

4.2.4 Mine Entries

No mine entries are recorded on the site and, as discussed in Section 4.1.3, mine workings may also be absent beneath the site.

Based on the above, we consider that the risk of mine entries beneath Site B is potentially **Low**.

4.3 Mine Gas Mitigation

As discussed in Section 2.5.3, the Coal Authority has no record of a mine gas emission requiring action in the vicinity of the site. Notwithstanding this, a mine gas risk assessment based on the guidelines published by Wilson et al (2021) would be required for any development – information on the ground conditions and state of the coal seam(s) would be required to undertake this assessment, so should be undertaken following the further investigation (see Section 4.3).

4.4 Recommended Further Mining Investigation Works

Based on the available information, we consider that the mining hazard beneath the site should be confirmed by further investigation. We consider that three boreholes to 30m are likely to be sufficient.

The above boreholes should identify the presence, depth and thickness of coal seams, and the nature of the bedrock strata between the various seams. Once this information is available, a further assessment of the subsidence risk to the proposed development can be made, and options for appropriate risk mitigation measures prepared. A mine gas risk assessment may also then be completed.

These boreholes are anticipated to take no more than two days to complete. Coal seams and workings are in the ownership of the Coal Authority and their permission will be required prior to any drilling works (this can take around four weeks). The use of water flush and gas monitoring at the drilling rig is likely to be required.

5 Identification and Assessment of Site-Specific Coal Mining Risks – Site C

5.1 Context

Site C is located to the south-east of Reservoir B. The proposed site development comprises a new adventure playground and boat house, along with refurbishment of pathways and landscaping.

5.2 Identified Coal Mining Risks

5.2.1 Preliminary Conceptual Ground Model

Based on the available information, Site C is likely to be underlain by bedrock of the Brithdir Beds with Diamicton anticipated beneath the eastern area only.

5.2.2 Summary of Mining Hazard

The potential coal mining risks identified at the site are summarised in Table 6 below:

Table 6: Identified Coal Mining Risks – Site C

Coal Mining Issue	Identified Hazard	Risk Assessment
Underground Coal Mining (recorded at shallow depth ¹)	No	See Section 5.2.3.
Underground Coal Mining (unrecorded shallow ¹)	Possible	
Underground Ironstone Mining (recorded at shallow depth ¹)	No	None identified.
Underground Ironstone Mining (unrecorded shallow ¹)	No	
Recorded Mine Entries (shafts and adits)	Yes	See Section 5.2.4.
Unrecorded Mine Entries (shafts and adits)	Unlikely	
Recorded Coal Mining Geology (fissures)	No	None identified.
Recorded Past Mine Gas Emissions or Potential	No	See Section 5.3.
Recorded Surface Coal Mining Hazard	No	None identified.
Recorded Surface Mining (opencast workings)	No	None identified.
Notes to Table 6: - The Coal Authority defines shallow depth as within 30m of the ground surface. - Identified risks are discussed further in the following sections.		

5.2.3 Shallow Coal Mine Workings

There are no recorded mine workings beneath Site C, although an abandonment plan is apparently available. The Coal Authority have not defined a general Development High Risk zone within the site. However, an old mine shaft is identified in the south-east of the site, and the Authority have defined a Development High Risk zone around this shaft.

Mine shafts constructed in the mid-19th Century were expensive, and were generally constructed if there was high confidence of shallow coal. Therefore, we cannot discount the presence of shallow coal seams, probably the Brithdir Rider, Graig and Brithdir seams, and associated mine workings. Given this, we consider that the potential for shallow mine workings is potentially **High**.

5.2.4 Mine Entries

A single mine shaft, dating from before 1877, is indicated on historical and geological maps in the south-east of the site. The Coal Authority identifies two mine shafts but, as discussed in Section 2.5.4, these are likely to be the same shaft plotted in two positions. No further information is available on the shaft.

Based on the above, the risk of mine entries on Site C is **High**.

5.3 Mine Gas Mitigation

As discussed in Section 2.5.4, the Coal Authority has no record of a mine gas emission requiring action in the vicinity of the site. Notwithstanding this, a mine gas risk assessment based on the guidelines published by Wilson et al (2021) would be required for any development – information on the ground conditions and state of the coal seam(s) would be required to undertake this assessment, so should be undertaken following the further investigation (see Section 5.3).

5.4 Recommended Further Mining Investigation Works

Based on the available information, we consider that the mining hazard beneath the site should be confirmed by further investigation.

We recommend that initially the mine shaft is located and investigated to confirm its depth and diameter. Clearance of vegetation will be required and the shaft position may then be evident, however, if not, geophysical investigation and/or trial trenching may be required to locate the shaft. Once located, at least one rotary drillhole should be constructed through the shaft to identify the shaft depth and diameter and the depth and nature of any backfill within the shaft.

Depending on the findings of the shaft investigation, we consider that further rotary drillholes would be required to investigate for shallow mine workings. The number of boreholes required will depend on the precise development layout, which is not known at present, and the findings of the initial shaft investigation, but we consider that a minimum of four boreholes are likely to be required. The boreholes should be taken down to at least 30m depth.

The above boreholes should identify the presence, depth and thickness of coal seams, and the nature of the bedrock strata between the various seams. Once this information is available, a further assessment of the subsidence risk to the proposed development can be made, and options for appropriate risk mitigation measures prepared. A mine gas risk assessment may also then be completed.

These boreholes are anticipated to take two days to complete. Coal seams and workings are in the ownership of the Coal Authority and their permission will be required prior to any drilling works (this

can take around four weeks). The use of water flush and gas monitoring at the drilling rig is likely to be required.

6 Conclusions

Based on the available desk study information, we consider that the following mine risks are applicable for the three sites:

- **Site A (south-west of reservoir):** high potential for shallow mine workings and mine entries, further investigation required to understand the hazard (see Section 3.5);
- **Site B (north-east of reservoir):** probably low potential for shallow mine workings and mine entries, but further investigation required, intended to confirm the low hazard potential (see Section 4.4); and
- **Site C (south-east of reservoir):** high risk from mine shaft, and possible shallow mine workings hazard, further investigation required to understand the hazard (see Section 5.4).

7 References

ARUP 1997. Swansea-Llanelli Earth Science Information for Planning and Development. For Dept of Environment. Report No 96/3179.

BRITISH GEOLOGICAL SURVEY (BGS). 2023. Website accessed May 2023.

COAL AUTHORITY (CA). 2014. Risk Based Approach to Development Management. Guidance for Developers.

COAL AUTHORITY. 2023. Website accessed May 2023.

PARRY D.N. and CHIVERRELL C.P. 2019. Abandoned Mine Workings Manual. CIRIA C758D.

STRAHAN A. 1907. The Geology of the South Wales Coalfield, Part VIII, The Country around Swansea. Memoirs of the Geological Survey England and Wales, An Account of the Region Comprised in Sheet 247 of the Map. HMSO.

WILSON S, HENMAN T, LEE A. and MEREDITH R. 2021. Good Practice for Risk Assessment for Coal Mine Gas Emissions. CL:AIRE, Buckinghamshire.

PLATES



Plate 1: Site A, entrance to compound.
Looking south.

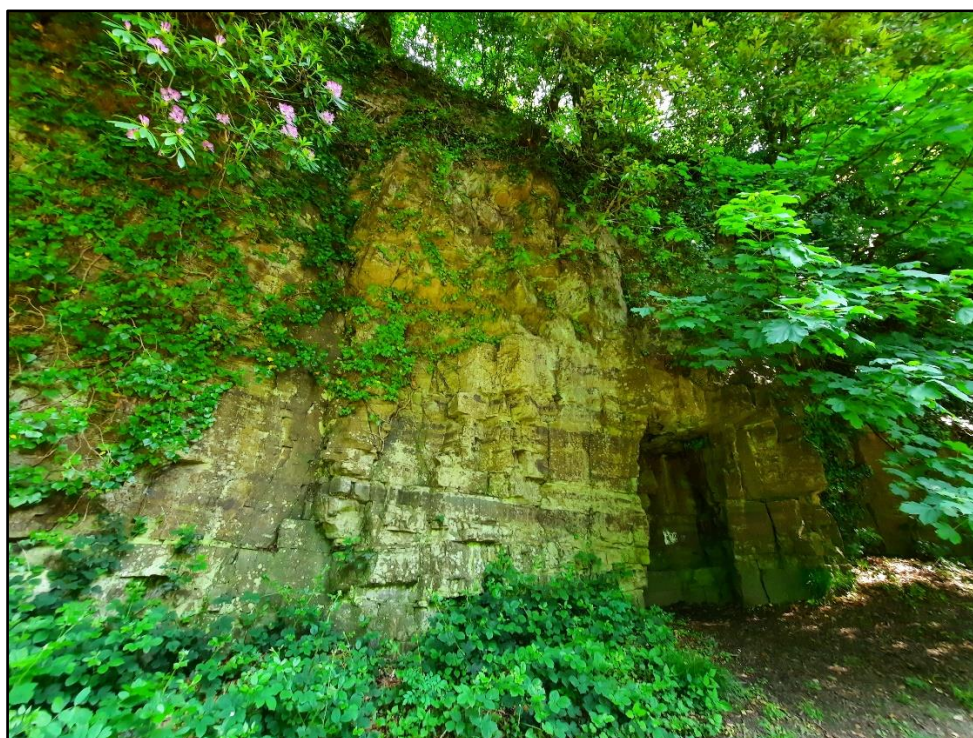


Plate 2: Site A, rock cutting beneath site

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Plate 3: Site B, visitor centre at east of lake.
Looking south-east.



Plate 4: Site B, visitors centre.
Looking north-west.

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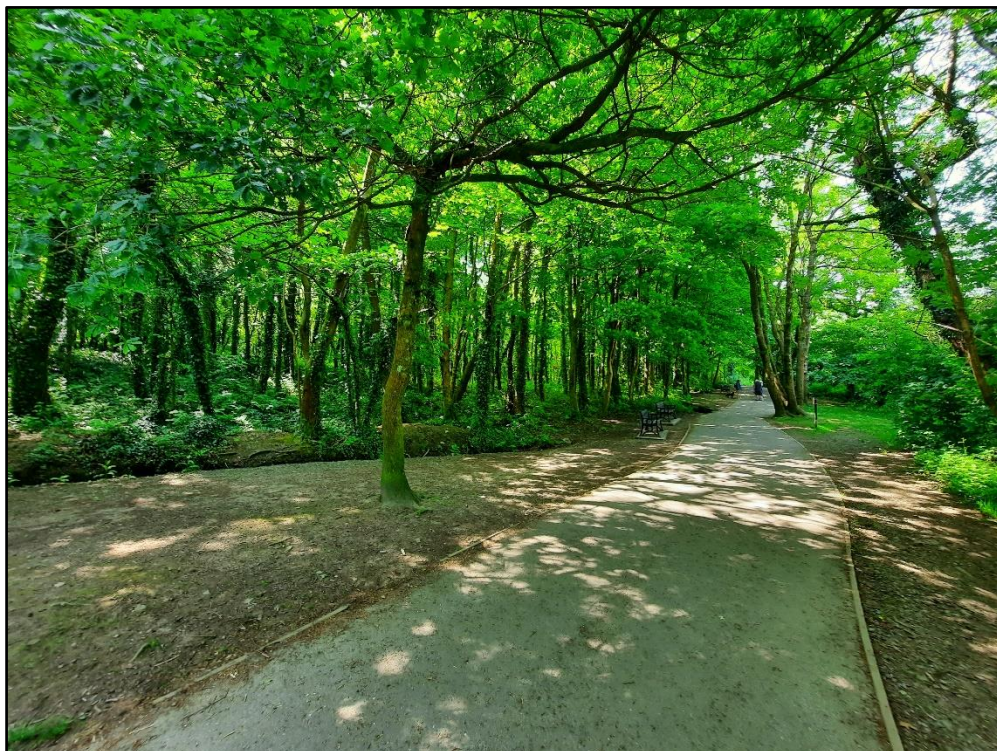


Plate 5: Site C, eastern end of pathway.
Looking south-west.



Plate 6: Site C, typical view of overgrown nature of site.

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Plate 7: Site C, rock outcrop beneath tree, just south of site.



Plate 8: Site C, play area in south-west of site. Looking east.

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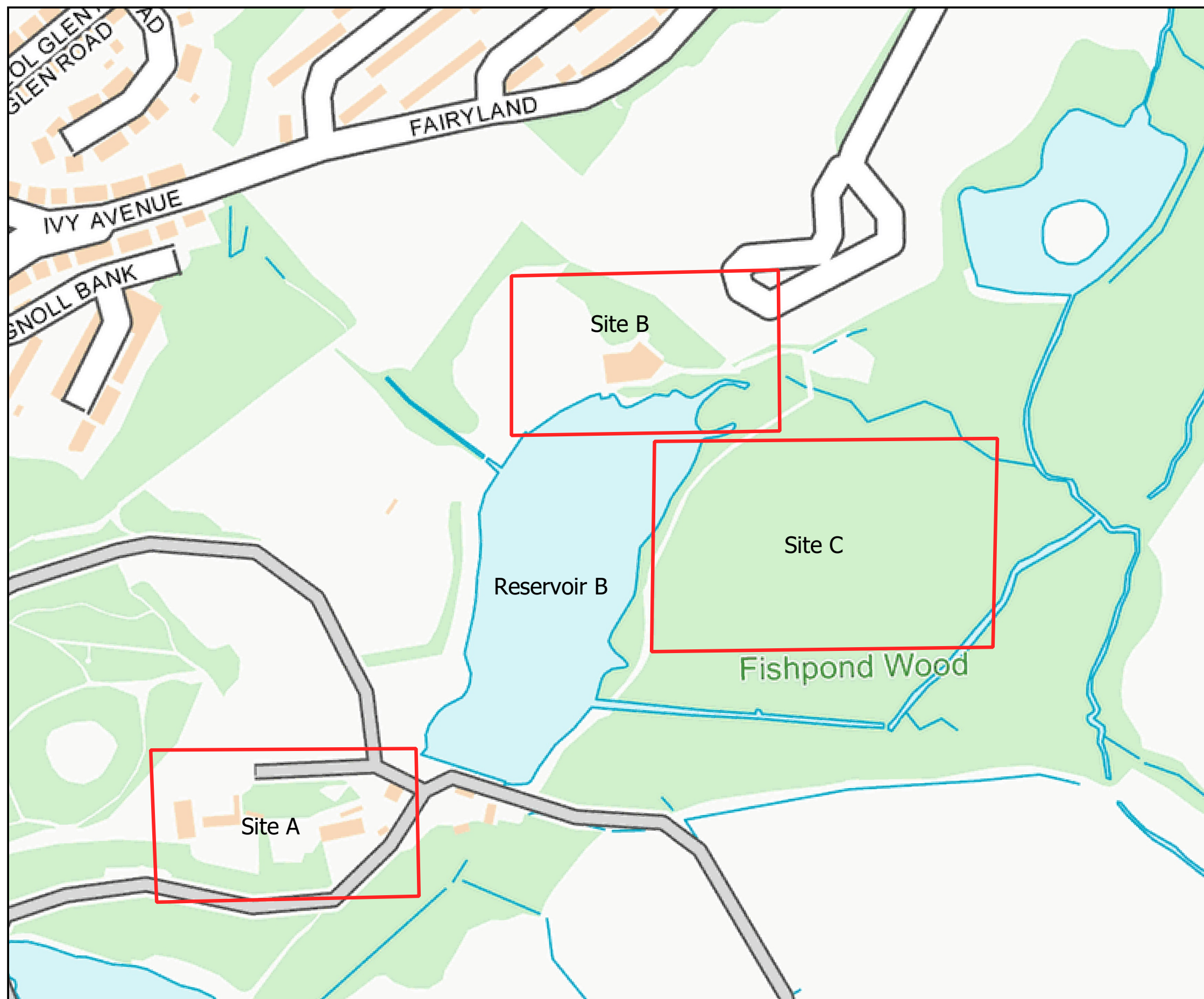
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FIGURES



LEGEND:

Site Boundaries

NOTES:

1. Do not scale from drawing. This drawing should be read in conjunction with all other associated project information.

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PROJECT NAME: GNOLL COUNTRY PARK, NEATH

REPORT REF: 8603

CLIENT: Andrew Scott Ltd

FIGURE TITLE: PROPOSED DEVELOPMENT SITE LOCATIONS

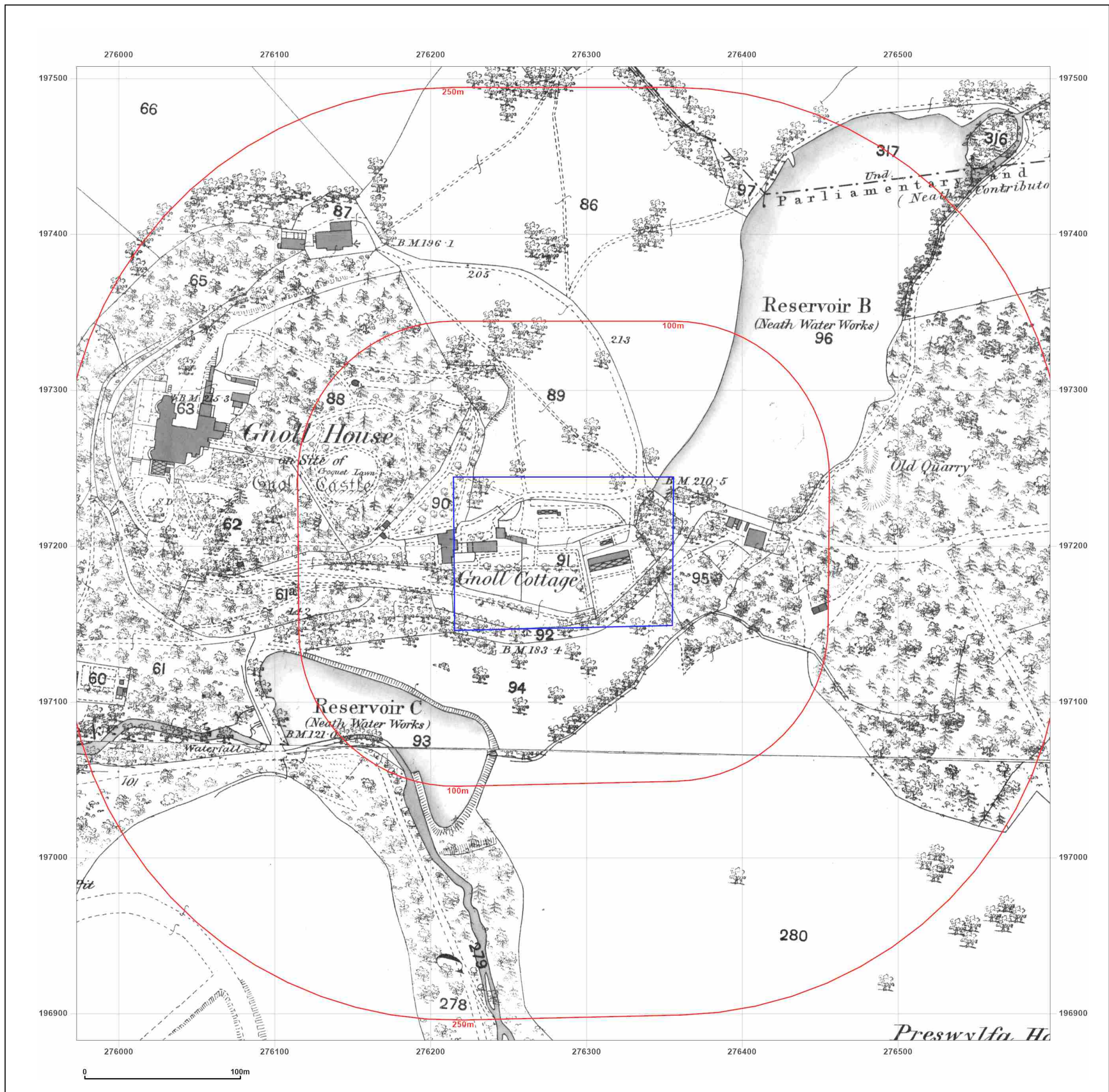
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DATE: 06/06/2023 SCALE: NTS

DRAWN BY: SW CHECKED BY: JH

esp EARTH SCIENCE PARTNERSHIP
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APPENDIX A1 Extracts from Historical Maps, Site A



Site Details:

GNOLL COUNTRY PARK,
FAIRYLAND, NEATH, SA11 3EF

Client Ref: 8603_Gnoll_Country_Park_W_PO11528
Report Ref: ESP-FEB-EOT-3EY-P3Q
Grid Ref: 276285, 197195

Map Name: County Series

Map date: 1877-1881

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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Report Ref: ESP-FEB-EOT-3EY-P3Q
Grid Ref: 276285, 197195

Map Name: County Series

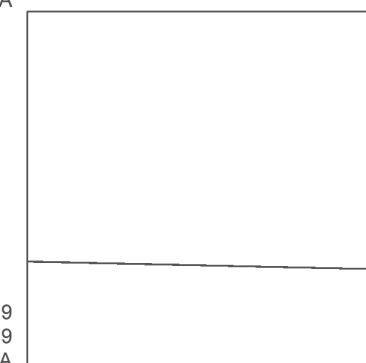
Map date: 1919

Scale: 1:2,500

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Edition N/A
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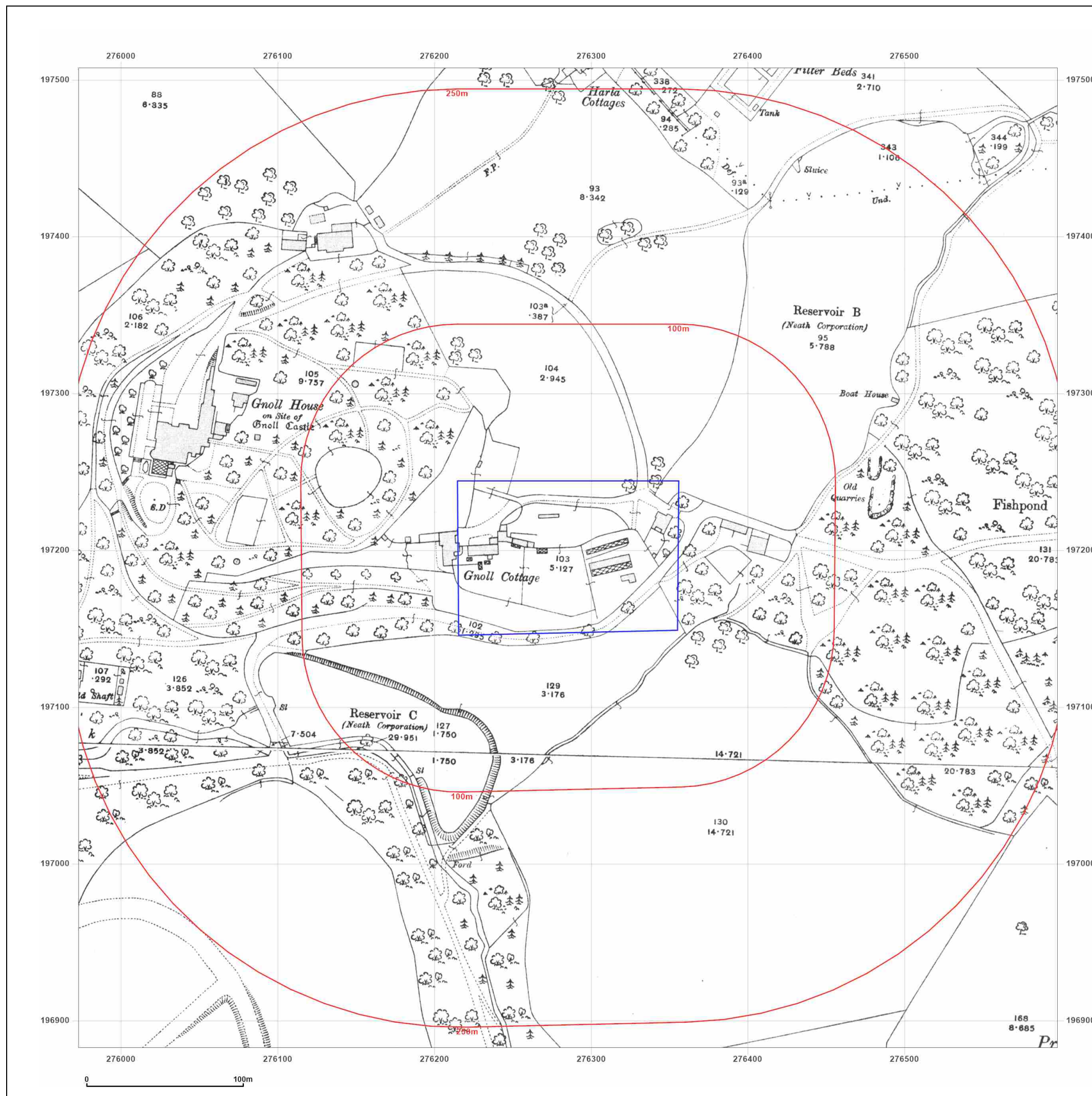


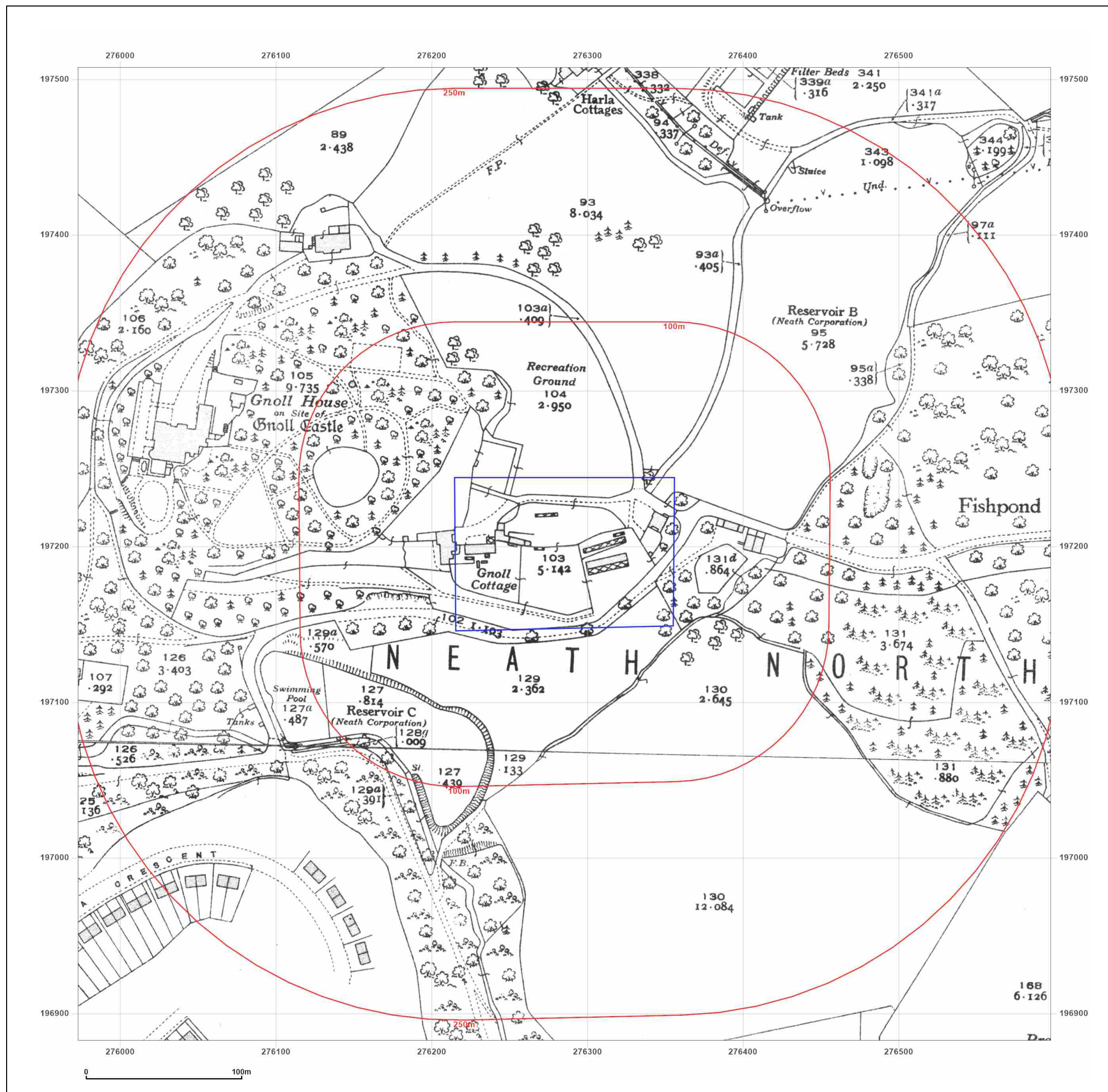
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Client Ref: 8603_Gnoll_Country_Park_W_PO11528
Report Ref: ESP-FEB-EOT-3EY-P3Q
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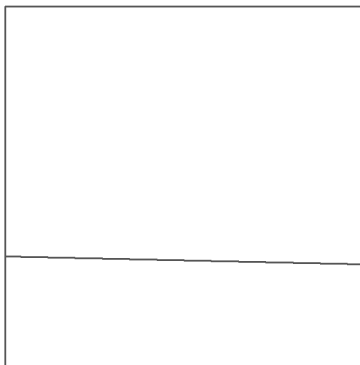
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Report Ref: ESP-FEB-EOT-3EY-P3Q
Grid Ref: 276285, 197195

Map Name: National Grid

Map date: 1962-1967

Scale: 1:1,250

Printed at: 1:2,000



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