluna vulgaris* and bilberry *Vaccinium myrtillus* plants are occasional and there are patches of sphagnum moss *Sphagnum* sp. present.
- 4.13 The fields marked TN27 and TN18, are wet semi-improved grassland, with marshy species such as lesser spearwort *Ranunculus flammula*, sedges, soft rush and water figwort *Scrophularia aquatica*.
- 4.14 The fields marked TN2 and TN74 all have over 25% soft rush which places them in the 'marshy grassland' category, but the intervening grassland is agriculturally improved, with abundant perennial rye-grass and frequent white clover. The fields marked TN74 (Photo 4) have a much higher cover of soft rush - ranging from 75% to 100% in with the intervening species are more typical of wet grassland, such as creeping bent *Agrostis stolonifera*, creeping buttercup and Yorkshire fog *Holcus lanatus*.
- 4.15 Areas of purple-moor grass dominated vegetation, which also falls into the 'marshy grassland' category are present at TN11 (Photo 5), TN23 and TN33 where the purple moor grass is dominant with very occasional cross-leaved heath *Erica tetralix* and heather plants in evidence and scattered willow *Salix* sp. scrub. At TN23 additional species recorded include soft rush, bracken, common haircap moss *Polytrichum commune*, unidentified sphagnum moss, heather, cross-leaved heath and bilberry along the margins with some birch and willow regeneration in small scattered copses. TN33 (Photo 4a) is a large field which is superficially similar to that at TN23 but appears to have been managed. Purple moor-grass is not as dominant with numerous patches of bare earth and young ling and cross-leaved heath plants. In addition hare's-tail cotton grass *Eriophorum vaginatum*, (Photo 1a) deergrass *Trichophorum germanicum* and lousewort *Pedicularis* sp. are common.

Semi-improved Grassland

- 4.16 The field to the south of the woodland at TN7 appears to be slightly less agriculturally improved, having a lower cover of perennial rye-grass, and a wider range of grasses such as Yorkshire fog, crested dog's tail *Cynosurus cristatus* and creeping and common bent *Agrostis capillaris*. The field is nevertheless species-poor. There are also several other species-poor semi-improved fields in the Study Site (TN27 (Photo 3a) and TN73).

Woodland and scrub

- 4.17 There is a block of broadleaved woodland along the eastern boundary of the Survey Site at TN7. The western end is on a hill, and is dry with widely-spaced trees and a grazed grassland ground flora including species such as Yorkshire fog, common mouse-ear and creeping buttercup. The trees here are small to medium-stemmed with very little understory, and include birch *Betula pendula*, crab-apple *Malus sylvestris*, holly *Ilex aquifolium* and pedunculate oak *Quercus robur*. The hill slopes down steeply to the east, where a stream delineates a lower, wetter area of woodland. Here the tree species composition is similar but the understorey is much thicker with bramble predominating. On wetter areas, where the bramble thins out, carpets of opposite-leaved

golden-saxifrage *Chrysosplenium oppositifolium* are present. There are also extensive areas of purple moor-grass dominated ground flora with sphagnum moss species also present.

- 4.18 To the north of this woodland there is a thin strip of deciduous woodland running along the banks of a stream running north to south at TN48. The species composition includes occasional birch, willow, ash and holly. There is an understory made up largely of gorse with bramble scrub and soft rush grading into improved grassland to the east.
- 4.19 Another relatively extensive area of broad-leaved woodland is present at the south-west end of the Survey Site around Felindre Gas Compressor Station and the two National Grid 400kV electrical substations. This forms a strip to the south and a more continuous block to the north of Felindre Gas Compressor Station and the two National Grid 400kV electrical substations. The woodland is generally quite wet, with alder *Alnus glutinosa* and willow species frequent along with pedunculate oak, birch and holly. The trees are growing close together and are generally small-stemmed and straggly. The understorey is dense bramble and ground flora was largely absent when surveyed, although where the woodland opens out, for example around the margins of Felindre Gas Compressor Station and the two National Grid 400kV electrical substations, soft-rush dominated marshy grassland is present.
- 4.20 There are also patches of deciduous woodland around the edges of the marshy grassland on the block of land to the west of the road that runs through the Survey Site. At TN20 there is a small wooded spur with tree species including oak, birch, holly, hawthorn and an understorey dominated by brambles and including ivy *Hedera helix*, creeping bent, Yorkshire fog, soft rush, hard fern *Blechnum spicant*, scaly male fern *Dryopteris affinis*, and bracken *Pteridium aquilinum*. At TN35 there is a wooded copse with young birch and willow and an understorey of bramble scrub. The ground flora includes nettle, lady fern *Athyrium filix-femina*, scaly male fern *Dryopteris affinis* and wood false brome *Brachypodium sylvaticum*. A continuous area of scrub is present to the south of the woodland at TN7 and around the pond at TN12. These areas are quite wet and include willow species (including grey and goat willow *Salix cinerea*, *S. caprea*), alder and bramble. At TN12 the scrub merges into stands of purple moor grass that are present around the pond. There are also blocks of scrub to the south of Abergelli Farm, along the stream that runs along the eastern boundary, at the northernmost point of the Survey Site, and within the marshy grassland to the west. Scattered scrub (mostly common gorse *Ulex europaeus*) is present along some fence lines, and there is a bramble scrub-covered bund at TN3.
- 4.21 Many of the trees within the Survey Site are along site boundaries and are remnant hedgerow stools, as described in the section below.

Boundary features

- 4.22 All boundaries within the Study Site are fences, except one length of species-poor hedgerow running north of Abergelli Farm and a second running along the northern side of the access track at TN58. The fences often run along the line of defunct hedges (Photo 1). These generally take the form of a degraded stone-faced hedge banks, with occasional small sections of overgrown hedge. The overgrown hedges include mature standard trees, large coppice stools and clumps of bramble and gorse scrub. Species present include pedunculate oak, holly, birch, ash *Fraxinus excelsior*, hazel *Corylus avellana* and hawthorn *Crataegus monogyna*.
- 4.23 Some of the fields on site have overgrown margins where the vegetation is less trampled and grazed along the fence line. For example the improved fields along the northern boundary of the Study Site have ditches lined with purple moor-grass and gorse, and further east along this boundary bracken is frequent. The western boundary of the field marked TN74 has purple moor-grass and heather growing along the fence.

Water Courses

- 4.24 There are numerous small water courses within the Survey Site. These are mostly ditches along field boundaries (T43, Photo 5a), but there is also some larger streams. The block of marshy grassland to the north-west is criss-crossed by numerous ditches, which were largely dry or with marshy bases when visited in April. There is also a stream that runs through this block of land – this is shaded by flanking woodland, with a stone bed and shallow banks. Another stream (Photos 8, 9 and 6a) runs south-east through the Survey Site and splits into smaller tributaries through the

woodland at TN7. There are also small watercourses present around the margin of Felindre Gas Compressor Station and the two National Grid 400kV electrical substations. All features that were visited in February had flowing water, reflecting a period of prolonged wet weather preceding the survey. Aquatic vegetation is not apparent in any of the water courses, but marginal vegetation includes frequent soft rush, occasional purple moor-grass and scattered gorse and bramble.

Water Bodies

- 4.25 There are four water bodies within the Survey Site. The pond at TN12 is approximately 10m in diameter, shallow, and completely covered in an unidentified sedge species. It has a small tree-covered island in the centre. The pond is ringed by small willow and alder trees. The surrounding vegetation is dominated by purple moor-grass with occasional heather and cross-leaved heath plants, with densely growing small trees and scrub (grey willow, bramble and alder). A small pond immediately to the south is shown on OS maps. This was not apparent amongst the scrub, but there were small patches of standing water (including wheel ruts) within purple moor grass in this area.
- 4.26 A small pond is present at TN15 and is adjacent to an electricity pylon. The pond is approximately circular and 5m in diameter. It is in woodland and completely surrounded by small saplings. There was no evidence of marginal or emergent aquatic vegetation when surveyed.
- 4.27 Two ponds are also present immediately to the south-west of TN41. The easternmost is approximately 10m in diameter, open and unshaded with both aquatic and marginal vegetation present. It appears to be an extension of two field drains that meet at this point. Pond 11 is a small wet depression containing no vegetation.

Invasive Species

- 4.28 Japanese knotweed *Fallopia japonica* was noted on at least two locations on the block of land to the west of the road that runs through the site. At TN29 several stands of the species were noted on an embankment to a large raised area. At TN30 a stand of the species was noted on a bend in the stream. There are also several stands of this species growing on the edge of the road that leads into Abergelli Farm from the west. These extend just beyond the western site boundary and into the Survey Site.
- 4.29 Himalayan balsam *Impatiens glandulifera* was also noted in two areas. Abundant seedlings of the species were noted in the wooded copse at TN34 and on an area of deciduous woodland at TN39.

Protected Species and Species of Conservation Importance

- 4.30 This section presents the protected species records provided by SEWBReC along with any evidence of the species, or potential for it to be present gathered during the field survey. Where relevant it also evaluates the potential for the Survey Site to support Section 42 species identified within the desk study area. The legislation and policy relevant to each species or species group is described in Appendix 5.

Bats

- 4.31 There were 126 bat records provided by SEWBREC from the 2 km radius search area. Of these the majority were recorded during bat transects carried out to inform a separate unrelated development proposal, named 'Felindre development site in the records' approximately 1 km to the south west of the Survey Site boundary.
- 4.32 The bat species recorded from the desk study include brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, Natterer's bat *Myotis nattereri*, noctule *Nyctalus noctula*, and whiskered bat *Myotis mystacinus*. There were also unidentified *Pipistrellus* sp. and records where the bat species was not specified.
- 4.33 There are four bat roosts amongst the records provided. The closest of these is a record of 50 unspecified bat species 1.8 km to the south-east of the Survey Site at Ynystawe, Swansea from 1992. The next closest is a night / feeding roost of an unspecified species 1.9 km south west of the Survey Site boundary in Tredegar-Fawr farm buildings from 1998. A record of a roost of 87

whiskered bats also comes from approximately 1.9 km to the north west of the Survey Site boundary in Felindre, Swansea from 1993. The fourth record is a roost of 70 bats of unspecified species, 2.5 km to the south east of the Survey Site in Ynysforan, Swansea from 1993.

- 4.34 Details of surveys carried out for roosting bats are contained within the bat survey report.
- 4.35 The northern end of the Survey Site offers limited foraging and commuting potential for bats. The boundaries are fences and short sections of remnant hedgerows and the fields are closely grazed. The block of marshy grassland, woodland and scrub to the west of the road that runs through the Survey Site, and the wooded stream that runs along the eastern boundary offer more potential, and both areas have good wooded connections with a network of hedgerows, tree-lines and marshy pastures off-site. The damp wooded area around Felindre Gas Compressor Station and the two National Grid 400kV electrical substations at the south-west end of the Survey Site also offers foraging potential and connects to off-site blocks of woodland to the north and south that may be good habitat for bats.
- 4.36 It is concluded that the Survey Site offers moderate habitat quality for foraging and commuting bats. There are potential roosting opportunities in some buildings and trees (see the bat survey report for full details), and some areas (woodland and marshy grassland) of the Survey Site which offer foraging opportunities, but the Survey Site as a whole does not have good linear commuting features and the majority of the habitats (tightly grazed improved grassland) are of low foraging value.

Great crested newt

- 4.37 There were no records for great crested newts provided by SEWBREC within 2 km of the Survey Site.
- 4.38 Details of the results of the HSI survey are given in the great crested newt survey report.

Dormouse

- 4.39 SEWBReC did not provide any records of dormouse *Muscardinus avellanarius*. The woodland areas on the eastern boundary, at the south-west end and within the marshy grassland in the north-west of the Survey Site do not provide optimum dormouse habitat although they are suitable for the species. Most of the woodland consists of relatively immature trees with little hazel understorey, limited foraging opportunities for this species and a lack of connectivity in the canopy. However, these areas of woodland have good connections to a complex of woodland and thick hedgerows to the west, south and east, and consequently could potentially form part of a wider network of dormouse-supporting habitat. There are a number of recent examples of dormouse occurring in sub-optimal habitat, such as coniferous plantation and species-poor hedges, in south and mid-Wales and their presence should not be ruled out if the habitat is sub-optimal but still has clear potential to support the species, as in this case.

Otter

- 4.40 SEWBReC provided 32 records of otter within the 2 km search radius, all recorded between 1991 and 2013. The closest record to the Survey Site is 0.5 km to the south west from the River Llan. At its closest point the River Llan is approximately 0.3 km south of the southern Survey Site boundary, and it links to the Survey Site via the stream running through the woodland in the centre of the Survey Site.
- 4.41 There are a number of water courses on site, most of which are ditches, but also a small stream running from north-west to south-east along the centre and eastern flank of the Survey Site and through the woodland in the centre of the Survey Site. None of the water courses on site are likely to provide good foraging opportunities because of their size, but they may offer lying up sites for otter, and it is possible that individuals might use the water courses to commute along from time to time.

Water Vole

- 4.42 SEWBRc provided three records of water vole from the River Llan approximately 1.9 km from the Survey Site boundary, all from 1996. This River is hydrologically linked to the Survey Site (see other section above), so it is possible, if any of the water courses retain water, particularly those linked to the River Llan, that water voles could be present on site.
- 4.43 No evidence of water voles was noted along the water courses on site when surveyed in February and April, although February is a time of low activity for the species, when field signs may not be evident. The water courses that were visited in February all had flowing water in them when surveyed, following a prolonged period of extremely wet weather during the winter. It is likely that many of these are usually dry or hold only a small amount of water and this was confirmed during the April survey. As such they do not provide good habitat for water voles. The stream that runs along the eastern boundary of the site; however, does provide suitable habitat for water vole, particularly at TN47-49. At TN49, a number of vole tunnels and holes were seen along the western side of the bank in long tussocks of grass, although it was not possible to ascertain which species had made them.

Reptiles

- 4.44 There were 12 records of reptiles provided by SEWBRc, between 1998 and 2010. These included records of all the common reptile species: adder *Vipera berus*, grass snake *Natrix natrix*, common lizard *Zootoca vivipara*, and slow worm *Anguis fragilis*. The closest record is of a common lizard, approximately 0.8 km to the west of the Survey Site boundary. Most records are from the south-west side of tinsplate workings near to Bryn Whilach Farm, approximately 1 km to the southwest of the Survey Site boundary.
- 4.45 There are several areas of the Survey Site that provide suitable habitat for common reptile species. This includes areas of marshy grassland to the south of the Survey Site, mounds of wood to the south of the woodland at TN7 (Photo 11), scrubby woodland fringes (Photo 12) and overgrown field margins either along remnant hedge banks or ditch banks. In addition a common lizard was seen during the April Phase 1 survey in the marshy grassland area in the north-west of the site and this area is particularly suitable for reptiles providing high quality habitat for foraging, sheltering and basking.

Badger

- 4.46 Information on badgers is provided in a confidential version of this report.

Birds

- 4.47 During the Phase 1 survey a number of common woodland and farmland bird species were recorded and these are listed in Appendix 4. The trees and woodland on site may provide nesting habitat for a range of common bird species. The marshy grassland on site could also provide nesting habitat for ground-nesting bird species. The Survey Site does not appear to be of particular importance for wintering birds with no notable aggregations of common species or any rarer species recorded during the walkover survey, except for a red kite *Milvus milvus* seen in flight over the Survey Site (see below) in both February and April.
- 4.48 SEWBRc provided a number of records of ground nesting birds in the search area. These included records for Eurasian curlew *Numenius arquata*, northern lapwing *Vanellus vanellus* and skylark *Alauda arvensis*. The closest of these records are located at the tinsplate workings site near to Bryn Whilach Farm, approximately 1 km to the southwest of the Survey Site boundary. There was one record of curlew, located at the Lliw reservoir, 1 km north of the Survey Site boundary.

Schedule 1 Birds

- 4.49 SEWBRc provided 21 records of barn owl *Tyto alba*. The closest of these records is 0.7 km to the west of the Survey Site boundary from 1997, with the nearest breeding record 3 km to the south west near Penllergaer Woods in 2000. It is possible that some of the farm buildings within the Survey Site may support breeding barn owl, although no trees were found that appear, from a

ground level inspection, to have sufficiently large cavities to support nesting barn owls. Full details of tree and buildings surveys are included in the bat survey report.

- 4.50 The marshy fields at the southern end of the Survey Site, although probably sub-optimal, could provide habitat for field vole *Microtus agrestis* (a preferred prey species) given the thick, tussocky structure of some parts of the sward. The marshy grassland in the north-west of the Survey Site provides optimal foraging habitat for barn owls due to its extensive areas of tussocky grassland that may support breeding field voles *Microtus agrestis*, their preferred prey species.
- 4.51 A red kite was noted circling above a field in the north of the Survey Site and also over Abergelli Farm during the February survey. Red kites generally breed in valley woodlands of which there is extensive habitat to 2-3 km to the east and west of the Survey Site. It is considered likely that the Survey Site is part of a much wider area of potential foraging habitat for the species. SEWBRc provided 54 records for red kite between 1999 and 2013.

Terrestrial Invertebrates

- 4.1 SEWBRc provided 40 records of Section 42 terrestrial invertebrate species. The species recorded are marsh fritillary, dingy skipper *Erynnis tages*, narrow-bordered bee hawk-moth *Hemaris tityus*, and small pearl-bordered fritillary *Boloria selene*. Twenty-nine of the records are of marsh fritillary; the closest of these is located approximately 0.7 km west of the Survey Site boundary in 2009. This location also contains the closest of the four dingy skipper records, as well as the closest of the five small pearl-bordered fritillary records and the only narrow-bordered bee hawk-moth record.
- 4.2 The marshy grassland to the west provides suitable habitat for marsh fritillaries, although the food plant devil's-bit scabious *Succisa pratensis* was not noted in any quantity during the April survey. Of the other Section 42 species recorded from the desk study, suitable habitat is present for narrow-bordered bee hawk-moth *Hemaris tityus*, which largely relies on devil's bit scabious, like marsh fritillary. For dingy skipper, there are few areas of bare ground, where this species prefers to bask and no areas where its usual food plant, bird's foot trefoil *Lotus corniculatus*, is found in any quantity. Small pearl-bordered fritillary is reliant on violets (*Viola* spp.) as its food plant and violets have not been recorded during either Phase 1 survey (the April survey was well timed to record them in flower). It is unlikely that either of these latter two species is present.
- 4.3 Other habitats that may be suitable for diverse assemblages of terrestrial invertebrates include the areas of broad-leaved ancient woodland at TN7, for example, which represents a fairly extensive area of semi-natural habitat that may be important for terrestrial invertebrates, particularly *Lepidoptera* (notably moths) and beetles (*Coleoptera*); which are both strongly represented in wooded habitats.

Aquatic Invertebrates

- 4.4 No records of Section 42 aquatic invertebrate species were provided by SEWBRc, and it is unlikely that any of the ponds on or close to the site support unusual or diverse assemblages of aquatic invertebrates.

5 References

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JNCC (2010). Handbook for Phase 1 habitat survey - a technique for environmental audit. JNCC, Peterborough

Oldham R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000) Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). Herpetological Journal 10(4), 143-155.

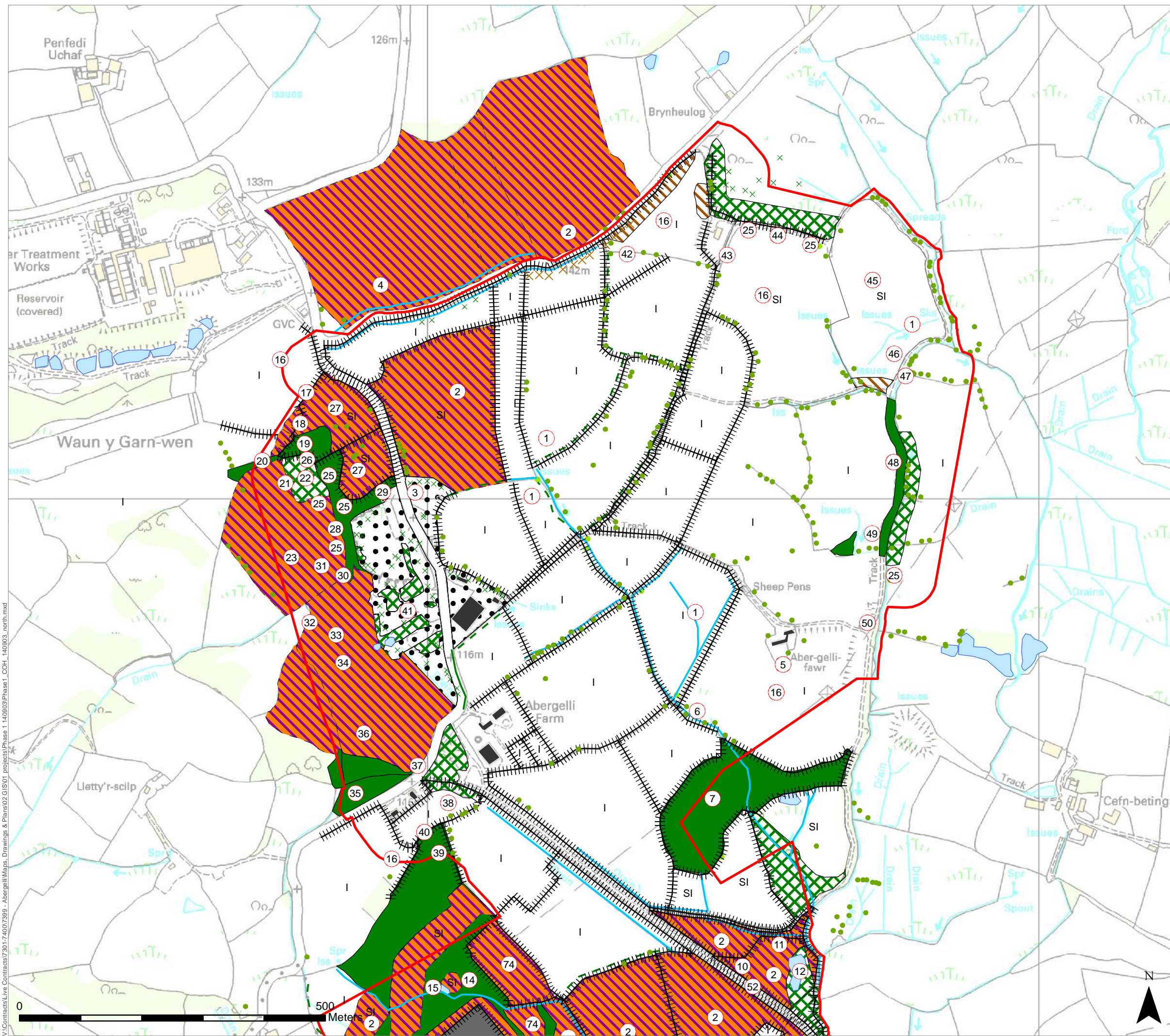
Stace, CA (2010). New Flora of the British Isles, Third Edition. Cambridge University Press, Cambridge.

Websites

MAGIC: www.magic.gov.uk

Appendix 1: Figures

(see overleaf)



- LEGEND**
- Survey Site boundary
 - 1 Target notes
 - Broadleaved woodland
 - Dense scrub
 - | Improved grassland
 - Marshy grassland
 - SI Semi-improved grassland
 - Tall ruderal
 - Ephemeral/short perennial
 - Bare ground
 - Hardstanding and buildings
 - Standing water
 - Buildings
 - Water course
 - Species-poor intact hedge
 - Species-poor defunct hedge
 - Fence
 - x Scattered scrub
 - Broadleaved tree
 - x Bracken
 - Trees with potential to support roosting bats

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PROJECT TITLE
ABERGELLI POWER PROJECT

DRAWING TITLE
Figure 1a - Phase 1 Habitat Survey North

DATE: 03.09.2014 CHECKED: NL SCALE: 1:6,000
 DRAWN: COH APPROVED: MH STATUS: FINAL

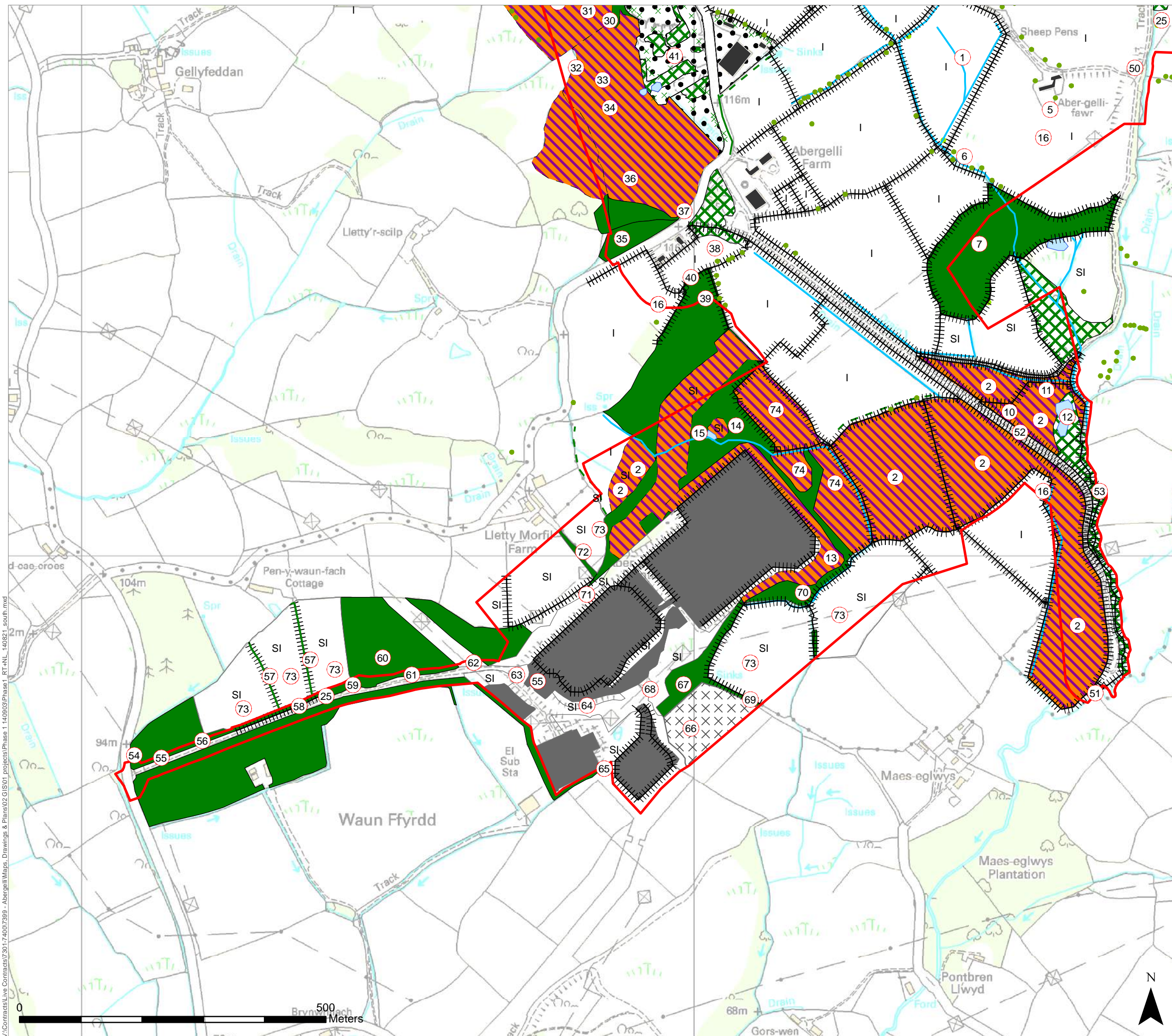
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- LEGEND**
- Survey Site boundary
 - 1 Target notes
 - Broadleaved woodland
 - Dense scrub
 - Improved grassland
 - Marshy grassland
 - SI Semi-improved grassland
 - Tall ruderal
 - Ephemeral/short perennial
 - Bare ground
 - Hardstanding and buildings
 - Standing water
 - Buildings
 - Water course
 - Species-poor intact hedge
 - Species-poor defunct hedge
 - Fence
 - x Scattered scrub
 - Broadleaved tree
 - x Bracken
 - Trees with potential to support roosting bats

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PROJECT TITLE
ABERGELLI POWER PROJECT

DRAWING TITLE
Figure 1b - Phase 1 Habitat Survey South

DATE: 27.08.2014 CHECKED: NL SCALE: 1:6,000
DRAWN: COH APPROVED: MH STATUS: FINAL

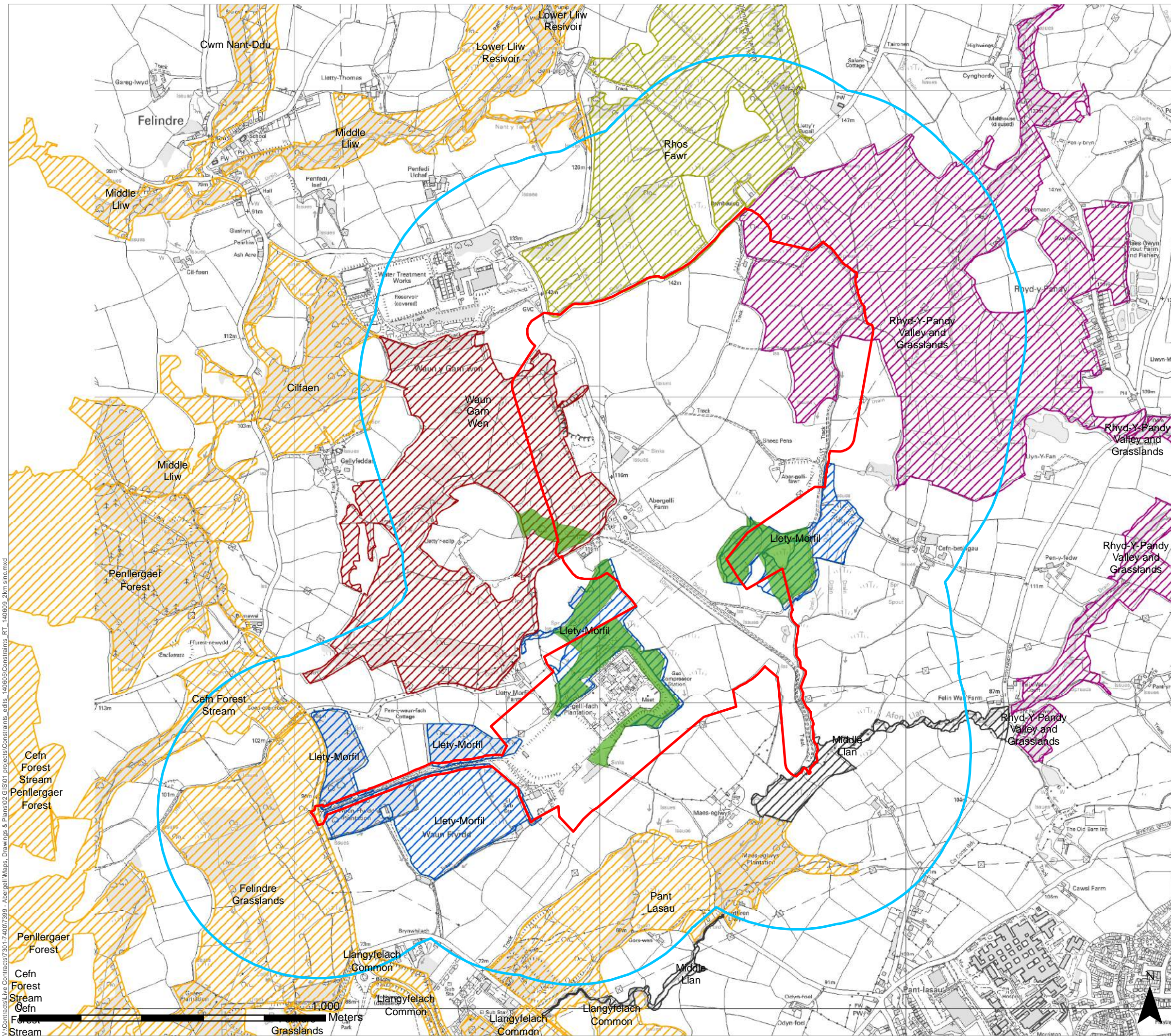
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LEGEND

- Site boundary
- 500m radius from site boundary

Site of Importance for Nature Conservation (SINC)

- SINC: Llety-Morfil
- SINC: Middle Llan
- SINC: Rhos Fawr
- SINC: Rhyd-Y-Pandy Valley and Grasslands
- SINC: Waun Garn Wen
- Other SINC location

Ancient Woodland

- Ancient Woodland

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PROJECT TITLE
 ABERGELLI POWER PROJECT

DRAWING TITLE
 Figure 2 - SINC and Ancient Woodland map

DATE: 16.06.2014 CHECKED: MH SCALE: 1:12,000
 DRAWN: RT APPROVED: MH STATUS: FINAL

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Appendix 2: Target Notes

1. Wet ditches, typically spring fed, one with ochre discolouration. With steep banks dominated by sweet-grass *Glyceria* sp. and soft rush *Juncus effusus*, with great willow herb *Epilobium hirsutum* present occasionally. Frog spawn was present in one of the ditches.
2. Marshy grassland with abundant to dominant soft rush. Sward height varies depending on stock grazing type and intensity. Sedge species frequently occur, including common sedge *Carex nigra* and glaucous sedge *Carex flacca*. Other species noted include sharp-flowered rush *Juncus acutiflorus* and/or jointed rush *Juncus articulatus* (difficult to separate in winter and when closely grazed), cinquefoil species (*Potentilla* sp.), daisy *Bellis perennis* and creeping bent *Agrostis capillaris*. In between the rushes, agriculturally improved and semi-improved grassland is present with perennial rye-grass *Lolium perenne*, common mouse-ear and white clover *Trifolium repens* dominating in the improved fields, with Yorkshire fog *Holcus lanatus*, creeping buttercup *Ranunculus repens*, silverweed *Potentilla anserina*, dandelion *Taraxacum officinale* agg., ribwort plantain *Plantago lanceolata*, lesser spearwort *Ranunculus flammula*, mouse-ear-hawkweed *Pilosella officinarum* and unidentified sedges *Carex* spp. occurring.
3. A small concrete bunker with wasteland area. The concrete bunker is formed of 2m high brick walls with a flat roof formed from concrete sleepers. There is an open doorway on the south elevation and a 30cm x 30cm hole at the top of the west-facing wall. No evidence of bats was recorded. The surrounding land is compacted course aggregate which is becoming colonised with common grassland species. There is an earth bund around the south-east and north-east boundary, topped with dense bramble and gorse scrub.
4. An area of marshy grassland which is very closely grazed. Occasional common heather *Calluna vulgaris* and bilberry *Vaccinium myrtillus* plants and patches of sphagnum moss *Sphagnum* sp. were recorded. Purple moor grass *Molinia caerulea* is frequent and forms dominant tussocks at the north end of the field. Other species include sheep's fescue *Festuca ovina* and a sedge species.
5. A derelict stone farmhouse with only the bottom halves of walls still present. Patches of rubble, a number of mature / dead ash *Fraxinus excelsior* trees and overgrown vegetation are present, which may provide good habitat for reptiles and bats.
6. A stream lined with trees, which is fast-flowing with a stony substrate.
7. An area of broadleaved woodland. The western end is on a hill, which slopes steeply down to the east. This end (delineated by a stream running north-south) is dry with widely spaced trees and a grazed grassland ground flora (Yorkshire fog, common mouse-ear, and creeping buttercup were the most prominent species) and very little understorey was noted. The eastern end is much wetter, with carpets of opposite-leaved golden-saxifrage *Chrysosplenium oppositifolium*, extensive areas of purple moor-grass dominated ground flora with some sphagnum moss species. The understorey is thicker here and is predominantly bramble *Rubus fruticosus*. Tree species include birch *Betula pubescens*, crab-apple *Malus sylvestris*, holly *Ilex aquifolium* and English oak *Quercus robur*. Most specimens are small-medium in size.
- 8, 9. and 24. These Target Notes relate to evidence of badger activity and are provided in a confidential version of this report. They are also omitted from Figures.
10. A ditch along a line of small-medium trees (beech *Fagus sylvatica*, holly, English oak) and a fence. Bilberry is growing along the fence.
11. A marshy grassland field with abundant soft rush tussocks. The area indicated by this target note is dominated by purple moor-grass with occasional cross-leaved heath *Erica tetralix* and scattered small trees/scrub.
12. A shallow pond (less than 10cm deep), approximately 10m in diameter, completely covered in a sedge species (only dead leaves were evident so identification was not possible) and with a small tree-covered island in the centre. The pond is ringed by small trees. The surrounding vegetation includes purple moor-grass with occasional common heather and cross-leaved heath and densely growing small trees and scrub (willow species *Salix* sp., bramble and alder *Alnus glutinosa*). A small pond immediately to the south is shown on OS maps. This consisted of small patches of standing water (including wheel ruts) within marshy (rushes, purple moor grass) vegetation.
13. A strip of land around the gas station, which is higher than the surrounding land. There is a gravel strip immediately surrounding the boundary fence then a steep slope covered in soft-rush dominated grassland. At the base of the slope is a mosaic of marshy rush-dominated grassland with dense bramble scrub and wet woodland. The woodland consists of closely spaced, small and straggly trees composed largely of holly, English oak, birch, willow and alder.

14. An area of wet woodland with dense bramble understorey. The species present and structure are as for Target Note 13. Wet underfoot.
15. A small pond within woodland fed by a stream. No emergent/marginal vegetation was in evidence and the pond is surrounded by small saplings.
16. Improved grassland with short sward grazed by horses. Access to field restricted by presence of horses. Species observed from track include creeping thistle *Cirsium arvense*, perennial rye-grass, broad-leaved dock *Rumex obtusifolius* and creeping bent.
17. Species-poor hedge with hawthorn *Crataegus monogyna* and willow, grading into old bank boundary with overgrown hedge with oak *Quercus* sp. and holly and drainage ditch along north side.
18. Marshy grassland with small copse of willow, oak and birch *Betula* sp., fenced off from horses with head of spring in centre. Potential for terrestrial phase amphibians and reptiles in sunny hedgebank and refugia provided by piles of dead wood and nesting birds in trees. Species recorded include common bent, Yorkshire fog, soft rush, creeping bent, sweet grass *Glyceria* sp., wavy bittercress *Cardamine flexuosa*, creeping buttercup, curled dock *Rumex crispus*, broad-leaved willowherb *Epilobium montanum*, bird's-foot-trefoil *Lotus corniculatus*, lady fern *Athyrium felix-femina*.
19. Area of dense bramble scrub and willow regeneration immediately beneath power lines which links to wooded spur to west and marshy grassland copse to east.
20. Small wooded spur with tree species including oak, birch, holly, hawthorn with an understorey dominated by brambles and including ivy *Hedera helix*, creeping bent, Yorkshire fog, soft rush, hard fern *Blechnum spicant*, scaly male fern *Dryopteris affinis*, and bracken *Pteridium aquilinum*.
21. Bank feature delineating boundary of small field (see TN22) with birch and willow regeneration and mature oak to southern end. Ground flora dominated by bracken and bramble with bluebell *Hyacinthoides non-scripta* and bilberry to south.
22. Small field dominated by bramble scrub with bracken, broad-leaved willowherb and soft rush. Grades into copse of birch and willow regeneration to east with ephemeral ditch along south and east boundaries.
23. Large field of wet dwarf shrub heath, dominated by purple moor grass with soft rush, bracken, common haircap moss *Polytrichum commune*, unidentified sphagnum moss, common heather, cross-leaved heath and bilberry along margins. Some birch and willow regeneration in small scattered copses.
25. Mature English oak.
26. Mature alder.
27. Semi-improved grassland with high proportion of herbs and low proportion of grass. Species recorded include soft rush, ribwort plantain, mouse-ear-hawkweed, dandelion, daisy, self-heal *Prunella vulgaris*, white clover, creeping buttercup, broad-leaved willowherb, bird's-foot-trefoil, common mouse-ear, yarrow *Achillea millefolium*, marsh thistle *Cirsium palustre* and with lesser spearwort, water figwort *Scrophularia aquatica* and horsetails *Equisetum* sp. in the southern corner.
28. Wooded stream corridor with oak, hawthorn, birch and occasional alder. Understorey dominated by bramble scrub.
29. Embankment of large raised area with mature trees on banks. Northern side with young willow, hawthorn, birch, elder *Sambucus nigra*, rowan *Sorbus aucuparia* and semi-mature / mature oak. Ground flora dominated by brambles but with hart's-tongue fern *Asplenium scolopendrium*, lady fern, hard fern, scaly male fern, unidentified polypody fern *Polypodium* sp., common nettle *Urtica dioica* and dog's mercury *Mercurialis perennis*. Several stands of Japanese knotweed *Fallopia japonica* were present.
30. Wooded stream corridor with willow and elder *Sambucus nigra* and intermittent bramble scrub. Species recorded include common nettle, broad-leaved willowherb, horsetails, water figwort, soft rush, hard fern, bracken, wild angelica *Angelica sylvestris*, herb Robert *Geranium robertianum* and pendulous sedge *Carex pendula*. Stand of Japanese knotweed at bend in stream.
31. Stand of bramble scrub within willow and birch regeneration with damp substrate supporting reed canary grass *Phalaris arundinacea*. Lots of piles of dead wood.
32. Dry irrigation ditch, occasional young birch and willow with purple moor-grass, soft rush and
33. Large field superficially similar to TN23 but appears to have been managed. Purple moor-grass not as dominant, lots of bare earth and common heather seedlings and cross-leaved heath. In addition hare's-tail cotton grass *Eriophorum vaginatum*, deergrass *Trichophorum germanicum* and lousewort *Pedicularis* sp.

34. Field drain holding water with greater reedmace *Typha latifolia*, broad-leaved pondweed *Potamogeton natans* and water-plantain *Alisma plantago-aquatica*. Common lizard *Lacerta vivipara* was directly observed on bank of ditch.
35. Wooded copse comprised of young birch and willow with understorey of bramble scrub and ground flora comprising common nettle, lady fern, scaly male fern, false brome *Brachypodium sylvaticum*. Himalayan balsam *Impatiens glandulifera* seedlings abundant. There is also a ditch with very shallow, ponded, oily water with no aquatic vegetation.
36. Drainage ditch holding water, and with dense stands of sphagnum moss in bottom of ditch. Steep sides with common heather, cross-leaved heath and purple moor-grass.
37. Mature Birch, 80cm DBH with dense ivy obscuring the trunk.
38. Area of tipped spoil which has become partially vegetated and was being re-graded at time of survey. Bramble and willow scrub around the margins / banks and a horse training area to the North. Species recorded in this area include bramble, gorse *Ulex europea*, curled dock, broad-leaved dock, common nettle, a brassica *Brassicaceae*, creeping thistle, colt's foot *Tussilago farfara*, foxglove *Digitalis purpurea*, wavy bittercress, bird's-foot trefoil, Yorkshire fog and white clover.
39. Area of deciduous woodland and scrub comprising occasional mature oak with hazel *Corylus avellana*, holly, birch, rowan *Sorbus aucuparia*, willow, a scrub layer of bramble and a ground flora including bluebells, hard fern, soft rush, creeping bent, common bent, a spurge *Euphorbiaceae* sp., false-brome and abundant Himalayan balsam seedlings. Area contains many piles of fallen deadwood and there is a bank feature along part of the northern boundary.
40. Mature ash *Fraxinus excelsior*.
41. Earth works with large percentage of bare, waterlogged earth. In undisturbed marginal sloped areas gorse, willow and bramble scrub is present.
42. Bank field boundary with many mature but small holly trees and ground flora of grazed improved grassland.
43. Stone wall / bank delineating eastern edge of domestic property.
44. Treeline along track with mature / semi-mature oak, and scrub layer comprising gorse and bramble. There are many loose rocks and exposed tree roots with a wet ditch along the northern side fringed by soft rush. The water is ponded and shallow with no aquatic plants observed.
46. Area where soft-rush dominant and very low percentage of grass. Herbs recorded include common sorrel *Rumex acetosa*, knotgrass *Polygonum aviculare*, common mouse-ear, creeping buttercup, wavy bittercress and cleavers *Gallium aparine*.
47. Stream, flowing water approximately 30cm deep, good water quality, moderate flow. Bankside vegetation including lesser water-parsnip *Berula erecta*, horsetail sp., reed canary-grass, wild angelica, broad-leaved willowherb, bramble, bracken, soft rush, common nettle, hard fern, common haircap moss, cuckoo pint *Arum maculatum* and lesser celandine *Ranunculus ficaria*. Stream fringed by regenerating birch and willow scrub.
48. Tree-lined stream corridor with mature / semi-mature oak trees along Eastern edge with occasional birch, willow, ash and holly. Understorey of gorse with bramble scrub and soft rush grading into improved grassland to east. Along western bank, grassland typical of wider area but with longer sward (low-density sheep-grazing) and also including sweet vernal grass *Anthoxanthum odoratum*, crested dog's tail *Cynosurus cristatus*, a fescue *Festuca* sp. and field wood rush *Luzula campestris*.
49. Large mammal slide and run to hole under bank / tree on eastern side of bank. Many small mammal tunnels are present along the western bank in long tussocky grass.
50. Drainage ditch and area of marshy grassland including species such as horsetails, floating sweet grass *Glyceria fluitans*, lesser water-parsnip, angelica and soft rush.
51. A small river 2- 3 metres wide with banks up to 0.5 metre tall, with a natural flow pattern of riffle – pool and occasional meanders with river cliffs and shingle bars present. The bed of the river is comprised of gravels and cobbles with some larger boulders present. The banks are well vegetated with abundant bramble, Himalayan balsam, bracken, river water dropwort *Oenanthe fluviatilis* and floating sweet grass.
52. Gallopway. A long feature that dissects the site which comprises of a hardstanding access track and a wood chip surfaced gallopway. These run parallel to each other with a strip of ruderal grassland in-between, the width of the central area varies along its length from one to five metres. The two tracks are largely devoid of vegetation with occasional colonising species from the grassed central strip encroaching onto either track

at various points. The grass strip has abundant common bent, creeping bent, Yorkshire fog, perennial rye and sweet vernal grass. Also recorded as present were floating sweet grass, spear thistle *Cirsium vulgare*, creeping thistle, red clover, curled dock, white clover, greater plantain, ragwort *Senecio jacobaea*, common knapweed *Centaurea nigra*, soft rush, sharp flowered rush, marsh thistle, green ribbed sedge *Carex binervis*, wild carrot *Daucus carota* and oval sedge *Carex ovalis*.

53. Small stream up to 1m wide and 10cm deep with a cobble base and banks to 0.5m tall, that flows alongside the track. Dense vegetation covers the stream and borders the farm track with abundant bramble, lady fern, Himalayan balsam, river water-dropwort and hard fern. The stream is overtopped by a canopy of mature and semi mature English oak and grey willow *Salix cinerea* and alder.

54. Road verge with rank grassland and tall ruderal vegetation. Creeping buttercup, crested dog's tail, Yorkshire fog, creeping thistle, bracken, rosebay willowherb *Chamerion angustifolium*, hemp agrimony *Eupatorium cannabinum*, buddleja *Buddleia davidii*, sweet vernal grass, false oat grass *Arrhenatherum elatius*, and soft rush all occur frequently. The trees running alongside the road include field maple *Acer campestre*, hawthorn, grey willow, beech and English oak.

55. Gravelled laybys, with wild carrot, hedge mustard *Sisymbrium officinale*, squirrels tail fescue *Vulpina bromoides*, bearded couch *Elymus caninus*, creeping bent, red clover, herb Robert and pale toad flax *Linaria repens*.

56. Two dead trees. One with some bat potential was a 15m tall dead elm *Ulmus* sp. with hanging plates of bark and a DBH of 80cm.

57. Dense hedgerow with few gaps. With good structure and diversity of species suitable for dormouse *Mycardinus avellanarius*. Hazel, willow and European gorse present.

58. Thin patchy hedgerow running along a fence with rose *Rosa* sp., hazel, grey willow, bracken, honeysuckle *Lonicera periclymenum*, bramble and holly.

59. Dead silver birch *Betula pendula* with a DBH of 70cm, has 2 woodpecker holes are present on its northern aspect at 3m and 5m with bat potential. A small clump of montbrecia *Crocodymia x crocosmiiflora* is present at its base.

60. Broad leaved woodland with English oaks dominating the canopy and holly dominated the understorey. Silver birch, beech and rowan also occur as both canopy and sub canopy trees. The ground-flora is sparse due to heavy shade but species present include tufted hair grass *Deschampsia flexuosa*, hairy sedge *Carex hirta*, water figwort and guelder rose *Viburnum opulus*.

61. Dead oak with two stems.

62. Ruderal strip along powerline way-leave clearance with frequent bracken, meadowsweet *Filipendula ulmaria*, soft rush, foxglove, grey willow, hemp agrimony, bramble, marsh thistle, compact rush *Juncus conglomeratus*, evening primrose *Oenothera* sp. and in a short section of wet ditch that runs briefly along the access track some greater reedmace occurs along with lady fern, woody nightshade and broad leaved willowherb.

63. Immature trees forming tall scrub with willow, alder, English oak, European gorse and rowan.

64. South facing banks covered in semi-improved rank grassland suitable for reptiles, with false oat grass and fescue sp. dominating. Yorkshire fog, bird's foot trefoil, marsh thistle, curled dock, ribwort plantain and soft rush all occur occasionally.

65. Culverted stream with a concrete bed studded with rocks, carrying a very shallow trickle of water through an area of alder, bramble, grey willow and birch scrub.

66. A field that has been stripped of top soil, leaving stony subsoil which has become colonised with a sparse covering of grassland and ephemeral species. The top soil has been banded on the northern and southern ends of the field. The sward is a mosaic with some areas bare and others with a species assemblage typical of improved grassland.

67. Woodland with young trees giving the appearance of secondary woodland with English oak, alder, hazel, rowan and willow. The ground flora comprises occasional lady fern, bracken, ivy, broad buckler *Dryopteris dilatata*, rowan, hard fern, enchanter's nightshade *Circaea lutetiana*, wavy hair grass, bramble, wood meadow grass *Poa nemoralis*, scaly male-fern and foxglove.

68. Damp hollow with greater reedmace, marsh St John's-wort *Hypericum elodes* and ribbed melilot *Melilotus officinalis*.

69. Twin tree line with hazel, holly, English oak, sycamore *Acer pseudoplatanus* and silver birch, small stream present in the base with greater stitchwort *Stellaria neglecta*, bluebell and hawthorn present on its banks.
70. Woodland with mostly immature scrubby trees. English oak, silver birch and sycamore are all frequent.
71. Planted willow sp. scrub.
72. Double hedgerow with English oak and hawthorn.
73. Semi-improved neutral grassland with dominant common bent, sweet vernal and perennial rye. Creeping buttercup, Yorkshire fog, marsh thistle, ribwort plantain *Plantago lanceolata*, common nettle *Urtica dioica*, white clover, dandelion *Taraxacum officinalis* agg. are also present along with occasional soft rush.
74. A series of marshy grassland fields with 75% to 100% of cover of soft rush. A small patch of bulrush were found towards centre of the small field surrounded by encroaching scrub and straggly woodland.

Appendix 3: Photographs

Habitats

Photo 1: Improved grassland with defunct hedge.



Photo 2: Marshy grassland at TN2.



Photo 3: Marshy grassland at TN4.



Photo 4: Marshy grassland at TN74.



Photo 5: Marshy grassland at TN11.



Photo 6: Woodland at TN7.



Habitats – April Survey

Photo 1a: Hare's-tail cottongrass



Photo 2a: Improved grassland



Photo 3a: Semi-improved grassland at TN27



Photo 4a: Marshy grassland at TN33.



Photo 5a: TN24 Field drain



Photo 6a: Stream corridor at TN48.



Photo 7: Woodland at TN14.



Photo 8: Stream in woodland TN7.



Photo 9: Stream at TN6.



Reptiles – examples of suitable habitat.

Photo 24: Mounds of wood south of TN10.



Photo 25: Tussocky grassland suitable for reptiles.



Appendix 4: Bird species recorded during Phase 1 survey.

Latin Name	Common Name
Mallard	<i>Anas platyrhynchos</i>
Buzzard	<i>Buteo buteo</i>
Red kite	<i>Milvus milvus</i>
Woodpigeon	<i>Columba palumbus</i>
Great spotted woodpecker	<i>Dendrocopos major</i>
Meadow pipit	<i>Anthus pratensis</i>
Pied Wagtail	<i>Motacilla alba yarrellii</i>
Dunnock	<i>Prunella modularis</i>
Wren	<i>Troglodytes troglodytes</i>
Robin	<i>Erithacus rubecula</i>
Blackbird	<i>Turdus merula</i>
Song Thrush	<i>Turdus philomelos</i>
Mistle thrush	<i>Turdus viscivorus</i>
Redwing	<i>Turdus iliacus</i>
Blue Tit	<i>Parus caeruleus</i>
Great Tit	<i>Parus major</i>
Long tailed tit	<i>Aegithalos caudatus</i>
Magpie	<i>Pica pica</i>
Jackdaw	<i>Corvus monedula</i>
Carrion crow	<i>Corvus corone</i>
Rook	<i>Corvus frugilegus</i>
House sparrow	<i>Passer domesticus</i>
Chaffinch	<i>Fingilla coelebs</i>
Greenfinch	<i>Carduelis chloris</i>
Goldfinch	<i>Carduelis carduelis</i>
Reed bunting	<i>Emberiza schoeniclus</i>

Appendix 5: Summaries of Relevant Legislation, Policy and Other Instruments

National Planning Policy

- 5.1 Technical Advice Note (TAN) 5 provides Welsh Assembly Government advice about how the land use planning system in Wales should contribute to protecting and enhancing biodiversity and geological conservation.
- 5.2 It follows that the TAN provides guidance to local planning authorities on: the key principles of positive planning for nature conservation; nature conservation and Local Development Plans; nature conservation in development management procedures; development affecting protected internationally and nationally designated sites and habitats; and, development affecting protected and priority habitats and species.
- 5.3 Planning considerations with regard to habitats and species are of greatest relevance to the Abergelli Farm proposal. For a full account, the TAN should be referred to, but some of the key principles are summarised as follows:
- i. *When dealing with cases where a European protected species of plant or animal may be affected, a local planning authority needs to have regard to the requirements of the Habitats Directive in the exercise of its functions.*
 - ii. *The TAN refers to the Wildlife and Countryside Act 1981 (as amended), which makes it an offence (with certain limited exceptions and in the absence of a licence) to intentionally to kill, injure or take any wild bird, or to damage, take or destroy the nest of any wild bird whilst that nest is being built or in use, or to take or destroy its eggs. Further offences apply to species listed under Schedule 1 of the Act.*
 - iii. *The above Act also affords protection to wild animals of the species listed in Schedule 5, and to wild plants listed in Schedule 8, most of which are not European protected species. Actions that are likely to result in an offence are identified;*
 - iv. *With regard to badger, *Meles meles*, the TAN refers to the provisions of the Protection of Badgers Act, 1992;*
 - v. *The TAN makes reference to Sections 40 and 42 of the Natural Environment and Rural Communities Act 2006, which place a duty on the Welsh Assembly Government to have regard to the purpose of conserving biodiversity (see Section 1.10 of this report);*
 - vi. *In section 2.4 it is noted that when deciding planning applications that may affect nature conservation, local planning authorities should protect wildlife and natural features in the wider environment, with appropriate weight attached to priority habitats and species in Biodiversity Action Plans;*
 - vii. *When determining planning applications, planning authorities should ensure that all material considerations are taken into account, that decisions are informed by adequate information about the potential effects of development on nature conservation, and that the range and population of protected species is sustained;*
 - viii. *Planning applications should demonstrate a step-wise approach to avoid harm to nature conservation, minimise unavoidable harm by mitigation measures, offset residual harm by compensation measures and look for new opportunities to enhance nature conservation.*

UK Post-2010 Biodiversity Framework

- 5.4 The Environment Departments of all four governments in the UK work together through the Four Countries Biodiversity Group. Together they have agreed, and Ministers have signed, a framework of priorities for UK-level work for the Convention on Biological Diversity. Published on 17 July 2012, the 'UK Post-2010 Biodiversity Framework' covers the period from 2011 to 2020.

- 5.5 Most work which was previously carried out under the UK Biodiversity Action Plan (UK BAP) is now focussed in the four countries of the UK through the new framework. The UK BAP partnership no longer operates but includes detailed Action Plans for priority habitats and species, which are still in use and of relevance. The list of priority habitats and species included within the UK BAP list is equivalent to the list of Section 42 habitats and species.
- 5.6 The UK BAP is supported by a series of Local Biodiversity Action Plans (LBAPs), usually set up on a local authority administrative boundary basis. Each LBAP identifies those habitats and species considered to be most important in that area (usually referred to as priority habitats and species). Commonly, an LBAP will identify a number of habitats and species for which “action plans” have been prepared. The Swansea LBAP is was created in 2005 but is unavailable as it is under review.

Wildlife Legislation

- 5.7 Legislation of most relevance to this assessment includes the following:

Natural Environment and Rural Communities (NERC) Act 2006

- 5.8 Section 40 of the Natural Environment and Rural Community Act (NERC) 2006 sets out the duty which public authorities have to conserve biodiversity. Section 40 States that: “every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity”. The term Public Authority includes local authorities and local planning authorities.
- 5.9 Paragraph 40(3) goes on to state that “conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat”.
- 5.10 Paragraph 42(1) states that “the Secretary of State must, as respects Wales, publish a list of the living organisms and types of habitat which in the Secretary of State’s opinion are of principal importance for the purpose of conserving biodiversity”. This replaces a similar reference to the list that was found in Section 74 of the Countryside and Rights of Way Act 2000 (the CRoW Act).

The Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000)

Protection afforded to birds

- 5.11 Section 1 of the Wildlife and Countryside Act 1981 (WCA) prohibits the intentional killing, injuring or taking of any wild bird and the taking, damaging or destroying of the nest (whilst being built or in use) or eggs. Section 1 also prohibits disturbing any bird listed on Schedule 1 of the Act whilst at or near the nest and prohibits disturbing the dependent young of such birds.

Protection afforded to other animals

- 5.12 Species listed on Schedule 5 that may be of relevance to this site include GCNs, bats, otter, water vole and all species of reptiles. The places of shelter used by otter and water vole are protected, but reptiles are protected from killing and injury only.

Protection afforded to Sites of Special Scientific Interest (SSSIs)

- 5.13 Section 28 allows for the creation of SSSIs by the government (through Natural Resources Wales in Wales) where Natural Resources Wales (NRW) “is of the opinion that any area of land is of special interest by reason of any of its flora, fauna, geological or physiographical features.”
- 5.14 Section 28G specifies the duty of specific public authorities (including local authorities) to further the conservation and enhancement of the features by reason of which the site is designated and also to notify NRW of operations likely to damage such features in order that NRW may consent to or refuse permission for such operations.

The Conservation of Habitats and Species Regulations 2010

- 5.15 The Conservation of Habitats and Species (Amendment) Regulations 2012 consolidates the various amendments that have been made to the Regulations. The original (1994) Regulations transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law.
- 5.16 “European protected species” (EPS) are those which are present on Schedule 2 of the Conservation of Habitats and Species Regulations 2010. They are subject to the provisions of Regulation 41 of those Regulations. All EPS are also protected under the Wildlife and Countryside Act 1981 (as amended). Taken together, these pieces of legislation make it an offence to:
- a) Intentionally or deliberately capture, injure or kill any wild animal included amongst these species;
 - b) Possess or control any live or dead specimens or any part of, or anything derived from a these species;
 - c) Deliberately disturb wild animals of any such species;
 - d) Deliberately take or destroy the eggs of such an animal; or
 - e) Intentionally, deliberately or recklessly damage or destroy a breeding site or resting place of such an animal, or obstruct access to such a place.
- 5.17 For the purposes of paragraph (c), disturbance of animals includes in particular any disturbance which is likely—
- a) to impair their ability—
 - I. to survive, to breed or reproduce, or to rear or nurture their young, or
 - II. in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
- 5.18 To affect significantly the local distribution or abundance of the species to which they belong.
- 5.19 Although the law provides strict protection to these species, it also allows this protection to be set aside (derogated) through the issuing of licences. The licences in England are currently determined by NE for development works. In accordance with the requirements of the Regulations (2012), a licence can only be issued where the following requirements are satisfied:
- a) The proposal is necessary ‘to preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment’;
 - b) ‘There is no satisfactory alternative’; and
 - c) The proposals ‘will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range’.
- 5.20 EPS that may be relevant to this proposal include GCNs, bats, dormouse and otter.

Invasive Species Legislation

- 5.21 Japanese knotweed and Himalayan balsam are both listed on Part 2, Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). Section 14 of the Act states that it is an offence for a person to plant or otherwise cause to grow in the wild any species listed on Part2, Schedule 9. The Environmental Protection Act 1990 contains a number of legal provisions concerning ‘controlled waste’. Any soil or plant material contaminated with Japanese knotweed that is to be discarded is classified as controlled waste.

Abergelli

Abergelli Power Project

Otter and Water Vole Survey Report

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1 Summary

- 1.1 Abergelli Power Limited (APL) is promoting a new Power Generation Plant with its associated Gas and Electricity Connections (the 'Project') on agricultural land within Abergelli Farm, north of Swansea in the City and County of Swansea (approximately at National Grid Reference 265284, 201431).
- 1.2 The preliminary ecological appraisal¹ identified records of otter *Lutra lutra* and water vole *Arvicola amphibius* within 2 km of the Project Site boundary, and suitable habitat to support these species within the Project Site boundary at the time of the survey (hereafter referred to as the 'Survey Site'). APL commissioned BSG Ecology to undertake an otter and water vole survey of streams and wet ditches within the 150 ha of pastoral farmland at and around Abergelli Farm in June 2014 within the Survey Site, to inform and support an application for Development Consent for the Project.
- 1.3 All accessible ponds, streams and wet ditches within the Survey Site boundary were surveyed for field signs of use by otter and water vole.
- 1.4 There are water courses on Survey Site that could provide resting places and commuting routes for otter. A single fresh spraint was recorded during the survey. This was observed on a rock in the stream that runs along the eastern boundary of the Survey Site.
- 1.5 Holes, that were likely to be mammal burrows, were observed at six points along two streams within the Survey Site. The holes have the right dimensions to allow use by water voles, but did not show signs of current occupation. No latrines, footprints or grazing lawns were observed during the survey.

¹ BSG Ecology (2014). Abergelli Power Project: Preliminary Ecological Appraisal.

2 Introduction

- 2.1 Abergelli Power Limited commissioned BSG Ecology to undertake an otter and water vole survey in May/June 2014 to inform and support an application for Development Consent for the Project described below.

Site Description

- 2.2 The Survey Site consists of approximately 150 ha of pastoral farmland, primarily grazed by horses. The extent of the Survey Site is shown in (Figure 1, Appendix 1) and is centred at National Grid Reference 265284, 201431. The nearest settlement is Felindre, which is located approximately 2 km to the north of the Survey Site, with Swansea approximately 5 km to the south.
- 2.3 The Survey Site is largely agriculturally improved pasture with several areas of marshy grassland, particularly in the north, south and north-western ends of the Survey Site. The fields are bounded by fences, running along the line of defunct hedgerows, and often accompanied by ditches. There is a block of broadleaved woodland on the eastern boundary of the Survey Site and other areas of woodland around the marshy grassland to the west of the Survey Site, and around Felindre Gas Compressor Station and the two National Grid 400 kV electrical substations that lie at the south-west end of the Survey Site. The habitats in the surrounding landscape are similar to those within the Survey Site boundary – a mixture of improved and marshy grassland interspersed with occasional patches of woodland.
- 2.4 There are a number of water courses within the Survey Site as described below:
- A stream corridor with small tributaries fed by springs and surface runoff along the eastern boundary of the Survey Site, which feeds into the River Llan to the south.
 - A wooded stream runs along the north western boundary.
 - Several small streams and wet ditches run through the woodland surrounding the Felindre Gas Compressor Station and the two National Grid 400 kV electrical substations.
 - Drainage ditches border many of the pasture fields.

Description of Project

- 2.5 APL is promoting a new Power Generation Plant with associated Gas and Electricity Connections within Abergelli Farm. The Power Generation Plant would operate as a Simple Cycle Gas Turbine (SCGT) peaking plant and would be designed to provide an electrical capacity of up to 299 Megawatts (MW). It would be fuelled by natural gas, supplied by a new underground gas pipeline connecting Power Generation Plant to the existing National Grid Gas (NGG) National Transmission System (NTS). It would also connect to the National Grid Electrical Transmission System (NETS) via underground cable or overhead lines.
- 2.6 BSG Ecology has been appointed as the ecological consultant to undertake an ecology survey, which includes a desk study and Extended Phase 1 Habitat Survey as well as a range of Phase 2 surveys, including an otter and water vole survey. These baseline surveys will be included in an appendix to an ecology chapter of an Environmental Statement, which is intended for submission in support of the application for Development Consent.

Aims of Study

- 2.7 The aims of the otter and water vole survey within the Survey Site were to:
- Assess where water courses within the Survey Site have the potential to support otter and water vole.
 - Establish the likely presence/absence of each species and, if present, their distribution throughout the relevant watercourses.

3 Methods

Desk Study

- 3.1 Existing ecological information for the Survey Site and the surrounding area was requested from the South East Wales Biodiversity Records Centre (SEWBRc). Information on European and nationally protected² species, including otter and water vole, was requested covering the Survey Site and land up to 2 km from the Survey Site boundary. In addition, on-line mapping and aerial photography of the area was also reviewed in May 2014 to identify watercourses that might be present within the Survey Site.

Scoping Survey

- 3.2 A Phase 1 habitat survey was carried out by BSG Ecology in February 2014 and updated in April and July 2014³. During the Phase 1 habitat survey it was noted that a number of watercourses within the Survey Site had the potential to support otter and water vole, although no field signs were observed. The ponds within the Survey Site were also assessed at this time, and no field signs of otter or water vole were noted.

Field Survey

- 3.3 The otter and water vole survey included two visits to cover water courses within the Survey Site. The first visit covered the north of the Survey Site and was conducted on 20 May 2014 by Anna Gundrey MCIEEM and Rachel Taylor ACIEEM. The second visit covered the south of the Survey Site and was conducted on 26 June 2014 by Rachel Taylor ACIEEM and Caitlin McCann. All accessible water courses were inspected for field signs of otter and water vole. In addition, Rachel Taylor ACIEEM and Caitlin McCann surveyed the ponds within the Survey Site while undertaking great crested newt *Triturus cristatus* presence/absence surveys in May 2014⁴.

Otter

- 3.4 The otter survey was carried out on all accessible water courses within the Survey Site. Survey methods followed those recommended in Chanin (2003)⁵.
- 3.5 The water courses, including the channel and banks, were systematically surveyed for signs of otter such as droppings ('spraints'), runs and footprints. All areas that were accessible were surveyed, and particular attention was given to suitable sprainting areas such as large, flat rocks or areas where otters were likely to leave the water course. Otter spraint can be distinguished from other mammal droppings, such as mink, by its distinctive musky smell and the presence of fish bones. Mink scats tend to be twisted in appearance and are smaller.
- 3.6 Signs of, or potential for, permanent dwellings ('holts') or resting places for otters were also recorded. Holts and resting places include structures such as cavities in roots of bank side trees, piles of logs or flood debris, drains and caves. Otters can also use resting places above ground in reed beds and dense scrub such as bramble *Rubus fruticosus* and blackthorn *Prunus spinosa*.

Water Vole

- 3.7 All water courses that were accessible were surveyed within the optimal period for finding water vole (late April to early October). This is in line with survey standards set out in The Water Vole Conservation Handbook⁶. The water courses, including the channel and banks, were

² Wildlife and Countryside Act 1981 Schedules 1, 5 & 8; Conservation of Habitats and Species Regulations 2010; Protection of Badgers Act.

³ BSG Ecology (2014). Abergelli Power Project: Preliminary Ecological Appraisal.

⁴ BSG Ecology (2014). Abergelli Power Project: Great Crested Newt Survey Report

⁵ Chanin P (2003). *Monitoring the Otter* *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10, English Nature, Peterborough.

⁶ Strachan, R. & Moorhouse, T. (2006) *Water Vole Conservation Handbook* 2nd Ed. WildCRU, Oxford.

systematically surveyed for signs of water vole such as latrines (a communal area of droppings), feeding stations and grazed lawns, burrows (wider than high, diameter 4-8 cm), runs and footprints.

- 3.8 In addition, an assessment was made of whether individual water courses have potential to support water vole. The Water Vole Conservation Handbook describes favourable water vole habitat as having: wide swathes of riparian vegetation to provide both food and shelter; easily penetrable earth banks; and slow flowing, relatively deep (over 1 m) slow flowing water courses. Factors such as shallow water or over-shading by trees are generally unfavourable to water voles.

Classification of Areas Surveyed for Otter and Water Vole

- 3.9 Target notes (TN) were used to describe the characteristics of the water courses surveyed and to record any field signs that were observed. These were mapped (Figure 1, Appendix 1) and the target notes included (Appendix 2). In order to further illustrate the findings of the survey, the streams and ditches were categorised as follows:
- 3.10 **Habitat considered unsuitable for use by otter/water vole** – water courses with some or all of the following characteristics: no/low water levels; shaded; little vegetation; poached banks; no suitable resting places; no field signs of otter or water vole.
- 3.11 **Habitat considered suitable for use by otter/water vole** – water courses with some or all of the following characteristics: permanent flow of water; vegetation on banks; minimal shading; suitable resting places present; signs of otter/water vole.
- 3.12 Photographs are included showing the characteristics of water courses within the Survey Site (Appendix 3).

4 Results

Otter

Desk Study

- 4.1 SEWBRc provided 32 records of otter within the 2 km search radius, all recorded between 1991 and 2013. The closest record to the Survey Site is 0.5 km to the south west of the River Llan. At its closest point the River Llan is approximately 0.3 km south of the southern Survey Site boundary, within the same surface water catchment, and it links to the Survey Site via the stream running through the woodland in the centre of the Survey Site.

Field Survey

- 4.2 A single fresh otter spraint was found in the stream that runs along the eastern boundary of the Survey Site (see TN3, Figure 1, Appendix 1; and Appendix 2). At this point the stream is approximately 15 cm deep and with a bed of mud, gravel and rocks, the eastern bank is approximately 2 m high and sheer with over hanging trees. The western bank has an approximately 45 degree grass slope and is approximately 1.5 m high.
- 4.3 No other signs were observed that confirm otter presence in the other water courses within the Survey Site.
- 4.4 The stream that runs along the eastern boundary of the Survey Site also had deep overhangs created by the root system of the mature hedge and trees on the east bank. These have potential to be used as resting places by otter (see Figure 1, Appendix 1). However, foraging opportunities for otters are likely to be limited due to the low water levels (20-30 cm), which would make the watercourse less suitable for fish, and therefore foraging otters.

Water Vole

Desk Study

- 4.5 SEWBRc provided three records of water vole, within a 2 km search radius. These records were from the River Llan approximately 1.9 km from the Survey Site boundary, all from 1996. This River is in the same surface water catchment as watercourses present in the Survey Site, so it is possible that water voles could move along water courses that are linked to the River Llan (see section 4.1 above).

Field Survey

- 4.6 During the surveys many of the ditches that had contained water during the first Phase 1 habitat survey (in February after a very wet winter) had completely dried out by the time of the otter and water vole surveys in May and June 2014. The remaining water courses were fast running and shallow. The banks of the streams were often over-shaded with encroaching bramble and gorse or had steep, bare banks.
- 4.7 No field signs were observed during the surveys that clearly establish the presence of water vole. Some burrows were noted that had dimensions suitable for use by water vole and/or bank vole *Myodes glareolus* and rats, but did not exhibit signs of current use (see TNs 1, 2, 4, 5 and 7). However, no associated latrines, footprints or grazing lawns were observed at any of these locations, Figure 1, Appendix 1; Appendix 2). There was also no evidence of associated burrows below the water line, which is typical of water vole burrows. The holes were therefore considered unlikely to be used by water vole and are more likely to have been created by another species of small mammal, such as bank vole *Myodes glareolus*, or been created by water vole but subsequently abandoned.

- 4.8 No water vole field signs were observed at the ponds within the Survey Site during the great crested newt presence/absence surveys in May 2014⁷.

Incidental Sightings

In addition to signs of otter and water vole presence recorded during the survey, some signs of badger activity were also noted and are included here for completeness. A single hole badger sett was found at TN9, with digging and a fresh latrine recorded at TN8.

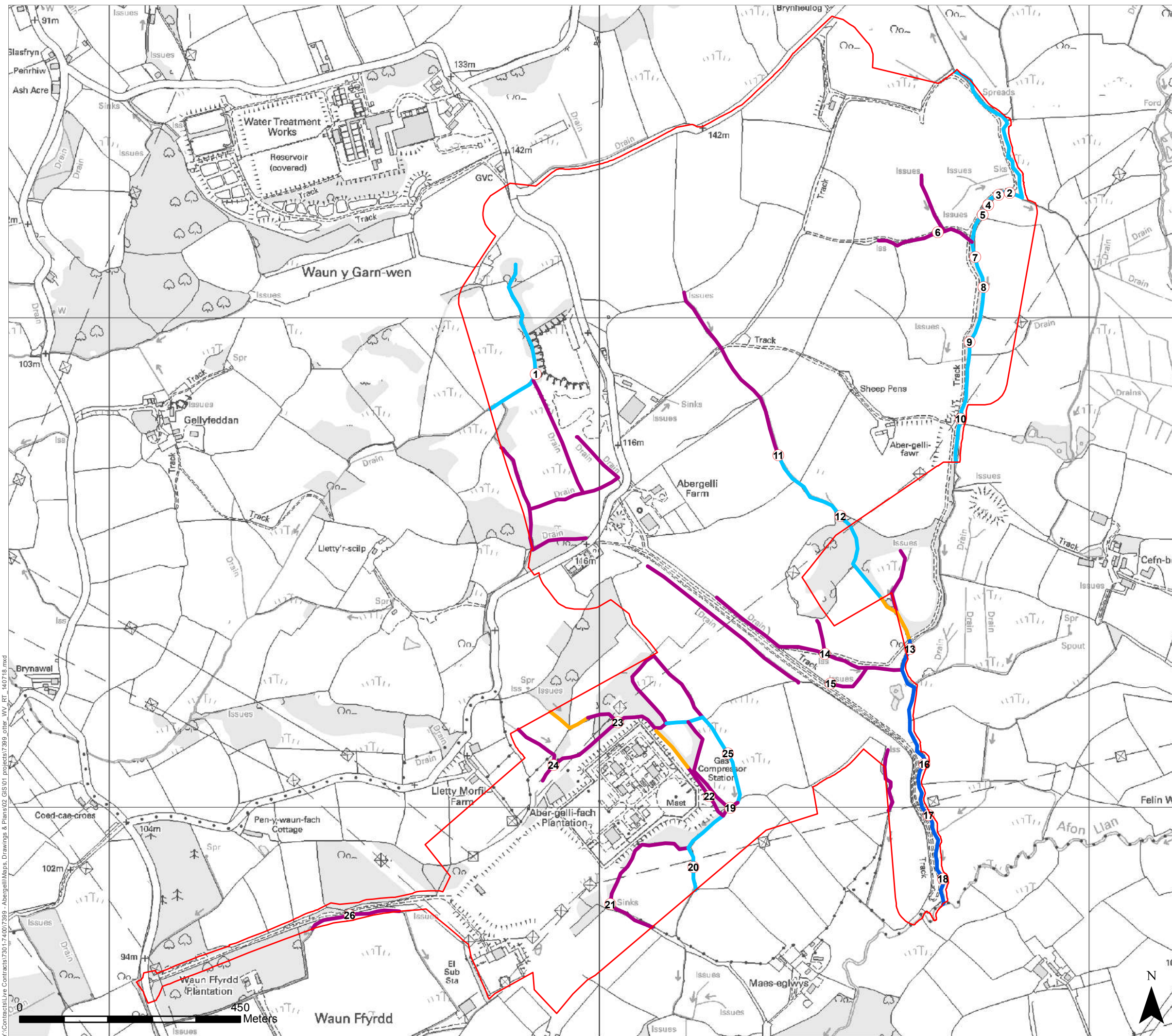
Limitations of Study

- 4.9 Some of the southern stretch of the stream along the eastern boundary of the Survey Site had extensive bramble and scrub along the banks, with low over-hanging branches and debris in the stream itself. This impeded the view of the surveyors along this stretch. However, a large stretch of the northern section of the same stream was also surveyed without issue, and therefore this limitation should not affect the overall results of the survey. Areas that were inaccessible, or for which the visibility was limited due to extensive scrub, are also indicated on the map (Figure 1, Appendix 1).

⁷ BSG Ecology (2014). Abergelli Power Project: Great Crested Newt Survey Report.

Appendix 1: Figure 1

(see overleaf)



LEGEND

Survey Site boundary

Target notes

Classification of areas surveyed for otter and water vole

Habitat considered unsuitable for use by otter / water vole

Habitat considered suitable for use by otter / water vole

Habitat considered suitable for use by otter but survey constrained by dense vegetation

Inaccessible

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PROJECT TITLE
ABERGELLI POWER PLANT

DRAWING TITLE
Figure 1 - Otter and Water Vole Survey

DATE: 11.08.2014

CHECKED: MH

SCALE: 1:7,500

DRAWN: RT

APPROVED: JG

STATUS: Final

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No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.

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Appendix 2: Target Notes (TN)

Stream at TN1 - The stream is wooded, mostly shaded with shallow bramble covered banks. The stream bed is stony, water fast moving and shallow. This provides a sheltered corridor through which otter may commute, but no obvious resting places or signs of otter use were observed.

1. At TN 1 there is a vertical 1m high bare mud bank on the western side of the stream. The stream is approximately 10 cm deep at this point. There is a hole 1 m above the water which had dimensions suitable for use by water vole and/or bank vole/rat. No other field signs were observed.

To the south of TN1 is a marshy field with a network of ditches - At the time of survey (May) these ditches were dry or contained very little water and had steep banks with very little or no vegetation.

Stream at TN2 to TN10 – The stream is relatively unshaded, with a bed of mud, gravel and rocks. The water depth ranges from approximately 10 cm to 20 cm where pools form. It is fast flowing and appears clean. The eastern bank is approximately 2 m high and sheer. It is topped by a mature hedge the root system of which form a number of deep overhangs by the side of the stream. The west bank has an approximately 45 degree grassed slope.

2. A hole was found in the vertical east bank, approximately 20 cm above the waterline, which had dimensions suitable for use by water vole and/or bank vole/rat. No other field signs were observed.
3. A fresh otter spraint was found on a large, flat stone in the middle of the stream.
4. A pair of holes was found in the east bank approximately 1.5 m from the water line, which had dimensions suitable for use by water vole and/or bank vole/rat. No other field signs were observed.
5. A possible otter resting place on east bank. No otter field signs were observed. A 15 cm diameter hole was found leading into a cavity under the tree root bole, approximately 2 m above the water line. Approximately 3 m to the south of this there are three further holes, 1 m above the waterline on the eastern bank with dimensions that would allow use by water vole and/or bank vole/rat. No water vole field signs were observed.
6. Tributary of the main stream, this is a narrow brook that has dried out at its northern end. It is over shaded by scrub, no field signs for otter or water vole were observed.
7. There is a particularly deep over-hang in the east bank under a root bole. Basal rocks are moss free on top suggesting that it may be regularly accessed; however no field signs of otter were observed. This has good potential as a resting place for otter. On the west bank, above a culvert pipe that runs into the stream from the brook at TN6 there are two holes with dimensions that would allow use by water vole and/or bank vole/rat. No other field signs of water vole were observed.
8. A deep cavity in the eastern bank along the waterline good provides a potential resting place for otter. No otter field signs were observed. On the top of the west bank opposite the cavity are a number of fresh patches of badger digging and a fresh badger latrine.
9. A hole was found in the east bank 2 m above the water line; dimensions suggest that this is a badger sett. There is a mammal run into the field to the east.
10. The stream becomes very shaded at this point, and the eastern bank is largely undercut providing several potential resting places for otter. No field signs were observed.

Damp ditch/brook at TN11 to TN12 – to the north of TN11 this is a dry to damp ditch that has mainly bare banks, with some areas over-grown by bramble. It is open to horses and sheep and the land around the ditch is poached. No signs of otter or water vole were observed and this section is considered unsuitable for use by either species. To the south of TN11 the amount of water in the ditch gradually becomes greater until it forms a narrow brook, approximately 10 cm in depth.

11. The brook is very over-grown with gorse and bramble, the banks are approximately 1 m high and the water is quick moving and shallow. There is a fenced culvert 10 m to the north which is partially blocked by debris from a fallen tree on the eastern bank. No field signs of otter or water vole were observed.
12. The brook is shallow and fast moving with low grassy banks, over grown by bramble and nettle in large sections. No signs of otter or water vole were observed. South of this location the stream runs through woodland and connects to the stream along the eastern boundary of the Survey Site.

Stream at TN13 to TN18 – The southern section of the stream previously described in TN2 to TN10. The banks are lined with trees and a scrub understorey of predominantly bramble, the stream is approximately 10 cm – 20 cm deep with a rocky bed. The bank is approximately 1 – 2 m high and undercut in places. The extensive scrub impeded the surveyors' ability to access the stream, however the length was walked and notes made when a good view was available.

13. The stream is narrow, with a bare bank approximately 1 m on each side. It is encroached by bramble and gorse and is largely over shaded. No signs of otter or water vole were observed.
14. A shallow ditch extending north-west of the stream, it is dry at the northern end, the banks are low and poached by horses. The south end contains a small amount of slow moving water and is overgrown with bramble.
15. A similar ditch to TN14, this is dry to the north and the banks are poached by horses. No signs of otter or water vole were observed.
16. The stream is wide, and fast moving, approximately 10 cm in depth. The banks are approximately 1 m high and covered by bramble. There is some undercutting of the bank, although not deep enough to provide resting opportunities for otter. No signs of otter or water vole were observed.
17. The stream is narrow and fast moving, approximately 15cm deep, banks are steep and bare topped with bramble. No signs of otter or water vole were observed.
18. The stream is wide and fast flowing, approximately 20 cm deep. Root boles of trees along the western bank provide resting opportunities for otter. The eastern bank is low with a stone beach where the stream bends. No signs were observed however access was limited due to bramble and a fence on the western bank.

Ditches and stream at TN19 to TN21 – ditches run along the edge of sheep pasture, most of these are dry with bare banks. A small brook runs from the edge of the woodland through the pasture and extends south outside of the site boundary.

19. This is a dry sheep poached ditch. No signs of otter or water vole were observed.
20. A shallow brook, approximately 10cm in depth with a 50cm high grassy bank to the west and trees along the eastern bank. There are fox runs along the western side. No signs of otter or water vole were observed.
21. A nearly dry ditch, small trickle of water runs over a muddy bed. The banks are low and bare, the ditch is over shaded by trees which line each side. No signs of otter or water vole were observed.

Water courses in and around wet woodland and National Grid land at TN22 to TN26 – There are shallow ditches along the edges of the woodland, with small streams running in the interior of the woodland. The streams are approximately 10 cm deep, containing leaf litter and debris. The banks are steep with little vegetation other than nettle.

22. Very narrow, over-shaded stream with fast moving, shallow water. There is bramble encroaching on both banks. No signs of otter or water vole were observed.
23. Slow flowing woodland ditch with little water, and a large amount of leaf litter and debris. The banks are low with no vegetation. No signs of otter or water vole were observed. The ditch to the north of this point becomes inaccessible.
24. Similar to the ditch at TN23 this ditch is shallow with slow moving water and completely over shaded by the woodland, with large amounts of leaf litter. No otter or water vole signs were observed.
25. Small stream along the east edge of the field to the east of the Felindre Gas Compressor Station. Fast flowing, shallow (15 cm) with gravel and rock bed. Wide mammal run down to the stream at this point, though to be used by the sheep resident in the field. No signs of otter or water vole were observed.
26. A dry ditch at the time of survey, shaded by trees and full of leaf litter.

Appendix 3: Photographs showing characteristics of water courses within Survey Site



Photograph 1 : Damp ditch in field to the south of TN1



Photo 2: Stream along eastern boundary (TN10)



Photo 3: Dry/overgrown ditch north of TN11, arrow indicates ditch.



Photo 4: Stream south of TN12.



Photo 5: Ditch running from a field boundary into the woodland surrounding the Gas Compressor Station.



Photograph 6: Ditch in woodland north of TN 22 (taken February 2014)

Abergelli
Breeding Bird Survey Report

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1 Summary

- 1.1 Abergelli Power Limited (APL) is promoting a new Power Generation Plant with its associated Gas and Electricity Connections (the 'Project') on agricultural land within Abergelli Farm north of Swansea in the City and County of Swansea (approximately at National Grid Reference 265284, 201431).
- 1.2 APL commissioned BSG Ecology to undertake a breeding bird survey within 150 ha of pastoral farmland at and around Abergelli Farm in 2014, to inform and support an application for Development Consent for the Power Generation Plant.
- 1.3 Breeding birds were surveyed by walking along field boundaries and tracks within the Survey Site at a slow pace to enable all birds detected to be located, identified and recorded. Frequent stops were made to listen and scan for singing and calling birds. The Survey Site was visited on three occasions, once during each of April, May and June. A constant search effort was employed during each survey visit, with all habitat types being approached to within approximately 50 m.
- 1.4 Seven bird 'species of principal importance for nature conservation' as referred to in Section 42 of the NERC Act 2006 (S42) (dunnock *Prunella modularis*, house sparrow *Passer domesticus*, linnet *Carduelis cannabina*, lesser redpoll *Carduelis cabaret*, skylark *Alauda arvensis*, song thrush *Turdus philomelos*, and tree pipit *Anthus trivialis*) were considered likely to breed on site. All seven S42 species recorded within the Survey Site are also red-listed species of conservation concern in Wales (RSPB, 2009), with the exception of dunnock (which is amber-listed). An additional seven amber-listed species, bullfinch *Pyrrhula pyrrhula*, mistle thrush *Turdus viscivorus*, meadow pipit *Anthus pratensis*, reed bunting *Emberiza schoeniclus*, common redstart *Phoenicurus phoenicurus*, whitethroat *Sylvia communis* and willow warbler *Phylloscopus trochilus* were also considered to have bred.
- 1.5 No territories of species listed under Schedule 1 Part 1 of the Wildlife & Countryside Act 1981 (as amended) (Schedule 1 species) were recorded, although two Schedule 1 species were recorded during the surveys, as follows. A pair of red kite *Milvus milvus* was recorded mobbing a peregrine falcon *Falco peregrinus* over the Felindre Gas Compressor Station land during survey in May. A pair of kites was also recorded flying over the eastern boundary in the northern compartment of the Survey Site during the same survey day. Given the timing of the records, and that at least one pair were recorded during survey it is likely that red kite breed locally but that the single record of peregrine referred to a transient bird. No evidence was found to suggest breeding of either species occurred within the Survey Site during 2014.

2 Introduction

- 2.1 Abergelli Power Limited (APL) commissioned BSG Ecology to undertake a breeding bird survey to inform and support an application for Development Consent for the Project described below.

Site Description

- 2.2 The Survey Site consists of approximately 150 ha of pastoral farmland primarily grazed by horses. The extent of the Survey Site is shown in Figure 1 in Appendix 1 and is centred at National Grid Reference 265284, 201431. The nearest settlement is Felindre, which is located approximately 2 km to the north of the Survey Site, with Swansea approximately 5 km to the south.
- 2.3 The Survey Site is largely agriculturally improved pasture with several areas of marshy grassland, particularly in the north, south and north-western ends of the Survey Site. The fields are bounded by fences, running along the line of defunct hedgerows, and often accompanied by ditches. There is a block of broadleaved woodland on the eastern boundary of the Survey Site and other areas of woodland around the marshy grassland to the west of the Survey Site, and around Felindre Gas Compressor Station and the two National Grid 400 kV electrical substations that lie at the south-west end of the Survey Site. The habitats in the surrounding landscape are similar to those within the Survey Site boundary – a mixture of improved and marshy grassland interspersed with occasional patches of woodland.

Description of Project

- 2.4 APL is promoting a new Power Generation Plant with associated Gas and Electricity Connections within the Survey Site. The Power Generation Plant would operate as a Simple Cycle Gas Turbine (SCGT) peaking plant and would be designed to provide an electrical capacity of up to 299 Megawatts (MW). It would be fuelled by natural gas, supplied by a new underground gas pipeline connecting the Power Generation Plant to the existing National Grid Gas (NGG) National Transmission System (NTS). It would also connect to the National Grid Electrical Transmission System (NETS) via underground cable or overhead lines.
- 2.5 BSG Ecology has been appointed as the ecological consultant to undertake an ecological survey, which includes a desk study and Extended Phase 1 Habitat Survey as well as a range of Phase 2 surveys, including a breeding bird survey. These baseline surveys will be included in an appendix to an ecology chapter of an Environmental Statement, which is intended for submission, as an integral part of the application for Development Consent.

Aims of Study

- 2.6 The survey work undertaken at Abergelli Farm between April and June 2014 aimed to establish:
- The number of species present on the Survey Site or the immediate surrounding habitat;
 - The number of territories held by each species, and
 - Whether the Survey Site or the immediate surrounding habitat is used by bird species of high conservation interest, including:
 - (a) Species protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
 - (b) Species listed on Annex 1 of the Council Directive 79/409/EEC on the Conservation of Wild Birds;
 - (c) Species listed in Section 42 of the Natural Environment and Rural Communities Act (NERC 2006) as species of principal importance for the conservation of biodiversity in Wales;
 - (d) Species listed in the Swansea Local Biodiversity Action Plan (LBAP); and

(e) Species listed as having a Red or Amber population status¹ (RSPB, 2009).

¹ Seven quantitative criteria are used to assess the population status of each bird species and to categorise it on the red, amber or green list of conservation concern (species that are red-listed are of greatest conservation concern whereas those that are green-listed are not considered to be of particular conservation priority or (in a few cases) have insufficient data to be robustly categorised). Criteria considered are: global conservation status; evidence of recent decline; evidence of historical decline; an unfavourable European conservation status; rarity (in terms of breeding numbers); restricted (localised) distribution; and whether a species is considered to be of international conservation importance (featuring in the list of birds in Annex 1 of the Birds Directive 1979). When considering whether a species is added to the red or the amber list, factors such as the extent of decline and range contraction are considered.

3 Methods

Desk Study

3.1 Existing ecological information for the Survey Site and its surrounding area was requested from the South East Wales Biodiversity Records Centre (SEWBRc). Information on European designated sites was requested from within 10 km with information on national statutory designated sites was requested covering the Survey Site and land up to 5 km from the Survey Site boundary and information regarding non-statutory designated sites and information on protected² or notable species (particularly those identified as S42 species and/or of local conservation importance or LBAP³ species), including birds, was requested covering the Survey Site and land up to 2 km from the Survey Site boundary. In addition, an initial study of on-line aerial photographs, topographical, and Ordnance Survey maps was made using web-based resources including: Where's the path?⁴, Google Maps⁵ and Google Earth Version 6 (Google Inc, 2010). This, together with the results from a preliminary ecological appraisal⁶ carried out in February 2014 and updated in April 2014, resulted in a detailed understanding of the habitats and features on the Survey Site along with an indication of the bird community potentially present.

Field Survey

3.2 The method used was adapted from the British Trust for Ornithology (BTO) Common Bird Census (CBC) as described by Gilbert *et al.* (1998), Although eight to ten visits are usually undertaken for CBC sites being monitored over the long term, it is generally accepted that for the purposes of assessing potential environmental impacts, three visits are sufficient to describe the value of a Survey Site for breeding birds and give an approximation of the number of breeding bird territories present within a Survey Site (e.g. SNH, 2005⁷). Breeding birds were surveyed by walking along field boundaries and tracks within the Survey Site at a slow pace to enable all birds detected to be located, identified and recorded. Frequent stops were made to listen and scan for singing and calling birds. All habitat features were approached to within approximately 50 m, except in horse pasture fields. Transects were not walked across closely grazed pasture fields, as it was possible to easily view birds by scanning from field boundaries (due to the lack of vegetation and small field sizes) and to avoid disturbing horses that were kept in many of them at the time of the survey. Bird locations were mapped using standard two-letter British Trust for Ornithology (BTO) codes, and bird activity was recorded using standard BTO behaviour codes (Marchant 1983).

3.3 The breeding status of birds recorded was categorised as either 'holding territory' or 'showing other evidence of breeding'. Birds presumed to be holding territory were those recorded in song. Other evidence of breeding included observations of:

- Distraction display or injury feigning;
- Used nests or eggshells found (occupied or laid within the survey period);
- Recently fledged young or downy young;
- Adults entering or leaving a nest site in circumstances indicating an occupied nest or an adult sitting on nest;
- Adults carrying food for young or faecal sacs;
- Nest containing eggs; and
- Nest with young seen or heard.

² Wildlife and Countryside Act 1981 Schedules 1, 5 & 8; Conservation of Habitats and Species Regulations 2010; Protection of Badgers Act.

³ Those listed under Local Biodiversity Action Plans for Swansea.

⁴ <http://mortimermaps.appspot.com/wtp3/wtp3.htm>

⁵ <https://maps.google.co.uk/>

⁶ BSG Ecology (2014). Abergelli Power Project: Preliminary Ecological Appraisal.

⁷ See Section 6.9.1. Although this reference describes methods appropriate for surveying at onshore wind farms this method is also appropriate for most walkover breeding bird surveys of lowland and/or farmland sites.

- 3.4 The presence of house sparrow near a suitable nesting building was also taken as evidence for breeding in this species.
- 3.5 The results of the three breeding bird territory mapping surveys were combined to create a single map showing all birds considered to be holding territory (Figures 1a and 1b in Appendix 1). BTO codes for each species illustrated in Figure 1a and 1b are provided in Table 2 (below). Where a bird was observed in the same location during more than one survey visit, and this is judged to be the same individual bird, only one registration of that bird is shown on the map. Where more than one individual of the same species is shown in close proximity, these are individual birds seen simultaneously during a single survey. Note the locations of presumed territories do not represent specific nest locations.
- 3.6 The Survey Site was divided into two survey compartments due to its size; the first covered the north of the Survey Site (the land north of the gallops that runs from the houses at Abergelli Farm to the south-east corner of the Survey Site), and the second covered the south of the Survey Site (the land south of the gallops). Three survey visits were made to each compartment; one in each of late April, late May and mid-June. Table 1 below provides details of the duration and weather conditions during surveys.

Table 1: Details of breeding bird surveys

Compartment	Date	Time	Weather conditions
North	25/04/2014	06:30 – 10:15	Wind E 1-2, cloud 8/8, dry, dull
South	25/04/2014	06:40 – 11:00	Wind E 1-2, cloud 8/8, dry, dull
North	24/05/2014	06:00 – 09:00	Wind W 1-2, cloud 6/8, dry, sunny
South	24/05/2014	07:00 – 10:00	Wind W 1-2, cloud 6/8, dry, sunny
North	19/06/2014	06:30 – 10:00	Wind NW 1-3, cloud 1/8, dry, sunny
South	19/06/2014	06:45 – 10:00	Wind NW 1-3, cloud 1/8, dry, sunny

- 3.7 The Felindre Gas Compressor Station and the National Grid electrical substation compounds to the south-west of the Survey Site were not entered, due to lack of access. The compounds can be viewed adequately from the fence and there is very little suitable habitat for breeding birds within these compounds. The land immediately beyond the northern and eastern Survey Site boundaries was also not entered. The surveyor(s) scanned areas of adjacent habitat by walking paths and field edges and made use of local vantage-points to record species present around the access restricted areas. This enabled the entire site to be sampled without trespassing.
- 3.8 In late June, all buildings within the Survey Site, with the exception of those within the National Grid compounds referred to above, were inspected for barn owl *Tyto alba* presence or other evidence of presence, such as pellets, nests, or faecal matter. The buildings were primarily visited to inspect for bat roosts and the methods are described in detail in the bat roost inspection report. Anecdotal evidence from the land owner prior to inspection suggested that none of the buildings were in use or had historically been used by barn owl. All trees within the Survey Site were also inspected from ground level for evidence of use by bats and barn owl. A sub-set of these trees were identified for further roped-access (tree-climbing) survey that involved internal and external inspection of these trees. Full details of these surveys are provided in the bat survey report.
- 3.9 The maps from the three visits were combined. For species where definitive evidence of breeding was not obtained, professional judgement (based on a range of factors including knowledge of habitat requirements, local status and/or repeat sightings) was used to conclude whether breeding was likely. A precautionary approach was taken, with species suspected to have bred being plotted as having done so.

4 Results

Desk Study Data

- 4.1 A full list of the European designated sites within 10 km, national statutory designated sites within 5 km, and non-statutory designated sites within 2 km of the Survey Site boundary is provided in the preliminary ecological appraisal. Sites that include a cited ornithological interest are described below.

Statutory Sites of Nature Conservation Importance

- 4.2 Carmarthen Bay and the tidal estuaries that extend from it, approximately 7.2 km west of the Survey Site, has been afforded multiple designations and is referred to under the umbrella term European Marine Site (EMS⁸) which includes the Carmarthen Bay area and Estuaries Special Area of Conservation (SAC⁹), and the Burry Inlet Special Protection Area (SPA¹⁰). This area also contains a Ramsar Wetland of International Importance (Ramsar¹¹). The boundaries of each of these sites are not contiguous but all fall within the EMS site. The details of each designation are provided below.
- 4.3 The Burry Inlet SPA and Ramsar, located approximately 9.7 km west south-west of the Survey Site, is classified for large numbers of overwintering wildfowl and waders that feed in the saltmarshes and on the intertidal mud and sand.
- 4.4 The SPA has been classified as it supports important overwintering populations of eleven migratory species of waterfowl and an assemblage of 34,962 wintering water fowl including common shelduck *Tadorna tadorna*, Eurasian wigeon *Anas penelope*, Eurasian teal *Anas crecca*, northern pintail *Anas acuta*, shoveler *Anas clypeata*, Eurasian oystercatcher *Haematopus ostralegus*, grey plover *Pluvialis squatarola*, red knot *Calidris canutus*, dunlin *Calidris alpina alpina*, Eurasian curlew *Numenius arquata*, and common redshank *Tringa totanus*. The SPA includes extensive areas of intertidal sand and mud-flats, large sand dune systems and the largest continuous area of saltmarsh in Wales.
- 4.5 The spring and autumn population of common redshank, and wintering population of northern pintail, Eurasian oystercatcher, and red knot are qualifying features for the Burry Inlet Ramsar designation.
- 4.6 The Carmarthen Bay and Estuaries SAC, located approximately 7.2 km to the west, is designated for its 'Sandbanks which are slightly covered by sea water all the time', 'Estuaries', 'Mudflats and sandflats not covered by water at low tide', 'Large shallow inlets and bays', 'Salicornia and other annuals colonising mud and sand', and 'Atlantic salt meadows'.

Non-Statutory Sites

- 4.7 There are 23 Sites of Interest for Nature Conservation (SINC) within 2 km of the Survey Site. These are described in detail in the preliminary ecological appraisal. Three SINC lie partially within the Survey Site boundary, of which two have cited ornithological interest.
- 4.8 Rhyd-Y-Pandy Valley Grasslands is a large SINC, which includes three fields that lie within the north-east corner of the Survey Site. The site is designated for its wet woodland and woodland with

⁸ The term 'European Marine Sites' (EMS) collectively describes Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) that are covered by tidal waters and protect some of our most important marine and coastal habitats and species of European importance.

⁹ SACs are strictly protected sites designated under the EC Habitats Directive in order to conserve the 189 habitat types and 788 faunal species identified in Annexes I and II of the Directive (as amended). They do not afford protection to birds directly (although are often subject to various other designations that do have an ornithological component and often offer protection to habitats of value to a range of bird species).

¹⁰ SPAs are internationally important sites classified in accordance with Directive 79/409/EEC on the conservation of wild birds (commonly referred to as the Bird Directive).

¹¹ Ramsar sites are wetlands of international importance designated under the Ramsar Convention.

assemblage of ancient woodland indicator species, scrub, purple moor grass and rush pasture, lowland meadow, neutral grassland, scrub, reed bed and water course habitats. Species of bird listed on the SINC form include sky lark *Alauda arvensis*, tree pipit *Anthus trivialis*, reed bunting *Emberiza schoeniclus*, common kestrel *Falco tinnunculus*, herring gull *Larus argentatus*, red kite *Milvus milvus*, house sparrow *Passer domesticus*, common starling *Sturnus vulgaris*, song thrush *Turdus philomelos* and Barn owl *Tyto alba*. It is unclear what the status of these species on the SINC is.

- 4.9 Warn Garn Wen is also an extensive SINC which includes the marshy grassland that lies within the western boundary of the Survey Site. The site is designated for purple moor grass and rush pasture, wet woodland, scrub and watercourse habitats. Species of bird listed on the SINC form include herring gull, lesser black-backed gull *Larus fuscus*, house sparrow, stonechat *Saxicola rubicola*, common starling and song thrush. It is unclear what the status of these species on the SINC is.
- 4.10 There are two SINC located adjacent to the boundary. Rhos Fawr SINC is a block of land immediately to the north of the Site boundary, and Felindre Grasslands SINC lies adjacent to the southern tip of the proposed access route. Both have cited ornithological interest.
- 4.11 The Rhos Fawr SINC is designated for its woodland containing an assemblage of ancient woodland indicator species, scrub, purple moor grass and rush pasture, and neutral grassland habitats. Species of bird listed on the SINC form include tree pipit and common cuckoo *Cuculus canorus*. It is unclear what the status of these species on the SINC is.
- 4.12 The Felindre Grasslands SINC is designated for its wet woodland and lowland mixed deciduous woodland, purple moor grass and rush pasture, and scrub habitats. Species of bird listed on the SINC form include northern goshawk *Accipiter gentilis*, tree pipit, lesser redpoll *Carduelis cabaret*, common linnet *Carduelis cannabina*, reed bunting, common kestrel, common snipe *Gallinago gallinago*, herring gull, house sparrow, green woodpecker *Picus viridis*, willow tit *Poecile montanus*, common bullfinch *Pyrrhula pyrrhula*, water rail *Rallus aquaticus*, stonechat, Eurasian woodcock *Scolopax rusticola*, common starling, song thrush, barn owl, and northern lapwing *Vanellus vanellus*. It is unclear what the status of these species on the SINC is.
- 4.13 Two additional SINC have cited ornithological interest. These are; Penllergaer Forest, located approximately 1 km south-west of the Survey Site, and Penllergaer to Llangyfelach Tunnel and Railway Line, located approximately 1 km south of the Survey Site.
- 4.14 The Penllergaer Forest SINC is designated for its range of woodland types, purple moor grass and rush pasture, reedbeds and watercourses. Species of bird listed on the SINC form include Northern goshawk, common kingfisher *Alcedo atthis*, lesser redpoll, common cuckoo, lesser spotted woodpecker *Picoides minor*, common grasshopper warbler *Locustella naevia*, common crossbill *Loxia curvirostra*, red kite, house sparrow, wood warbler *Phylloscopus sibilatrix*, green woodpecker, willow tit, common bullfinch, common starling and song thrush. It is unclear what the status of these species on the SINC is.
- 4.15 Penllergaer to Llangyfelach Tunnel and Railway Line SINC is also designated for its range of woodland types, purple moor grass and rush pasture, scrub and watercourses. Species of bird listed on the SINC form include tree pipit, lesser redpoll, common bullfinch, and song thrush. It is unclear what the status of these species on the SINC is.
- 4.16 Most of the woodland within the Survey Site is also designated as Ancient Woodland.

Species Data

- 4.17 SEWBRc provided 21 records of barn owl *Tyto alba*. The closest of these records is 0.7 km to the west of the Survey Site boundary from 1997, with the nearest breeding record 3 km to the south west near Penllergaer Woods in 2000. The most recent record is from approximately 3.7 km north-west of the Survey Site in April 2013. An additional 5 records were provided for the last 10 years, the nearest of which was recorded in 2007, approximately 2 km south-west of the Survey Site,
- 4.18 A red kite was noted circling above a field in the north-west corner of the Survey Site and also over Abergelli Farm during the Phase 1 Survey in April 2014. SEWBRc provided 54 records for red

kite between 1999 and 2013, the record nearest the Survey Site being approximately 150 m to the east.

- 4.19 SEWBRc provided a number of records of ground nesting birds in the search area. These included records for Eurasian curlew, northern lapwing and skylark. A total of 63 records of lapwing were provided from between 2000 and 2009, all south of the Survey Site. The closest of these records are located at the tinplate workings site near to Bryn Whilach Farm, approximately 1 km to the south-west of the Survey Site boundary. There was one record of curlew from 2011, located at the Lliw Reservoir, 1 km north of the Survey Site boundary.
- 4.20 A full list of species, returned from the data search can be found in **Table 3** in **Appendix 2**.

Breeding Bird Survey (2014)

- 4.21 A total of 53 species were recorded on the Survey Site during the breeding bird survey in 2014. Of these, 46 were passerines (including near-passerines) and 7 non-passerines.

Breeding passerines

- 4.22 The bird community was passerine dominated. Those observed holding territories and considered to have bred on the Survey Site are presented in Table 2 below. A full list of species, including non-breeding birds, recorded during the breeding bird survey can be found in Table 4 in Appendix 2.

Table 2: Estimated numbers of passerine territories recorded.

Species	BTO species code	Number of territories	Other evidence of breeding ¹²	Section 42 species	Red (R) or Amber (A) listed species
Blackbird <i>Turdus merula</i>	B.	8	6		
Blackcap <i>Sylvia atricapilla</i>	BC	10			
Bullfinch <i>Pyrrhula pyrrhula</i>	BF	4	2		A
Blue Tit <i>Cyanistes caeruleus</i>	BT	9	9		
Chiffchaff <i>Phylloscopus collybita</i>	CC	19			
Chaffinch <i>Fringilla coelebs</i>	CH	22	3		
Cuckoo <i>Cuculus canorus</i>	CK	3		✓	R
Coal Tit <i>Periparus ater</i>	CT	1			
Dunnock <i>Prunella modularis</i>	D.	15	1	✓	A
Goldcrest <i>Regulus regulus</i>	GC	2	1		
Grasshopper Warbler <i>Locustella naevia</i>	GH	2		✓	R
Goldfinch <i>Carduelis carduelis</i>	GO	3	1		
Great Tit <i>Parus major</i>	GT	4	5		
House Sparrow <i>Passer domesticus</i>	HS		3	✓	R
Linnet <i>Carduelis cannabina</i>	LI	2	1	✓	R
Mistle Thrush <i>Turdus viscivorus</i>	M.	2			A
Meadow Pipit <i>Anthus pratensis</i>	MP	7	1		A
Nuthatch <i>Sitta europaea</i>	NH	1	2		
Lesser Redpoll <i>Acanthis cabaret</i>	LR		1	✓	R
Robin <i>Erithacus rubecula</i>	R.	27	8		

¹² The number of territories where other evidence was found to confirm breeding is indicated. Other evidence of breeding was considered to include observations of adults carrying nesting material or food, adults being repeatedly alarmed or engaging in territorial disputes, and families including juveniles accompanied by adults. The presence of house sparrow near a suitable nesting building was also taken as evidence for breeding in this species.

Species	BTO species code	Number of territories	Other evidence of breeding ¹²	Section 42 species	Red (R) or Amber (A) listed species
Reed Bunting <i>Emberiza schoeniclus</i>	RB	3			A
Redstart <i>Phoenicurus phoenicurus</i>	RT	6			A
Skylark <i>Alauda arvensis</i>	S.	4		✓	R
Stonechat <i>Saxicola torquata</i>	SC	2	2		
Song Thrush <i>Turdus philomelos</i>	ST	18		✓	R
Sedge Warbler <i>Acrocephalus schoenobaenus</i>	SW	1			
Tree Pipit <i>Anthus trivialis</i>	TP	3	2	✓	R
Whitethroat <i>Sylvia communis</i>	WH	12	1		A
Wren <i>Troglodytes troglodytes</i>	WR	34			
Willow Warbler <i>Phylloscopus trochilus</i>	WW	49	2		A

- 4.23 28 species of passerine were noted holding breeding territories on the Survey Site. An additional two species, lesser redpoll and house sparrow, were observed showing other evidence of breeding.
- 4.24 No passerine species listed under Schedule 1 Part 1 of the Wildlife & Countryside Act 1981 (as amended)¹³ were recorded.
- 4.25 Nine Section 42¹⁴ species (cuckoo, dunnock, grasshopper warbler, house sparrow, linnet, lesser redpoll, skylark, song thrush, and tree pipit) were considered likely to breed on the Survey Site. All nine Section 42 species recorded within the Survey Site are also listed in the Swansea LBAP¹⁵, and are red-listed species of conservation concern in Wales (RSPB Undated), with the exception of dunnock (which is amber-listed). An additional seven amber-listed species, bullfinch, mistle thrush, meadow pipit, reed bunting, redstart, whitethroat and willow warbler were also considered to have bred.
- 4.26 Willow warbler was the most abundant breeding species on the Survey Site. Large numbers of territories were also held by other passerines typical of a lowland farmland mosaic habitat including chiffchaff, chaffinch, robin and wren. Of the Section 42 species recorded, dunnock and song thrush were most abundant, with territories widely distributed across the Survey Site. The abundance of willow warbler, dunnock and song thrush on the Survey Site may be attributed to the relatively wide-ranging habitat preferences of these generalist species (and the tendency of the former two species to breed in scrub).
- 4.27 The presence of ground nesting species (skylark and meadow pipit) within the Survey Site reflects the fact that much of the Survey Site is grazed pasture. However, the distribution of these species was localised, only being recorded in the pasture fields in the north-west of the Survey Site. Other species recorded on the pasture habitat during survey in April include stonechat, for which two territories were recorded, and northern wheatear *Oenanthe oenanthe* which were likely to have been on passage and not remained to breed on site. Stonechat and wheatear were not recorded during breeding bird surveys in May and June. However, see Incidental Records below.

¹³ Schedule 1 birds receive full protection under the Wildlife and Countryside Act 1981 (as amended), In addition to the protection from killing or taking that all birds, their nests and eggs have under the Act, Schedule 1 birds and their young must not be disturbed at the nest.

¹⁴ The Natural Environment and Rural Communities Act 2006 (NERC 2006) required the Welsh Assembly Government (WAG), based on advice from the Countryside Council for Wales (now part of Natural Resources Wales), to identify species and habitats of principal importance for the conservation of biodiversity in Wales. Section 42 of The NERC Act requires the WAG to take steps to “further the conservation” of these species/habitats.

¹⁵ Based on the 2005 consultation draft of the Swansea LBAP. The forthcoming replacement to this plan will be expected to reflect Section 42 Species and Habitats more closely.

- 4.28 Grasshopper warbler was associated with marshy areas in the north-western part of the Survey Site which reflect the species' breeding habitat preferences. The species was only recorded during survey in April. No further records were made during dusk bat surveys or moth trap surveys carried out on the Survey Site during 2014. All registrations of cuckoo were beyond the Survey Site boundary. These were recorded near Lletty'r Bugail, approximately 300 m north of the Survey Site and at Waun y Garn-wen, and approximately 100 m west of the Survey Site, during survey in April and near a pond, north of Cefn-betingau, approximately 100 m east of the Survey Site during survey in May.
- 4.29 House sparrow colonies were recorded at the barn north of Abergelli Farm during all survey visits and at the Abergelli Farm buildings during the survey in May and June. The individual count was 26 during the visit in April, 20 during the survey in May and 18 during the survey in June. Therefore, the number of breeding pairs within the Survey Site is likely to be between nine and 13.
- 4.30 A family of lesser redpoll were observed in scrub bordering the marshy grassland to the west of the Survey Site during the survey in June. Two birds were also recorded in this area during the survey in April. No further evidence of breeding in this species was recorded. Observations of single individuals were made near the Felindre Gas Compressor Station and National Grid electrical substation during survey in May and June.
- 4.31 Three tree pipit territories were recorded during survey. These were recorded immediately south of the gallops at the centre of the Survey Site in May and around the fringes of marshy grassland in the western part of the Survey Site and in the scrub line on the north-east corner of the Survey Site in June. Tree pipit were recorded during all survey visits, with flocks of up to 14 observed over the marshy grassland in the western part of the Survey Site during survey work in May. A family of tree pipit were recorded on a field boundary in the south-east corner of the Survey Site in June. Two pairs of tree pipit were observed immediately south of the gallops at the centre of the Survey Site in June. It is likely that these records are of breeding pairs.
- 4.32 Indicative central territory locations are shown on Figures 1a and 1b in Appendix 1.

Non-Passerines

- 4.33 Red kite were recorded during surveys in April and May. A bird was noted flying over the houses at Abergelli Farm and over the pasture in the northern part of the Survey Site during the survey in April. Two red kites were recorded mobbing a peregrine falcon over the Felindre Gas Compressor Station land during the survey in May. An apparent pair was also recorded flying over the eastern boundary in the northern compartment of the Survey Site during the same survey day. Given the timing of the records, and that at least one pair was recorded during the survey in May it is likely that red kite breed locally. However, no evidence was found to suggest breeding occurred within the Survey Site during 2014.
- 4.34 Red kite are listed under Schedule 1 Part 1 of the Wildlife & Countryside Act 1981 (as amended) and Annex 1 of the Council Directive 79/409/EEC on the Conservation of Wild Birds making it an offence to intentionally or recklessly disturb birds at, on or near an 'active' nest, or to directly threaten birds, such as deliberately kill or capture birds, destroy their nests or take their eggs.
- 4.35 A peregrine falcon was observed flying over the Felindre Gas Compressor Station and National Grid electrical substation during survey in May. There is limited suitable breeding habitat within the Survey Site for peregrine falcon, and therefore this species is only likely to visit the Survey Site to forage on an occasional basis. Electricity pylons within the Survey Site were scanned from the ground for the presence of peregrine (and corvid) nests. No evidence of crow nests, which are sometimes appropriated by peregrine were found. Peregrine falcon is listed under Schedule 1 Part 1 of the Wildlife & Countryside Act 1981 (as amended).
- 4.36 It is possible that some of the farm buildings within the Survey Site may support breeding barn owl, although no trees were found that appear, from a ground level inspection, to have sufficiently large cavities to support nesting barn owls. The marshy fields in the north-west and at the southern end of the Survey Site could provide habitat for field vole *Microtus agrestis* (a preferred prey species) given the thick, tussocky structure of some parts of the sward. There was no evidence that barn owl breed within the Survey Site, and are unlikely to have done so in the recent past due to lack of droppings in the buildings and anecdotal evidence to this effect from the landowner. No signs of

barn owl presence were found during building inspections and no birds were recorded during the breeding bird surveys.

Incidental Records

- 4.37 Species recorded during other survey work in the bird breeding season but not recorded during breeding bird surveys are described below.
- 4.38 10 male and two female wheatear were observed on the horse pasture in the northern part of the Survey Site during a bat transect recce on 24 April 2014, and were presumably transient migrant birds.
- 4.39 Young tawny owls *Strix aluco* were heard calling near the houses in the western part of the Survey Site during a moth survey on 16 June, with birds of unknown age heard during a second survey on 13 August 2014. This suggests that tawny owl bred on the Survey Site in 2014, presumably in the woodland block immediately to the south-west of Abergelli Farm, although much of the woodland within the Survey Site is suitable nesting habitat for this species. No further observations of tawny owl were made. A goshawk (female) was observed flying over the Survey Site at dusk on 16 June, and a sparrowhawk *Accipiter nisus*, was recorded roosting in a tree near the aforementioned houses on 13 August.
- 4.40 Red kite were observed flying over the marshy grassland in the western part of the Survey Site during a dormouse survey on 29 May, and near Abergelli Farm during bat transect surveys on 22 May and 17 July 2014. Single red kites flying over the Survey Site were also recorded during Phase 1 habitat surveys on 24 February 2014 and 14 April 2014.
- 4.41 A spotted flycatcher *Muscicapa striata* was recorded in the hedge-line near the two houses on 17 June 2014. Spotted flycatcher is a Section 42 species of principal importance in Wales, is listed in the Swansea LBAP and is a red-listed species of conservation concern in Wales (RSPB, 2009).

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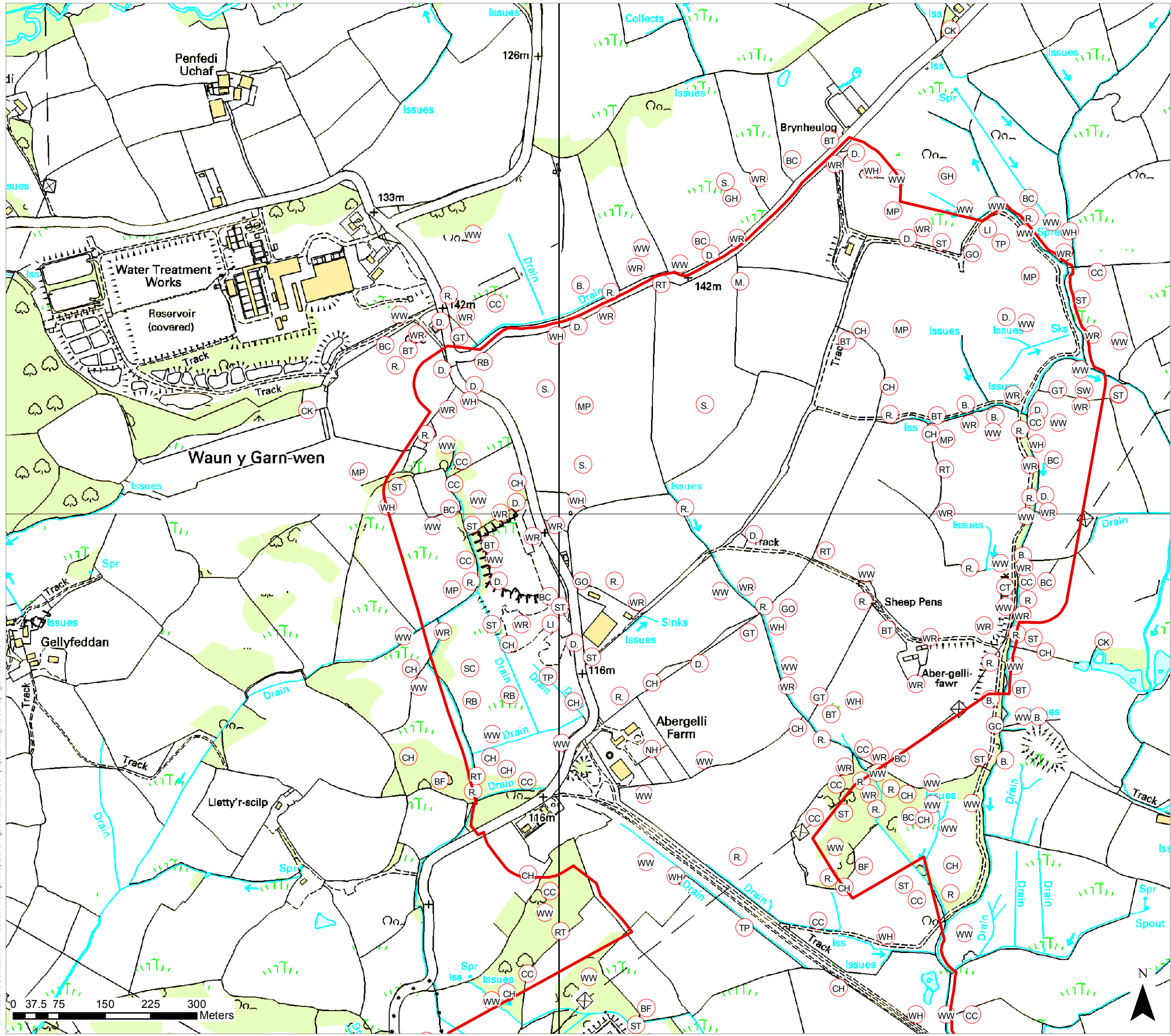
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Appendix 1: Figures

(overleaf)



- LEGEND**
- Survey Site Boundary
 - Breeding Bird Territories

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PROJECT TITLE
 ABERGELLI BREEDING BIRD SURVEY 2014

DRAWING TITLE
 Figure 1a - Breeding Bird Territories - North

DATE: 11.08.2014 CHECKED: OG SCALE: 1:6,000
 DRAWN: GL APPROVED: OG STATUS: FINAL

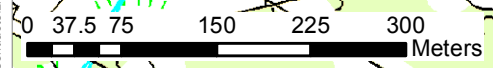
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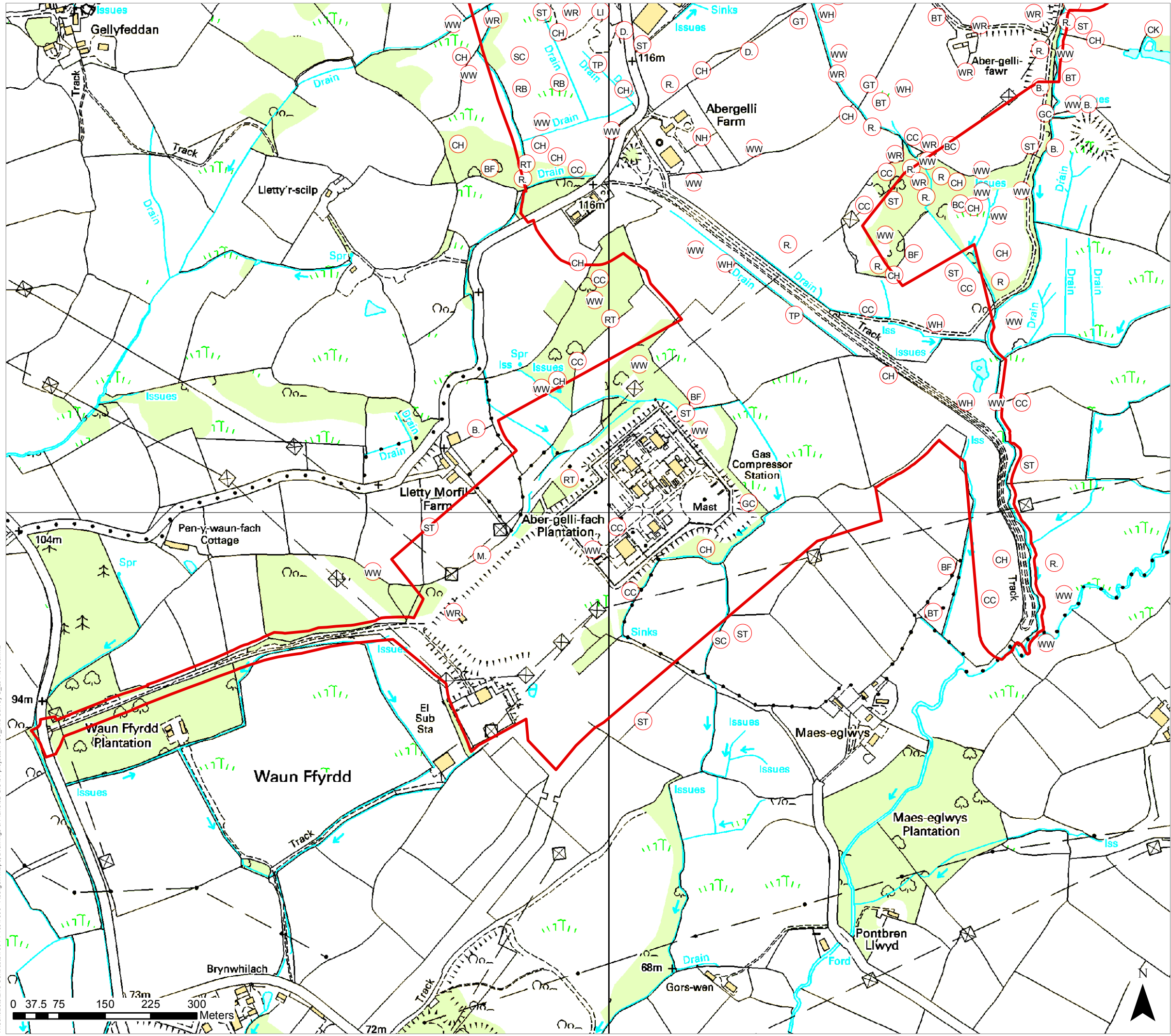
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LEGEND

- Survey Site Boundary
- Breeding Bird Territories



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PROJECT TITLE
 ABERGELLI BREEDING BIRD SURVEY 2014

DRAWING TITLE
 Figure 1b - Breeding Bird Territories - South

DATE: 11.08.2014
 CHECKED: OG
 SCALE: 1:6,000
 DRAWN: GL
 APPROVED: OG
 STATUS: FINAL

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Appendix 2: Species Tables

Table 3. List of species and count of records within 2 km of the Survey Site obtained from the SEWBReC data search.

Species	Count of records
Barn Owl <i>Tyto alba</i>	21
Black-headed Gull <i>Chroicocephalus ridibundus</i>	11
Common Bullfinch <i>Pyrrhula pyrrhula</i>	94
Common Crossbill <i>Loxia curvirostra</i>	3
Common Cuckoo <i>Cuculus canorus</i>	17
Common Goldeneye <i>Bucephala clangula</i>	2
Common Grasshopper Warbler <i>Locustella naevia</i>	6
Common Kestrel <i>Falco tinnunculus</i>	22
Common Kingfisher <i>Alcedo atthis</i>	6
Common Linnet <i>Carduelis cannabina</i>	17
Common Starling <i>Sturnus vulgaris</i>	55
Corn Crane <i>Crex crex</i>	1
Eurasian Curlew <i>Numenius arquata</i>	1
Eurasian Hobby <i>Falco subbuteo</i>	1
Fieldfare <i>Turdus pilaris</i>	6
Hedge Accentor <i>Prunella modularis</i>	145
House Sparrow <i>Passer domesticus</i>	33
Lesser Redpoll <i>Carduelis cabaret</i>	22
Lesser Spotted Woodpecker <i>Dendrocopos minor</i>	4
Little Plover <i>Charadrius dubius</i>	42
Marsh Tit <i>Poecile palustris</i>	7
Merlin <i>Falco columbarius</i>	2
Northern Goshawk <i>Accipiter gentilis</i>	4
Northern Lapwing <i>Vanellus vanellus</i>	63
Osprey <i>Pandion haliaetus</i>	1
Peregrine Falcon <i>Falco peregrinus</i>	14
Pied Flycatcher <i>Ficedula hypoleuca</i>	3
Red Kite <i>Milvus milvus</i>	54
Redwing <i>Turdus iliacus</i>	45
Reed Bunting <i>Emberiza schoeniclus</i>	23
Ring Ouzel <i>Turdus torquatus</i>	1
Ringed Plover <i>Charadrius hiaticula</i>	31
Sky Lark <i>Alauda arvensis</i>	13
Song Thrush <i>Turdus philomelos</i>	140
Spotted Flycatcher <i>Muscicapa striata</i>	12
Tree Pipit <i>Anthus trivialis</i>	7
Willow Tit <i>Poecile montanus</i>	11

Species	Count of records
Wood Warbler <i>Phylloscopus sibilatrix</i>	8
Yellowhammer <i>Emberiza citrinella</i>	15

Table 4. List of all species recorded during the 2014 breeding bird surveys

Species	BTO species code	Species count			Schedule 1 species	Section 42 species	Red (R) or Amber (A) listed species
		April	May	June			
Blackbird <i>Turdus merula</i>	B.	22	29	29			
Blackcap <i>Sylvia atricapilla</i>	BC	9	6	5			
Blue Tit <i>Cyanistes caeruleus</i>	BT	20	20	26			
Bullfinch <i>Pyrrhula pyrrhula</i>	BF	8	3	5			A
Buzzard <i>Buteo buteo</i>	BZ	2	0	3			
Canada Goose <i>Branta canadensis</i>	CG	10	1	1			
Carrion Crow <i>Corvus corone</i>	C.	38	18	27			
Chaffinch <i>Fringilla coelebs</i>	CH	24	18	30			
Chiffchaff <i>Phylloscopus collybita</i>	CC	15	11	17			
Coal tit <i>Periparus ater</i>	CT	3	0	1			
Cuckoo <i>Cuculus canorus</i>	CK	3	0	1		✓	R
Dunnock <i>Prunella modularis</i>	D.	12	6	6		✓	A
Feral Pigeon <i>Columba livia</i>	FP	0	0	4			
Goldcrest <i>Regulus regulus</i>	GC	2	2	1			
Greenfinch <i>Carduelis chloris</i>	GF	0	0	2			
Goldfinch <i>Carduelis carduelis</i>	GO	9	10	16			
Grasshopper Warbler <i>Locustella naevia</i>	GH	2	0	0			R
Great Spotted Woodpecker <i>Dendrocopos major</i>	GS	3	1	6			
Garden Warbler <i>Sylvia borin</i>	GW	1	0	0			
Great Tit <i>Parus major</i>	GT	16	10	13			
Herring Gull <i>Larus argentatus</i>	HG	2	0	2			R
House Sparrow <i>Passer domesticus</i>	HS	34	19	22		✓	R
Jackdaw <i>Corvus monedula</i>	JD	9	30	29			
Jay <i>Garrulus glandarius</i>	J.	4	1	1			
Lesser Black-backed Gull <i>Larus fuscus</i>	LB	2	2	1			A
Linnet <i>Carduelis cannabina</i>	LI	14	15	10			R
Magpie <i>Pica pica</i>	MG	11	23	6			
Mallard <i>Anas platyrhynchos</i>	MA	1	0	0			
Meadow Pipit <i>Anthus pratensis</i>	MP	2	12	9			
Mistle Thrush <i>Turdus viscivorus</i>	M.	3	2	12			A
Nuthatch <i>Sitta europaea</i>	NH	1	3	0			
Peregrine <i>Falco peregrinus</i>	PE	0	0	1	✓		
Pied Wagtail <i>Motacilla alba</i>	PW	1	1	2			
Red Kite <i>Milvus milvus</i>	KT	2	0	5	✓		A

Species	BTO species code	Species count			Schedule 1 species	Section 42 species	Red (R) or Amber (A) listed species
		April	May	June			
Redpoll (Lesser) <i>Carduelis cabaret</i>	LR	1	7	5		✓	R
Redstart <i>Phoenicurus phoenicurus</i>	RT	3	5	8			A
Reed Bunting <i>Emberiza schoeniclus</i>	RB	3	1	1		✓	A
Robin <i>Erithacus rubecula</i>	R.	30	24	23			
Rook <i>Corvus frugilegus</i>	RO	1	18	0			
Sand Martin <i>Riparia riparia</i>	SM	0	0	1			A
Sedge Warbler <i>Acrocephalus schoenobaenus</i>	SW	0	1	0			
Skylark <i>Alauda arvensis</i>	S.	6	6	1		✓	R
Song Thrush <i>Turdus philomelos</i>	ST	14	19	13		✓	R
Starling <i>Sturnus vulgaris</i>	SG	3	6	15			R
Stonechat <i>Saxicola torquata</i>	SC	2	6	6			
Swallow <i>Hirundo rustica</i>	SL	21	7	17			A
Swift <i>Apus apus</i>	SI	0	7	0			A
Tree Pipit <i>Anthus trivialis</i>	TP	19	8	18		✓	R
Whitethroat <i>Sylvia communis</i>	WH	13	12	15			A
Willow Warbler <i>Phylloscopus trochilus</i>	WW	41	18	21			A
Woodpigeon <i>Columba palumbus</i>	WP	8	15	20			
Wren <i>Troglodytes troglodytes</i>	WR	22	26	31			
Northern wheatear <i>Oenanthe oenanthe</i>	W.	2	0	0			A

Abergelli

Abergelli Power Project

Great Crested Newt Survey Report

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1 Summary

- 1.1 Abergelli Power Limited (APL) is promoting a new Power Generation Plant with its associated Gas and Electricity Connections (the 'Project') on agricultural land within Abergelli Farm north of Swansea in the City and County of Swansea (approximately at National Grid Reference 265284, 201431).
- 1.2 A Habitat Suitability Index (HSI) assessment for great crested newts *Triturus cristatus* (GCN) was carried out at accessible ponds as part of the preliminary ecological appraisal of the Project Site at the time of the survey (hereafter referred to as the 'Survey Site'). The results of the HSI assessment are set out in the Preliminary Ecological Appraisal (BSG, June 2014). APL subsequently commissioned BSG Ecology to undertake a presence/absence survey for GCN of ponds within 150 ha of pastoral farmland at and around Abergelli Farm in May 2014, to inform and support an application for Development Consent for the Project.
- 1.3 Owing to the size and nature of the Survey Site, and the lack of GCN records in the desk study search area, it was recommended that a survey for GCNs be conducted for all ponds within the Survey Site boundary and within 250 m of the Survey Site boundary. A total of five ponds were surveyed including three within the Survey Site and a further two within 250 m of the Survey Site boundary. It was not possible to access a number of ponds, which included:
- seven ponds outside of the Survey Site but within 250 m of the Survey Site boundary; and
 - a further four ponds between 250m and 500m from the Survey Site boundary that formed part of a cluster of ponds, the remainder of which were within 250m of the Survey Site boundary.
- 1.4 The survey did not record any GCNs in the ponds surveyed, although palmate newts *Lissotriton helveticus* were recorded in three ponds and smooth newts *Lissotriton vulgaris* were recorded in two ponds. As a consequence, further surveys to establish the population size class of GCN were not necessary and were not undertaken.

2 Introduction

- 2.1 Abergelli Power Limited commissioned BSG Ecology to undertake a presence/absence GCN survey in May 2014 to inform and support an application for Development Consent for the Project described below.

Site Description

- 2.2 The Survey Site consists of approximately 150 ha of pastoral farmland primarily grazed by horses. The extent of the Survey Site is shown in Figure 1 in Appendix 1 and is centred at National Grid Reference 265284, 201431. The nearest settlement is Felindre, which is located approximately 2 km to the north of the Survey Site, with Swansea approximately 5 km to the south.
- 2.3 The Survey Site is largely agriculturally improved pasture with several areas of marshy grassland, particularly in the north, south and north-western ends of the Survey Site. The fields are bounded by fences, running along the line of defunct hedgerows, and often accompanied by ditches. There is a block of broadleaved woodland on the eastern boundary of the Survey Site and other areas of woodland around the marshy grassland to the west of the Survey Site, and around Felindre Gas Compressor Station and the two National Grid 400 kV electrical substations that lie at the south-west end of the Survey Site. The habitats in the surrounding landscape are similar to those within the Survey Site boundary – a mixture of improved and marshy grassland interspersed with occasional patches of woodland.

Description of Project

- 2.4 APL is promoting a new Power Generation Plant with associated Gas and Electricity Connections within Abergelli Farm. The Power Generation Plant would operate as a Simple Cycle Gas Turbine (SCGT) peaking plant and would be designed to provide an electrical capacity of up to 299 Megawatts (MW). It would be fuelled by natural gas, supplied by a new underground gas pipeline connecting the Power Generation Plant to the existing National Grid Gas (NGG) National Transmission System (NTS). It would also connect to the National Grid Electrical Transmission System (NETS) via underground cable or overhead lines.
- 2.5 BSG Ecology has been appointed as the ecological consultant to undertake an ecology survey, which includes a desk study and Extended Phase 1 Habitat Survey as well as a range of Phase 2 surveys, including presence / absence survey for GCNs. These baseline surveys will be included in an appendix to an ecology chapter of an Environmental Statement, which is intended for submission, in support of the application for Development Consent.

Aims of Study

- 2.6 The aims of the GCN survey were to identify whether GCNs are present in the ponds within the Survey Site and those within 250 m of the Survey Site boundary using standard survey methods (as specified in Section 3).

3 Methods

Desk Study

- 3.1 Existing ecological information for the Survey Site and its surrounding area was requested from the South East Wales Biodiversity Records Centre (SEWBReC). Information on protected¹ species, including GCNs, was requested covering the Survey Site and land up to 2 km from the Survey Site boundary. The National Biodiversity Network Gateway² was also checked for records for 1 x 1 km grid squares in which GCN records have occurred. In addition, on-line mapping and aerial photography of the area were also reviewed to identify ponds that might be present within the Survey Site and 500 m of the boundary based on recommendations made in the Natural England (formerly English Nature) GCN Mitigation Guidelines³ (the selection of an appropriate buffer distance for survey is explained in more detail below).

Scoping (HSI) Survey

- 3.2 A Preliminary Ecological Appraisal was carried out by BSG Ecology in February 2014 and updated in April 2014⁴. As part of this survey, all accessible ponds within 250 m of the Survey Site were visited and assessed against the criteria of Oldham *et al.* (2000)⁵. This was to establish the likelihood of their use by GCNs using a Habitat Suitability Index (HSI), and to identify the scope of the GCN presence/absence field survey described below.
- 3.3 The information collected during the HSI assessment provides context of how ponds within or in proximity to the Survey Site may connect with habitat available for newts in the surrounding landscape, and also to give greater confidence to the assessment carried out on each pond.
- 3.4 Information on the physical features and characteristics of each pond within 250 m of the Survey Site was collected, to enable an HSI score to be derived for each pond, by applying the scoring system developed by the Herpetological Conservation Trust (HCT, 2008)⁶. Where a cluster of ponds was found (P01-P08; see Figure 1) with some ponds within 250 m of the Survey Site and some ponds beyond this distance, the intention was to carry out an HSI on all ponds within the cluster (although lack of access prevented this in this case).
- 3.5 The HSI is calculated by allocating scores to features associated with each pond including features such as size, quality of surrounding habitat and presence of fish. These scores are then used to calculate the overall HSI for each pond as a number between 0 and 1, with 0 being the least suitable and 1 being the most suitable. The HSI score allows each pond to be placed in one of five categories defining its suitability for GCNs as follows:
- <0.5 = poor
 - 0.5 – 0.59 = below average
 - 0.6 – 0.69 = average
 - 0.7 – 0.79 = good
 - >0.8 = excellent
- 3.6 In addition, there are a number of wet ditches present within the Survey Site and within 250 m of the Survey Site boundary. All of the wet ditches are narrow (<1 m width) and did not hold more than a few centimetres of water during February – June 2014 despite an exceptionally wet winter.

¹ Wildlife and Countryside Act 1981 Schedules 1, 5 & 8; Conservation of Habitats and Species Regulations 2010; Protection of Badgers Act.

² <http://www.nbn.org.uk/>

³ English Nature (2001). The Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.

⁴ BSG Ecology (2014). Abergelli Power Project: Preliminary Ecological Appraisal.

⁵ Oldham, R.S., Keeble, J., Swan, M.J.S., and Jeffcote, M (2000) Evaluating the Suitability of Habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal, Vol. 10, pp. 143-155.

⁶ Herpetological Conservation Trust (HCT) (2008). Habitat Suitability Index – Guidance Notes. National Amphibian and Reptile Recording Scheme.

They are not thought to provide suitable habitat for GCNs and presence / absence surveys are not considered to be required for these waterbodies.

Field Survey

- 3.7 Following the initial HSI assessment (see above) four GCN survey visits were undertaken within the period mid-March to mid-June to establish presence/absence (with at least two surveys during mid-April to mid-May), with an additional two surveys (six in total) required to estimate population size if GCN were found during the first four surveys. The GCN field survey work was undertaken in 2014 and was completed in accordance with the Natural England (2001) GCN Mitigation Guidelines.
- 3.8 In determining the distance at which presence/absence survey of ponds would take place, Natural England guidance has been considered and an approach developed that is proportionate to the likelihood of encountering GCNs (Note that where a survey is conducted in Wales, Natural Resources Wales advise that the Natural England guidance is consulted.)
- 3.9 Natural England guidance on geographical limits of survey is discussed in Section 5.4 of the GCN Mitigation Guidelines which recommends that:
- “For a common situation, where a plot of land containing a pond is proposed for development, the pond itself should be surveyed, and other ponds up to 500 m away should also be checked, if it is thought likely that great crested newt populations centred on these ponds would be affected by changes to the plot.”*
- 3.10 Natural England guidance is further developed in the GCN Method Statement⁷ which states that:
- “In keeping with a proportionate and risk-based approach, surveys need reasonable boundaries. The great crested newt mitigation guidelines explain that surveys of ponds up to around 500m from the development might need to be surveyed. The decision on whether to survey depends primarily on how likely it is that the development would affect newts using those ponds. For developments resulting in permanent or temporary habitat loss at distances over 250m from the nearest pond, carefully consider whether a survey is appropriate. Surveys of land at this distance from ponds are normally appropriate when all of the following conditions are met: (a) maps, aerial photos, walk-over surveys or other data indicate that the pond(s) has potential to support a large great crested newt population, (b) the footprint contains particularly favourable habitat, especially if it constitutes the majority available locally, (c) the development would have a substantial negative effect on that habitat, and (d) there is an absence of dispersal barriers.”*
- 3.11 The approach that has been taken for these field surveys is consistent with the above guidance and advice from Natural England. Where access was available, presence/absence surveys for GCN were carried out on all ponds within 250 m of the Project Site. The exception to this were pond clusters that are interconnected to each other (less than 250 m apart) and which therefore could be considered to be part of the same population (should GCN be found). However, no such ponds (P01-P08 and P012-P014) were accessible as shown on Figure 1. As explained in the limitations section below, it is not considered to be a significant constraint to the findings of the survey that some ponds could not be accessed.

Limitations of study

- 3.12 The GCN field surveys were undertaken within the recommended survey period and in suitable weather conditions apart from the torchlight survey and egg search on 19/05/2014 where heavy rain occurred leaving some ponds turbid, making survey less effective for a short period. Nevertheless, the surveys were considered to be effective despite the reduced visibility.
- 3.13 Two ponds (P07 and P08) located within the Water Treatment Works to the northwest of Project Site that were classified during the HSI assessment as being of ‘average’ or ‘good’ value for GCNs could not be surveyed due to access not being granted by landowners. In addition, access was not granted by landowners to Ponds P01, P02, P03, P04, P05, P06, P12, P13 and P14, which would have been surveyed for presence/absence of GCN, had access been possible.

⁷ Available at www.naturalengland.org.uk/Images/wml-a14-2_tcm6-4103.xls

- 3.14 In considering the significance of not surveying the inaccessible ponds both within and beyond 250 m from the Project Site, it is useful to examine the results of the presence / absence surveys for those ponds that could be surveyed, as well as the results of the desk study, which places the Survey Site into a wider context (see 4.1). The presence/absence survey did not reveal the presence of GCNs in any of the five ponds surveyed, although three of the ponds supported smooth and /or palmate newts and were also thought to provide suitable habitat for GCNs. This included all ponds within the Survey Site, three of which were of 'average' suitability as derived from the Habitat Suitability Assessment. The Survey Site is on the edge of the known range of GCN and the lack of desk study records within 2 km of the Survey Site is consistent with this, as is a search of the National Biodiversity Network website where the closest record of GCN was approximately 7.5 km from the Survey Site.
- 3.15 The conclusion that may be drawn is that since suitable ponds within the Survey Site were not occupied by GCNs, and no GCN records have been located within 7 km of the Survey Site, it is unlikely that GCNs are present in the inaccessible ponds. Notwithstanding this, if any of the ponds that were not surveyed (most are beyond 250 m from the Survey Site) did indeed support GCNs, it is likely that they would be present in such low numbers and at a sufficient distance from the Survey Site as to be unaffected by the Project. A Natural England funded research report into trapping efficiency on sites where GCNs are present (Cresswell and Whitworth, 2004) supports this assertion. It arrives at the conclusion that very few animals were captured at distances greater than 100 m from a breeding pond. As a consequence, it is not considered to be a significant constraint to the findings of the survey that some ponds could not be surveyed.

4 Results

Desk Study

- 4.1 No records of GCNs within 2 km of the Survey Site were returned by SEWBRc. The closest 1 x 1 km Grid Square in which GCN records have occurred is ca. 7.5 km to the south-east of the Survey Site, near Llandarcy⁸.

Scoping survey

- 4.2 Twelve ponds were identified within 250 m of the Survey Site boundary with the aid of aerial photographs and OS maps. Of these, two (P16 and P17) were identified within the Survey Site boundary, 10 (P05, P06, P07, P08, P09, P10, P12, P13, P14, and P15) were located within 250 m of the Survey Site and another four (P01, P02, P03, and P04) beyond 250m of the Survey Site but forming part of a cluster of ponds (with P05-P08) within the Water Treatment Works to north-west of the Survey Site. An additional on-site pond (P11) was found whilst carrying out other survey work on 21 May 2014 in the marshy grassland in the north-west of the Survey Site. An HSI assessment was carried out on the seven ponds that were accessible within 250 m of the Survey Site boundary during the first Phase 1 survey visit (in February). This included: the two on-site ponds (P16 and P17); one pond within 100 m of the Survey Site boundary (P15); and ponds within 250 m of the Survey Site boundary for which access was possible (P07, P08, P09 and P10). An HSI assessment was also carried out on P11 following its discovery in May 2014.
- 4.3 Figure 1 shows which ponds were surveyed and which were inaccessible on private land.
- 4.4 Table 1 below summarises the results of the HSI, and detailed results are provided in Appendix 3.

Table 1: HSI Results

Pond	HSI	Value for GCNs
P07	0.67	Average
P08	0.77	Good
P09	0.47	Poor
P10	0.64	Average
P11 on site	0.39	Poor
P15	0.66	Average
P16 on site	0.61	Average
P17 on site	0.53	Below average

- 4.5 The Survey Site lies in a part of Wales where the distribution of GCNs is patchy, with the species largely absent to the west of the Survey Site. Whilst this reduces the probability that GCNs would be present within the Survey Site, it does not rule out their presence. There are a number of ponds in and around the Survey Site, and suitable habitat for newts in their terrestrial phase, including old hedge banks, marshy grassland and woodland within the Survey Site. Accordingly, whilst the ponds surveyed did not have a 'good' or 'excellent' HSI score, they did have potential to provide breeding habitat for GCNs.
- 4.6 The scoping exercise concluded that surveys should be carried out on all ponds within 250 m of the Survey Site boundary, except P09, which was a small recession with a small amount of water in February and completely dry in April. In addition the cluster of inaccessible ponds within the grounds of the water treatment works (to the north-west of the Survey Site) are likely to be of similar 'good' quality as Pond 08 (which was visible through the gate) and it was concluded that surveys of this cluster of ponds (including P01, P02, P03 and P04) should also be carried out following the rationale explained in Section 3.7.

⁸ <https://data.nbn.org.uk/imt/#3-4.231,51.507,-3.293,51.781!091EHm!081EHm>

Field Survey

- 4.7 GCN presence-absence surveys were carried out on Ponds P10, P11, P15, P16, and P17. P15 dried out completely between the first and second visits and was only surveyed once. The ponds within the Water Treatment Works (P01-P08), including four ponds beyond 250m from the Survey Site could not be surveyed: access to these ponds was denied on grounds of Health & Safety. In addition, access was denied to the cluster of three ponds (P12-P14) to the east of the Survey Site. The land surrounding these ponds contains Japanese Knotweed *Fallopia japonica* (an invasive species) and is subject to an exclusion and treatment programme which precludes access to third-parties due to the risk of spreading the plant.
- 4.8 Surveys between May 12th and May 22nd were carried out by Stephanie Boocock MCIEEM under the class licence (WML-CL08) with assistance from Caitlin McCann, Owain Waters and Rachel Taylor. For Pond 11, which was identified late during other surveys, the third and fourth visits were carried out by Matthew Hobbs MCIEEM under license number (52219:OTH:SA:2014) with assistance from Rachel Taylor and Gareth Lang. On each visit, weather conditions, including air temperature were recorded. Table 1 gives details of the surveys.

Table 1: Details of GCN surveys. BT= Bottle trapping, TL- torchlight survey, ES= Egg search, N= Netting. Surveyors: SB = Stephanie Boocock, OW= Owain Waters, RT= Rachel Taylor, CMc = Caitlin McCann, MH = Matthew Hobbs, and GL = Gareth Lang.

Visit no.	Date	Surveyors	Survey methods	*Air temp °C		Weather Conditions
				BT	TL/ES	
1	12-13/05/2014	SB + OW	BT, TL, ES	14	8-3	Showers, light wind
2	15-16/05/2014	SB + OW	BT, TL, ES	19	13	No precipitation, light wind
3	19-20/05/2014	SB + RT	BT, TL, ES	18	13	Dry during BT deployment with rain, light wind and thunder during TL/ES
4	22-23/05/2014	SB + CMc	BT, TL, ES	16.3	13	Rain during day, dry and no wind during survey.
3 (for P11)	3-4/06/2014	MH + GL	BT, TL, N	19	14	Light wind, dry.
4 (for P11)	16-17/06/2014	MH + RT	BT, TL, N	21	18	Light wind, dry.

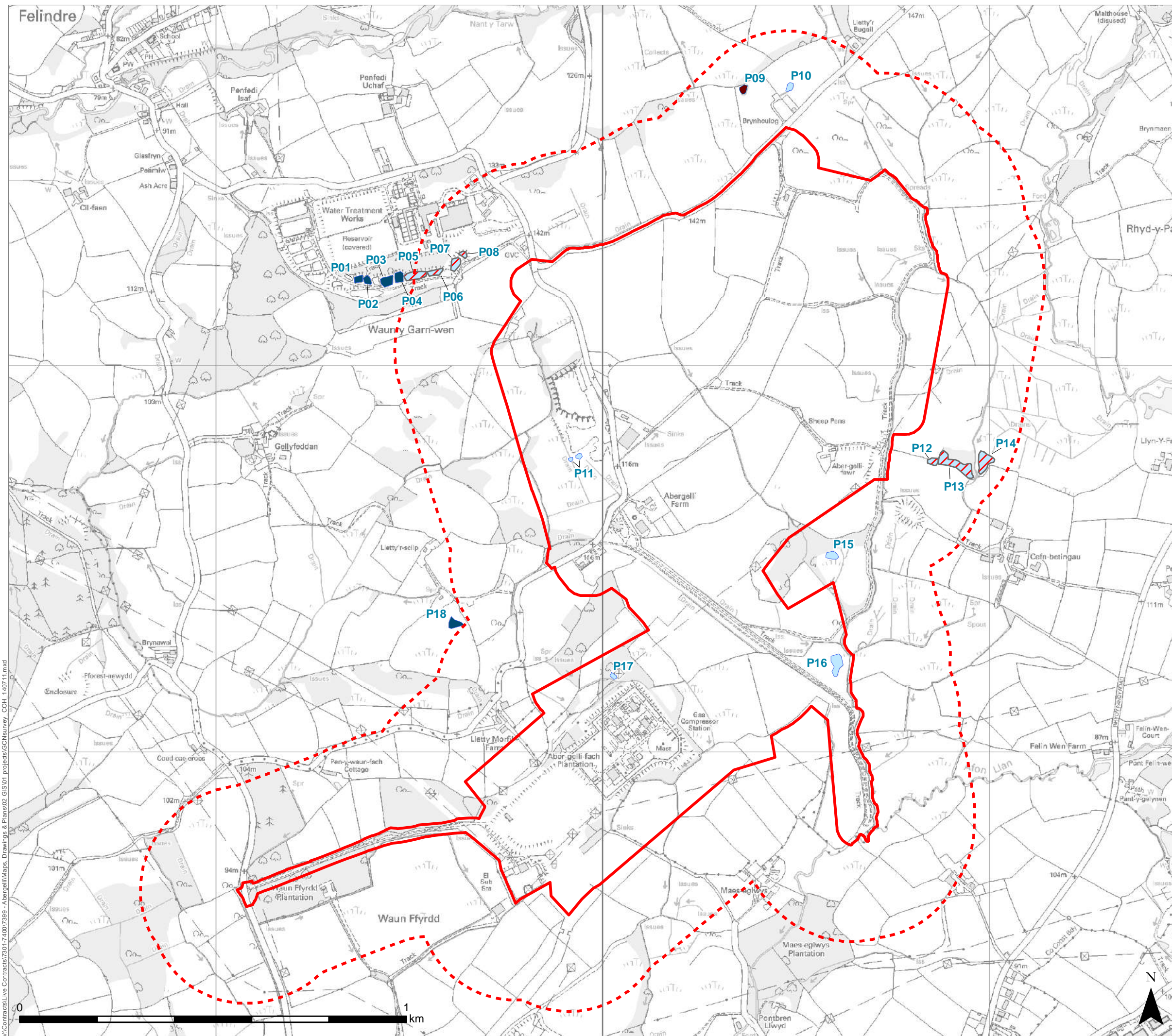
- 4.9 The survey results are summarised in Table 2. Pond P15 dried out between the first and second surveys and only one survey visit to this pond was possible.
- 4.10 The likely absence of GCNs was established for all five ponds surveyed in 2014 the four presence / absence surveys. Additional surveys to make a population size class assessment were not required (following Natural England 2001).

Table 2: GCN survey results. Key: Tc = GCN; Lv = smooth newt; Lh = palmate newt; Lv/Lh = smooth or palmate newt; juv = juvenile; ♂ = male; ♀ = female.

Pond and	Bottle Trap				Torchlight				Egg Search			Netting			
Date of Survey	Tc	Lv	Lh	Lv/Lh	Tc	Lv	Lh	Lv/Lh	Tc	Lv/Lh		Tc	Lv	Lh	Lv/Lh
P10															
12-13/05/2014															
15-16/05/2014															
19-20/05/2014										P					
22-23/05/2014															
P11															
19-20/05/2014			4♂ 3♀					4							
22-23/05/2014			1♀				2♂	5							
3-4/06-2014			1♂					1♀						2♂	4juv , 4eft
16-17/06/2014							1♂	13♂						1♂, 2♂	
P15															
12-13/05/2014															
15-16/05/2014		Dried													
19-20/05/2014		Dried													
22-23/05/2014		Dried													
P16															
12-13/05/2014			2♂				2♂	12♀							
15-16/05/2014							2♂, 2♀								
19-20/05/2014			1♀				4♂								
22-23/05/2014			5♀, 10♂				3♂	1							
P17															
12-13/05/2014							4♂	3♀							
15-16/05/2014							6♂, 2♀								
19-20/05/2014			5♂ 2♀				4♂ 1♀								
22-23/05/2014			1♂ 2♀				2♂ 1♀	1							

Appendix 1: Figures

(overleaf)



LEGEND

- Survey Site boundary
- 250m buffer from Survey Site

Great crested newts

- Pond within 250m of Survey Site that have been surveyed for GCN
- Ponds within 250m of the Survey Site for which access was denied
- Ponds within 250m of the Survey Site that are unsuitable for amphibians
- Ponds within 250-500m of the Survey Site

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 JOB REF: 7399.00

PROJECT TITLE
ABERGELLI POWER PLANT

DRAWING TITLE
Figure 1: Great Crested Newt Survey Map

DATE: 11.07.2014 CHECKED: MH SCALE: 1:9,500
 DRAWN: COH APPROVED: MH STATUS: FINAL

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 All dimensions are to be checked on site.
 Area measurements for indicative purposes only.

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Sources: BSG Ecology survey data, Ordnance Survey

V:\Contracts\Live Contracts\73017-74007399 - Abergelli\Maps, Drawings & Plans\02 GIS\01 projects\GCNsurvey_COH_140711.mxd

Appendix 2: Photographs of Ponds

Photo 1: Pond P08.



Photo 2: Pond P07.



Photo 3: Pond P10.



Photo 4: Pond P09.



Photo 5: Pond P11.



Photo 6: Pond P15.



Photo 7: Pond P16.



Photo 8: Pond P17



Appendix 3: HSI results.

Pond ref.	Location	Pond Area m ²	Pond permanence	Water Quality	Pond Shading %	No. of waterfowl	Occurrence of fish	Pond density	Proportion of newt friendly habitat around pond within 500 m – Any Barriers	Macrophyte content (est. % total of emergent and submerged macrophytes)	Notes
P07	SN6464602272	150	Never dries	Good	30	Minimal	Possible	Y	Good	0	Not well vegetated
P08	SN6463502258	240	Never dries	Good	10	Minimal	Possible	Y	Good	30	Typha and rushes around edge. Close access not possible
P09	SN6535602709	20	Annual dries	Moderate	30	Absent	No	Y	Good	0	Very shallow and unlikely to fill up – probably mostly dry
P10	SN6548702727	70	Sometimes dries	Good	5	Minimal	Possible	Y	Good	20	Small and shallow
P11	SN6494401748		Never dries	Good		Minimal	Possible	Y	Good	35	Very well vegetated
P16	SN6558701536	25	Sometimes	Good	60	Absent	No	Y	Good	40	
P17	SN6569801237	100	Annually dries	Good	80	Absent	No	Y	Good	100	Water shallow and covered in Carex species. To south consists of patches of standing water within Molinia
P18	SN6503101199	50	Never dries	Moderate	100	Absent	No	Y	Moderate	0	Small pond within woodland – water dark and no aquatic

												vegetation in evidence
--	--	--	--	--	--	--	--	--	--	--	--	------------------------

Abergelli

Abergelli Power Project

Invasive Plant Species Survey Report

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Client	Stag Energy
Job	Abergelli Power Project
Report title	Invasive Plant Species Survey Report
Draft version/final	FINAL
File reference	7399_InvasiveSpecies_APPR (4)_011014.docx

	Name	Position	Date
Originated	Niall Lusby	Senior Ecologist	23 July 2012
Reviewed	Jim Gillespie	Partner	28 July 2014
2nd Draft	Niall Lusby	Senior Ecologist	28 July 2014
Approved for issue to client	Jim Gillespie	Partner	15 August 2014
Issued to client	Jim Gillespie	Partner	15 August 2014
2nd issue to client	Matt Hobbs	Principal Ecologist	02 September 2014
3rd issue to client	Matt Hobbs	Principal Ecologist	08 September 2014

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Nothing in this report constitutes legal opinion. If legal opinion is required the advice of a qualified legal professional should be secured.

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1 Summary 2

2 Introduction 3

3 Methods 5

4 Results 6

Appendix 1: Figures 7

1 Summary

- 1.1 Abergelli Power Limited (APL) is promoting a new Power Generation Plant with its associated Gas and Electricity Connections (the 'Project') on agricultural land within Abergelli Farm, north of Swansea in the City and County of Swansea (approximately at National Grid Reference 265284, 201431).
- 1.2 The preliminary ecological appraisal¹ identified that invasive species of plants, as listed under Part II of Schedule 9 of the Wildlife and Countryside Act (WCA), 1981 (as amended) (specifically Japanese Knotweed *Fallopia japonica* and Himalayan balsam *Impatiens glandulifera*), are present on the Survey Site in a number of areas. The report recommended that a detailed survey to map the distribution of any invasive species should be carried out to inform any management measures that would need to be implemented to remove or control the spread of these species during the construction and operation of the Project.
- 1.3 APL commissioned BSG Ecology to undertake an invasive survey of streams and wet ditches within the 150 ha of pastoral farmland at and around Abergelli Farm in June 2014 within the Survey Site, to inform and support an application for Development Consent for the Project.
- 1.4 The Survey Site was surveyed in July 2014 by an ecologist from BSG Ecology. All accessible areas of the Survey Site were walked with areas of dense scrub assessed from the perimeter of the scrub, and the presence of five species included under Part II were recorded within the Survey Site: Japanese knotweed, Himalayan balsam, rhododendron *Rhododendron ponticum*, floating pennywort *Hydrocotyle ranunculoides* and montbretia *Crocasmia x crocosmiiflora*.
- 1.5 Of the five species Himalayan balsam and Japanese knotweed were the most widespread within the Survey Site.

¹ BSG Ecology (2014). Abergelli Power Project: Preliminary Ecological Appraisal.

2 Introduction

- 2.1 APL commissioned BSG Ecology to undertake an invasive species survey in May 2014 to inform and support an application for Development Consent for the Power Generation Plant.

Site Description

- 2.2 The Survey Site consists of approximately 150 ha of pastoral farmland, primarily grazed by horses. The extent of the Survey Site is shown in Figure 1 in Appendix 1 and is centred at National Grid Reference 265284, 201431. The nearest settlement is Felindre, which is located approximately 2 km to the north of the Survey Site, with Swansea approximately 5 km to the south.
- 2.3 The Survey Site is largely agriculturally improved pasture with several areas of marshy grassland, particularly in the north, south and north-western ends of the Survey Site. The fields are bounded by fences, running along the line of defunct hedgerows, and often accompanied by ditches. There is a block of broadleaved woodland on the eastern boundary of the Survey Site and other areas of woodland around the marshy grassland to the west of the Survey Site, and around Felindre Gas Compressor Station and the two National Grid 400 kV electrical substations that lie at the south-west end of the Survey Site. The habitats in the surrounding landscape are similar to those within the Survey Site boundary – a mixture of improved and marshy grassland interspersed with occasional patches of woodland.

Description of Project

- 2.4 APL is promoting a new Power Generation Plant with associated Gas and Electricity Connections within Abergelli Farm. The Power Generation Plant would operate as a Simple Cycle Gas Turbine (SCGT) peaking plant and would be designed to provide an electrical capacity of up to 299 Megawatts (MW). It would be fuelled by natural gas, supplied by a new underground gas pipeline connecting Power Generation Plant to the existing National Grid Gas (NGG) National Transmission System (NTS). It would also connect to the National Grid Electrical Transmission System (NETS) via underground cable or overhead lines.
- 2.5 BSG Ecology has been appointed as the ecological consultant to undertake an ecology survey, which incorporates a desk study and Extended Phase 1 Habitat Survey as well as a range of Phase 2 surveys, including a survey for invasive species. The methods and results of baseline surveys will be provided as appendices to an ecology chapter of an Environmental Statement, which is intended for submission, in support of the application for Development Consent.

Background to Survey

- 2.6 For the purposes of this survey, invasive plant species are defined as those species of non-native plants included in part II of Schedule 9 of the WCA 1981 (as amended).
- 2.7 Since its creation in 1981, part II of Schedule 9 of the WCA (as amended) 1981, pertaining to invasive plants, has undergone many revisions, to the extent that the original four species has now been expanded to include over 30 invasive plant species.
- 2.8 The Phase 1 survey of the Survey Site was carried out in three phases, in February 2014 and updated in April 2014, and July 2014. The timing of the first two surveys during the winter and early spring meant that the presence of some of the Schedule 9 species was missed as the vegetative parts of the plants (growing above ground) can be absent during the colder months of the year, with the plant persisting, over winter, below ground as rhizomes or lying dormant in the seed bank. Because of this it was recommended in the Phase 1 survey report that a dedicated invasive species survey should be undertaken within the main botanical survey season (May to September) to attempt to map the distribution and extent of Schedule 9 species within the Survey Site.

Aims of Study

- 2.9 The aim of the survey is to confirm the presence and identify the locations of species of plant included under Schedule 9 of the WCA (as amended) 1981.

3 Methods

- 3.1 No standard method exists for invasive plant species survey; and the survey was based on an ecological walkover survey approach, whereby all accessible areas of the Survey Site were walked by the surveyor in daylight hours, with a visual search for the target species undertaken.
- 3.2 Particular focus was also given to areas where the target species were most likely to be found, for example water courses, areas of disturbed ground and tracks where imported material may have been used or where fly-tipping or movements of vehicles or machinery could have led to the spread of these species.
- 3.3 Where found to be present, the species and location were recorded using a handheld GPS. The locations of individual plants, small clusters and large clusters of plants found during the walkover survey are provided in Figure 1. The locations are representative and do not necessarily provide mapping of the exact extent of each species or the precise location of each individual plant.

Limitations of Study

- 3.4 The scale of the Survey Site and the presence of dense areas of scrub or woodland understorey in some areas mean that it is possible that small stands or individual plants of invasive species could have been missed during the walkover survey. In addition, the presence of horses in some fields restricted access to some areas of the Survey Site although these areas were assessed using binoculars and it is likely, given the heavily grazed nature of these fields, that most invasive plant species would have been visible using binoculars. It is considered that the majority of the Survey Site was surveyed adequately and that overall the distribution of invasive species across the Survey Site has been mapped accurately.
- 3.5 The mapping produced in support of the report is based on point locations taken using a handheld GPS device which is subject to varying degrees of accuracy depending on satellite coverage and other factors. Further to this the GPS locations recorded were for the main aggregation of each plant species at each location. Each point therefore does not represent full coverage of the species at each point. Any invasive plant management plan should take account of this with up to date, detailed surveying by a qualified land surveyor undertaken to provide accurate extents of species coverage. The distribution of each invasive plant species will, inevitably, change from year to year to a greater or lesser extent and these locations should be re-checked as necessary.

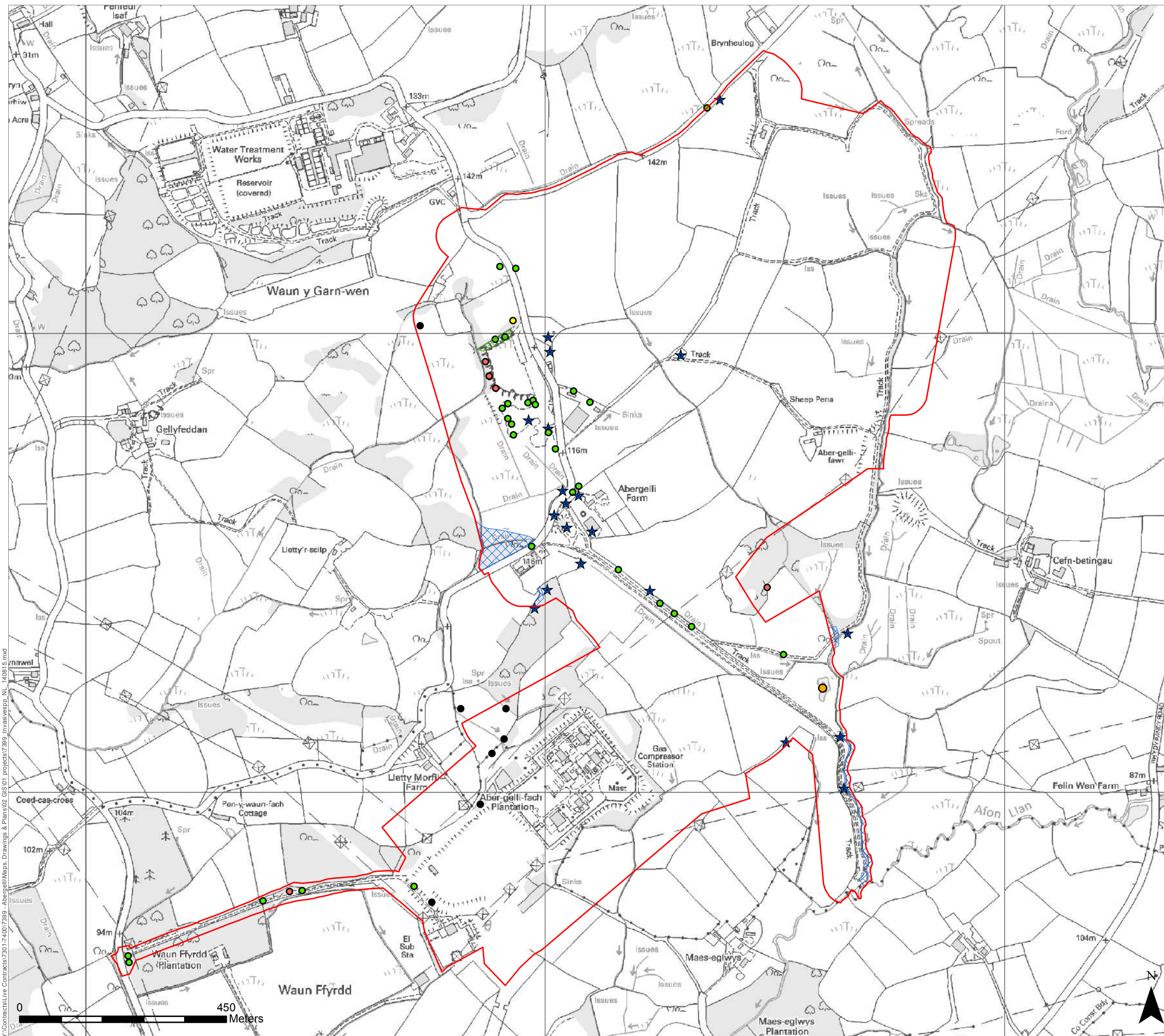
4 Results

- 4.1 Five species of plant included on Part II of Schedule 9 of the WCA 1981 were recorded during the survey: Japanese knotweed; Himalayan balsam; rhododendron; floating pennywort; and montbretia. The locations and extents of these species are shown on Figure 1.
- 4.2 The most frequently recorded species were Japanese knotweed and Himalayan balsam.
- 4.3 Japanese knotweed was found to be strongly associated with roads and trackways on the Survey Site as well as the area of inert landfill in the north-west half of the Survey Site. This perennial species is typically spread through the movement of contaminated soils or through spreading of vegetative parts through flailing of hedges or movement of other machinery.
- 4.4 Himalayan balsam is an annual plant that is typically found in wetter habitats, although it will tolerate drier conditions. It is strongly associated with woodland, stream corridors and ditches across the Survey Site.
- 4.5 Rhododendron is restricted to woodlands with a small patch occurring in the marshy grassland area in the north-west of the Survey Site. Montbretia was recorded in two locations alongside roads, which is a typical location for this species to be found in given that it is often spread from the fly tipping of garden waste.
- 4.6 Floating pennywort was found in one of the Survey Site ponds in the south-east of the Survey Site².

² Pond 16 as referred to in the great-crested newt survey report.

Appendix 1: Figures

(overleaf)



LEGEND

Survey site boundary

Larger area of invasive species

Himalayan Balsam

Japanese knotweed

Small area of invasive species

Floating Pennywort

Himalayan Balsam

Japanese knotweed

Montbrecia

Montbrecia and Japanese knotweed

Rhododendron

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PROJECT TITLE

ABERGELLI POWER PLANT

DRAWING TITLE

Figure 1 - Invasive Plant Species Survey

DATE: 22.07.2014

CHECKED: MH

SCALE: 1:8,000

DRAWN: RT

APPROVED: JG

STATUS: Final

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Y:\Contracts\Live Contracts\730174007399 - Abergelli\Maps, Drawings & Plans\02_GIS\01_projects\7399_invasive\espp_NL_140815.mxd



GroundSure Envirolnsight

Address: ABERGELLI FACH FARM, FELINDRE, ABERTAWE, SA5 7NN
Date: 29 Jul 2014
Reference: GS-1587647
Client: Parsons Brinckerhoff



SW S SE
Aerial Photograph Capture date: 22-May-2010
Grid Reference: 265243,201702
Site Size: 146.24ha

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Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Environmental Permits, Incidents and Registers		On-site	0-50m	51-250	251-500		
1.1 Industrial Sites Holding Environmental Permits and/or Authorisations							
1.1.1	Records of historic IPC Authorisations	0	0	0	0		
1.1.2	Records of Part A(1) and IPPC Authorised Activities	2	0	0	0		
1.1.3	Records of Water Industry Referrals (potentially harmful discharges to the public sewer)	0	0	0	0		
1.1.4	Records of Red List Discharge Consents (potentially harmful discharges to controlled waters)	0	0	0	0		
1.1.5	Records of List 1 Dangerous Substances Inventory sites	0	0	0	0		
1.1.6	Records of List 2 Dangerous Substances Inventory sites	0	0	0	0		
1.1.7	Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0		
1.1.8	Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0		
1.1.9	Records of Licensed Discharge Consents	3	0	2	3		
1.1.10	Records of Planning Hazardous Substance Consents and Enforcements	0	0	0	1		
1.2	Records of COMAH and NIHHS sites	0	0	2	0		
1.3 Environment Agency Recorded Pollution Incidents							
1.3.1	National Incidents Recording System, List 2	3	0	0	2		
1.3.2	National Incidents Recording System, List 1	0	0	0	0		
1.4	Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0		
Section 2: Landfill and Other Waste Sites		On-site	0-50m	51-250	251-500	501-1000	1000-5000
2.1 Landfill Sites							
2.1.1	Environment Agency Registered Landfill Sites	1	0	0	0	0	Not searched
2.1.2	Environment Agency Historic Landfill Sites	1	0	2	1	0	0
2.1.3	BGS/DoE Landfill Site Survey	0	0	0	1	0	0
2.1.4	GroundSure Local Authority Landfill Sites Data	0	0	0	0	0	0
2.2 Landfill and Other Waste Sites Findings							
2.2.1	Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	2	0	0	0	Not searched	Not searched
2.2.2	Environment Agency Licensed Waste Sites	2	0	0	0	2	4

Section 3: Current Land Use	On-site	0-50m	51-250	251-500
3.1 Current Industrial Sites Data	14	6	6	Not searched
3.2 Records of Petrol and Fuel Sites	0	0	0	0
3.3 Underground High Pressure Oil and Gas Pipelines	0	0	0	0

Section 4: Geology

4.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?	No
4.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	Yes
4.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 5: Hydrogeology and Hydrology

	0-500m
5.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?	Yes
5.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?	Yes

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
5.3 Groundwater Abstraction Licences (within 2000m of the study site)	1	0	1	1	5	10
5.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	2	3
5.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	2
5.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
5.7 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	4	0	2	1	Not searched	Not searched

	On-site	0-50m	51-250	251-500	501-1000	1000-1500
5.8 Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	Yes	Yes
5.9 Detailed River Network entries within 500m of the site	47	19	72	82	Not searched	Not searched
5.10 Surface water features within 250m of the study site	Yes	Yes	Yes	Not searched	Not searched	Not searched

Section 6: Flooding

6.1 Are there any Environment Agency Zone 2 floodplains within 250m of the study site?	Yes
6.2 Are there any Environment Agency Zone 3 floodplains within 250m of the study site?	Yes
6.3 Are there any Flood Defences within 250m of the study site?	No
6.4 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
6.5 Are there any areas used for Flood Storage within 250m of the study site?	No
6.6 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Potential at Surface
6.7 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	High

Section 7: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	2
7.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
7.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
7.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
7.5 Records of Ramsar sites	0	0	0	0	0	0
7.6 Records of Ancient Woodlands	1	0	0	0	1	6
7.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
7.8 Records of World Heritage Sites	0	0	0	0	0	0
7.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0
7.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
7.11 Records of National Parks	0	0	0	0	0	0
7.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
7.13 Records of Nitrate Vulnerable Zones	0	0	0	0	0	0

Section 8: Natural Hazards

8.1 What is the maximum risk of natural ground subsidence? High

Section 9: Mining

9.1 Are there any coal mining areas within 75m of the study site? Yes

9.2 What is the risk of subsidence relating to shallow mining within 150m of the study site? Low

9.3 Are there any brine affected areas within 75m of the study site? No

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between GroundSure and the Client. The document contains the following sections:

1. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

2. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

3. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure underground oil and gas pipelines.

4. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

5. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licenses, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

6. Flooding

Provides information on surface water flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

7. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

8. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence.

9. Mining

Provides information on areas of coal and shallow mining.

10. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, GroundSure provide a free Technical Helpline (08444 159000) for further information and guidance.

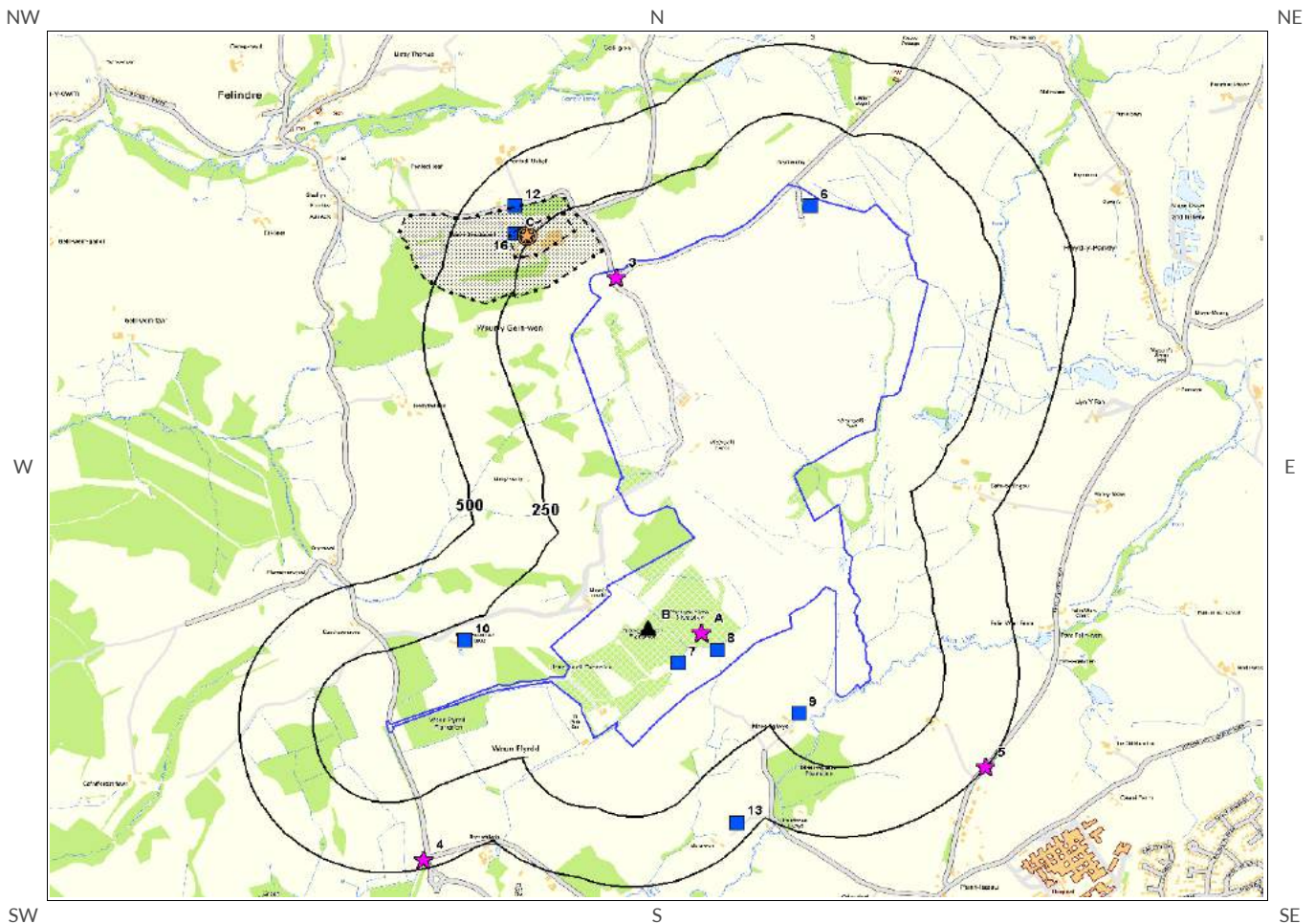
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.















1. Environmental Permits, Incidents and Registers Map



Environmental Permits,
Incidents and Registers Legend



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- | | | | | | |
|---|--------------------|---|-------------------------------|---|--|
|  | Site Outline |  | Recorded Pollution Incident |  | RAS 3 & 4 Authorisations |
|  | Search Buffers (m) |  | Dangerous Substances (List 1) |  | Part A(1) Authorised Processes and Historic IPC Authorisations |
| | |  | Dangerous Substances (List 2) |  | Part A(2) and Part B Authorised Processes |
| | |  | Water Industry Referrals |  | COMAH / NIHHS Sites |
| | |  | Licenced Discharge Consents |  | Sites Determined as Contaminated Land |
| | |  | Red List Discharge Consents |  | Hazardous Substance Consents and Enforcements |



1. Environmental Permits, Incidents and Registers

1.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

1.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

1.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

2

The following Part A(1) and IPPC Authorised Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance	Direction	NGR		Details
19B	0.0	On Site	264950 200990	Operator: National Grid Gas Plc Installation Name: Felindre, Gas Compressor Station Process: COMBUSTION; ANY FUEL =>50MW	Permit Number: RP3232LD Original Permit Number: RP3232LD EPR Reference: - Issue Date: 2/7/2007 Effective Date: 2/7/2007 Last date noted as effective: 2014-04-01 Status: Superseded
20B	0.0	On Site	264950 200990	Operator: National Grid Gas Plc Installation Name: Felindre, Gas Compressor Station Process: COMBUSTION; ANY FUEL =>50MW	Permit Number: WP3230TU Original Permit Number: RP3232LD EPR Reference: - Issue Date: 29/3/2010 Effective Date: 29/3/2010 Last date noted as effective: 2014-04-01 Status: Effective

1.1.3 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

1.1.4 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

1.1.5 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

1.1.6 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

1.1.7 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

0

Database searched and no data found.

1.1.8 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

1.1.9 Records of Licensed Discharge Consents within 500m of the study site:

8

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details	
6	0.0	On Site	265500 202500	Address: Abergelli Farm Felindre Swansea, Abergelli Farm Felindre Swansea, Felindre Swansea, Swansea, Swansea, SWANSEA Effluent Type: Unspecified Permit Number: BP0051701 Permit Version: 1	Receiving Water: To Land Status: Consent Expired - Time Limit Issue date: 14/8/1987 Effective Date: 14/8/1987 Revocation Date: -

ID	Distance	Direction	NGR	Details	
7	0.0	On Site	265052 200870	Address: Nat'l Grid Compressor Sta Swansea, Nat'l Grid Newb'd Compressor Sta, Felindre, Swansea, SA5 7LU Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: BP0370301 Permit Version: 1	Receiving Water: Unnamed Land Drain Status: Surrendered Under Epr 2010 Issue date: 2/11/2007 Effective Date: 2/11/2007 Revocation Date: 26/8/2010
8	0.0	On Site	265183 200917	Address: National Grid Site Llangyfelach, National Grid Site, Llangyfelach, Felindre, Swansea Effluent Type: Trade Discharges - Site Drainage Permit Number: BP0361101 Permit Version: 1	Receiving Water: Afon Llan Status: Surrendered Under Epr 2010 Issue date: - Effective Date: - Revocation Date: 16/6/2011
9	146.0	SW	265460 200690	Address: Maes Eglwys Farm Pantlasau Morrsto, Maes Eglwys Farm Pantlasau Morri, Pantlasau Morrston, Morrston Effluent Type: Unspecified Permit Number: BF0214701 Permit Version: 1	Receiving Water: To Land Nr. River Llan Status: Consent Expired - Time Limit Issue date: 1/2/1979 Effective Date: 1/2/1979 Revocation Date: 22/4/1994
10	188.0	N	264330 200950	Address: Penywaun Fach Cottages Felindre Swa, Penywaun Fach Cottages Felindre, Felindre Swansea., Swansea. Effluent Type: Unspecified Permit Number: BP0108201 Permit Version: 1	Receiving Water: To Land Status: Consent Expired - Time Limit Issue date: - Effective Date: - Revocation Date: -
11 C	302.0	NW	264500 202400	Address: Felindre Chlor.overflow, Felindre Chlor.overflow Effluent Type: Unspecified Permit Number: BP0180001 Permit Version: 1	Receiving Water: To Land Status: Consent Expired - Time Limit Issue date: 2/10/1989 Effective Date: 2/10/1989 Revocation Date: 14/3/1994
12	365.0	NW	264500 202500	Address: Felindre Wtw (septic Tank Disc, Felindre Wtw (septic Tank Disc Effluent Type: Unspecified Permit Number: BC0011901 Permit Version: 1	Receiving Water: Unnamed Trib. River Lliw Status: Consent Expired - Time Limit Issue date: 22/5/1970 Effective Date: 22/5/1970 Revocation Date: -
13	442.0	SE	265250 200300	Address: Bungalow At Gorswen Farm Pontlasse, Bungalow At Gorswen Farm Pontlas, Pontlasse Swansea , Swansea , Swansea , Effluent Type: Unspecified Permit Number: BP0011401 Permit Version: 1	Receiving Water: To Land Status: Consent Expired - Time Limit Issue date: 7/2/1986 Effective Date: 7/2/1986 Revocation Date: -

1.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

1

The following records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance	Direction	Application Reference Number	NGR	Application Status	Application Date	Address	Details	Details of Enforcement Action
21C	265.0	NW	HAZ 5/92	264539 202392	Approved	No details.	Felindre Waterworks, Felindre, Welsh Water, Swansea, West Glamorgan, SA5 7NP	Storage of chlorine.	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified

1.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site:

2

The following COMAH & NIHHS Authorisation records provided by the Health and Safety Executive are represented as polygons or buffered points on the Environmental Permits, Incidents and Registers Map:

ID	Distance	Direction	Company	Address	Operational Status	Tier
16	58.0	NW	Dwr Cymru / Welsh Water	Dwr Cymru / Welsh Water, Felindre Water Treatment Works, Felindre, Swansea, Sa5 7np	Current COMAH Site	COMAH Lower Tier Operator
17C	168.0	NW	Welsh Water Development Authority	Welsh Water Development Authority(glamorgan Water Division), Felindre Treatment Plant, Felindre, Sa5 7np	Historical NIHHS Site	-

1.3 Environment Agency Recorded Pollution Incidents

1.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

5

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details	
1A	0.0	On Site	265129 200977	Incident Date: 25/06/2002 Incident Identification: 87384 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Smoke	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
2A	0.0	On Site	265129 200977	Incident Date: 25/06/2002 Incident Identification: 87384 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Smoke	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
3	0.0	On Site	264841 202246	Incident Date: 10/05/2007 Incident Identification: 493773 Pollutant: Inert Materials and Wastes Pollutant Description: Soils and Clay	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
4	467.0	S	264189 200169	Incident Date: 16/08/2002 Incident Identification: 100861 Pollutant: Oils and Fuel Pollutant Description: Mixed/Waste Oils	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
5	496.0	SE	266090 200500	Incident Date: 10/05/2001 Incident Identification: 5132 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)

1.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

Database searched and no data found.

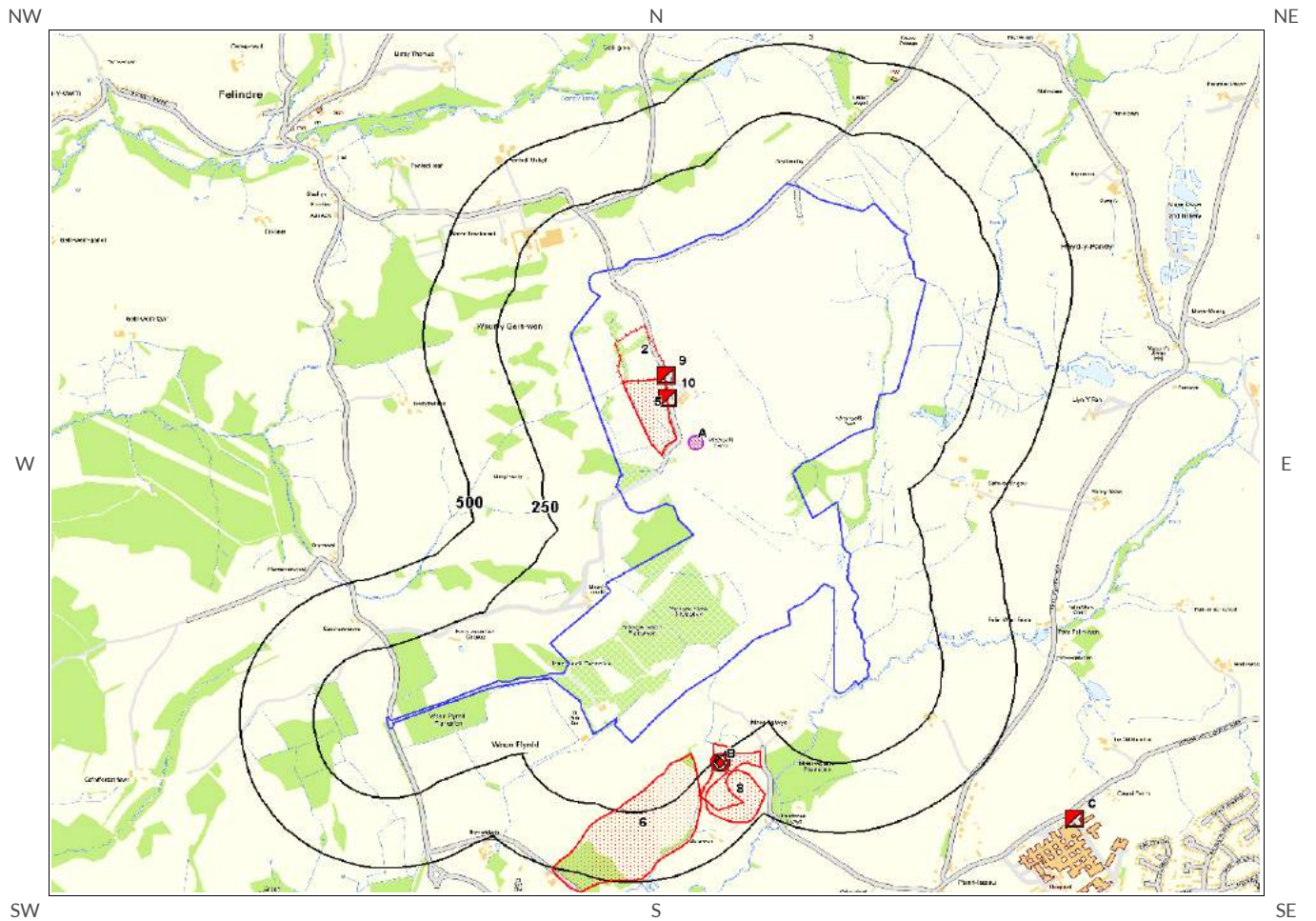
1.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site?

0

Database searched and no data found.




2. Landfill and Other Waste Sites Map



Landfill and Other Waste Sites Legend



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- | | | | | | |
|---|--------------------|---|--------------------------|---|----------------------------------|
|  | Site Outline |  | E.A. Active Landfill |  | Historic and Planned Waste Sites |
|  | Search Buffers (m) |  | E.A. Historic Landfill |  | E.A. Licensed Waste Site |
| | |  | Local Authority Landfill |  | BGS / DoE Survey Landfill |



2. Landfill and Other Waste Sites

2.1 Landfill Sites

2.1.1 Records from Environment Agency landfill data within 1000m of the study site:

1

The following Environment Agency landfill records are represented as polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
2	0.0	On Site	265014 201890	Address: Abergelli Fach Farm, Felindre, Swansea, SA5 7NN Landfill Reference: 34108.0 Environmental Permitting Regulations (Waste) Reference: LLE001 Landfill Type: A5 : Landfill taking Non-Biodegradable Wastes Operator: Llewellyn Bryn Status: Closure IPPC Reference: EPR Reference:

2.1.2 Records of Environment Agency historic landfill sites within 1500m of the study site:

4

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
5	0.0	On Site	265020 201808	Site Address: Abergelli Fach Farm Landfill Extension, Felindre Waste Licence: Yes Site Reference: - Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 06-Sep-1999 Licence Surrendered: Licence Hold Address: Felindre Operator: Abergelli Fach Farm Landfill Extension
6	147.0	SE	264900 200200	Site Address: British Steel Corporation, Velindre, Pant-Iasau, Swansea Waste Licence: Yes Site Reference: - Waste Type: Industrial, Household, Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 21-Jun-1991 Licence Surrendered: 20-Jun-1994 Licence Hold Address: Velindre, Swansea Operator: -
7B	200.0	SE	265200 200400	Site Address: Gorswen Farm, Pontdassau, Llangyfelach, Glamorgan Waste Licence: - Site Reference: - Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -

ID	Distance (m)	Direction	NGR	Details
8	302.0	SE	265200 200300	Site Address: Gors Wen, Felindre Waste Licence: - Site Reference: - Waste Type: Inert, Industrial, Special, Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -

2.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

1

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
1B	266.0	SE	26520 0.0 20050 0.0	Address: Gorswen Farm, Pontdassau, Llangyfelach, Glam BGS Number: 1208.0 Risk: No risk to aquifer Waste Type: N/A

2.1.4 Records of Local Authority landfill sites within 1500m of the study site:

0

Database searched and no data found.

2.2 Other Waste Sites

2.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

2

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
3A	0.0	On Site	265117 201648	Type of Site: Recycling Facility Site Address: Abergelli Fach Farm, Felindre, SWANSEA, West Glamorgan, SA5 7NN Planning Application Reference: 2008/0827 Date: - Further Details: Scheme comprises change of use from agricultural land to recycling of green waste and composting treatment. An application (ref: 2008/0827) for detailed planning permission was refused by Swansea C.C. A detailed planning application has been refused. Data Source: Historic Planning Application Data Type: Point

ID	Distance (m)	Direction	NGR	Details	
4A	0.0	On Site	265117 201648	Type of Site: Waste Transfer Station Site Address: Landfill Site, Abergelli Fach Farm, Felindre, SWANSEA, West Glamorgan, SA5 7NN	Planning Application Reference: 2002/0312 Date: - Further Details: Scheme comprises provision of a waste transfer station together with the removal of inert material and engineering works at Abergelli tip. An application (ref: 2002/0312) for Detailed Planning permission was submitted to Swansea C.C. on 22nd February 2002. Data Source: Historic Planning Application Data Type: Point

2.2.2 Records of Environment Agency licensed waste sites within 1500m of the study site:

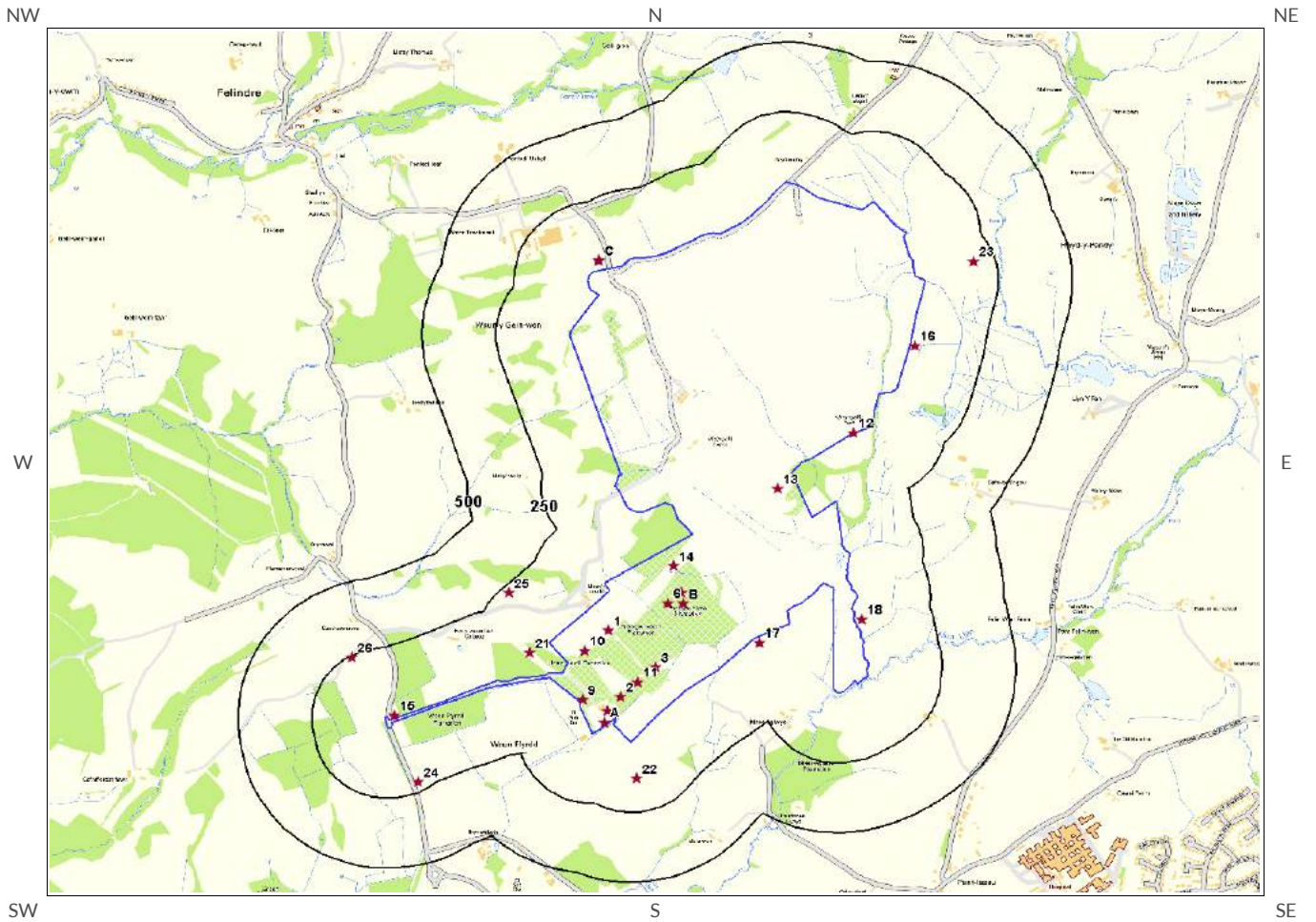
8

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
9	0.0	On Site	265014 201890	Site Address: Abergelli Fach Farm, Felindre, Swansea, SA5 7NN Type: Landfill taking Non-Biodegradable Wastes Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: LLE001 EPR reference: EA/EPR/XP3198FC/A001 Operator: Llewellyn Bryn Waste Management licence No: 34108 Annual Tonnage: 82628.0	Issue Date: 29/09/1994 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Closure Site Name: Abergelli Fach Farm Correspondence Address: -, -
10	0.0	On Site	265020 201808	Site Address: - Type: Landfill taking Non-Biodegradable Wastes Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: LLE002 EPR reference: EA/EPR/CP3098FZ/V002 Operator: Llewellyn William Bryn Waste Management licence No: 34165 Annual Tonnage: 35000.0	Issue Date: 06/09/1999 Effective Date: - Modified: 10/10/2003 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: Abergelli Fach Farm Landfill Extension Correspondence Address: -, -
11C	864.0	SE	266400 200300	Site Address: Morryston Hospital, Heol Maes Eglwys, Morryston, Swansea, SA6 6NL Type: Clinical Waste Transfer Station Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MOR003 EPR reference: EA/EPR/TP3598FV/S002 Operator: Morryston Hospital NHS Trust Waste Management licence No: 34135 Annual Tonnage: 1606.0	Issue Date: 30/03/1996 Effective Date: - Modified: - Surrendered Date: 11/04/2001 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Morryston Hospital Correspondence Address: -, -
12C	864.0	SE	266400 200300	Site Address: Morryston Hospital, Heol Maes Eglwys, Morryston, Swansea, SA6 6NL Type: Clinical Waste Transfer Station Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MOR003 EPR reference: - Operator: Morryston Hospital NHS Trust Waste Management licence No: 34135 Annual Tonnage: 0.0	Issue Date: 30/03/1996 Effective Date: - Modified: - Surrendered Date: 11/04/2001 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Morryston Hospital Correspondence Address: -, Morryston Hospital, Heol Maes Eglwys, Morryston, Swansea, SA6 6NL

ID	Distance (m)	Direction	NGR	Details
Not shown	1209.0	S	263976 199417	<p>Site Address: Jr Works, Bryntywod, Swansea, SA5 7LE Type: - Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: GAV004 EPR reference: EA/EPR/EB3397TU/A001 Operator: Mr Gavin Griffiths Waste Management licence No: 900031 Annual Tonnage: 0.0</p> <p>Issue Date: 09/09/2013 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Griffiths Recycling Correspondence Address: -, -</p>
Not shown	1209.0	S	263976 199417	<p>Site Address: Jr Works, Bryntywod, Langyfelach, Swansea, SA5 7LE Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: GAV004 EPR reference: EA/EPR/EB3397TU/A001 Operator: Mr Gavin Griffiths Waste Management licence No: 900031 Annual Tonnage: 75000.0</p> <p>Issue Date: 09/09/2013 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Griffiths Recycling Correspondence Address: -, -</p>
Not shown	1222.0	S	263865 199418	<p>Site Address: J R Works, Bryntywod Llangyfellach, Swansea, W Glamorgan, SA5 7LE Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: GRI015 EPR reference: DP3193SR/V002 Operator: Griffiths Pallet Services Ltd Waste Management licence No: 100069 Annual Tonnage: 0.0</p> <p>Issue Date: 08/04/2008 Effective Date: - Modified: 29/01/2010 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Griffiths Pallet Services Correspondence Address: -, -</p>
Not shown	1222.0	S	263865 199418	<p>Site Address: Former J R Works, Bryntywod, Llangyfellach, Swansea, West Galmorgan, SA5 7LE Type: Material Recycling Treatment Facility Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: GRI039 EPR reference: EA/EPR/NP3699VX/T001 Operator: Griffiths Waste Management Ltd Waste Management licence No: 100069 Annual Tonnage: 24999.0</p> <p>Issue Date: 08/04/2008 Effective Date: 23/12/2010 Modified: 29/01/2010 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred Site Name: Former J R Steelworks Correspondence Address: -, -</p>

3. Current Land Use Map



Current Land Use Legend



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 Site Outline

 Current Industrial Sites

 Search Buffers (m)

 Petrol & Fuel Sites

 Underground High Pressure Oil & Fuel Pipelines



3. Current Land Uses

3.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site:

26

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	0.0	On Site	Pylon	264821 200971	SA5	Electrical Features	Infrastructure and Facilities
2	0.0	On Site	Pylon	264863 200735	SA5	Electrical Features	Infrastructure and Facilities
3	0.0	On Site	Pylon	264980 200840	SA5	Electrical Features	Infrastructure and Facilities
4A	0.0	On Site	Pylon	264807 200643	SA5	Electrical Features	Infrastructure and Facilities
5A	0.0	On Site	Electricity Sub Station	264817 200683	SA5	Electrical Features	Infrastructure and Facilities
6	0.0	On Site	Chimney	265024 201070	SA5	Chimneys	Industrial Features
7B	0.0	On Site	Gas Compressor Station	265075 201068	SA5	Gas Features	Infrastructure and Facilities
8B	0.0	On Site	Chimney	265068 201107	SA6	Chimneys	Industrial Features
9	0.0	On Site	Pylon	264733 200726	SA5	Electrical Features	Infrastructure and Facilities
10	0.0	On Site	Pylon	264742 200899	SA5	Electrical Features	Infrastructure and Facilities
11	0.0	On Site	Pylon	264922 200788	SA5	Electrical Features	Infrastructure and Facilities
12	0.0	On Site	Pylon	265653 201680	SA6	Electrical Features	Infrastructure and Facilities
13	0.0	On Site	Pylon	265395 201479	SA6	Electrical Features	Infrastructure and Facilities
14	0.0	On Site	Pylon	265041 201203	SA5	Electrical Features	Infrastructure and Facilities
15	12.0	N	Pylon	264095 200669	SA5	Electrical Features	Infrastructure and Facilities
16	14.0	E	Pylon	265860 201991	SA6	Electrical Features	Infrastructure and Facilities
17	21.0	SE	Pylon	265335 200929	SA6	Electrical Features	Infrastructure and Facilities
18	25.0	NE	Pylon	265681 201011	SA6	Electrical Features	Infrastructure and Facilities
19C	36.0	N	Gas Valve Compound	264788 202296	SA5	Gas Features	Infrastructure and Facilities
20C	38.0	N	Gas Valve Compound	264788 202298	SA5	Gas Features	Infrastructure and Facilities
21	76.0	SW	Pylon	264554 200892	SA5	Electrical Features	Infrastructure and Facilities

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
22	130.0	S	Pylon	264918 200442	SA6	Electrical Features	Infrastructure and Facilities
23	178.0	NE	Pylon	266060 202293	SA6	Electrical Features	Infrastructure and Facilities
24	217.0	SE	Pylon	264177 200429	SA5	Electrical Features	Infrastructure and Facilities
25	224.0	NW	Pylon	264485 201107	SA5	Electrical Features	Infrastructure and Facilities
26	243.0	NW	Pylon	263952 200875	SA5	Electrical Features	Infrastructure and Facilities

3.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 0

Database searched and no data found.

3.3 Underground High Pressure Oil and Gas Pipelines

Records of high pressure underground pipelines within 500m of the study site: 0

Database searched and no data found.



4. Geology

4.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

4.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
PEAT-P	PEAT	PEAT
TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
PEAT-P	PEAT	PEAT
GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL

4.3 Bedrock and Solid Geology

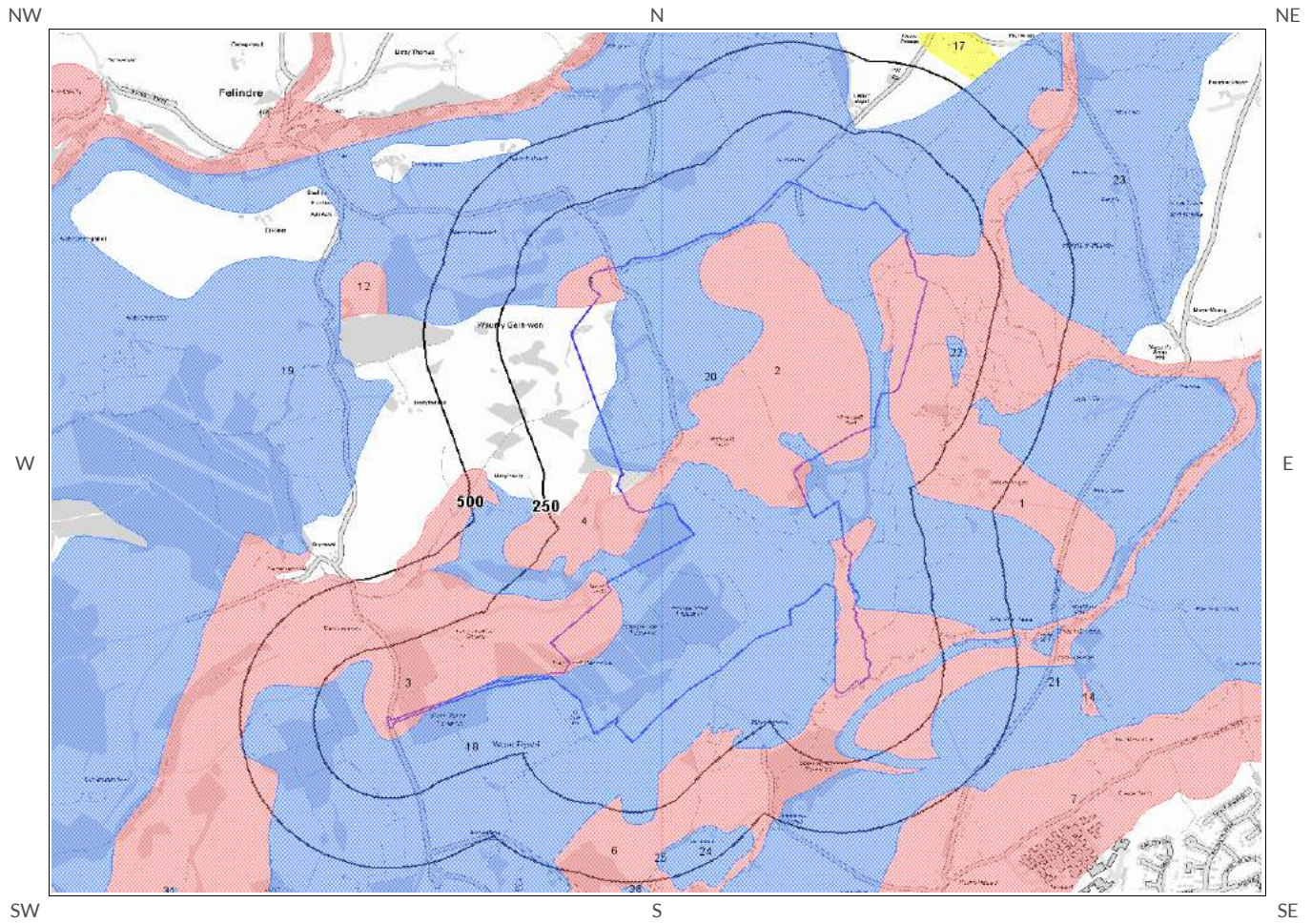
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
GDB-MDSS	GROVESEND FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE
GDB-MDSS	GROVESEND FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE
SW-SDST	SWANSEA MEMBER	SANDSTONE
GDB-MDSS	GROVESEND FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE
GDB-MDSS	GROVESEND FORMATION	MUDSTONE, SILTSTONE AND SANDSTONE
SW-MDSS	SWANSEA MEMBER	MUDSTONE, SILTSTONE AND SANDSTONE
SW-SDST	SWANSEA MEMBER	SANDSTONE

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

5. Hydrogeology and Hydrology









5a. Aquifer Within Superficial Geology



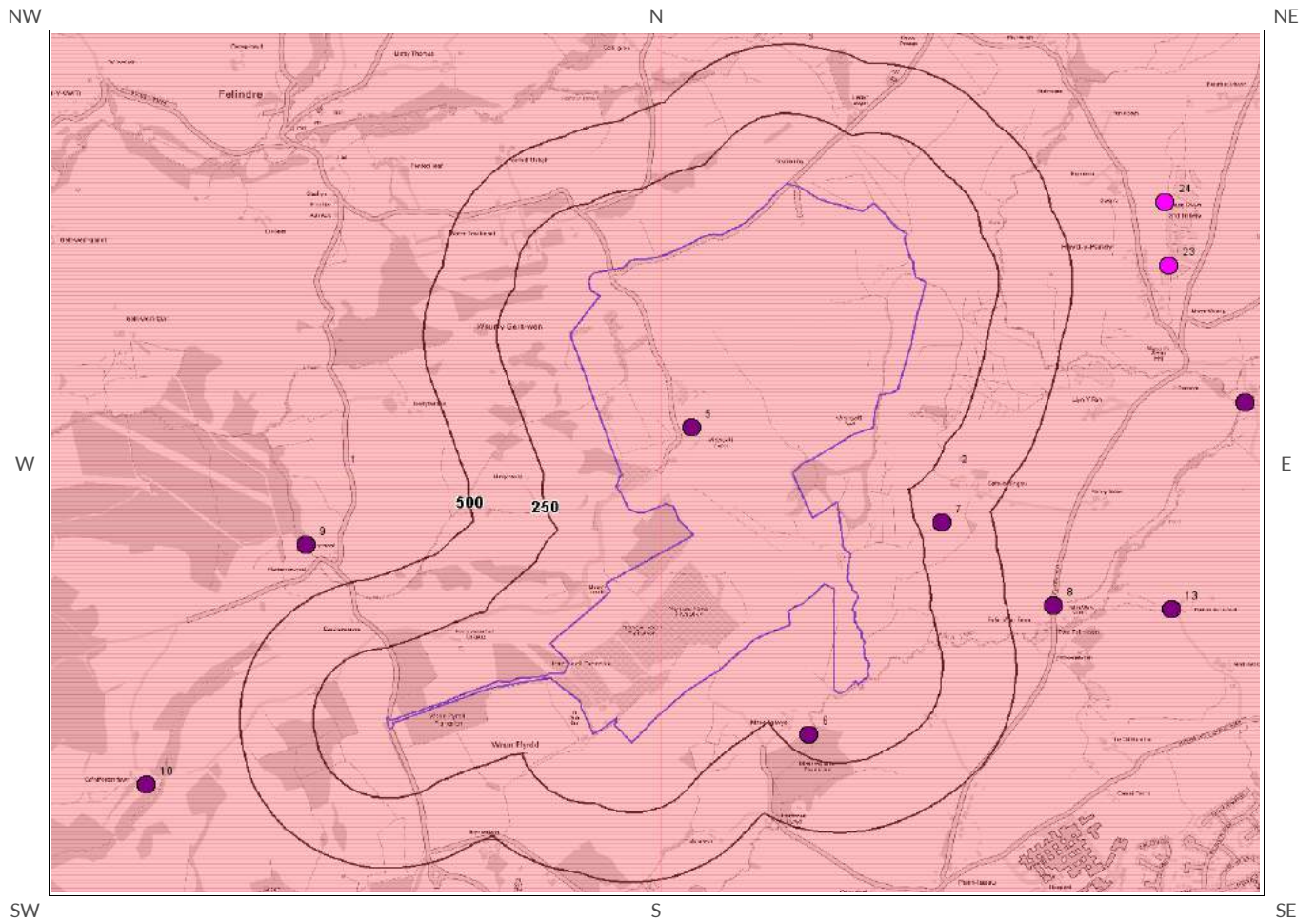
Map Legend



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-  Site Outline
-  Principal Aquifer
-  Secondary Aquifer - Undifferentiated Layers
-  Search Buffers (m)
-  Secondary (A) Aquifer - Permeable Layers
-  Unproductive
-  Secondary (B) Aquifer - Lower Permeability Layers
-  Unknown (lakes and landslip)











5b. Aquifer Within Bedrock Geology and Abstraction Licenses



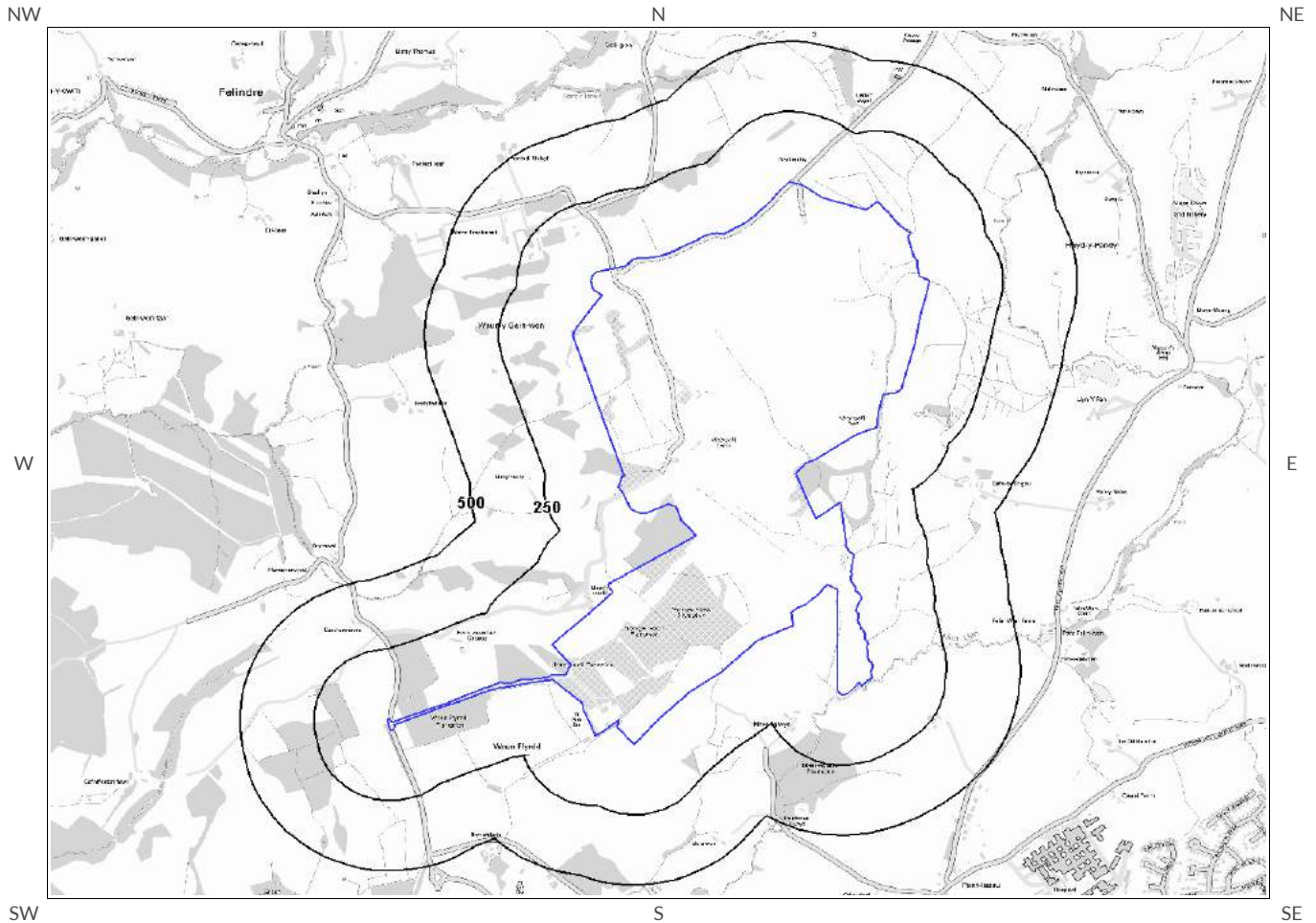
Map Legend



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- | | | | | | |
|---|--------------------|---|---|--|---|
|  | Site Outline |  | Principal Aquifer |  | Secondary Aquifer - Undifferentiated Layers |
|  | Search Buffers (m) |  | Secondary (A) Aquifer - Permeable Layers |  | Unproductive |
| | |  | Secondary (B) Aquifer - Lower Permeability Layers |  | Unknown (lakes and landslip) |
| | |  | Groundwater Abstraction Licence |  | Surface Water Abstraction Licence |









5c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences



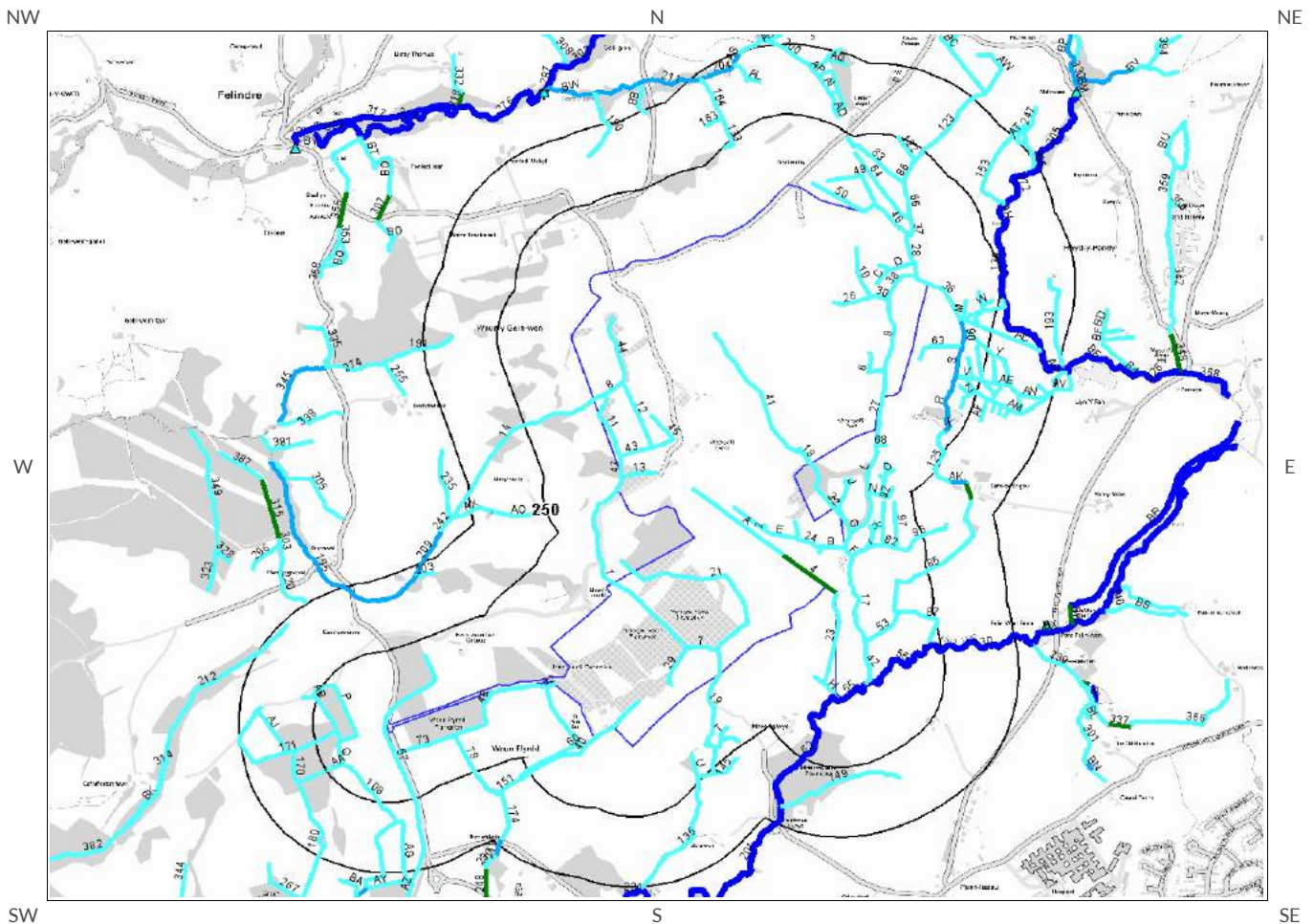
Map Legend



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-  Site Outline
-  Source Protection Zone 1 - Inner Catchment
-  Source Protection Zone 2 - Outer Catchment
-  Source Protection Zone 3 - Total Catchment
-  Source Protection Zone 4 - Zone of Special Interest
-  250 Search Buffers (m)
-  500 Search Buffers (m)
-  Potable Water Abstraction Licence
















5d. Hydrology – Detailed River Network and River Quality



Map Legend

Mapping sourced from 

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- | | | | | | |
|---|--------------------|---|---------------------------------------|--|-------------------------------------|
|  | Site Outline |  | Primary River |  | Canal |
|  | Search Buffers (m) |  | Secondary River |  | Canal Tunnel |
| | |  | Tertiary River |  | Culvert |
| | |  | Lake/Reservoir |  | Multiple Channel Culvert |
| | |  | Underground River (inferred) |  | Underground River (Potential Sewer) |
| | |  | General Quality Assessment: Biology |  | Underground River (local knowledge) |
| | |  | General Quality Assessment: Chemistry | | |



5. Hydrogeology and Hydrology

5.1 Aquifer within Superficial Deposits

Are there records of strata classification within the superficial geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the GroundSure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (5a):

ID	Distance (m)	Direction	Designation	Description
1	0.0	On Site	Secondary A	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
2	0.0	On Site	Secondary A	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
3	0.0	On Site	Secondary A	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
4	0.0	On Site	Secondary A	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
5	0.0	On Site	Secondary A	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
18	0.0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
19	0.0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
20	0.0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
21	51.0	SE	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
22	108.0	E	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
6	137.0	SE	Secondary A	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
23	296.0	E	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

ID	Distance (m)	Direction	Designation	Description
24	376.0	SE	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
25	401.0	S	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
7	476.0	SE	Secondary A	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

5.2 Aquifer within Bedrock Deposits

Are there records of strata classification within the bedrock geology at or in proximity to the property? **Yes**

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the GroundSure Enviroinsight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (5b):

ID	Distance (m)	Direction	Designation	Description
1	0.0	On Site	Secondary A	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
2	0.0	On Site	Secondary A	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

5.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site? **Yes**

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (5b):

ID	Distance (m)	Direction	NGR	Details
5	0.0	On Site	265100 201700	Licence No: 22/59/4/0027 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Well In Enclosure 481 At Abergelli Farm, Data Type: Point Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: 5/3596 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/2/1993 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
6	179.0	SW	265500 200600	Licence No: 22/59/4/0013 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Well On Land Belonging To Maeseglwys Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/3627 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/2/1993 Version End Date:
7	328.0	E	265950 201360	Licence No: 22/59/4/0022 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Spring At Cwfn Betinge Farm Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/3625 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/2/1993 Version End Date:
8	655.0	E	266330 201060	Licence No: 22/59/4/0008 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Well At Felin Wen Court Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/809 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/2/1993 Version End Date:
9	678.0	NW	263790 201280	Licence No: 22/59/4/0011 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Spring At Fforest Newydd Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/267 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 26/3/1999 Version End Date:
10	848.0	W	263250 200420	Licence No: 22/59/4/0016 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Spring In Field 830,cefn Fforest Fawr Farm Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/3595 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/12/1965 Version End Date:
Not shown	870.0	N	265750 203390	Licence No: 22/59/4/0024 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Well At Rhosfawr Farm Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/3495 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/2/1993 Version End Date:
Not shown	888.0	N	264580 203130	Licence No: 22/59/4/0003 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Spring In Field No. 5700 At Lletty-thomas Farm Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/12/1965 Version End Date:
13	1045.0	E	266730 201050	Licence No: 22/59/4/0006 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Spring In Field No. 586 At Gelliwastad Farm Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/3534 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/12/1965 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
14	1151.0	E	266980 201790	Licence No: 22/59/4/0025 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Spring In Enc. South West Of Pontycoedcae Farm Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/3613 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/2/1993 Version End Date:
Not shown	1363.0	E	267260 202190	Licence No: 22/59/4/0019 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Well In Field No. 437 At Nantymilwr Farm Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/3473 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/2/1993 Version End Date:
Not shown	1413.0	NW	264830 203860	Licence No: 22/59/4/0005 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Spring 1 At Pant Y Fallen Farm Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/3471 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/12/1965 Version End Date:
Not shown	1539.0	E	267200 200460	Licence No: 22/59/1/0057 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Well & Reservoir In Enc. No. 2047 Nr Wernfadog Cottage Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/3514 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 30/3/1966 Version End Date:
Not shown	1543.0	N	265730 204090	Licence No: 22/59/4/0039 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Well At Cwmcile Farm Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR3576 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 30/3/1966 Version End Date:
Not shown	1661.0	N	266080 204130	Licence No: 22/59/4/0039 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Spring Adjacent To Pentre Bedw Cottage Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR3576 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 30/3/1966 Version End Date:
Not shown	1824.0	N	265500 204400	Licence No: 22/59/4/0040 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Spring In Enc. No. 847 At Maestir Mawr Farm Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR3614 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 30/3/1966 Version End Date:
Not shown	1906.0	E	267610 200910	Licence No: 22/59/1/0013 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Well In Field No. 349 At Penrhiwgwysfa Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/3580 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/12/1965 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1920.0	N	265250 204490	Licence No: 22/59/4/0005 Details: General Farming & Domestic Direct Source: Eaw Groundwater Point: Spring 2 At Pant Y Fallen Farm Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: WR5/3471 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/12/1965 Version End Date:

5.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site? Yes

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (5b):

ID	Distance (m)	Direction	NGR	Details	
23	825.0	E	266720 202280	Licence No: 22/59/4/0066 Details: Lake & Pond Throughflow Direct Source: Eaw Surface Water Point: Un-named Trib Of Afon Llan Data Type: Point	Annual Volume (m ³): 469612 Max Daily Volume (m ³): 2730 Application No: - Original Start Date: 17/4/1990 Expiry Date: - Issue No: 1 Version Start Date: 1/4/2005 Version End Date:
24	862.0	E	266710 202510	Licence No: 22/59/4/0066 Details: Lake & Pond Throughflow Direct Source: Eaw Surface Water Point: Un-named Trib Of Afon Llan Data Type: Point	Annual Volume (m ³): 469612 Max Daily Volume (m ³): 2730 Application No: - Original Start Date: 17/4/1990 Expiry Date: - Issue No: 1 Version Start Date: 1/4/2005 Version End Date:
Not shown	1014.0	NW	264890 203440	Licence No: 22/59/4/0065 Details: Potable Water Supply - Storage Direct Source: Eaw Surface Water Point: Lower Lliw Reservoir Data Type: Point	Annual Volume (m ³): 82964500 Max Daily Volume (m ³): 227300 Application No: - Original Start Date: 9/8/1989 Expiry Date: - Issue No: 101 Version Start Date: 18/9/2003 Version End Date:
Not shown	1014.0	NW	264890 203440	Licence No: 22/59/4/0065 Details: Potable Water Supply - Storage Direct Source: Eaw Surface Water Point: Lower Lliw Reservoir - Point B Data Type: Point	Annual Volume (m ³): 82964500 Max Daily Volume (m ³): 454600 Application No: - Original Start Date: 9/8/1989 Expiry Date: - Issue No: 101 Version Start Date: 1/4/2011 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1951.0	S	266130 198870	Licence No: 22/59/1/0083 Details: Spray Irrigation - Direct Direct Source: Eaw Surface Water Point: Unnamed Stream Data Type: Point	Annual Volume (m ³): - Max Daily Volume (m ³): - Application No: - Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 1/4/2001 Version End Date:

5.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site? Yes

The following Potable Water Abstraction Licences records are represented as points, lines and regions on the SPZ and Potable Water Abstraction Licences Map (5c):

ID	Distance (m)	Direction	NGR	Details	
Not shown	1014.0	NW	264890 203440	Licence No: 22/59/4/0065 Details: Potable Water Supply - Storage Direct Source: Eaw Surface Water Point: Lower Lliw Reservoir Data Type: Point	Annual Volume (m ³): 82964500 Max Daily Volume (m ³): 227300 Original Application No: - Original Start Date: 9/8/1989 Expiry Date: - Issue No: 101 Version Start Date: Version End Date:
Not shown	1014.0	NW	264890 203440	Licence No: 22/59/4/0065 Details: Potable Water Supply - Storage Direct Source: Eaw Surface Water Point: Lower Lliw Reservoir - Point B Data Type: Point	Annual Volume (m ³): 82964500 Max Daily Volume (m ³): 454600 Original Application No: - Original Start Date: 9/8/1989 Expiry Date: - Issue No: 101 Version Start Date: Version End Date:

5.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site? No

Database searched and no data found.

5.7 Groundwater Vulnerability and Soil Leaching Potential

Is there any Environment Agency information on groundwater vulnerability and soil leaching potential within 500m of the study site? Yes

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Minor Aquifer/High Leaching Potential	H2	Deep, permeable, coarse textured soils which readily transmit a wide range of pollutants because of their rapid drainage and low attenuation potential.
0	On Site	Minor Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.
0	On Site	Minor Aquifer/Intermediate Leaching Potential	I1	Soils which can possibly transmit a wide range of pollutants.
0	On Site	Minor Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.
194	N	Minor Aquifer/High Leaching Potential	H3	Coarse textured or moderately shallow soils which readily transmit non-adsorbed pollutants and liquid discharges but have some ability to attenuate adsorbed pollutants because of their clay or organic matter content.
243	NW	Minor Aquifer/Intermediate Leaching Potential	I1	Soils which can possibly transmit a wide range of pollutants.
440	S	Minor Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.

5.8 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site? Yes

5.8.1 Biological Quality:

Biological Quality data describes water quality in terms of 83 groups of macroinvertebrates, some of which are pollution sensitive. The results are graded from A ('Very Good') to F ('Bad').

The following Biological Quality records are shown on the Hydrology Map (5d):

ID	Distance (m)	Direction	NGR	River Quality Grade	Biological Quality Grade				
					2005	2006	2007	2008	2009
399BW	667.0	N	264600 202900	River Name: Loughor Lliw Reach: Conf.nant Y Crimp - Conf Un Named Trib. End/Start of Stretch: Start of Stretch NGR	A	A	A	A	B
400BW	667.0	N	264600 202900	River Name: Loughor Lliw Reach: Conf Un Named Trib - Lower Lliw Res End/Start of Stretch: End of Stretch NGR	A	A	A	A	B
Not shown	954.0	NW	264800 203300	River Name: Loughor Lliw Reach: Conf Un Named Trib - Lower Lliw Res End/Start of Stretch: Start of Stretch NGR	A	A	A	A	B
Not shown	1333.0	S	263900 199300	River Name: Llan Reach: Melin Llan Br Llangafelach - Cuckoo Mill End/Start of Stretch: Start of Stretch NGR	B	B	B	B	B
Not shown	1333.0	S	263900 199300	River Name: Llan Reach: Cuckoo Mill - Felin-wen End/Start of Stretch: End of Stretch NGR	B	B	B	B	B

5.8.2 Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAHI). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (5d):

ID	Distance (m)	Direction	NGR	River Quality Grade	Chemical Quality Grade				
					2005	2006	2007	2008	2009
404BX	614.0	E	266300 201000	River Name: Llan Reach: Cuckoo Mill - Felin-wen End/Start of Stretch: Start of Stretch NGR	A	A	A	A	-
405BX	614.0	E	266300 201000	River Name: Llan Reach: Felin-wen - Cynghordy End/Start of Stretch: End of Stretch NGR	A	A	A	A	-
406BW	667.0	N	264600 202900	River Name: Lliw Reach: Conf.nant Y Crimp - Conf Un Named Trib. End/Start of Stretch: Start of Stretch NGR	A	A	A	A	-
407BW	667.0	N	264600 202900	River Name: Lliw Reach: Conf Un Named Trib - Lower Lliw Res End/Start of Stretch: End of Stretch NGR	A	A	A	A	-
408BM	759.0	NE	266400 202900	River Name: Llan Reach: Felin-wen - Cynghordy End/Start of Stretch: Start of Stretch NGR	A	A	A	A	-
Not shown	954.0	NW	264800 203300	River Name: Lliw Reach: Conf Un Named Trib - Lower Lliw Res End/Start of Stretch: Start of Stretch NGR	A	A	A	A	-
410BY	1097.0	NW	263760 202700	River Name: Lliw Reach: Conf.nant Y Crimp - Conf Un Named Trib. End/Start of Stretch: Sample Point NGR	A	A	A	A	-
411BY	1097.0	NW	263760 202700	River Name: Lliw Reach: Conf Un Named Trib - Lower Lliw Res End/Start of Stretch: Sample Point NGR	A	A	A	A	-
Not shown	1333.0	S	263900 199300	River Name: Llan Reach: Cuckoo Mill - Felin-wen End/Start of Stretch: End of Stretch NGR	A	A	A	A	-
Not shown	1333.0	S	263900 199300	River Name: Llan Reach: Melin Llan Br Llangafelach - Cuckoo Mill End/Start of Stretch: Start of Stretch NGR	A	A	A	A	-

5.9 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site?

Yes

The following Detailed River Network records are represented on the Hydrology Map (5d):

ID	Distance (m)	Direction	Details	
1	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
2	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
3	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
4	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
5B	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
6	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
7	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
8	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
9	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
10	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
12	0.0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
13	0.0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
14	0.0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
15 A	0.0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
16 A	0.0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
17	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
18	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
19	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
20 E	0.0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
21	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
22	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
23	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
24	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
25 B	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
26	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
27	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
28	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
29	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
30	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
31 C	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
32	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
33 C	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
34 D	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
35 D	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
36	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
37	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
38	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
39 E	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
40	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
41	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
42	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
43	0.0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
44	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
45	0.0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
46	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
47	0.0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
48	2.0	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
49	2.0	NW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
50	2.0	NW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
51 F	2.0	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
52 F	2.0	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
53	3.0	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
54 B	3.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
55	3.0	SE	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
56	3.0	SE	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
57	4.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
58 H	8.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
59 G	9.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
60	14.0	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
61 G	24.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
62	26.0	SW	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
63	31.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
64	40.0	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
65 H	41.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
66	50.0	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
67 L	52.0	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
68	52.0	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
69I	52.0	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
70I	52.0	NE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
71J	68.0	N	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
72J	68.0	N	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
73	76.0	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
74 K	96.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
75 K	98.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
76 K	98.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
77 K	99.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
78	102.0	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
79 P	108.0	W	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
80 N	109.0	NE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
81 K	112.0	NE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
82	112.0	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
83	116.0	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
84 L	118.0	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
85	119.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
86	122.0	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
87	136.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
88 M	136.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
89 M	136.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
90	139.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
91 N	147.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
92	147.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
93 M	149.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
94 O	151.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
95 L	152.0	S	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
96	155.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
97	155.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
98 O	156.0	S	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
99 S	158.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
10 OR	158.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
10 1U	160.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
10 2V	164.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
10 3P	165.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
10 4Q	165.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
10 5T	170.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
10 6Y	172.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
10 7M	175.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
10 8	180.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
10 9Q	182.0	W	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11 0R	184.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11 1M	185.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11 2S	189.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11 3A A	190.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11 4T	191.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11 5T	191.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11 6M	196.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11 7W	196.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11 8U	198.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11 9A C	199.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
12 0X	200.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
12 1V	200.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
12 2	203.0	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
12 3	203.0	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
12 4W	203.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
12 5	204.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
12 6X	208.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
12 7X	208.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
12 8Y	208.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
12 9X	209.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
13 0	214.0	E	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
13 1R	214.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
13 2V	220.0	E	River Name: Drains Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
13 3	230.0	NW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
13 4Z	232.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
13 5	234.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
13 6U	234.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
13 7Z	244.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
13 8	249.0	E	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
13 9A A	253.0	SW	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
14 0A B	256.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
14 1A B	256.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
14 2Z	258.0	E	River Name: Drains Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
14 3A C	264.0	E	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
14 4Z	264.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
14 5	267.0	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
14 6A O	276.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
14 7Y	277.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
14 8A D	282.0	NE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
14 9	283.0	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
15 0A F	290.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
15 1	290.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
15 2Z	291.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
15 3	294.0	NE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
15 4A D	301.0	N	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
15 5A D	301.0	N	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
15 6A E	303.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
15 7A E	310.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
15 8A F	310.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
15 9A F	311.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
16 0A K	315.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
16 1A H	317.0	E	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
16 2A G	320.0	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
16 3	320.0	NW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
16 4	320.0	NW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
16 5A F	321.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
16 6A F	322.0	E	River Name: Drains Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
16 7A G	322.0	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
16 8A H	324.0	E	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
16 9A H	324.0	E	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
17 0	328.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
17 1	328.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
17 2	342.0	E	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
17 3A F	343.0	E	River Name: Drains Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
17 4	345.0	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
17 5AI	348.0	N	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
17 6AI	348.0	N	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
17 7A F	348.0	E	River Name: Drains Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
17 8A J	350.0	W	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
17 9A J	350.0	W	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
18 0	354.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
18 1A K	359.0	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
18 2AI	365.0	N	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
18 3A F	366.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
18 4A M	372.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
18 5A N	375.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
18 6A L	376.0	N	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
18 7A L	388.0	N	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
18 8A M	391.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
18 9A P	400.0	N	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
190	403.0	N	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
191	403.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
192AL	406.0	N	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
193	411.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
194AN	413.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
195	423.0	N	River Name: Nant y Crimp Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
196AO	423.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
197AX	430.0	W	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
198AR	430.0	E	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
199AP	431.0	N	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
200	433.0	N	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
201	439.0	SW	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
202AN	439.0	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
203	453.0	N	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
204	455.0	NW	River Name: Nant y Tarw Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
205	456.0	NE	River Name: Afon Llan Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
206	456.0	NE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
207AQ	463.0	N	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
208AS	464.0	NW	River Name: Nant y Tarw Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
209	464.0	NW	River Name: Nant y Crimp Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
210AQ	466.0	N	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
21 1	478.0	NW	River Name: Nant y Tarw Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
21 2	479.0	NW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
21 3	481.0	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
21 4A R	485.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
21 5B B	488.0	NW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
21 6A N	492.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
21 7A S	493.0	N	River Name: Nant y Tarw Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
21 8A T	495.0	NE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
21 9A V	495.0	E	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
22 0	499.0	NW	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

5.10 Surface Water Features

Are there any surface water features within 250m of the study site?

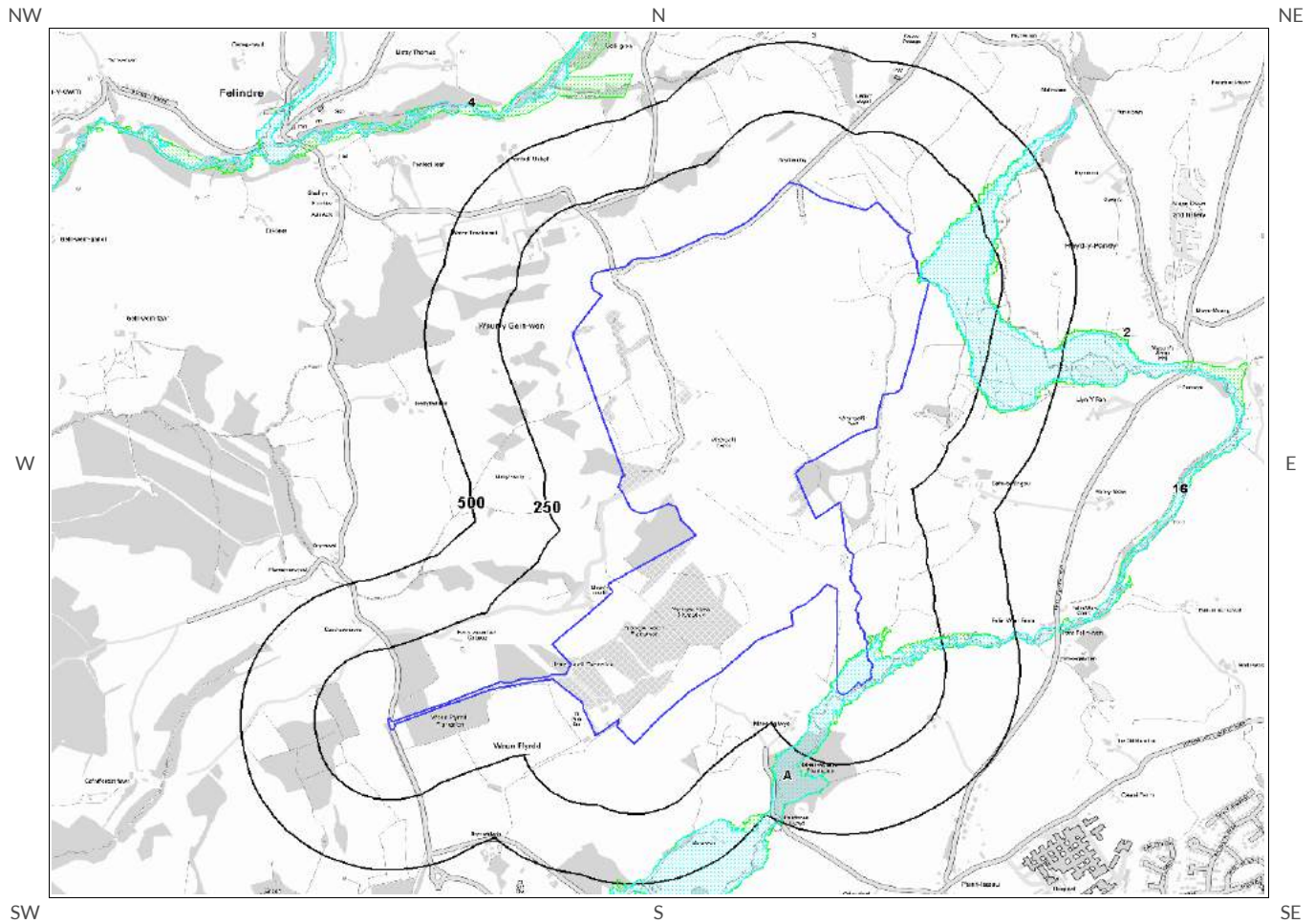
Yes

The following surface water records are not represented on mapping:

Distance (m)	Direction
1.0	SE
2.0	NW
2.0	NW
2.0	NE
2.0	NE
2.0	S
3.0	E
3.0	NE
4.0	W
8.0	W
9.0	E
11.0	NE
13.0	N
14.0	S
24.0	E
28.0	N
31.0	E
40.0	NE
41.0	W
52.0	S
52.0	S
52.0	NE
52.0	NE
57.0	S
64.0	SW
65.0	SW
68.0	N
68.0	N
76.0	S
91.0	SE
95.0	NW
95.0	SW
96.0	E
98.0	SE
98.0	E
98.0	E
99.0	E
102.0	S
105.0	NW
108.0	W
109.0	NE
112.0	NE
112.0	NE
117.0	NE
117.0	W
118.0	S
119.0	E
121.0	E
122.0	NE
136.0	E
136.0	E
147.0	E
147.0	E
149.0	E
151.0	SE

Distance (m)	Direction
152.0	S
155.0	E
155.0	E
156.0	S
160.0	SE
161.0	E
165.0	W
165.0	W
166.0	E
169.0	W
170.0	SE
172.0	E
175.0	E
180.0	SW
182.0	W
184.0	E
185.0	E
189.0	E
190.0	SW
191.0	SE
191.0	SE
196.0	E
196.0	E
197.0	NW
198.0	SE
199.0	E
200.0	E
203.0	NE
203.0	NE
203.0	E
205.0	SE
207.0	W
208.0	E
214.0	E
220.0	E
232.0	NW
232.0	E
234.0	SE
234.0	SE
239.0	W
244.0	E
247.0	E








6. Environment Agency Flood Map for planning (from rivers and the sea)



Map Legend



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-  Site Outline
-  Search Buffers (m)
-  Zone 2 Floodplain
-  Zone 3 Floodplain
-  Flood Storage Area
-  Area Benefiting from Flood Defences
-  Flood Defences



6. Flooding

6.1 Zone 2 Flooding

Environment Agency Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 1 – Environment Agency Flood Map for Planning:

Is the site within 250m of an Environment Agency Zone 2 floodplain? Yes

The following floodplain records are represented as green shading on the Flood Map:

ID	Distance (m)	Direction	Update	Type
1A	0.0	On Site	10-Jun-2014	Zone 2 - (Fluvial Models)
2	0.0	On Site	10-Jun-2014	Zone 2 - (Fluvial Models)

6.2 Zone 3 Flooding

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 1 – Environment Agency Flood Map for Planning.

Is the site within 250m of an Environment Agency Zone 3 floodplain? Yes

The following floodplain records are represented as blue shading on the Flood Map:

ID	Distance (m)	Direction	Update	Type
9A	0.0	On Site	10-Jun-2014	Zone 3 - (Fluvial Models)
10	0.0	On Site	10-Jun-2014	Zone 3 - (Fluvial Models)

6.3 Flood Defences

Are there any Flood Defences within 250m of the study site? No

Database searched and no data found.

6.4 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? No

6.5 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? No

6.6 Groundwater Flooding Susceptibility Areas

6.6.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site?

Yes

Does this relate to Clearwater Flooding or Superficial Deposits Flooding? Superficial Deposits Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

6.6.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Potential at Surface

Where potential for groundwater flooding to occur at surface is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

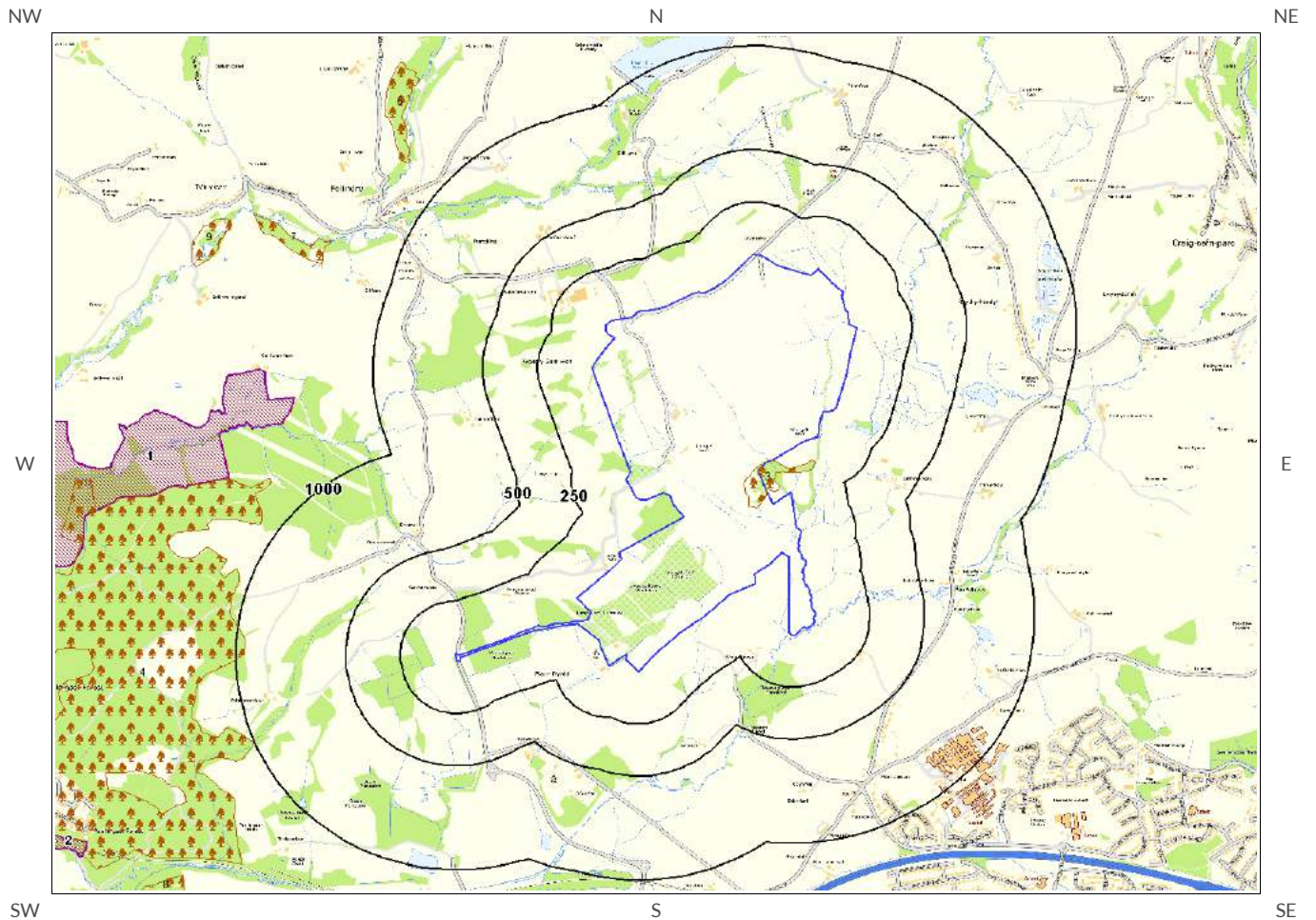
6.7 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result? High

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.











7. Designated Environmentally Sensitive Sites Map



Map Legend

Mapping sourced from 

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- | | | | | |
|---|---|--|---|---|
|  Site Outline |  SAC |  SSSI |  NNR |  World Heritage Sites |
|  Areas of Outstanding Natural Beauty |  SPA |  Ramsar |  LNR |  Environmentally Sensitive Areas |
|  Nitrate Vulnerable Zones |  Nitrate Sensitive Areas |  National Parks |  Ancient Woodlands | |



7. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site? No

7.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site: 2

The following Site of Special Scientific Interest (SSSI) records provided by Natural England/Countryside Council for Wales and Scottish Natural Heritage are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	SSSI Name	Data Source
1	1334.0	NW	Nant Y Crimp	Countryside Council for Wales
2	1897.0	SW	Penllergaer Railway Cutting	Countryside Council for Wales

7.2 Records of National Nature Reserves (NNR) within 2000m of the study site: 0

Database searched and no data found.

7.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site: 0

Database searched and no data found.

7.4 Records of Special Protection Areas (SPA) within 2000m of the study site: 0

Database searched and no data found.

7.5 Records of Ramsar sites within 2000m of the study site: 0

Database searched and no data found.

7.6 Records of Ancient Woodland within 2000m of the study site:

8

The following Ancient Woodland records are supplied by English Nature/Scottish Natural Heritage/Countryside Council for Wales and are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
3	0.0	On Site	Unknown	Ancient and Semi-Natural Woodland
4	962.0	W	PENLLERGAER FOREST	Ancient and Semi-Natural Woodland
5	1196.0	NW	LLWYN-GWENO WOOD	Ancient and Semi-Natural Woodland
Not shown	1235.0	S	Unknown	Ancient and Semi-Natural Woodland
7	1319.0	W	Unknown	Ancient and Semi-Natural Woodland
8	1616.0	SW	TIR-FFORDD WOOD	Ancient and Semi-Natural Woodland
9	1774.0	W	TYN-Y-CWM WOOD	Ancient and Semi-Natural Woodland
Not shown	1989.0	SW	VALLEY WOOD	Ancient Replanted Woodland

7.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

0

Database searched and no data found.

7.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

7.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

7.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

7.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

7.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

7.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

0

Database searched and no data found.



8. Natural Hazards Findings

8.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a **GroundSure GeoInsight**, available from our [website](#). The following information has been found:

8.1.1 Shrink Swell

What is the maximum Shrink-Swell* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

8.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site? Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property no significant increase in insurance risk due to natural slope instability problems.

8.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site? Null - Negligible

Soluble rocks are not present in the search area. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This indicates an automatically generated 50m buffer and site.

8.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site?

High

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Very significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Construction may not be possible at economic cost. For existing property probable increase in insurance risk from compressibility especially if water conditions or loading of the ground change significantly.

8.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site?

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

8.1.6 Running Sand

What is the maximum Running Sand** hazard rating identified on the study site?

Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property no significant increase in insurance risk due to running sand problems is likely.

* This indicates an automatically generated 50m buffer and site.



9. Mining

9.1 Coal Mining

Are there any coal mining areas within 75m of the study site? Yes

The following coal mining information provided by the Coal Authority is not represented on Mapping:

Distance	Direction	Details
0.0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

9.2 Shallow Mining

What is the subsidence hazard relating to shallow mining on-site*? Low

*Please note this data is searched with a 150m buffer.

9.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? No

Guidance: No Guidance Required.

Contact Details

GroundSure Helpline
Telephone: 08444 159 000
info@groundsure.com



British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email: enquiries@bgs.ac.uk
Web: www.bgs.ac.uk



BGS Geological Hazards Reports and general geological enquiries

Environment Agency

National Customer Contact Centre, PO Box 544
Rotherham, S60 1BY
Tel: 08708 506 506

Web: www.environment-agency.gov.uk
Email: enquiries@environment-agency.gov.uk



Public Health England

Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
<https://www.gov.uk/government/organisations/public-health-england>
Email: enquiries@phe.gov.uk
Main switchboard: 020 7654 8000



The Coal Authority

200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk



Ordnance Survey

Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505



Local Authority

Authority: Swansea City and Borough Council
Phone: 01792 636000
Web: www.swansea.gov.uk
Address: County Hall, Oystermouth Road, Swansea, SA1 3SN

Gemapping PLC

Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444



Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, English Nature who retain the Copyright and Intellectual Property Rights for the data. PointX © Database Right/Copyright, Thomson Directories Limited © Copyright Link Interchange Network Limited © Database Right/Copyright and Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [03421028]. This report has been prepared in accordance with the GroundSure Ltd standard Terms and Conditions of business for work of this nature.

Standard Terms and Conditions

1 Definitions

In these terms and conditions unless the context otherwise requires:

"Beneficiary" means the person or entity for whose benefit the Client has obtained the Services.

"Client" means the party or parties entering into a Contract with GroundSure.

"Commercial" means any building or property which is not Residential.

"Confidential Information" means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than

(i) information which the Client can prove was rightfully in its possession prior to disclosure by GroundSure and

(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

"Support Services" means Support Services provided by GroundSure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

"Contract" means the contract between GroundSure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

"Third Party Data Provider" means any third party providing Third Party Content to GroundSure.

"Data Reports" means reports comprising factual data with no accompanying interpretation.

"Fees" has the meaning set out in clause 5.1.

"GroundSure" means GroundSure Limited, a company registered in England and Wales under number 03421028.

"GroundSure Materials" means all materials prepared by GroundSure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

"Intellectual Property" means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

"Mapping" means a map, map data or a combination of historical maps of various ages, time periods and scales.

"Order" means an electronic, written or other order form submitted by the Client requesting Services from GroundSure in respect of a specified Site.

"Ordnance Survey" means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

"Order Website" means the online platform through which Orders may be placed by the Client and accepted by GroundSure.

"Report" means a Risk Screening Report or Data Report for Commercial or Residential property.

"Residential" means any building or property used as or intended to be used as a single dwelling.

"Risk Screening Report" means a risk screening report comprising factual data with an accompanying interpretation by GroundSure.

"Services" means any Report, Mapping and/or Support Services which GroundSure has agreed to provide by accepting an Order pursuant to clause 2.6.

"Site" means the area of land in respect of which the Client has requested GroundSure to provide the Services.

"Third Party Content" means data, database information or other information which is provided to GroundSure by a Third Party Data Provider.

"User Guide" means the user guide, as amended from time to time, available upon request from GroundSure and on the website (www.GroundSure.com) and forming part of this Contract.

2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 GroundSure agrees to provide the Services in accordance with the Contract.

2.2 GroundSure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions

implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, GroundSure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and GroundSure will have no liability therefor. In addition you acknowledge and agree that GroundSure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 GroundSure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by GroundSure. GroundSure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by GroundSure. GroundSure's acceptance of an Order shall be binding only when made in writing and signed by GroundSure's authorised representative or when accepted through the Order Website.

3 The Client's obligations

3.1 The Client shall comply with the terms of this Contract and

(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and

(ii) be liable to GroundSure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to GroundSure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as GroundSure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable GroundSure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the GroundSure Materials, or use the GroundSure Materials in a manner for which they were not intended. The Client may make the GroundSure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that GroundSure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

4 Reliance

4.1 The Client acknowledges that the Services provided by GroundSure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by GroundSure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;

(i) the Beneficiary,

(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),

(iv) the first purchaser or first tenant of the Site, and

(v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by GroundSure. Any party considering such Reports and Services does so at their own risk.

5 Fees and Disbursements

5.1 GroundSure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by GroundSure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").

5.2 The Client shall pay all outstanding Fees to GroundSure in full without deduction, counterclaim or set off within 30 days of the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of GroundSure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

6 Intellectual Property and Confidentiality

6.1 Subject to

(i) full payment of all relevant Fees and

(ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the GroundSure Materials.

6.2 All Intellectual Property in the GroundSure Materials are and shall remain owned by GroundSure or GroundSure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the GroundSure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to GroundSure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the GroundSure Materials in order to advise the Beneficiary in a professional capacity. However, GroundSure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify GroundSure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

7. Liability: Particular Attention Should Be Paid To This Clause

7.1 This Clause 7 sets out the entire liability of GroundSure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by GroundSure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death

or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 GroundSure shall not be liable for

(i) loss of profits;

(ii) loss of business;

(iii) depletion of goodwill and/or similar losses;

(iv) loss of anticipated savings;

(v) loss of goods;

(vi) loss of contract;

(vii) loss of use;

(viii) loss or corruption of data or information;

(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the GroundSure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the GroundSure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of GroundSure's internet ordering service.

7.5 GroundSure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 GroundSure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of GroundSure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against GroundSure in relation to the Services or other matters arising pursuant to the Contract.

8 GroundSure's right to suspend or terminate

8.1 If GroundSure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, GroundSure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 GroundSure shall be entitled to terminate the Contract immediately on written notice in the event that:

(i) the Client fails to pay any sum due to GroundSure within 30 days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

9. Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon GroundSure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

(a) supplied to the Client's specification(s) and in any event

(b) by their nature cannot be returned.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

(i) GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in

GroundSure's possession or control; and

(ii) the Client shall pay to GroundSure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination or suspension of the Contract.

11 Anti-Bribery

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of GroundSure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to GroundSure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through GroundSure.

12.3 GroundSure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of GroundSure.

12.4 No failure on the part of GroundSure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

- (i) the Client or Beneficiary's failure to provide facilities, access or information;
- (ii) fire, storm, flood, tempest or epidemic;
- (iii) Acts of God or the public enemy;
- (iv) riot, civil commotion or war;
- (v) strikes, labour disputes or industrial action;
- (vi) acts or regulations of any governmental or other agency;
- (vii) suspension or delay of services at public registries by Third Party Data Providers;
- (viii) changes in law; or
- (ix) any other reason beyond GroundSure's reasonable control.

In the event that GroundSure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then GroundSure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English

law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 GroundSure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at GroundSure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law. © GroundSure Limited June 2013



Parsons Brinckerhoff
27-29 PARSONS BRINCKERHOFF LTD,
CATHEDRAL ROAD,
CARDIFF, CF11 9HA

GroundSure Reference: GS-1587648

Your Reference: PB84891

Report Date: 29 Jul 2014

Report Delivery Method: Email - pdf

GroundSure Geoinsight

Address: ABERGELLI FACH FARM, FELINDRE, ABERTAWE, SA5 7NN

Dear Sir/ Madam,

Thank you for placing your order with GroundSure. Please find enclosed the **GroundSure GeoInsight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above GroundSure reference number.

Yours faithfully,

A handwritten signature in black ink, appearing to be "J. O.", with a flourish at the end.

Managing Director
Groundsure Limited

Enc.
GroundSure GeoInsight



GroundSure GeoInsight

Address: ABERGELLI FACH FARM,FELINDRE,ABERTAWE, SA5 7NN
Date: 29 Jul 2014
Reference: GS-1587648
Client: Parsons Brinckerhoff

NW N NE

W E



SW S SE

Aerial Photograph Capture date: 22-May-2010
Grid Reference: 265243,201702
Site Size: 146.24ha

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Overview of Findings

The GroundSure GeoInsight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and GroundSure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1:Geology

1.1 Artificial Ground	1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?	Yes
	1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?	Yes
	1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	1.2.4 Are there any records relating to permeability of landslips within the study site boundary?	No
1.3 Bedrock, Solid Geology & Faults	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records relating to permeability of bedrock within the study site boundary?	Yes
	1.3.3 Are there any records of faults within 500m of the study site boundary?	Yes
1.4 Radon data	1.4.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a Radon Affected Area, as between 3 and 5% of properties are above the Action Level
	1.4.2 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	Basic radon protective measures are necessary

Section 2:Ground Workings

	On-site	0-50m	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	13	10	9	Not Searched	Not Searched
2.2 Historical Underground Workings from Small Scale Mapping	4	0	0	1	10
2.3 Current Ground Workings	1	0	0	3	8

Section 3:Mining, Extraction & Natural Cavities

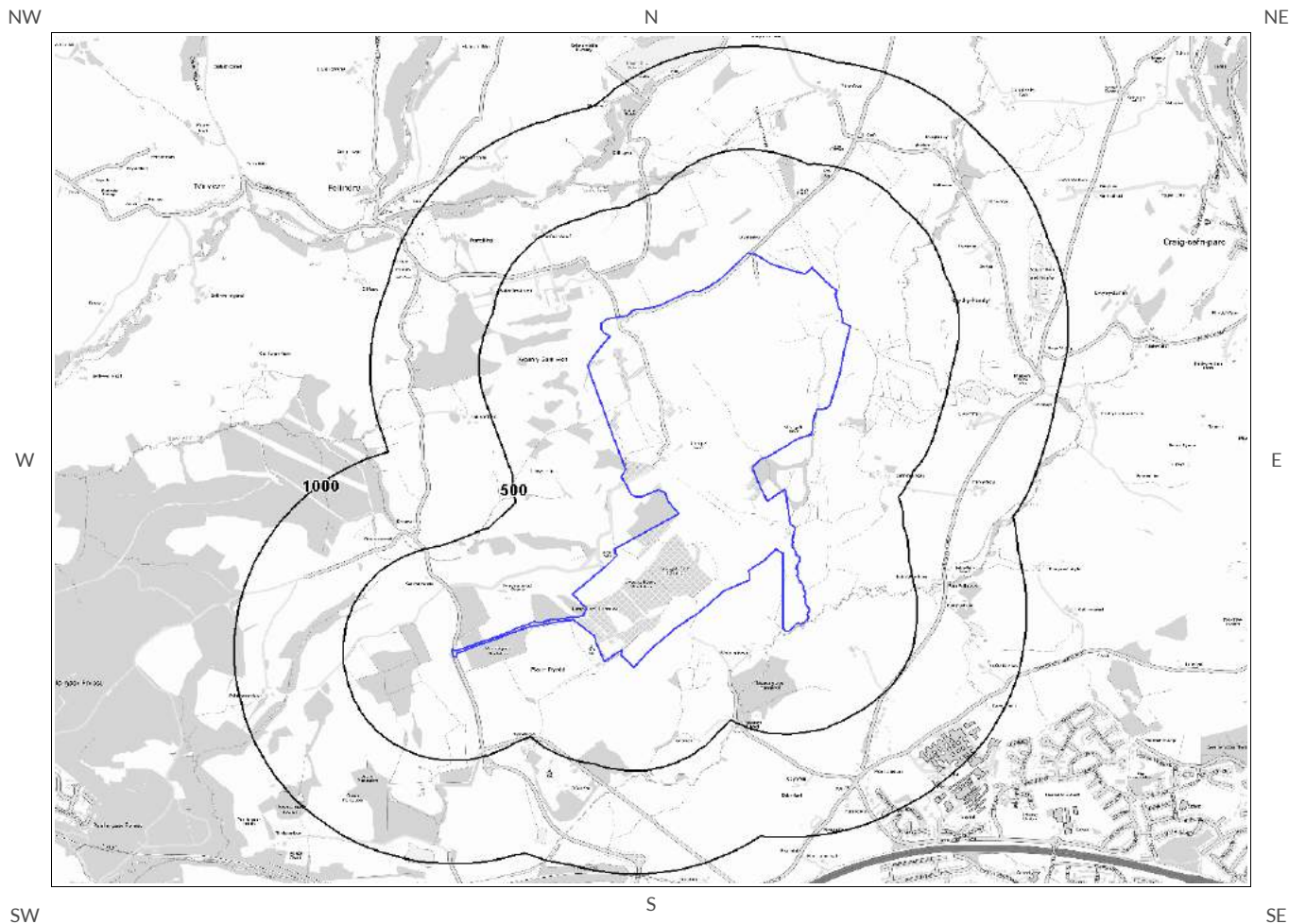
	On-site	0-50m	51-250	251-500	501-1000
3.1 Historical Mining	4	0	0	1	4

Section 3: Mining, Extraction & Natural Cavities					
	On-site	0-50m	51-250	251-500	501-1000
3.2 Coal Mining	1	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
3.4 Non-Coal Mining	0	0	0	0	0
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0
Section 4: Natural Ground Subsidence					
	On-site				
4.1 Shrink Swell Clay	Very Low				
4.2 Landslides	Low				
4.3 Ground Dissolution of Soluble Rocks	Null				
4.4 Compressible Deposits	High				
4.5 Collapsible Deposits	Very Low				
4.6 Running Sand	Low				
Section 5: Borehole Records					
	On-site	0-50m	51-250		
5 BGS Recorded Boreholes	3	0	2		
Section 6: Estimated Background Soil Chemistry					
	On-site	0-50m	51-250		
6 Records of Background Soil Chemistry	43	3	34		
Section 7: Railways and Tunnels					
	On-site	0-50m	51-250	251-500	
7.1 Tunnels	0	0	0	Not Searched	
7.2 Historical Railway and Tunnel Features	9	2	0	Not Searched	
7.3 Historical Railways	0	0	0	Not Searched	
7.4 Active Railways	0	0	0	Not Searched	

Section 7:Railways and Tunnels	On-site	0-50m	51-250	251-500
7.5 Railway Projects	0	0	0	0

1 Geology




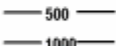




1.1 Artificial Ground Map



Artificial Ground Legend



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	Site Outline		Made Ground (undivided)		Disturbed Ground (undivided)
	Search Buffers (m)		Worked Ground (undivided)		Landscaped Ground (undivided)
			Infilled Ground		Reclaimed Ground



1 Geology

1.1 Artificial Ground

1.1.1 Artificial/ Made Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:247

Are there any records of Artificial/Made Ground within 500m of the study site boundary? No

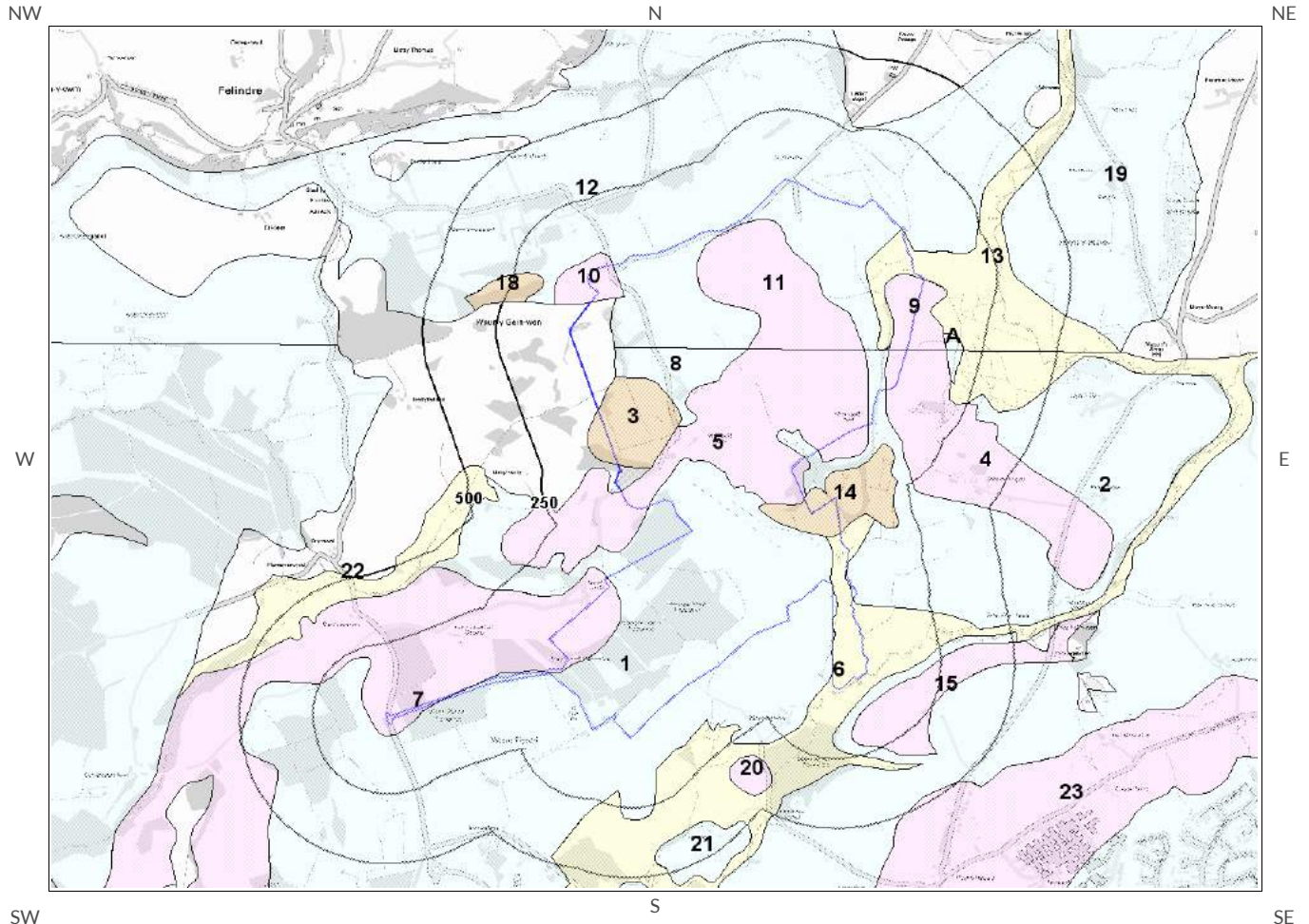
Database searched and no data found.

1.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

1.2 Superficial Deposits and Landslips Map



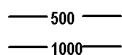
Superficial Deposits and Landslips Legend



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Site Outline



Search Buffers (m)

1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
2	0.0	On Site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
3	0.0	On Site	PEAT-P	PEAT	PEAT
4	0.0	On Site	GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
5	0.0	On Site	GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
6	0.0	On Site	ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
7	0.0	On Site	GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
8	0.0	On Site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
9	0.0	On Site	GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
10	0.0	On Site	GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
11	0.0	On Site	GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
12	0.0	On Site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
13	0.0	On Site	ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
14	0.0	On Site	PEAT-P	PEAT	PEAT
15	93.0	SE	GFSDD-SAGR	GLACIOFLUVIAL SHEET DEPOSITS, DEVENSIAN	SAND AND GRAVEL
16A	108.0	E	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
17A	130.0	E	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
18	153.0	W	PEAT-P	PEAT	PEAT
19	296.0	E	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
20	311.0	SE	GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
21	376.0	SE	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
22	400.0	NW	ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
23	476.0	SE	GFDUD-SAGR	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL

1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	Very High	High
0.0	On Site	Mixed	High	Low
0.0	On Site	Intergranular	Very High	High
0.0	On Site	Intergranular	Very High	High
0.0	On Site	Mixed	Low	Very Low
0.0	On Site	Intergranular	Very High	High
0.0	On Site	Mixed	Low	Very Low
0.0	On Site	Mixed	Low	Very Low
0.0	On Site	Intergranular	Very High	High
0.0	On Site	Mixed	High	Low
0.0	On Site	Mixed	High	Low
0.0	On Site	Intergranular	High	Very Low
0.0	On Site	Mixed	High	Low

1.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

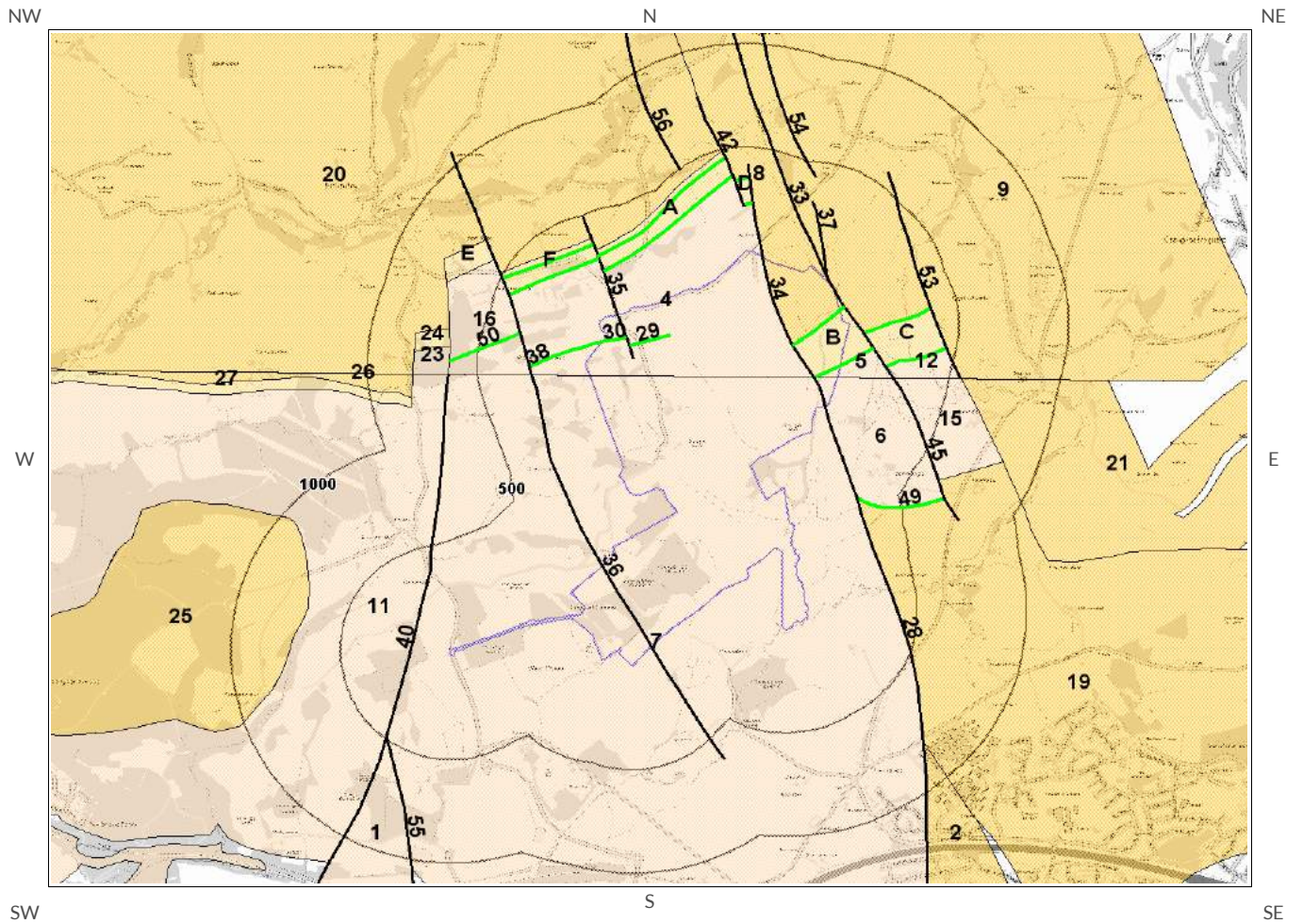
1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site** boundary? No

Database searched and no data found.

* This includes an automatically generated 50m buffer zone around the site

1.3 Bedrock and Faults Map



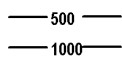
Bedrock and Faults Legend



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Site Outline



Search Buffers (m)

1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:247

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/ Solid Geology within 500m of the study site boundary:

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	492.0	SW	GDB-MDSS	Grovesend Formation - Mudstone, Siltstone And Sandstone	Westphalian D
3B	0.0	On Site	SW-MDSS	Swansea Member - Mudstone, Siltstone And Sandstone	Westphalian D
4	0.0	On Site	GDB-MDSS	Grovesend Formation - Mudstone, Siltstone And Sandstone	Westphalian D
5	0.0	On Site	GDB-MDSS	Grovesend Formation - Mudstone, Siltstone And Sandstone	Westphalian D
6	0.0	On Site	GDB-MDSS	Grovesend Formation - Mudstone, Siltstone And Sandstone	Westphalian D
7	0.0	On Site	GDB-MDSS	Grovesend Formation - Mudstone, Siltstone And Sandstone	Westphalian D
8	0.0	On Site	SW-SDST	Swansea Member - Sandstone	Westphalian D
9	0.0	On Site	SW-SDST	Swansea Member - Sandstone	Westphalian D
10C	70.0	E	SW-MDSS	Swansea Member - Mudstone, Siltstone And Sandstone	Westphalian D
11	170.0	W	GDB-MDSS	Grovesend Formation - Mudstone, Siltstone And Sandstone	Westphalian D
12	207.0	E	GDB-MDSS	Grovesend Formation - Mudstone, Siltstone And Sandstone	Westphalian D
13A	218.0	NW	SW-MDSS	Swansea Member - Mudstone, Siltstone And Sandstone	Westphalian D
14D	224.0	N	SW-MDSS	Swansea Member - Mudstone, Siltstone And Sandstone	Westphalian D
15	249.0	E	GDB-MDSS	Grovesend Formation - Mudstone, Siltstone And Sandstone	Westphalian D
16	253.0	W	GDB-MDSS	Grovesend Formation - Mudstone, Siltstone And Sandstone	Westphalian D
17F	271.0	N	SW-MDSS	Swansea Member - Mudstone, Siltstone And Sandstone	Westphalian D
18A	294.0	NW	SW-MDSS	Swansea Member - Mudstone, Siltstone And Sandstone	Westphalian D
19	312.0	E	SW-SDST	Swansea Member - Sandstone	Westphalian D
20	325.0	NW	SW-SDST	Swansea Member - Sandstone	Westphalian D

1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site* boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Moderate	Low
0.0	On Site	Fracture	Moderate	Low
0.0	On Site	Fracture	Moderate	Low
0.0	On Site	Fracture	High	Moderate

1.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	Category Description	Feature Description
28	0.0	On Site	FAULT	Normal fault, inferred
29	0.0	On Site	ROCK	Coal seam, inferred
30	0.0	On Site	ROCK	Coal seam, inferred
31B	0.0	On Site	ROCK	Coal seam, inferred
32B	0.0	On Site	ROCK	Coal seam, inferred
33	0.0	On Site	FAULT	Normal fault, observed
34	0.0	On Site	FAULT	Normal fault, observed
35	0.0	On Site	FAULT	Normal fault, inferred
36	0.0	On Site	FAULT	Normal fault, inferred
37	18.0	NE	FAULT	Normal fault, observed
38	29.0	NW	ROCK	Coal seam, inferred
39C	70.0	E	ROCK	Coal seam, inferred
40	170.0	W	FAULT	Normal fault, inferred
41C	207.0	E	ROCK	Coal seam, inferred
42	215.0	N	FAULT	Normal fault, observed
43A	218.0	NW	ROCK	Coal seam, inferred
44D	224.0	N	ROCK	Coal seam, observed
45	249.0	E	FAULT	Normal fault, inferred
46E	253.0	W	FAULT	Normal fault, inferred
47F	271.0	N	ROCK	Coal seam, inferred
48A	294.0	NW	ROCK	Coal seam, inferred
49	319.0	NE	ROCK	Coal seam, inferred
50	335.0	NW	ROCK	Coal seam, inferred
51F	344.0	N	ROCK	Coal seam, inferred
52D	344.0	N	ROCK	Coal seam, observed
53	373.0	E	FAULT	Normal fault, inferred
54	427.0	N	FAULT	Normal fault, observed
55	492.0	SW	FAULT	Normal fault, inferred

* This includes an automatically generated 50m buffer zone around the site

ID	Distance (m)	Direction	Category Description	Feature Description
56	495.0	NW	FAULT	Normal fault, inferred

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.4 Radon Data

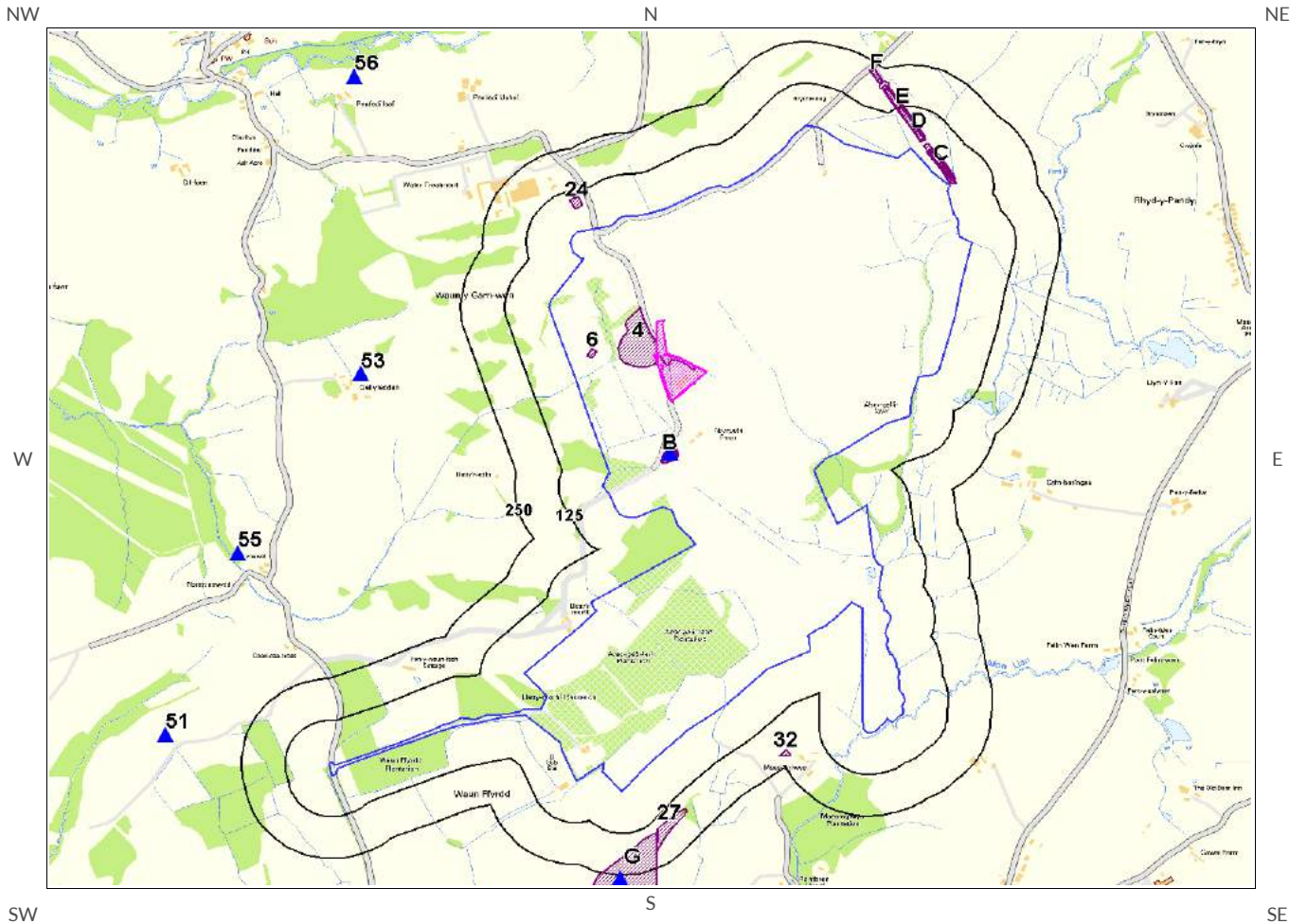
1.4.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is in a Radon Affected Area, as between 3 and 5% of properties are above the Action Level

1.4.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? Basic radon protective measures are necessary


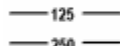


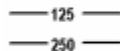
2 Ground Workings Map



Ground Workings Legend



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-  Site Outline
-  Search Buffers (m)
-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings



2 Ground Workings

2.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on GroundSure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

The following Historical Surface Ground Working Features are provided by GroundSure:

ID	Distance (m)	Direction	NGR	Use	Date
1A	0.0	On Site	265024 201864	Refuse Heap	1936
2A	0.0	On Site	265070 201821	Colliery	1936
3B	0.0	On Site	265033 201582	Unspecified Pit	1936
4	0.0	On Site	264946 201939	Refuse Heap	1964
5B	0.0	On Site	265034 201586	Old Gravel Pit	1913
6	0.0	On Site	264815 201891	Pond	1914
7A	0.0	On Site	265029 201871	Refuse Heap	1948
8B	0.0	On Site	265033 201582	Unspecified Pit	1948
9A	0.0	On Site	265070 201821	Colliery	1948
10B	0.0	On Site	265040 201589	Gravel Pit	1897
11B	0.0	On Site	265036 201585	Unspecified Pit	1975
12B	0.0	On Site	265027 201591	Unspecified Pit	1964
13B	0.0	On Site	265035 201587	Old Gravel Pit	1921
14C	4.0	NE	265807 202454	Cuttings	1921
15C	8.0	NE	265813 202453	Unspecified Ground Workings	1921
16C	17.0	NE	265814 202455	Unspecified Pit	1964
17C	17.0	NE	265814 202455	Unspecified Pit	1975
18C	18.0	NE	265800 202473	Cuttings	1897
19D	33.0	NE	265743 202550	Cuttings	1921
20D	36.0	NE	265750 202546	Cuttings	1921
21E	36.0	NE	265698 202621	Cuttings	1975

ID	Distance (m)	Direction	NGR	Use	Date
22E	36.0	NE	265698 202621	Cuttings	1964
23D	37.0	NE	265701 202614	Cuttings	1897
24	69.0	N	264769 202343	Covered Reservoir	1991
25E	98.0	N	265680 202646	Cuttings	1921
26E	101.0	N	265677 202648	Cuttings	1921
27	150.0	SE	265020 200459	Refuse Heap	1975
28G	154.0	SE	264905 200262	Refuse Heap	1991
29F	202.0	N	265622 202725	Cuttings	1921
30F	205.0	N	265625 202726	Cuttings	1921
31F	211.0	NE	265621 202730	Cuttings	1897
32	215.0	SE	265363 200689	Pond	1913

2.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the GroundSure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? Yes

The following Historical Underground Working Features are provided by GroundSure:

ID	Distance (m)	Direction	NGR	Use	Date
33A	0.0	On Site	265070 201869	Unspecified Disused Mine	1964
34A	0.0	On Site	265070 201869	Unspecified Disused Mine	1975
35A	0.0	On Site	265070 201821	Colliery	1948
36A	0.0	On Site	265070 201821	Colliery	1936
Not shown	480.0	S	264756 200086	Old Coal Pit	1914
Not shown	515.0	S	264707 200029	Coal Pit	1878
Not shown	536.0	S	264701 200070	Unspecified Shaft	1878
Not shown	787.0	S	264931 199675	Colliery	1948
Not shown	787.0	S	264931 199675	Colliery	1936
Not shown	992.0	S	264918 199568	Tunnel	1964

ID	Distance (m)	Direction	NGR	Use	Date
Not shown	993.0	S	265755 199362	Tunnel	1913
Not shown	993.0	S	264918 199568	Tunnel	1994
Not shown	993.0	S	264918 199568	Tunnel	1980
Not shown	993.0	S	264918 199568	Tunnel	1968
Not shown	998.0	S	265739 199358	Tunnel	1921

2.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

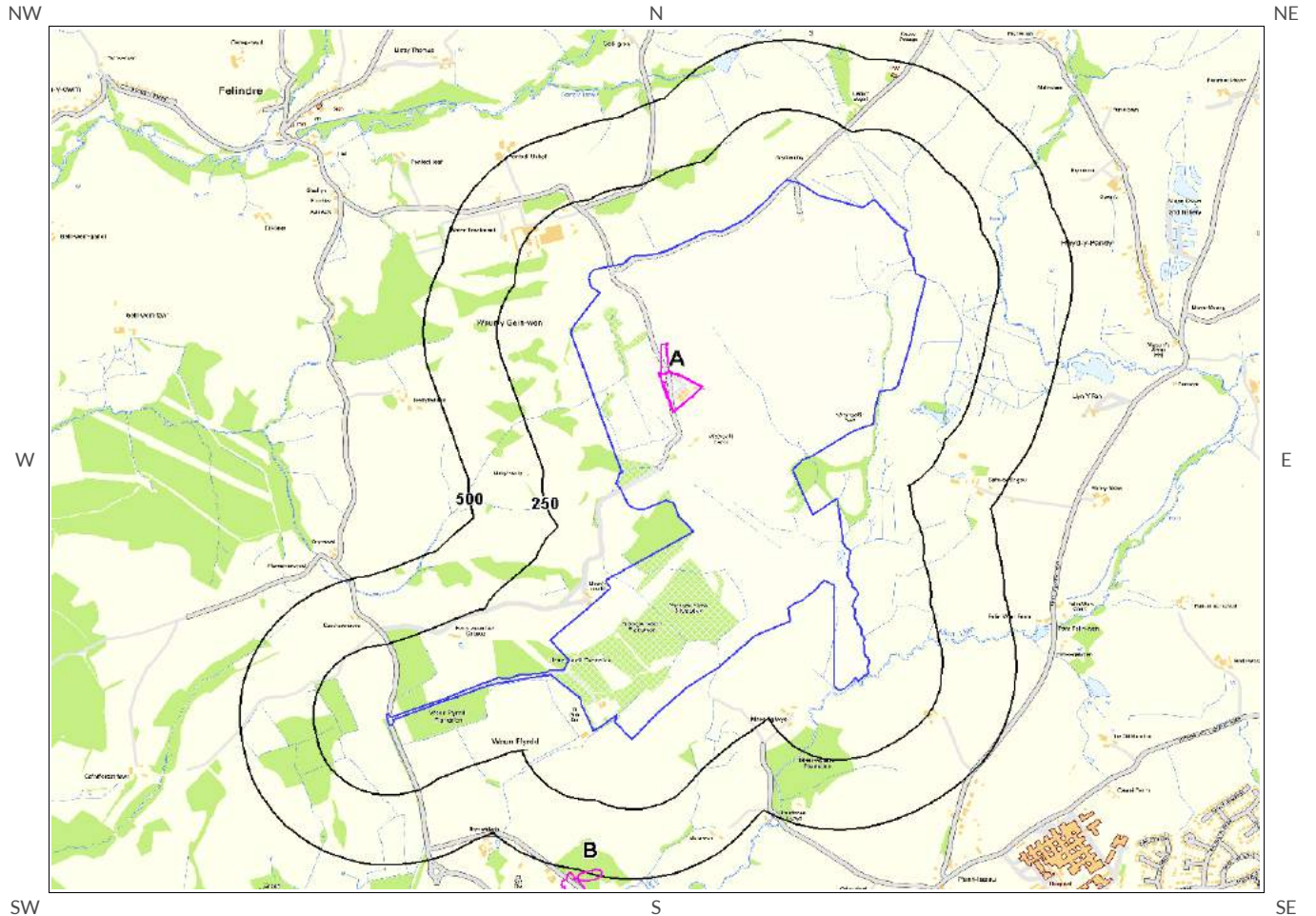
The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
48B	0.0	On Site	265036 201591	Sand & Gravel	Aber-gelli-fach Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
49G	261.0	S	264893 200311	Sand & Gravel	Bryn-whilach Plantation Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	465.0	NE	265652 202994	Sandstone	Waun-fach	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
51	476.0	W	263598 200743	Sand	Waen Ffyrdd Plantation Sand Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	507.0	S	264757 200086	Coal, Deep	Bryn-whilach	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
53	573.0	W	264154 201828	Sandstone	Gelli-feddan	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	620.0	N	264937 202972	Sandstone	Gelli-gron	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
55	681.0	NW	263805 201290	Sandstone	Llidiard -y-cleders	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
56	786.0	NW	264137 202724	Sandstone	Pen-y-fedw-isaf	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	874.0	S	264288 199775	Sand	Nant-y-ganol Wood Sand Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	877.0	NW	264910 203289	Sandstone	Waterworks Cottage	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	958.0	E	266801 201886	Sandstone	Rhyd-y-pandy	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased



3 Mining, Extraction & Natural Cavities Map



Mining, Extraction and Natural Cavities Legend



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3 Mining, Extraction & Natural Cavities

3.1 Historical Mining

This dataset is derived from GroundSure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? Yes

The following Historical Mining information is provided by GroundSure:

ID	Distance (m)	Direction	NGR	Details	Date
1A	0.0	On Site	265070 201869	Unspecified Disused Mine	1975
2A	0.0	On Site	265070 201869	Unspecified Disused Mine	1964
3A	0.0	On Site	265070 201821	Colliery	1936
4A	0.0	On Site	265070 201821	Colliery	1948
5B	480.0	S	264756 200086	Old Coal Pit	1914
6B	515.0	S	264707 200029	Coal Pit	1878
7B	536.0	S	264701 200070	Unspecified Shaft	1878
Not shown	787.0	S	264931 199675	Colliery	1936
Not shown	787.0	S	264931 199675	Colliery	1948

3.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? Yes

The following Coal Mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0.0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

3.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

3.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

3.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

3.7 Brine Extraction

This dataset provides information from the Brine Compensation Board which has been discontinued and is now covered by the Coal Authority.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

3.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

3.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level.

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.10 Clay Mining

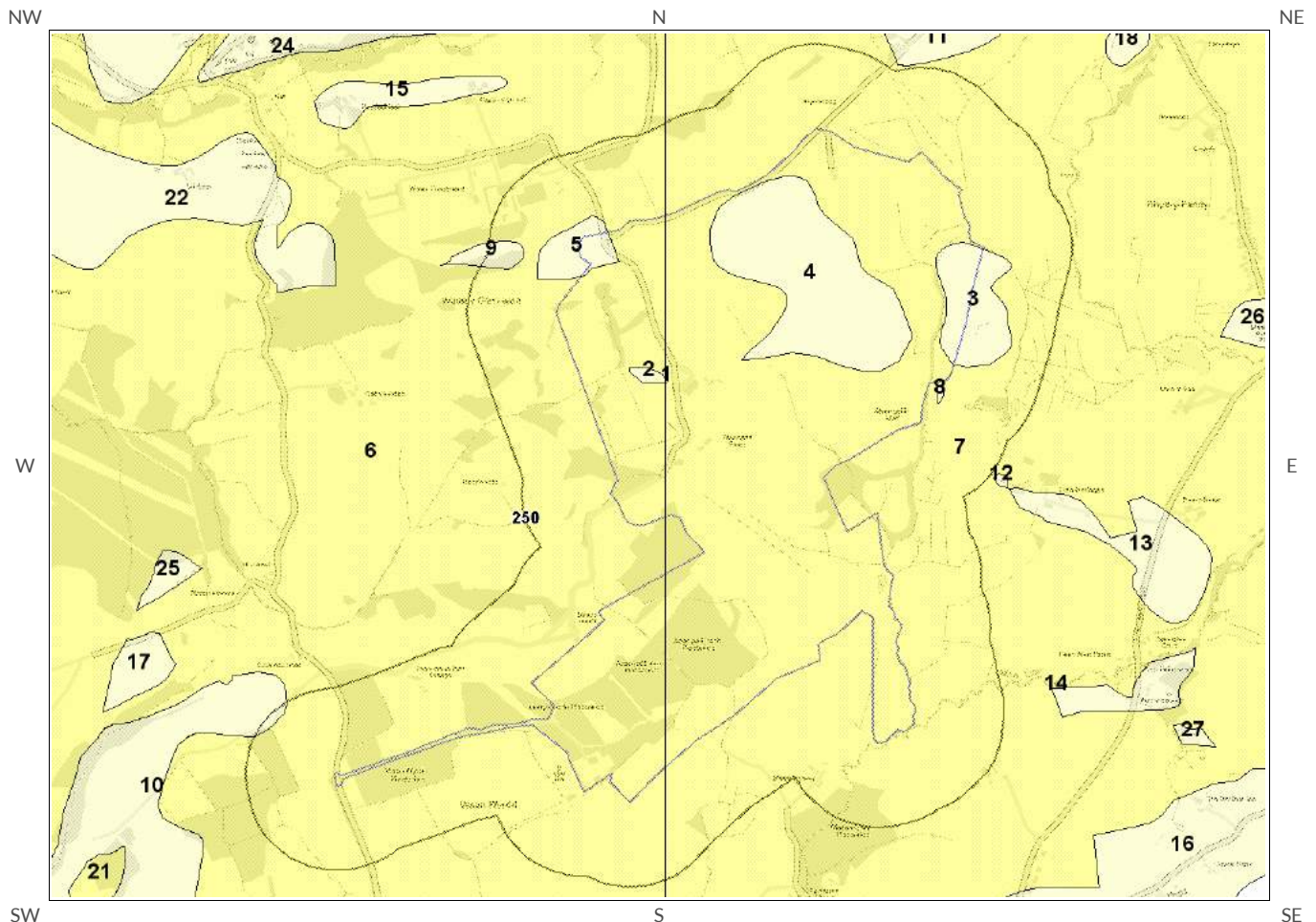
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

4 Natural Ground Subsidence

4.1 Shrink-Swell Clay Map



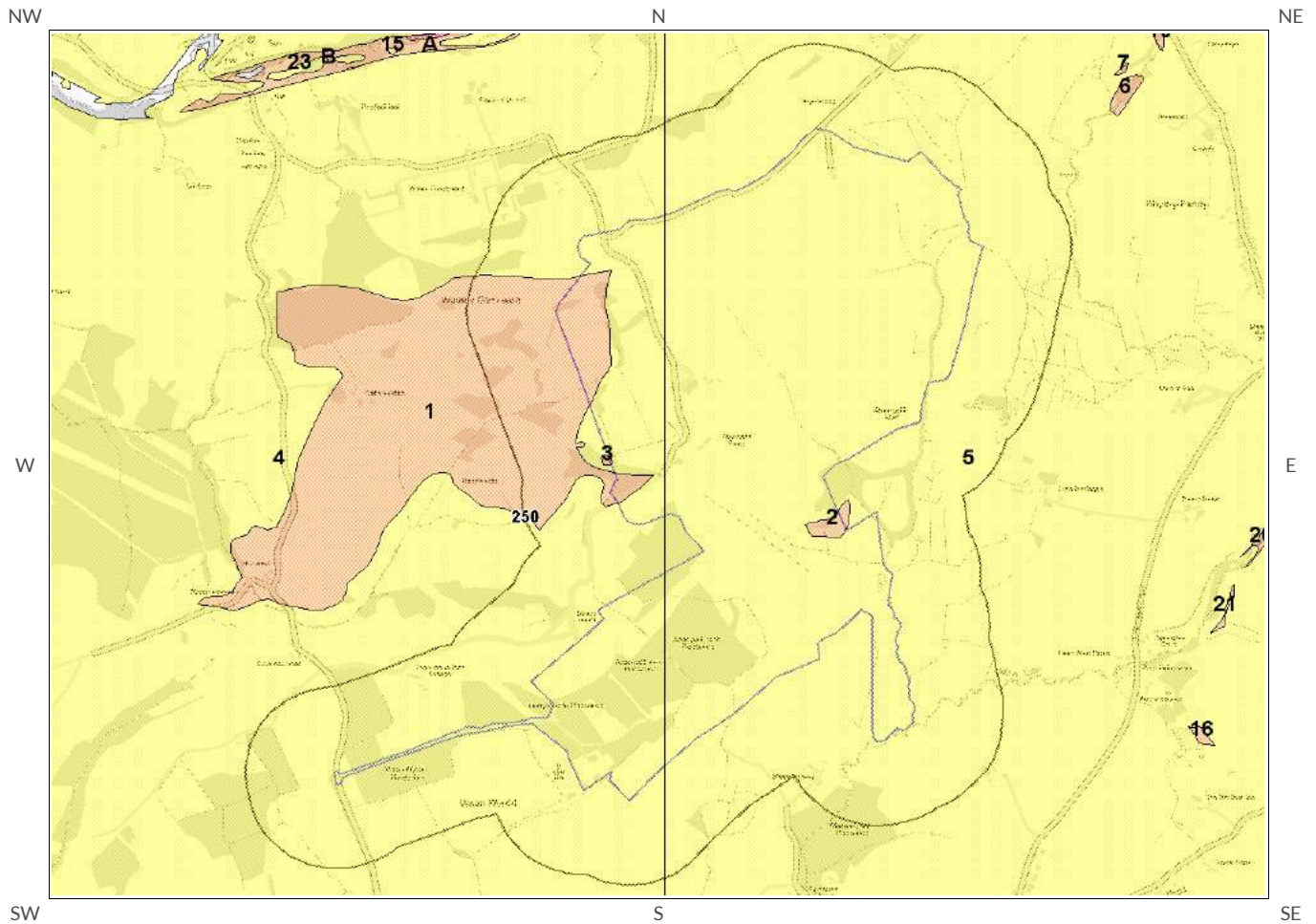
Shrink Swell Clay Legend



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4.2 Landslides Map



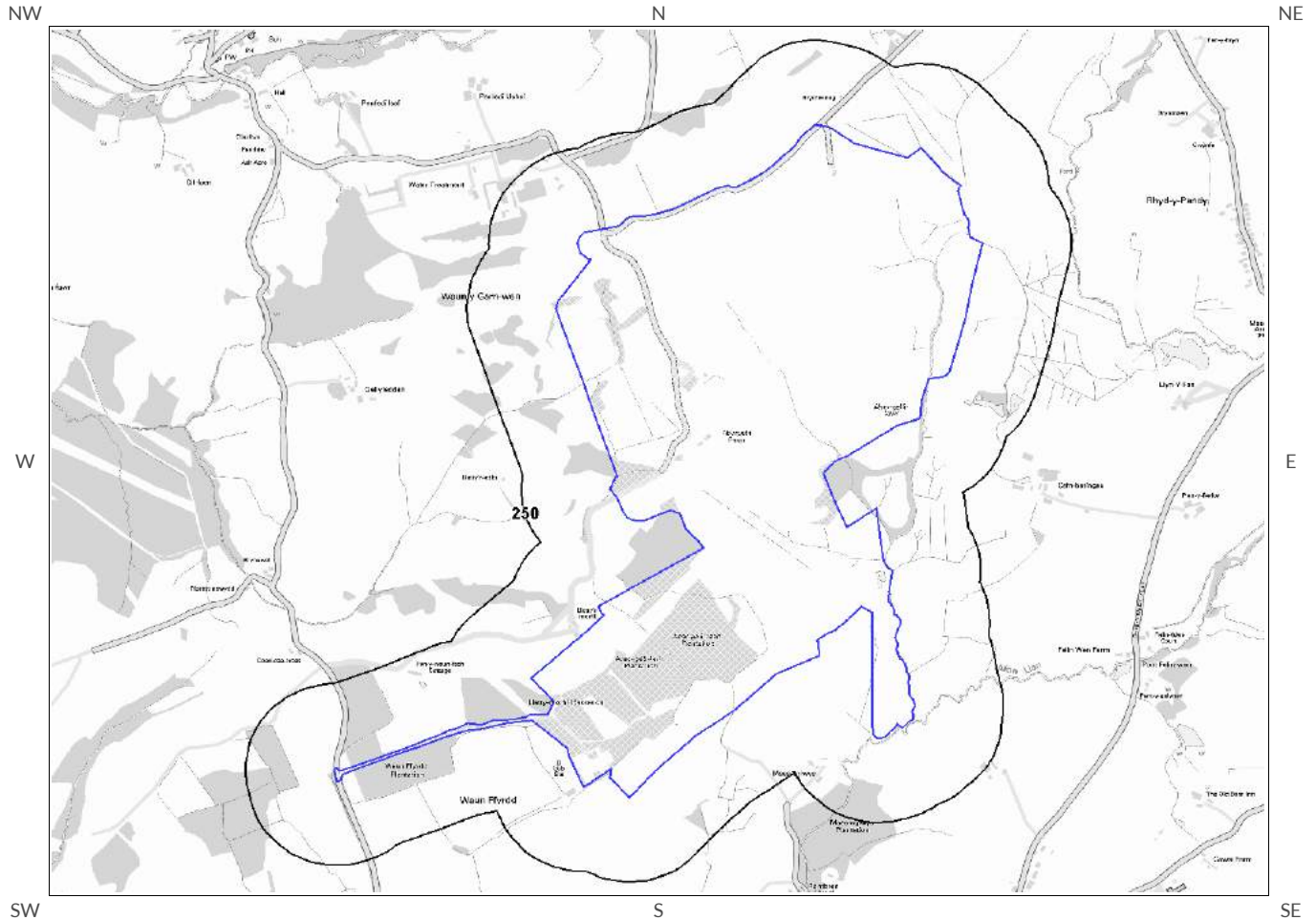
Landslides Legend



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	Site Outline		No Data / Null		Low
	Search Buffers (m)		Negligible		Moderate
			Very Low		High

4.3 Ground Dissolution Soluble Rocks Map



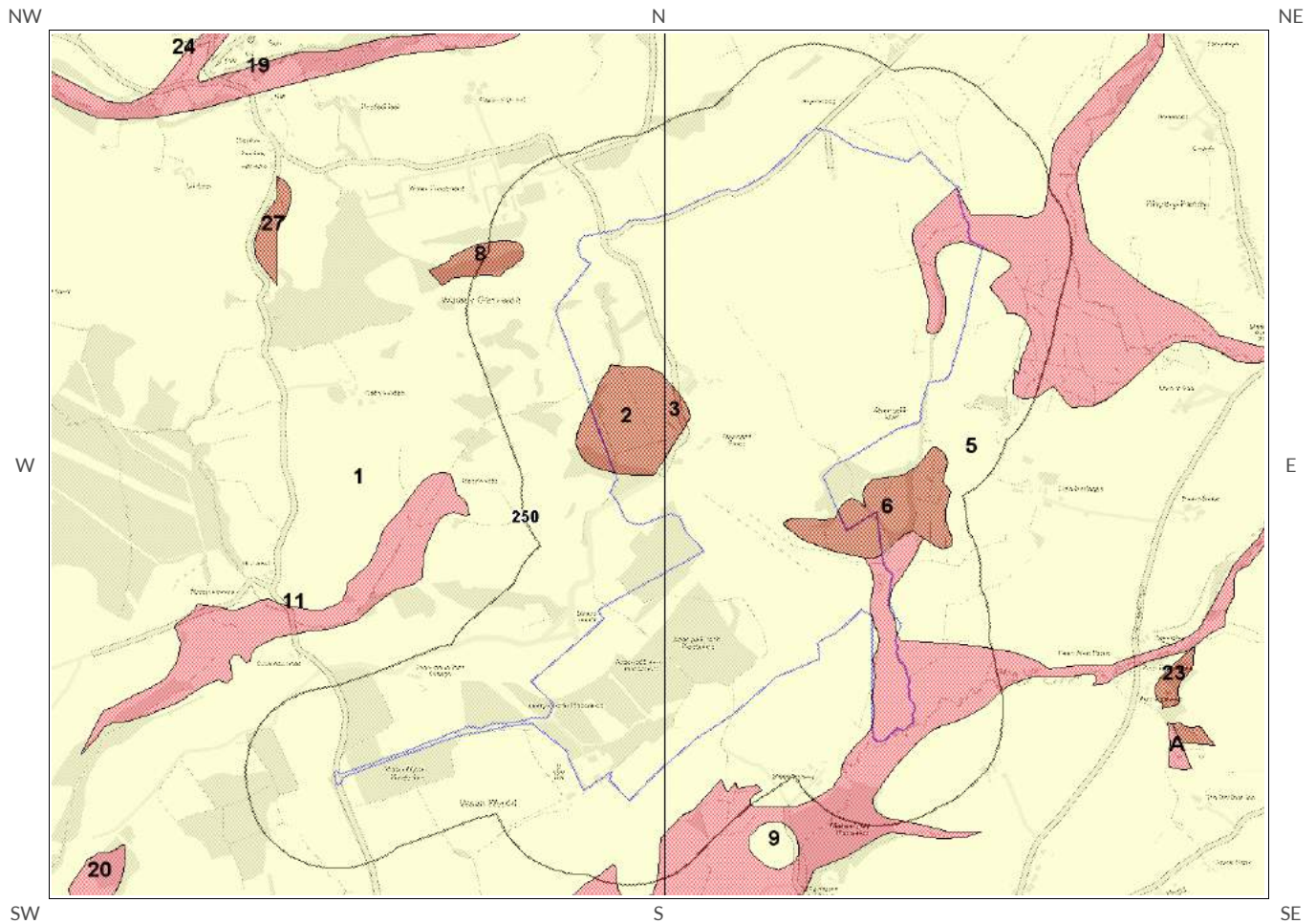
Ground Dissolution Soluble Rocks Legend



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4.4 Compressible Deposits Map



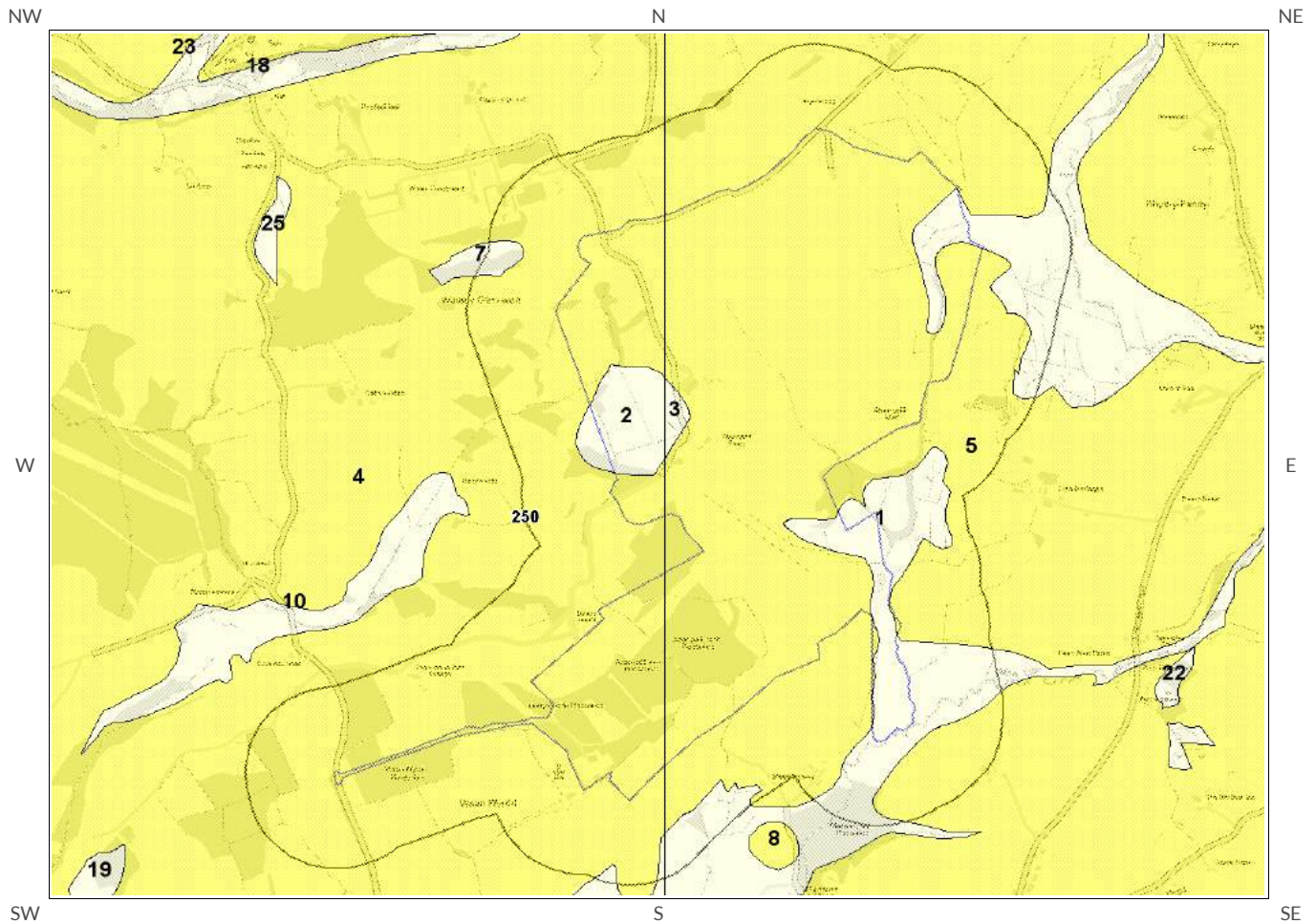
Compressible Deposits Legend



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4.5 Collapsible Deposits Map



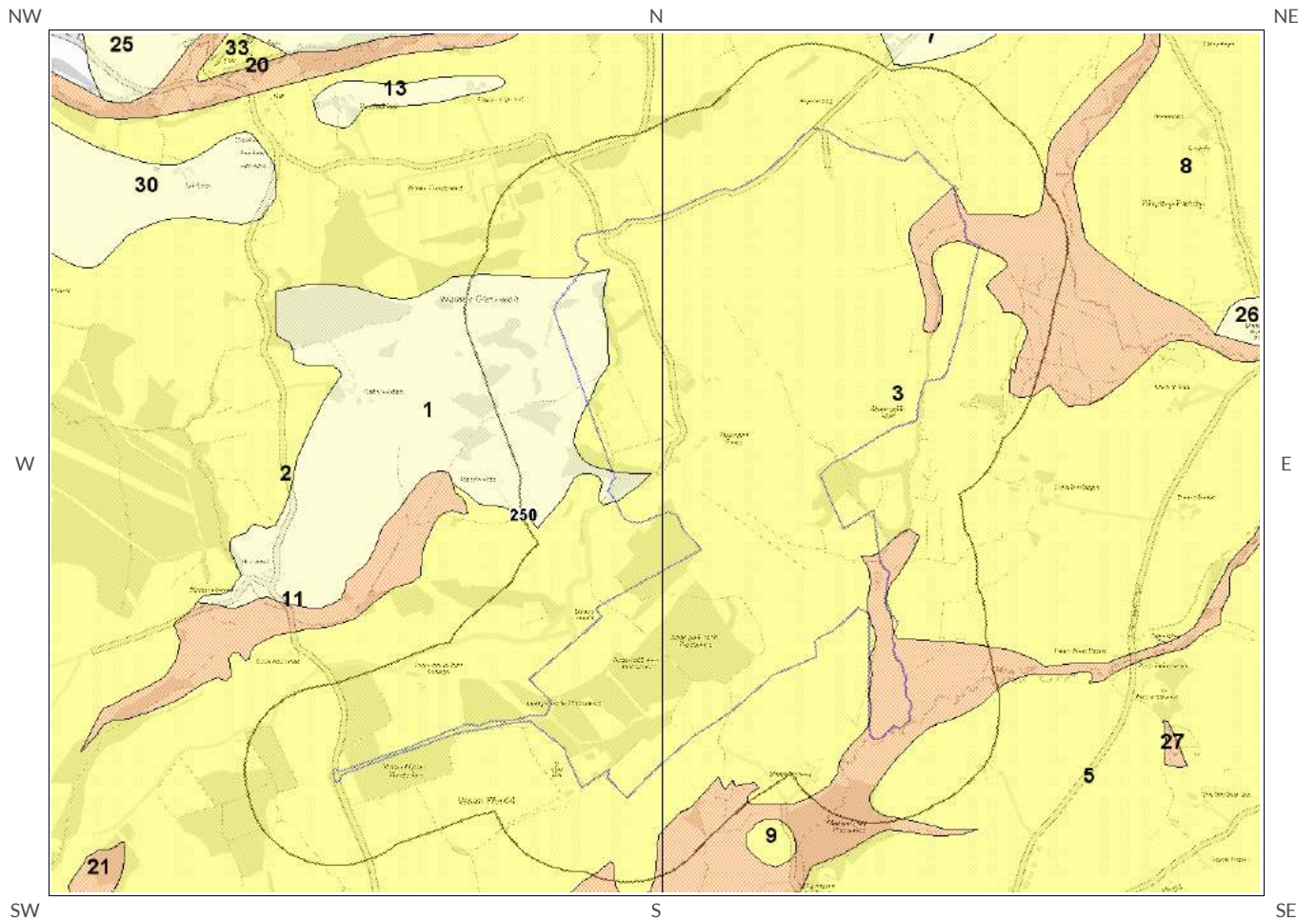
Collapsible Deposits Legend



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4.6 Running Sand Map



Running Sand Legend



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4 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site* boundary? High

4.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
2	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
3	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
4	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
5	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
6	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
7	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
8	10.0	S	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.

* This includes an automatically generated 50m buffer zone around the site

4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.
2	0.0	On Site	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.
3	0.0	On Site	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.
4	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.
5	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

4.3 Ground Dissolution of Soluble Rocks

The following Compressible Deposits information provided by the British Geological Survey:

Distance (m)	Direction	Hazard Rating	Details
0	On site	Null-Negligible	Soluble rocks are not present in the search area. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

4.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

ID	Distance (m)	Direction	Hazard Rating	Details
2	0.0	On Site	High	Very significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Construction may not be possible at economic cost. For existing property - probable increase in insurance risk from compressibility especially if water conditions or loading of the ground change significantly.
3	0.0	On Site	High	Very significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Construction may not be possible at economic cost. For existing property - probable increase in insurance risk from compressibility especially if water conditions or loading of the ground change significantly.
4	0.0	On Site	Moderate	Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property - possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.
5	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.
6	0.0	On Site	High	Very significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build - consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Construction may not be possible at economic cost. For existing property - probable increase in insurance risk from compressibility especially if water conditions or loading of the ground change significantly.

4.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

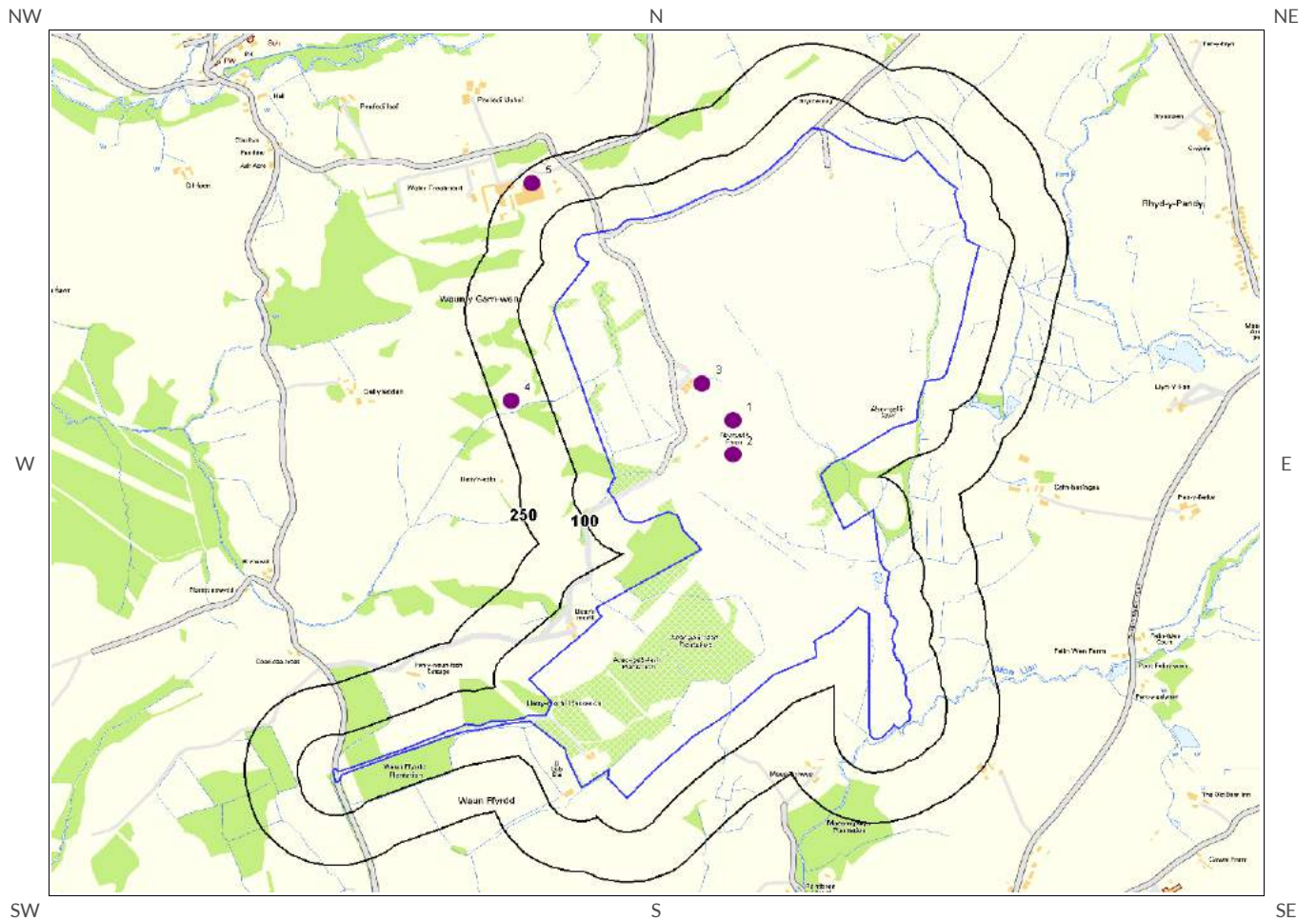
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
3	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
4	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
5	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

4.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
3	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
4	0.0	On Site	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build - consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property - no significant increase in insurance risk due to running sand problems is likely.





5 Borehole Records Map



Borehole Records Legend



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-  Site Outline
-  Borehole Locations
-  125 Search Buffers (m)
-  250 Search Buffers (m)



5 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

5

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	0.0	On Site	265200 201700	SN60SE16	-1.0	ABERGELLI SLANT, BRYN WHILACH. 2FT V WORKINGS PLAN
2	0.0	On Site	265200 201600	SN60SE24	16.0	ABERGELLI-FACH FARM P4
3	0.0	On Site	265110 201810	SN60SE15	-1.0	ABERGELLI COLLIERY
4	203.0	W	264570 201760	SN60SW68	7.92	ABERGELLI. BOREHOLES 3
5	210.0	NW	264630 202410	SN60SW63	1.98	RIVER TOWN SCHEME, LOWER LLIW RESERVOIR, TP.10

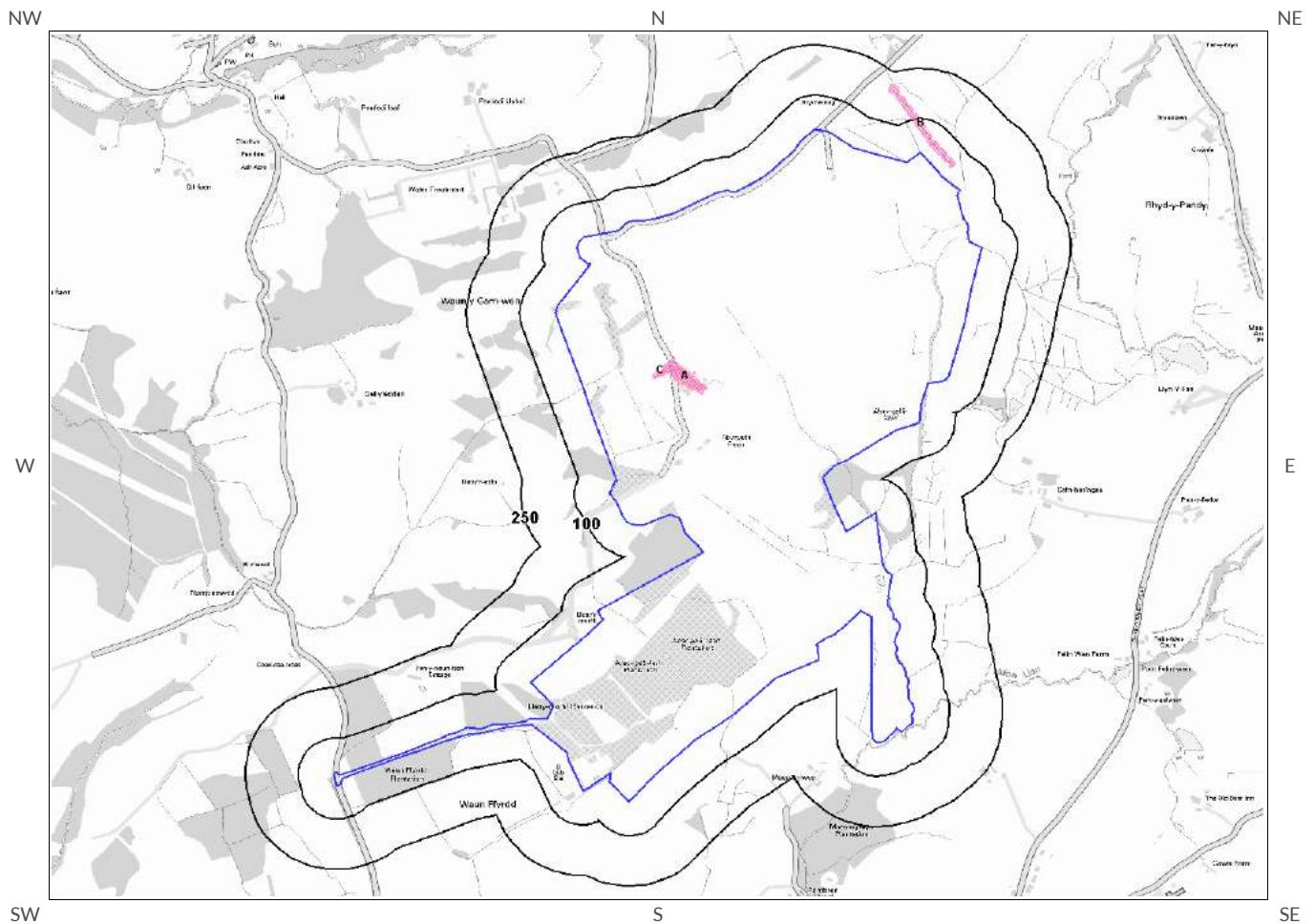
Additional online information is available for the following boreholes listed above:

- #1: scans.bgs.ac.uk/sobi_scans/boreholes/256136
- #2: scans.bgs.ac.uk/sobi_scans/boreholes/256144
- #3: scans.bgs.ac.uk/sobi_scans/boreholes/256135
- #4: scans.bgs.ac.uk/sobi_scans/boreholes/256277
- #5: scans.bgs.ac.uk/sobi_scans/boreholes/256272

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
12.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
19.0	NE	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
49.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
51.0	SE	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<150 mg/kg
56.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
67.0	W	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<150 mg/kg
67.0	W	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
70.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
77.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
78.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
93.0	SE	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
103.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
106.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
108.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
115.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
126.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
129.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
130.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
137.0	NE	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
137.0	SE	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
146.0	E	Sediment	35 - 45 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
149.0	E	Sediment	35 - 45 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
153.0	W	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
156.0	E	Sediment	35 - 45 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
156.0	NW	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<150 mg/kg
168.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
170.0	W	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	<150 mg/kg
173.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
179.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
207.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
208.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
214.0	N	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
218.0	NW	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
221.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
224.0	NW	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
224.0	N	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg
249.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<150 mg/kg

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.













7 Railways and Tunnels Map

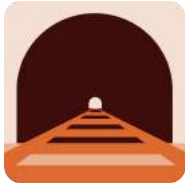


Railways and Tunnels Legend



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-  Underground or Partially Underground Railway / Subway System
-  Railway Track (OpenStreetMap)
-  Site Outline
-  Railway Tunnel (OS Mapping)
-  High Speed 2
-  Search Buffers (m)
 250
 500
-  Abandoned or Dismantled Railway (OpenStreetMap)
-  Crossrail
-  Railway Track (OS Mapping)
-  Railway and/or Tunnel Feature from Historical Mapping



7 Railways and Tunnels

7.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

7.2 Historical Railway and Tunnel Features

This data is derived from GroundSure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? Yes

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1C	0	On Site	264984 201852	Railway Sidings	1964
2A	0	On Site	265040 201842	Railway Sidings	1948
3A	0	On Site	265058 201840	Railway Sidings	1964
4A	0	On Site	265040 201842	Railway Sidings	1936
5A	0	On Site	265043 201843	Railway Sidings	1938
8A	0	On Site	264970 201835	Railway Sidings	1960
9C	0	On Site	264992 201849	Railway Sidings	1989
10C	0	On Site	264992 201850	Railway Sidings	1958

ID	Distance (m)	Direction	NGR	Details	Date
11A	0	On Site	265034 201845	Railway Sidings	1935
6B	36	NE	265728 202586	Tramway Sidings	1975
7B	36	NE	265728 202586	Tramway Sidings	1964

Any records that have been identified are represented on the Railways and Tunnels Map.

7.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Note: multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels Map.

7.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Note: multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels Map.

7.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail.

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail rail project? No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a GroundSure HS2 and Crossrail Report.

Contact Details



GroundSure Helpline
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info@groundsure.com



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British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS Geological Hazards Reports and general geological enquiries

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The Coal
Authority

Public Health England

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Report Reference: GS-1587648

Client Reference: PB84891

Standard Terms and Conditions

1 Definitions

In these terms and conditions unless the context otherwise requires:

"Beneficiary" means the person or entity for whose benefit the Client has obtained the Services.

"Client" means the party or parties entering into a Contract with GroundSure.

"Commercial" means any building or property which is not Residential.

"Confidential Information" means the contents of this Contract and all information received from the Client as a result of, or in connection with, this Contract other than

(i) information which the Client can prove was rightfully in its possession prior to disclosure by GroundSure and

(ii) any information which is in the public domain (other than by virtue of a breach of this Contract).

"Support Services" means Support Services provided by GroundSure including, without limitation, interpreting third party and in-house environmental data, providing environmental support advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

"Contract" means the contract between GroundSure and the Client for the provision of the Services, and which shall incorporate these terms and conditions, the Order, and the relevant User Guide.

"Third Party Data Provider" means any third party providing Third Party Content to GroundSure.

"Data Reports" means reports comprising factual data with no accompanying interpretation.

"Fees" has the meaning set out in clause 5.1.

"GroundSure" means GroundSure Limited, a company registered in England and Wales under number 03421028.

"GroundSure Materials" means all materials prepared by GroundSure and provided as part of the Services, including but not limited to Third Party Content, Data Reports, Mapping, and Risk Screening Reports.

"Intellectual Property" means any patent, copyright, design rights, trade or service mark, moral rights, data protection rights, know-how or trade mark in each case whether registered or not and including applications for the same or any other rights of a similar nature anywhere in the world.

"Mapping" means a map, map data or a combination of historical maps of various ages, time periods and scales.

"Order" means an electronic, written or other order form submitted by the Client requesting Services from GroundSure in respect of a specified Site.

"Ordnance Survey" means the Secretary of State for Business, Innovation and Skills, acting through Ordnance Survey, Adanac Drive, Southampton, SO16 0AS, UK.

"Order Website" means the online platform through which Orders may be placed by the Client and accepted by GroundSure.

"Report" means a Risk Screening Report or Data Report for Commercial or Residential property.

"Residential" means any building or property used as or intended to be used as a single dwelling.

"Risk Screening Report" means a risk screening report comprising factual data with an accompanying interpretation by GroundSure.

"Services" means any Report, Mapping and/or Support Services which GroundSure has agreed to provide by accepting an Order pursuant to clause 2.6.

"Site" means the area of land in respect of which the Client has requested GroundSure to provide the Services.

"Third Party Content" means data, database information or other information which is provided to GroundSure by a Third Party Data Provider.

"User Guide" means the user guide, as amended from time to time, available upon request from GroundSure and on the website (www.GroundSure.com) and forming part of this Contract.

2 Scope of Services, terms and conditions, requests for insurance and quotations

2.1 GroundSure agrees to provide the Services in accordance with the Contract.

2.2 GroundSure shall exercise reasonable skill and care in the provision of the Services.

2.3 Subject to clause 7.3 the Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in writing in the Contract and all such statements and representations are hereby excluded to the fullest extent permitted by law.

2.4 The Client acknowledges that terms and conditions appearing on a Client's order form, printed stationery or other communication, or any terms or conditions implied by custom, practice or course of dealing shall be of no effect, and that this Contract shall prevail over all others in relation to the Order.

2.5 If the Client or Beneficiary requests insurance in conjunction with or as a result of the Services, GroundSure shall use reasonable endeavours to recommend such insurance, but makes no warranty that such insurance shall be available from insurers or that it will be offered on reasonable terms. Any insurance purchased by the Client or Beneficiary shall be subject solely to the terms of the policy issued by insurers and GroundSure will have no liability therefor. In addition you acknowledge and agree that GroundSure does not act as an agent or broker for any insurance providers. The Client should take (and ensure that the Beneficiary takes) independent advice to ensure that the insurance policy requested or offered is suitable for its requirements.

2.6 GroundSure's quotations or proposals are valid for a period of 30 days only unless an alternative period of time is explicitly stipulated by GroundSure. GroundSure reserves the right to withdraw any quotation or proposal at any time before an Order is accepted by GroundSure. GroundSure's acceptance of an Order

shall be binding only when made in writing and signed by GroundSure's authorised representative or when accepted through the Order Website.

3 The Client's obligations

3.1 The Client shall comply with the terms of this Contract and

(i) procure that the Beneficiary or any third party relying on the Services complies with and acts as if it is bound by the Contract and

(ii) be liable to GroundSure for the acts and omissions of the Beneficiary or any third party relying on the Services as if such acts and omissions were those of the Client.

3.2 The Client shall be solely responsible for ensuring that the Services are appropriate and suitable for its and/or the Beneficiary's needs.

3.3 The Client shall supply to GroundSure as soon as practicable and without charge all requisite information (and the Client warrants that such information is accurate, complete and appropriate), including without limitation any environmental information relating to the Site and shall give such assistance as GroundSure shall reasonably require in the provision of the Services including, without limitation, access to the Site, facilities and equipment.

3.4 Where the Client's approval or decision is required to enable GroundSure to carry out work in order to provide the Services, such approval or decision shall be given or procured in reasonable time and so as not to delay or disrupt the performance of the Services.

3.5 Save as expressly permitted by this Contract the Client shall not, and shall procure that the Beneficiary shall not, re-sell, alter, add to, or amend the GroundSure Materials, or use the GroundSure Materials in a manner for which they were not intended. The Client may make the GroundSure Materials available to a third party who is considering acquiring some or all of, or providing funding in relation to, the Site, but such third party cannot rely on the same unless expressly permitted under clause 4.

3.6 The Client is responsible for maintaining the confidentiality of its user name and password if using the Order Website and the Client acknowledges that GroundSure accepts no liability of any kind for any loss or damage suffered by the Client as a consequence of using the Order Website.

4 Reliance

4.1 The Client acknowledges that the Services provided by GroundSure consist of the presentation and analysis of Third Party Content and other content and that information obtained from a Third Party Data Provider cannot be guaranteed or warranted by GroundSure to be reliable.

4.2 In respect of Data Reports, Mapping and Risk Screening Reports, the following classes of person and no other are entitled to rely on their contents;

(i) the Beneficiary,

(ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate),

(iv) the first purchaser or first tenant of the Site, and

(v) the professional advisers and lenders of the first purchaser or tenant of the Site.

4.3 In respect of Support Services, only the Client, Beneficiary and parties expressly named in a Report and no other parties are entitled to rely on its contents.

4.4 Save as set out in clauses 4.2 and 4.3 and unless otherwise expressly agreed in writing, no other person or entity of any kind is entitled to rely on any Services or Report issued or provided by GroundSure. Any party considering such Reports and Services does so at their own risk.

5 Fees and Disbursements

5.1 GroundSure shall charge and the Client shall pay fees at the rate and frequency specified in the written proposal, Order Website or Order acknowledgement form, plus (in the case of Support Services) all proper disbursements incurred by GroundSure. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services (together "Fees").

5.2 The Client shall pay all outstanding Fees to GroundSure in full without deduction, counterclaim or set off within 30 days of the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client ("Payment Date"). Interest on late payments will accrue on a daily basis from the Payment Date until the date of payment (whether before or after judgment) at the rate of 8% per annum.

5.3 The Client shall be deemed to have agreed the amount of any invoice unless an objection is made in writing within 28 days of the date of the invoice. As soon as reasonably practicable after being notified of an objection, without prejudice to clause 5.2 a member of GroundSure's management team will contact the Client and the parties shall then use all reasonable endeavours to resolve the dispute within 15 days.

6 Intellectual Property and Confidentiality

6.1 Subject to

(i) full payment of all relevant Fees and

(ii) compliance with this Contract, the Client is granted (and is permitted to sub-licence to the Beneficiary) a royalty-free, worldwide, non-assignable and (save to the extent set out in this Contract) non-transferable licence to make use of the GroundSure Materials.

6.2 All Intellectual Property in the GroundSure Materials are and shall remain owned by GroundSure or GroundSure's licensors (including without limitation the Third Party Data Providers) the Client acknowledges, and shall procure acknowledgement by the Beneficiary of, such ownership. Nothing in this Contract purports to transfer or assign any rights to the Client or the Beneficiary in respect of such Intellectual Property.

6.3 Third Party Data Providers may enforce any breach of clauses 6.1 and 6.2 against the Client or Beneficiary.

6.4 The Client shall, and shall procure that any recipients of the GroundSure Materials shall:

(i) not remove, suppress or modify any trade mark, copyright or other proprietary marking belonging to GroundSure or any third party from the Services;

(ii) use the information obtained as part of the Services in respect of the subject Site only, and shall not store or reuse any information obtained as part of the Services provided in respect of adjacent or nearby sites;

(iii) not create any product or report which is derived directly or indirectly from the Services (save that those acting in a professional capacity to the Beneficiary may provide advice based upon the Services);

(iv) not combine the Services with or incorporate such Services into any other information data or service;

(v) not reformat or otherwise change (whether by modification, addition or enhancement), the Services (save that those acting for the Beneficiary in a professional capacity shall not be in breach of this clause 6.4(v) where such reformatting is in the normal course of providing advice based upon the Services);

(vi) where a Report and/or Mapping contains material belonging to Ordnance Survey, acknowledge and agree that such content is protected by Crown Copyright and shall not use such content for any purpose outside of receiving the Services; and

(vii) not copy in whole or in part by any means any map prints or run-on copies containing content belonging to Ordnance Survey (other than that contained within Ordnance Survey's OS Street Map) without first being in possession of a valid Paper Map Copying Licence from Ordnance Survey,

6.5 Notwithstanding clause 6.4, the Client may make reasonable use of the GroundSure Materials in order to advise the Beneficiary in a professional capacity. However, GroundSure shall have no liability in respect of any advice, opinion or report given or provided to Beneficiaries by the Client.

6.6 The Client shall procure that any person to whom the Services are made available shall notify GroundSure of any request or requirement to disclose, publish or disseminate any information contained in the Services in accordance with the Freedom of Information Act 2000, the Environmental Information Regulations 2004 or any associated legislation or regulations in force from time to time.

7. Liability: Particular Attention Should Be Paid To This Clause

7.1 This Clause 7 sets out the entire liability of GroundSure, including any liability for the acts or omissions of its employees, agents, consultants, subcontractors and Third Party Content, in respect of:

(i) any breach of contract, including any deliberate breach of the Contract by GroundSure or its employees, agents or subcontractors;

(ii) any use made of the Reports, Services, Materials or any part of them; and

(iii) any representation, statement or tortious act or omission (including negligence) arising under or in connection with the Contract.

7.2 All warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.

7.3 Nothing in the Contract limits or excludes the liability of the Supplier for death or personal injury resulting from negligence, or for any damage or liability incurred by the Client or Beneficiary as a result of fraud or fraudulent misrepresentation.

7.4 GroundSure shall not be liable for

(i) loss of profits;

(ii) loss of business;

(iii) depletion of goodwill and/or similar losses;

(iv) loss of anticipated savings;

(v) loss of goods;

(vi) loss of contract;

(vii) loss of use;

(viii) loss or corruption of data or information;

(ix) business interruption;

(x) any kind of special, indirect, consequential or pure economic loss, costs, damages, charges or expenses;

(xi) loss or damage that arise as a result of the use of all or part of the GroundSure Materials in breach of the Contract;

(xii) loss or damage arising as a result of any error, omission or inaccuracy in any part of the GroundSure Materials where such error, omission or inaccuracy is caused by any Third Party Content or any reasonable interpretation of Third Party Content;

(xiii) loss or damage to a computer, software, modem, telephone or other property; and

(xiv) loss or damage caused by a delay or loss of use of GroundSure's internet ordering service.

7.5 GroundSure's total liability in relation to or under the Contract shall be limited to £10 million for any claim or claims.

7.6 GroundSure shall procure that the Beneficiary shall be bound by limitations and exclusions of liability in favour of GroundSure which accord with those detailed in clauses 7.4 and 7.5 (subject to clause 7.3) in respect of all claims which the Beneficiary may bring against GroundSure in relation to the Services or other matters arising pursuant to the Contract.

8 GroundSure's right to suspend or terminate

8.1 If GroundSure reasonably believes that the Client or Beneficiary has not provided the information or assistance required to enable the proper provision of the Services, GroundSure shall be entitled to suspend all further performance of the Services until such time as any such deficiency has been made good.

8.2 GroundSure shall be entitled to terminate the Contract immediately on written notice in the event that:

(i) the Client fails to pay any sum due to GroundSure within 30

days of the Payment Date; or

(ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an administration order made against it or if a receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or

(iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or

(iv) the Client or the Beneficiary breaches any term of the Contract (including, but not limited to, the obligations in clause 4) which is incapable of remedy or if remediable, is not remedied within five days of notice of the breach.

9. Client's Right to Terminate and Suspend

9.1 Subject to clause 10.1, the Client may at any time upon written notice terminate or suspend the provision of all or any of the Services.

9.2 In any event, where the Client is a consumer (and not a business) he/she hereby expressly acknowledges and agrees that:

(i) the supply of Services under this Contract (and therefore the performance of this Contract) commences immediately upon GroundSure's acceptance of the Order; and

(ii) the Reports and/or Mapping provided under this Contract are

(a) supplied to the Client's specification(s) and in any event

(b) by their nature cannot be returned.

10 Consequences of Withdrawal, Termination or Suspension

10.1 Upon termination of the Contract:

(i) GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client and/or Beneficiary any property of the Client and/or Beneficiary in GroundSure's possession or control; and

(ii) the Client shall pay to GroundSure all and any Fees payable in respect of the performance of the Services up to the date of termination or suspension. In respect of any Support Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination or suspension of the Contract.

11 Anti-Bribery

11.1 The Client warrants that it shall:

(i) comply with all applicable laws, statutes and regulations relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(ii) comply with such of GroundSure's anti-bribery and anti-corruption policies as are notified to the Client from time to time; and

(iii) promptly report to GroundSure any request or demand for any undue financial or other advantage of any kind received by or on behalf of the Client in connection with the performance of this Contract.

11.2 Breach of this Clause 11 shall be deemed a material breach of this Contract.

12 General

12.1 The Mapping contained in the Services is protected by Crown copyright and must not be used for any purpose other than as part of the Services or as specifically provided in the Contract.

12.2 The Client shall be permitted to make one copy only of each Report or Mapping Order. Thereafter the Client shall be entitled to make unlimited copies of the Report or Mapping Order only in accordance with an Ordnance Survey paper map copy license available through GroundSure.

12.3 GroundSure reserves the right to amend or vary this Contract. No amendment or variation to this Contract shall be valid unless signed by an authorised representative of GroundSure.

12.4 No failure on the part of GroundSure to exercise, and no delay in exercising, any right, power or provision under this Contract shall operate as a waiver thereof.

12.5 Save as expressly provided in this Contract, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.

12.6 The Secretary of State for Business, Innovation and Skills ("BIS") or BIS' successor body, as the case may be, acting through Ordnance Survey may enforce a breach of clause 6.4(vi) and clause 6.4(vii) of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.

12.7 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:

(i) the Client or Beneficiary's failure to provide facilities, access or information;

(ii) fire, storm, flood, tempest or epidemic;

(iii) Acts of God or the public enemy;

(iv) riot, civil commotion or war;

(v) strikes, labour disputes or industrial action;

(vi) acts or regulations of any governmental or other agency;

(vii) suspension or delay of services at public registries by Third

Party Data Providers;

(viii) changes in law; or

(ix) any other reason beyond GroundSure's reasonable control.

In the event that GroundSure is prevented from performing the Services (or any part thereof) in accordance with this clause 12.6 for a period of not less than 30 days then GroundSure shall be entitled to terminate this Contract immediately on written notice to the Client.

12.8 Any notice provided shall be in writing and shall be deemed to be properly

given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.

12.9 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email (save to the extent such day is not a working day where it shall be deemed to have been delivered on the next working day) and on the second working day after the day of posting if sent by first class post.

12.10 The Contract constitutes the entire agreement between the parties and shall supersede all previous arrangements between the parties relating to the subject matter hereof.

12.11 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.

12.12 This Contract shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with this Contract shall be subject to the exclusive jurisdiction of the English courts.

12.13 GroundSure is an executive member of the Council of Property Search Organisation (CoPSO) and has signed up to the Search Code administered by the Property Codes Compliance Board (PCCB). All Risk Screening Reports shall be supplied in accordance with the provisions of the Search Code.

12.14 If the Client or Beneficiary has a complaint about the Services, written notice should be given to the Compliance Officer at GroundSure who will respond in a timely manner.

12.15 The Client agrees that it shall, and shall procure that each Beneficiary shall, treat in confidence all Confidential Information and shall not, and shall procure that each Beneficiary shall not (i) disclose any Confidential Information to any third party other than in accordance with the terms of this Contract; and (ii) use Confidential Information for a purpose other than the exercise of its rights and obligations under this Contract. Subject to clause 6.6, nothing shall prevent the Client or any Beneficiary from disclosing Confidential Information to the extent required by law

Site Details:
 ABERGELLI FACH FARM, FELINDRE, ABERTAWE, SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series
Map date: 1876-1878
Scale: 1:10,560
Printed at: 1:10,560



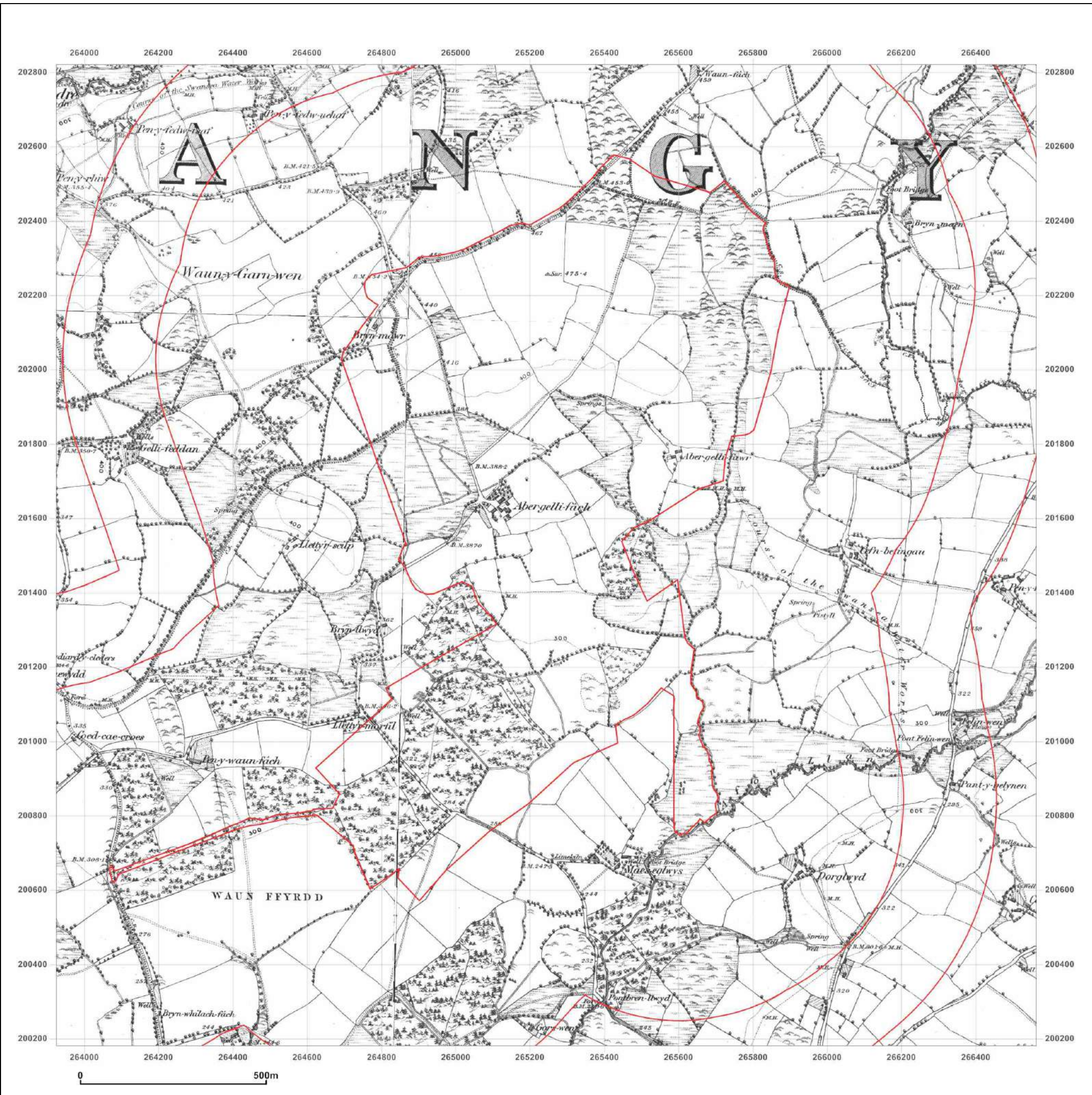
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SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: 1896-1897

Scale: 1:10,560

Printed at: 1:10,560

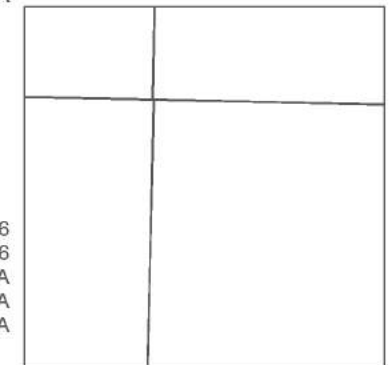


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Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
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Edition N/A
Copyright N/A
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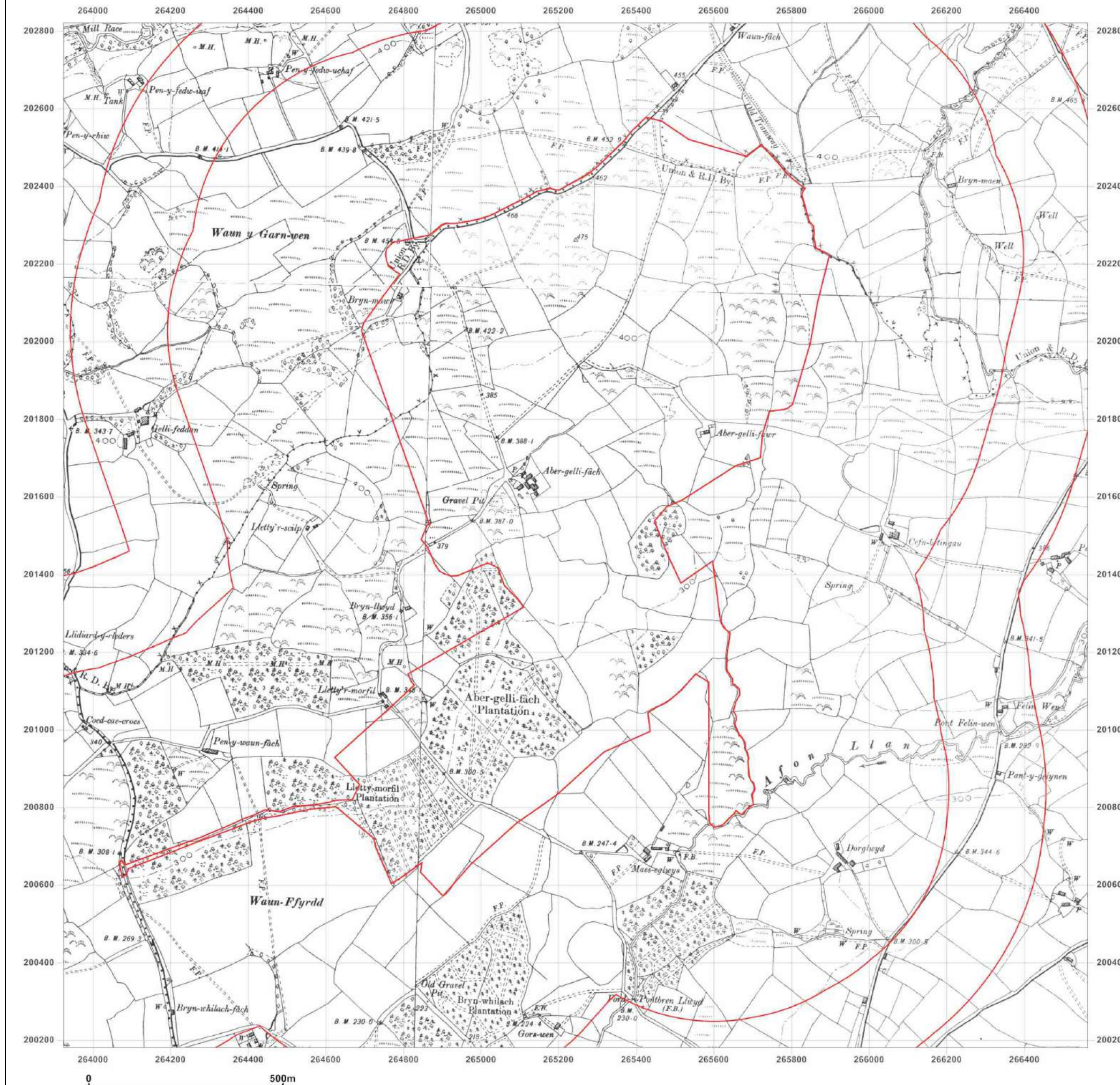


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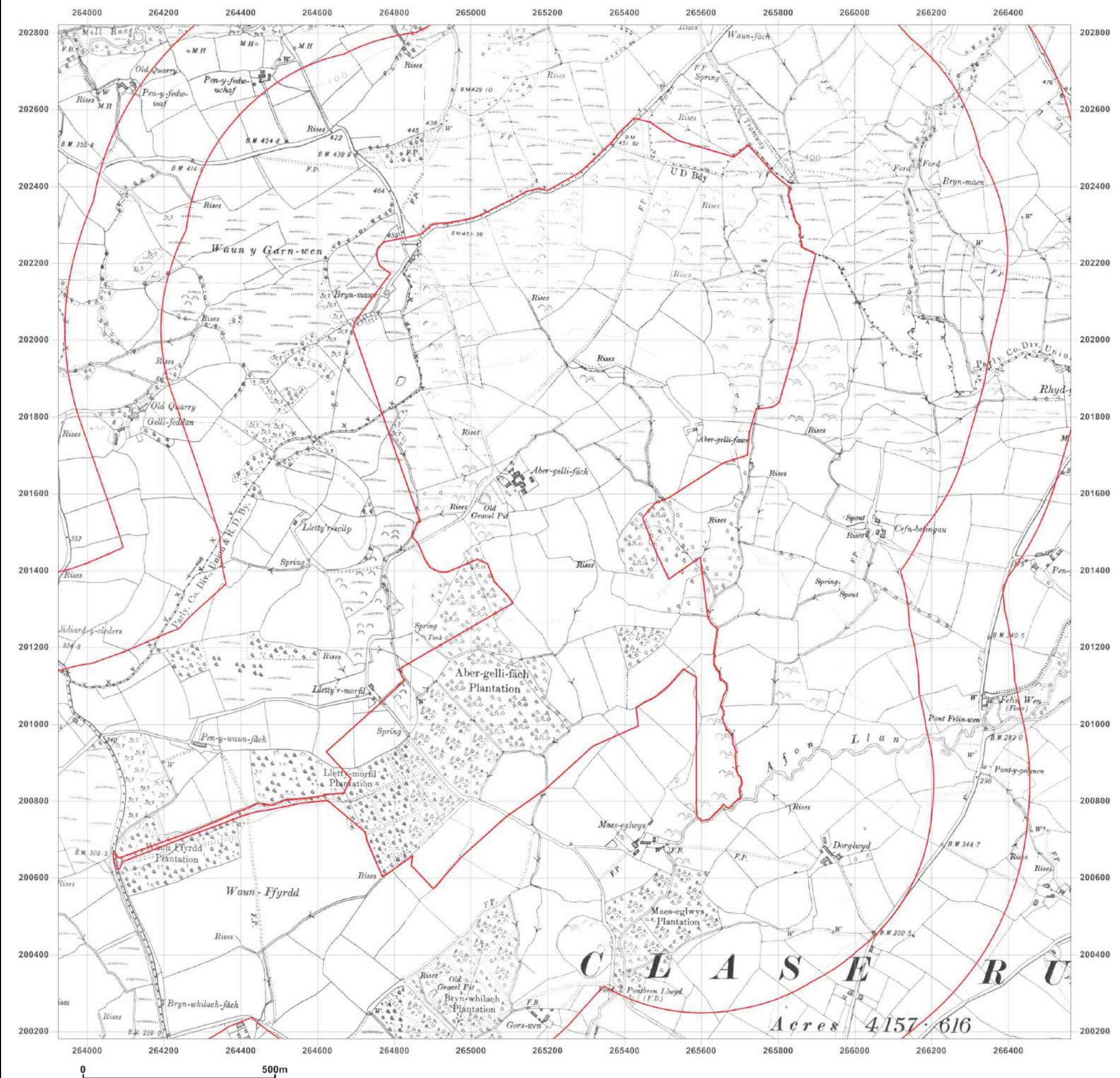
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Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series
Map date: 1913-1914
Scale: 1:10,560
Printed at: 1:10,560



Surveyed 1875 Revised 1913 Edition N/A Copyright N/A Levelled N/A	Surveyed 1875 Revised 1913 Edition N/A Copyright N/A Levelled N/A
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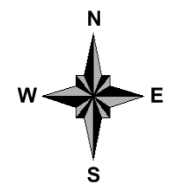
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 SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series
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Printed at: 1:10,560



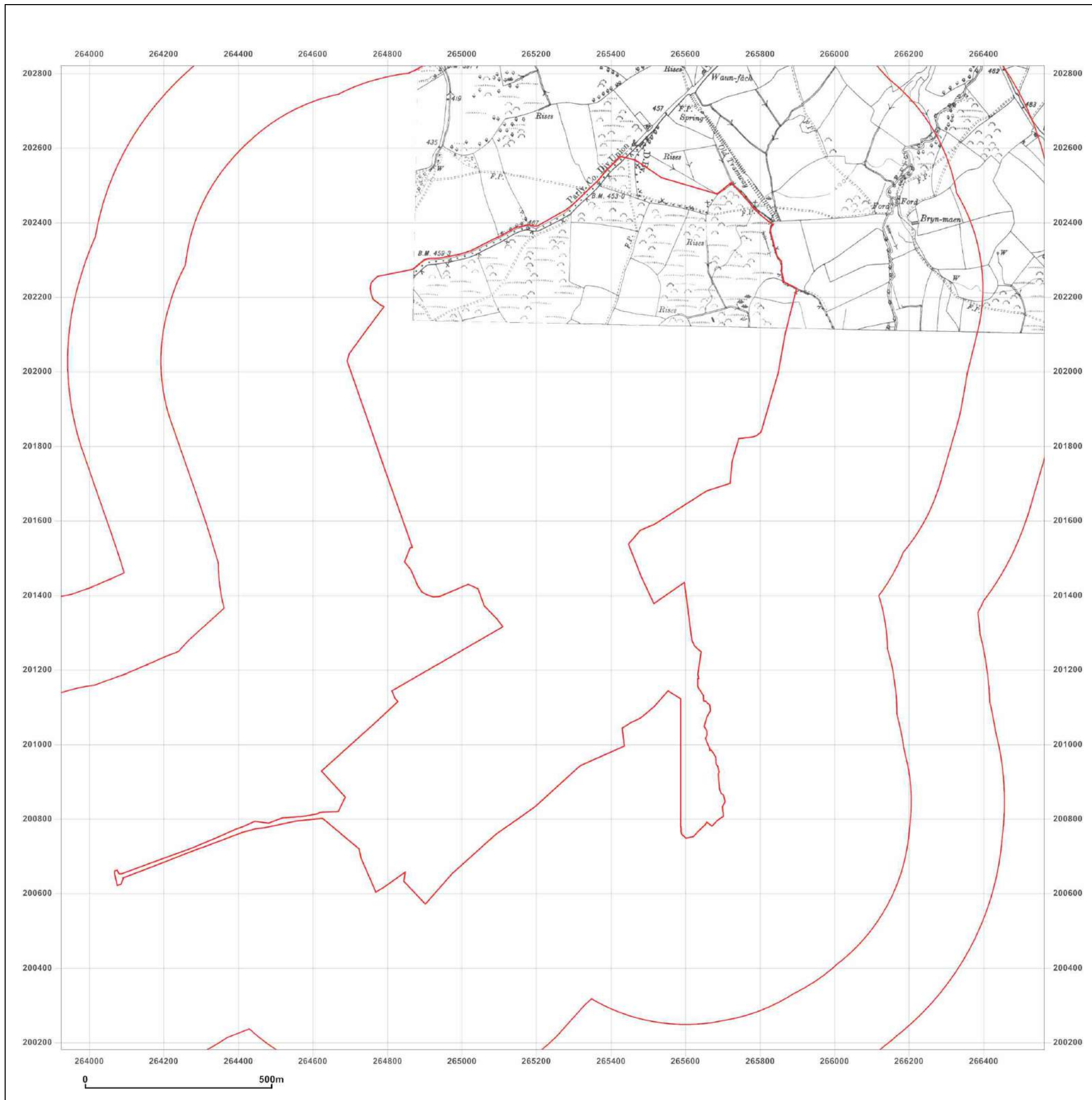
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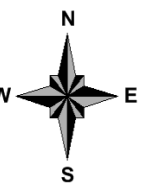
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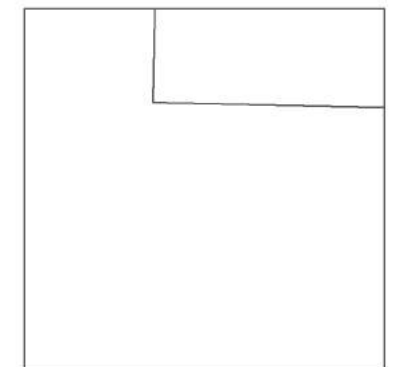
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Scale: 1:10,560

Printed at: 1:10,560



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Edition N/A
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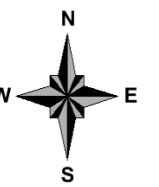
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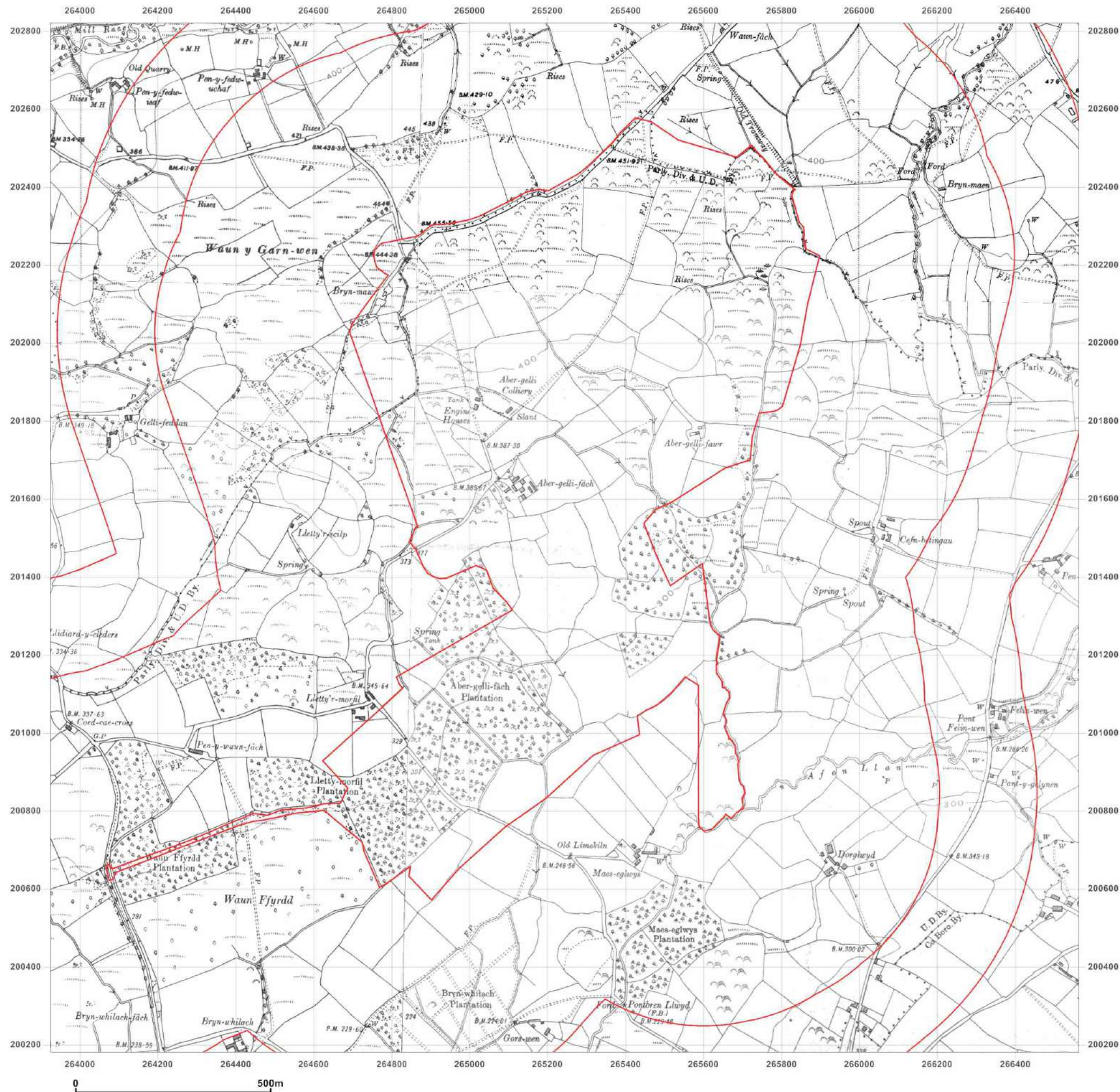
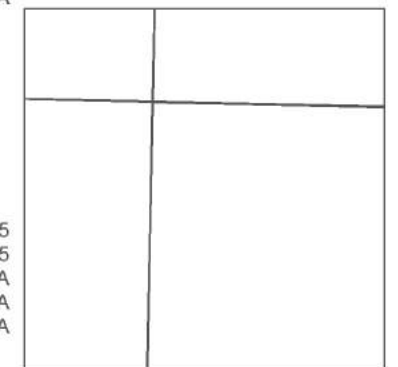


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Edition 1938
Copyright N/A
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Surveyed N/A
Revised N/A
Edition N/A
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Edition N/A
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Revised 1936
Edition N/A
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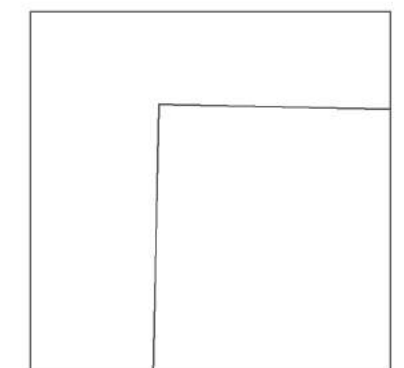
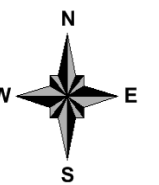
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Surveyed 1876
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

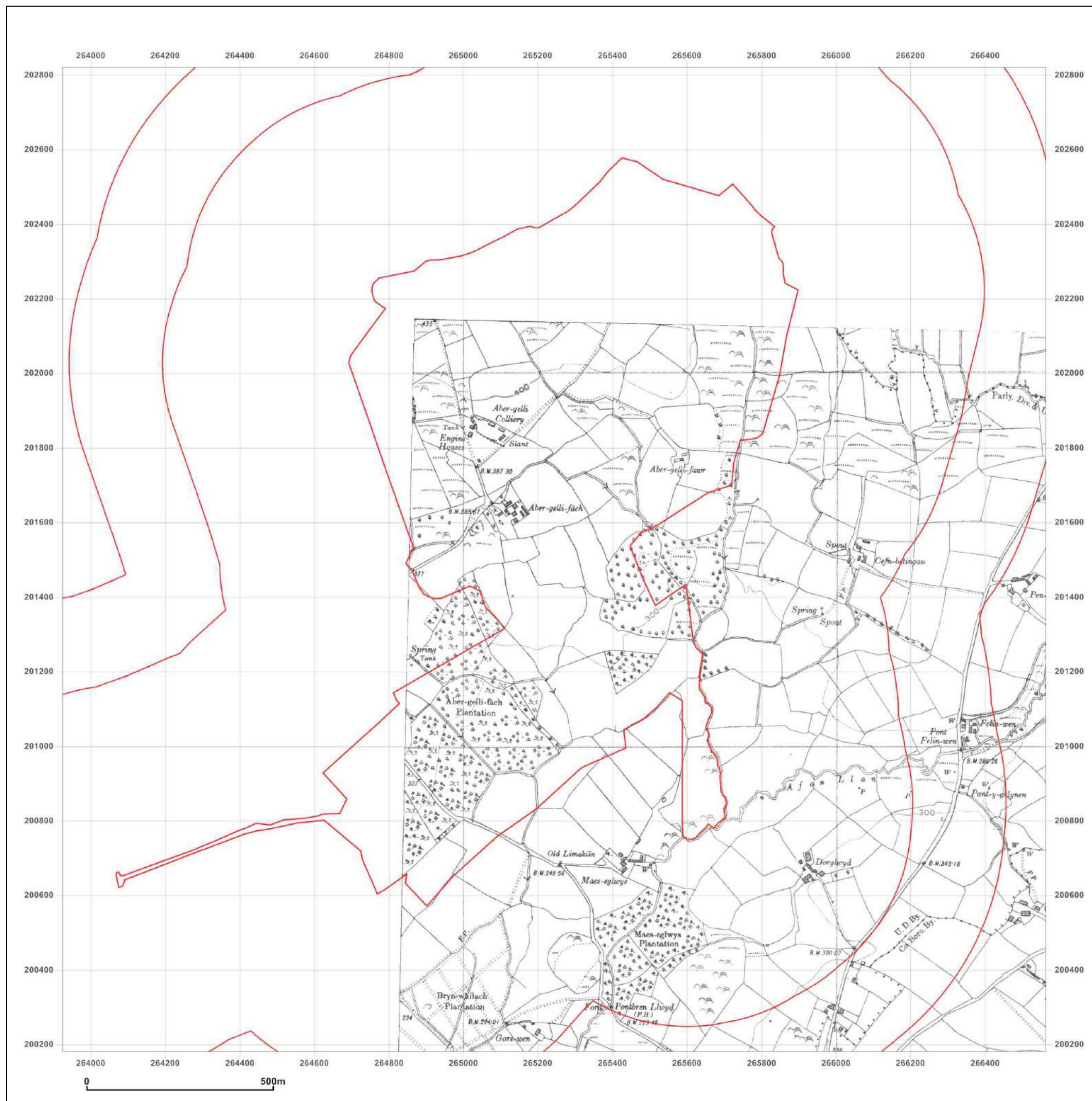


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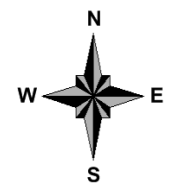
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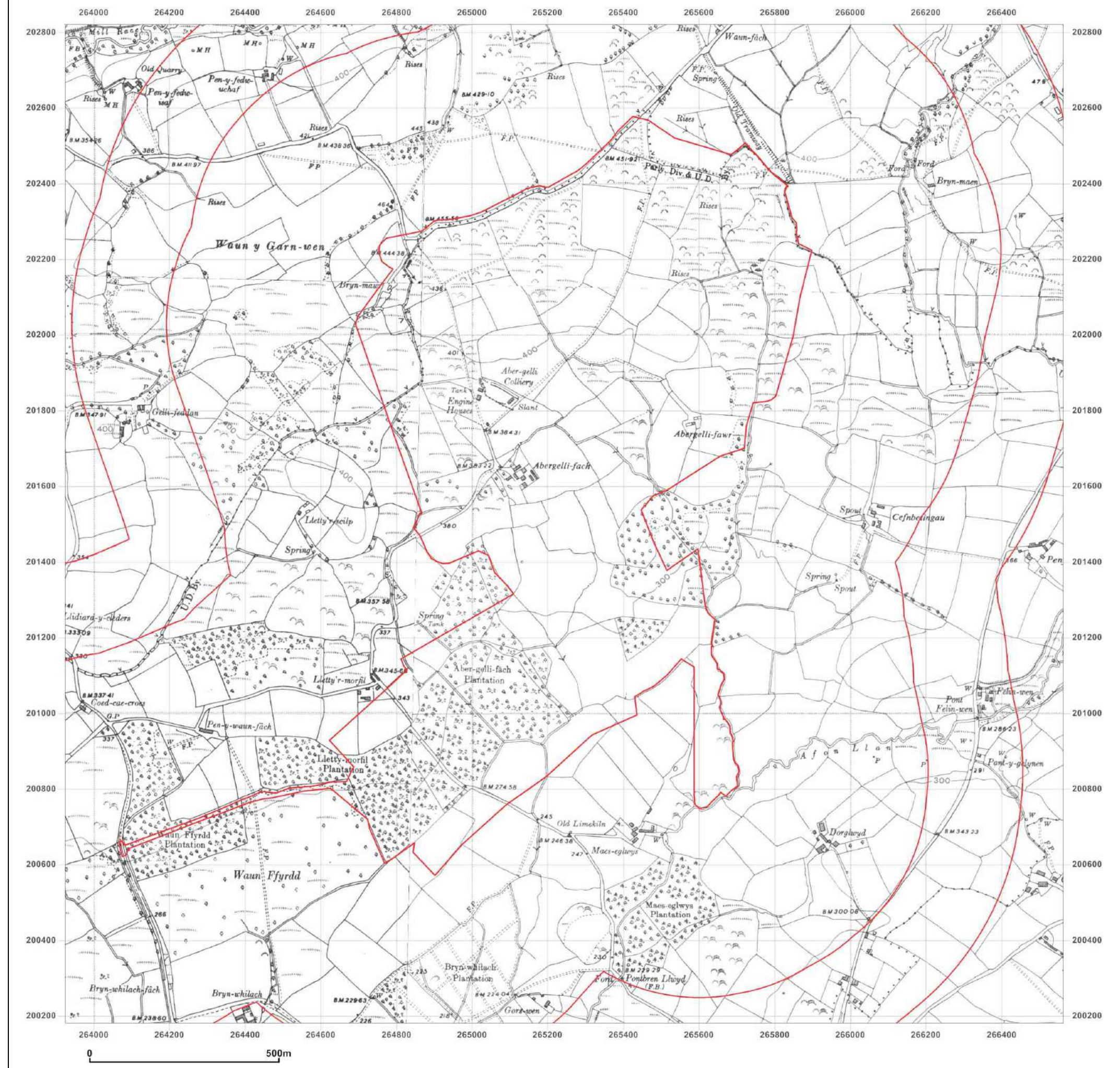
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Client Ref: PB84891
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Grid Ref: 265243, 201500

Map Name: County Series
Map date: 1948
Scale: 1:10,560
Printed at: 1:10,560



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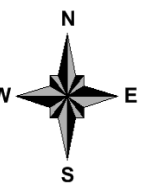
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Map Name: Provisional

Map date: 1964

Scale: 1:10,560

Printed at: 1:10,560



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Edition N/A
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Revised 1964
Edition N/A
Copyright N/A
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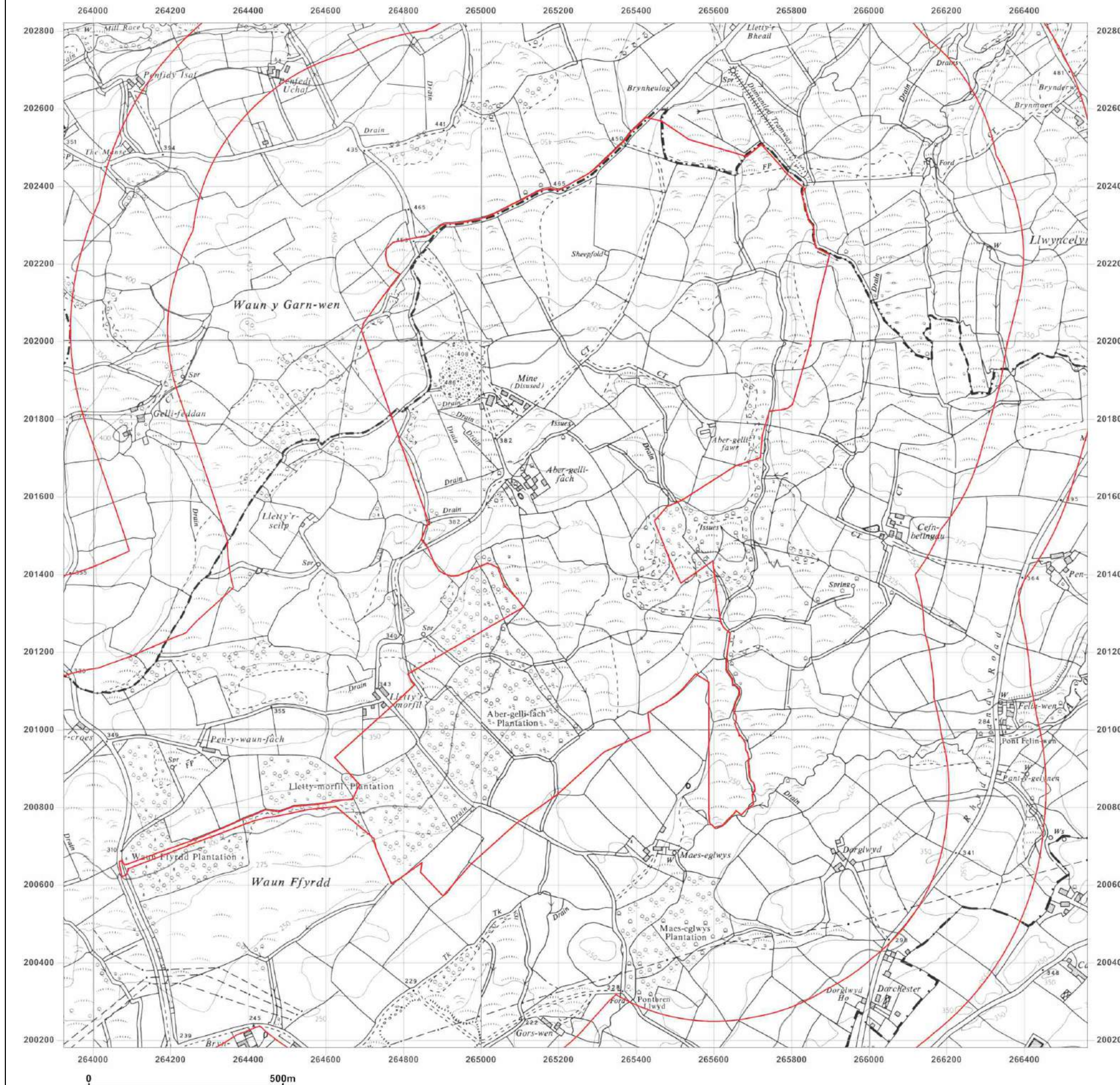


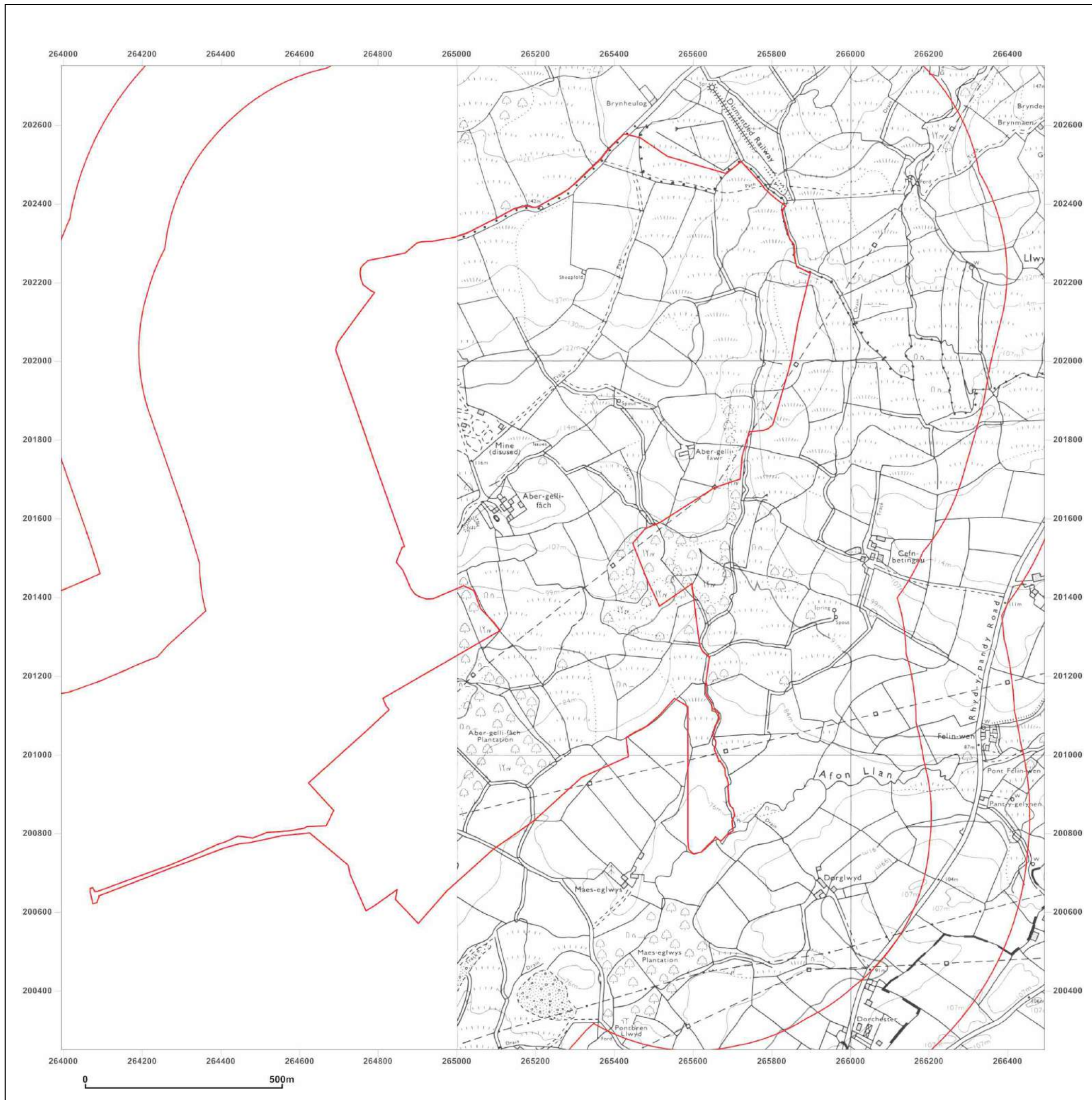
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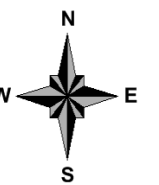
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Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: National Grid

Map date: 1975

Scale: 1:10,000

Printed at: 1:10,000



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Revised 1975
Edition N/A
Copyright N/A
Levelled N/A

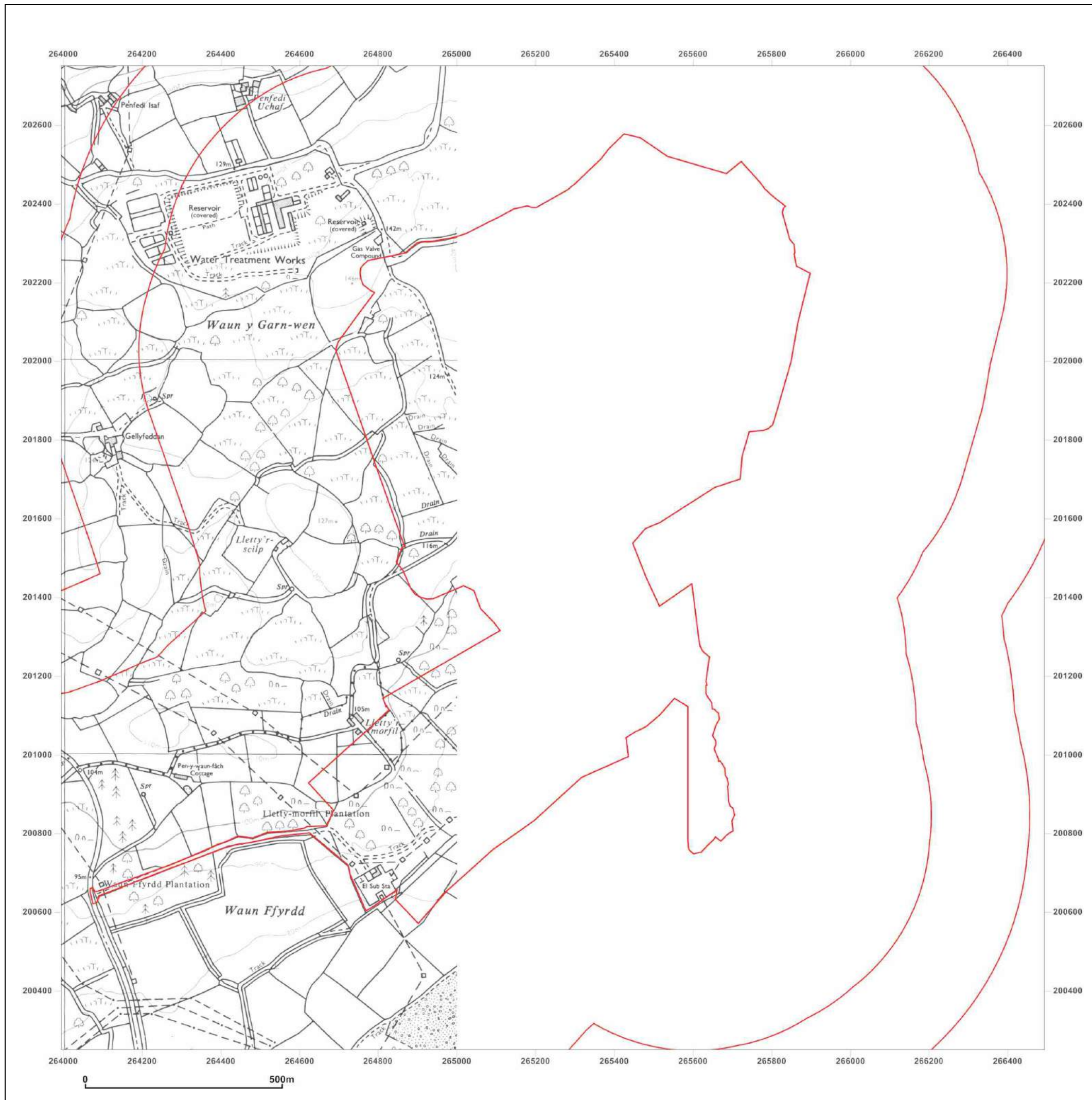


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Client Ref: PB84891
Report Ref: GS-1587646
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Map Name: National Grid

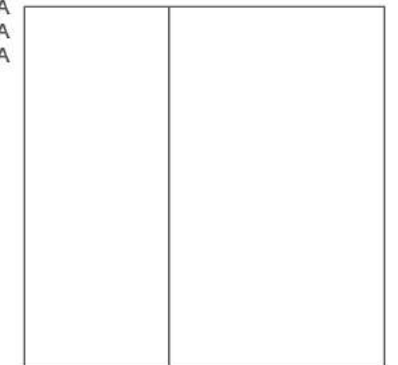
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Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1990
Revised 1991
Edition N/A
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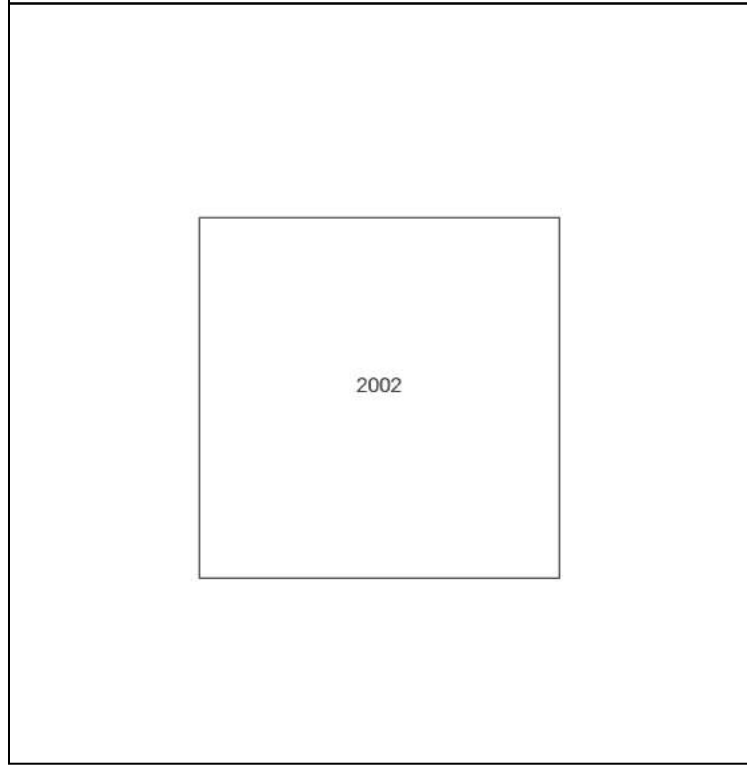
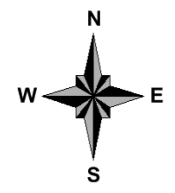
Production date: 30 July 2014

To view map legend click here [Legend](#)

Site Details:
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Client Ref: PB84891
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Grid Ref: 265243, 201500

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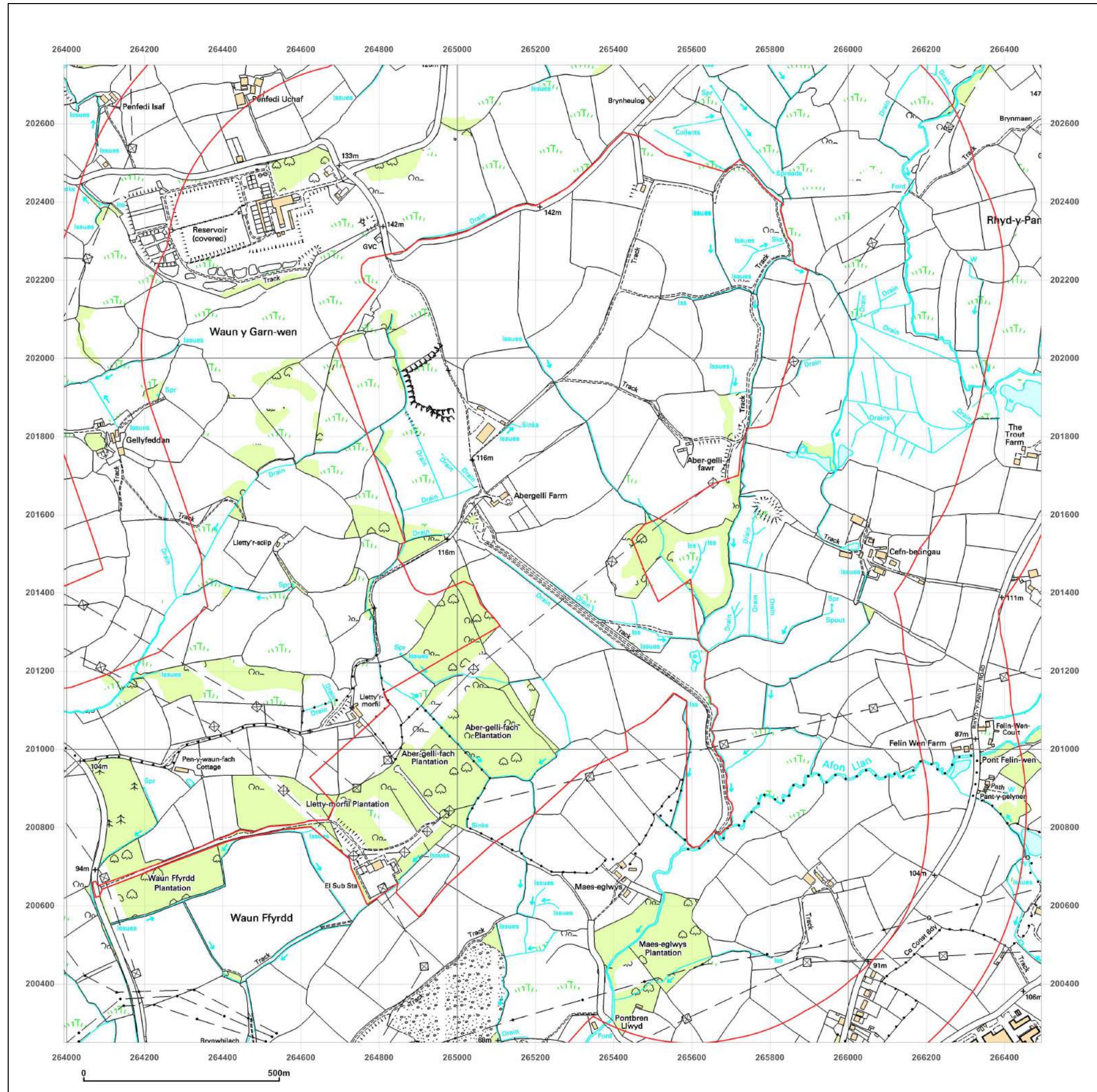
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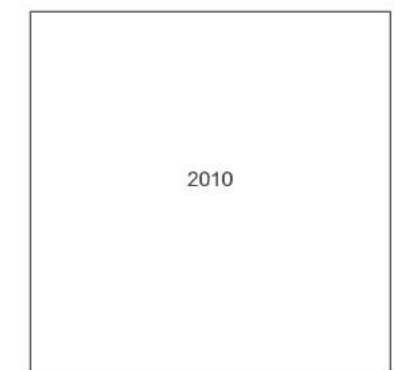
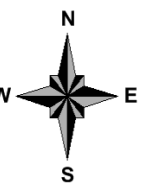
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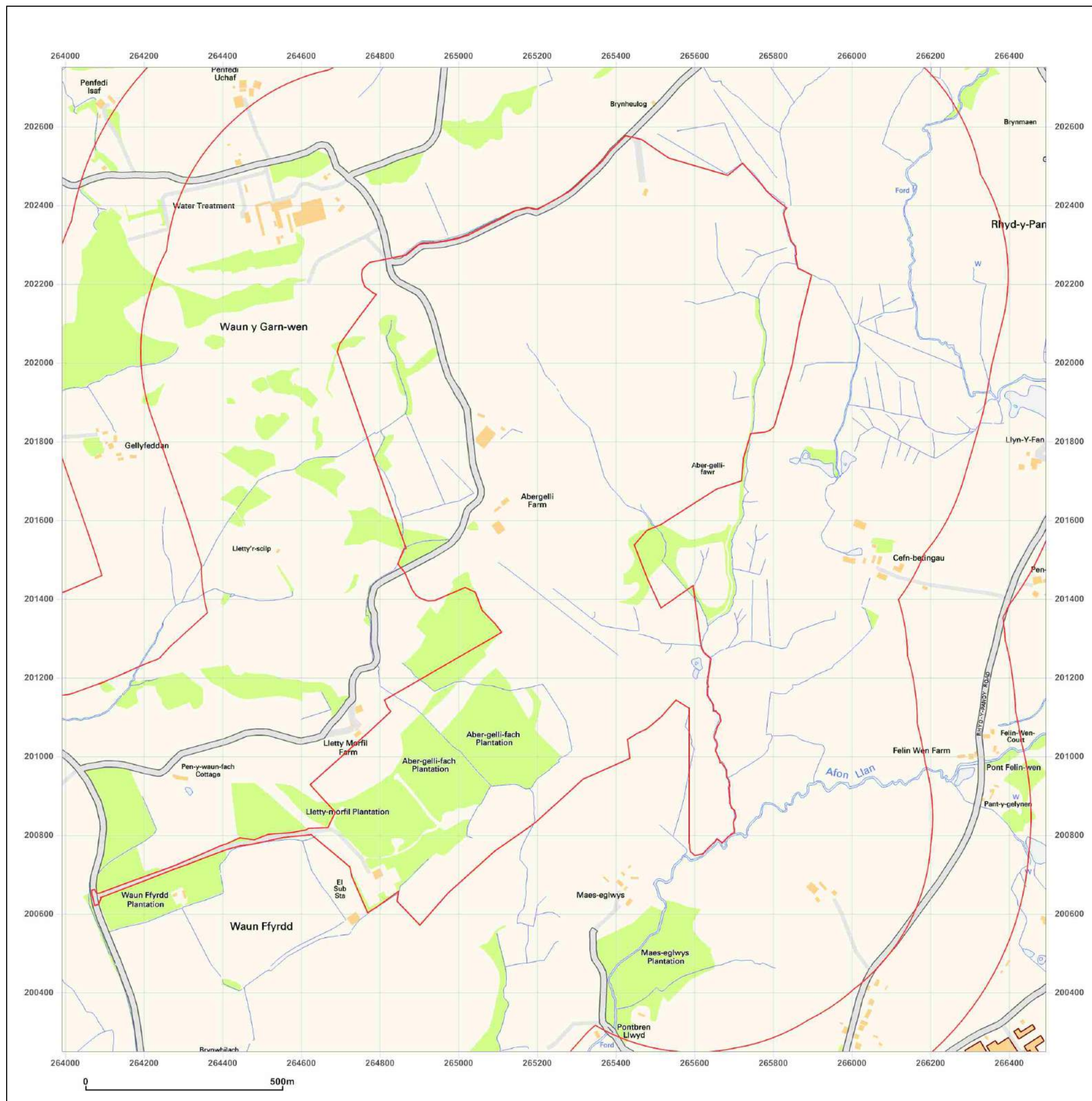


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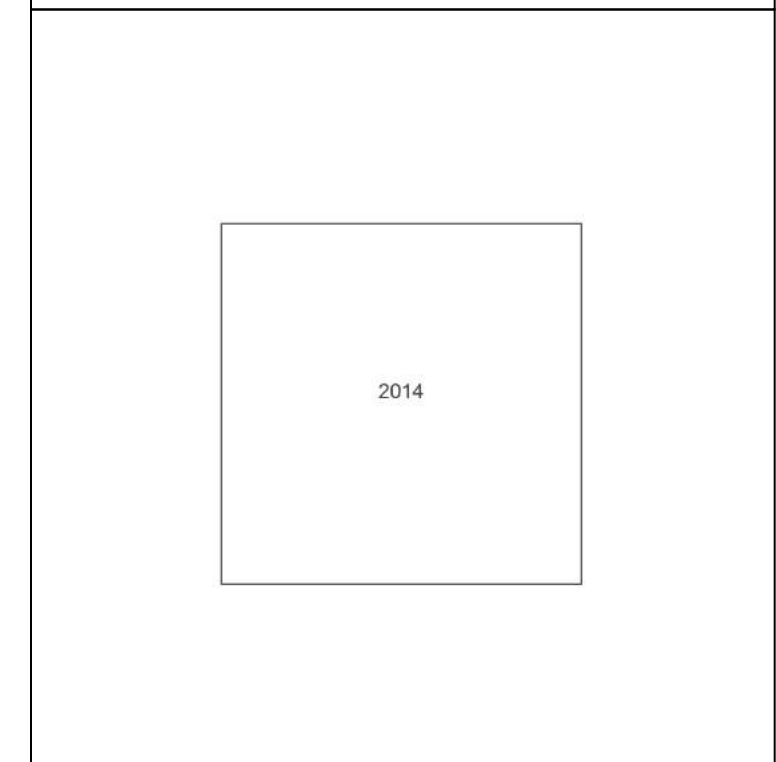
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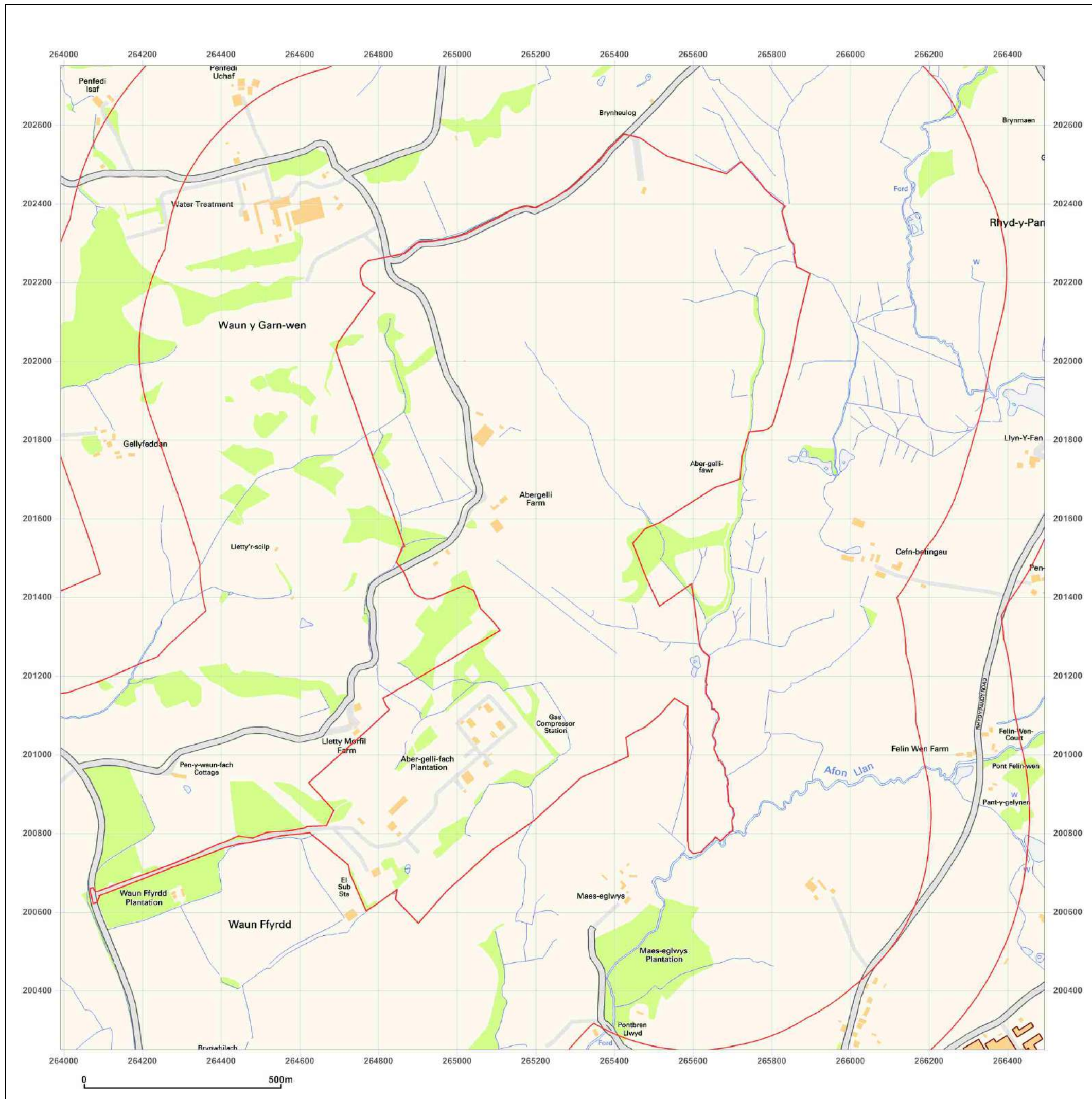


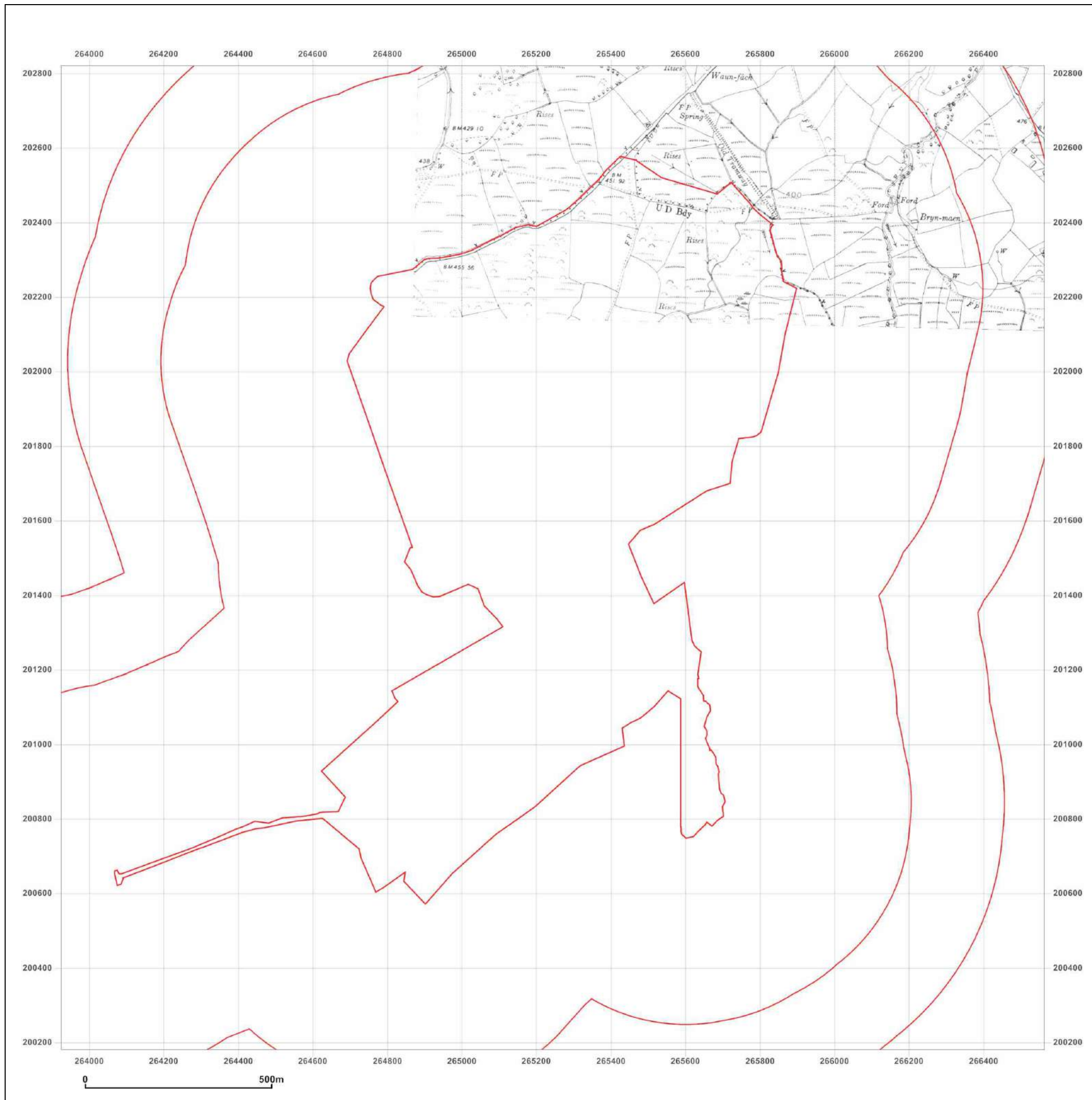
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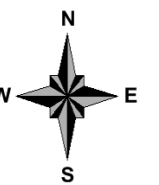
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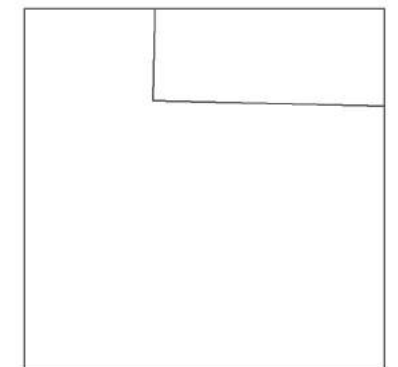
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Levelled 1947



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Site Details:

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SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: County Series

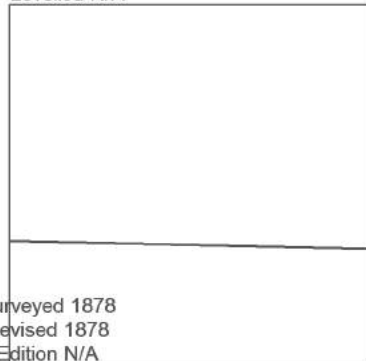
Map date: 1876-1878

Scale: 1:2,500

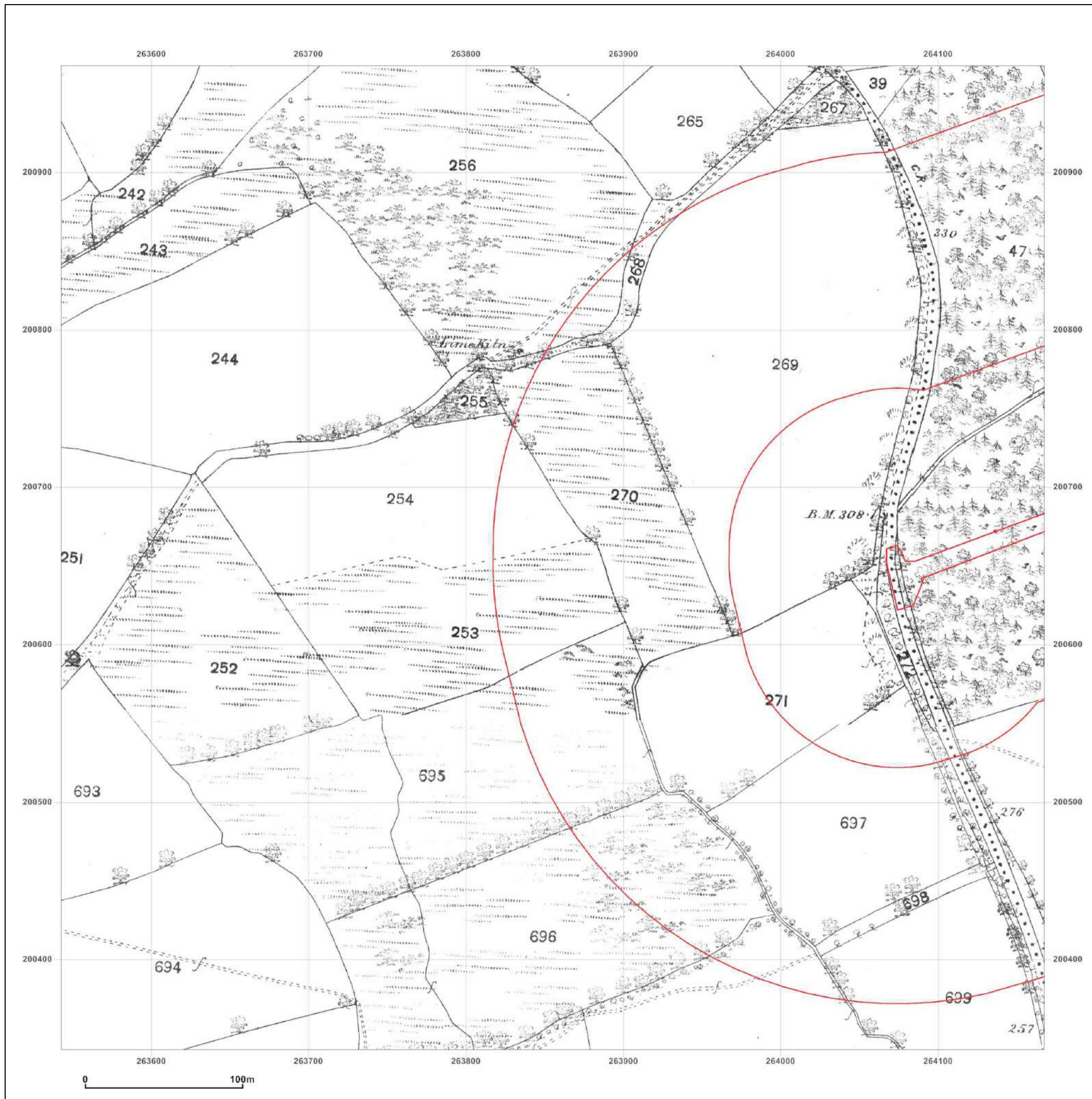
Printed at: 1:2,500



Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1878
Revised 1878
Edition N/A
Copyright N/A
Levelled N/A



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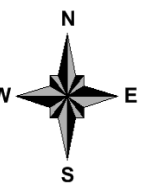
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Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: County Series

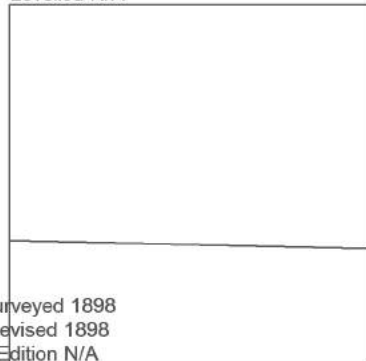
Map date: 1898

Scale: 1:2,500

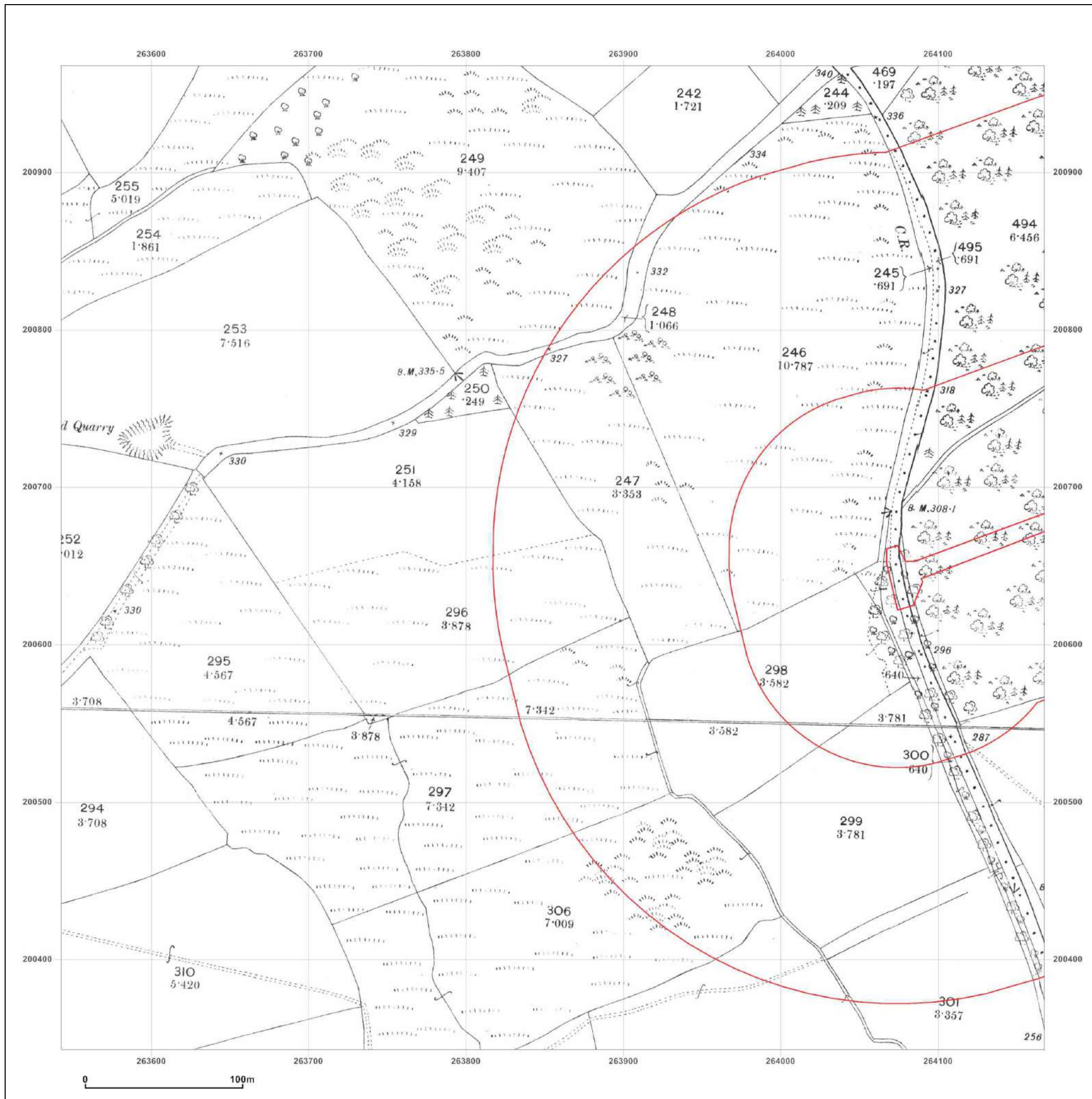
Printed at: 1:2,500



Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A



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Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: County Series

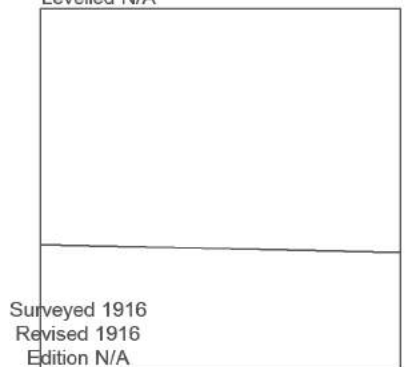
Map date: 1916

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A

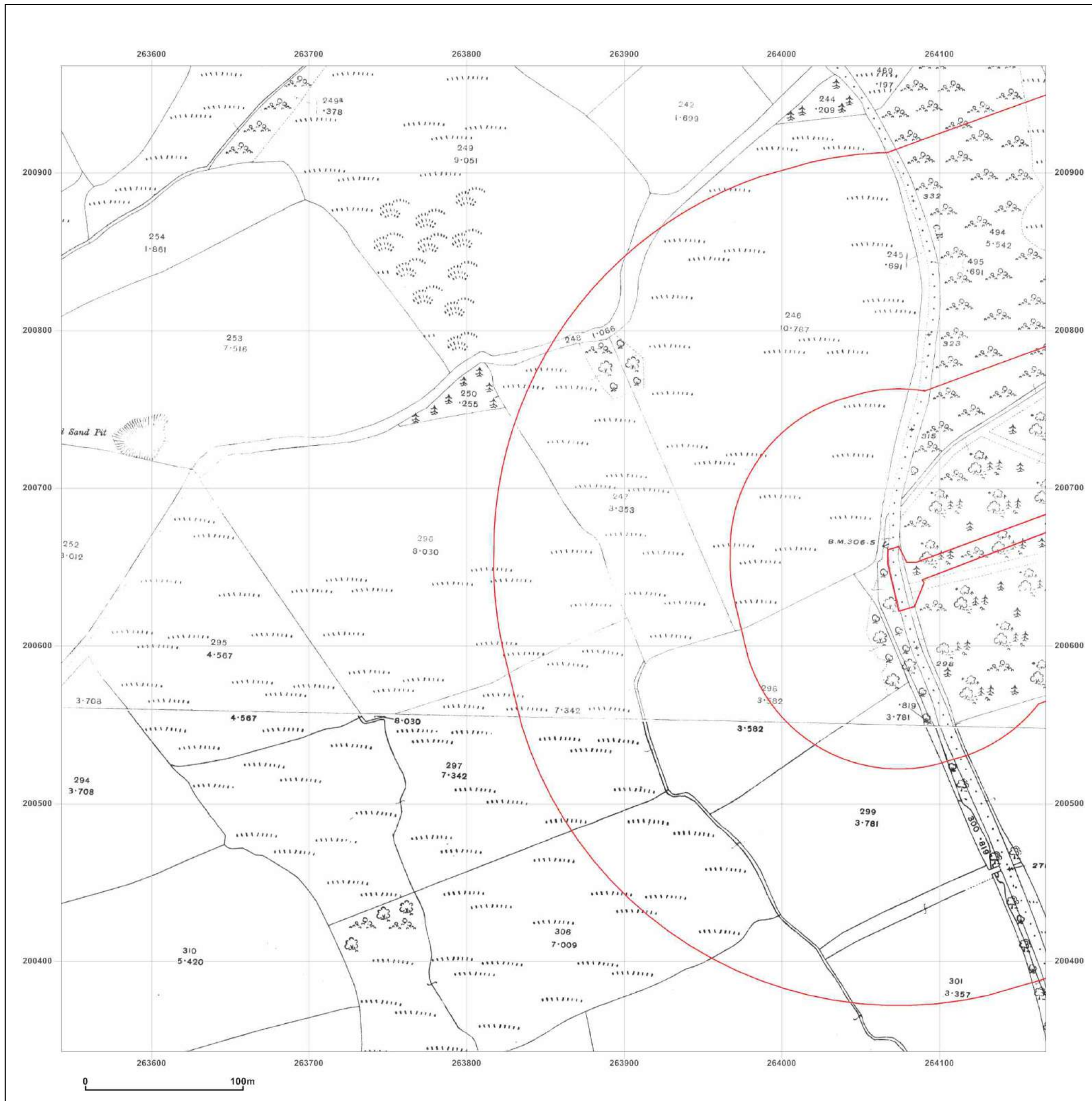


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Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: County Series


Map date: 1935

Scale: 1:2,500

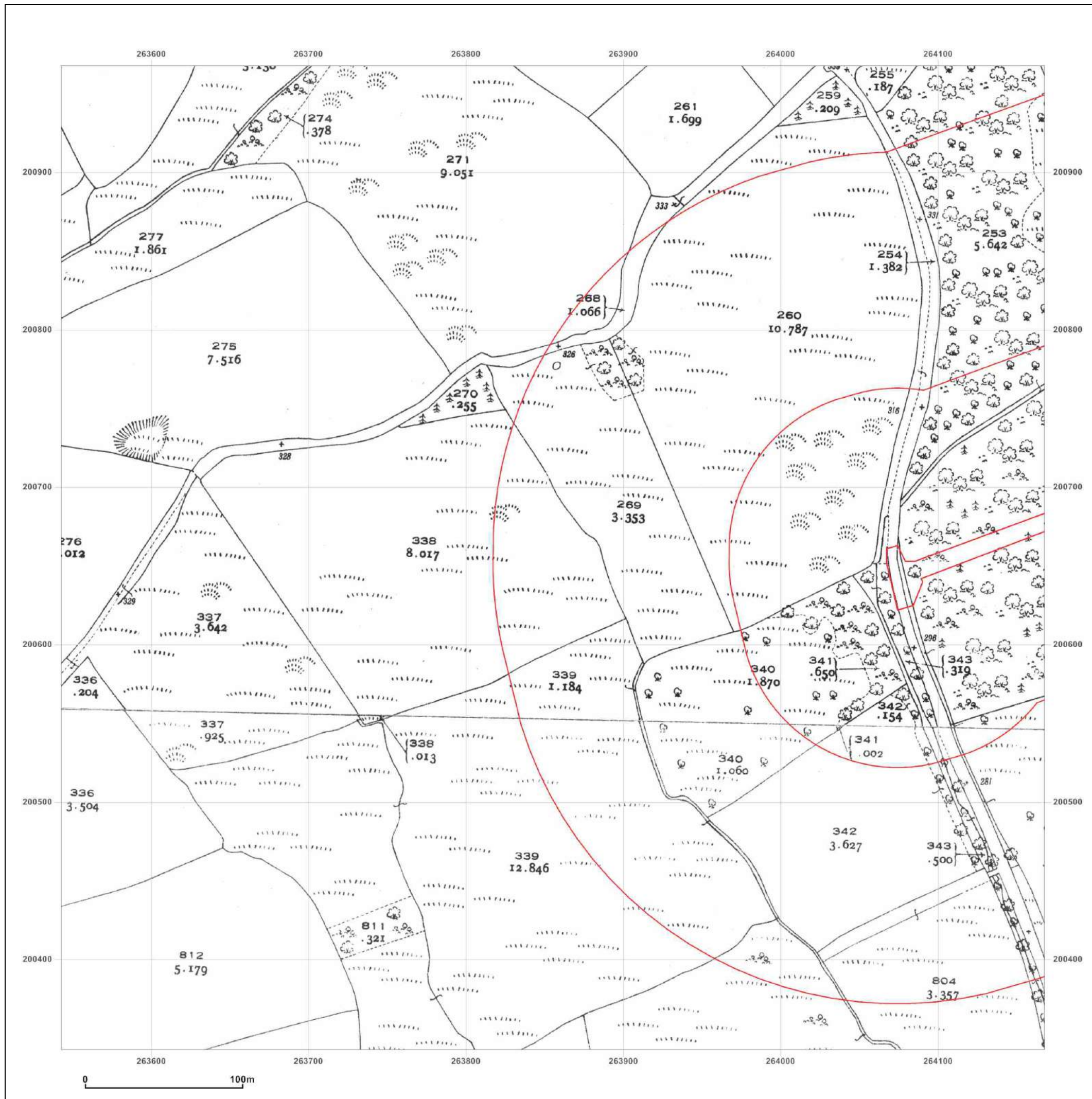
Printed at: 1:2,500



Surveyed 1935
Revised 1935
Edition N/A
Copyright N/A
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Surveyed 1935
Revised 1935
Edition N/A
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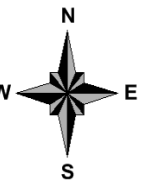
Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: National Grid

Map date: 1958

Scale: 1:2,500

Printed at: 1:2,500



<p>Surveyed 1958 Revised 1958 Edition N/A Copyright 1959 Levelled 1956</p>	<p>Surveyed 1958 Revised 1958 Edition N/A Copyright 1959 Levelled 1956</p>
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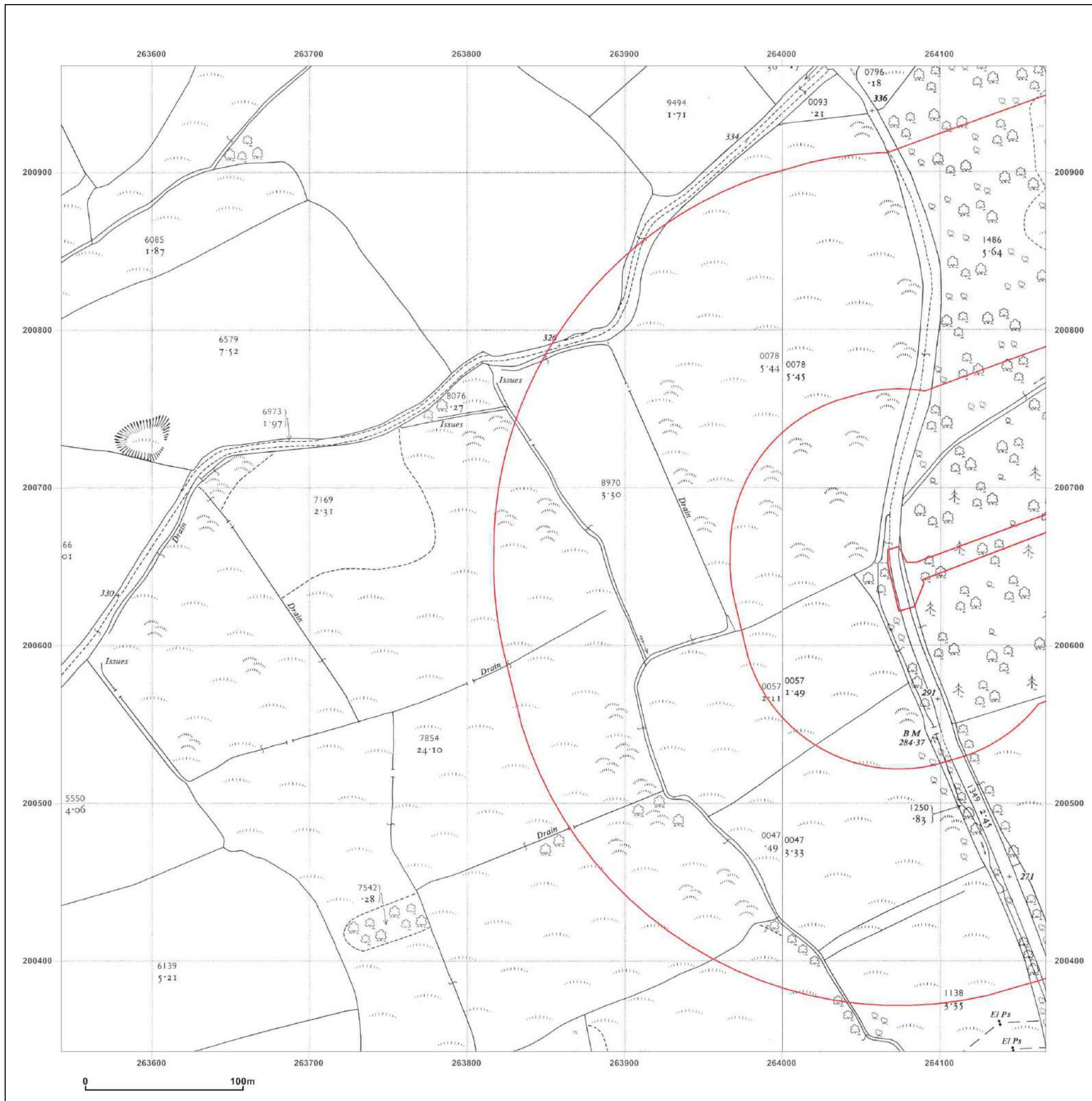


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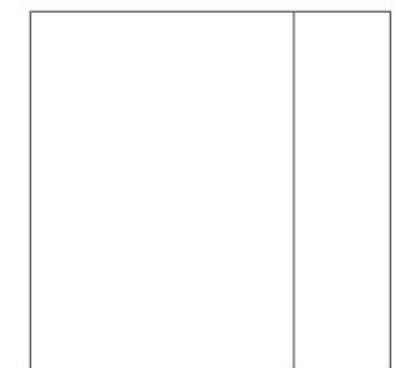
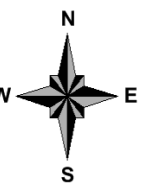
Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1960
Edition N/A
Copyright 1962
Levelled 1956

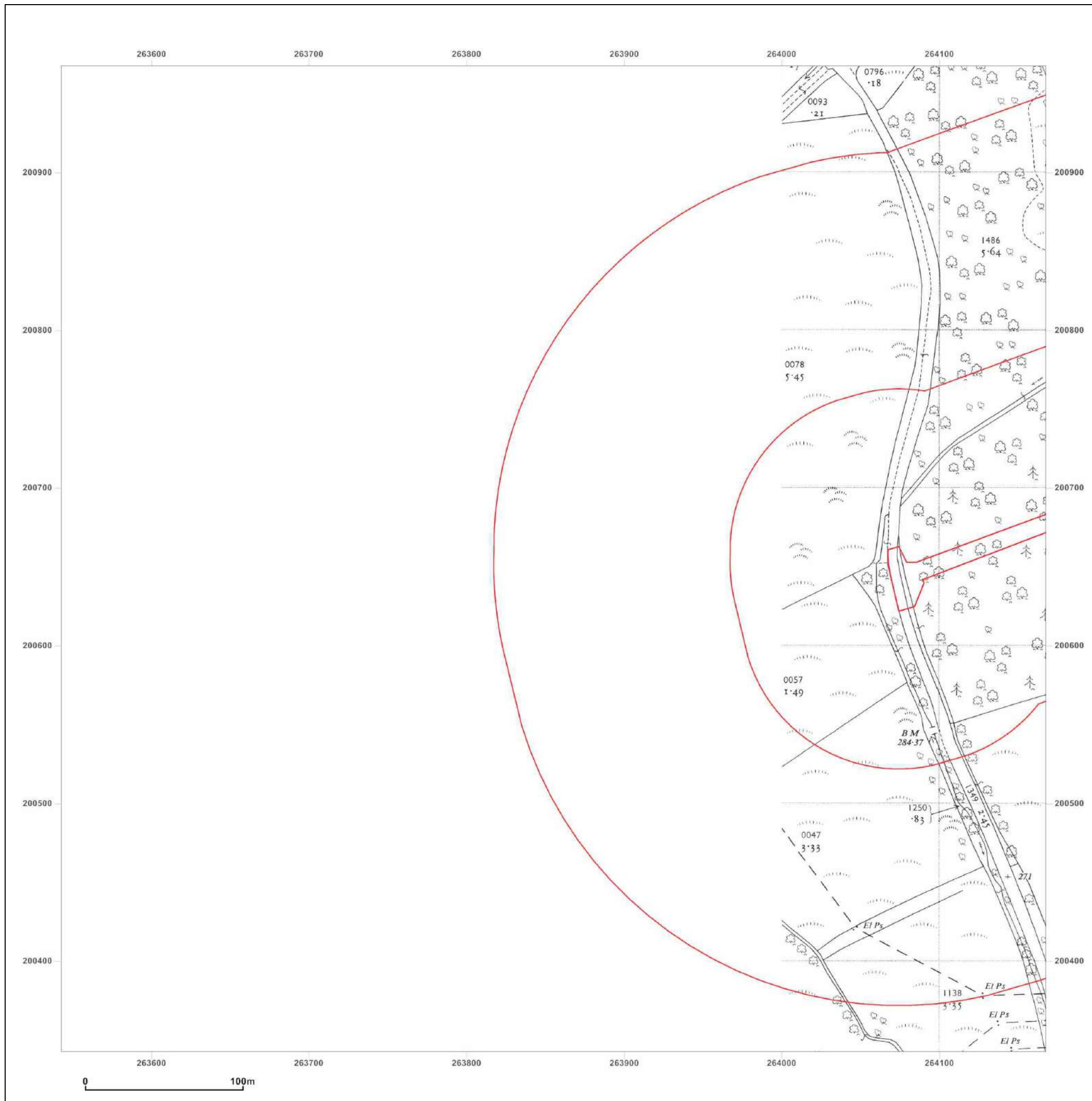


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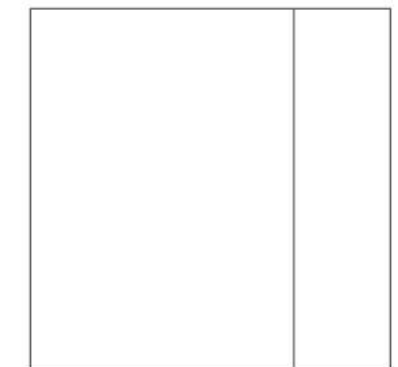
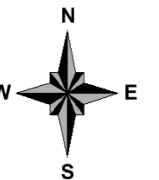
Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: National Grid

Map date: 1974

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1963

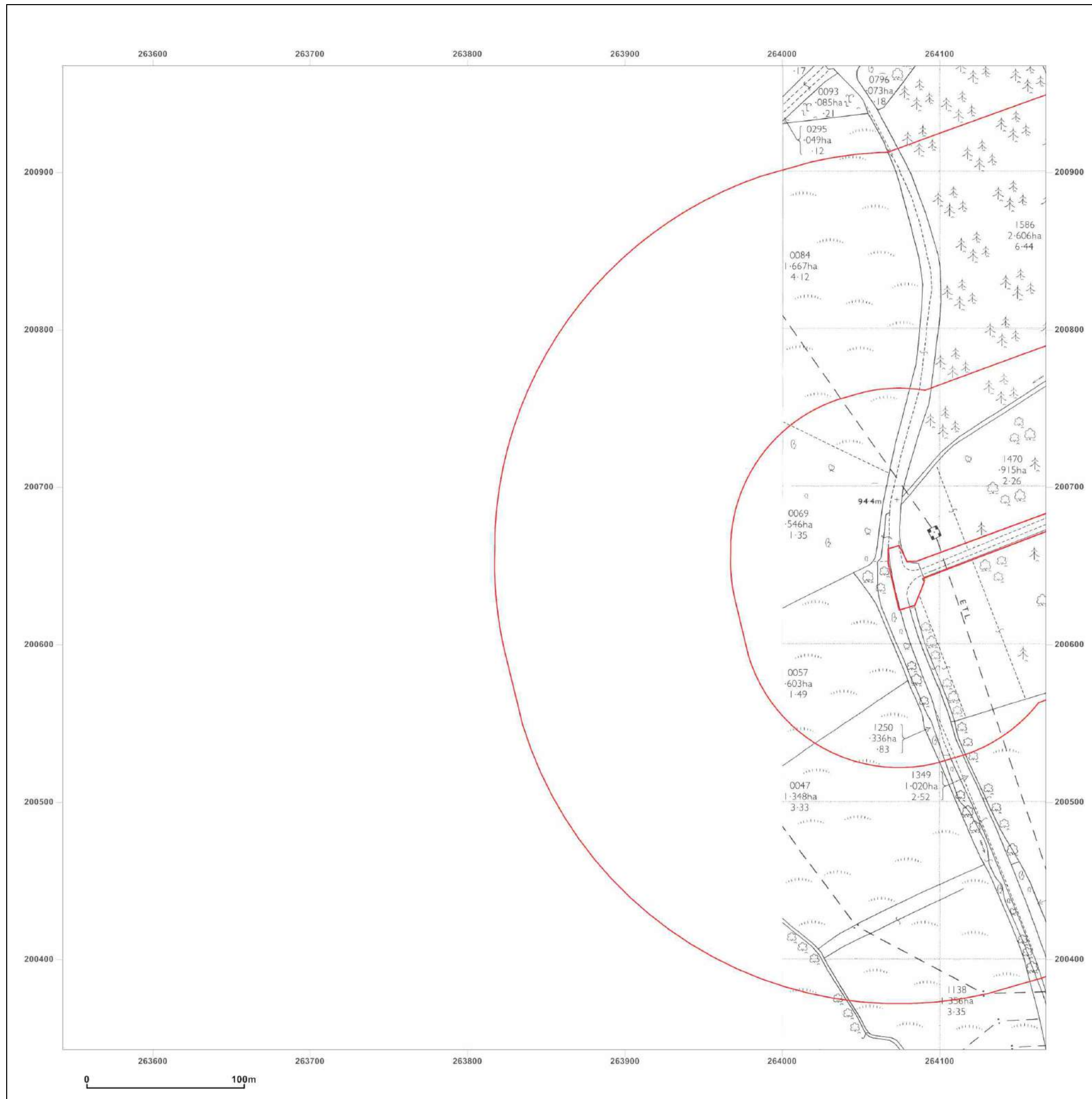


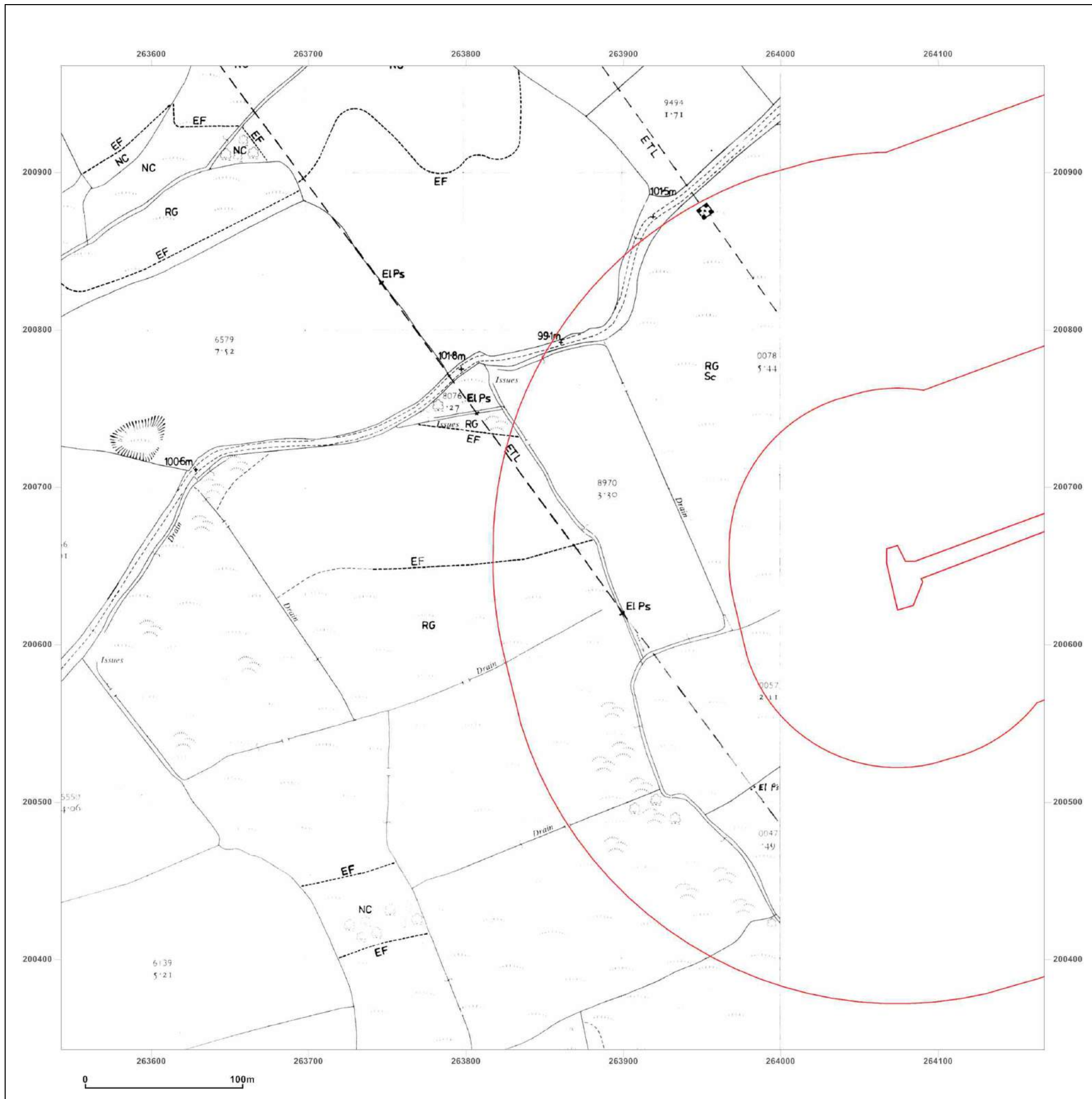
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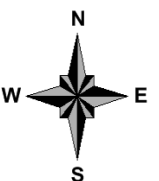
Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: National Grid

Map date: 1989

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1962
Revised 1989
Edition N/A
Copyright 1989
Levelled 1962



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Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



<p>Surveyed N/A Revised N/A Edition N/A Copyright 1993 Levelled N/A</p>	<p>Surveyed N/A Revised N/A Edition N/A Copyright 1993 Levelled N/A</p>
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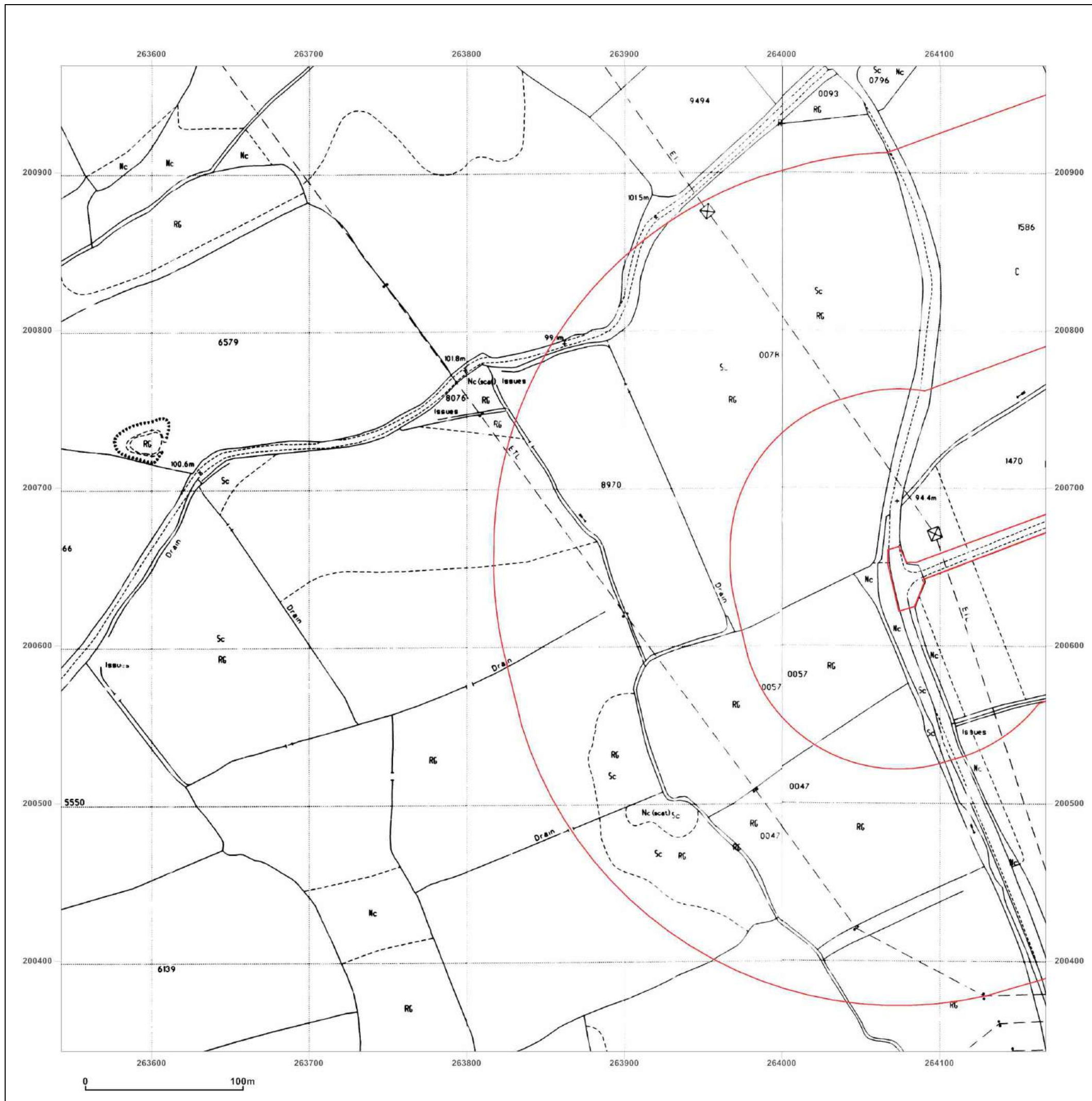


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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: County Series

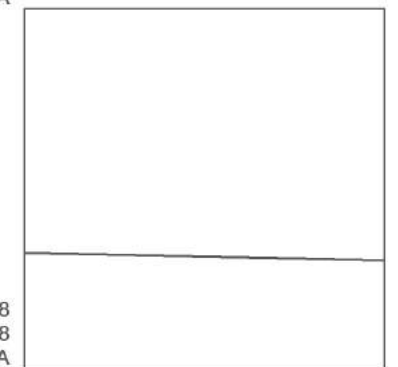
Map date: 1876-1878

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1878
Revised 1878
Edition N/A
Copyright N/A
Levelled N/A

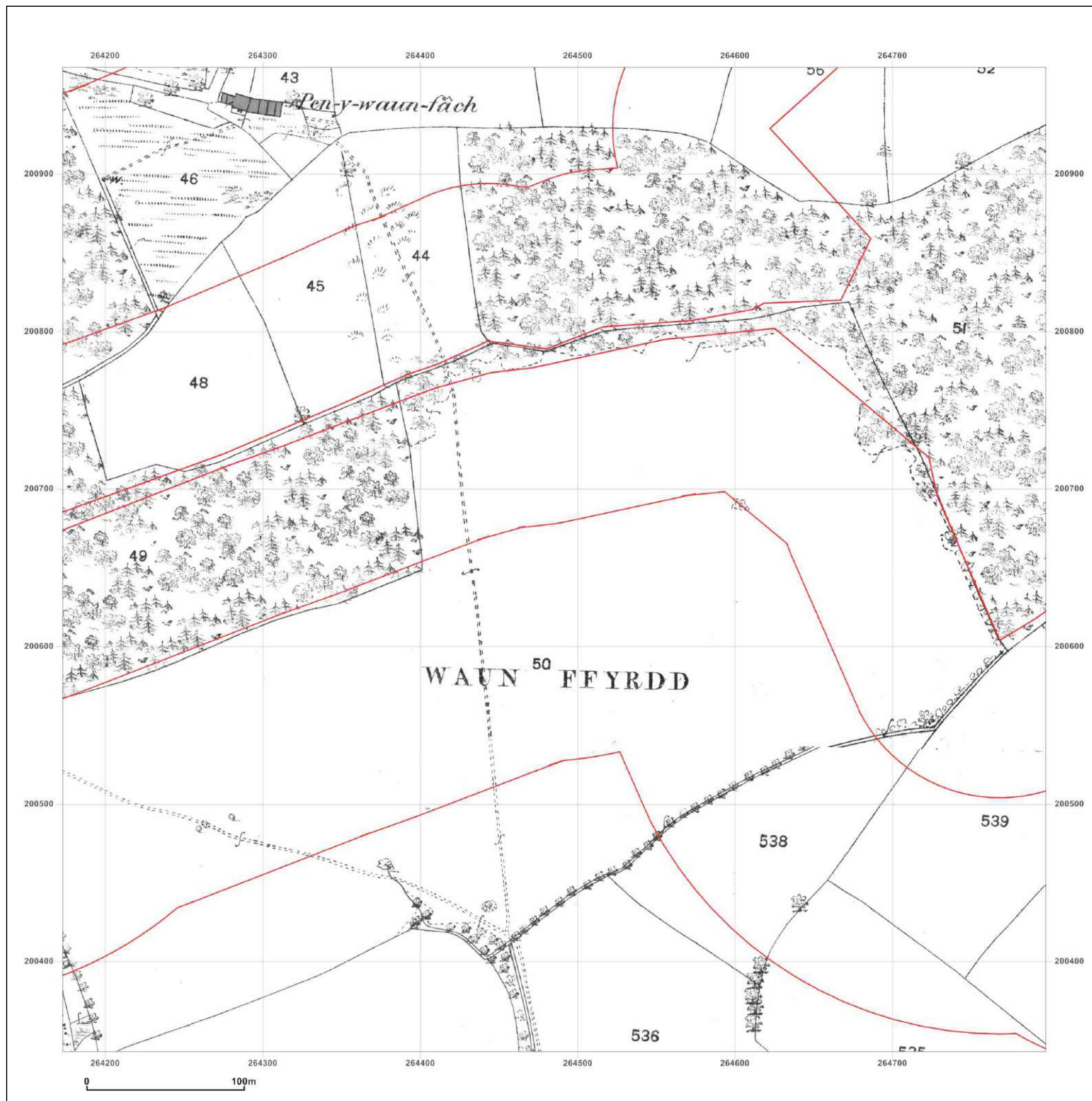


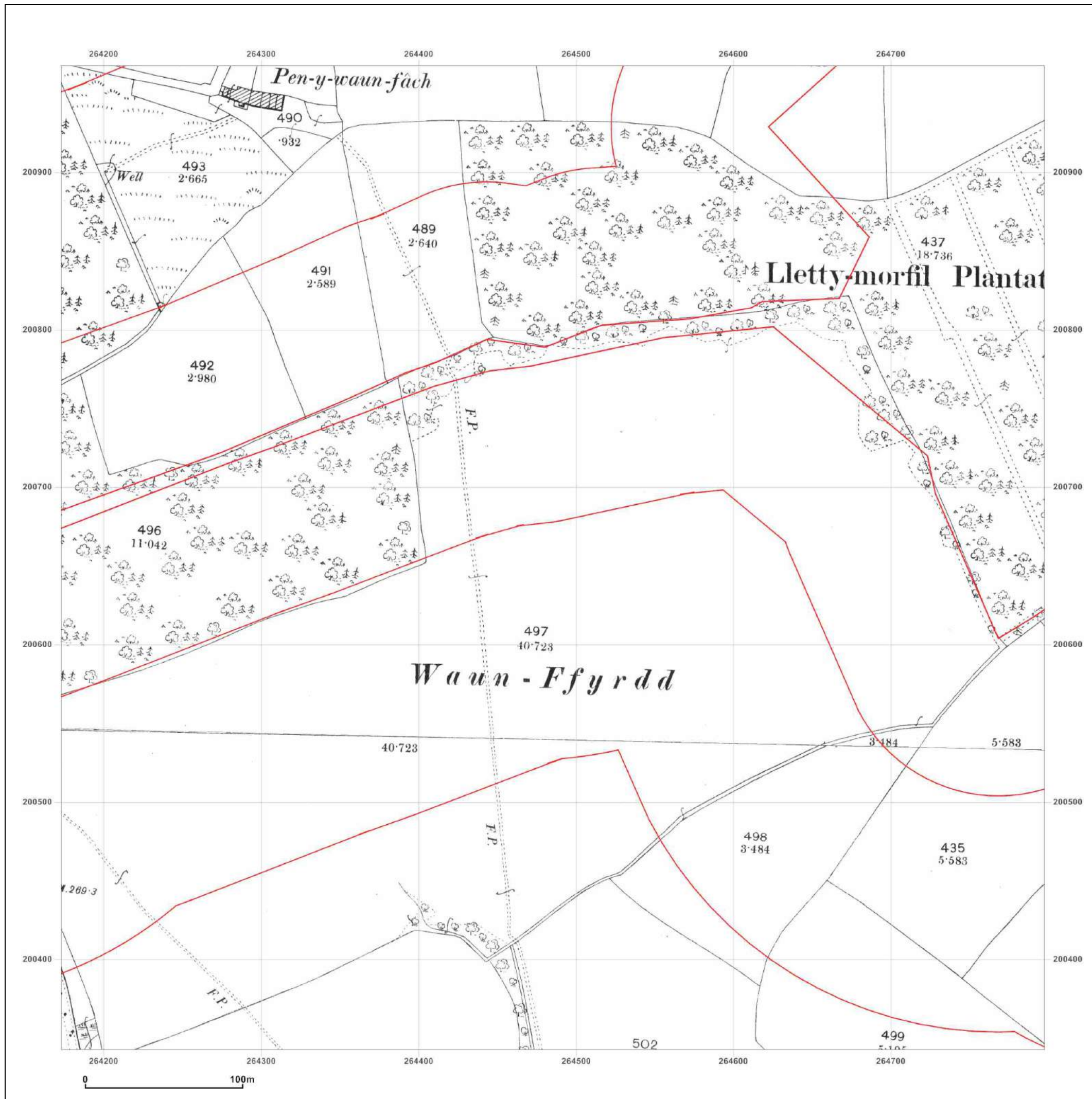
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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: County Series

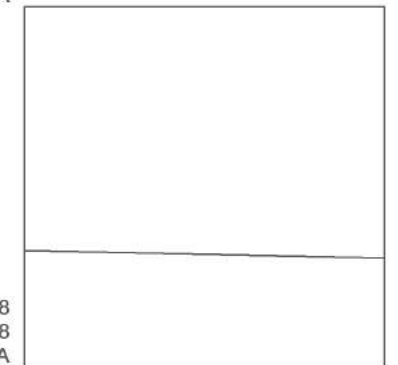
Map date: 1898

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1898
Revised 1898
Edition N/A
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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: County Series

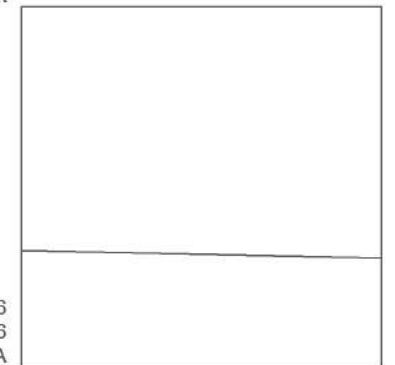
Map date: 1916

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A

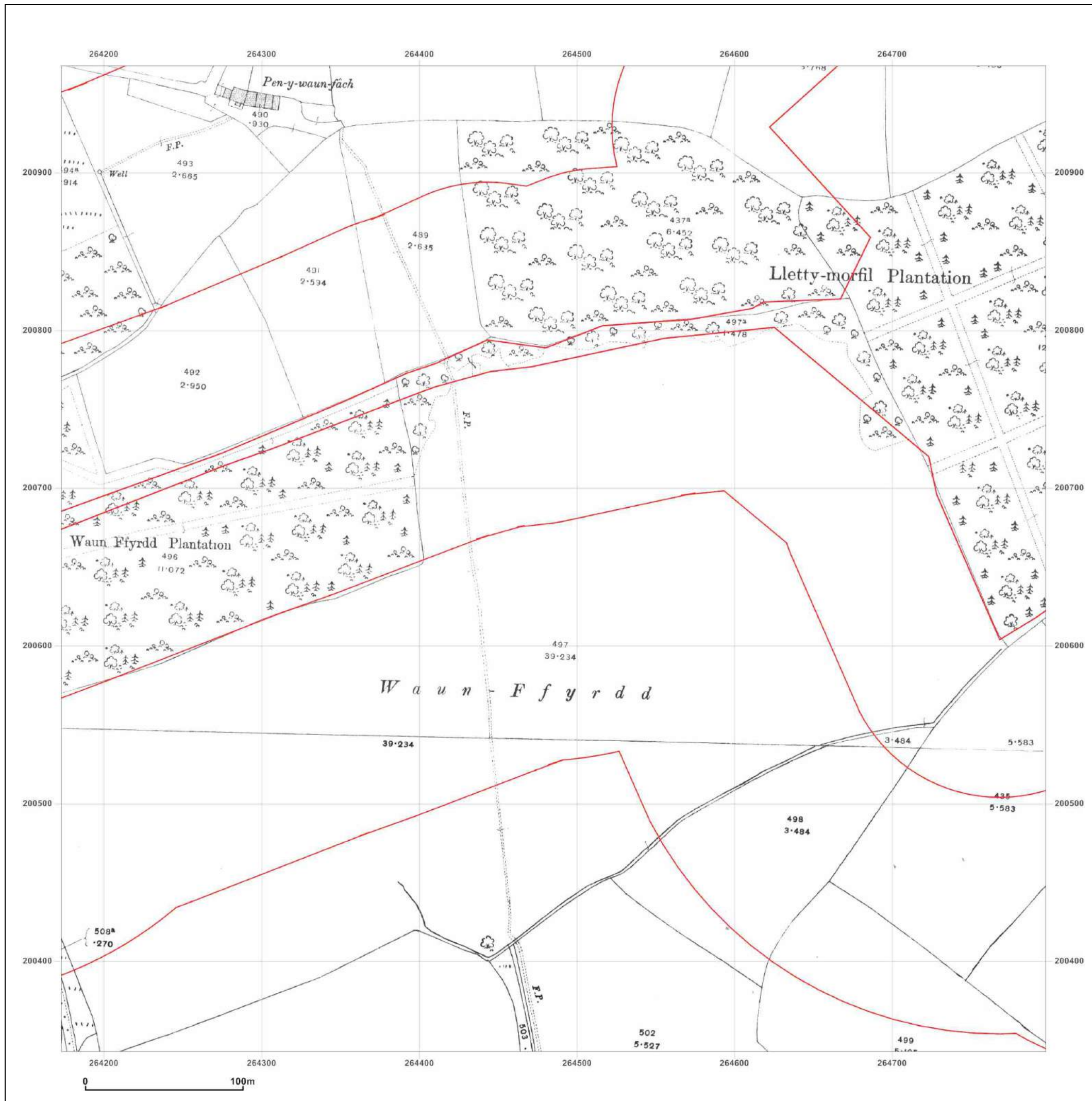


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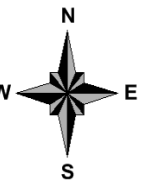
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Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: County Series

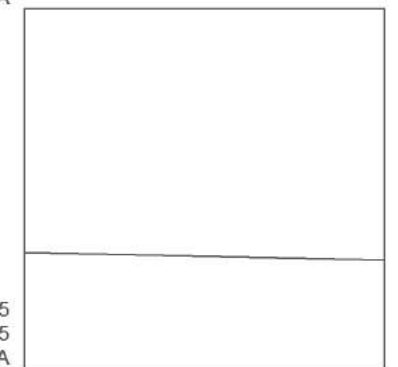
Map date: 1935

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1935
Revised 1935
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1935
Revised 1935
Edition N/A
Copyright N/A
Levelled N/A

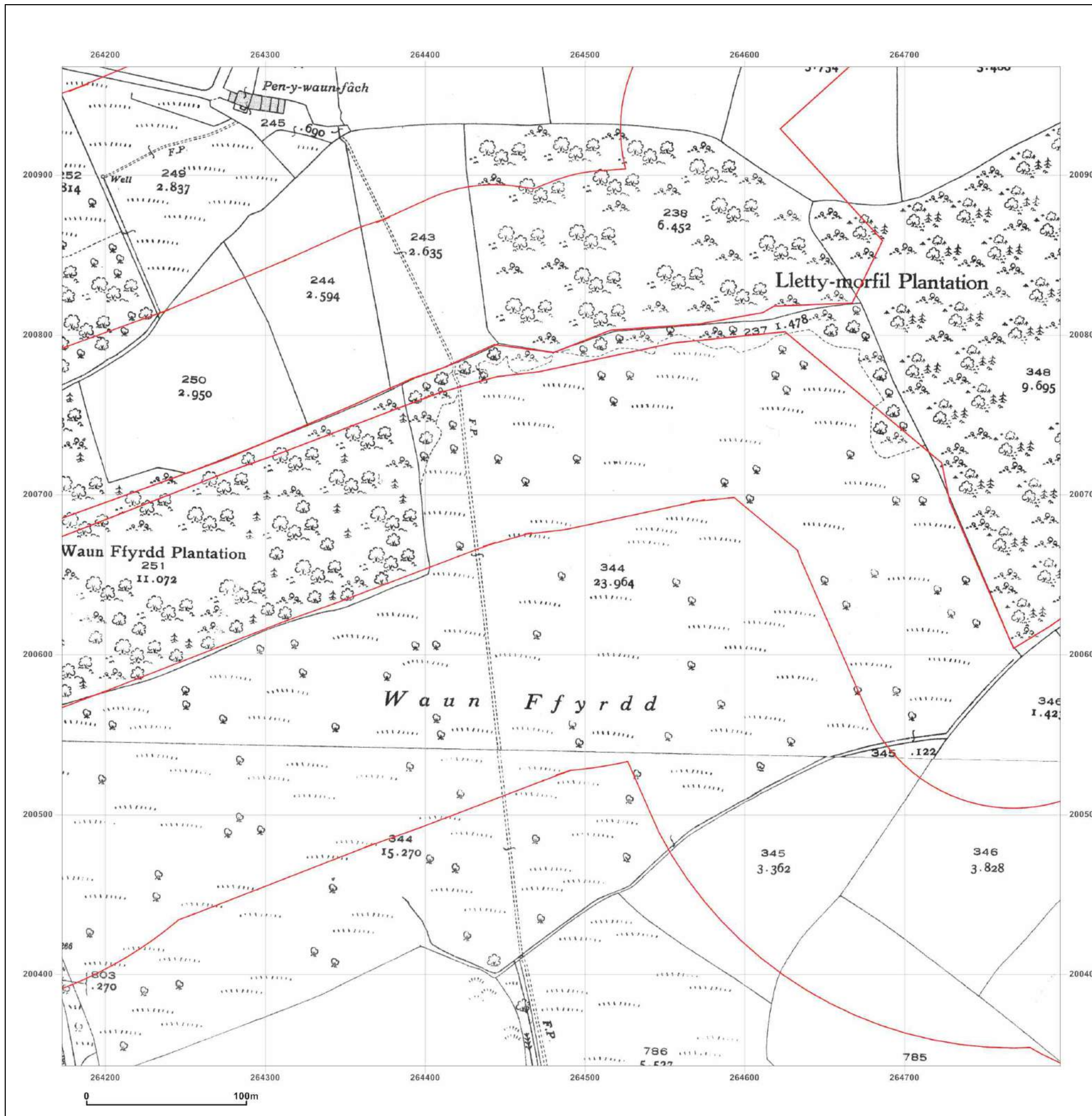


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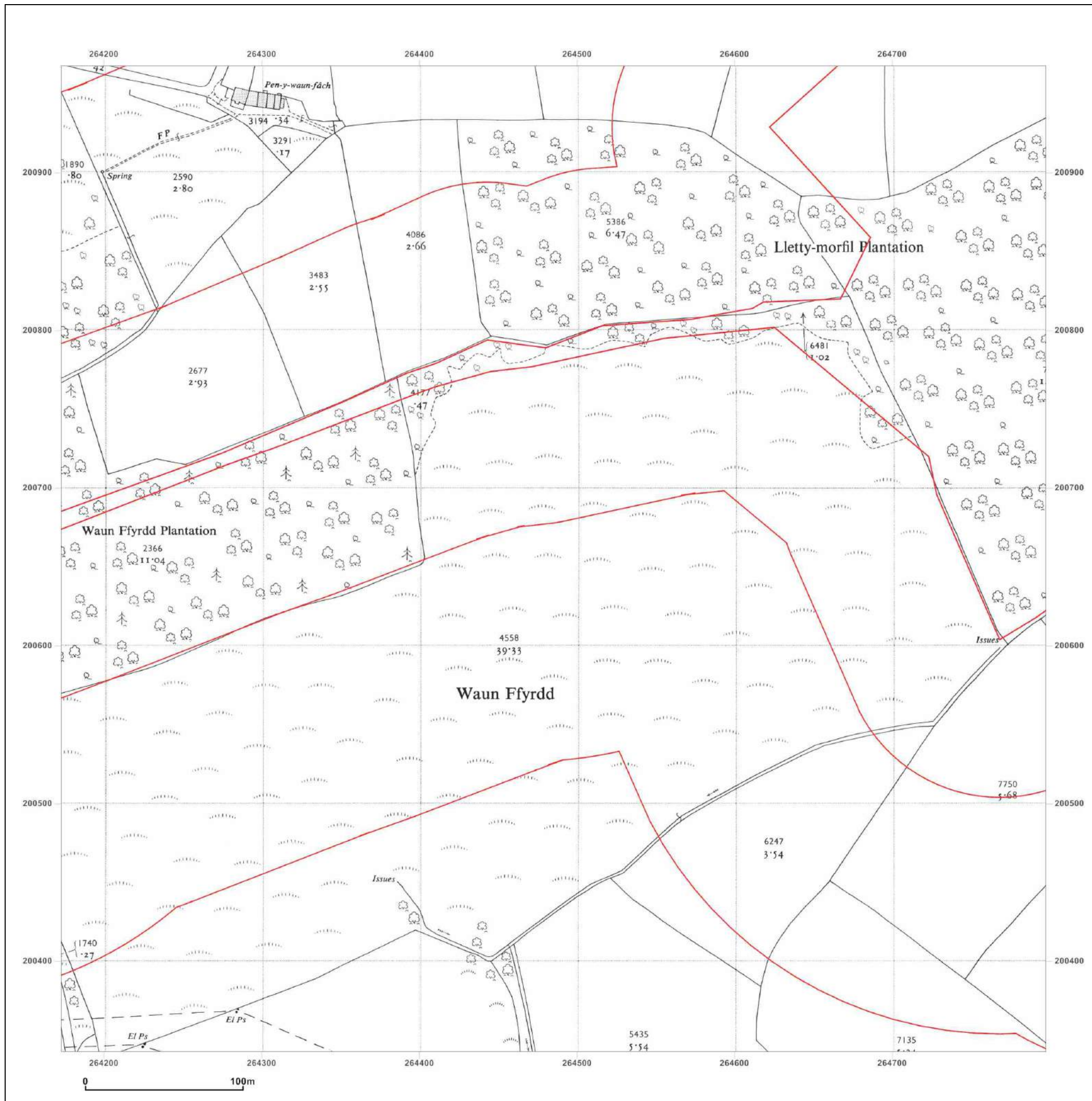
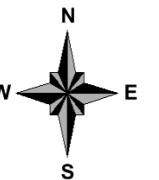
Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: National Grid

Map date: 1958

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1956



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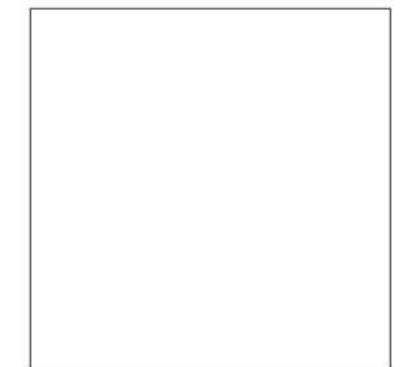
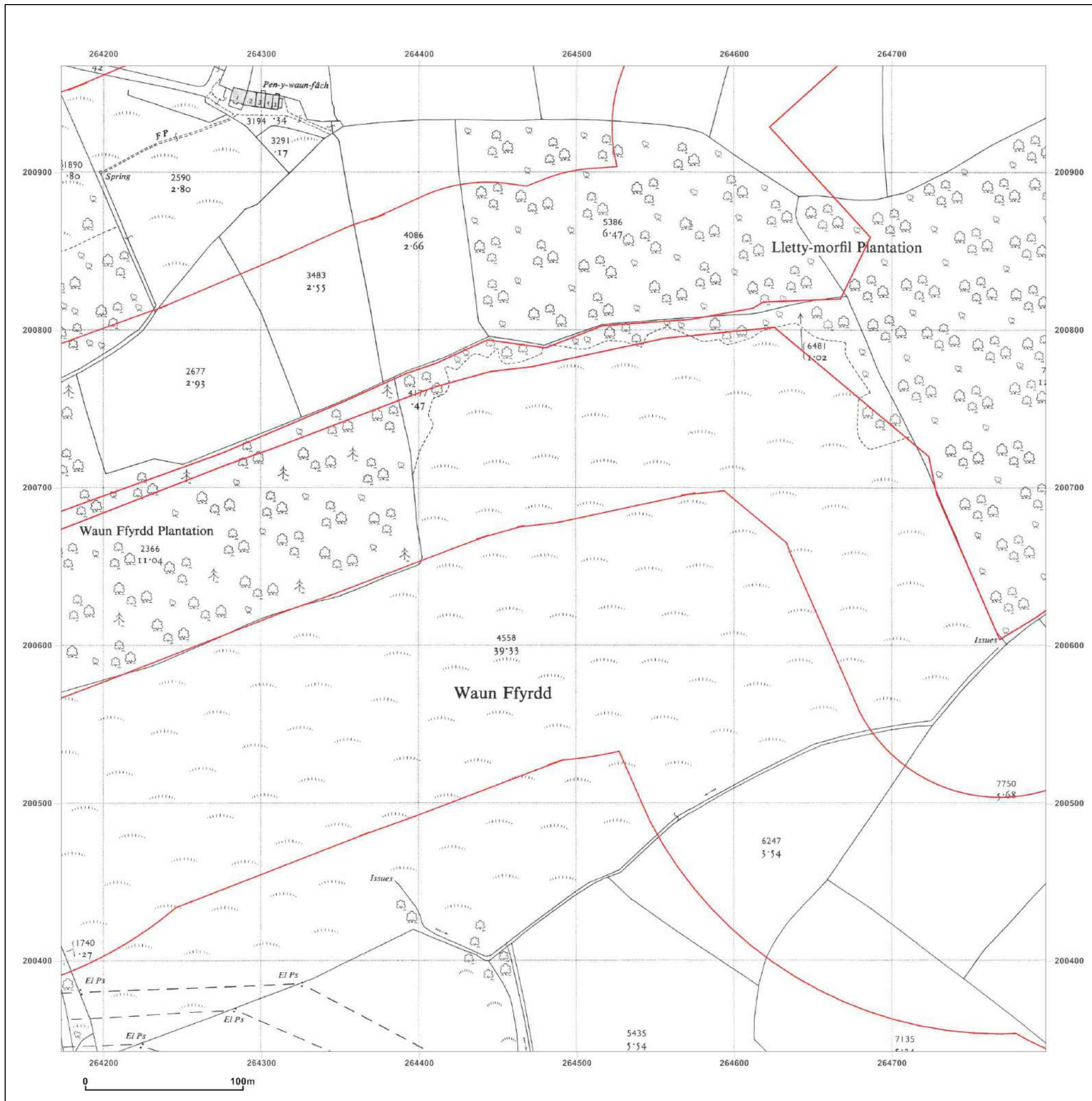
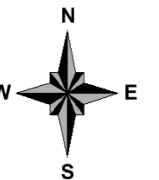
Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1960
Edition N/A
Copyright 1962
Levelled 1956

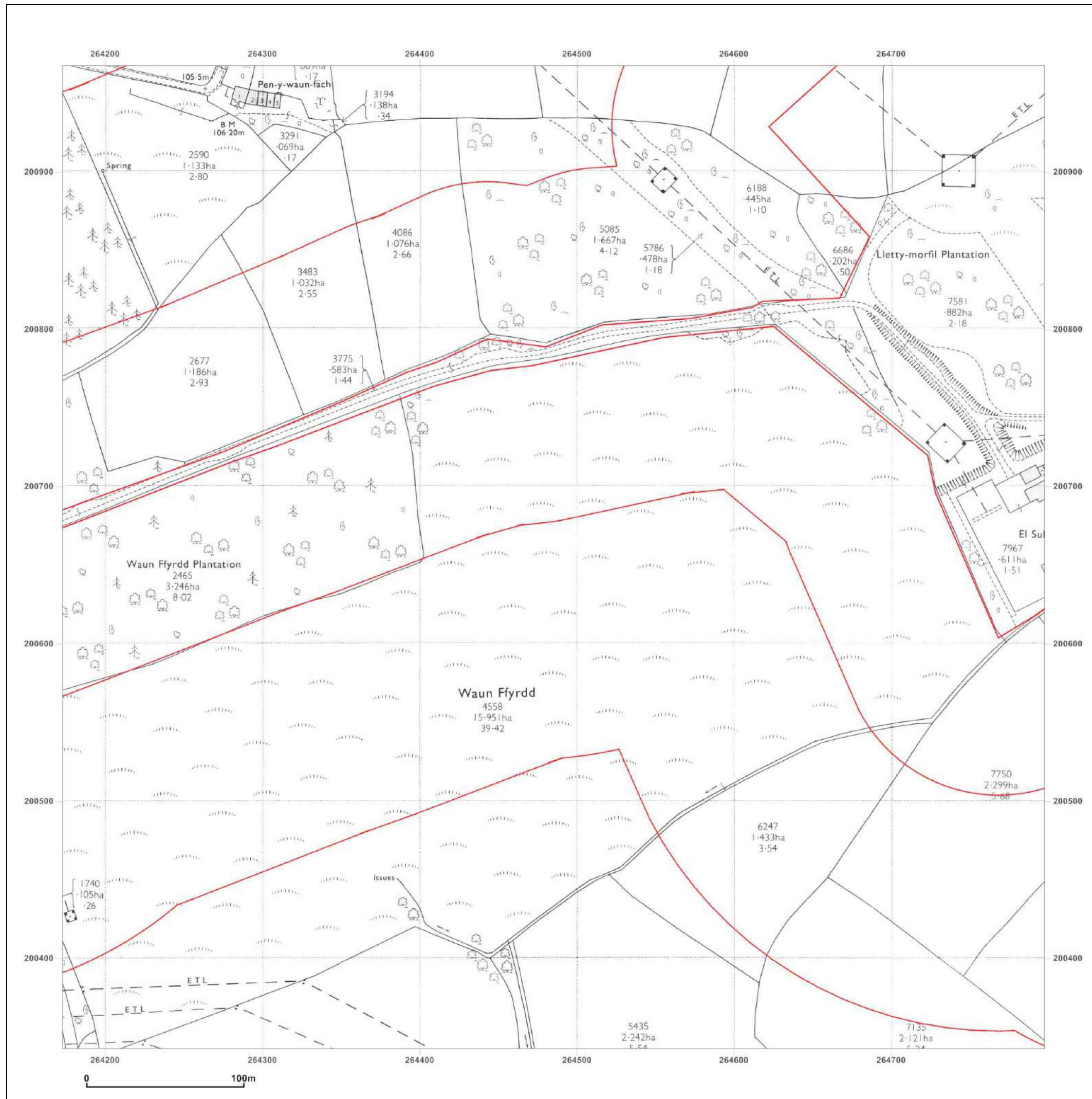


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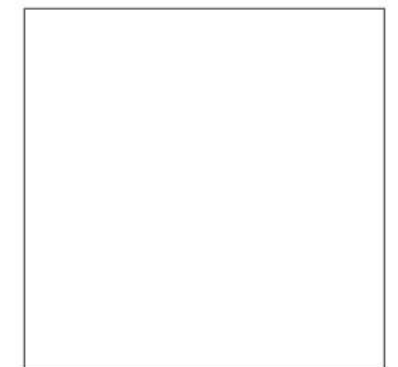
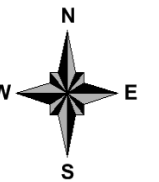
Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: National Grid

Map date: 1974

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1963

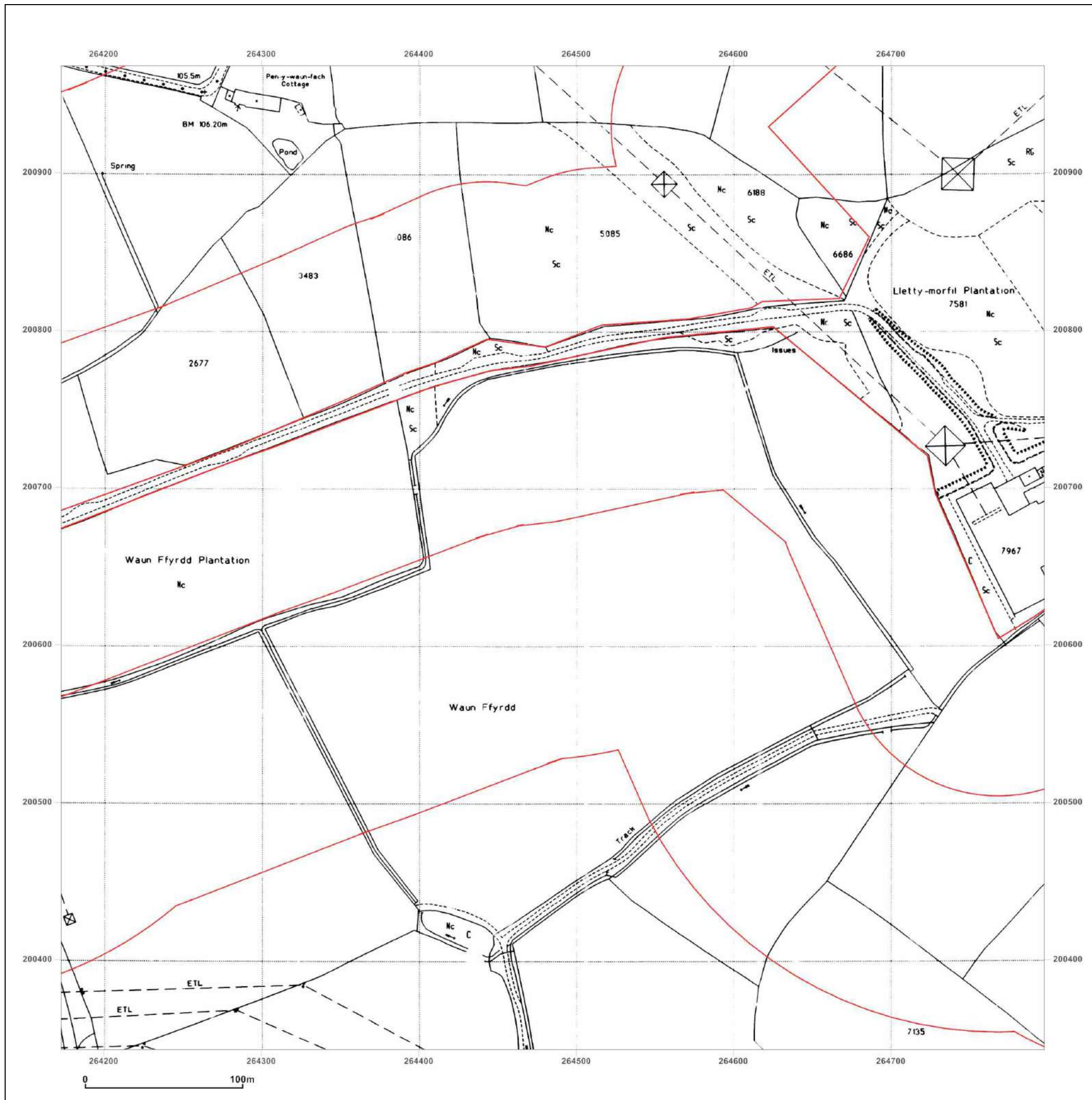


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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: County Series

Map date: 1876

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

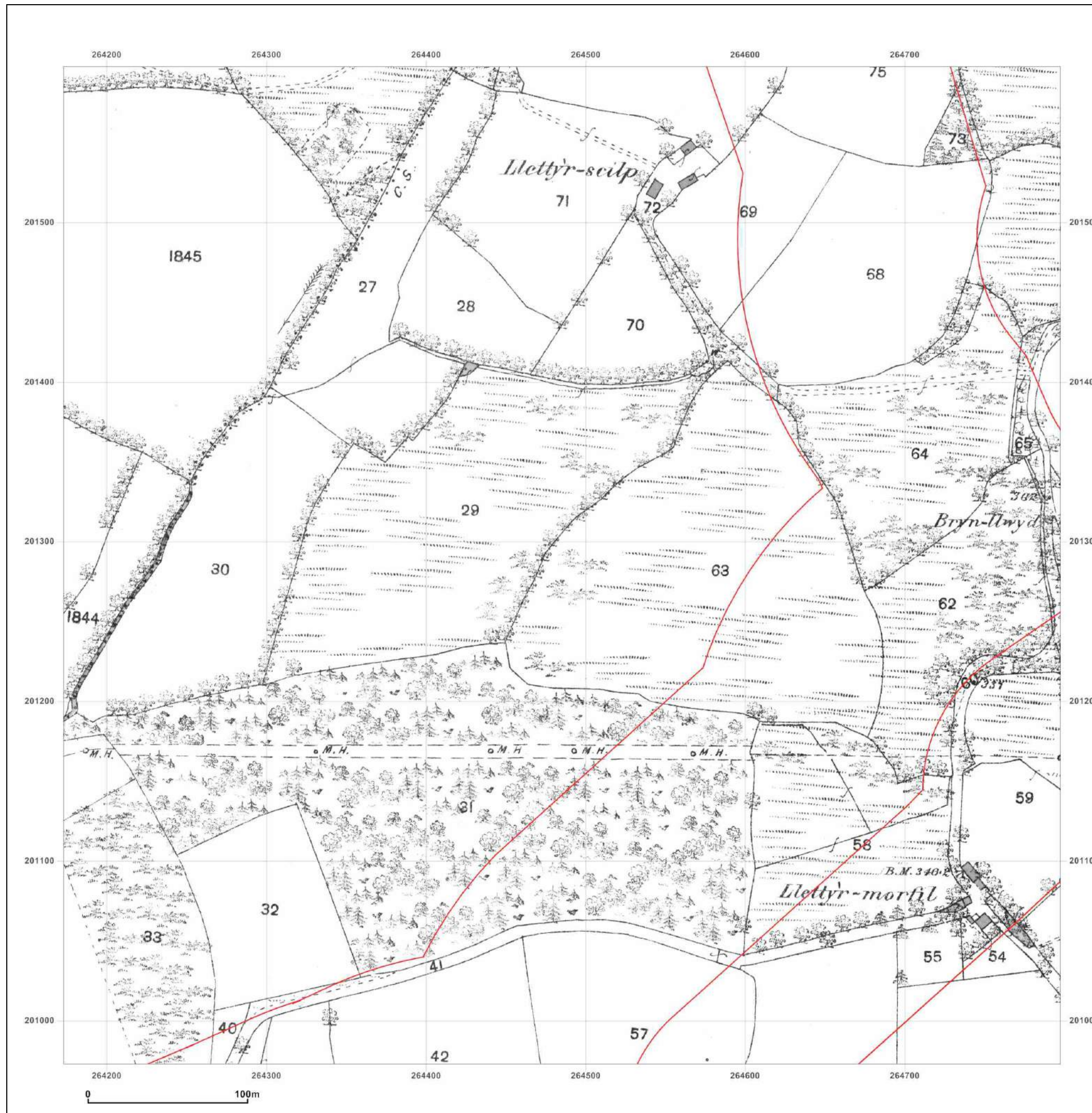


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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: County Series

Map date: 1898

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

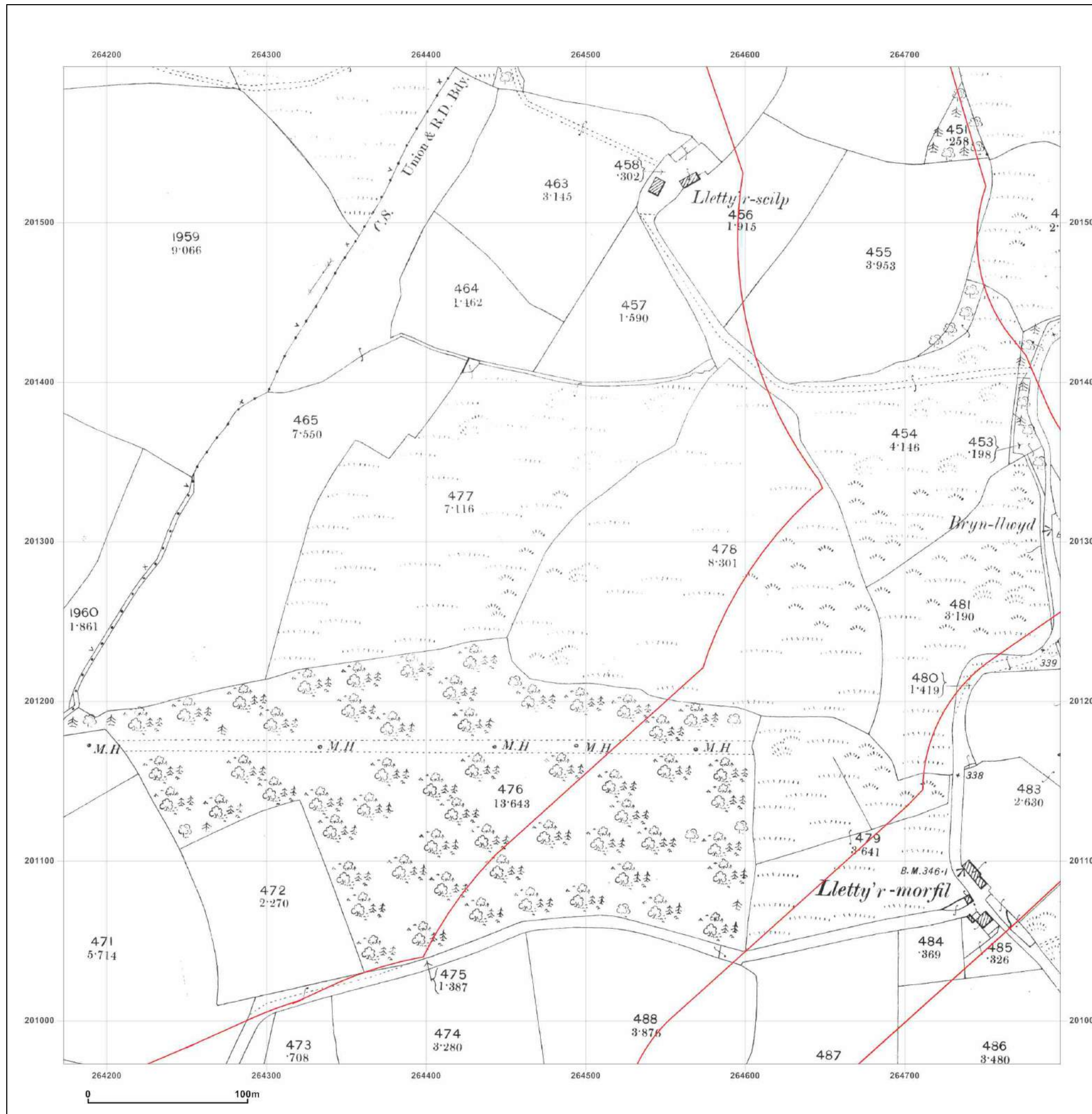


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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: County Series

Map date: 1916

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A

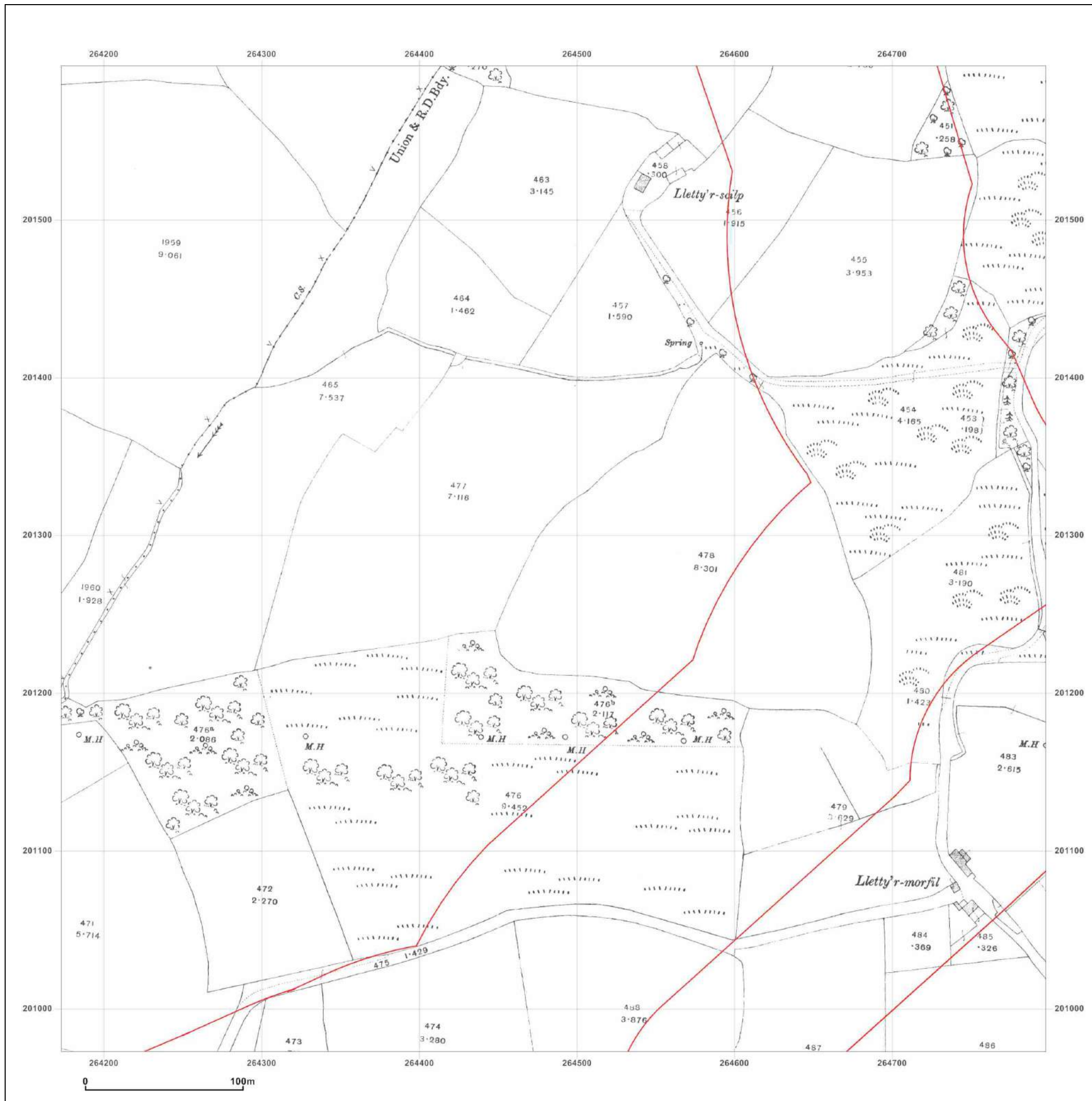


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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: County Series

Map date: 1935

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1935
Revised 1935
Edition N/A
Copyright N/A
Levelled N/A

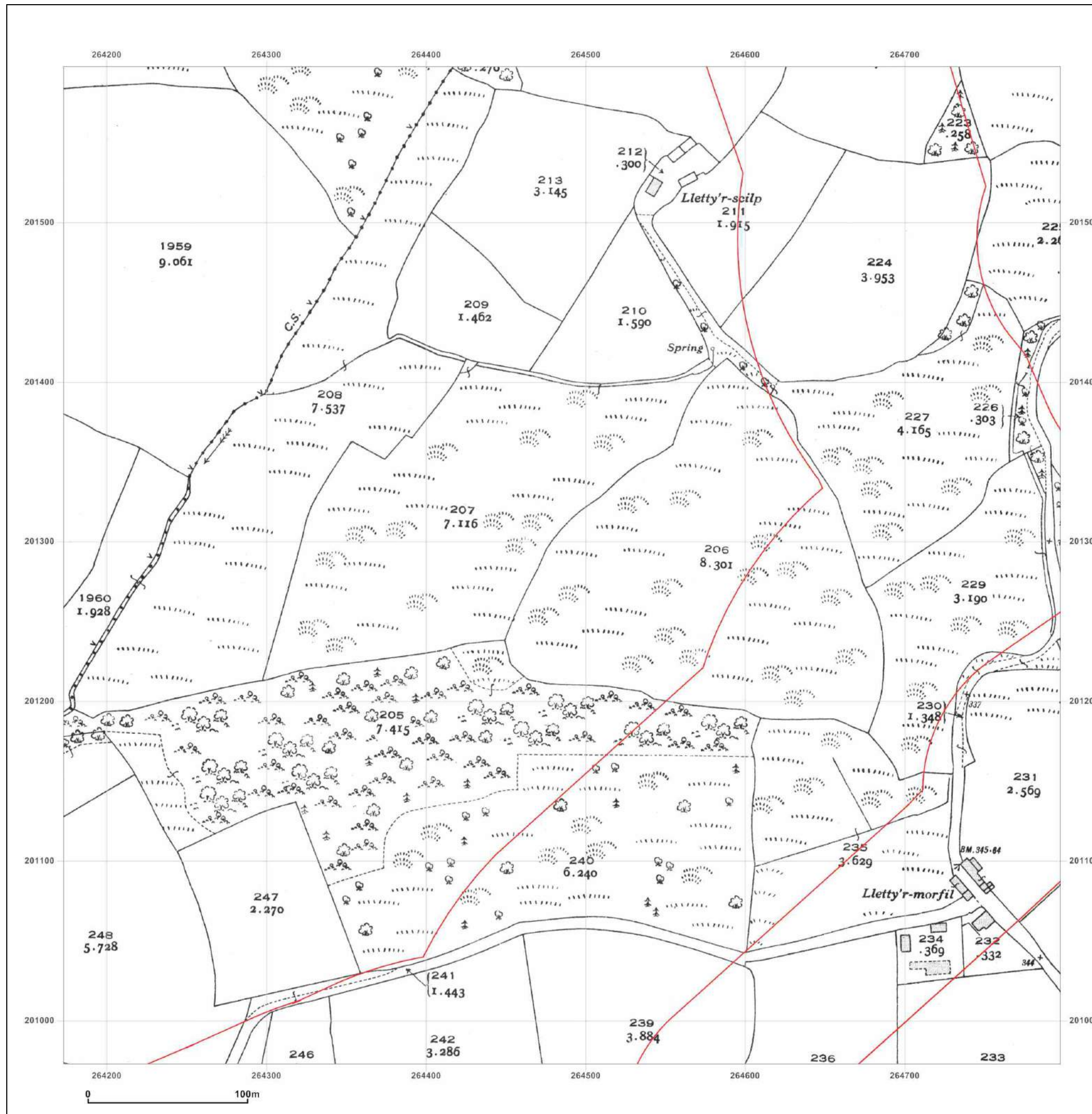


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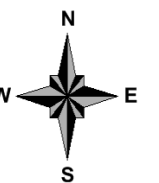
Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: National Grid

Map date: 1958

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1946

Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1956

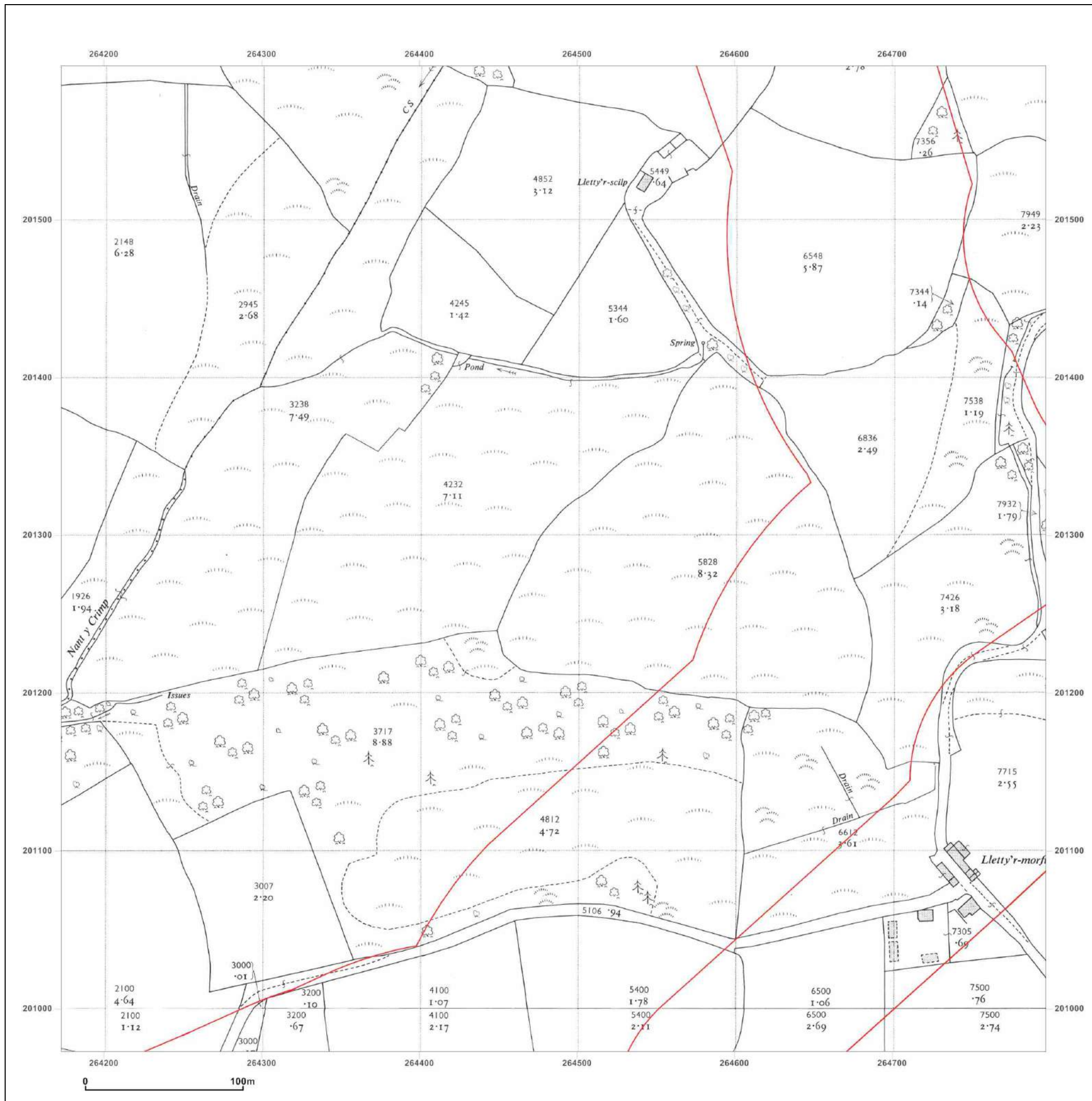


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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1956

Surveyed 1960
Revised 1960
Edition N/A
Copyright 1962
Levelled 1956



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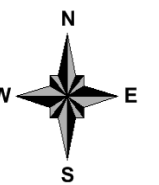
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Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: National Grid

Map date: 1974

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1963

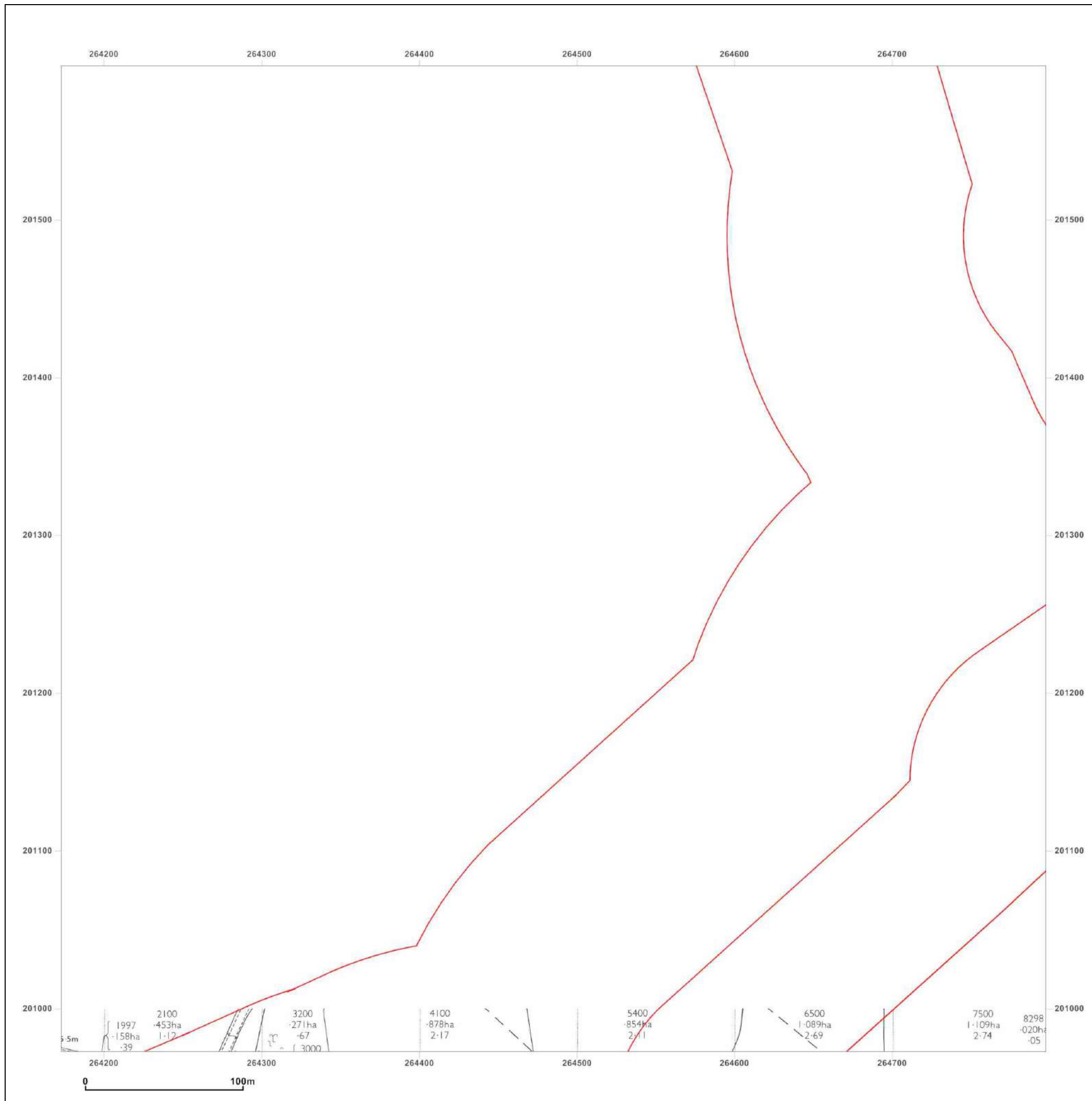


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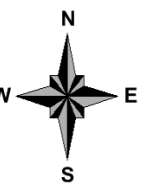
Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: National Grid

Map date: 1989

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1956
Revised 1989
Edition N/A
Copyright 1989
Levelled 1956

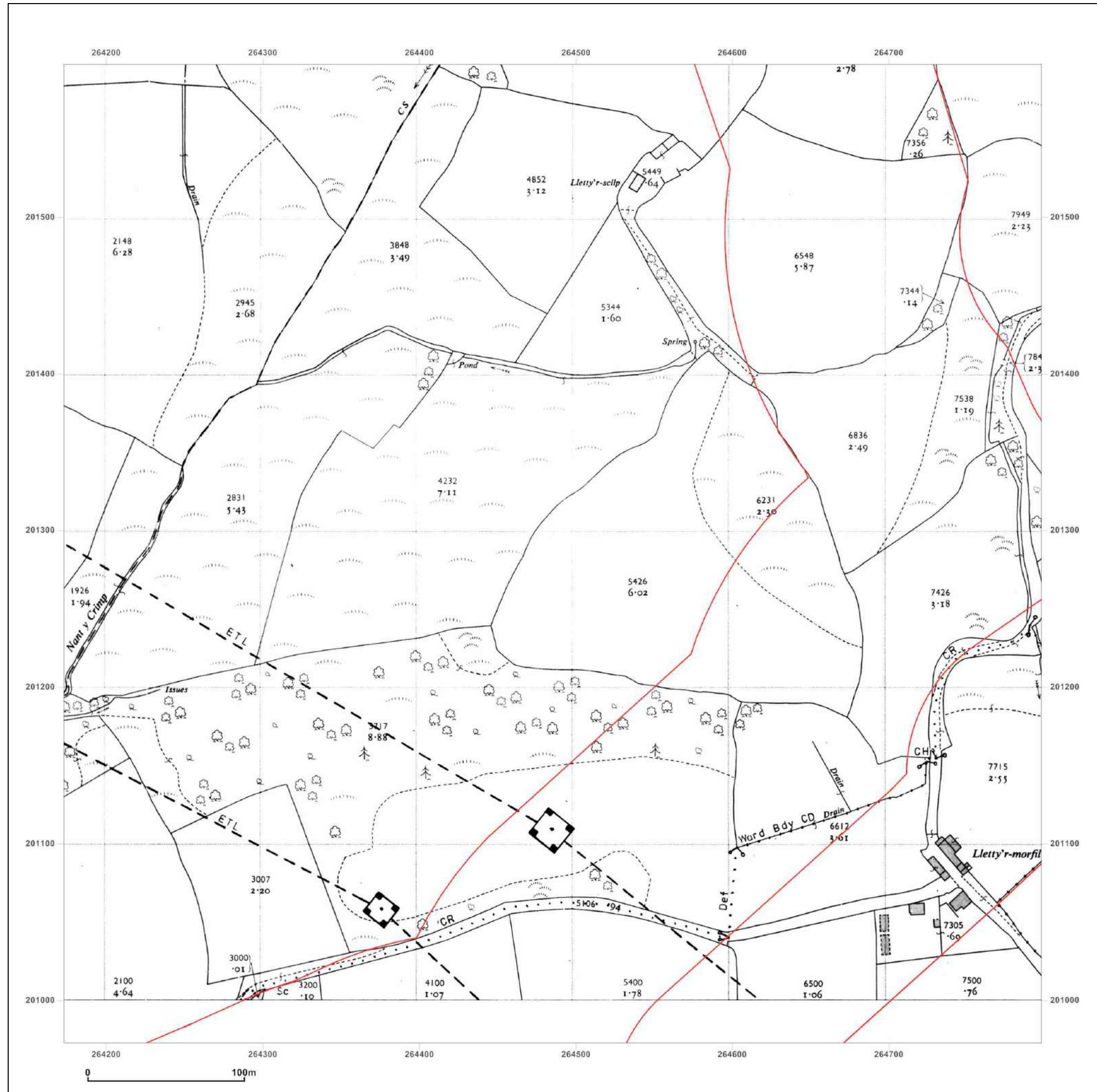


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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

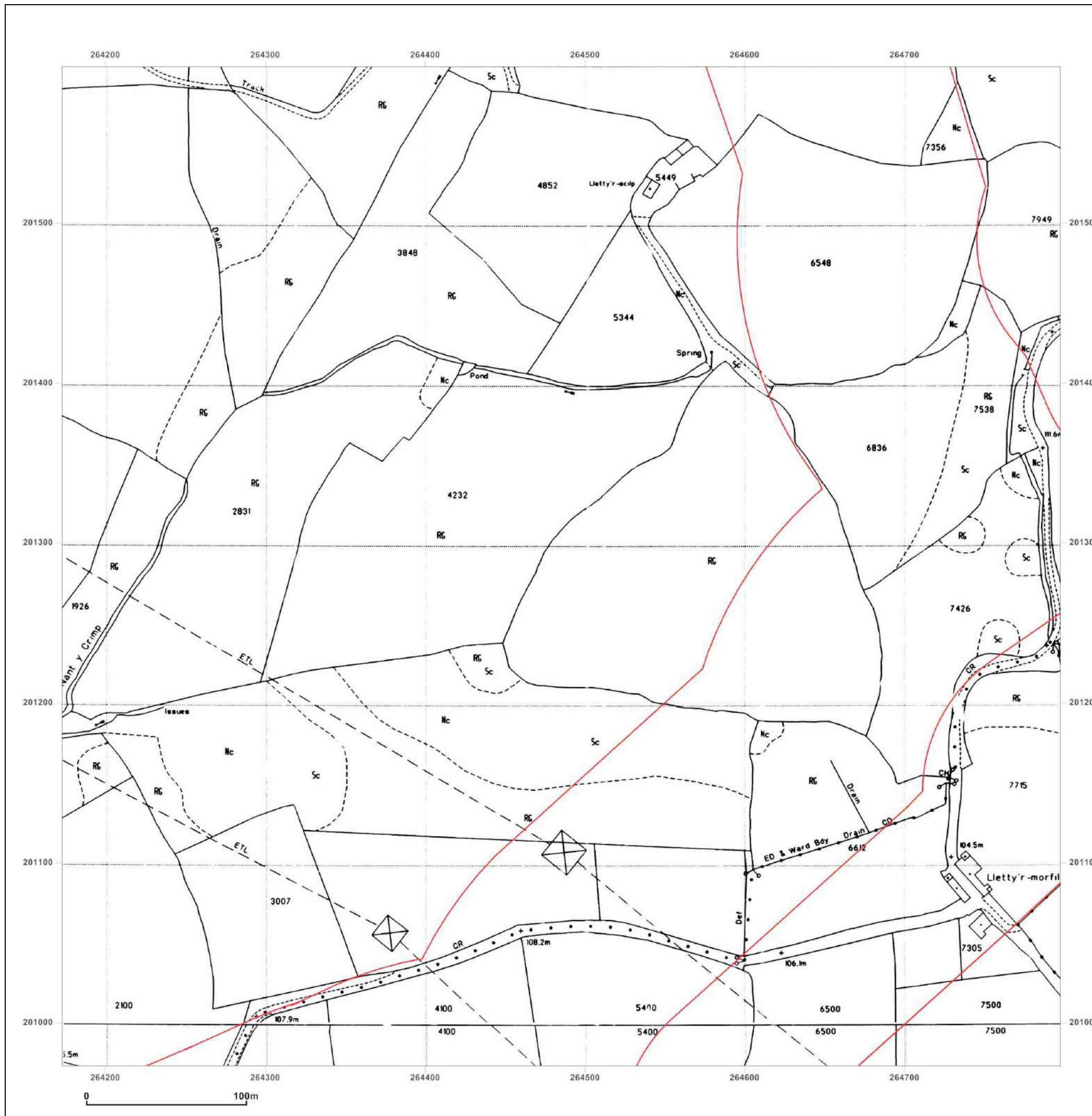


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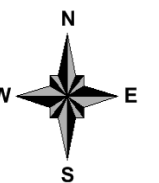
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Grid Ref: 264485, 201915

Map Name: County Series

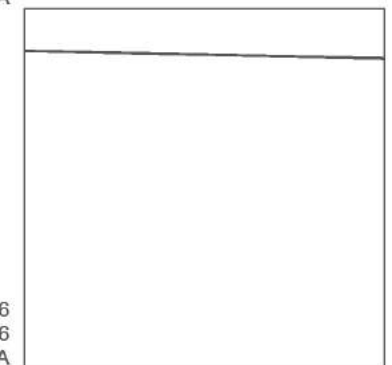
Map date: 1876

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

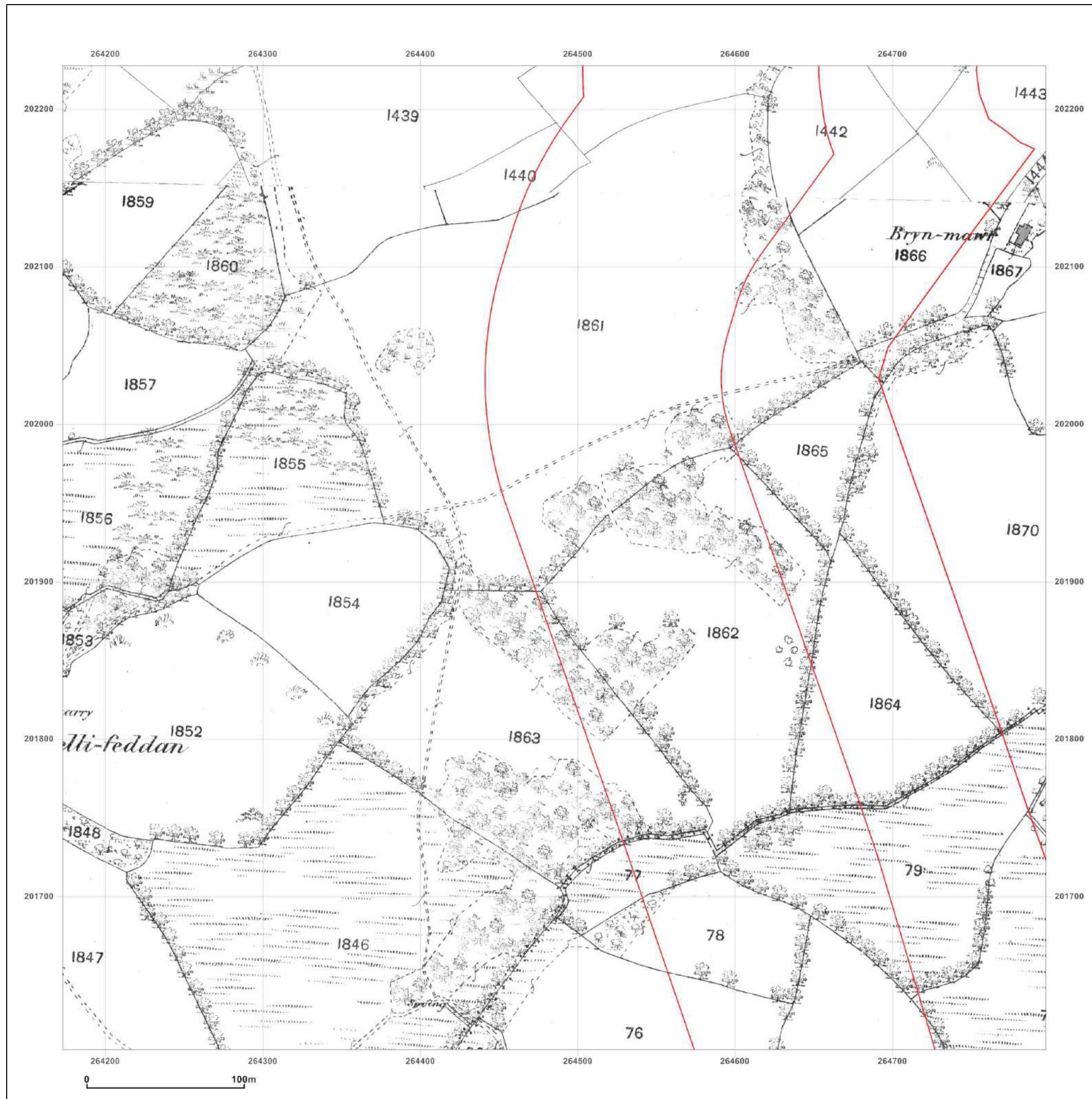


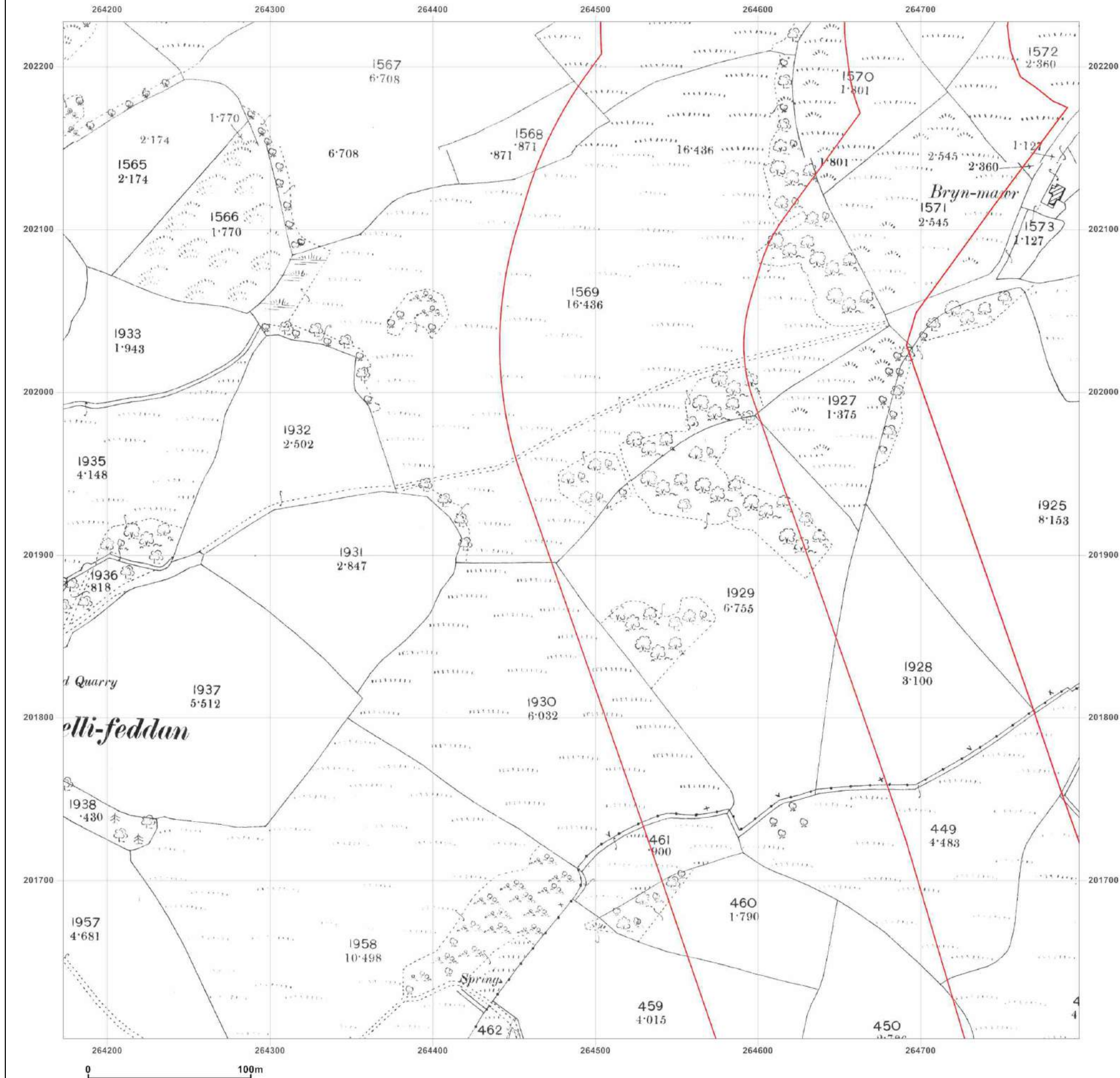
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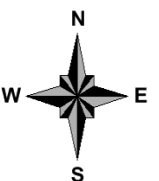
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Grid Ref: 264485, 201915

Map Name: County Series

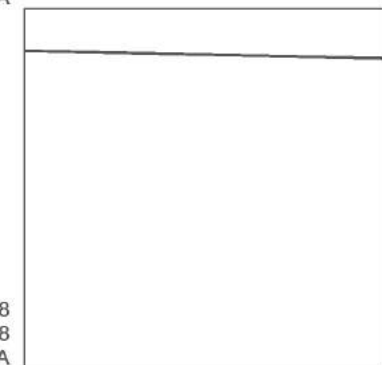
Map date: 1898-1899

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1899
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Edition N/A
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Surveyed 1898
Revised 1898
Edition N/A
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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_4
Grid Ref: 264485, 201915

Map Name: County Series

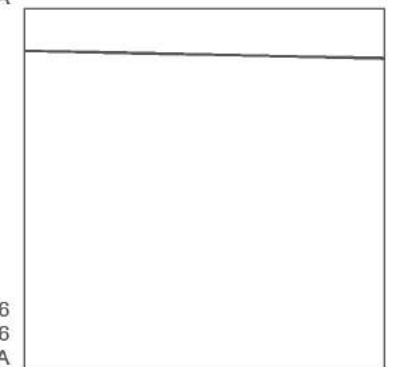
Map date: 1916

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A

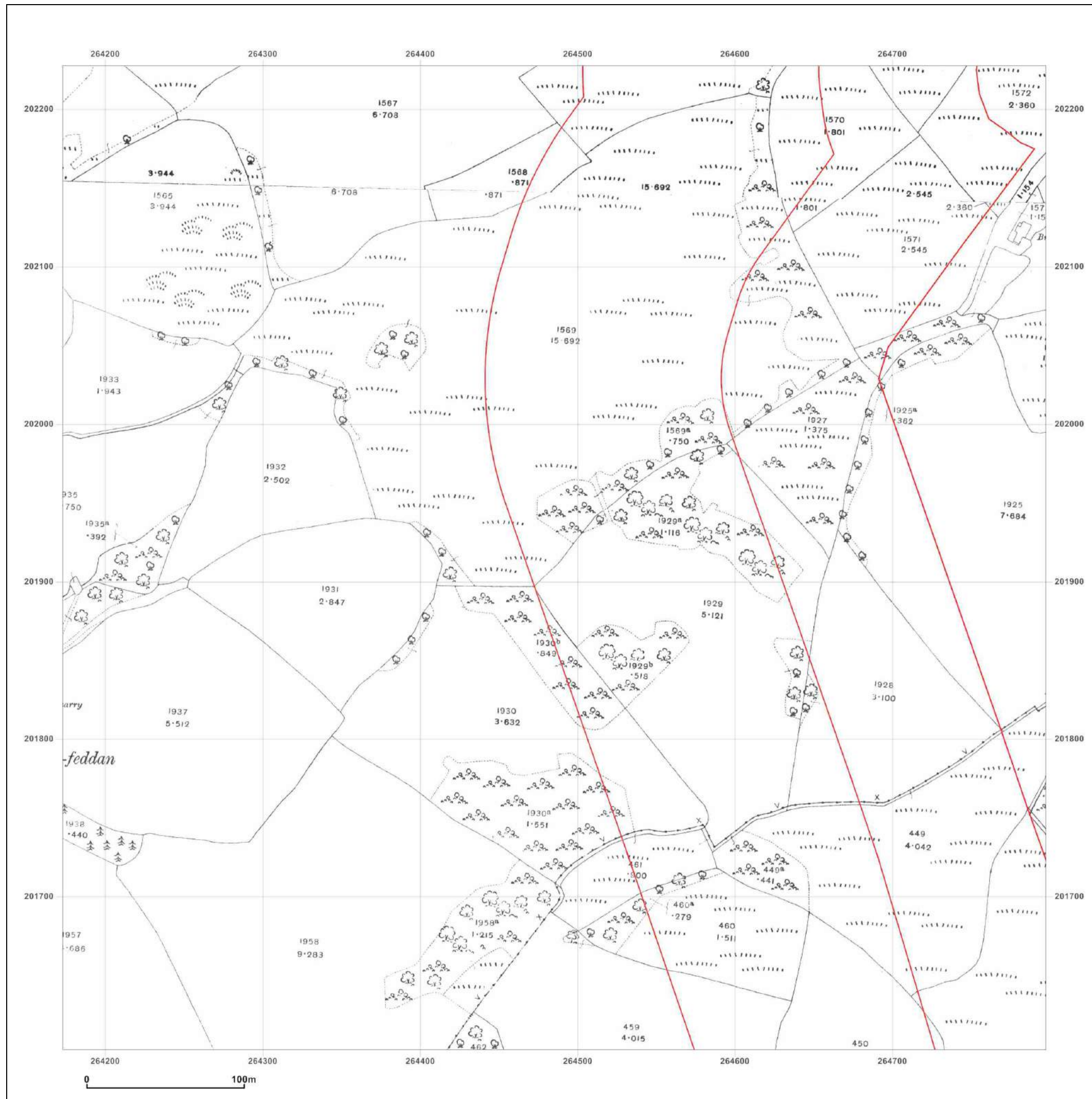


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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_4
Grid Ref: 264485, 201915

Map Name: County Series

Map date: 1935

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1935
Revised 1935
Edition N/A
Copyright N/A
Levelled N/A

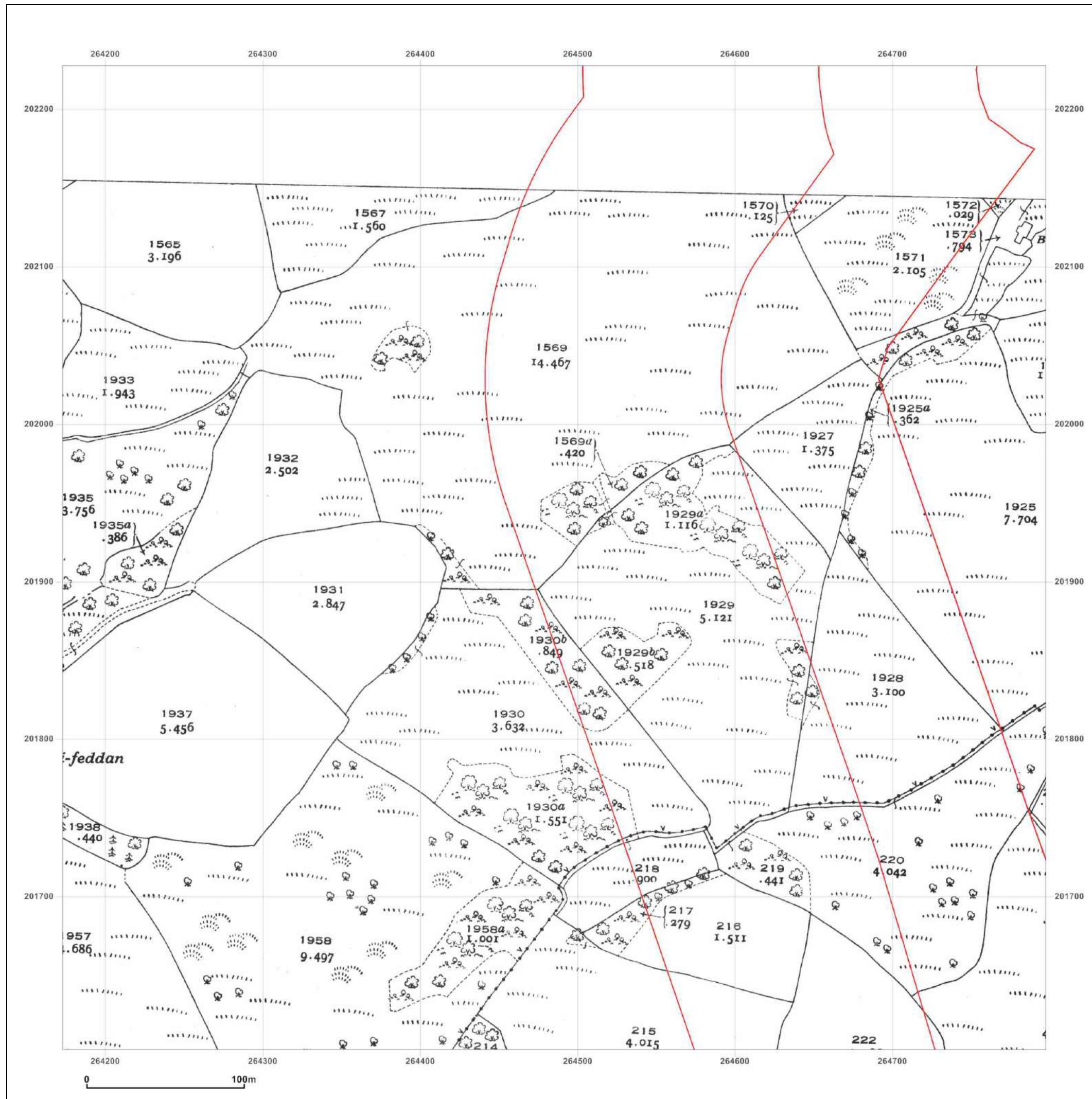


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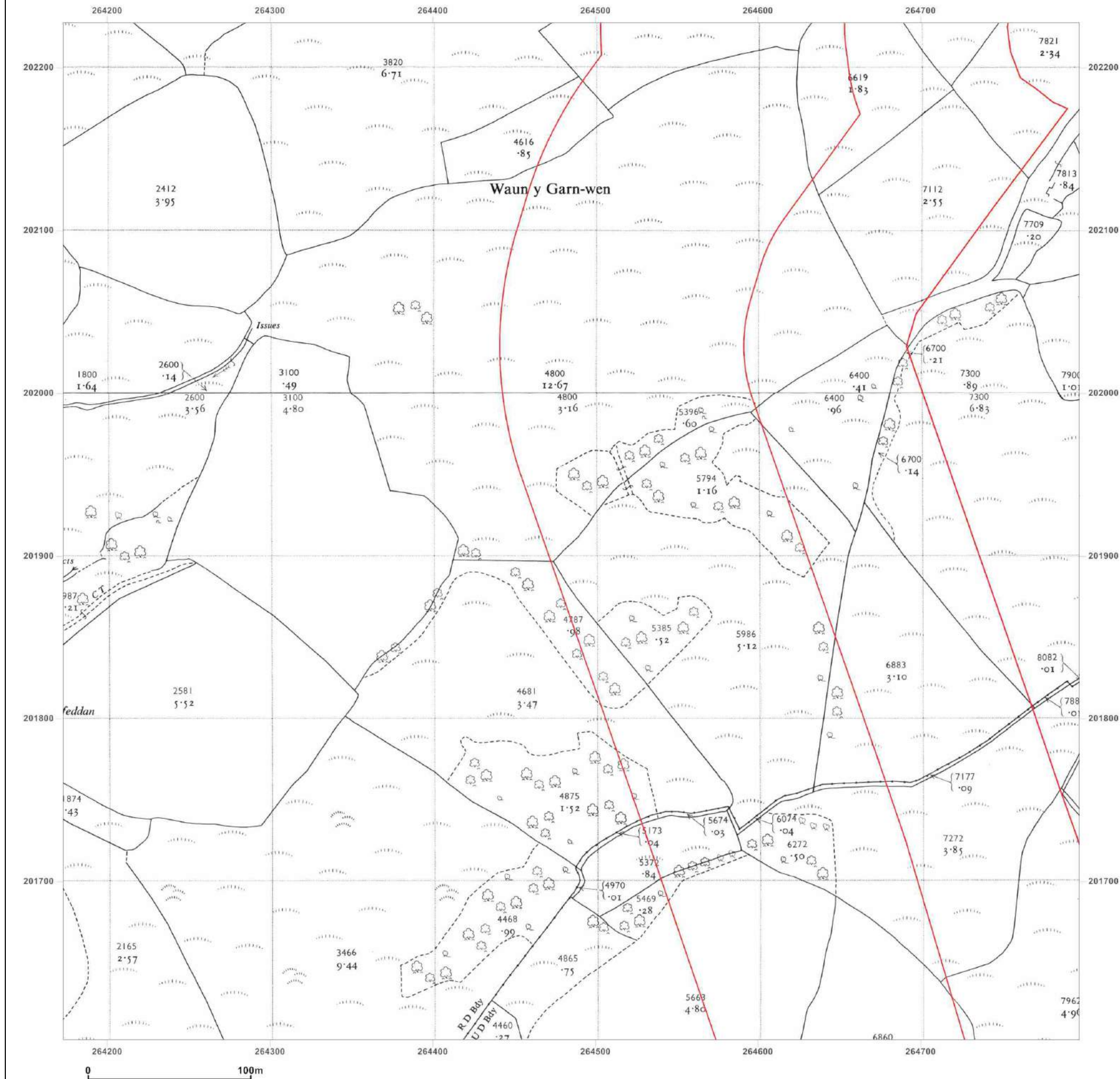
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Report Ref: GS-1587646_LS_3_4
Grid Ref: 264485, 201915

Map Name: National Grid

Map date: 1958

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1956

Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1946

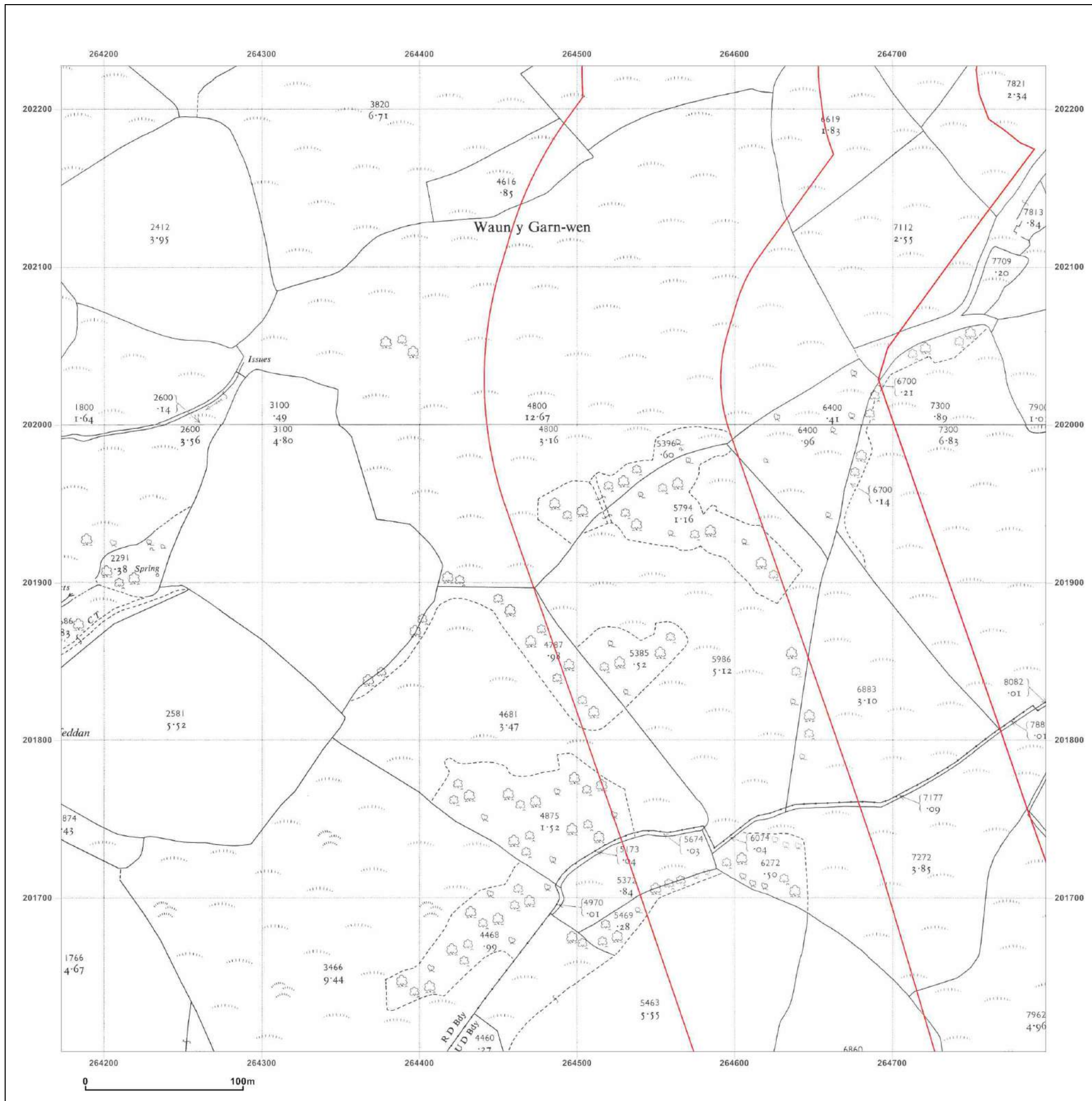


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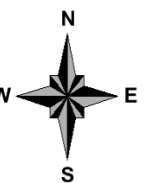
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Grid Ref: 264485, 201915

Map Name: National Grid

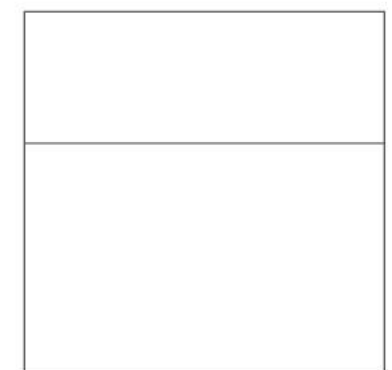
Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1956



Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1956



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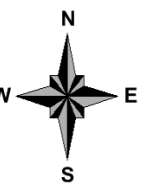
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Report Ref: GS-1587646_LS_3_4
Grid Ref: 264485, 201915

Map Name: National Grid

Map date: 1989

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1989
Revised 1989
Edition N/A
Copyright 1989
Levelled N/A

Surveyed 1956
Revised 1989
Edition N/A
Copyright 1989
Levelled 1956

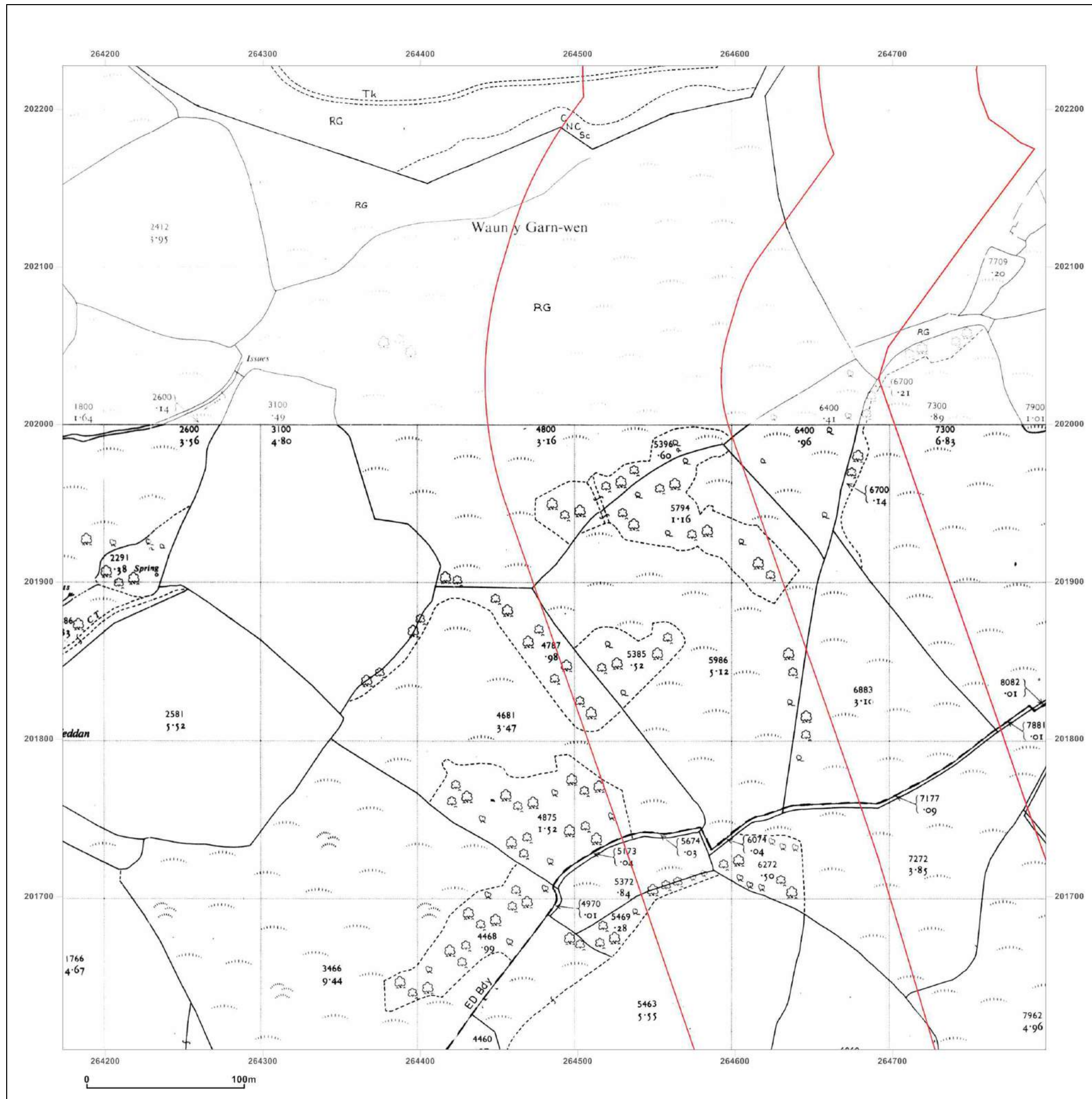


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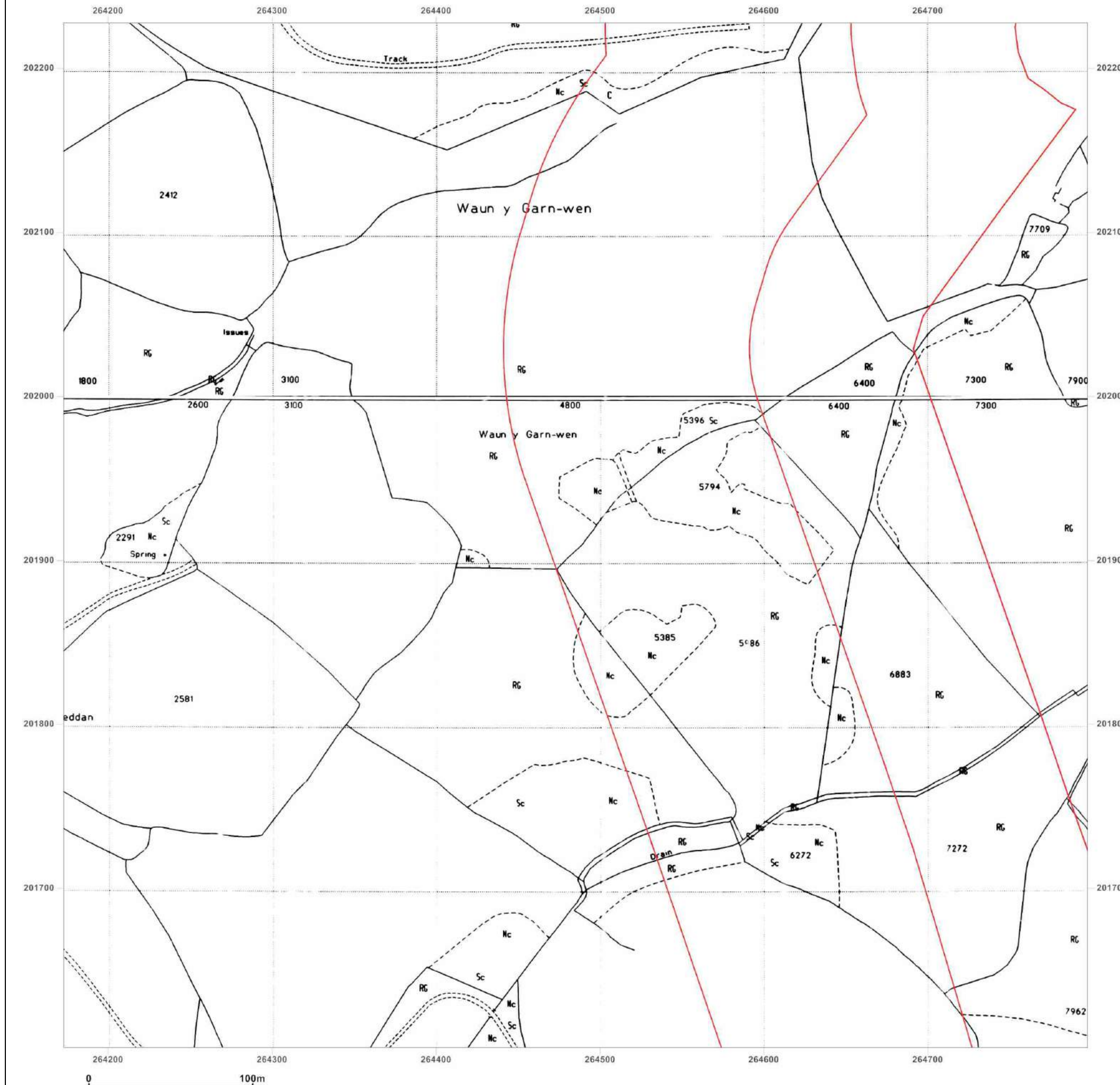
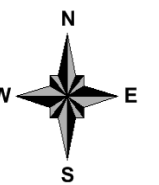
Client Ref: PB84891
Report Ref: GS-1587646_LS_3_4
Grid Ref: 264485, 201915

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

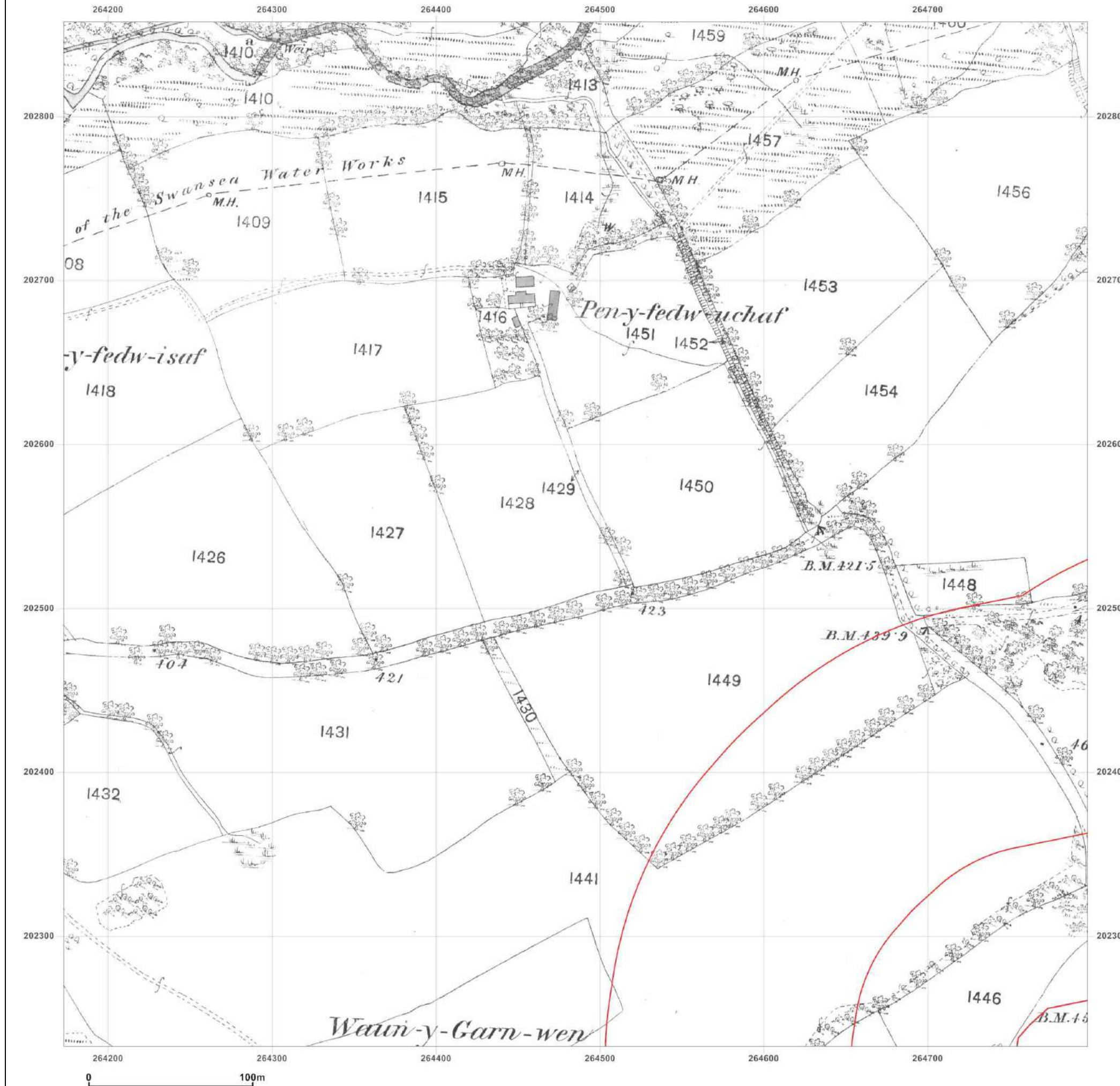


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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_5
Grid Ref: 264485, 202545

Map Name: County Series

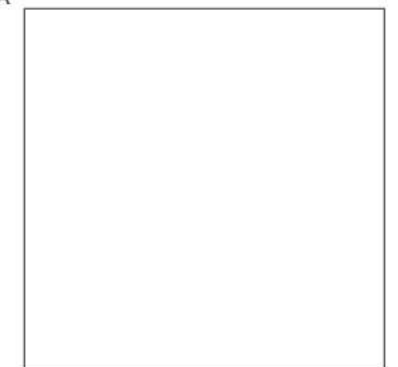
Map date: 1876

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A



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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_5
Grid Ref: 264485, 202545

Map Name: County Series

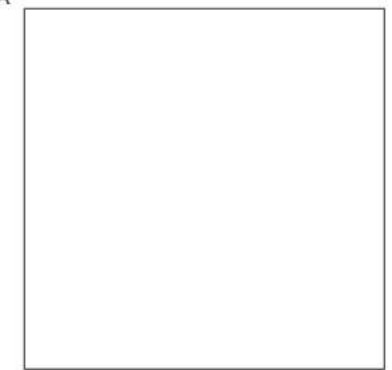
Map date: 1899

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1899
Revised 1899
Edition N/A
Copyright N/A
Levelled N/A

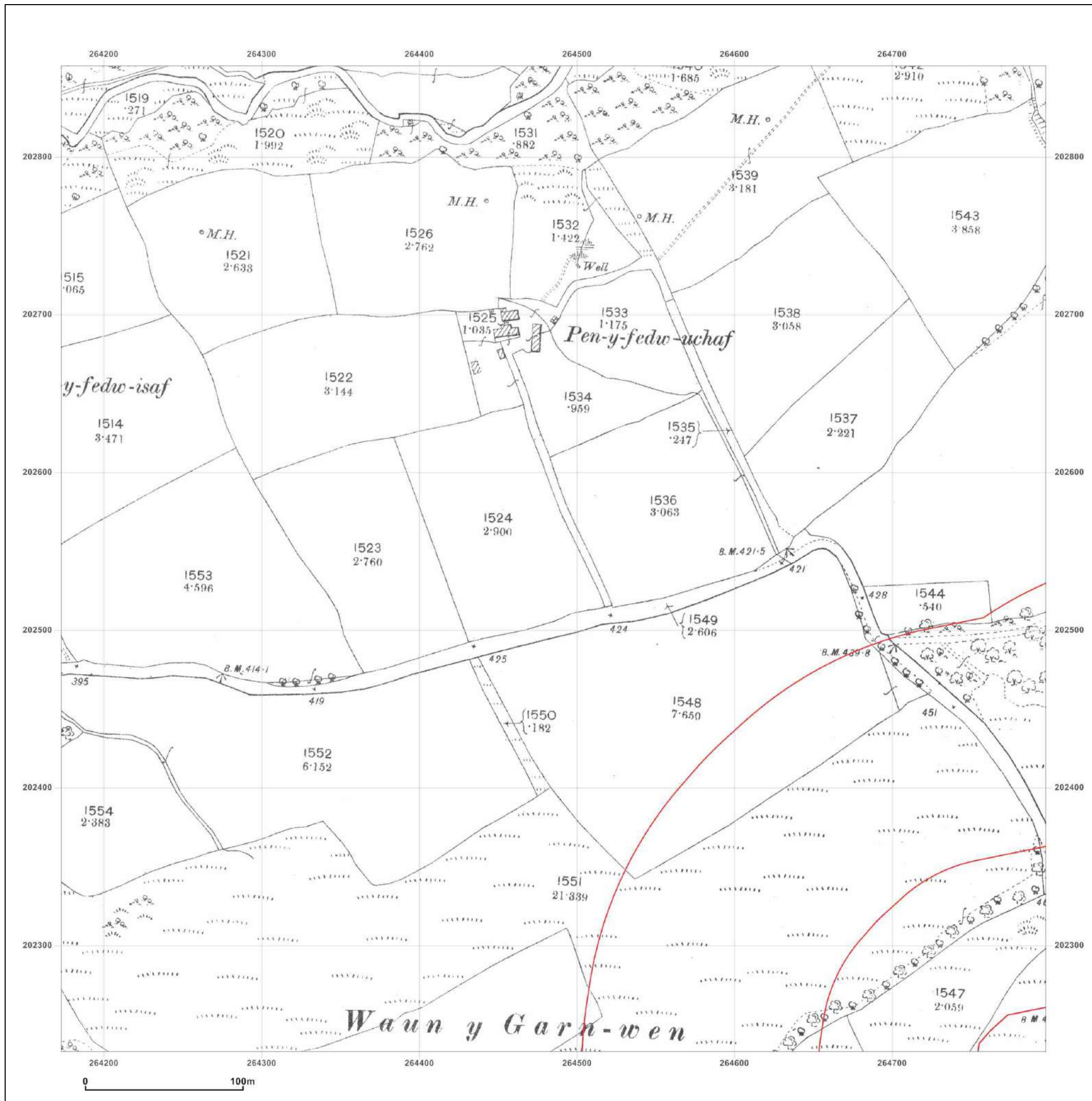


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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_5
Grid Ref: 264485, 202545

Map Name: County Series

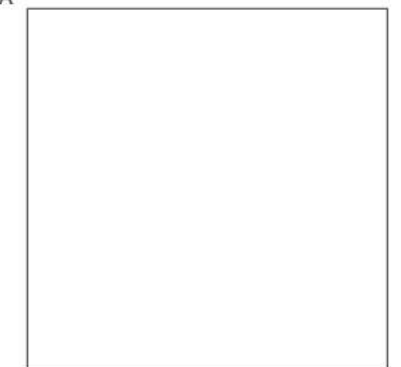
Map date: 1916

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A

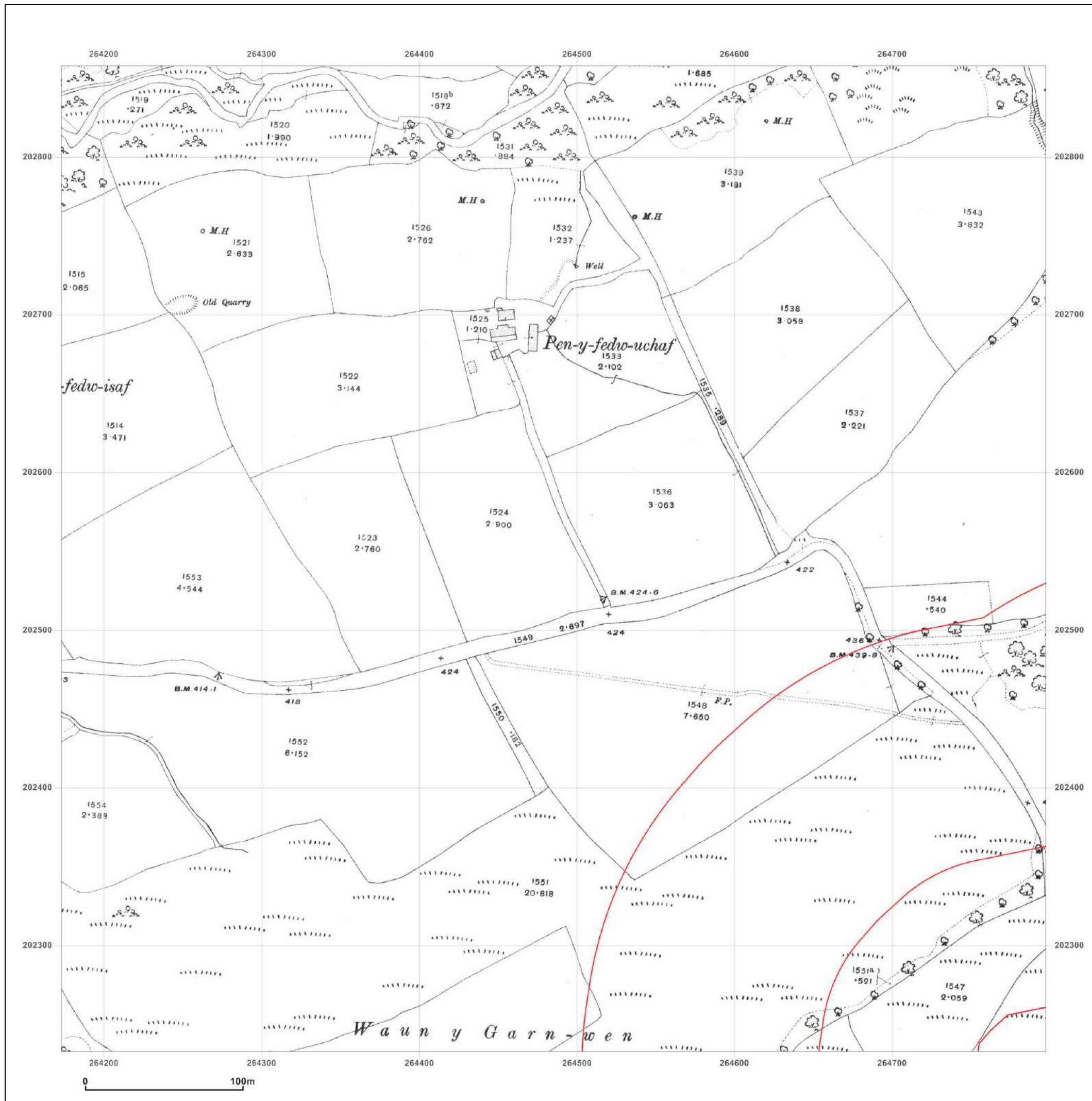


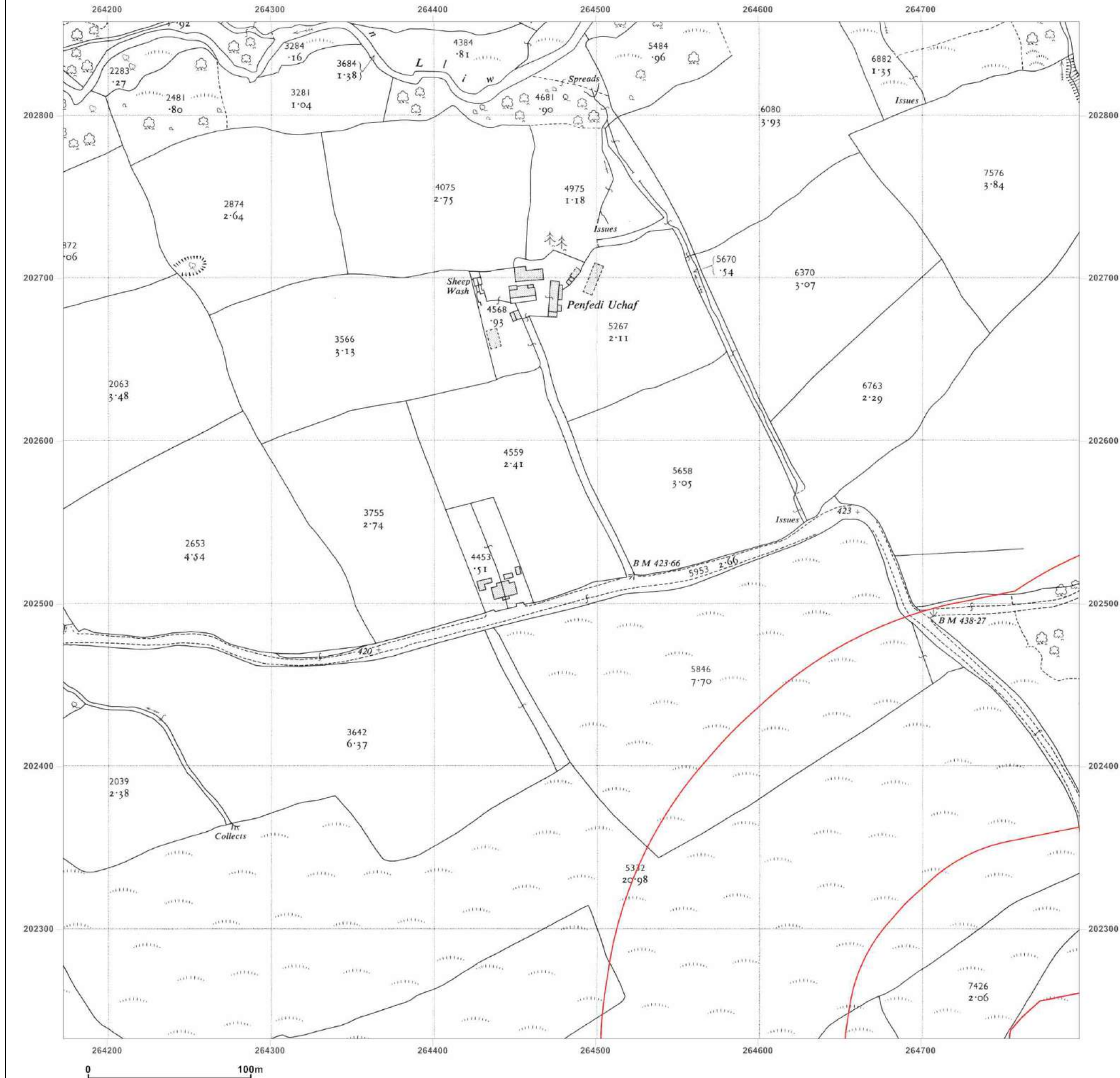
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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_5
Grid Ref: 264485, 202545

Map Name: National Grid

Map date: 1958

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1956



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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_5
Grid Ref: 264485, 202545

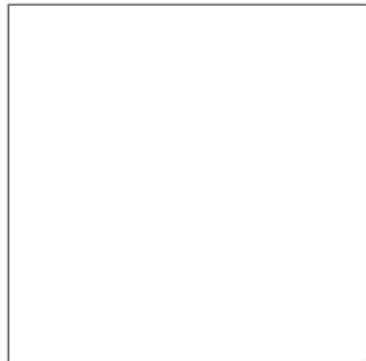
Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500





Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1956

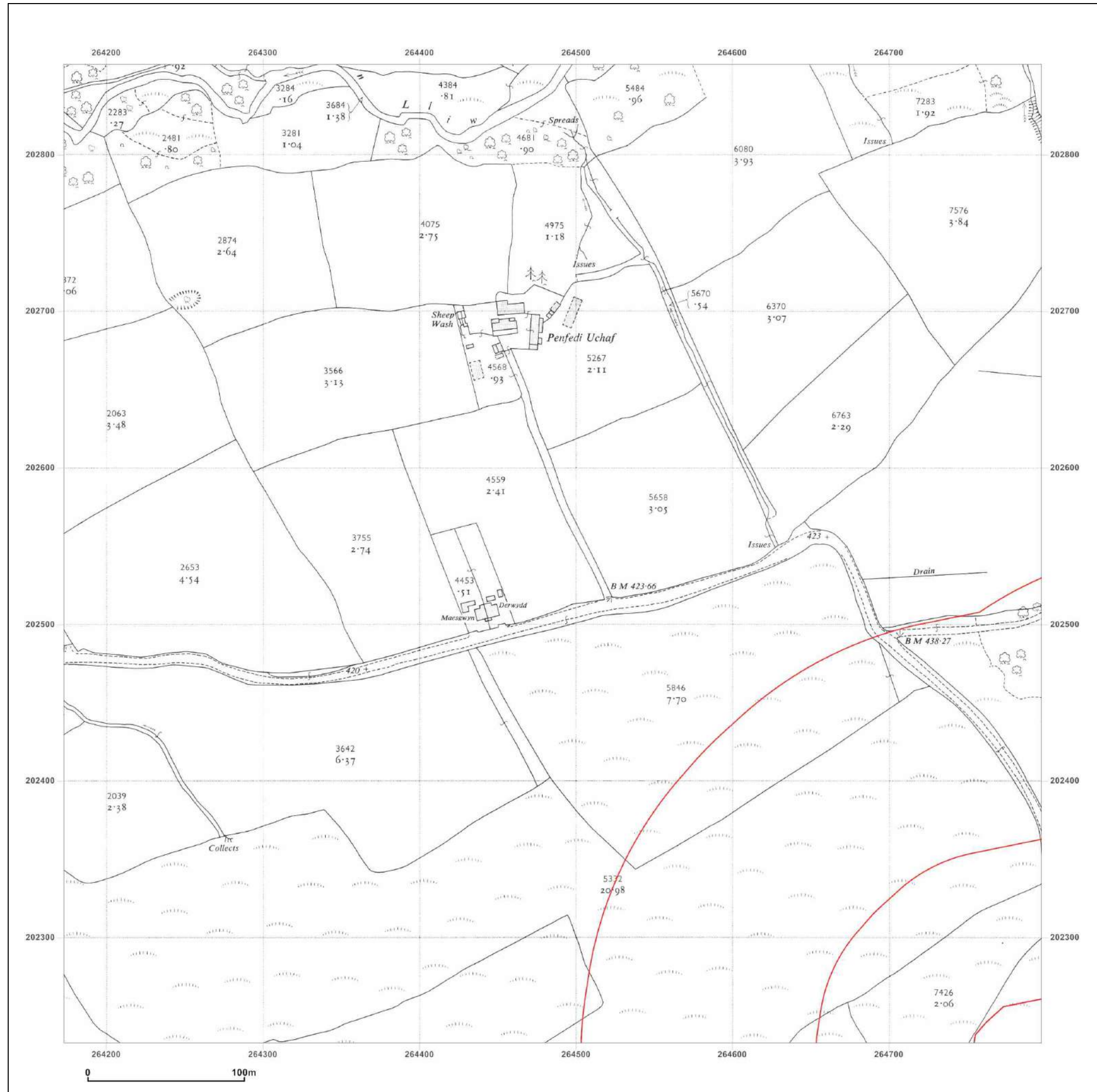


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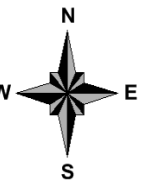
Client Ref: PB84891
Report Ref: GS-1587646_LS_3_5
Grid Ref: 264485, 202545

Map Name: National Grid

Map date: 1989

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1989
Revised 1989
Edition N/A
Copyright 1989
Levelled N/A

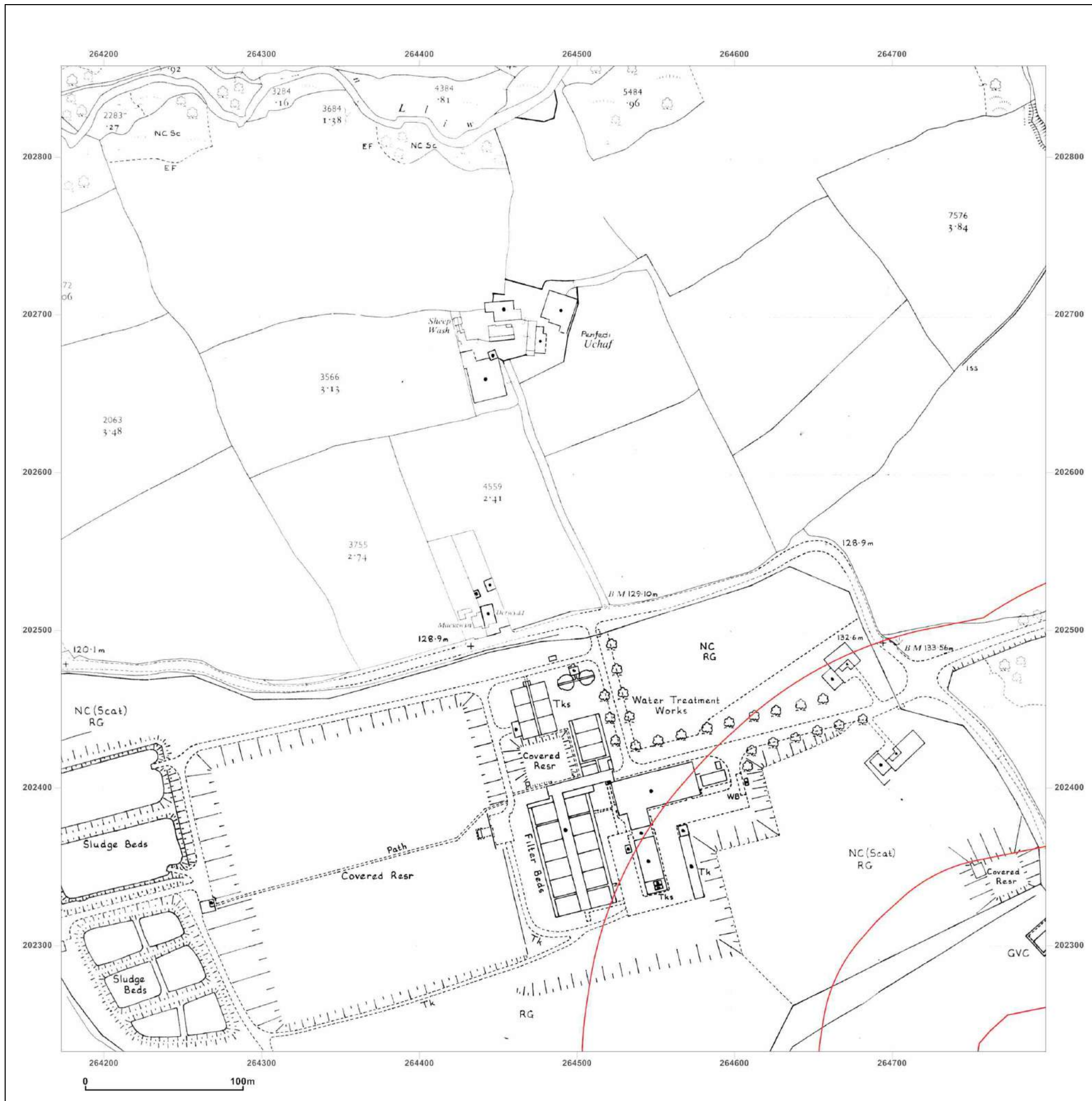


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Client Ref: PB84891
Report Ref: GS-1587646_LS_3_5
Grid Ref: 264485, 202545

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
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Client Ref: PB84891
Report Ref: GS-1587646_LS_4_2
Grid Ref: 265115, 200655

Map Name: County Series

Map date: 1876-1878

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1878
Revised 1878
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

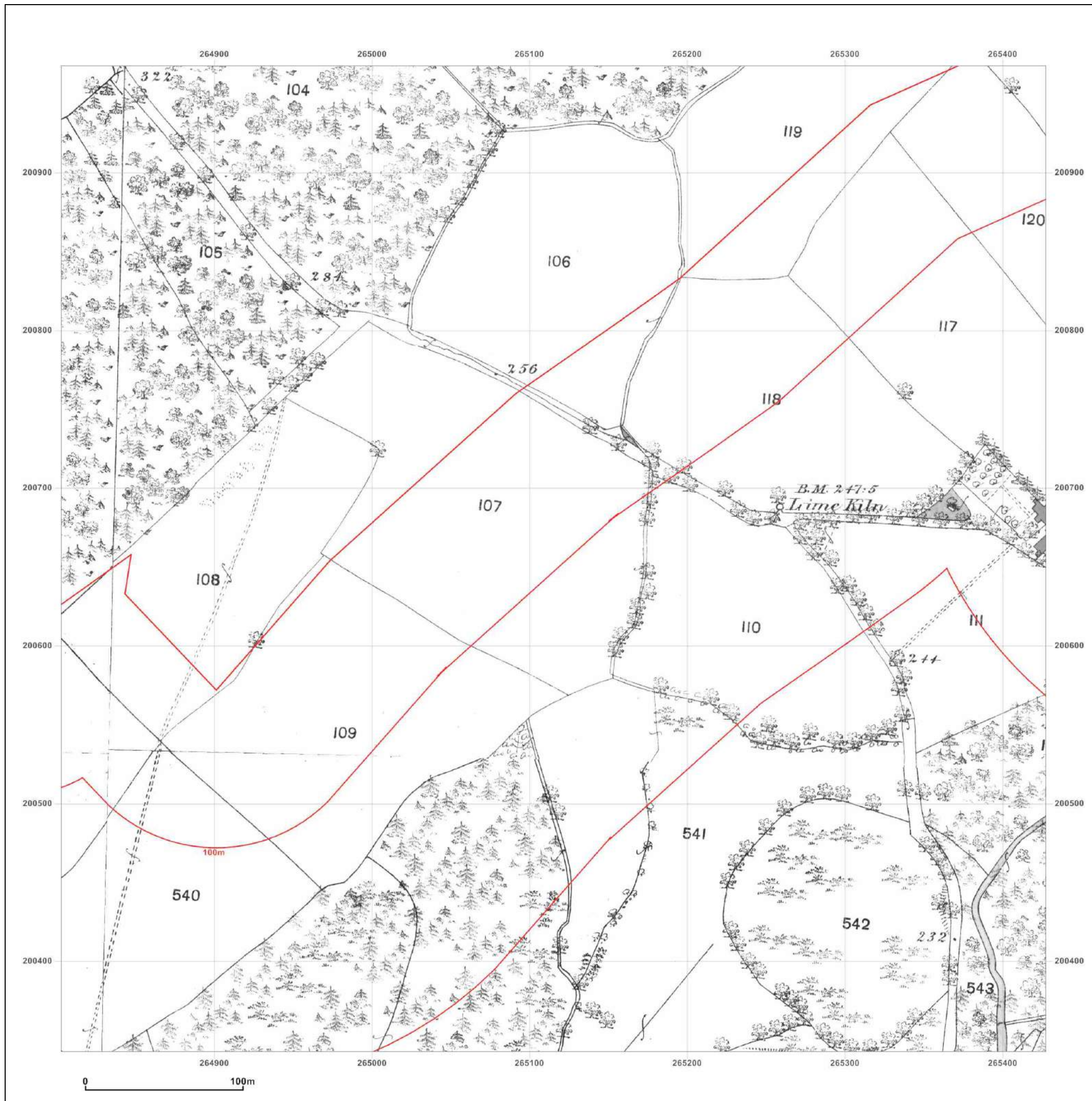


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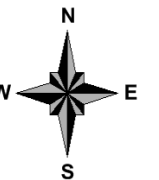
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Report Ref: GS-1587646_LS_4_2
Grid Ref: 265115, 200655

Map Name: County Series

Map date: 1898-1899

Scale: 1:2,500

Printed at: 1:2,500



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Surveyed 1899
Revised 1899
Edition N/A
Copyright N/A
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Levelled N/A

Surveyed 1899
Revised 1899
Edition N/A
Copyright N/A
Levelled N/A

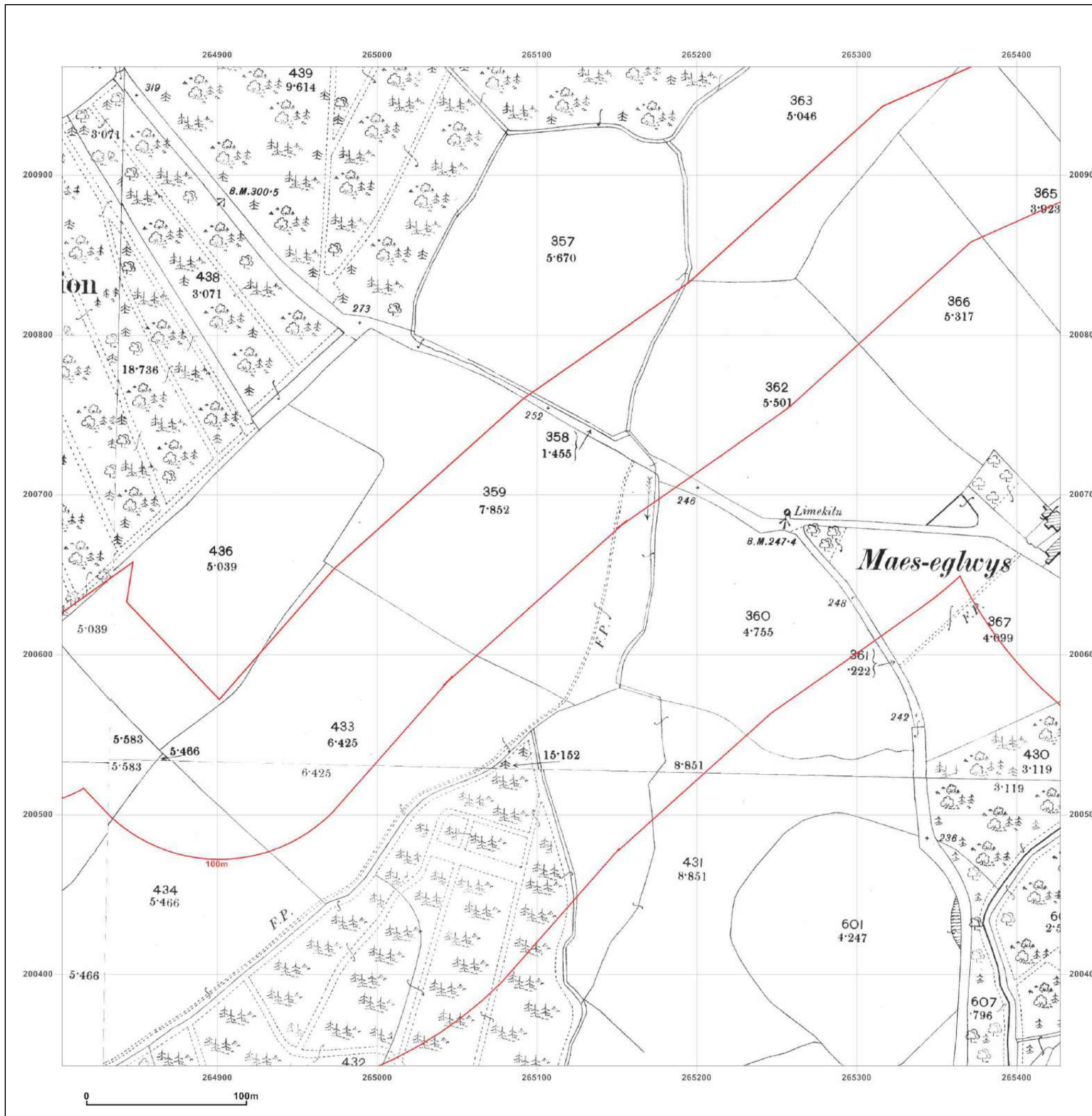


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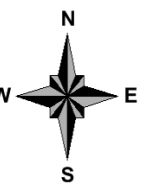
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Report Ref: GS-1587646_LS_4_2
Grid Ref: 265115, 200655

Map Name: County Series

Map date: 1916-1918

Scale: 1:2,500

Printed at: 1:2,500



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Surveyed 1918
Revised 1918
Edition N/A
Copyright N/A
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Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
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Surveyed 1917
Revised 1917
Edition N/A
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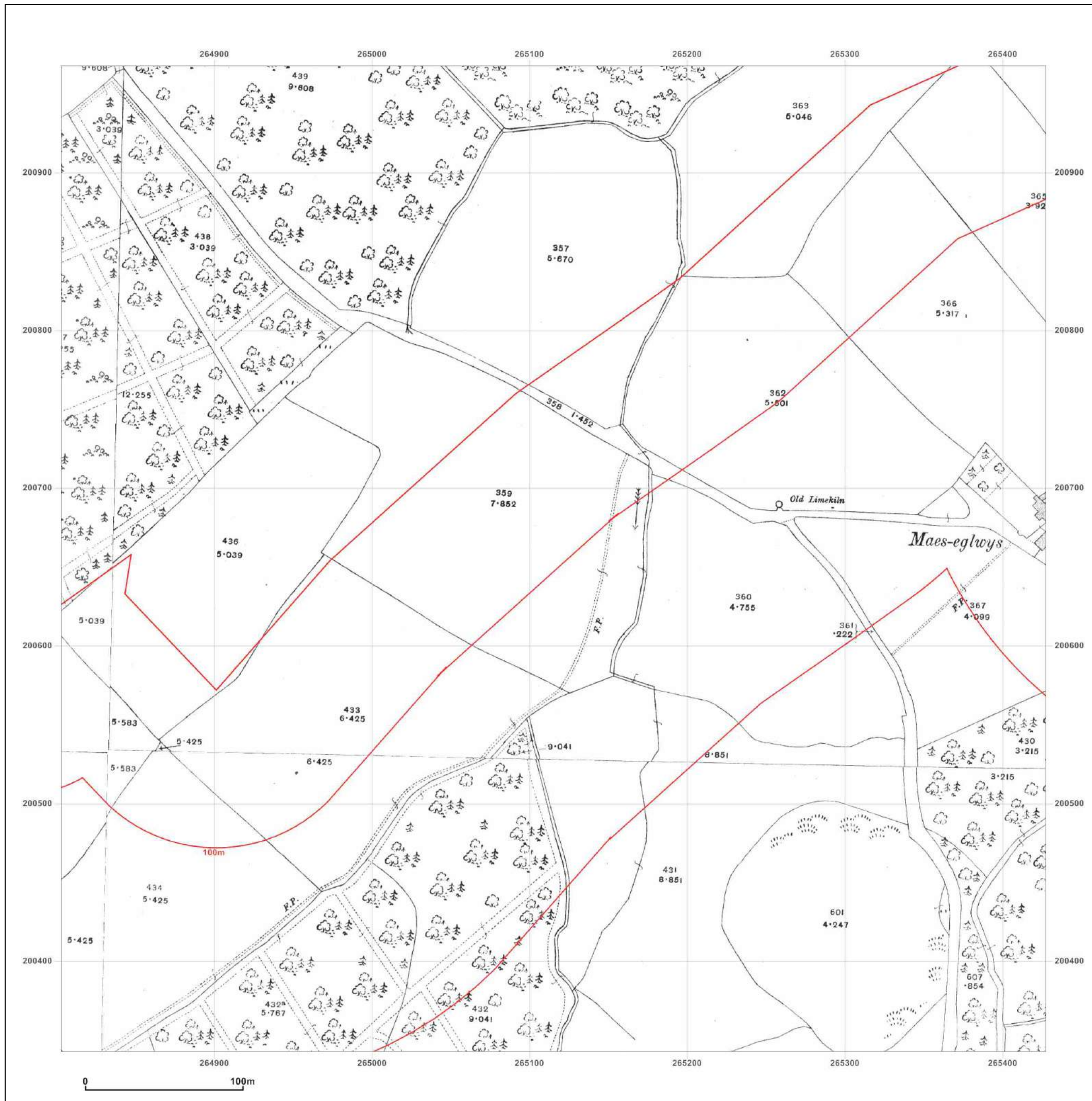


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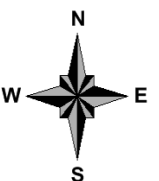
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Grid Ref: 265115, 200655

Map Name: County Series

Map date: 1935

Scale: 1:2,500

Printed at: 1:2,500



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Revised 1935
Edition N/A
Copyright N/A
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Surveyed 1935
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Copyright N/A
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Revised 1935
Edition N/A
Copyright N/A
Levelled N/A

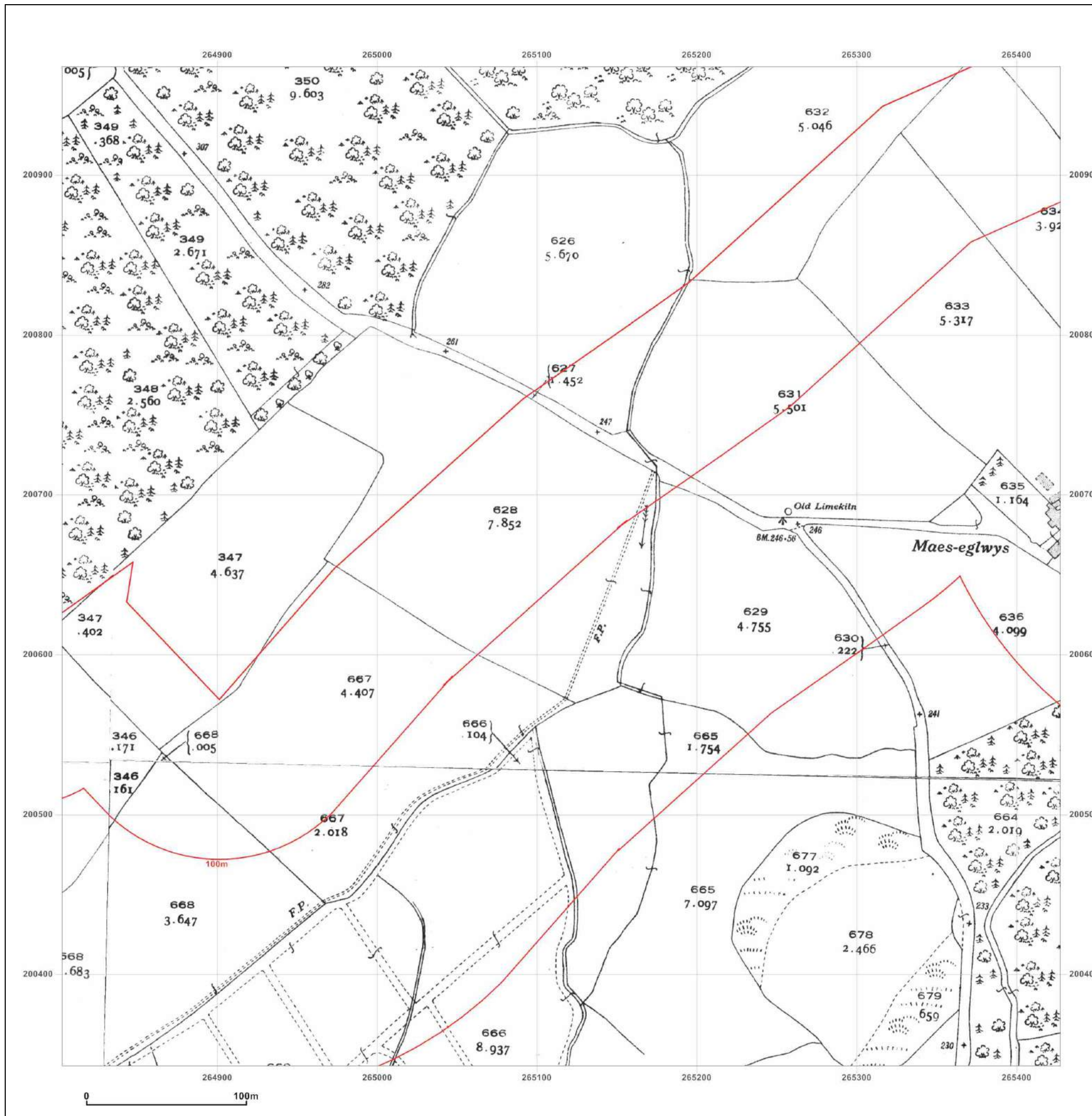


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Grid Ref: 265115, 200655

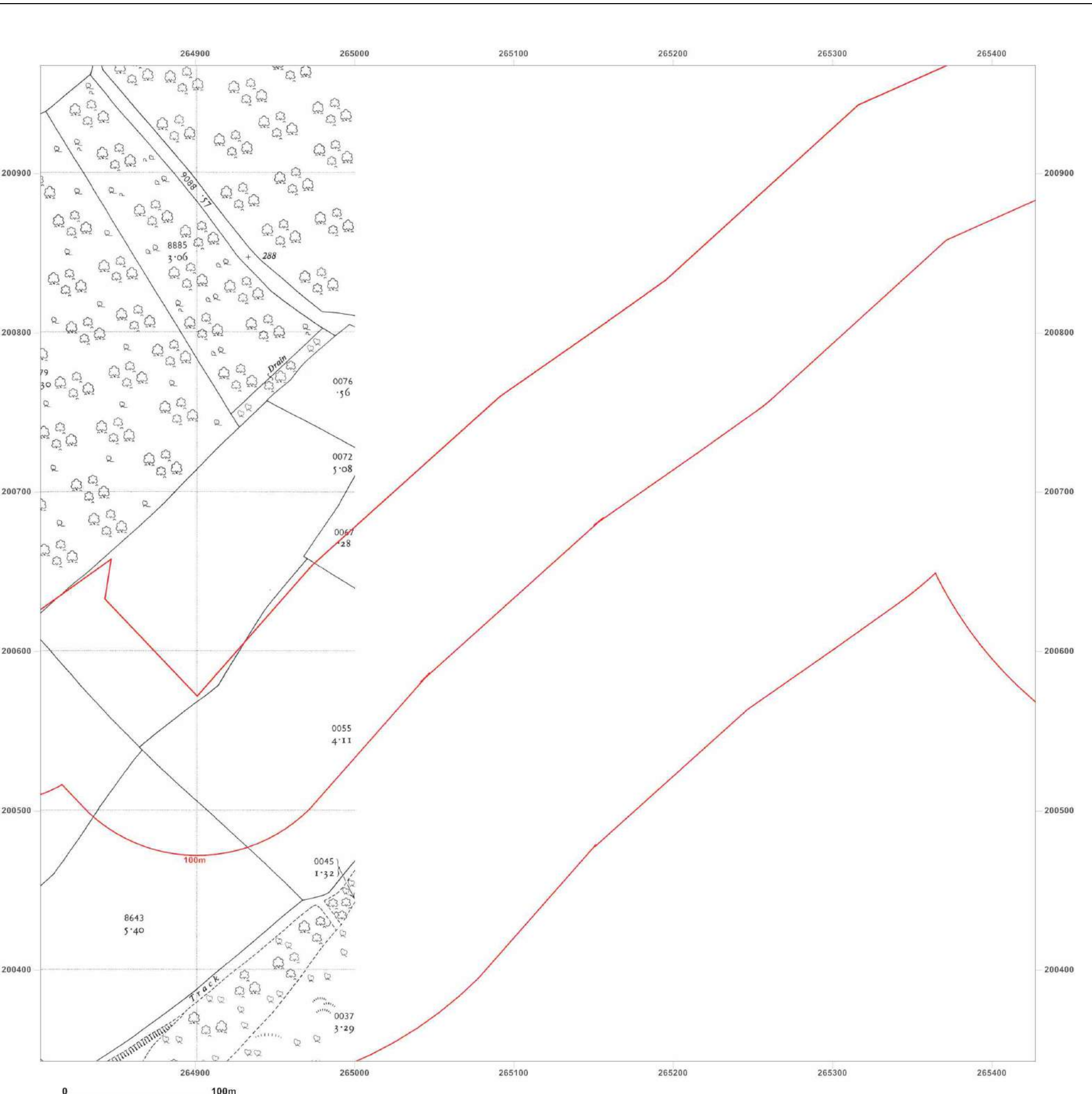
Map Name: National Grid

Map date: 1958

Scale: 1:2,500

Printed at: 1:2,500





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Client Ref: PB84891
Report Ref: GS-1587646_LS_4_2
Grid Ref: 265115, 200655

Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1960
Edition N/A
Copyright 1962
Levelled 1956

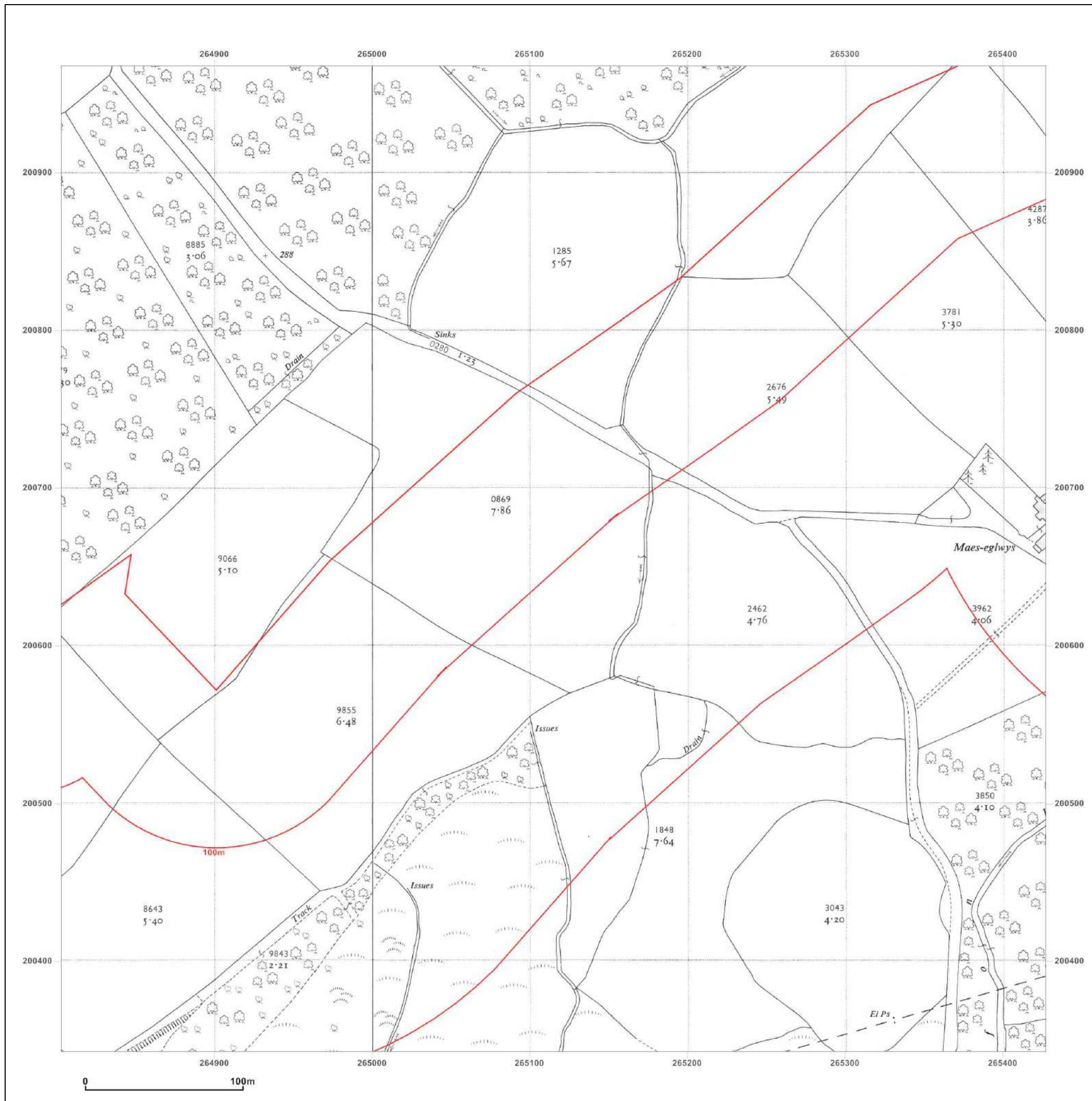


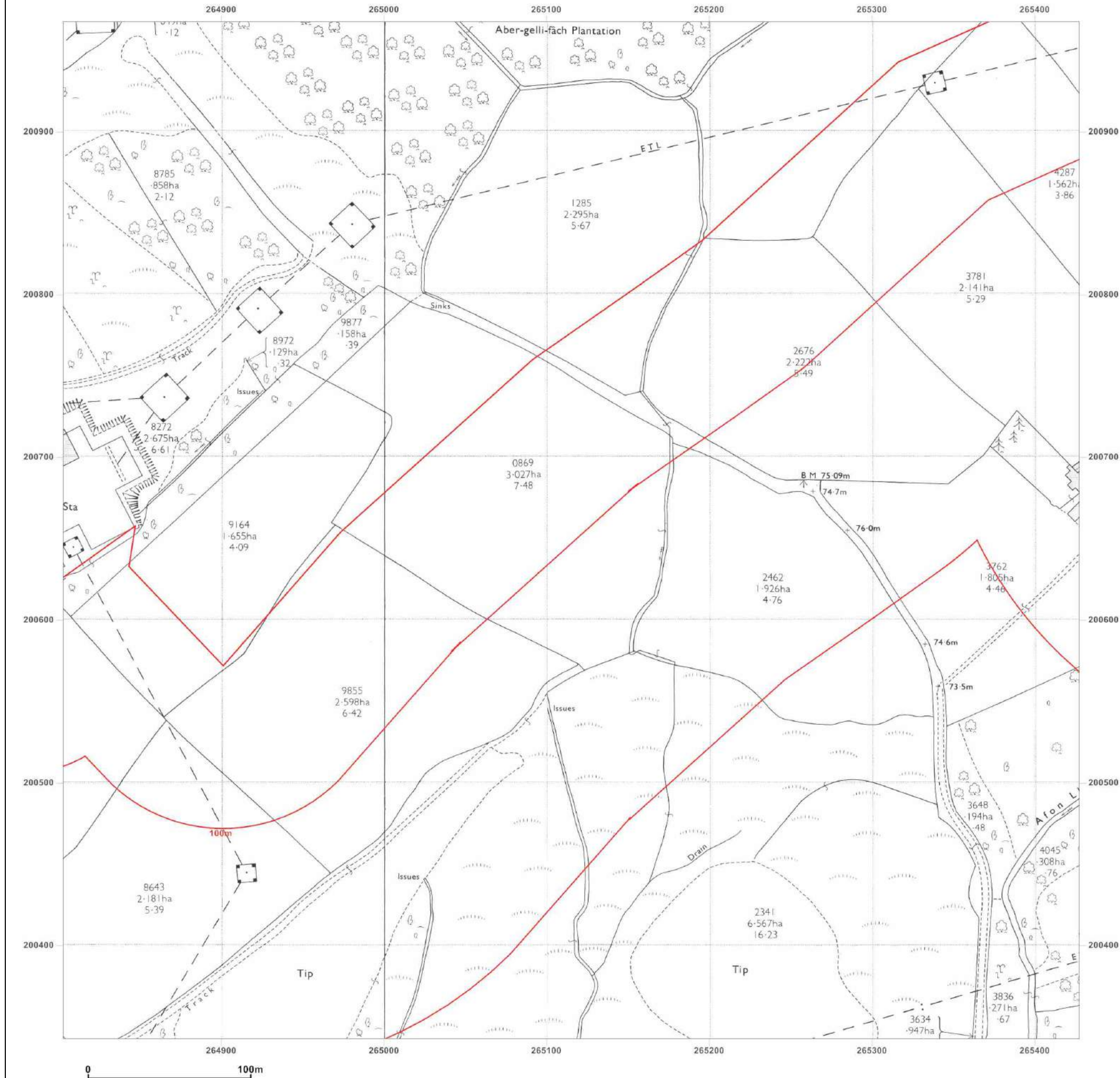
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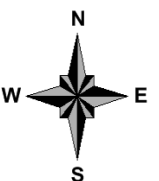
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Grid Ref: 265115, 200655

Map Name: National Grid

Map date: 1974

Scale: 1:2,500

Printed at: 1:2,500



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Client Ref: PB84891
Report Ref: GS-1587646_LS_4_2
Grid Ref: 265115, 200655

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



<p>Surveyed N/A Revised N/A Edition N/A Copyright 1993 Levelled N/A</p>	<p>Surveyed N/A Revised N/A Edition N/A Copyright 1993 Levelled N/A</p>
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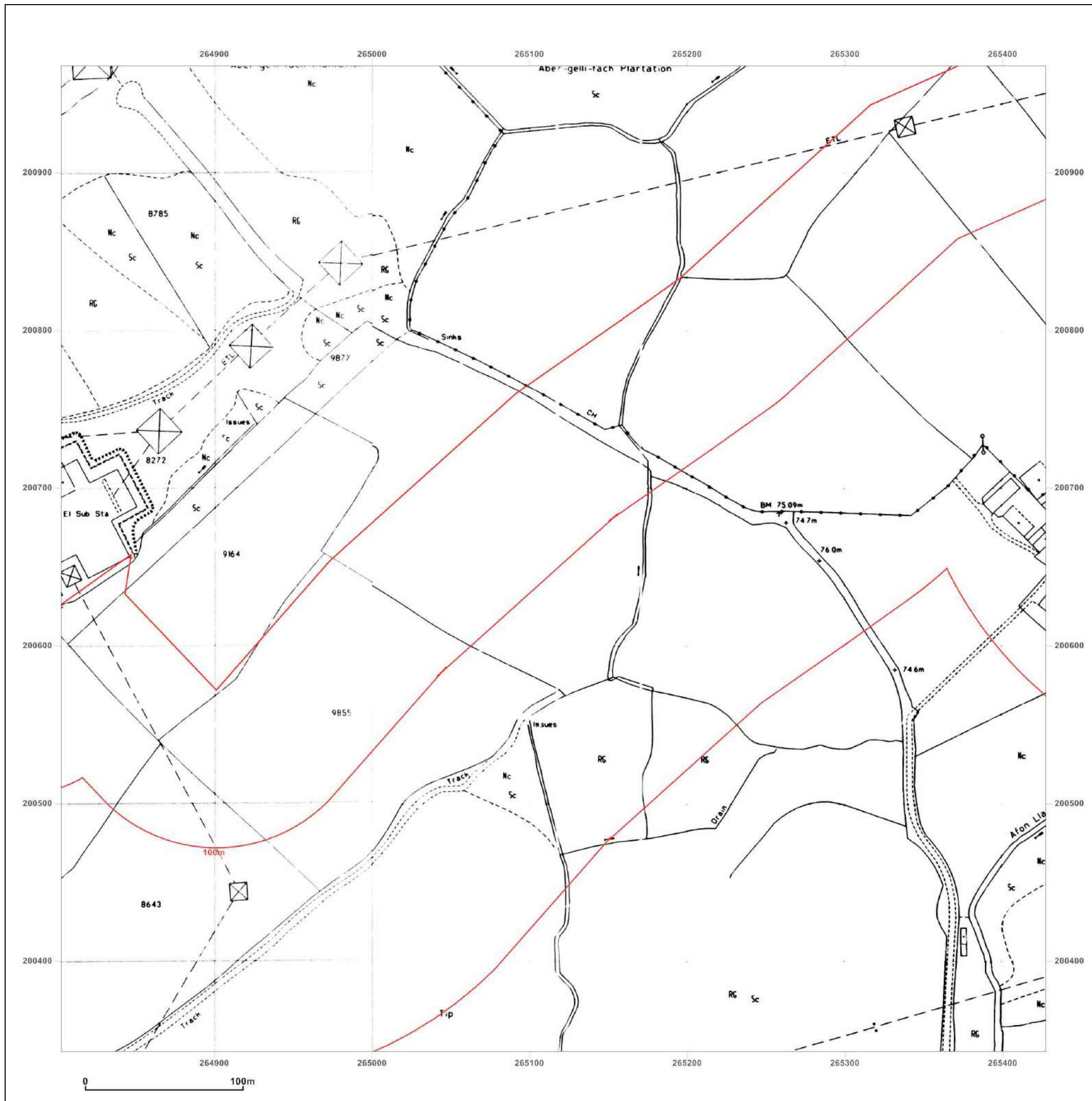


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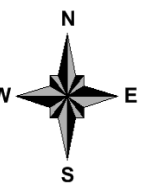
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Report Ref: GS-1587646_LS_4_3
Grid Ref: 265115, 201285

Map Name: County Series

Map date: 1876

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1876
Edition N/A
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Levelled N/A

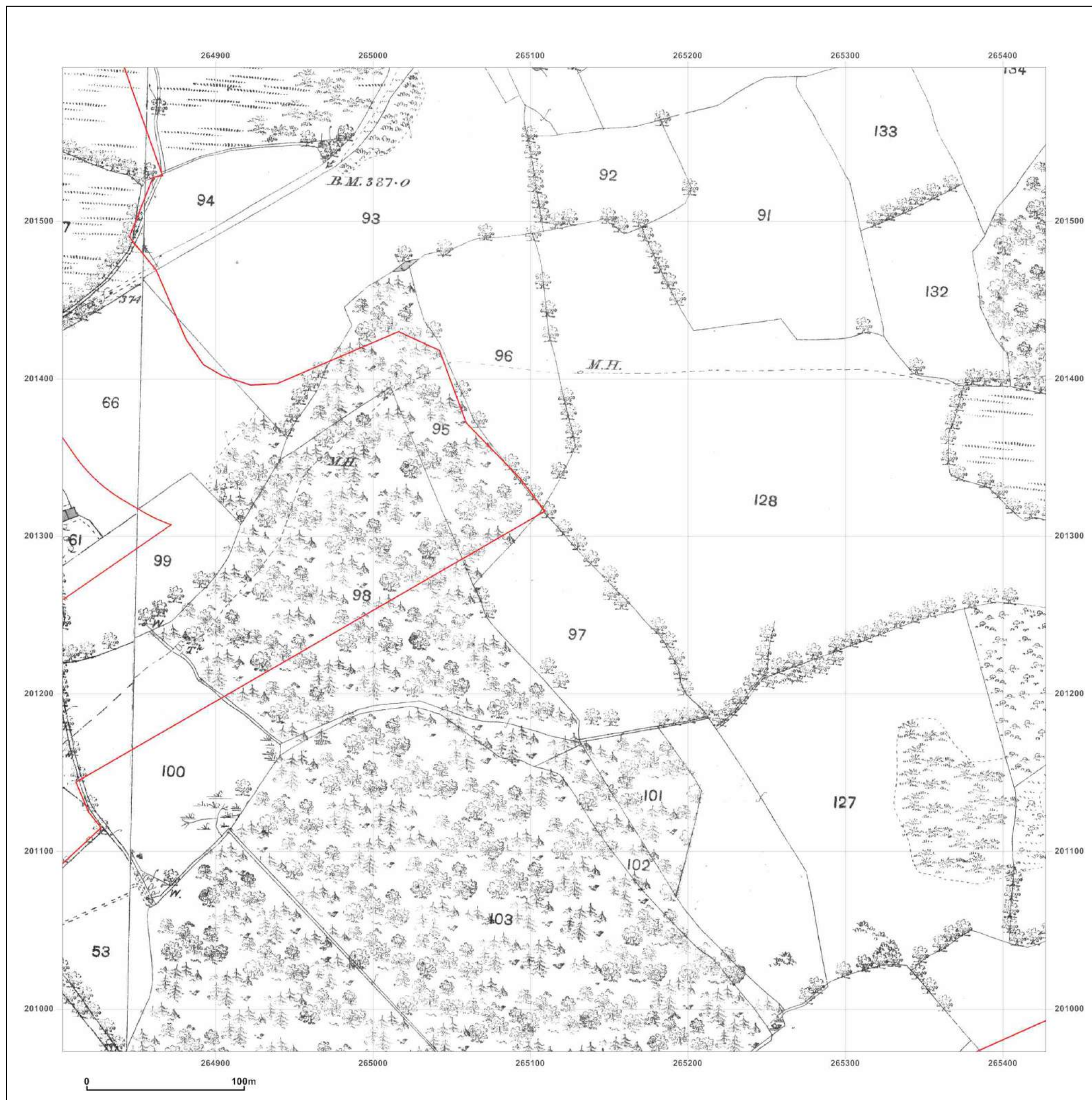


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Client Ref: PB84891
Report Ref: GS-1587646_LS_4_3
Grid Ref: 265115, 201285

Map Name: County Series

Map date: 1935

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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Levelled N/A

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Revised 1935
Edition N/A
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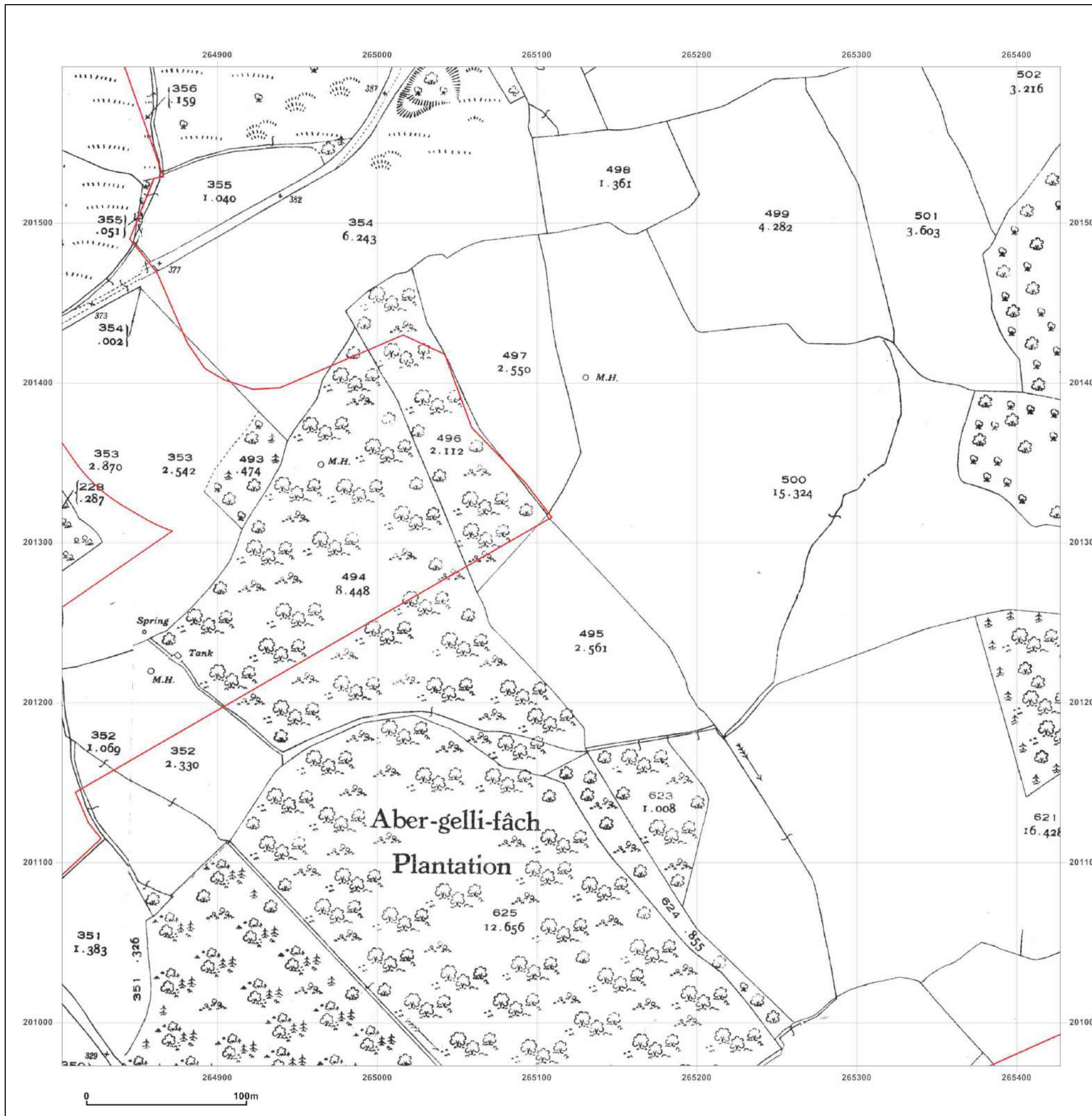


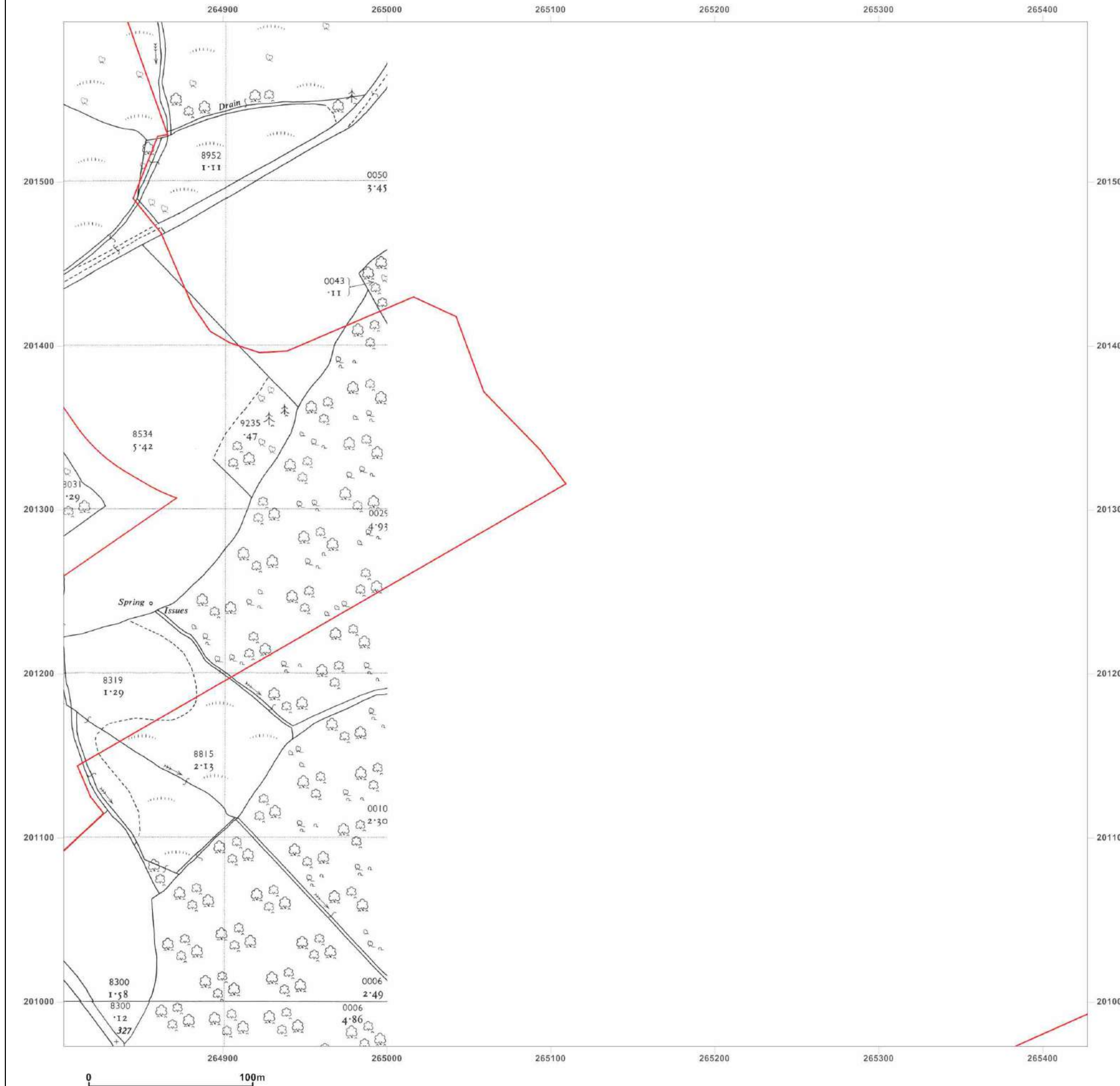
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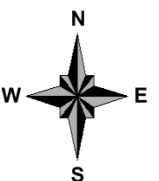
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Grid Ref: 265115, 201285

Map Name: National Grid

Map date: 1958

Scale: 1:2,500

Printed at: 1:2,500



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Client Ref: PB84891
Report Ref: GS-1587646_LS_4_3
Grid Ref: 265115, 201285

Map Name: National Grid

Map date: 1960

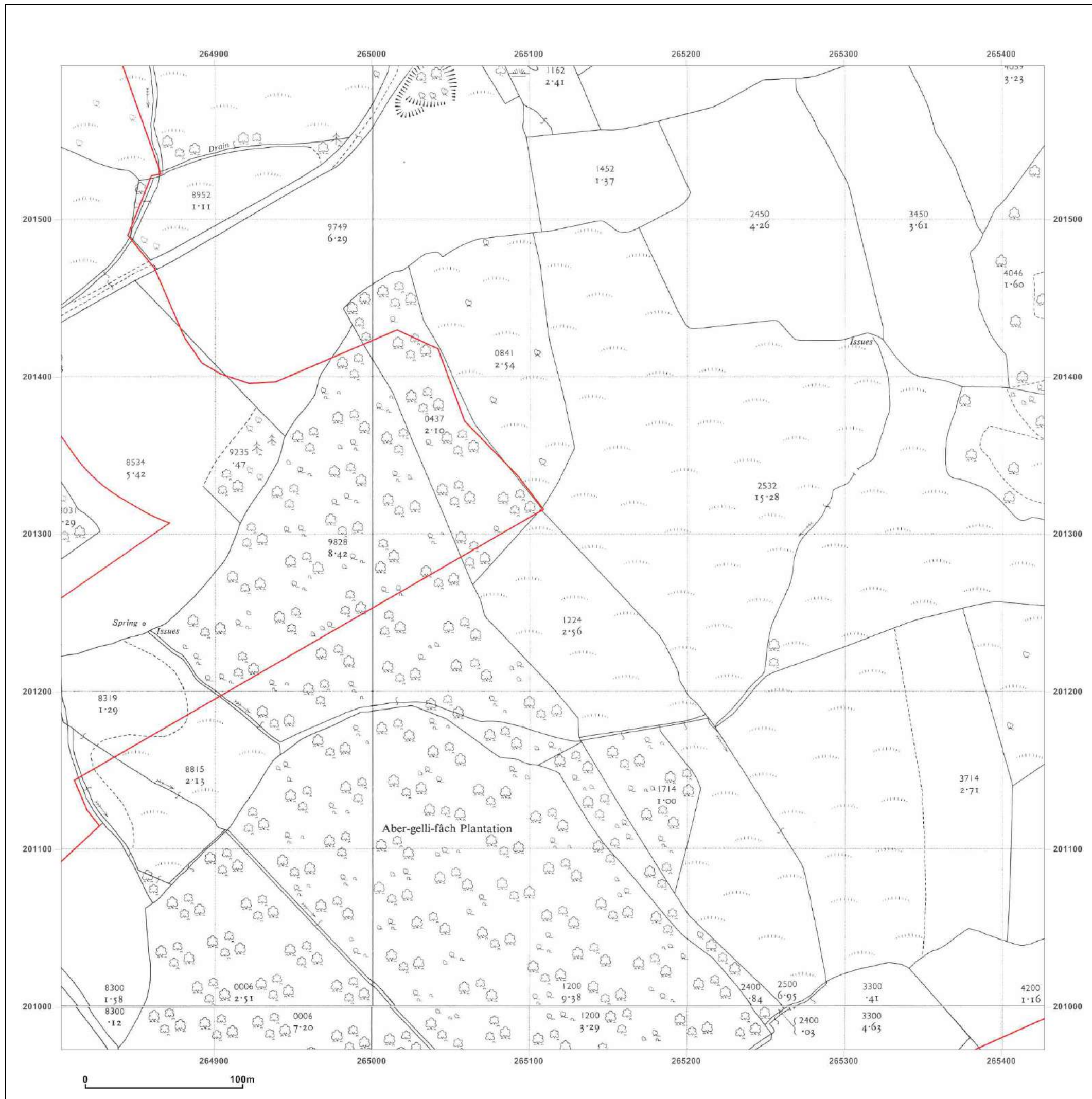
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Printed at: 1:2,500



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Surveyed 1960
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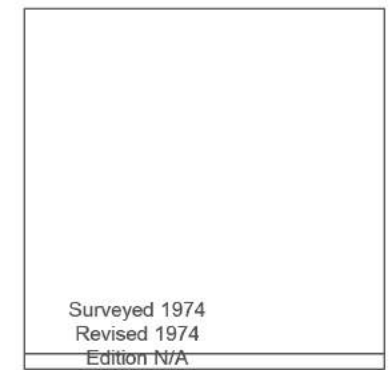
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Report Ref: GS-1587646_LS_4_3
Grid Ref: 265115, 201285

Map Name: National Grid

Map date: 1974

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1963

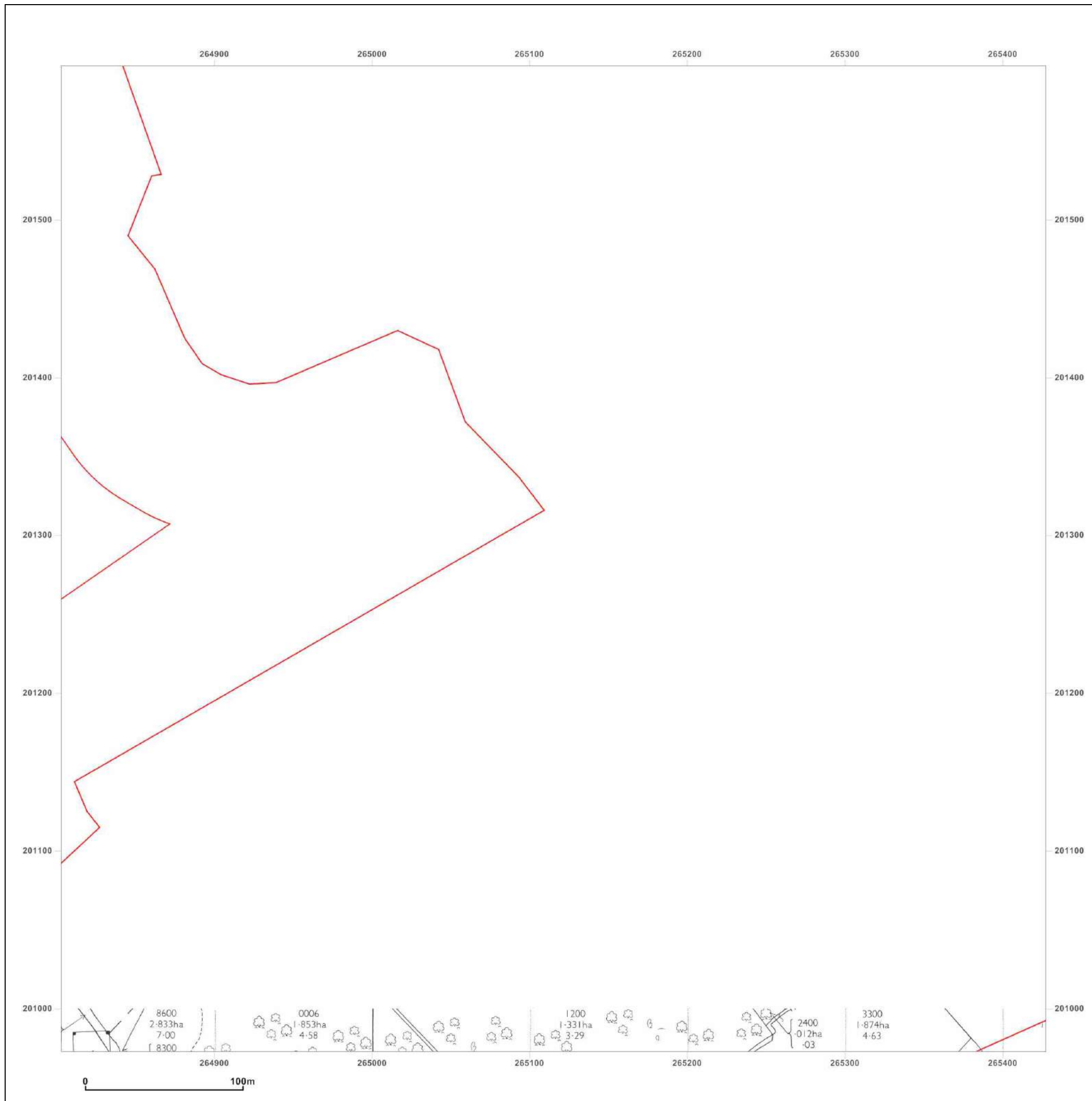


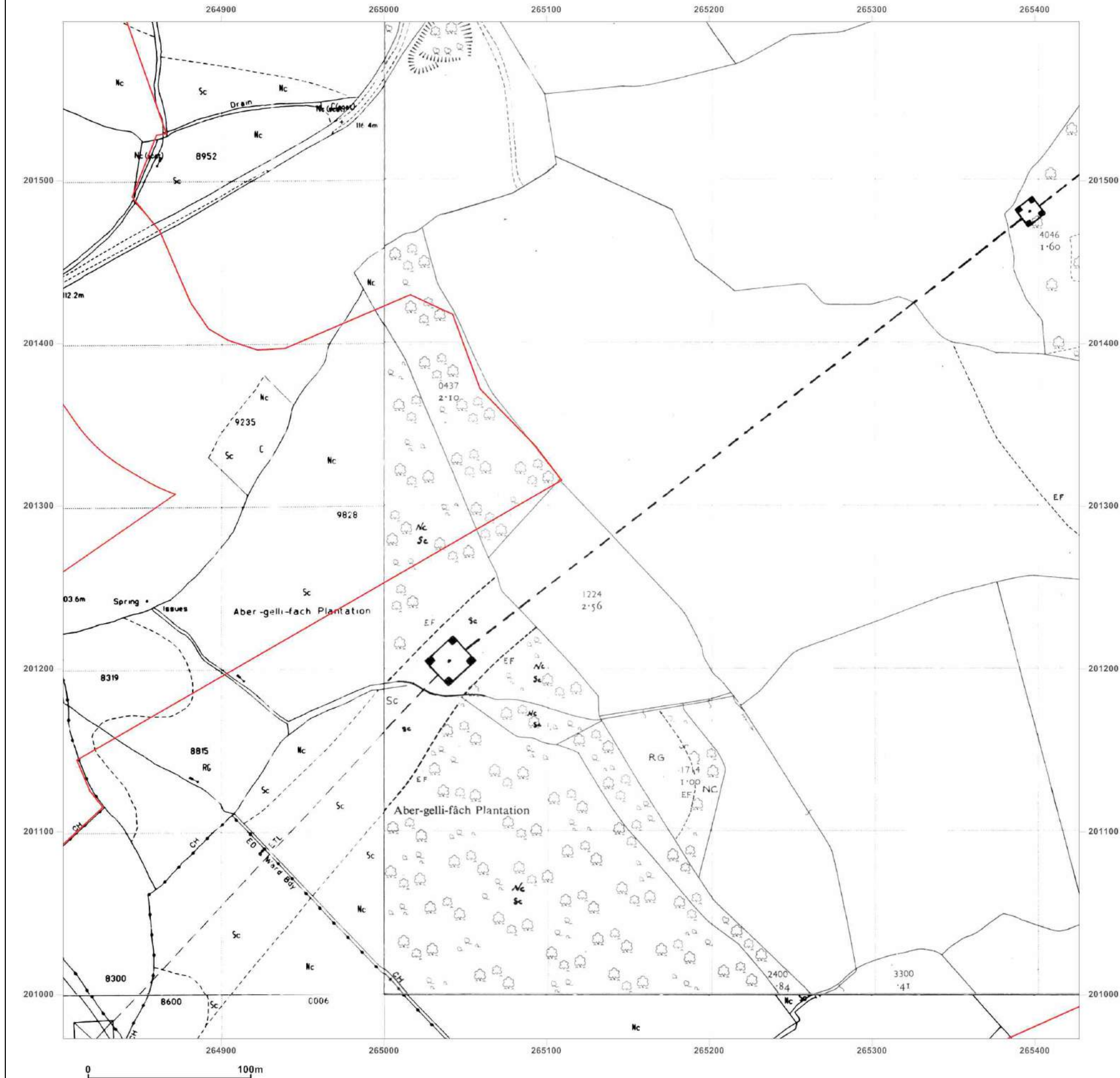
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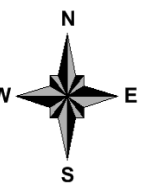
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Report Ref: GS-1587646_LS_4_3
Grid Ref: 265115, 201285

Map Name: National Grid

Map date: 1992-1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

Surveyed N/A
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Client Ref: PB84891
Report Ref: GS-1587646_LS_4_3
Grid Ref: 265115, 201285

Map Name: National Grid

Map date: 1989-1993

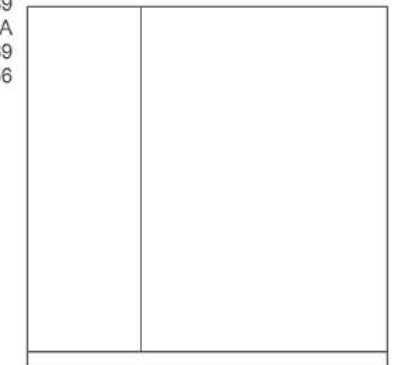
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Printed at: 1:2,500



Surveyed 1956
Revised 1989
Edition N/A
Copyright 1989
Levelled 1956

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

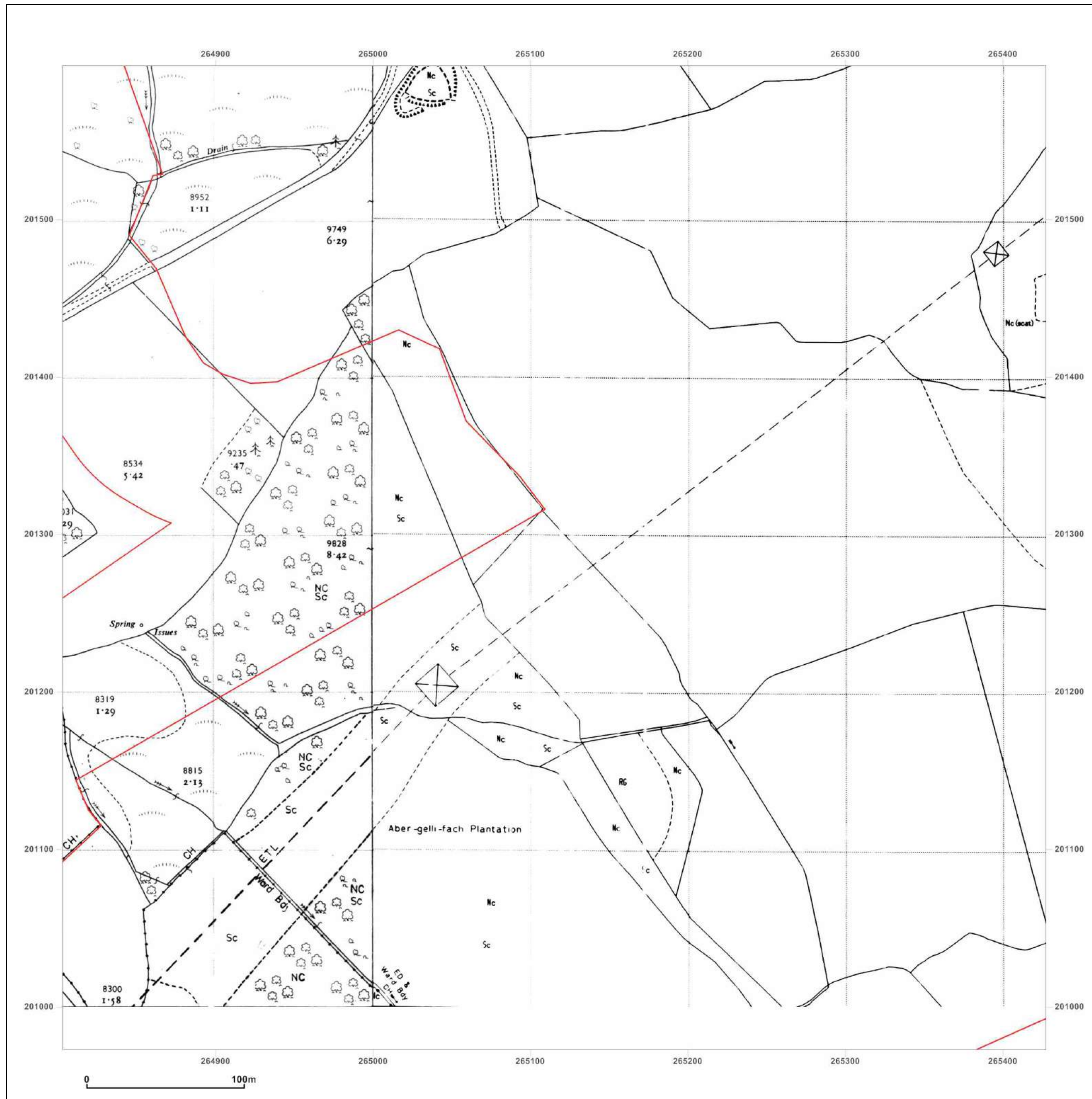


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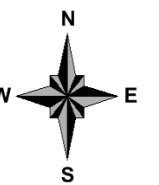
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Grid Ref: 265115, 201915

Map Name: County Series

Map date: 1876

Scale: 1:2,500

Printed at: 1:2,500



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Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

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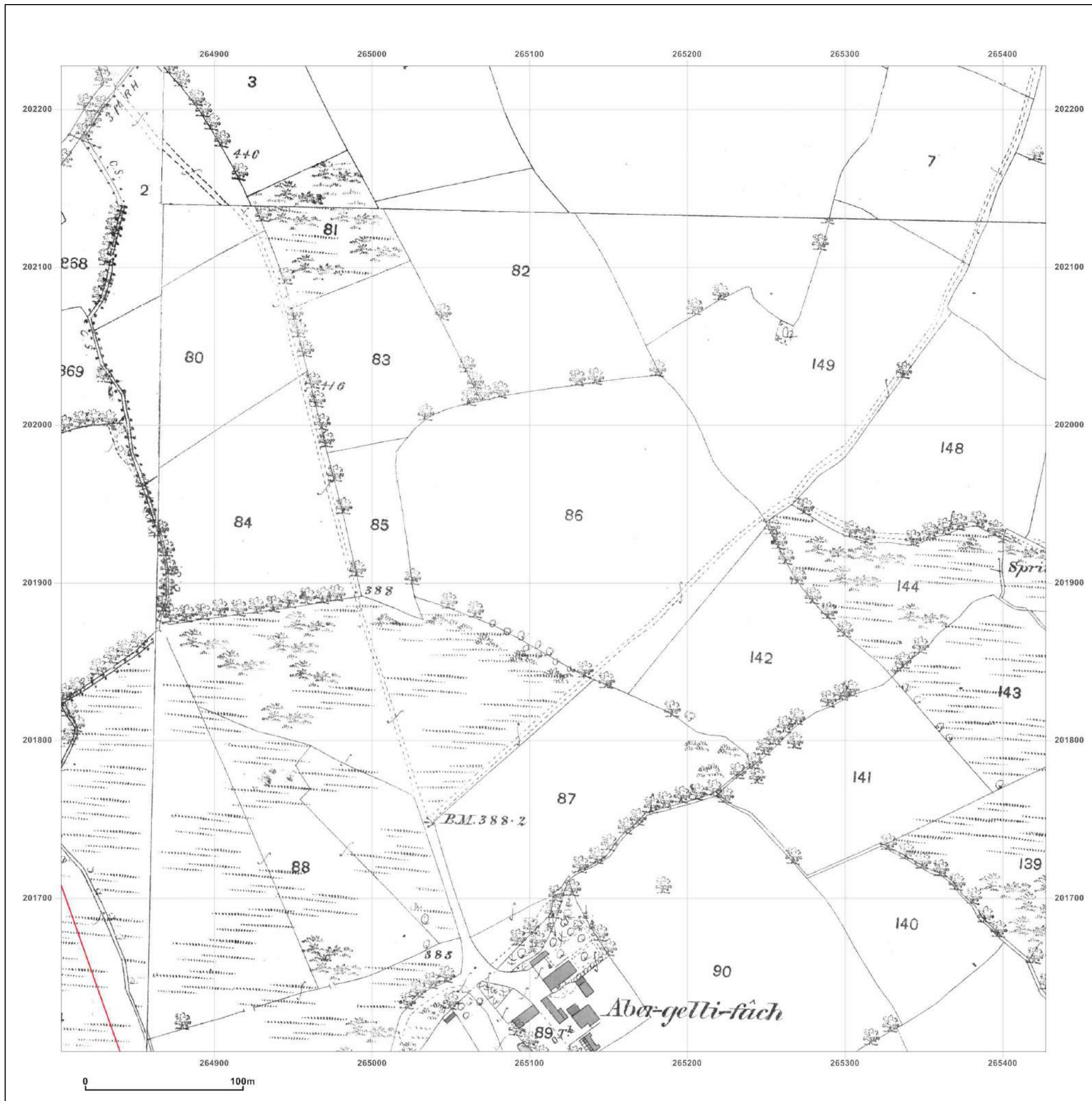


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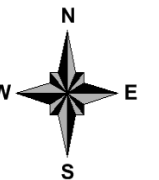
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Map Name: County Series

Map date: 1898-1899

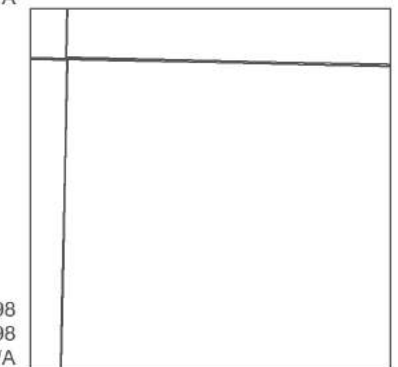
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Printed at: 1:2,500



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Edition N/A
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Revised 1898
Edition N/A
Copyright N/A
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Revised 1898
Edition N/A
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Levelled N/A

Surveyed 1899
Revised 1899
Edition N/A
Copyright N/A
Levelled N/A

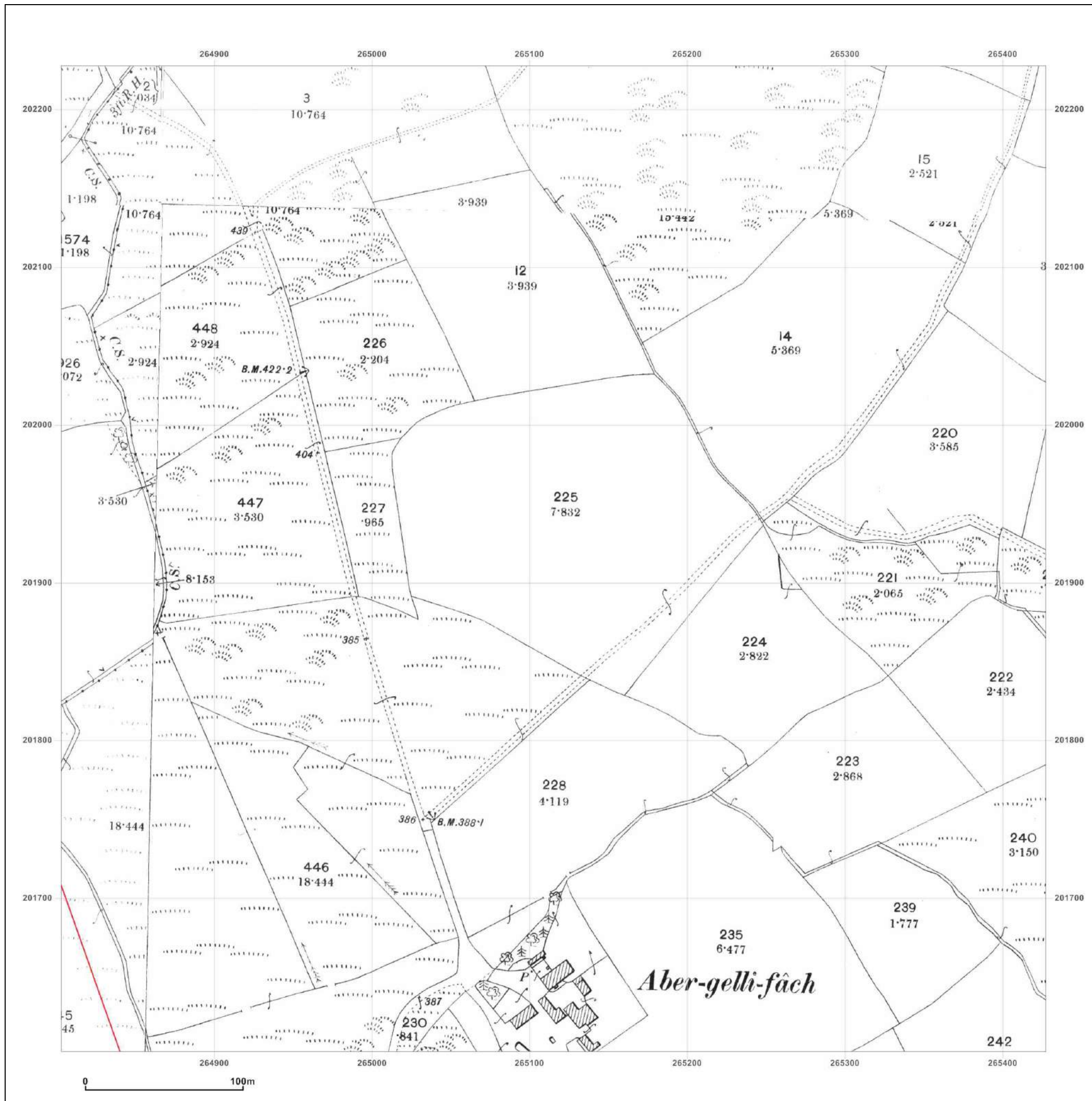


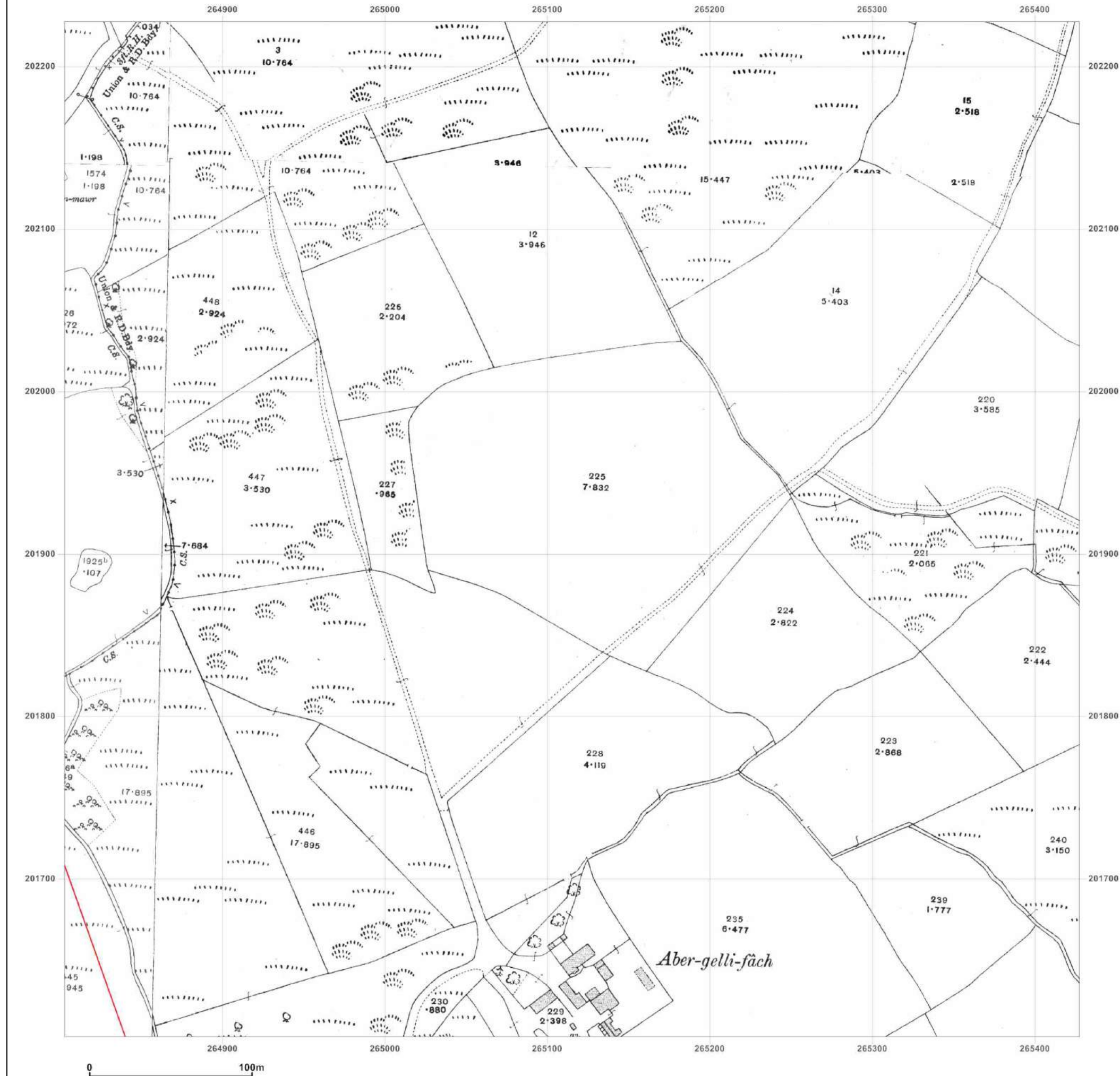
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Client Ref: PB84891
Report Ref: GS-1587646_LS_4_4
Grid Ref: 265115, 201915

Map Name: County Series

Map date: 1913-1918

Scale: 1:2,500

Printed at: 1:2,500



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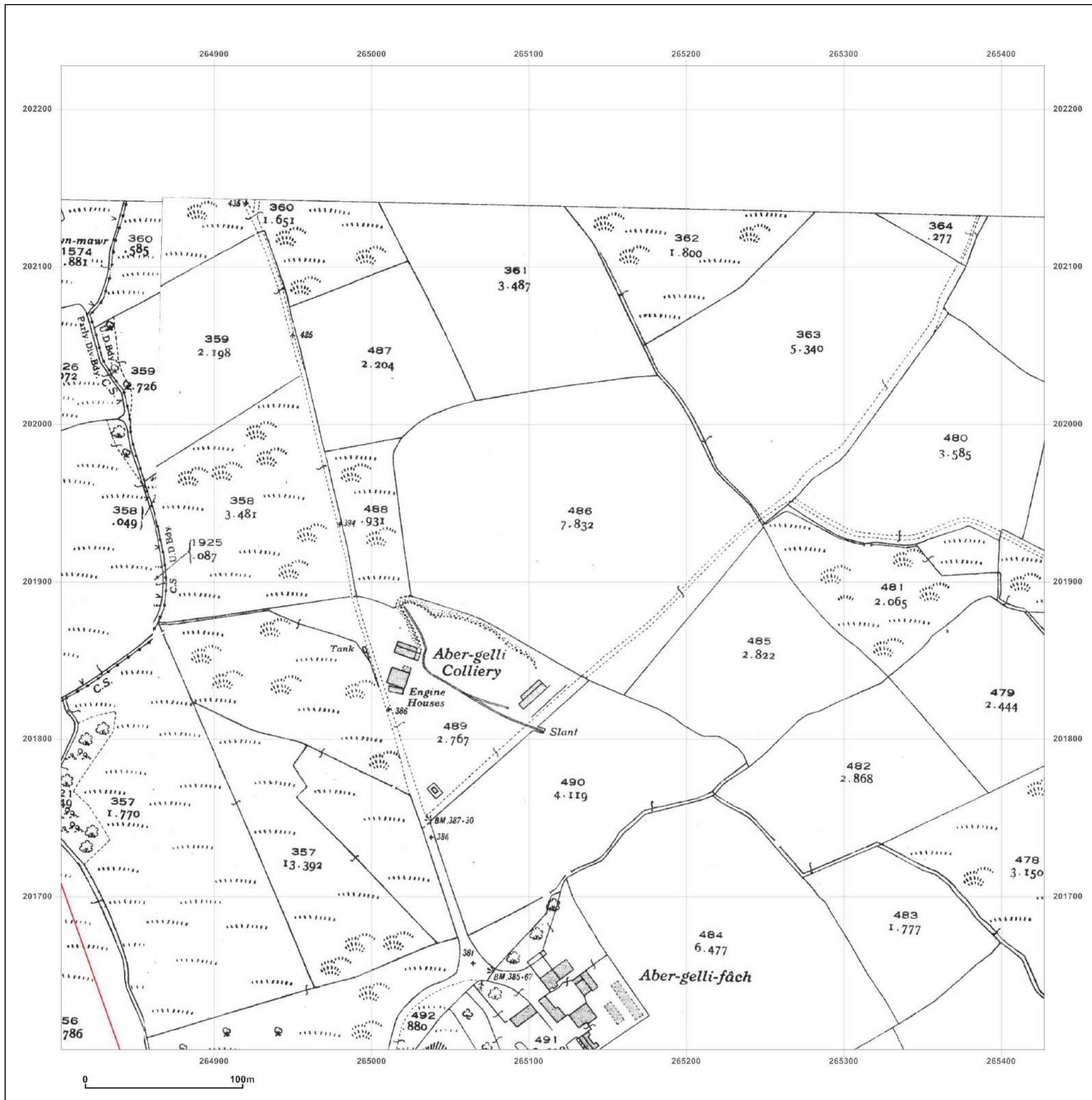


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Grid Ref: 265115, 201915

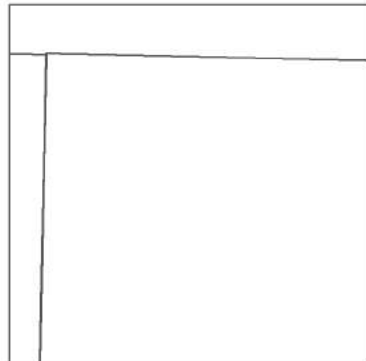
Map Name: County Series

Map date: 1935

Scale: 1:2,500

Printed at: 1:2,500





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Surveyed 1935
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Edition N/A
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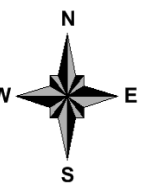
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Map Name: National Grid

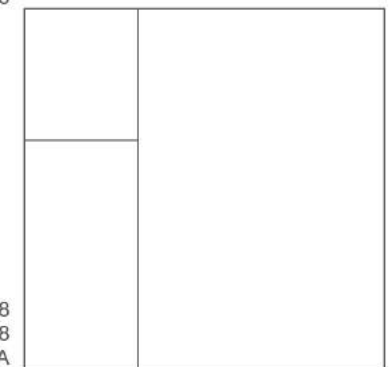
Map date: 1958

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1956



Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1946

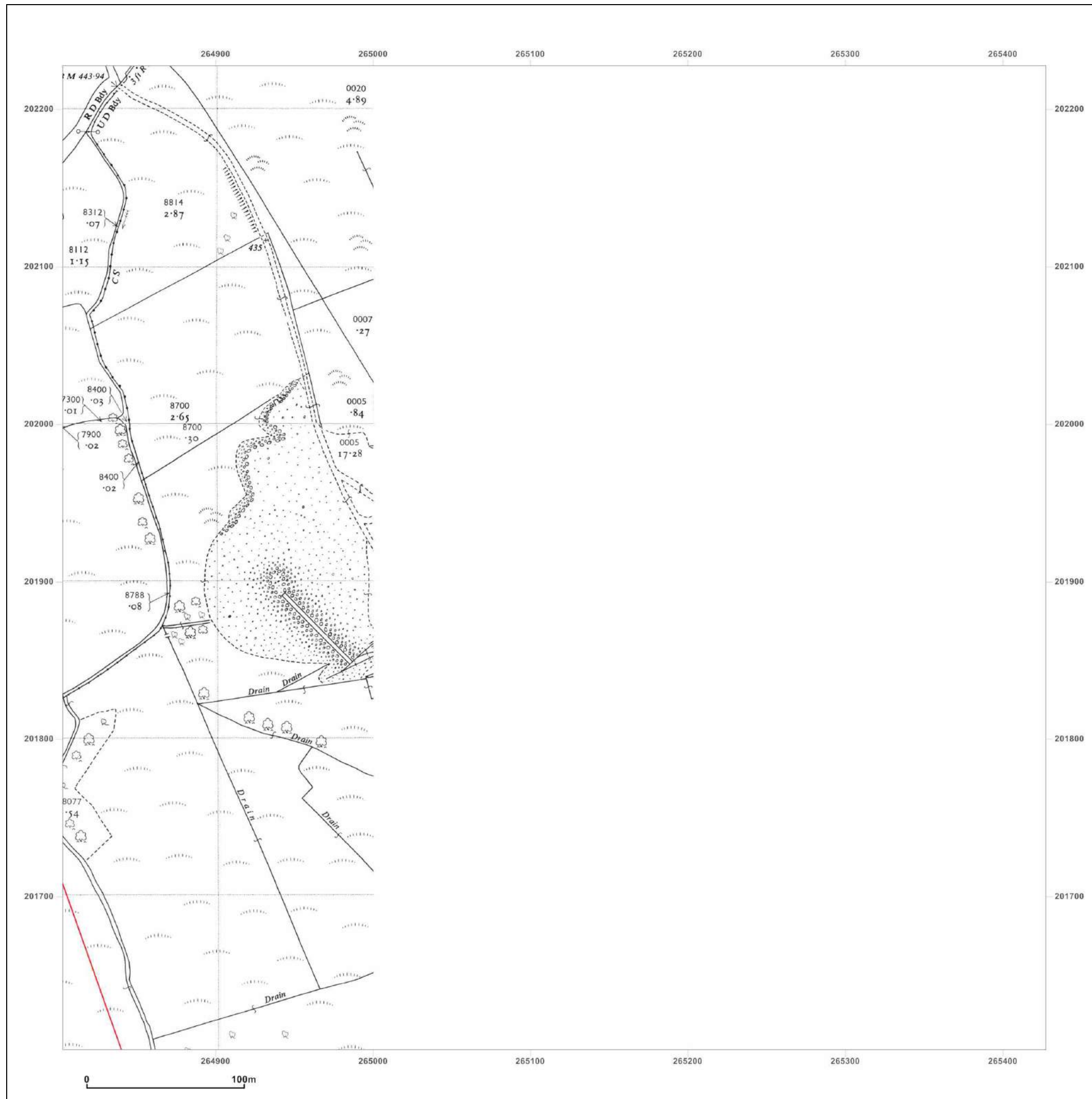


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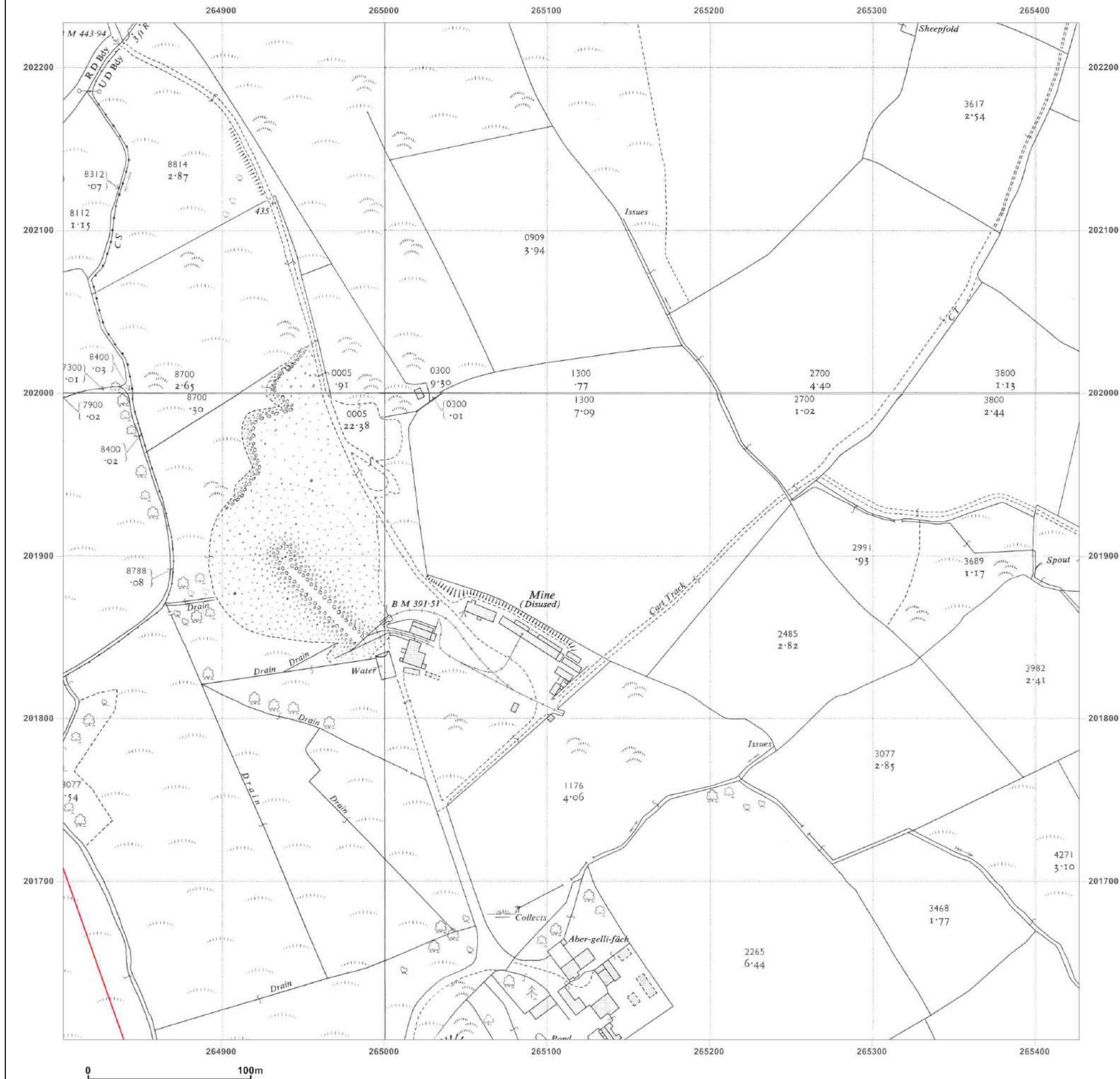
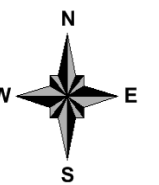
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Report Ref: GS-1587646_LS_4_4
Grid Ref: 265115, 201915

Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1960
Edition N/A
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Levelled 1956

Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1956

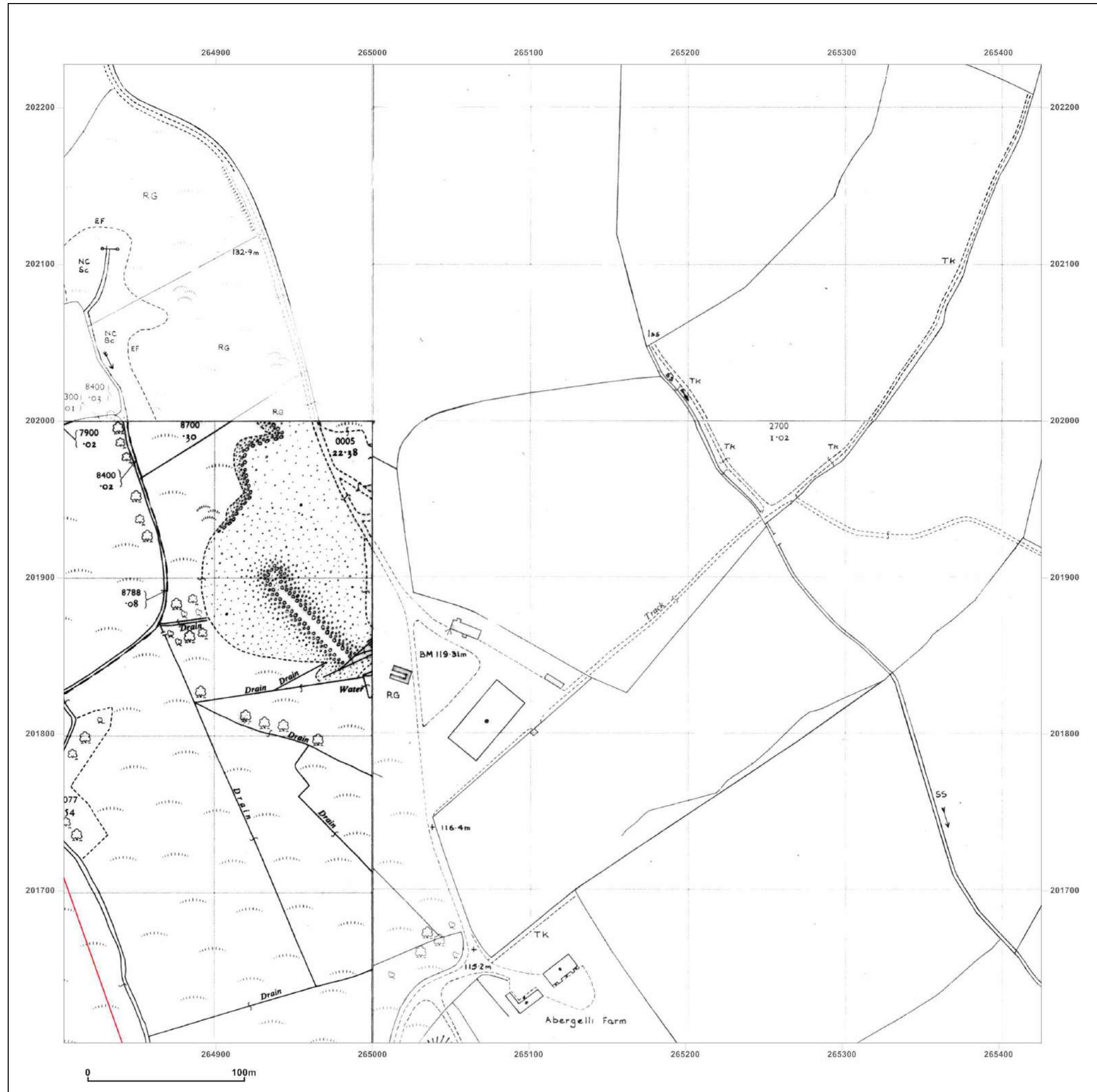


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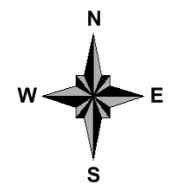
To view map legend click here [Legend](#)



Site Details:
 ABERGELLI FACH
 FARM, FELINDRE, ABERTAWE,
 SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_4_4
Grid Ref: 265115, 201915

Map Name: National Grid
Map date: 1989-1992
Scale: 1:2,500
Printed at: 1:2,500



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Surveyed 1956 Revised 1989 Edition N/A Copyright 1989 Levelled 1956	Surveyed 1992 Revised 1992 Edition N/A Copyright 1992 Levelled N/A


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SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_4_4
Grid Ref: 265115, 201915

Map Name: National Grid

Map date: 1993

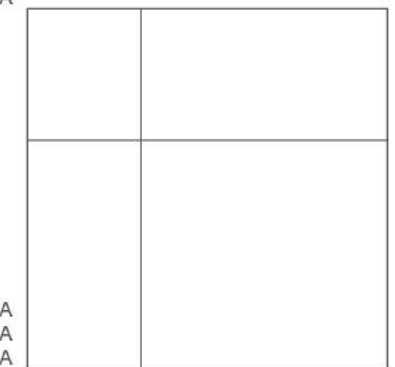
Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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Revised N/A
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Client Ref: PB84891
Report Ref: GS-1587646_LS_4_5
Grid Ref: 265115, 202545

Map Name: County Series

Map date: 1876

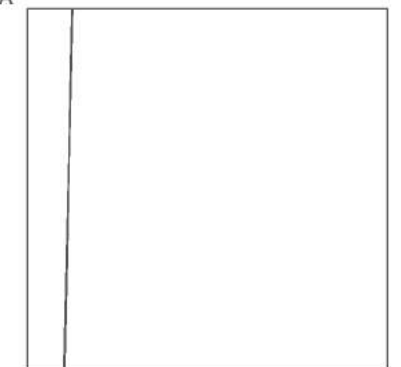
Scale: 1:2,500

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Edition N/A
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Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

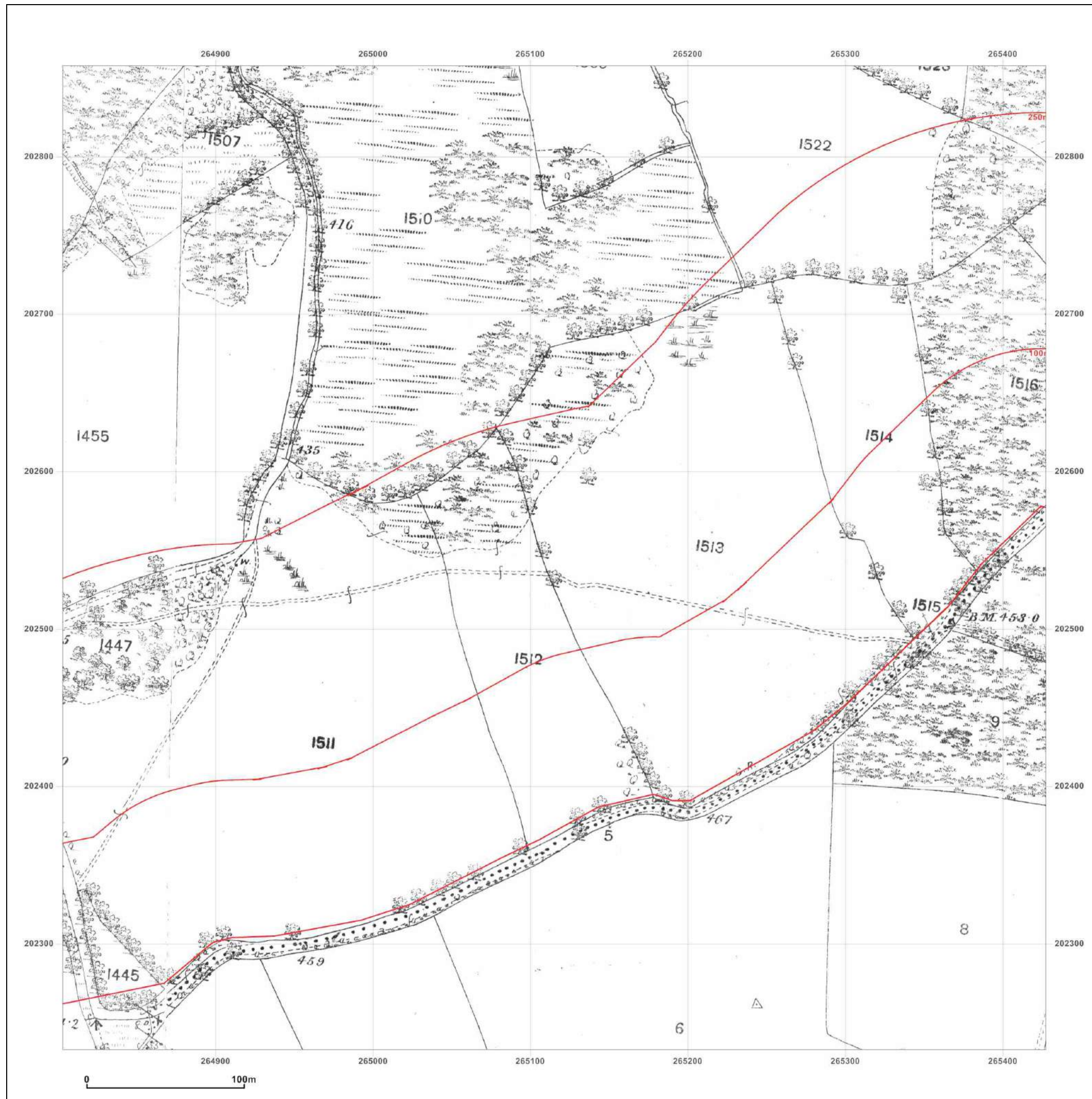


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Client Ref: PB84891
Report Ref: GS-1587646_LS_4_5
Grid Ref: 265115, 202545

Map Name: County Series

Map date: 1898-1899

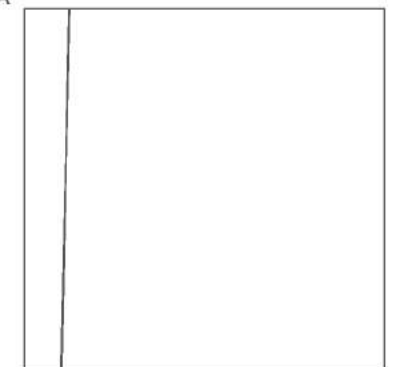
Scale: 1:2,500

Printed at: 1:2,500



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Revised 1899
Edition N/A
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Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

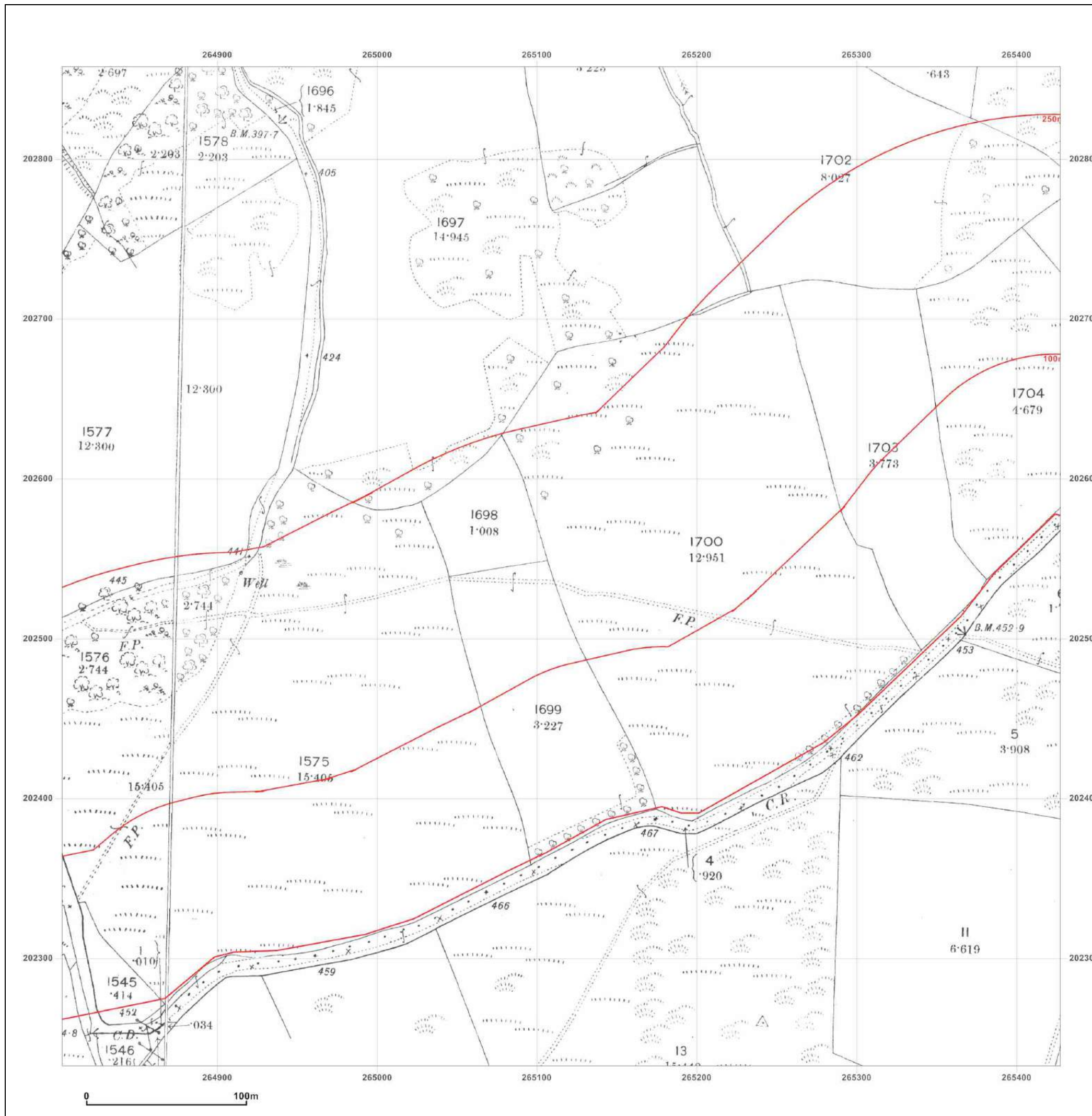


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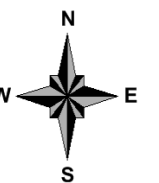
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Grid Ref: 265115, 202545

Map Name: County Series

Map date: 1913-1916

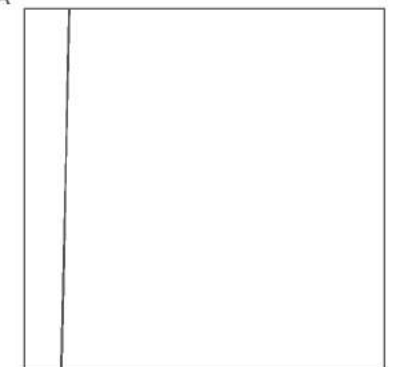
Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1913
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A

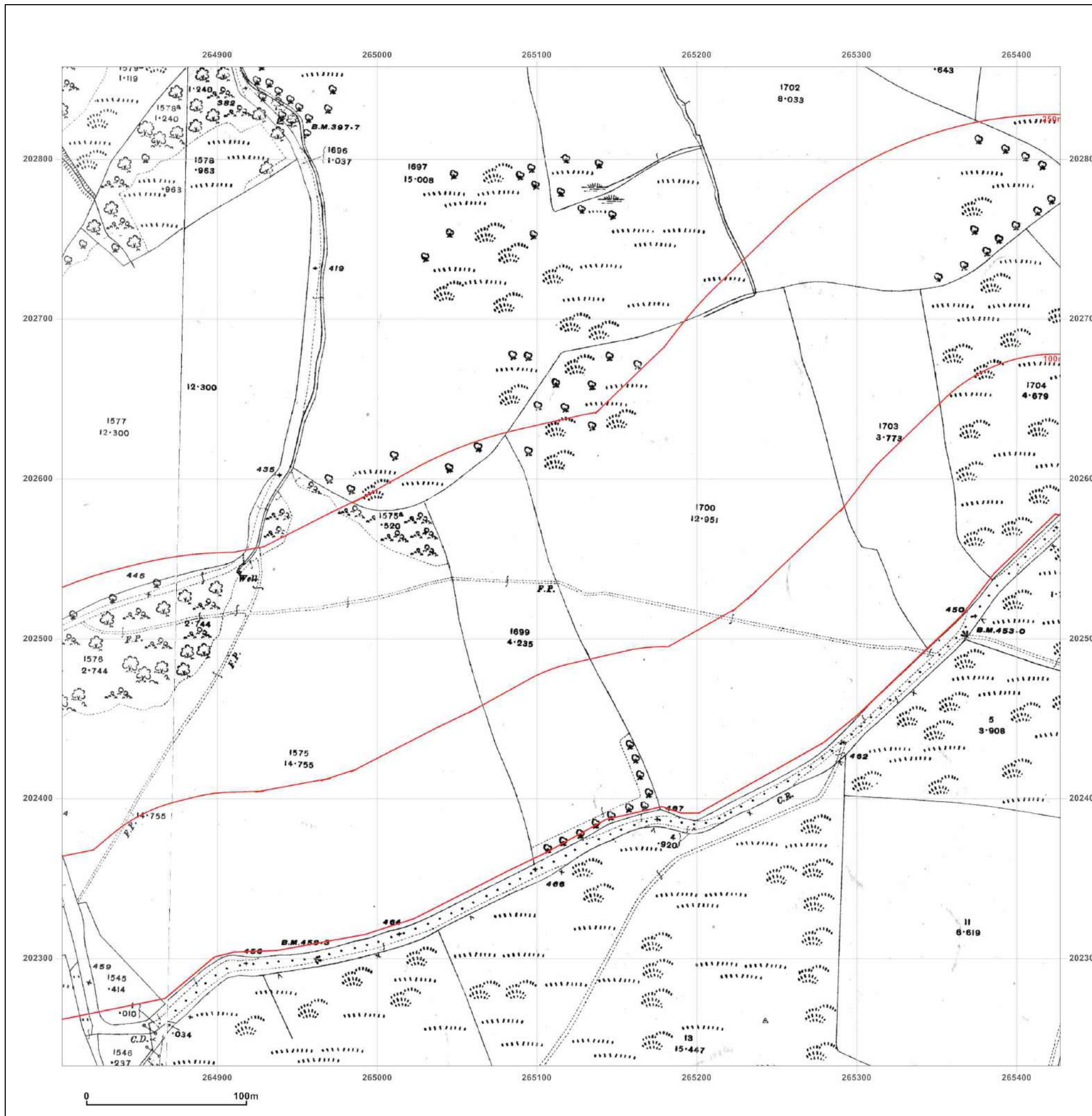


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Client Ref: PB84891
Report Ref: GS-1587646_LS_4_5
Grid Ref: 265115, 202545

Map Name: National Grid

Map date: 1958

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1956

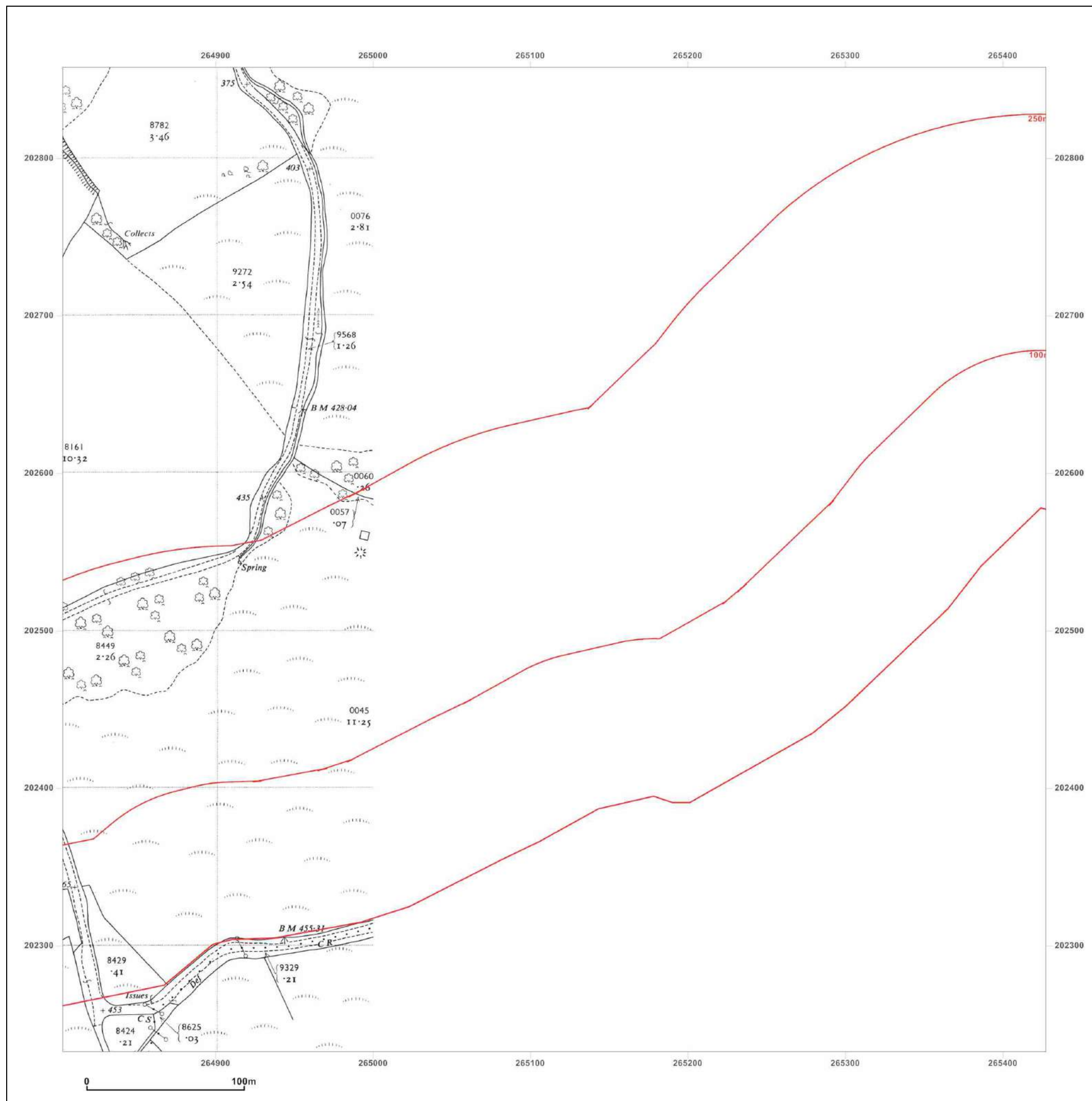


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Client Ref: PB84891
Report Ref: GS-1587646_LS_4_5
Grid Ref: 265115, 202545

Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1956

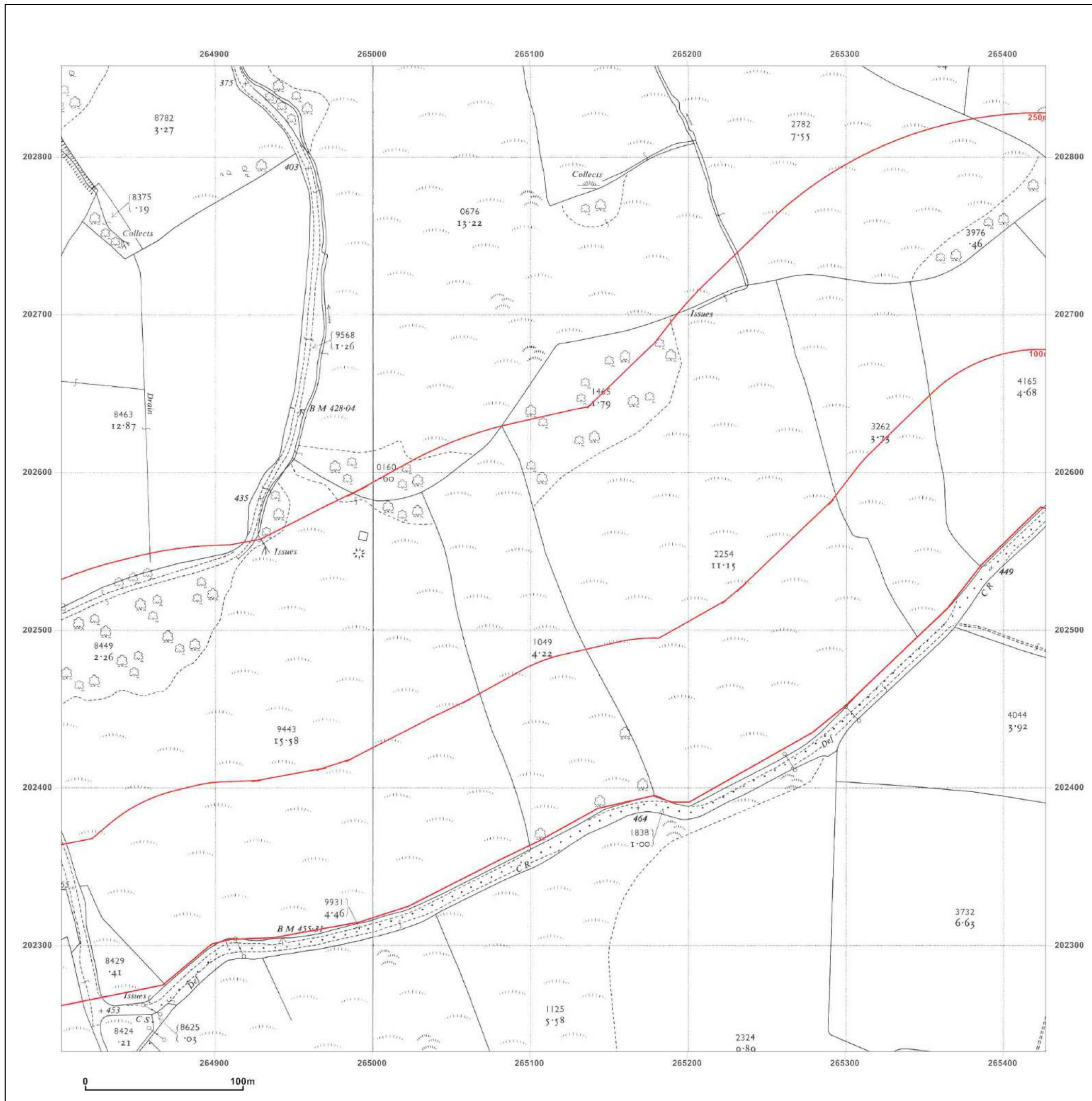


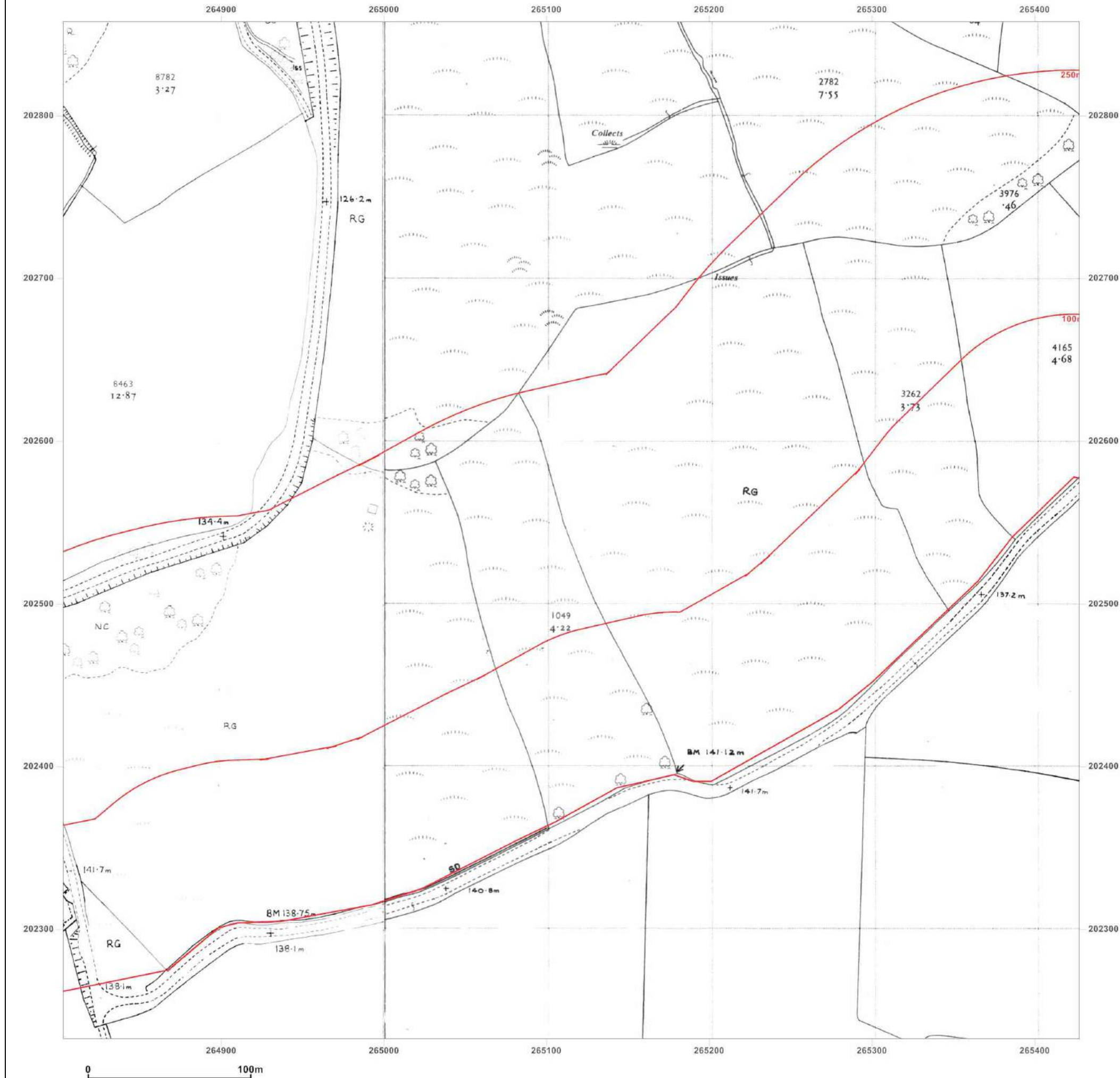
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Client Ref: PB84891
Report Ref: GS-1587646_LS_4_5
Grid Ref: 265115, 202545

Map Name: National Grid

Map date: 1989-1992

Scale: 1:2,500

Printed at: 1:2,500



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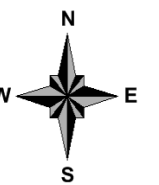
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Grid Ref: 265115, 202545

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



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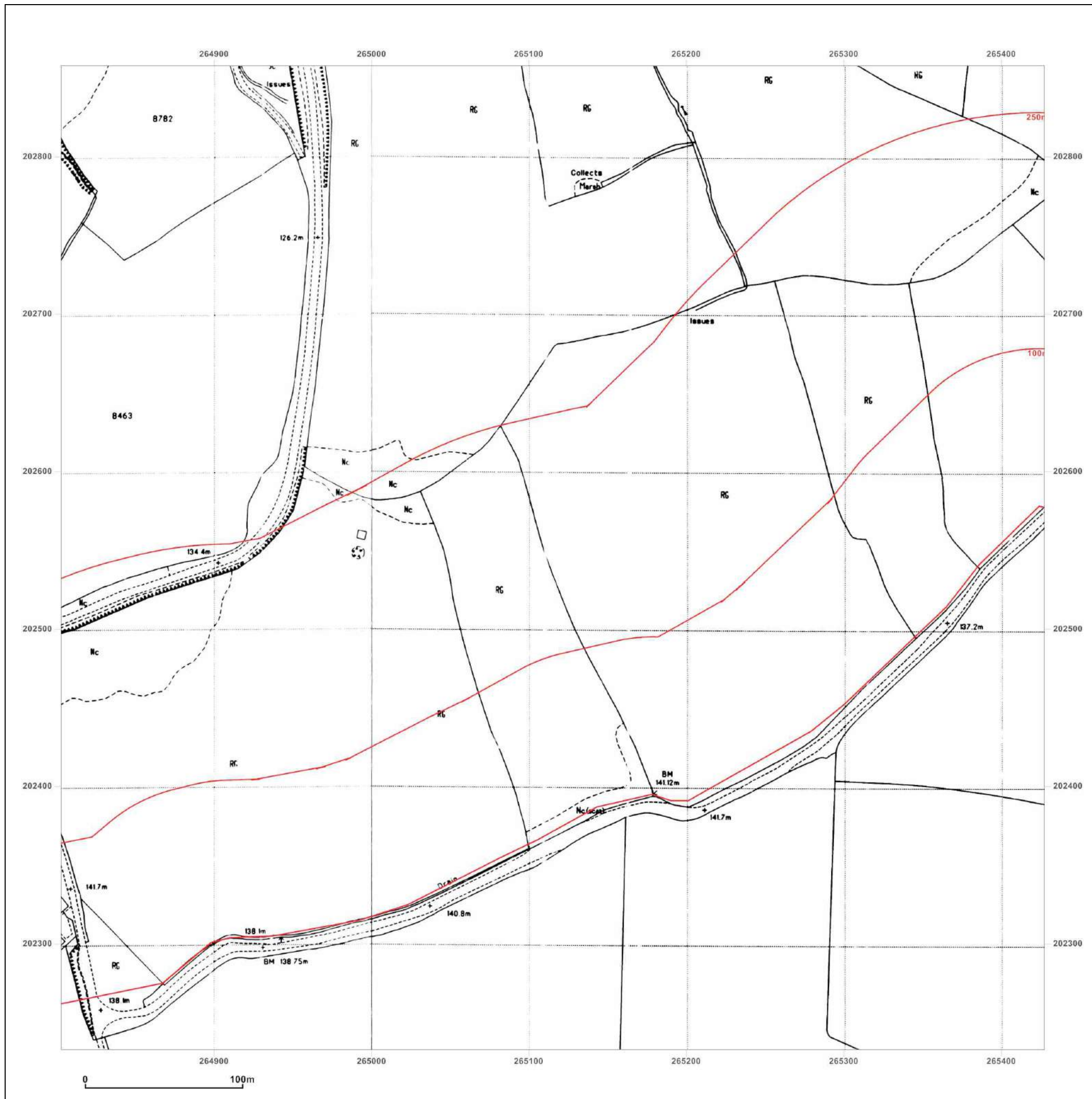


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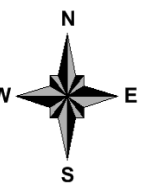
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Grid Ref: 265745, 200655

Map Name: County Series

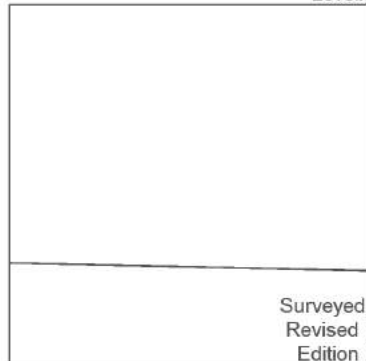
Map date: 1876

Scale: 1:2,500

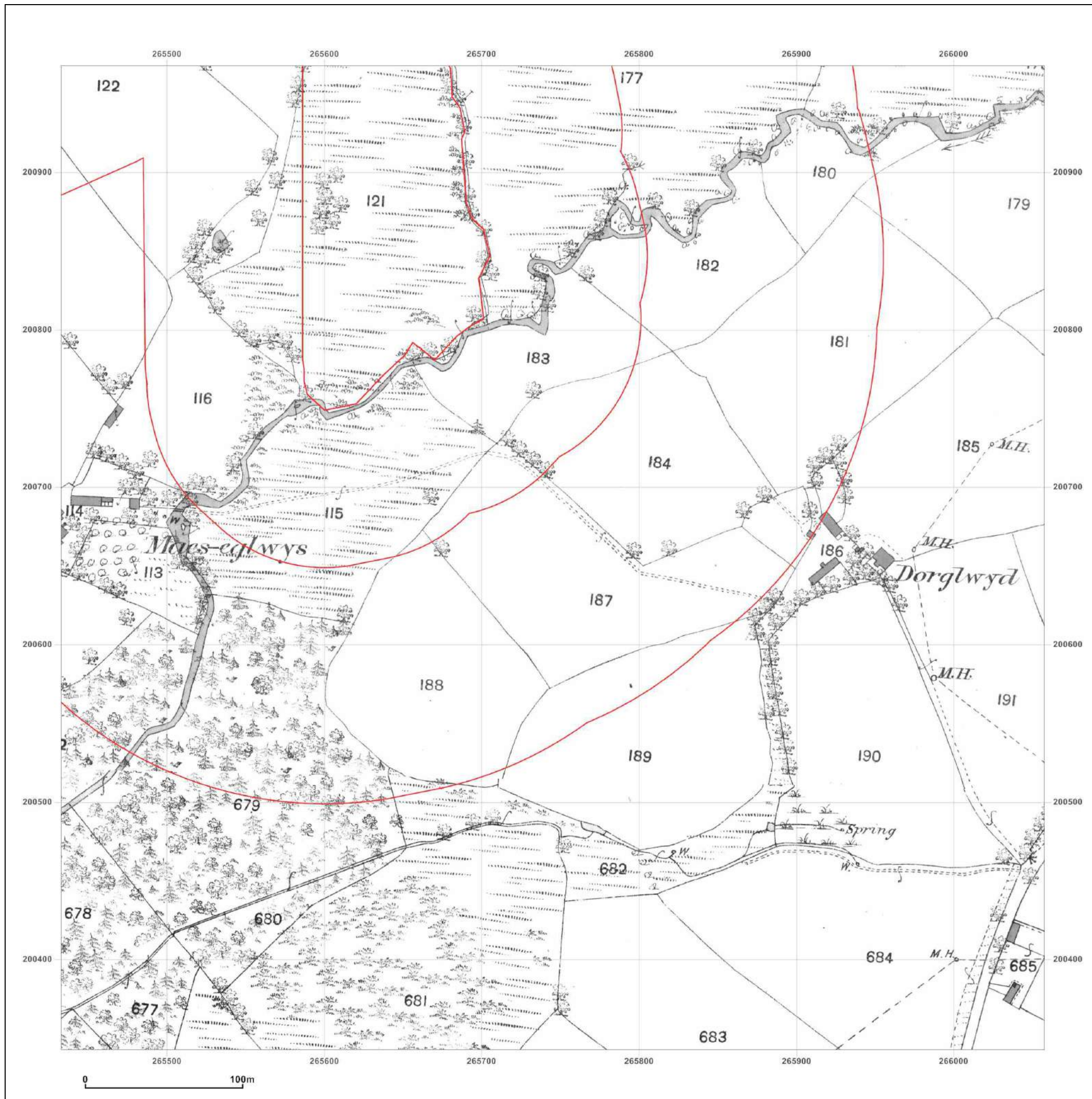
Printed at: 1:2,500



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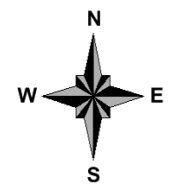
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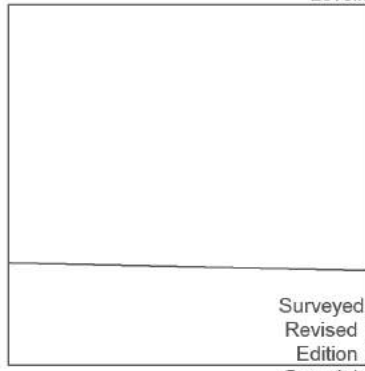
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 SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_5_2
Grid Ref: 265745, 200655

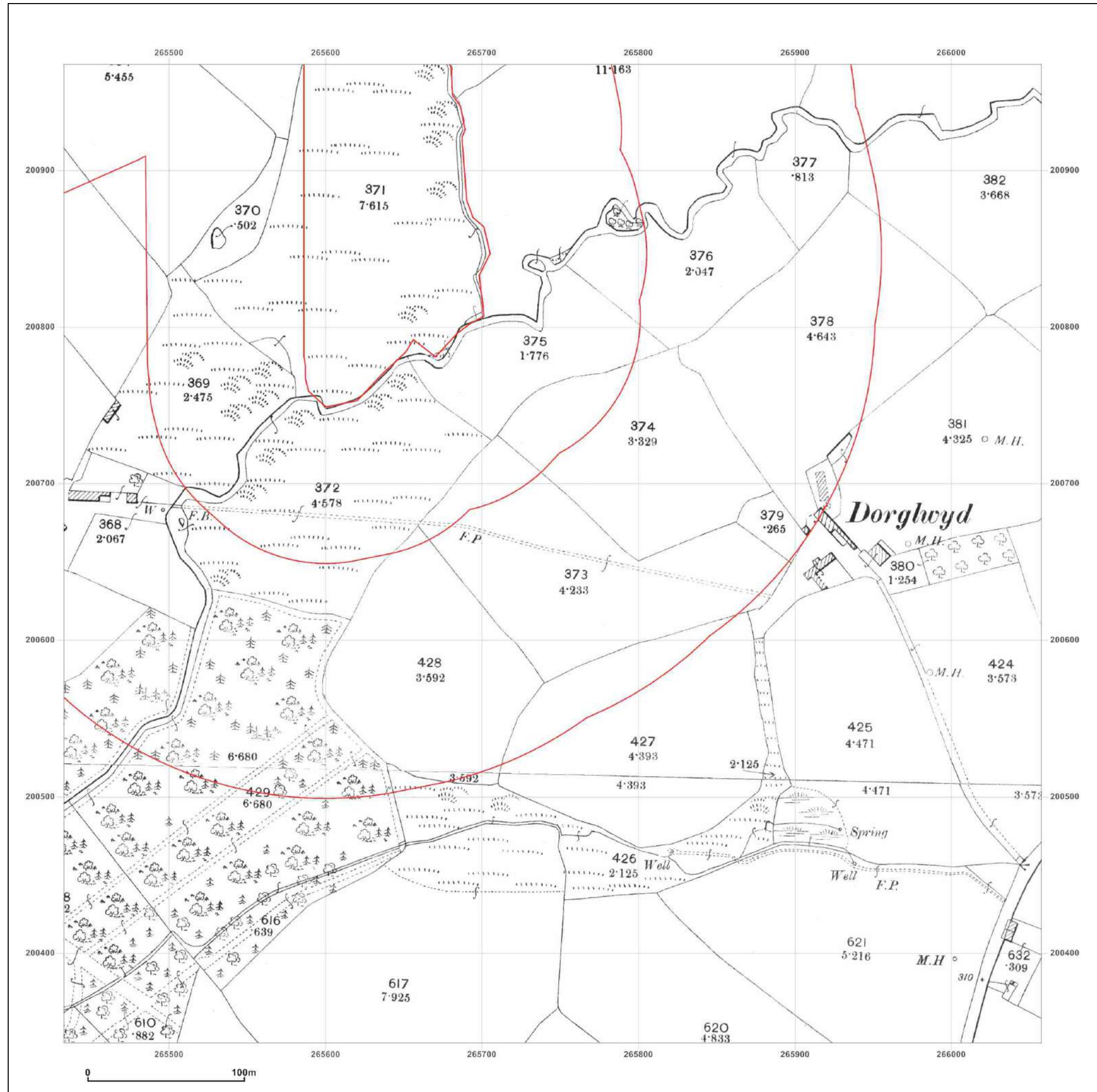
Map Name: County Series
Map date: 1899
Scale: 1:2,500
Printed at: 1:2,500



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 Edition N/A
 Copyright N/A
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 Revised 1899
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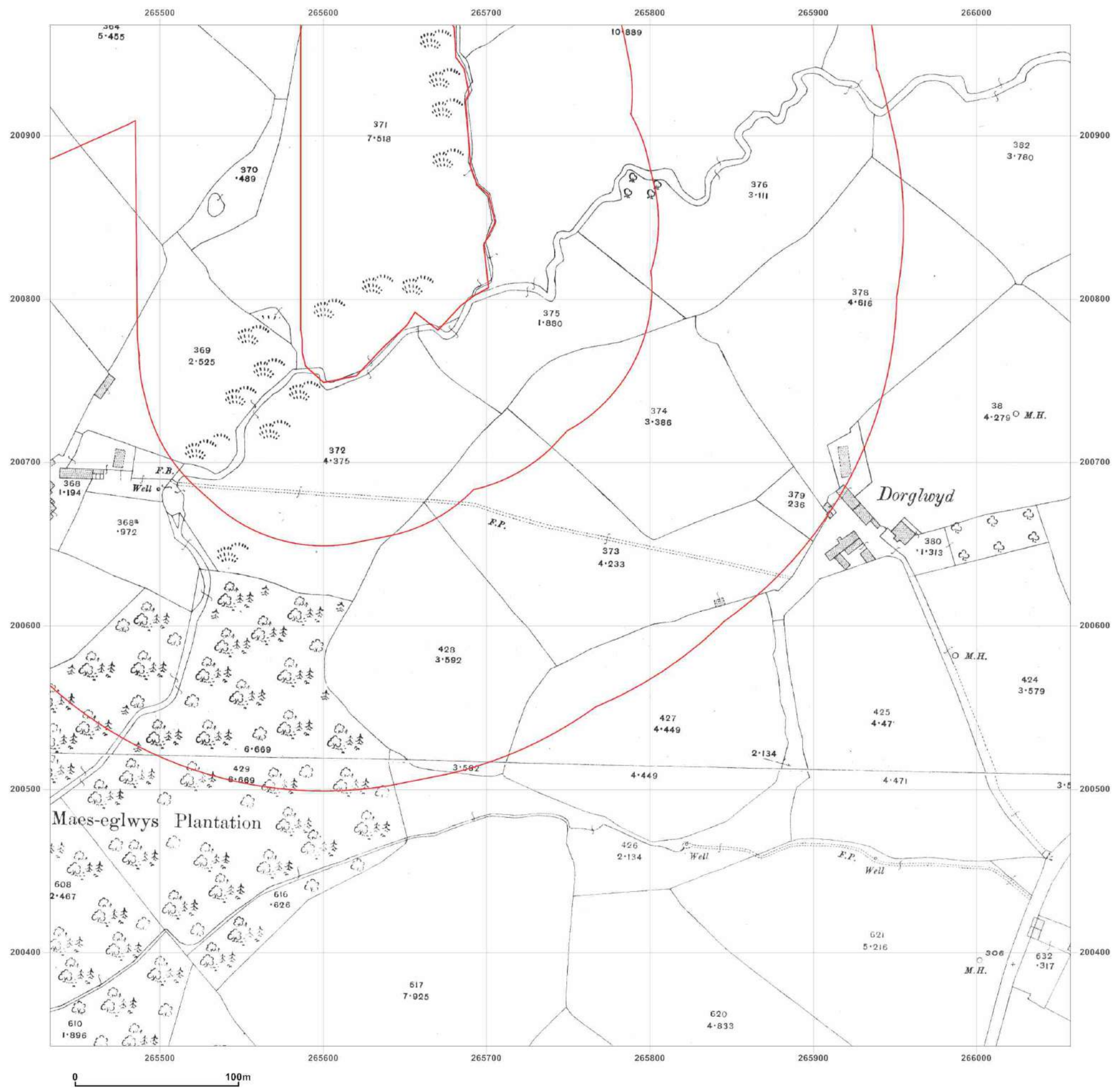
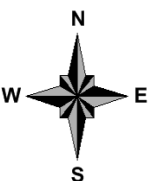
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Grid Ref: 265745, 200655

Map Name: County Series

Map date: 1917-1918

Scale: 1:2,500

Printed at: 1:2,500



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Surveyed 1917
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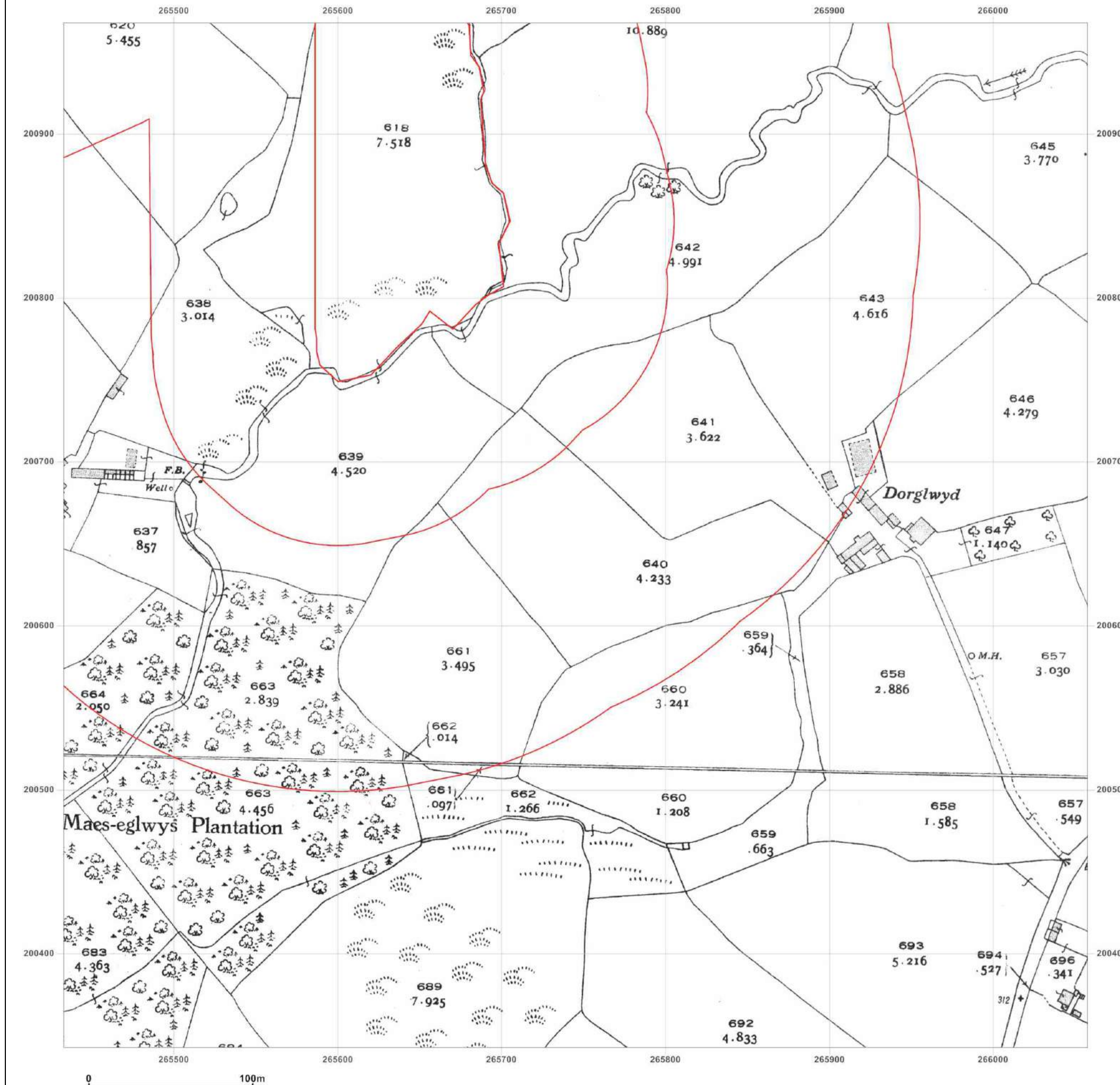
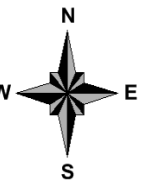
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Grid Ref: 265745, 200655

Map Name: County Series

Map date: 1935

Scale: 1:2,500

Printed at: 1:2,500



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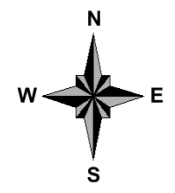
Production date: 30 July 2014

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Site Details:
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Client Ref: PB84891
Report Ref: GS-1587646_LS_5_2
Grid Ref: 265745, 200655

Map Name: National Grid
Map date: 1960
Scale: 1:2,500
Printed at: 1:2,500



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 Edition N/A
 Copyright 1962
 Levelled 1956

Surveyed 1960
 Revised 1960
 Edition N/A
 Copyright 1961
 Levelled 1956

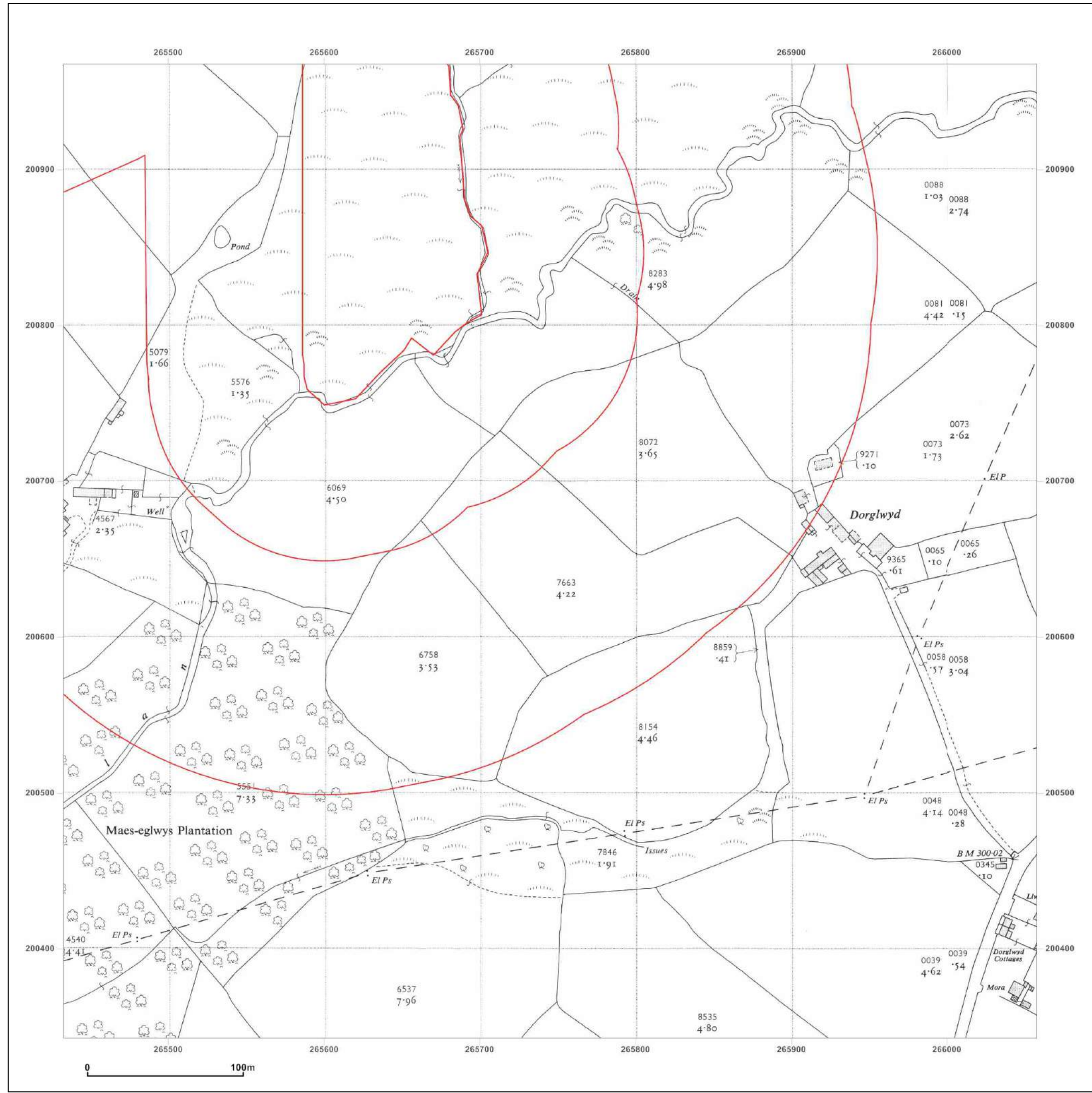
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Client Ref: PB84891
Report Ref: GS-1587646_LS_5_2
Grid Ref: 265745, 200655

Map Name: National Grid

Map date: 1974

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1963

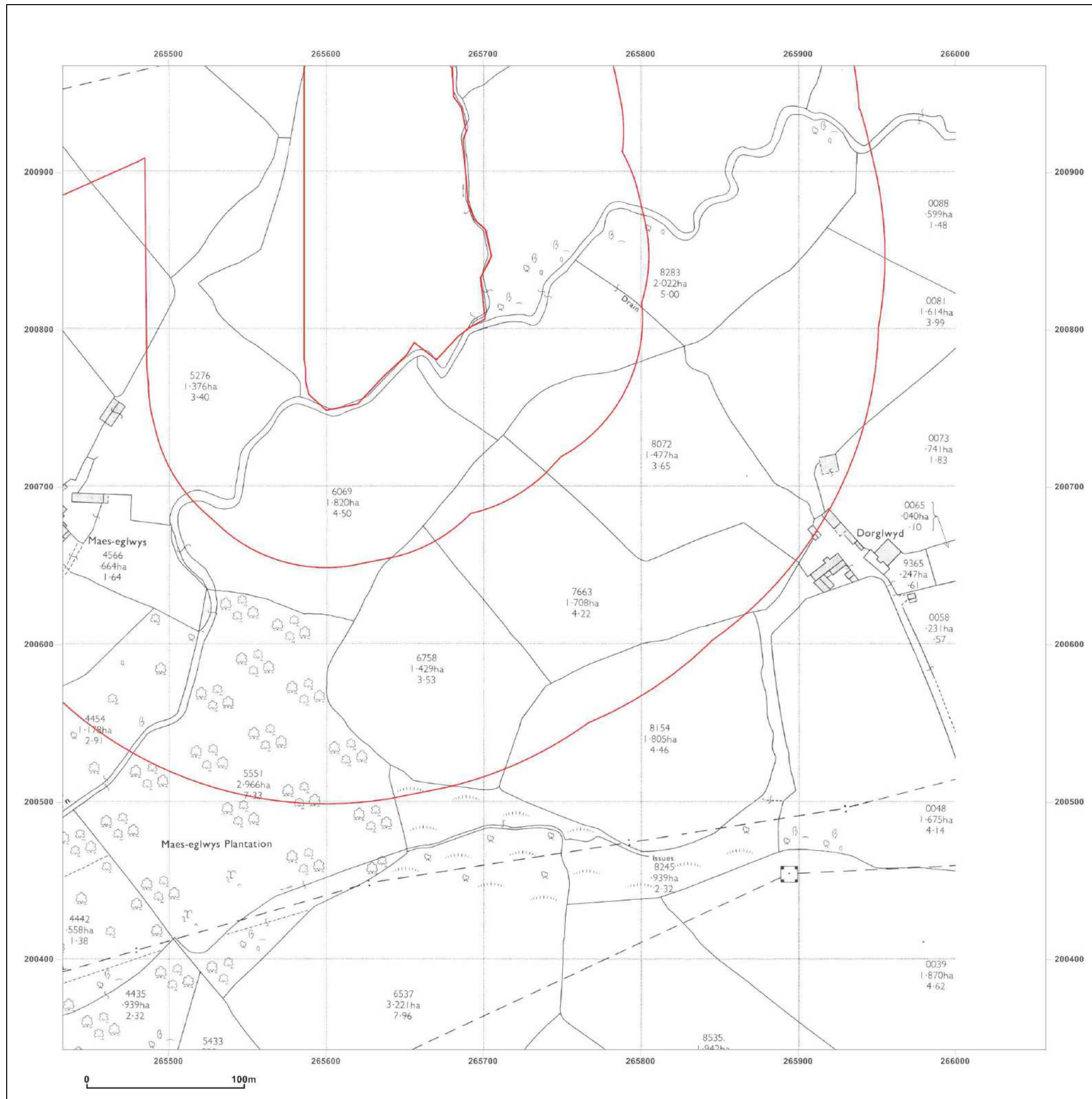


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Client Ref: PB84891
Report Ref: GS-1587646_LS_5_2
Grid Ref: 265745, 200655

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

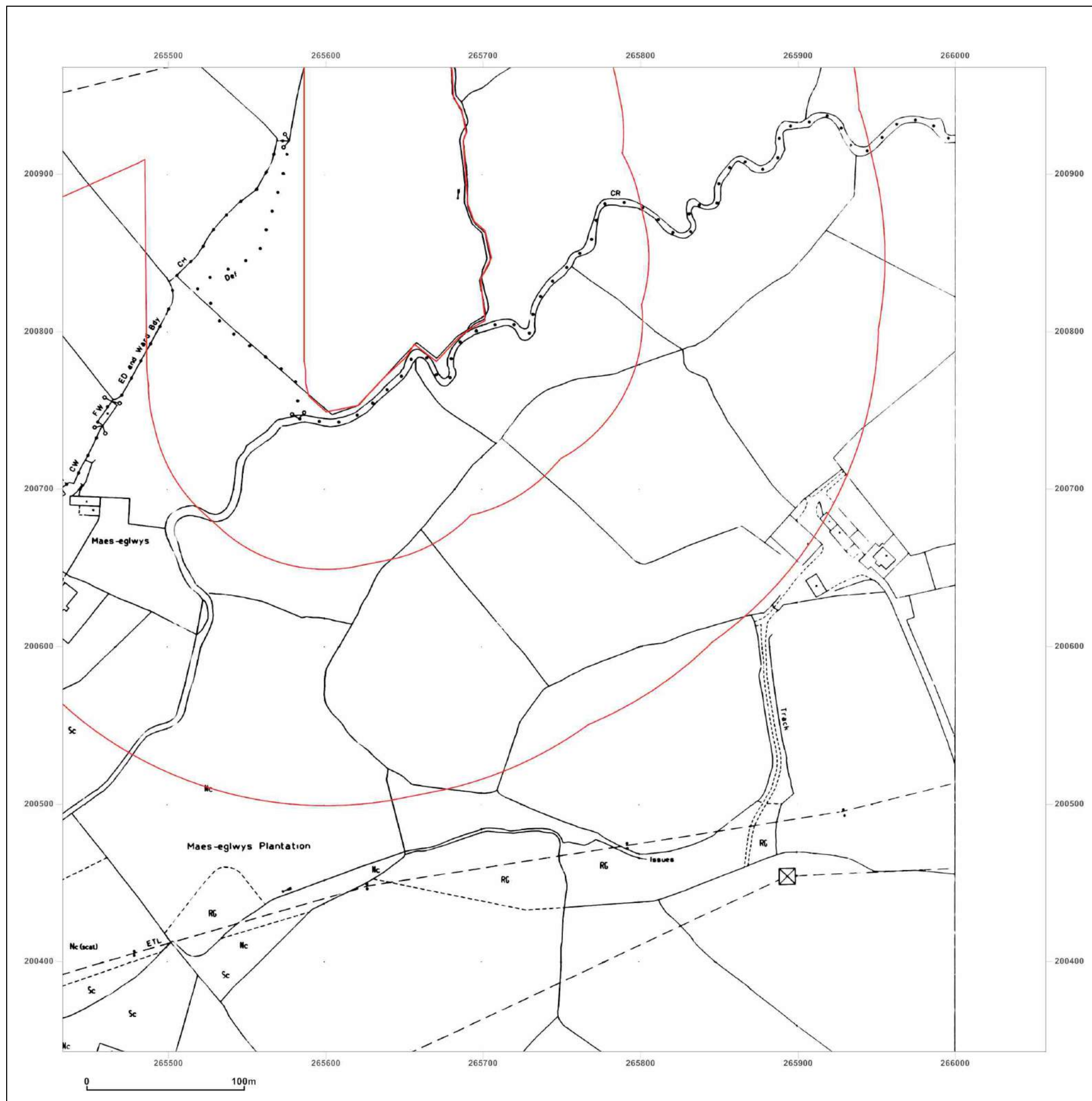


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Client Ref: PB84891
Report Ref: GS-1587646_LS_5_3
Grid Ref: 265745, 201285

Map Name: County Series

Map date: 1876

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

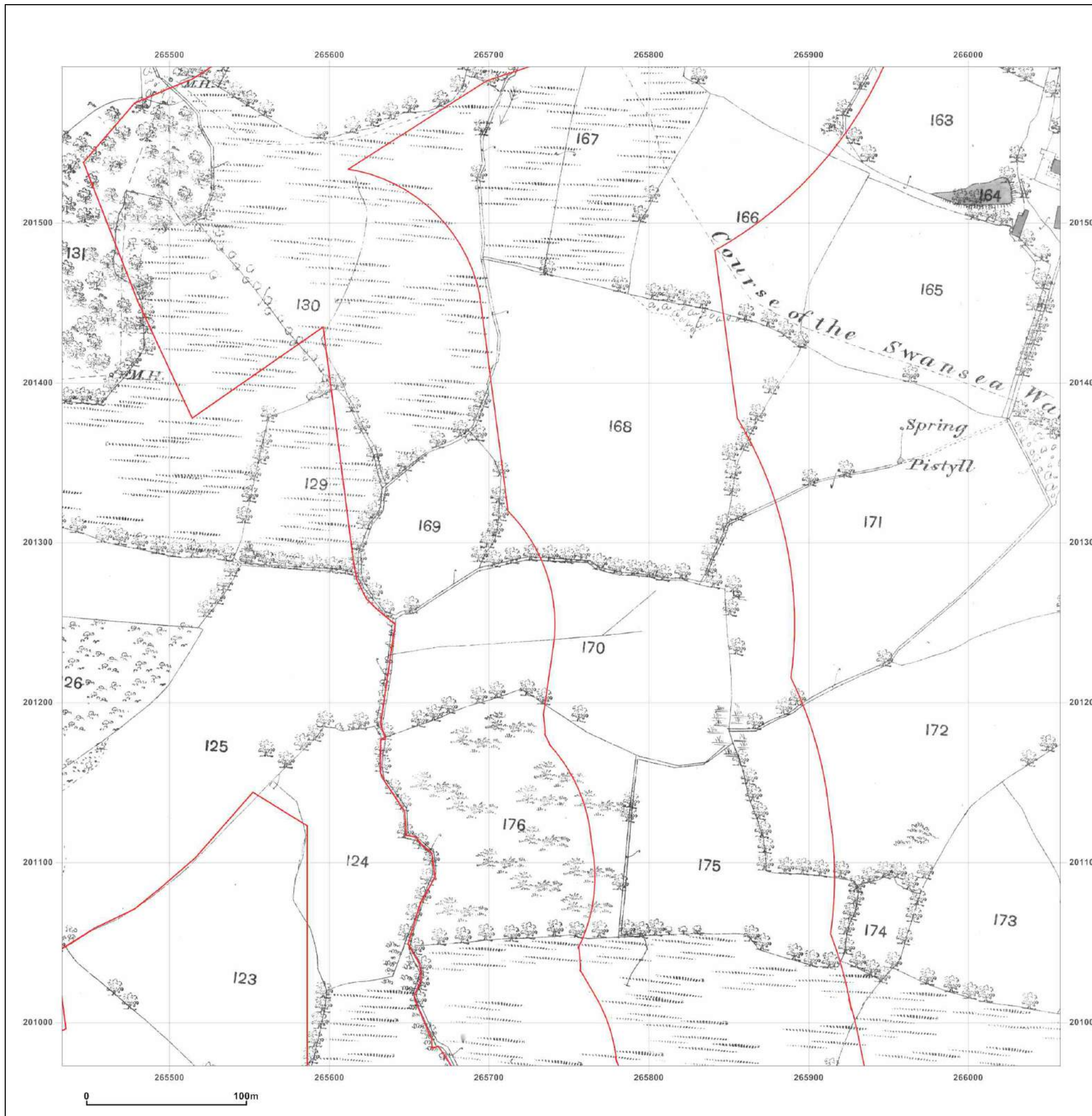


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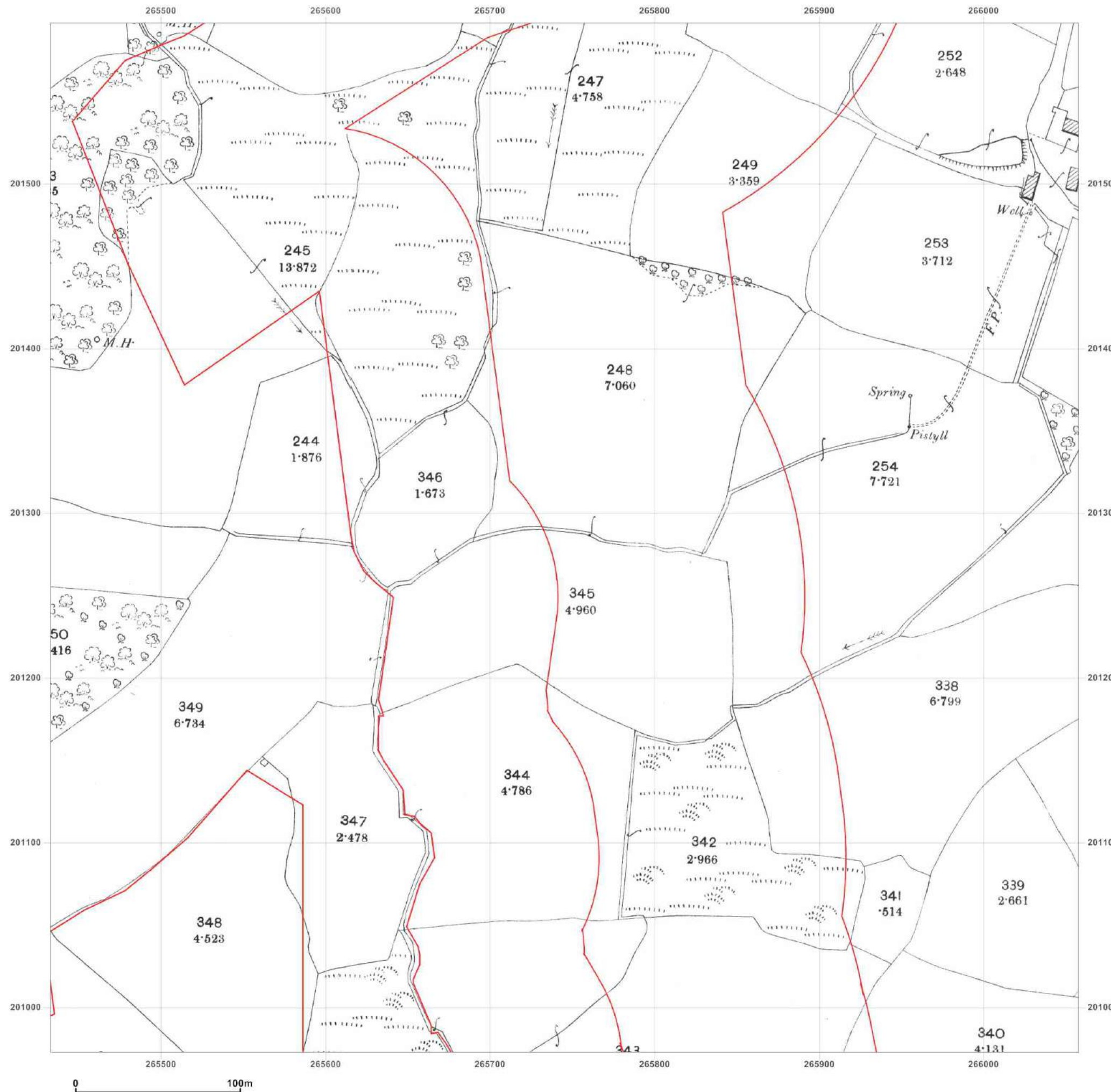
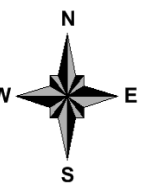
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Report Ref: GS-1587646_LS_5_3
Grid Ref: 265745, 201285

Map Name: County Series

Map date: 1899

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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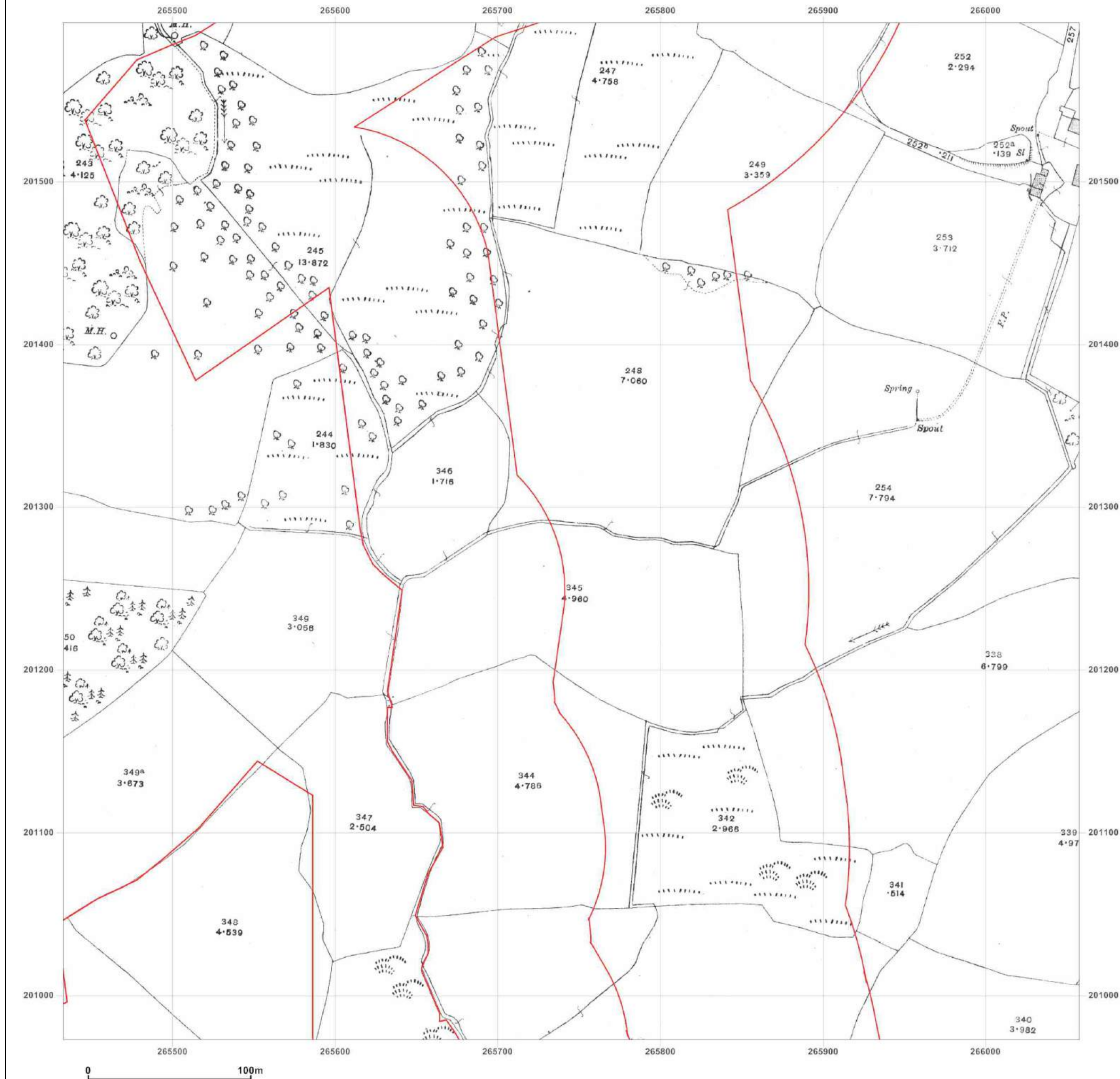
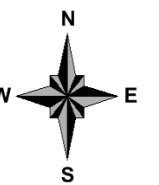
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Report Ref: GS-1587646_LS_5_3
Grid Ref: 265745, 201285

Map Name: County Series

Map date: 1918

Scale: 1:2,500

Printed at: 1:2,500



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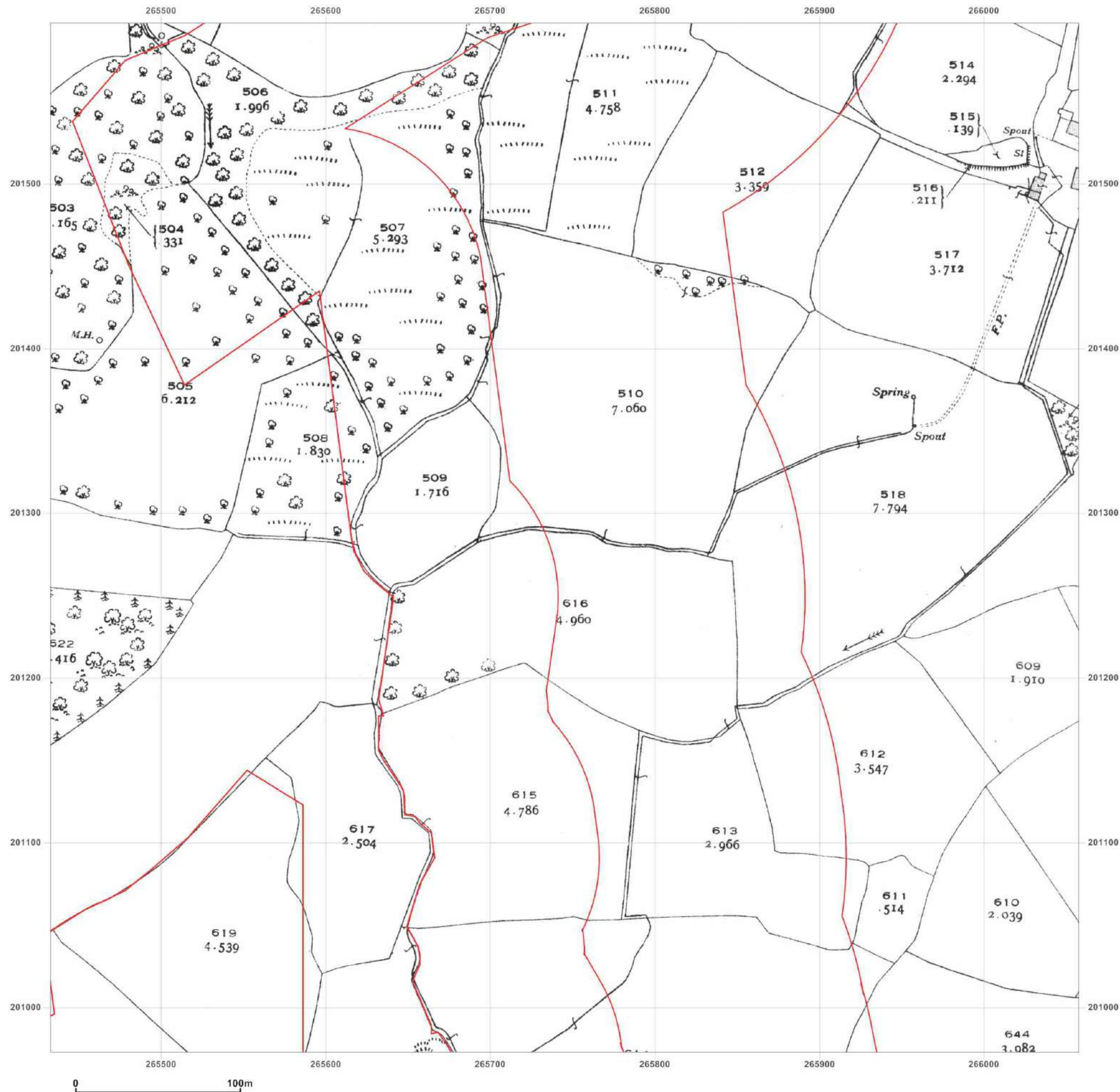
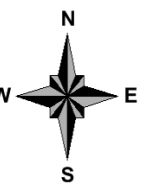
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Report Ref: GS-1587646_LS_5_3
Grid Ref: 265745, 201285

Map Name: County Series

Map date: 1935

Scale: 1:2,500

Printed at: 1:2,500



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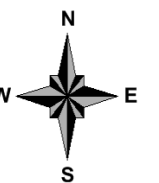
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Report Ref: GS-1587646_LS_5_3
Grid Ref: 265745, 201285

Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



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Revised 1960
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Copyright 1961
Levelled 1956

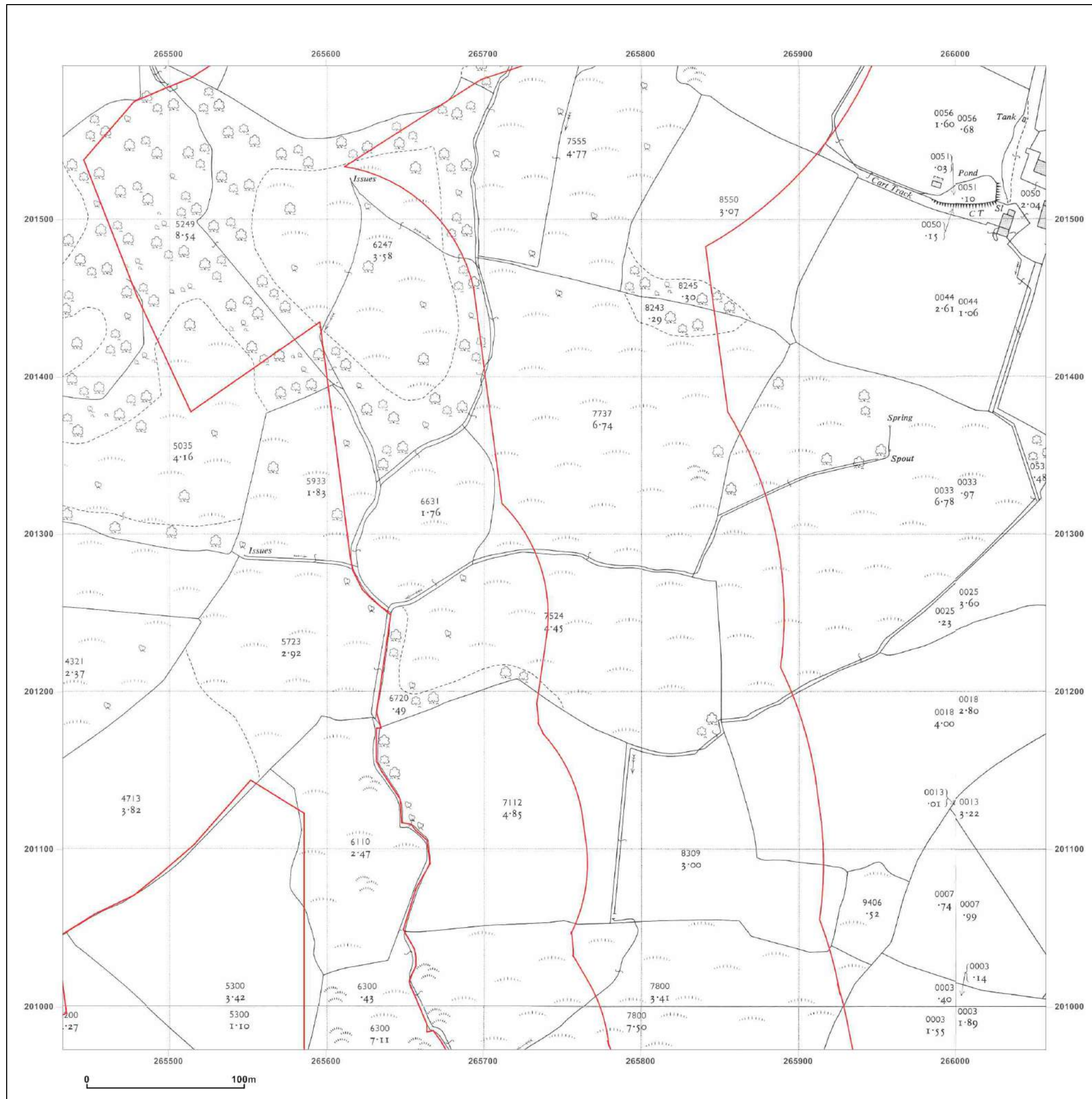


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Site Details:

ABERGELLI FACH
FARM, FELINDRE, ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_5_3
Grid Ref: 265745, 201285

Map Name: National Grid

Map date: 1974

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1963

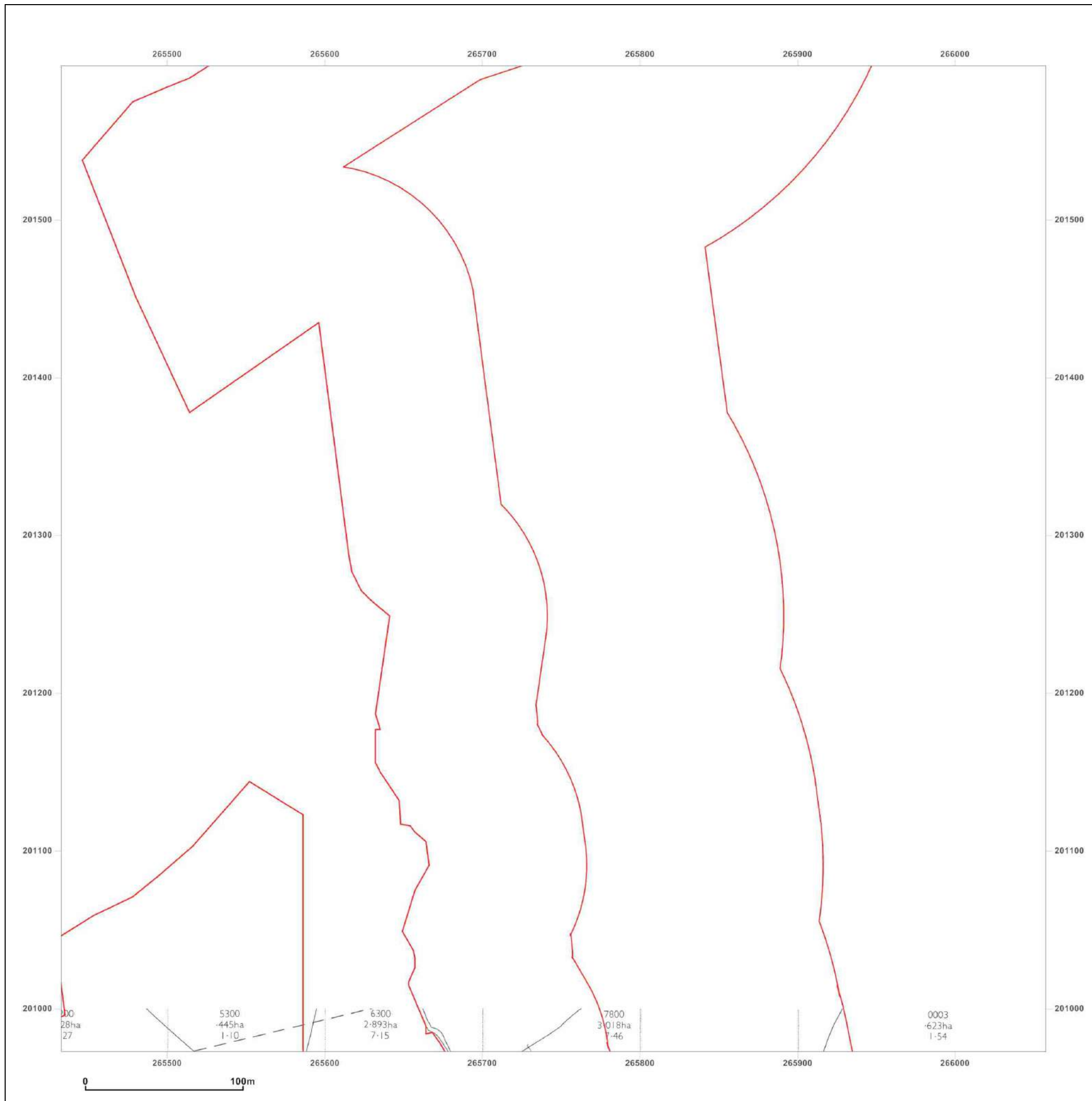


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Site Details:

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SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_5_3
Grid Ref: 265745, 201285

Map Name: National Grid

Map date: 1987-1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1962
Revised 1992
Edition N/A
Copyright 1992
Levelled 1962

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1962
Revised 1987
Edition N/A
Copyright 1987
Levelled 1962

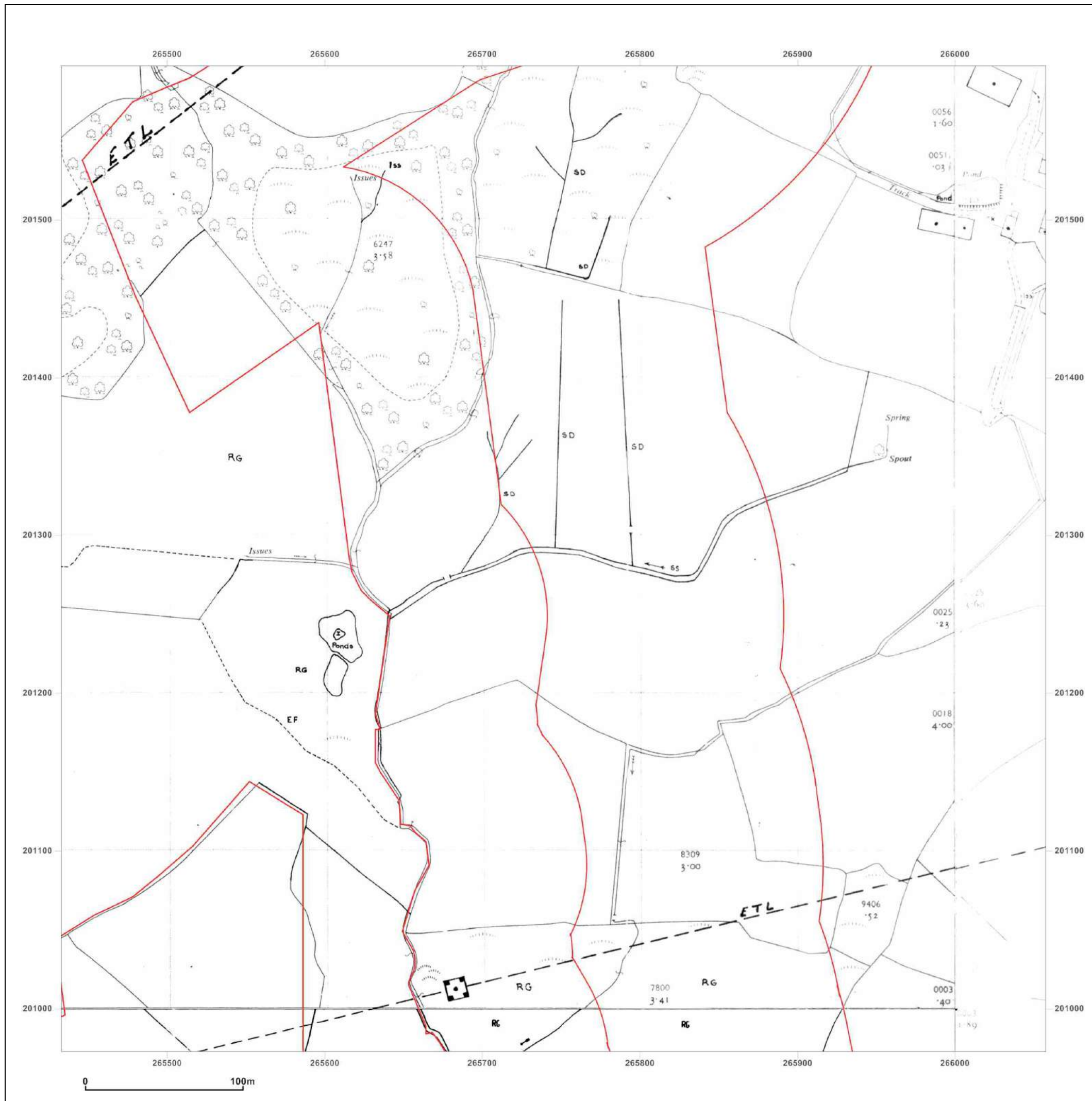


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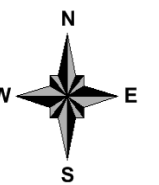
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Report Ref: GS-1587646_LS_5_3
Grid Ref: 265745, 201285

Map Name: National Grid

Map date: 1992-1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1962
Revised 1992
Edition N/A
Copyright 1992
Levelled 1962

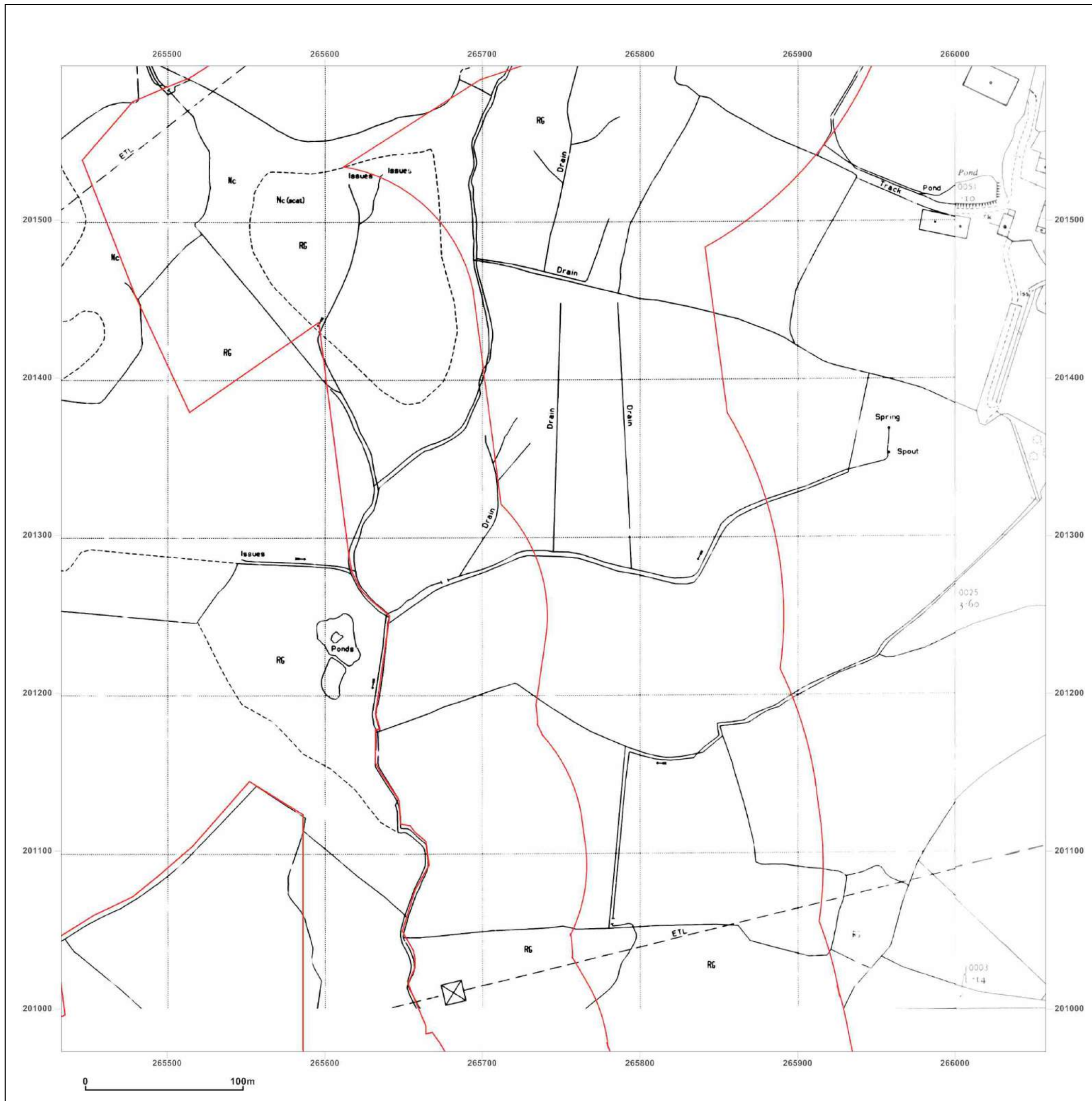


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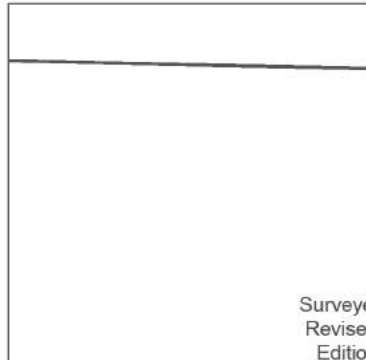
Client Ref: PB84891
Report Ref: GS-1587646_LS_5_4
Grid Ref: 265745, 201915

Map Name: County Series

Map date: 1876

Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

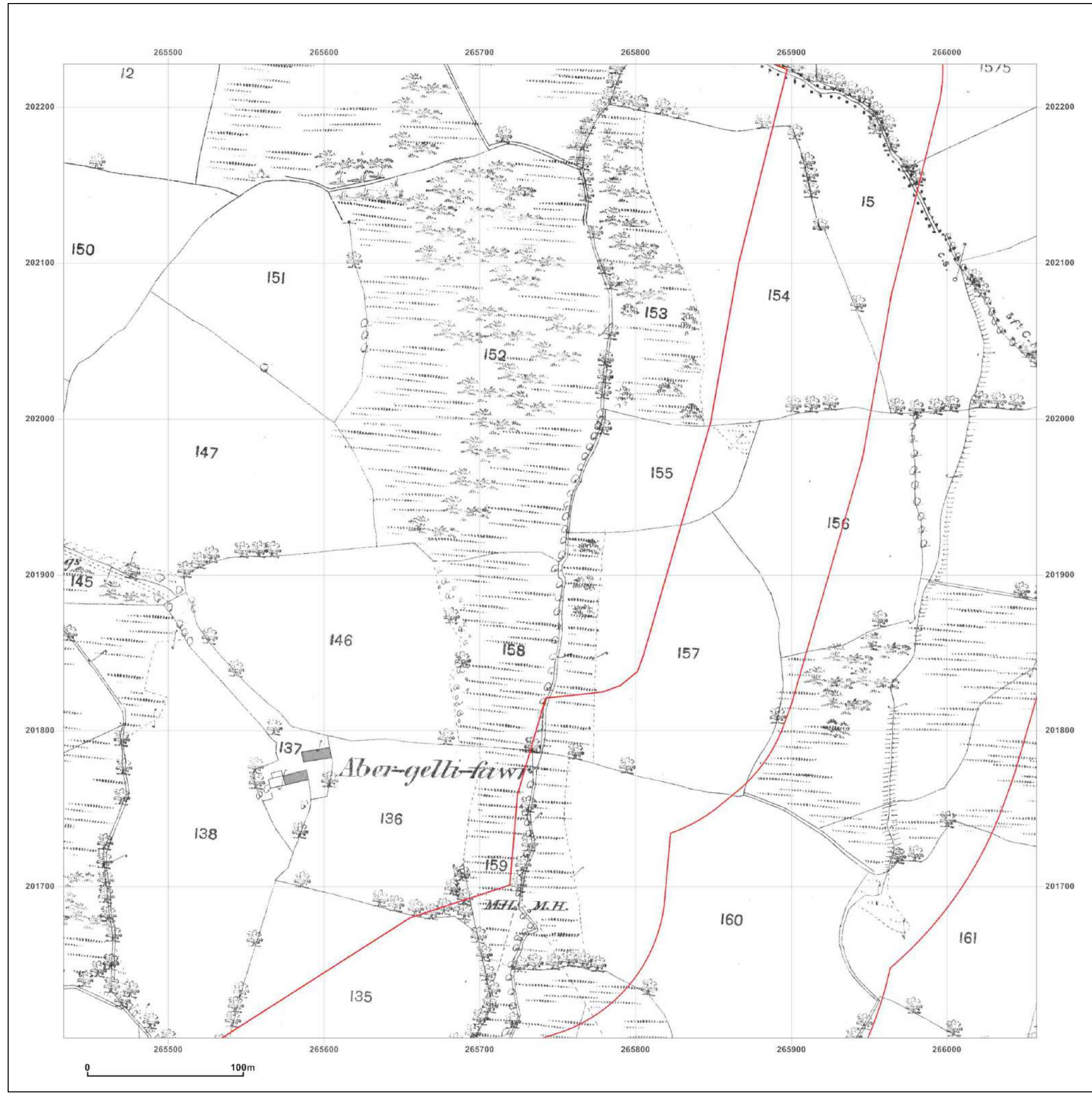


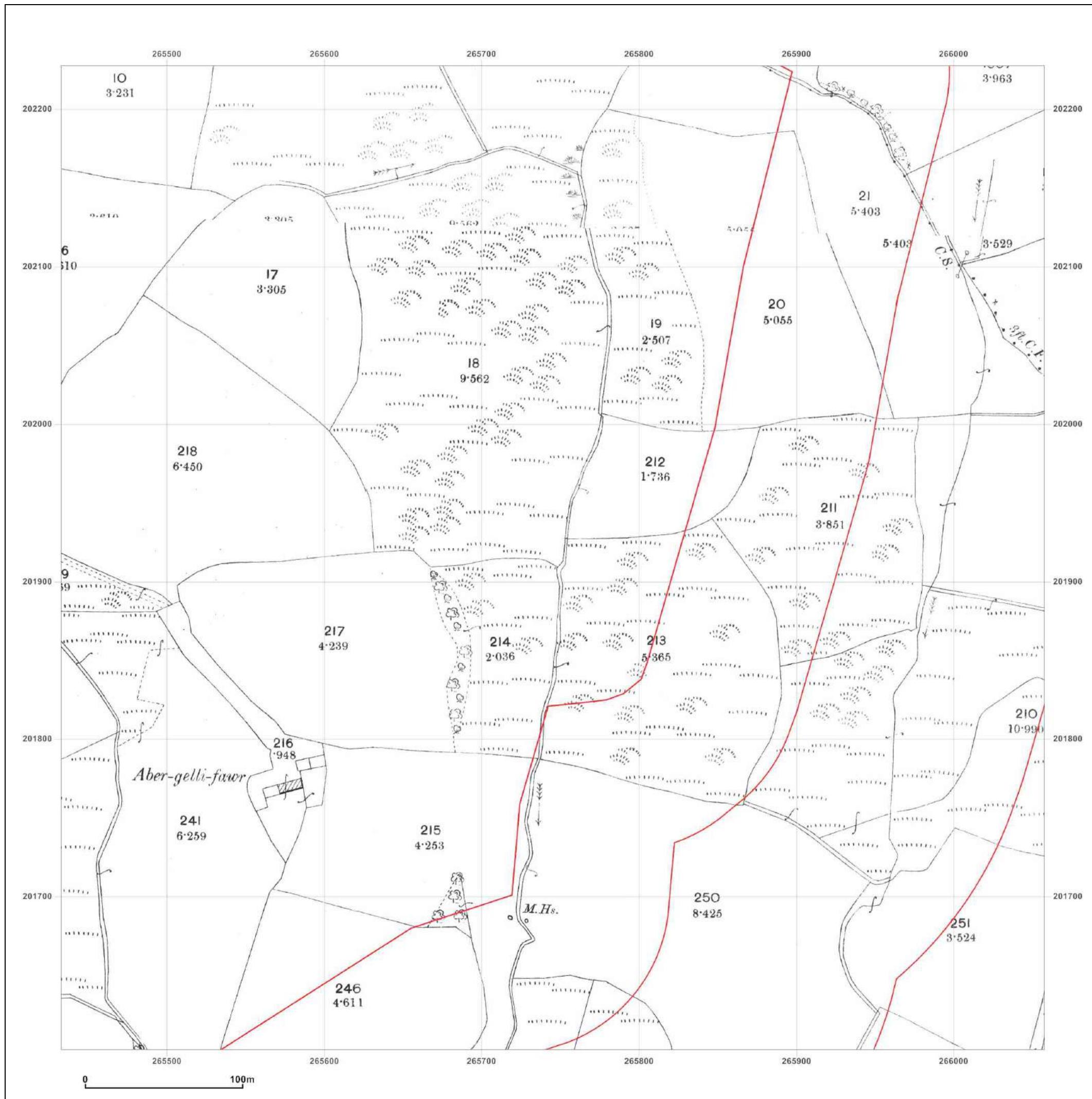
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Client Ref: PB84891
 Report Ref: GS-1587646_LS_5_4
 Grid Ref: 265745, 201915

Map Name: County Series

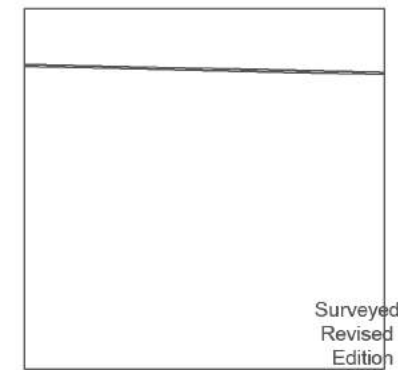
Map date: 1898-1899

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1898
 Revised 1898
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed 1899
 Revised 1899
 Edition N/A
 Copyright N/A
 Levelled N/A

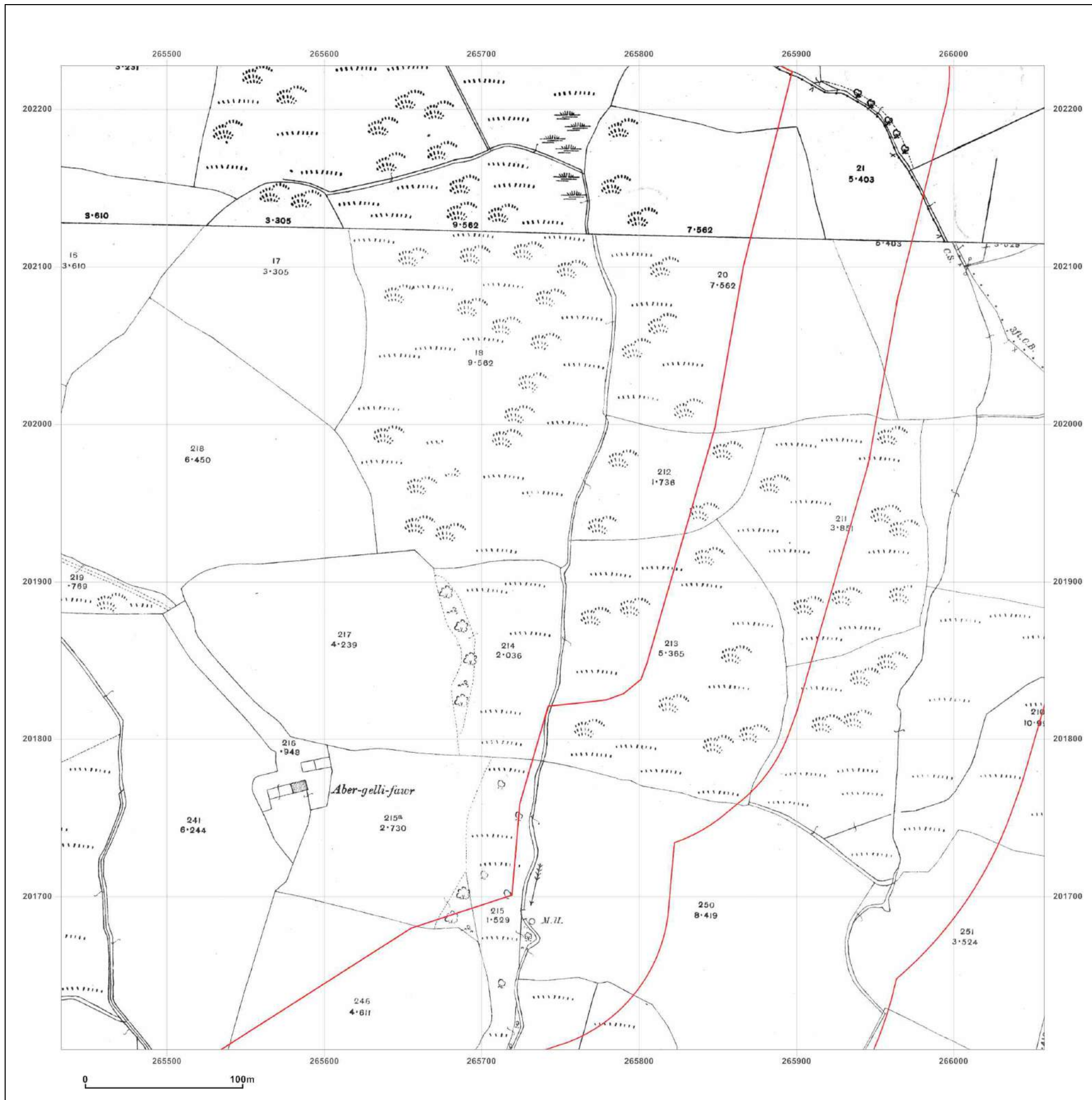


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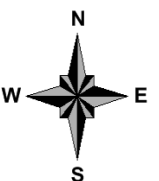
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Grid Ref: 265745, 201915

Map Name: County Series

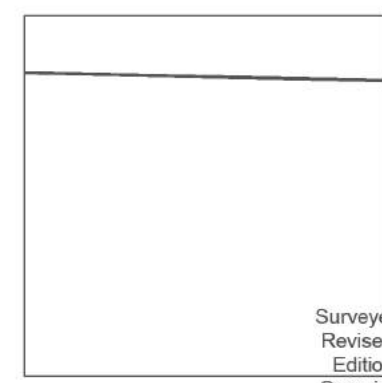
Map date: 1913-1918

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1913
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1918
Revised 1918
Edition N/A
Copyright N/A
Levelled N/A



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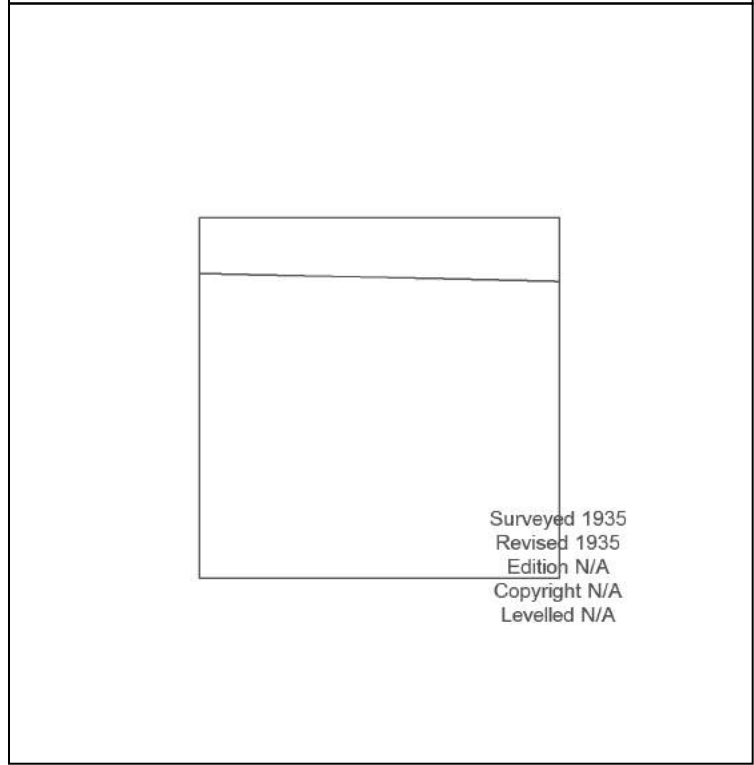
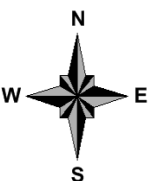
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Report Ref: GS-1587646_LS_5_4
Grid Ref: 265745, 201915

Map Name: County Series

Map date: 1935

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1935
Revised 1935
Edition N/A
Copyright N/A
Levelled N/A

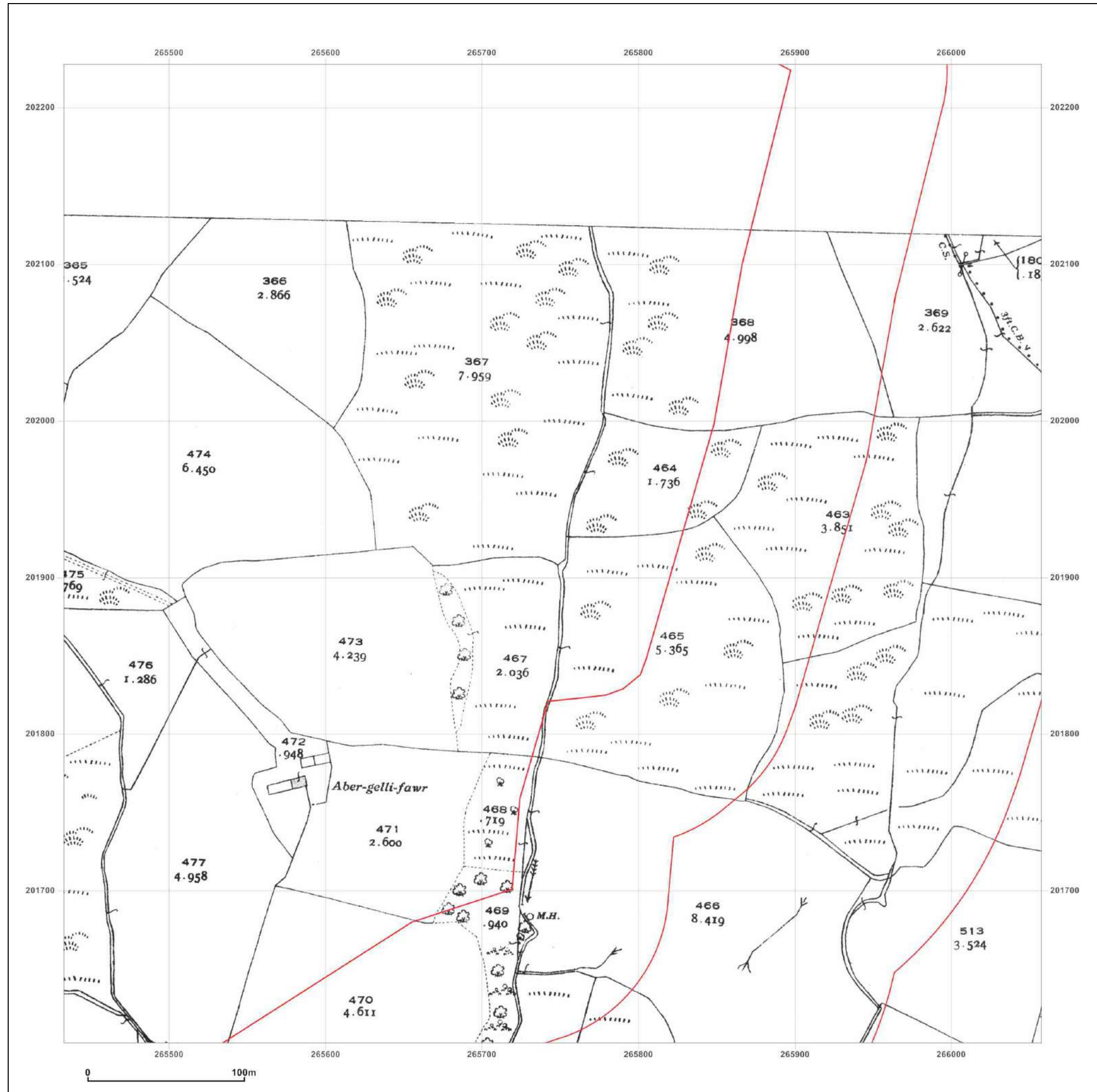


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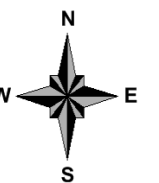
Client Ref: PB84891
Report Ref: GS-1587646_LS_5_4
Grid Ref: 265745, 201915

Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1956

Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1956

Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1956

Surveyed 1960
Revised 1960
Edition N/A
Copyright 1962
Levelled 1956

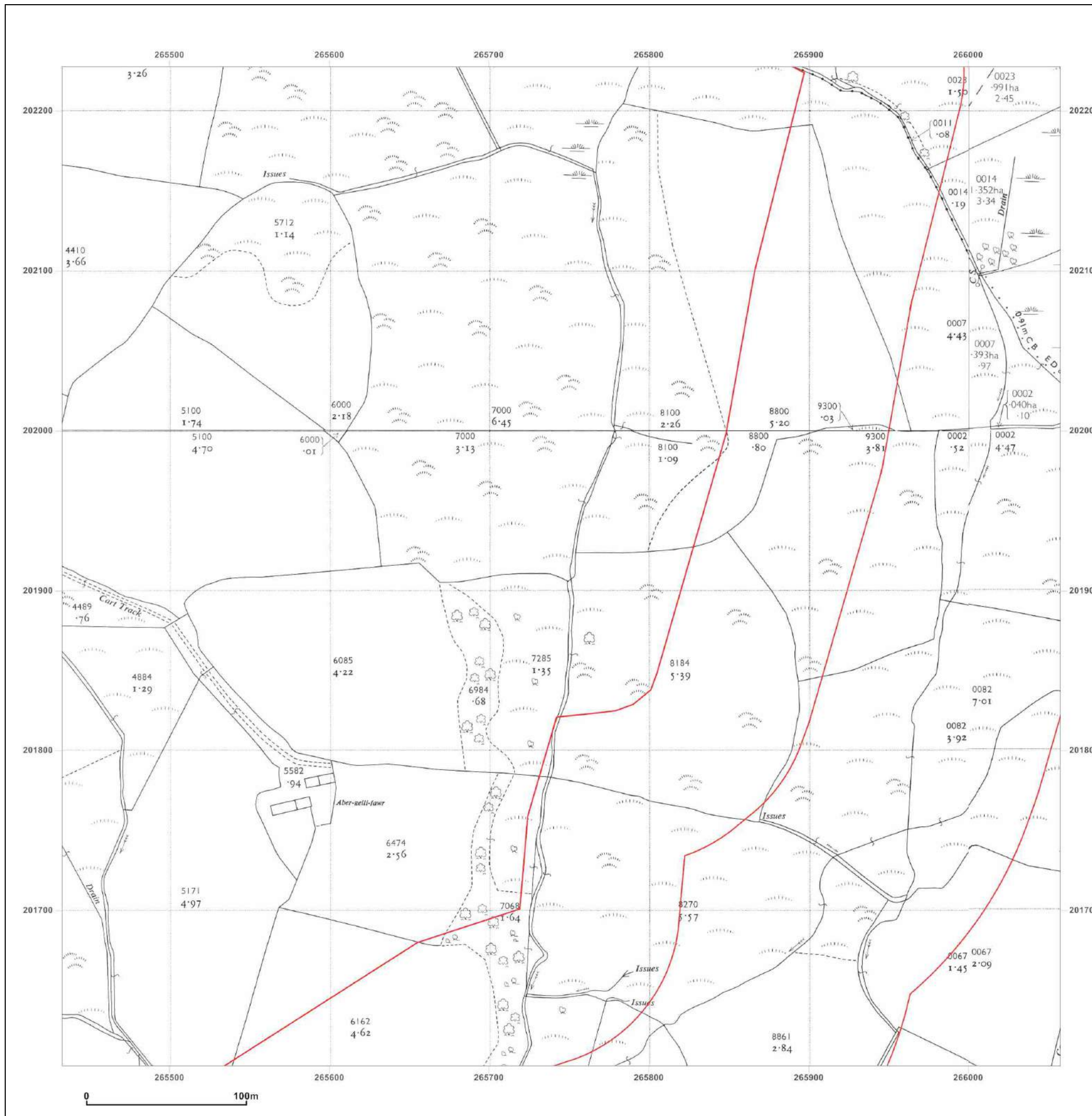


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Client Ref: PB84891
Report Ref: GS-1587646_LS_5_4
Grid Ref: 265745, 201915

Map Name: National Grid

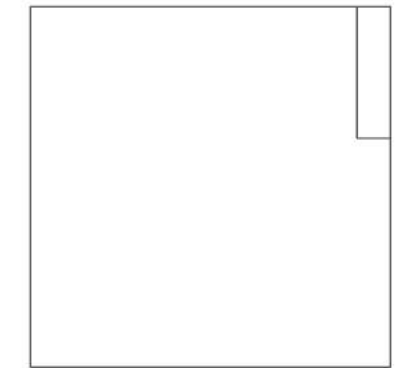
Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1956

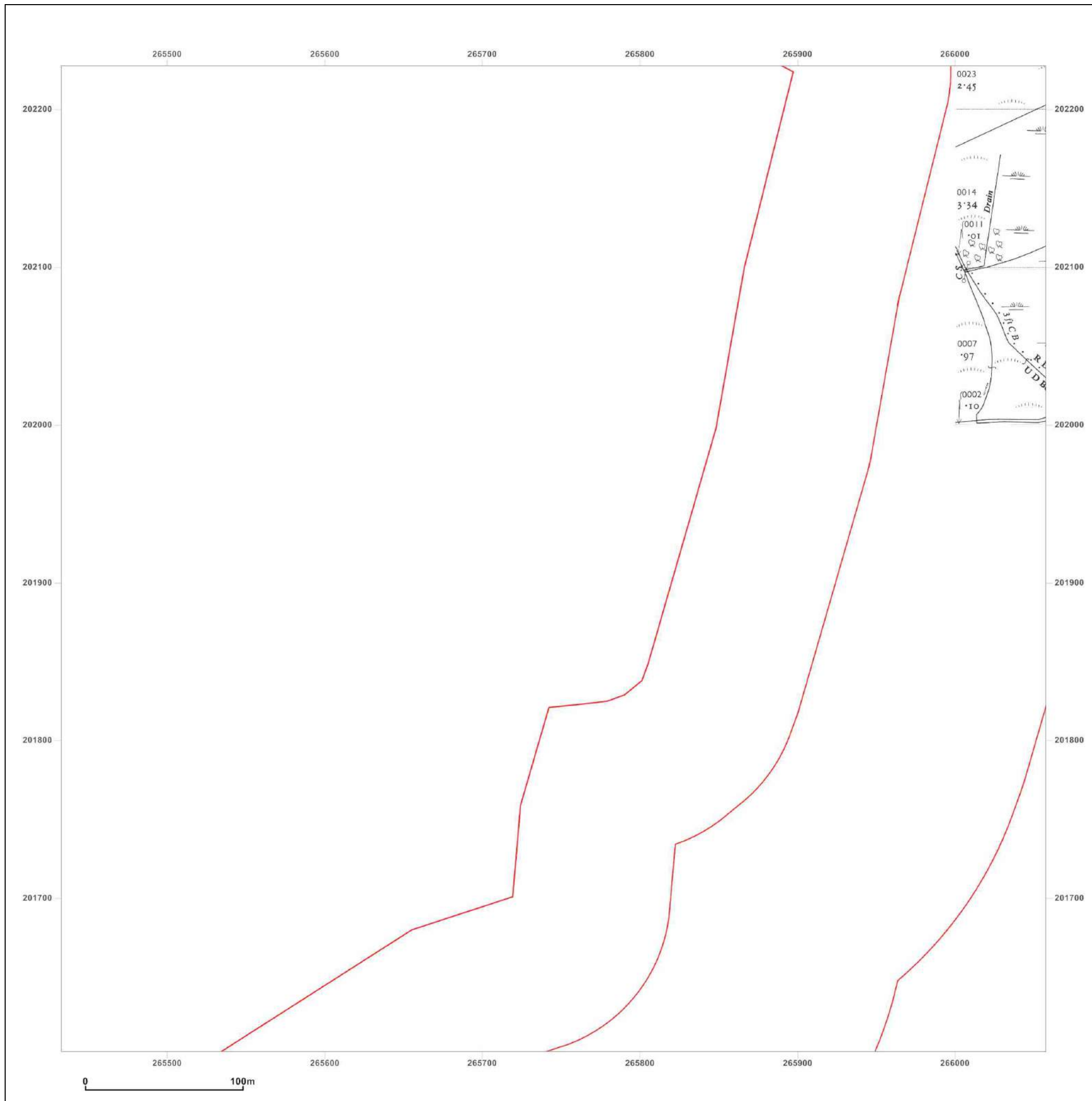


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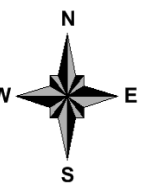
Client Ref: PB84891
Report Ref: GS-1587646_LS_5_4
Grid Ref: 265745, 201915

Map Name: National Grid

Map date: 1992-1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1962
Revised 1992
Edition N/A
Copyright 1992
Levelled 1962

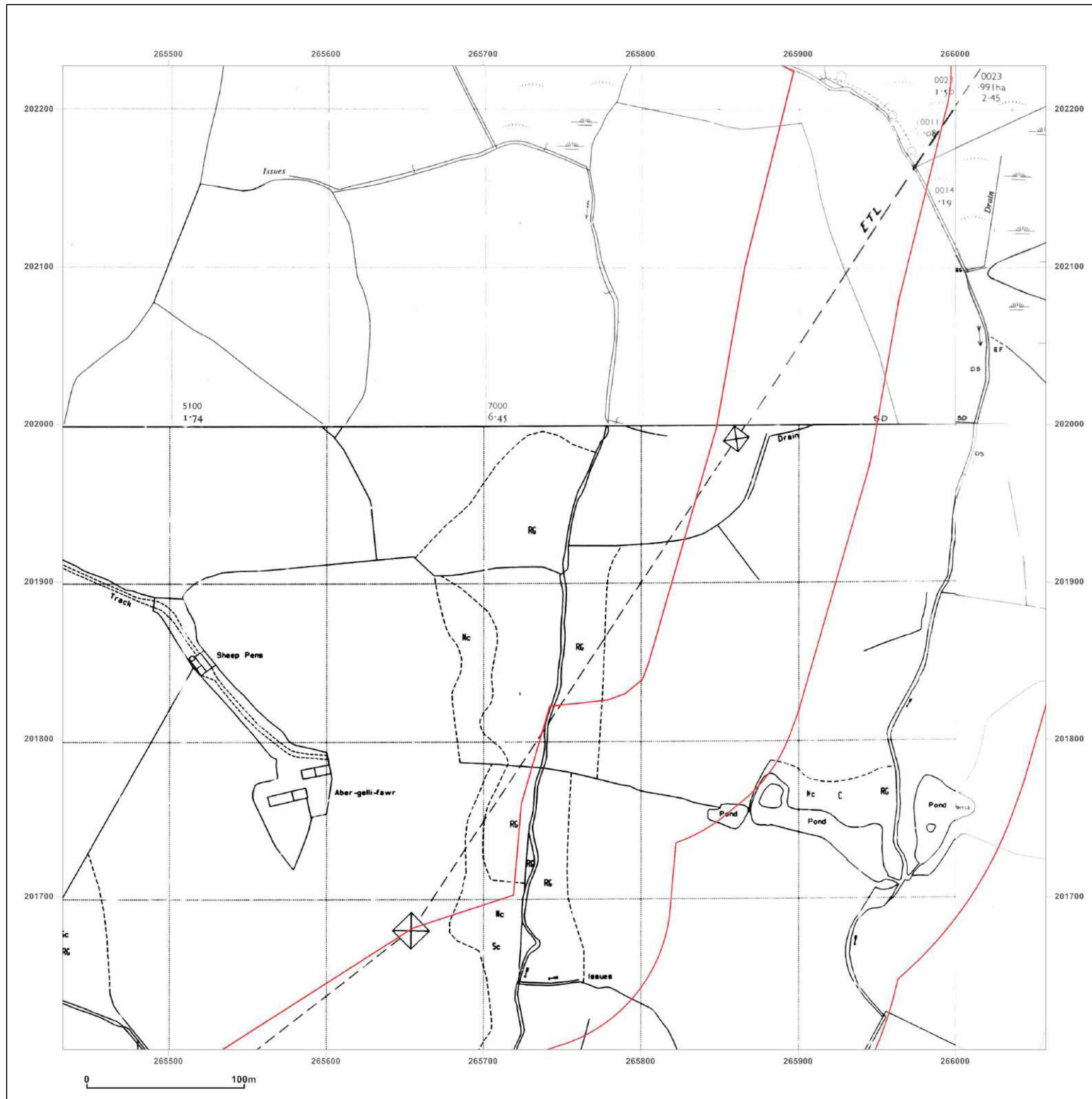


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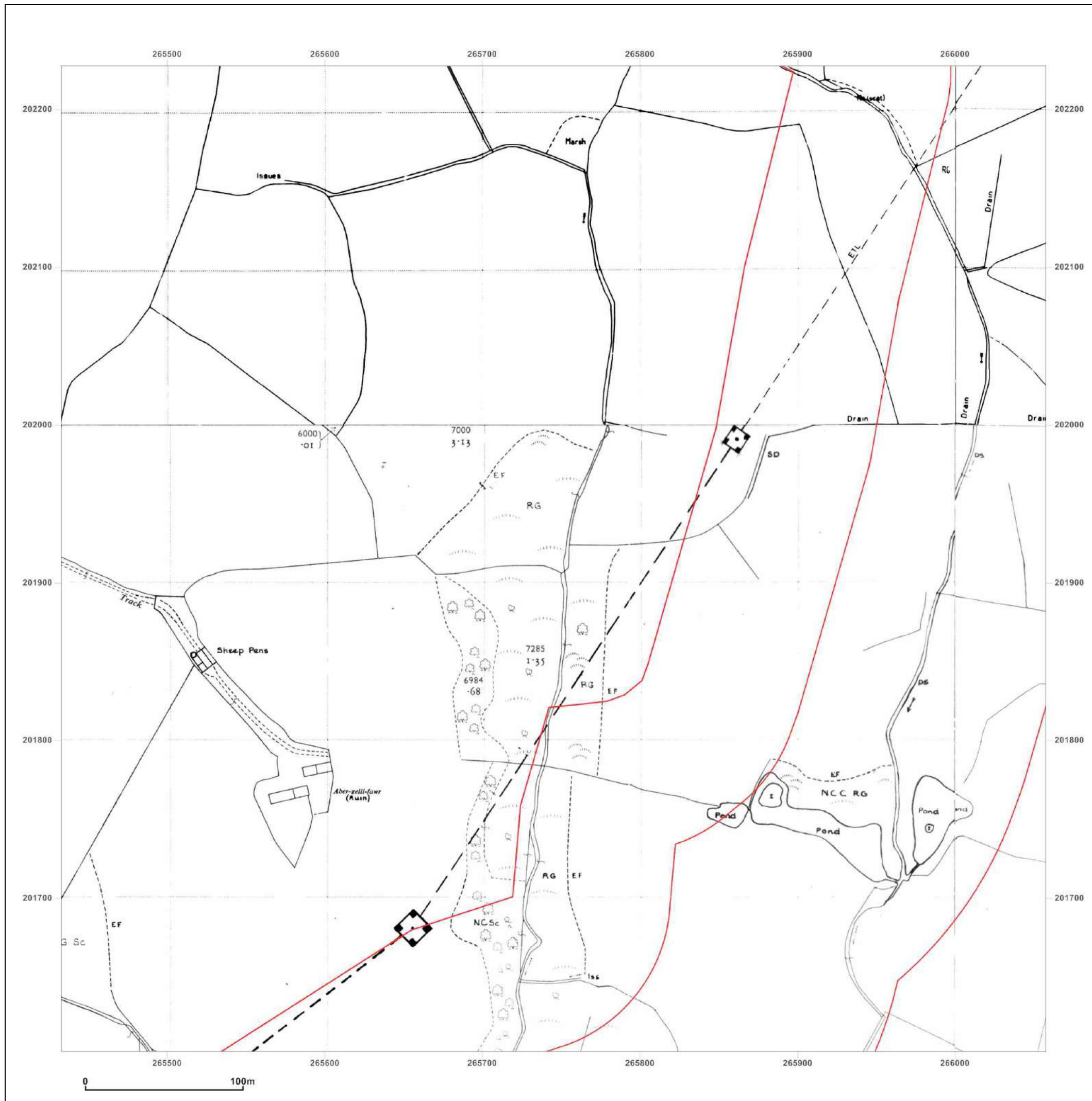
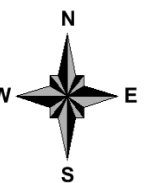
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Report Ref: GS-1587646_LS_5_4
Grid Ref: 265745, 201915

Map Name: National Grid

Map date: 1992-1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1962
Revised 1992
Edition N/A
Copyright 1992
Levelled 1962



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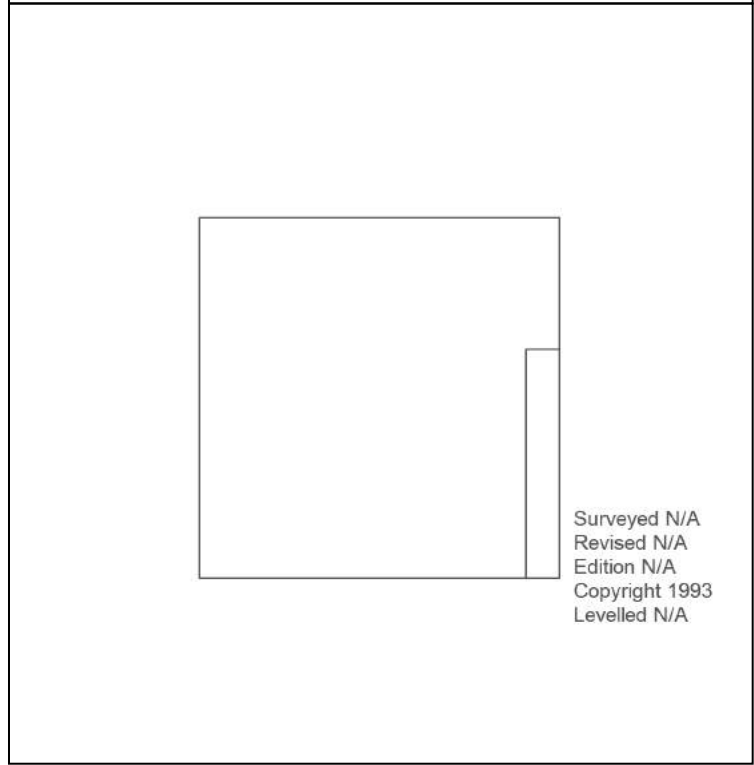
Client Ref: PB84891
Report Ref: GS-1587646_LS_5_4
Grid Ref: 265745, 201915

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500

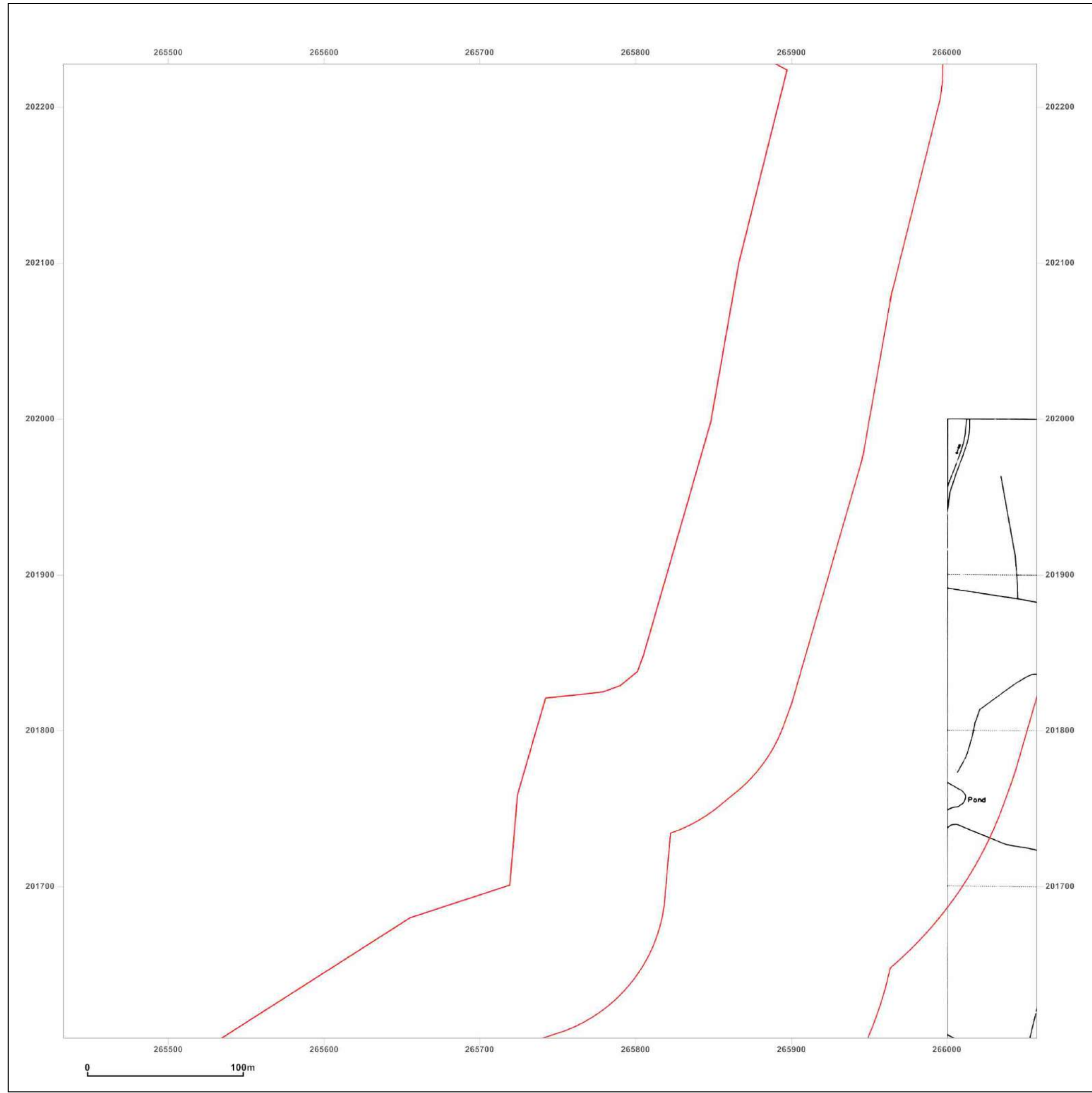


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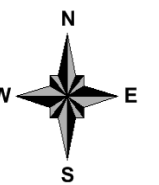
Client Ref: PB84891
Report Ref: GS-1587646_LS_5_5
Grid Ref: 265745, 202545

Map Name: County Series

Map date: 1876

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

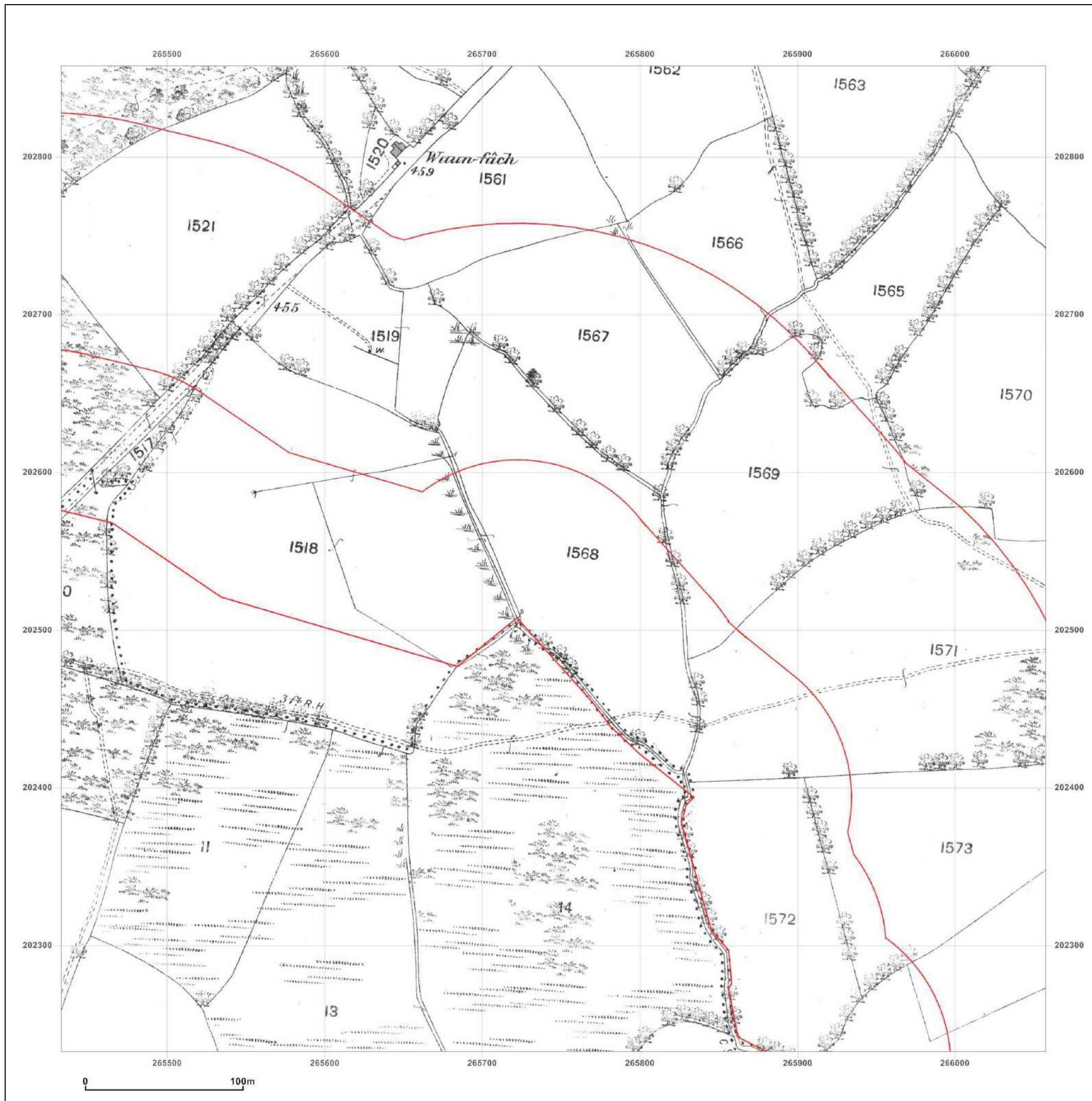


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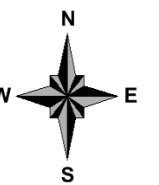
Client Ref: PB84891
Report Ref: GS-1587646_LS_5_5
Grid Ref: 265745, 202545

Map Name: County Series

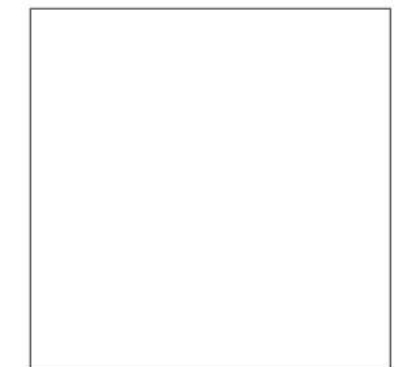
Map date: 1898

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

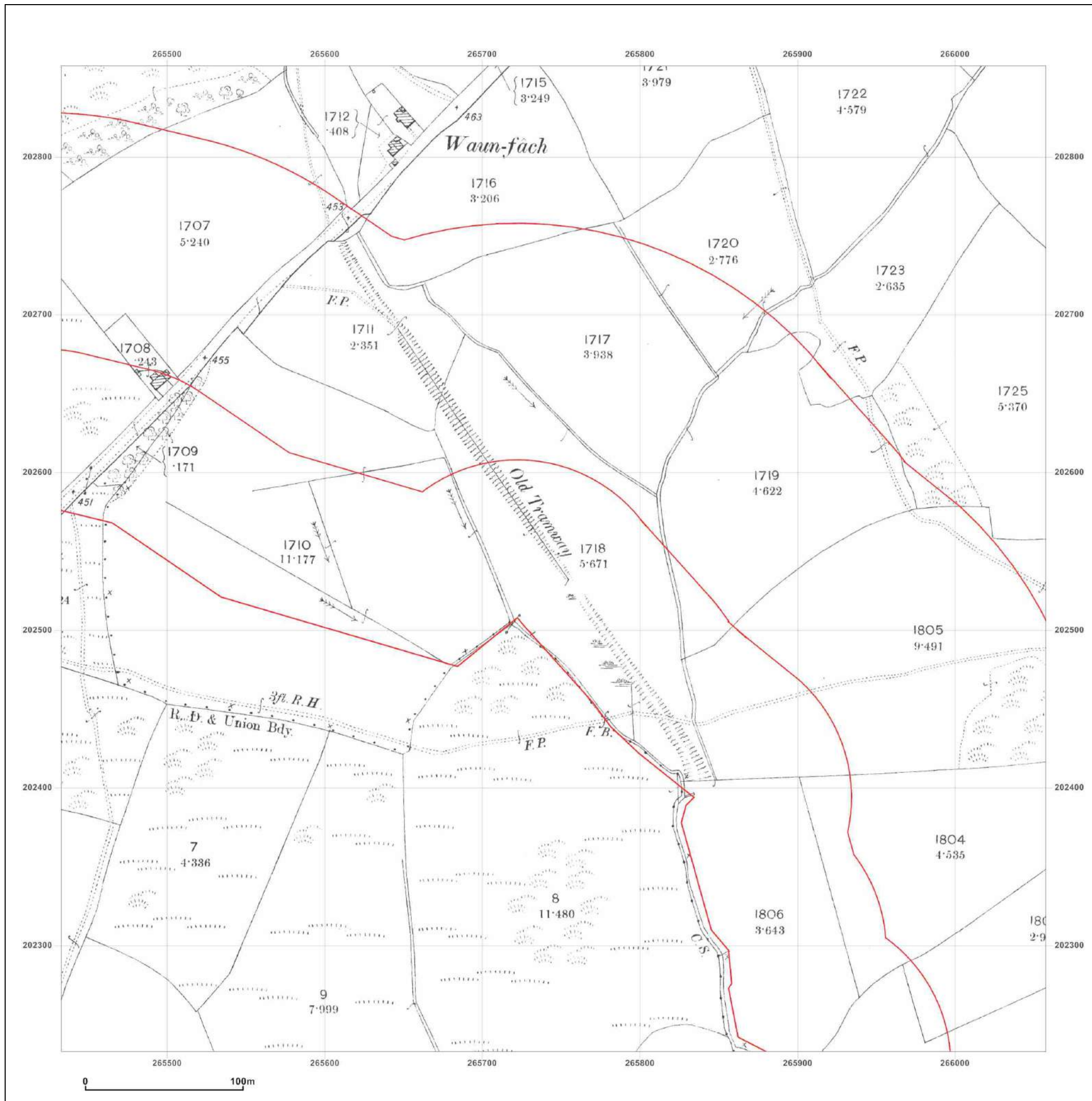


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Client Ref: PB84891
Report Ref: GS-1587646_LS_5_5
Grid Ref: 265745, 202545

Map Name: County Series

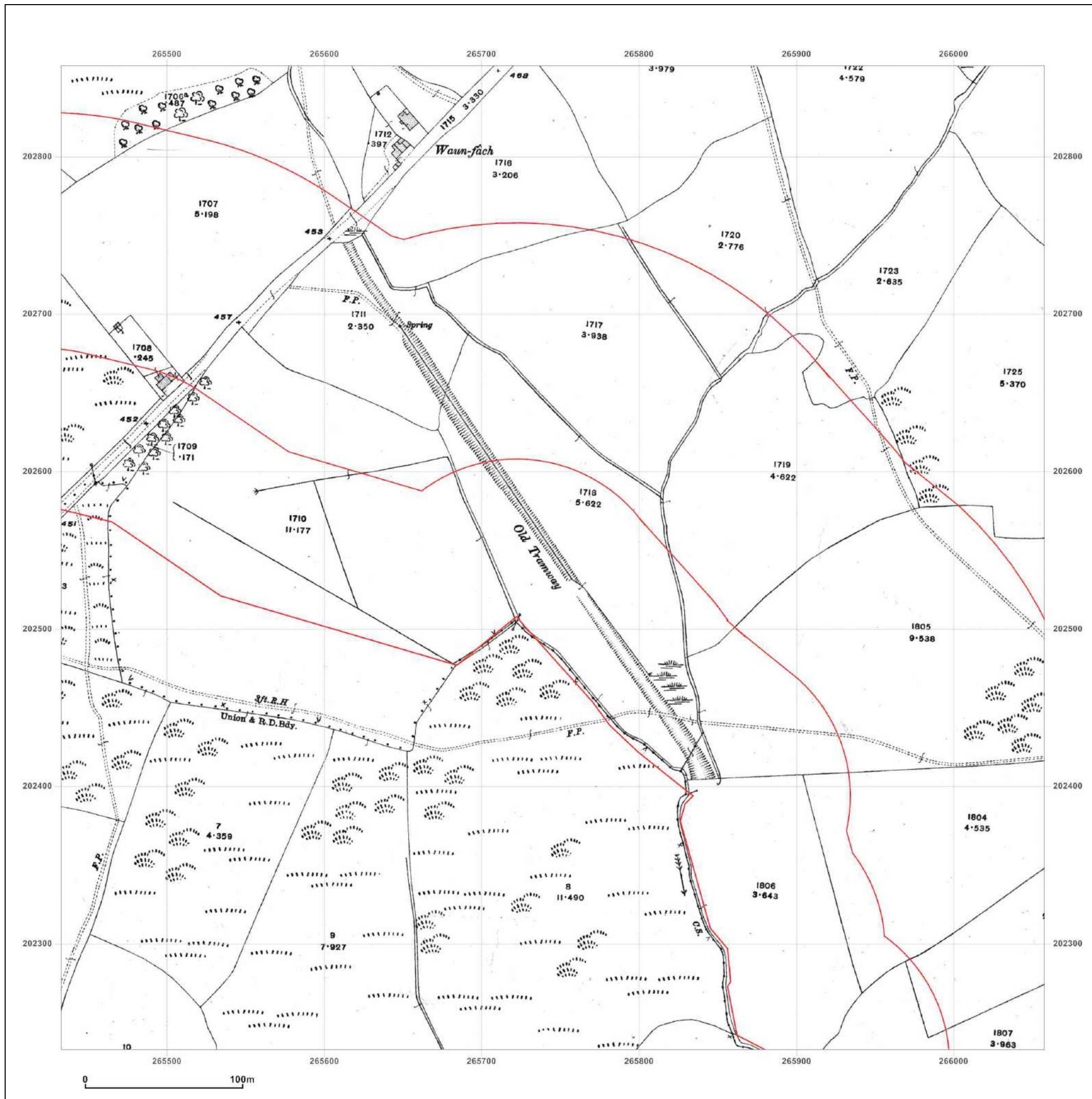
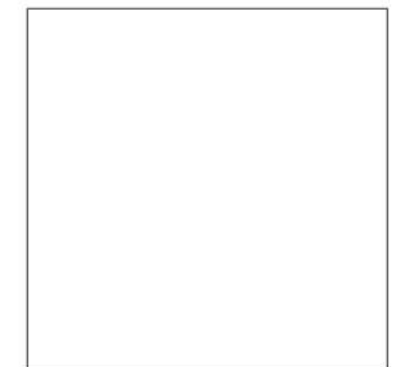
Map date: 1913

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1913
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A



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Site Details:

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Client Ref: PB84891
Report Ref: GS-1587646_LS_5_5
Grid Ref: 265745, 202545

Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1956

Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1956

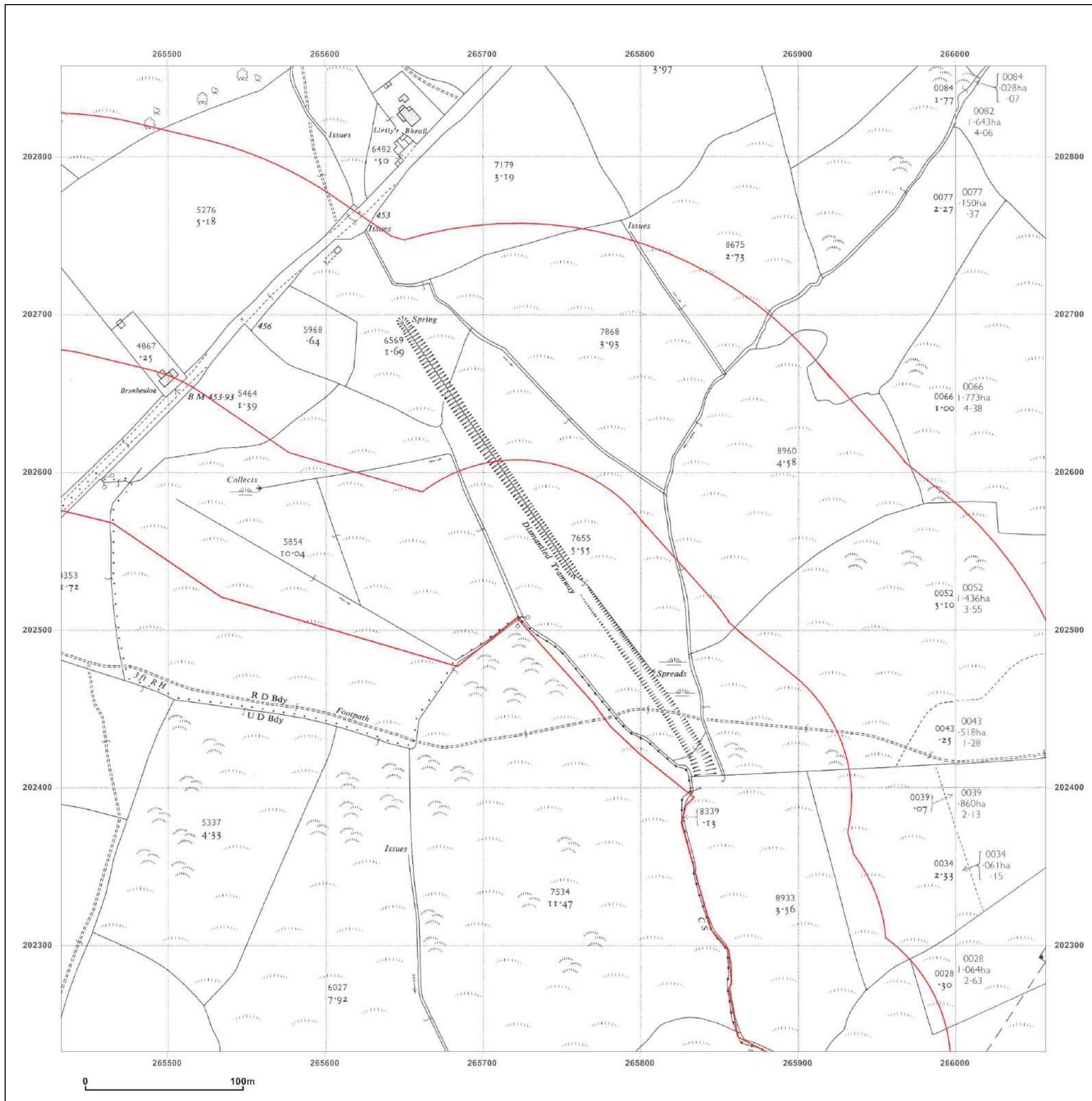


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SA5 7NN

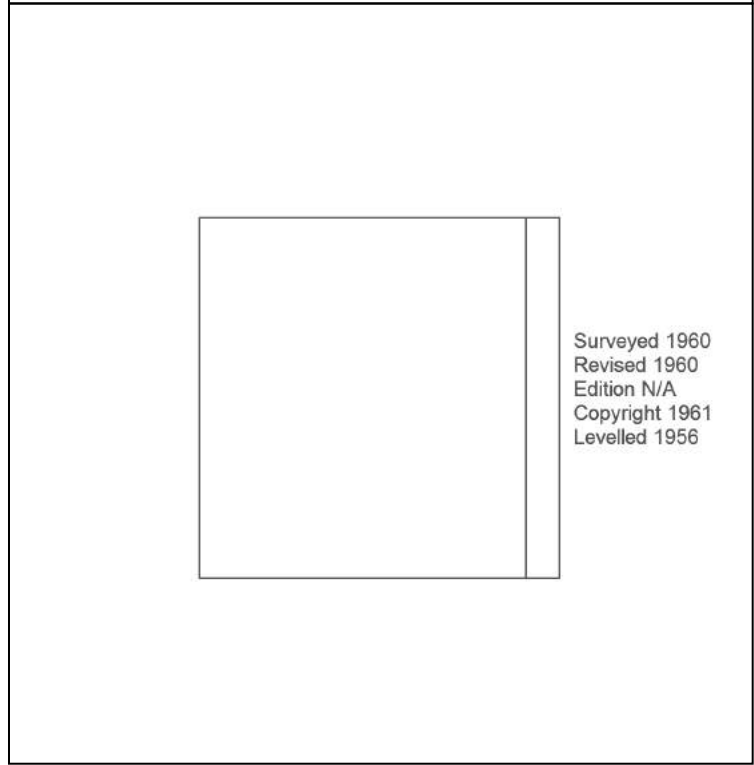
Client Ref: PB84891
Report Ref: GS-1587646_LS_5_5
Grid Ref: 265745, 202545

Map Name: National Grid

Map date: 1960

Scale: 1:2,500

Printed at: 1:2,500



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Site Details:

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SA5 7NN

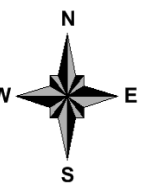
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Grid Ref: 265745, 202545

Map Name: National Grid

Map date: 1992-1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

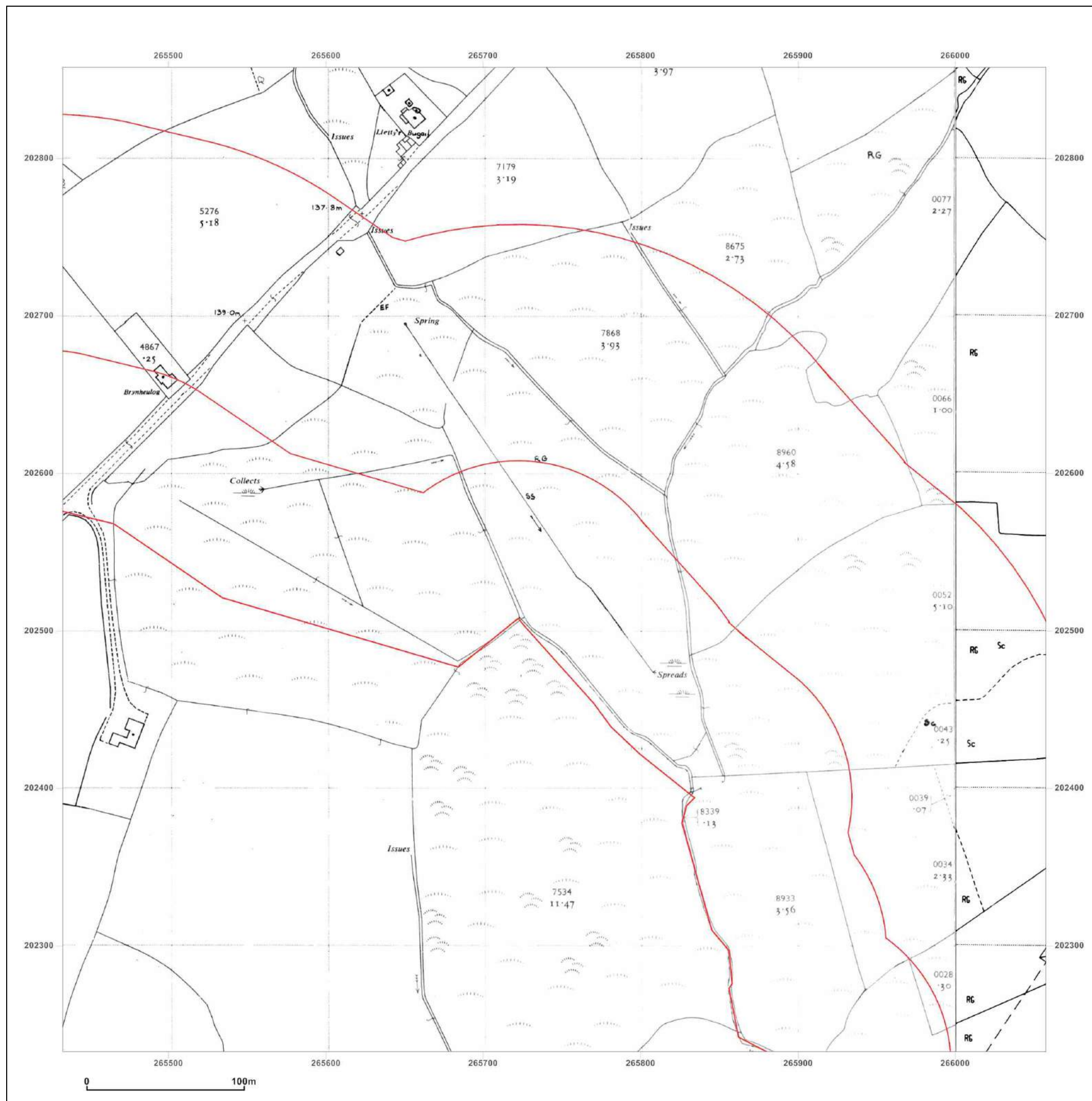


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SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_5_5
Grid Ref: 265745, 202545

Map Name: National Grid

Map date: 1992-1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A Revised N/A Edition N/A Copyright 1993 Levelled N/A	Surveyed 1992 Revised 1992 Edition N/A Copyright 1992 Levelled N/A
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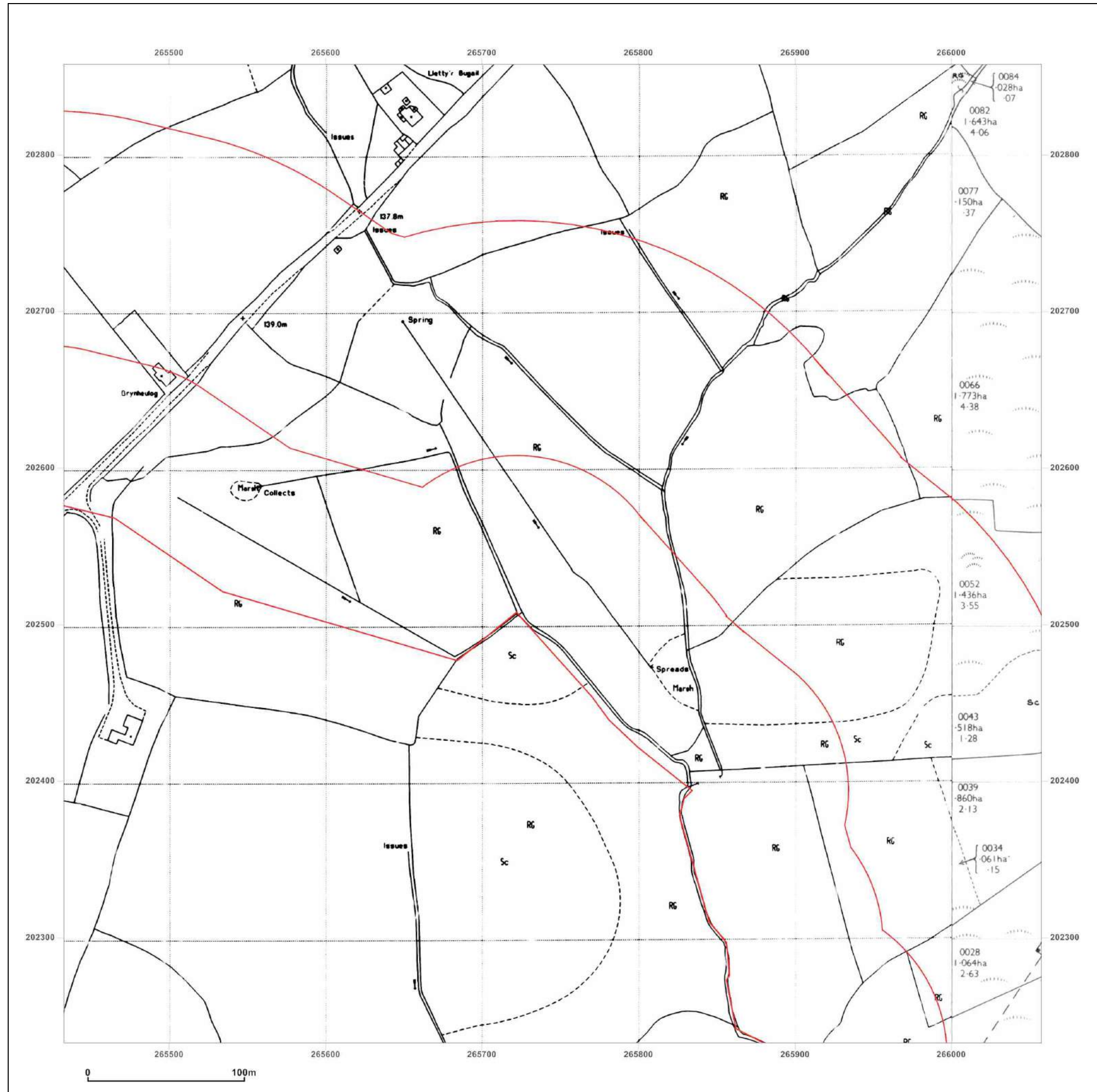


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Issued by:

The Coal Authority, Property Search Services, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire, NG18 4RG
Website: www.groundstability.com Phone: 0845 762 6848 DX 716176 MANSFIELD 5

PARSONS BRINCKERHOFF
27-29 CATHEDRAL ROAD
CARDIFF
CF11 9HA

Our reference: **51000592880001**
Your reference: **QUOTE ONLY**
Date of your enquiry: **30 July 2014**
Date we received your enquiry: **30 July 2014**
Date of issue: **01 August 2014**

This report is for the property described in the address below and the attached plan.

Non-Residential Coal Authority Mining Report

ABERGELLI FACH FARM, FELINDRE, SWANSEA, SA5 7NN

This report is based on and limited to the records held by, the Coal Authority, and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

Coal mining	See comments below
Brine Compensation District	No

Information from the Coal Authority

Underground coal mining

Past

The property is in the likely zone of influence from workings in 3 seams of coal at shallow to 380m depth, and last worked in 1986.

Present

The property is not in the likely zone of influence of any present underground coal workings.

Future

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

The property is not in an area for which a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area that is likely to be affected at the surface from any planned future workings.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine entries

Within, or within 20 metres of, the boundary of the property there are 2 mine entries, the approximate positions of which are shown on the attached plan.

There is no record of what steps, if any, have been taken to treat the mine entries.

Records may be incomplete. Consequently, there may exist in the local area mine entries of which the Coal Authority has no knowledge.

For an additional fee, the Coal Authority will provide a supplementary Mine Entry Interpretive Report. The report will provide a separate assessment for the mine entry (entries) referred to in this report. It will give details based on information in the Coal Authority's possession, together with an opinion on the likelihood of mining subsidence damage arising from ground movement as a consequence of the existence of the mine entry/entries. It will also give details of the remedies available for subsidence damage where the mine entry was sunk in connection with coal mining. Please note that it may not be possible to produce a report if the main building to the property cannot be identified from Coal Authority plans (ie. for development sites and new build).

For further advice on how to order this additional information visit www.groundstability.com or telephone 0845 7626 848.

Coal mining geology

The Authority is not aware of any evidence of damage arising due to geological faults or other lines of weakness that have been affected by coal mining.

Opencast coal mining

Past

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

Present

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

Future

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

Coal mining subsidence

A damage notice or claim for alleged subsidence damage was made in November 1996 for ABERGELLI FARM, FELINDRE, SWANSEA, SA5 7NN. However, the claim was rejected.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

A damage notice or claim for alleged subsidence damage was made in June 1995 for ABERGELLI FARM, FELINDRE, SWANSEA, WEST GLAMORGAN, SA5 7NN. However, the claim was rejected.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

If further subsidence damage claims information is required in addition to that provided in this report, the Authority need to manually search their records. For further advice on how to order this additional information visit www.groundstability.com or telephone 0845 7626 848.

Mine gas

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

Hazards related to coal mining

The property has been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

Withdrawal of support

The property is in an area for which notices of entitlement to withdraw support were published in 1943, 1945, 1976, 1977.

The property is not in an area for which a notice has been given under section 41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

Working facilities orders

The property is not in an area for which an Order has been made under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

Payments to owners of former copyhold land

The property is not in an area for which a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Comments on Coal Authority information

The attached plan shows the approximate location of the disused mine entry/entries referred to in this report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan.

Property owners have the benefit of statutory protection (under the Coal Mining Subsidence act 1991*). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A leaflet setting out the rights and the obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by telephoning 0845 762 6848 or online at www.coal.decc.gov.uk/en/coal/cms/services/claims.

If you wish to discuss the relevance of any of the information contained in this report you should seek the advice of a qualified mining engineer or surveyor. If you or your adviser wish to examine the source plans from which the information has been taken these are normally available at our Mansfield office, free of charge, by prior appointment, telephone 01623 637235. Should you or your adviser wish to carry out any physical investigations that may enter, disturb or interfere with any disused mine entry the prior permission of the owner must be sought. For coal mine entries the owner will normally be the Coal Authority.

The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries). Our emergency telephone number at all times is 01623 646333.

*Note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore if development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Additional Remarks

This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions 2006. The Coal Authority owns the copyright in this report. The information we have used to write this report is protected by our database right. All rights are reserved and unauthorised use is prohibited. If we provide a report for you, this does not mean that copyright and any other rights will pass to you. However, you can use the report for your own purposes.

Issued by:	The Coal Authority, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG
Tax Point Date:	30 July 2014
Issued to:	PARSONS BRINCKERHOFF 27-29 CATHEDRAL ROAD CARDIFF CF11 9HA
Property Search for:	ABERGELLI FACH FARM, FELINDRE, SWANSEA, SA5 7NN
Reference Number:	51000592880001
Date of Issue:	01 August 2014
Cost:	£414.00
VAT @ 20%:	£82.80
Total Received:	£496.80
VAT Registration	598 5850 68

Map images are being sent under separate cover

Location map



Approximate position of property



Enquiry boundary

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Key

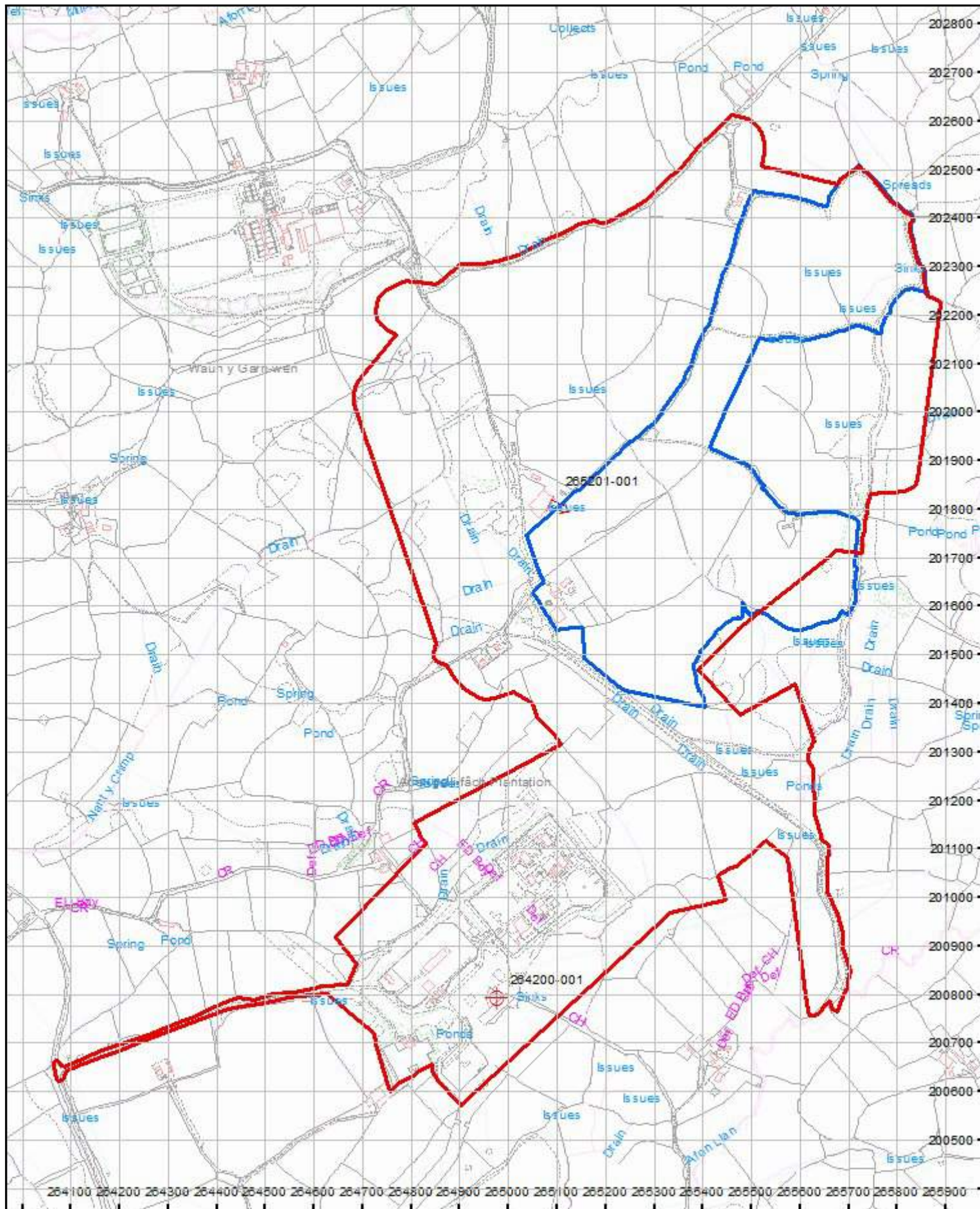
Approximate position of enquiry boundary shown



Disused Adit or Mineshaft



Coal Claims





The Coal
Authority

Issued by:

The Coal Authority, Property Search Services, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire, NG18 4RG
Website: www.groundstability.com Phone: 0845 762 6848 DX 716176 MANSFIELD 5

**CHARLES ADEGITE
OXFORD HOUSE
OXFORD ROAD
MANCHESTER
M1 7ED**

Our reference:	51000588204001
Your reference:	Mine entry
Date of your enquiry:	17 July 2014
Date we received your enquiry:	17 July 2014
Date of issue:	21 July 2014

This report is for the property described in the address below and the attached plan.

Shaft Plan and Data Sheets

ABERGELLI FACH FARM, FELINDRE, SWANSEA, SA5 7NN

I refer to the enquiry dated 17 July 2014, received 17 July 2014, in connection with the above.

As requested I enclose the mine entry data sheet(s) held for the mine entry/entries referred to.

Mine Entry Data

Shaft/adit:	Adit
Reference:	265201-001
Source:	1/2500 O.S Sheet Glam 15:1 1935 Ed Ab plans SW154 SW514 SWR666 SWA1795. Other: AG1 PD110 Abergelli No.1 Geological Sheet SN60SE N.G Ed 1/10560 O.S Sheet SN60SE N.G Ed - site of
Colliery name:	Unknown
Entry name:	Aber Gelli Colliery
Date abandoned:	Unknown
Depth of superficial deposits (m):	Unknown
Depth of shaft (m):	Unknown
Diameter of shaft (m):	Unknown
Probable adit azimuth:	115
Treatment details:	Unknown
Conveyance:	Not Applicable
Easting:	265091
Northing:	201811
Other information:	None

Issued by:	The Coal Authority, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG
Tax Point Date:	17 July 2014
Issued to:	CHARLES ADEGITE OXFORD HOUSE OXFORD ROAD MANCHESTER M1 7ED
Property Search for:	ABERGELLI FACH FARM, FELINDRE, SWANSEA, SA5 7NN
Reference Number:	51000588204001
Date of Issue:	21 July 2014
Cost:	£35.00
VAT @ 20%:	£7.00
Total Received:	£42.00
VAT Registration	598 5850 68

Location map

Approximate position of enquiry



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This plan shows the approximate location of the disused mine entry / entries referred to in the attached mining report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan.

Property owners have the benefit of statutory protection (under the Coal Mining Subsidence Act 1991). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A DTI leaflet setting out the rights and obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by telephoning 0845 762 6848.

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The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries).

Our emergency telephone number at all times is 01623 646333.

Key

Disused Adit or Mineshaft

