

Our Ref: 3600-01/BH/ARB

05 March 2024

Planning and Development Management
North Hertfordshire Council
Gernon Road
Letchworth Garden City
SG6 3JF

Sent by email only to: planning.control@north-herts.gov.uk

PRE-APPLICATION ADVICE REQUEST – COMMERCIAL IN-CONFIDENCE

PROPOSED DEVELOPMENT OF A BATTERY ENERGY STORAGE SYSTEM, ASSOCIATED INFRASTRUCTURE AND ACCESS ON LAND OFF NEWNHAM ROAD, BALDOCK, HERTFORDSHIRE (EASTING: 524111 / NORTHING: 236683)

We write on behalf of our client, Balance Power Projects Limited (BPP), to seek pre-application advice in relation to the above proposal. The pre-application submission includes:

- This cover letter which sets out, amongst other things, details of the proposal and considers a range of planning and environmental matters.
- The completed online pre-application advice request form.
- Drawings including a Site Location Plan, Aerial Plan, Existing Plans and Proposed Plan.
- Technical Reports including a Preliminary Ecological Appraisal, Noise Assessment and Phase One Desk Top Study.

The relevant fee of £508 (based on non-residential Category D) will be paid separately and it is requested that electronic payment details are provided to facilitate this. BBP would be grateful if, at this juncture, the pre-application process could be conducted on a commercial in-confidence basis.

To assist you in formulating your pre-application advice, the subsequent sections of this letter provide relevant details of the proposed Battery Energy Storage System (BESS) and associated infrastructure (the 'Proposed Development').

Site and Surroundings

As illustrated by the site location plan, the Proposed Development would be located to the north of Newnham Road set within the eastern corner of an agricultural field, circa 2.5 km east of Stotfold and circa 2.8 km north of Baldock. The site comprises part of a much larger agricultural field which is partially screened by vegetation along its eastern and southern boundaries and extends across the wider agricultural field on its western and northern boundaries. Circa 400 m

west of the field is Baldock Services, situated off Junction 10 of the A1(M). To the north, east and south (beyond Newnham Road) are further agricultural fields. Overhead power lines supported by towers over sail part of the site.

Access is proposed to be achieved from Junction 10 of the A1(M) and thereafter the A507 and Newnham Road. The existing access junction off Newnham Road would be utilised to accommodate temporary construction traffic and thereafter periodic vehicles for routine maintenance. There are no public rights of way within the site, the nearest (Caldcote and Newham 006) traverses through the agricultural field immediately to the east of the site.

The closest residential properties are situated circa 450 m northwest of the Proposed Development. Other properties are located off Newnham Road and Ashwell Road to the north east of the site at a greater distance. It is also worthy of note that a hotel is contained within the services circa 550 m to the west of the site. In terms of heritage assets there are several Grade II listed buildings which are located to the north west of the site. The closest Grade II listed building is 'Radwell Grange', which is situated circa 450 m northwest of the site. Additionally, there is a Scheduled Monument titled 'Ring ditch and enclosure' that is located circa 570m northeast of the site within Newnham, which is also designated as a conservation area.

The Site is located on land at lowest risk of flooding (Flood Zone 1) and is remote from ecological designations, the nearest being 'Stotfold Mill Meadows' Local Nature Reserve located circa 1.5 km west of the site. Thereafter 'Ivel Springs' Local Nature Reserve is situated circa 2 km south of the site.

Whilst the site is not located in the Green Belt, its boundary extends to the south beyond Newnham Road. A review of the agricultural land classification maps illustrate that the site is located on Grade 2 (Very Good) land. Furthermore the predictive best and most versatile land assessment maps illustrate that the site has a high likelihood of being best and most versatile land.

Description of the Proposed Development

The Proposed Development would consist of a BESS that would provide multiple services to the distribution network operator (DNO in this instance UK Power Networks) to enable them to manage the distribution network in a cleaner, efficient, and cost-effective way. It would store electricity during periods of excess renewable generation and then export this electricity back to the grid when there is a need, such as times of high electricity use.

An indicative layout of the Proposed Development (see drawings enclosed with this letter) and a series of key component elevational plans are provided with this letter. The plans illustrates that the Proposed Development would include two separate compounds, so as not conflict with the existing power lines. Each has been described in turn below.

The northern compound would include:

- 1 No. Private Substation Transformer
- 1 No. DNO Room
- 1 No. Control Room and Welfare
- 1 No. 132kV Substation Area (including transformer, and other electrical infrastructure set within its own fenced compound)
- 2 No. Transformers

The southern compound would include:

- 48 No. Prefabricated containerised modular Battery Energy Storage Systems (BESS), grouped into fours and arranged in rows.
- 12 No. Inverter / transformer modules.
- 1 No. Storage Room

Both compounds would be surfaced in gravel and secured by fencing and gating with associated CCTV security cameras. There would be an access road connecting the compounds and to the existing double leaf field gate (see Figure 2 enclosed with this letter). In addition, there would further emergency access (which would only be used in an emergency) connecting the compound to Newnham Road.

The compounds would be off set from the existing field boundaries to protect and enhance existing landscape and biodiversity features. These features have not been developed at the time of preparing this pre-application request, but would be formulated to support any forthcoming planning application.

The grid connection from the Proposed Development would be to the Letchworth Grid Substation (132/33kV) off the B656 within Letchworth Garden City (please see Figure 1 enclosed with this letter). The connection would be constructed in existing roadways by a statutory undertaker through permitted development rights and therefore this element of the scheme is excluded from the application or assessment work.

The full construction period is anticipated to take circa 12 months. There may be a need for a temporary construction compound on land immediately next to the BSF. As this construction compound adjoins the land to which the future planning application will relate (i.e. red line) this element of the scheme benefits from permitted development rights and does not form part of the application.

The Proposed Development would be sought on a temporary basis for 40 years, at the point when the BSF first becomes operational (i.e. electricity connection becomes 'live'). Following this timeframe energy operations would cease the infrastructure would be removed and the Site restored to its present use and condition. Should permission be granted it is requested that the commencement period is five years to mirror the connection date requirements. It would be of assistance if consideration of this matter could be provided within the response.

Due to the rapidly evolving nature of the battery storage sector, as part of other BESS applications BBP have proposed parameters approach where alongside a proposed site layout plan a micro-siting and height parameter plans are submitted. These plans seek a degree of flexibility on the arrangement of infrastructure across the compounds and set a maximum height threshold. The assessment work would be based on the maximum parameters (for example, the landscape and visual appraisal would take account of the maximum height). The acceptability of this approach is sought through this pre-application request.

Planning and Environmental Context

From the outset it should be recognised that North Hertfordshire District Council declared a climate emergency in May 2019 and have since adopted the North Herts Council Climate Change Strategy 2022-2027. The objectives within this document include achieving a net zero carbon district by 2040. The Proposed Development would contribute towards achieving the Council's net zero carbon goal. Whilst BESS schemes do not generate renewable and low carbon energy they are categorised as such on the basis they provide a means of allowing electricity to be stored at times of low demand / high generation (due to the intermittent nature of wind or the sun), which can then be exported back into the Grid at times of higher demand / system stress. BESS schemes therefore can provide balancing services to the Grid through both frequency response (responding rapidly to variations that result from local and national energy demand) and reactive power services (balancing voltages to maintain stability and efficiency of the transmission system). These services are vital to Grid especially within this area of the transmission network which is known to be heavily constrained and will become more so as future renewable energy schemes connect into the system on route to reaching NGs aim of operating a zero-carbon electricity system by 2025, in response the Government's net zero target by 2050.

The Proposed Development clearly accords with the aforementioned declaration and could provide grid stability for circa 125,000 houses and will reduce the carbon footprint by circa 6,250 tonnes per annum, which is equivalent to taking circa 2,300 cars off the road.

The adopted North Hertfordshire Local Plan (NHLP) includes a range of strategic objectives including ENV4, which aims to mitigate the effects of climate change by encouraging the use of sustainable techniques and the appropriate use of renewable energy technologies and reduce the risk of flooding. The Proposed Development clearly accords with this strategic objective.

Principle of Development

The Policies Map which supports the adopted North Hertfordshire Local Plan (NHLP, 2022) illustrates that the site is located within a 'Rural Area beyond the Green Belt', to which Strategic Policy SP5 and Countryside and Green Belt Policy CGB1 apply.

Policy SP5 'Countryside and Green Belt' states that the Council will operate a general policy of restraint in Rural Areas beyond the Green Belt through the application of their detailed policies.

Policy CGB1 'Rural Areas beyond the Green Belt' sets out that planning permission will be granted if it accords with criteria, including: *"Is a modest proposal for rural economic development or diversification."*

Strategic Policy SP11 'Natural Resources and Sustainability' confirms the NHLP will seek to meet the challenges of climate change and flood by (amongst others) supporting proposals for renewable and low carbon energy development in appropriate locations. The supporting text to this policy confirms that: *"Proposals for renewable and low carbon energy will be favourably considered subject to consideration of the impacts. A balance needs to be struck between the beneficial outcomes of renewable energy, and any adverse impacts produced by the development itself."* (Paragraph 4.114)

More specifically Policy NE12 'Renewable and Low Carbon Energy Development' sets out that proposals for: *"renewable and low carbon energy development which would contribute towards reducing greenhouse gas emissions will be permitted subject to an assessment of the impacts upon: (a) landscape quality, landscape character and visual amenity, including consideration of cumulative impacts of development; (b) environmental assets; (c) the historic environment, including the impact on the setting of historic assets; (d) the transport network; (e) air quality; (f) aviation interests; and (g) the amenity of residents."* The policy also goes on to confirm that: *"In assessing renewable and low carbon energy proposals against the above criteria the Council will give significant weight to their local and wider benefits, particularly the potential to reduce greenhouse gas and other harmful emissions...In all cases, end of life/redundant plant, buildings, apparatus, and infrastructure must be removed and the site restored to its former state or a condition agreed with the Council."*

The significant benefits of the Proposed Development would be set out in detail within a Planning Statement. Whilst not an exhaustive list in summary this would include:

- The clear national policy message of energy security is strong and unambiguous. The increased deployment of renewable energy reinforces the need to ensure security of supply through the development of a diverse system that supports increasing peak demands and the move to electric vehicles.
- BESSs are a key component of the future energy mix under all scenarios considered by National Grid. National Grid also identify that existing storage provision will need to increase significantly to achieve net zero and support the deployment renewables. National Grid also anticipate that a significant increase in power flows through the Grid which will need to be supported by storage to maintain voltage, stability and frequency.
- Decarbonisation, decentralisation and digitalisation are creating significant changes across the Grid. National Grid consider that the next big challenge is around managing system imbalance during normal operation. As technology is becoming more decentralised (closure of large Power Stations etc.) the significant distributed and local generation will need to be supported by storage.
- A BESS clearly assists towards mitigating against climate change and is wholly in line with the climate change strategy and Council's climate emergency declaration.

From a land-use perspective and noting the site's distance to the substation an assessment of potentially more sequentially preferable sites would be necessary to demonstrate whether the Proposed Development could be located in the urban areas of Letchworth or Baldock, for example. This would assist in justifying the site's location within the open countryside. To this end, it is anticipated that an alternative site assessment would be prepared in support of the application. It is anticipated that this would illustrate that there are no more suitable sites in the defined area of search and why the site was chosen, rather than in the Green Belt for example.

Whilst consideration of any impacts referred to in the above policies also needs to be carried out and this is provided below. It is requested that an opinion on the principle of development and approach to justifying the open countryside location is sought from Officers.

Landscape and Visual

A Landscape and Visual Assessment is proposed to be prepared to support the future planning application. This would present the findings of the potential effects of the Proposed Development on the landscape character and visual amenity of the area. For the purposes of the appraisal a study area of up to 3 km from the application site is suggested on the basis it is considered to capture all the relevant landscape character and visual amenity given the nature of the proposal. The findings of the assessment would assist in determining the need for mitigation measures, such as planting, to assist in screening the Proposed Development from the surrounding area. It would assist if the details of the landscape officer could be provided so that the relevant consultant can discuss the scope of the assessment and viewpoint locations.

An illustrative landscape scheme is also proposed to be prepared in partnership with the ecologist to ensure that suitable landscaping is proposed and that a suitable biodiversity net gain can be achieved.

Biodiversity

BBP have commissioned a Preliminary Ecological Appraisal (PEA) and Ecological Constraints and Opportunities Plan (ECOP). The documents have been submitted as part of the pre-application request and several recommendations have been made. It is anticipated that any recommendations would be followed as part of the Proposed Development. The report contains details of protected species which should be treated as confidential and must not be circulated publicly.

An ecological assessment (including extended phase one habitat survey and data record search) would be prepared in support of the future planning application. Due to the site only being visited periodically by an engineer, it is not anticipated that permanent lighting would be required and therefore, any assessment of lighting (including potential impact of species) is not considered necessary. At this stage, the compounds and roadways have been designed (as far as possible) to be offset from the field boundaries so that these higher value habitats are unaffected.

A biodiversity net-gain calculation would be carried out to determine the pre- and post-development biodiversity units on a site. This would correlate with the illustrative landscape plan to ensure that a suitable biodiversity net gain score would be achieved. The calculation would be completed using the Biodiversity Metric (or an appropriate metric as agreed with the LPA Ecologist). It would be of assistance if the relevant ecological officer's details could be provided in order that the scope of the assessment / calculation work can be confirmed.

Agricultural Land

On the basis that the online resources illustrate that the site forms Grade 2 (Very Good) agricultural land classification, and therefore in line with the NPPF it is considered best and most versatile land. Considering that much of the surrounding land is also within this grade and that predictive best and most versatile land assessment maps illustrate that the site has a high likelihood of being best and most versatile land, it is not proposed to carry out a site-specific agricultural land classification assessment in this instance.

Surface Waters and Flood Risk

The site lies within Flood Zone One (low risk of flooding) but covers an area greater than one hectare. As such, in line with national and local planning policy, a Flood Risk and Drainage Assessment would be prepared in support of the future planning application. The assessment would consider all sources of flood risk. Future surface runoff from the site would be calculated (taking account of climate change) and thereafter in line with the SuDS hierarchy the potential for ground infiltration would be considered, should this not be possible then discharge to existing drainage feature would be considered. Any attenuation and discharge / pollution controls would be described in the assessment to ensure that the Proposed Development would not result in an increased risk of flooding. It would be of assistance if the relevant drainage officer's details could be provided in order that the scope of the assessment / calculation work can be confirmed. Finally, whilst the site is not located within the Bedfordshire and River Ivel Internal Drainage Board Area it would be beneficial if the need to discuss the proposal with the drainage board is required. If so, could any contact details be confirmed.

Contamination

A Phase One Assessment has been prepared to support the application. This demonstrates that the site has not been the subject of previous development and therefore with no plausible contamination linkages that could pose a risk to human health and / or the environment no further assessment work is considered necessary. During the construction and operation of the Proposed Development there would be a range of standard pollution control measures which would ensure that there would be no significant effect on the surrounding area. These pollution control measures would be set out in detail within the Planning Statement. It would be of assistance if the acceptability of the aforementioned approach is confirmed, or not, through the advice provided.

Historic Environment

As identified in the site and surroundings sub-heading there are heritage assets within the surrounding area. As such, it is proposed that a Heritage Assessment is proposed to be prepared in support of the planning application. This will identify designated heritage assets including Listed Buildings, Registered Parks and Gardens, Conservation Areas and Scheduled Monuments within 1 km of the site boundary, aided by the data from the historic environment record. Thereafter site visits to assets which would potentially be impacted would be carried out. This would enable an assessment of potential direct and setting impacts upon heritage assets resulting from the development. Should it be necessary mitigation measures to avoid minimise or offset any adverse effects identified during assessment work would be proposed.

The site is located on an agricultural field, which may offer archaeological potential and any programme of investigation would need to be discussed with the relevant officer. It would be of assistance if the relevant heritage officer's details could be provided in order that the scope of the assessment / calculation work can be confirmed. At this stage it would be of assistance to understand the acceptability of a condition in relation to any potential for archaeology, rather than need for site investigative works prior to any potentially forthcoming permission.

Traffic and Transportation

Access would be via the existing gated field entrance on Newnham Road. The only regular vehicular movements associated with the operational development would-be periodical visits from a maintenance engineer. A second emergency access would also be developed. Accordingly, the Proposed Development would generate very limited traffic movements during this phase. On this basis it is proposed that the Transport Statement prepared in support of a future application focuses upon the construction phase of the Proposed Development.

The Proposed Development would have a short construction phase due to the infrastructure being prefabricated before it arrives at the Site. The construction timescales and construction vehicle movements are to be confirmed for this project, but from previous schemes the works were anticipated to occur for a temporary period of circa 52 weeks, with 5.5 construction days per week. Initial estimates anticipate that peak construction activity (in terms of vehicle numbers) would occur during the enabling phase, when daily traffic levels are estimated to be in the region of 15 vehicles per day, including 5 HGV trips. This equates to in the region of 30 daily two-way movements, which will include 10 two-way HGV movements per day. Such traffic levels are unlikely to give rise to any material issues on the local highway network. Moreover, such levels of HGV traffic would not be maintained over any lengthy period.

It would be of assistance if the relevant officer's details could be provided in order that the scope of the assessment / calculation work can be confirmed.

Amenity

A noise impact assessment has been undertaken and provided as part of this pre-application advice request. The assessment identifies that the Proposed Development will give rise to rating sound levels that do not exceed the measured background sound level in the area during the daytime and night-time, thus giving rise to a 'Low Impact'. Consequently, the assessment demonstrates that the Proposed Development will give rise to noise impacts that would be within the range of NOAEL of the NPPG England guidance. For ease of reference, the definition of No Observed Adverse Effect Level in PPG Noise is reproduced here: *"Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life."* Since the Proposed Development conforms to British Standard and National Planning Policy requirements, it recommends that noise should not be a considered constraint to the planning application, providing that the plant is constructed and operated in accordance with the acoustic assumptions and recommendations set out within the report.

During the determination of applications for other BESS schemes, BBP has noted that in some instances consultees are concerned with the potential risk of fire. Specifically, in the unlikely event a battery were to overheat and combust it may be subject to discharging flammable and toxic gasses. This is not a new phenomenon and batteries have always been prone to potential combustion; however, media articles relating to batteries and personal hardware have raised public concerns and, in some cases, overexaggerated the issue. It must be recognised that lithium-based batteries are a proven technology used extensively in mobile phones, laptops and tablets across the planet. Regardless there are several potential fire suppression systems that can be installed prior to the operation of the Proposed Development and will be in-situ and maintained thereafter. On this basis, the LPA, consultees and other local stakeholders should be reassured that the Proposed Development would be safe for the entirety of its operation. It would be of assistance if any experience during the determination of other applications and / or the statutory consultation responses from the fire and rescue service could be shared during the pre-application process.

This pre-application request has not sought to identify all the policies which will need to be considered. However, if there are specific matters of attention it would be helpful if these could be identified through the response.

Proposed Structure of the Planning Application

A formal Environmental Impact Assessment (EIA) Screening Request would be sought through a separate correspondence. However, in the project team's experience, it has been found that similar schemes did not constitute EIA development and thus have not required the preparation of an Environmental Statement (ES). For the purposes of the following proposed structure it has been assumed that the future application would not need to be accompanied by an ES.

The planning application would be made in detail. It is currently intended, subject to the pre-application advice received, that the planning application would comprise / be supported by the following information:

- The planning application forms and certificates;
- A drawing package including a site location plan, site layout plan, detailed drawings of all infrastructure and illustrative landscaping plan;
- A Planning, Design and Access Statement; Statement (PDAS), the likely contents are set out below:
 - Introduction and Overview;
 - The Site and its Surroundings;
 - Scheme Description;
 - Need, Benefits and Locational Requirements (including Alternative Site Assessment);
 - Technical, Environmental and Amenity Matters, covering:
 - Traffic and Transportation – supported by a standalone Transport Statement;
 - Landscape and Visual – supported by a standalone assessment;
 - Noise – supported by a standalone assessment;
 - Ecology and Biodiversity – supported by standalone assessments and metric;
 - Heritage – supported by a standalone assessment;
 - Flood Risk and Surface Waters – supported by a standalone Flood Risk Assessment and Drainage Strategy;
 - Contamination – supported by a standalone Phase One Assessment; and
 - Outline Battery Fire Safety Management Plan;
 - Planning Policy Context and Appraisal; and
 - Summary and Conclusions.
- Statement of Community Involvement

Matters which the Applicant specifically wishes to receive pre-application advice.

Whilst probably not an exhaustive list, it would assist the Applicant if the following matters could be covered in the pre-application advice process:

- The in-principal acceptability of the Proposed Development in the ‘Rural Area beyond the Green Belt’.
- The contact details for relevant officers in respect of specific topics set out within this letter, and the acceptability of the approach advocated in relation to agricultural land and contamination.
- The acceptability of a parameters approach to provide flexibility within the permission.
- The scope and content of the planning application and need to carry out any further assessment work to support the application. For example the acceptability of a condition in relation to any potential for archaeology, rather than need for site investigative works prior to any potentially forthcoming permission.
- The Council’s experience of the fire safety concerns and if they are aware of existing consultation comments from the Fire and Rescue Service. If not, the Applicant is keen to

engage with the service directly and can undertake this in tandem with the preparation of a planning application.

- Any other local issues that the Council believes the applicant needs to be aware of, such as the potential requirement to consider other developments cumulatively?

We trust that the content of this letter and the application documentation are self-explanatory. However, please do not hesitate to contact the undersigned at our South Manchester Office should you have any queries or require any further information.

Yours sincerely

Andrew Barton

Andrew Barton
Associate

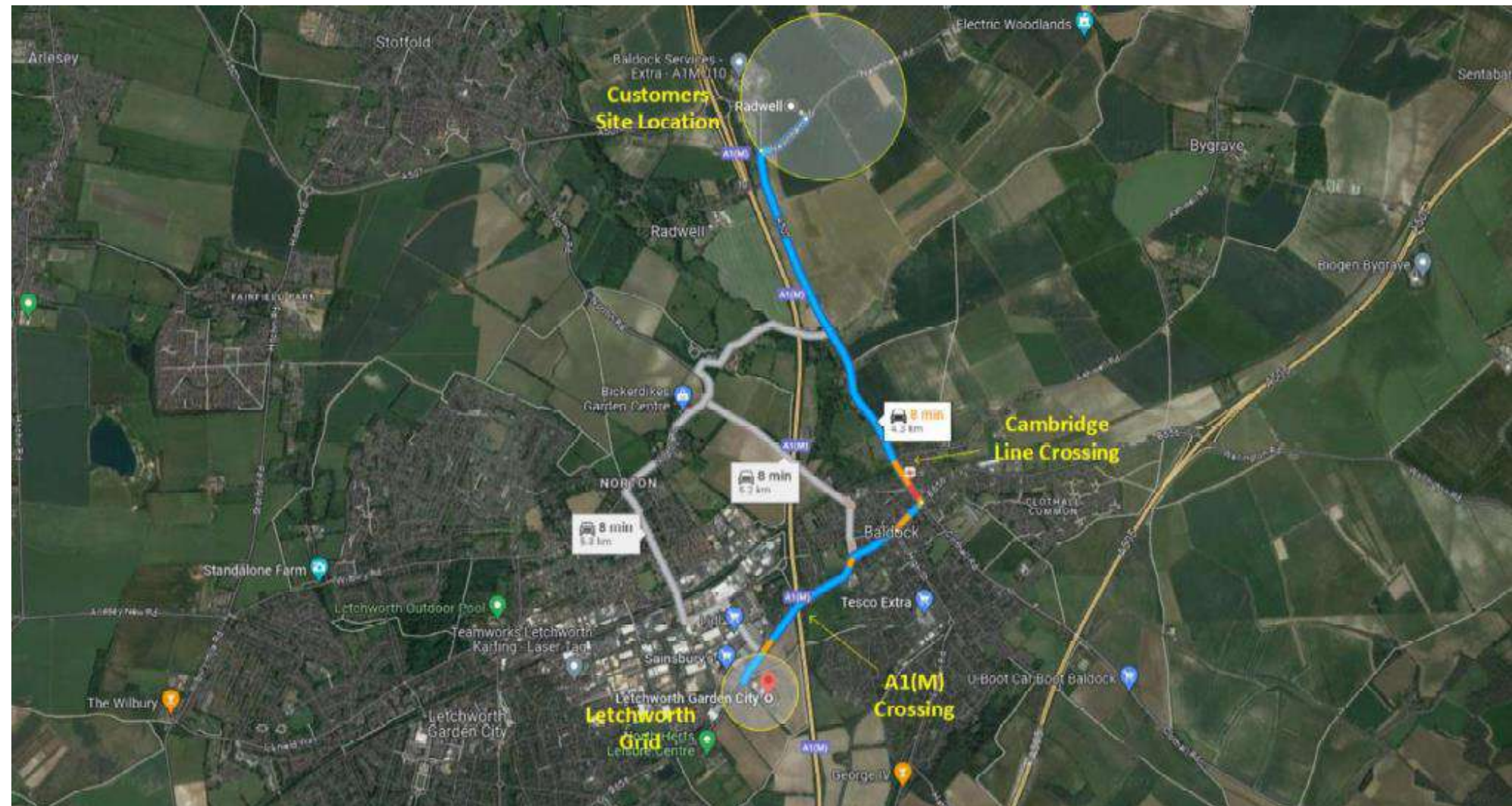


Figure 2: Photograph of Access off Newnham Road



Request for pre-application advice

Please complete all sections of the form and use BLOCK LETTERS

In accordance with the confidentiality statement on our website, information will be released in relation to this pre-application advice if requested under FOI/EIR unless you advise otherwise at this point

Please indicate category of advice required

Residential		Non-residential	
Significant Major	☐	Category B – 2000m ² + floor space Solar Farms/Wind Farms on site area greater than 10 Hectares	☐
Category A – 100-499 dwellings	☐	Category C – 1000-1999m ² floor space & change of use of buildings on land exceeding 500m ² (gross) Solar Farms/Wind Farms on site area between 5 to 10 Hectares	☐
Category B – 25-99 dwellings	☐	Category D – Adverts, up to 999m ² floor space, change of use of buildings on land up to 499m ² (gross) and General engineering works/operational development Solar Arrays/Farms and Wind Farms on site area less than 5 Hectares	x
Category C – 10-24 dwellings	☐		
Category D – up to 9 dwellings	☐		
Category E – Householder/Listed Building	☐		

1) NAME/ADDRESS OF APPLICANT

Balance Power Projects Limited (C/o Agent) .

Postcode: Tel: Email:.....

2) NAME/ADDRESS OF AGENT

Mr Andrew Barton, AXIS, Camellia House, 76 Water Lane, Wilmslow, Cheshire,

Postcode: SK9 5BB Email: andrewbarton@axis.co.uk

3) INTEREST IN PROPERTY/LAND

Option agreement with land owner

4) ADDRESS OF APPLICATION SITE

Land off Newnham Road, Baldock (easting 514111 / Northing 236683)

5) DESCRIPTION OF PROPOSED DEVELOPMENT

Proposed Development of a Battery Energy Storage System associated infrastructure and access

Below is a basic list of information which should accompany a request for advice. However, what you can provide will vary depending the nature of the proposal and how advanced your scheme is.

6) ATTACHED INFORMATION

Please tick or complete boxes as necessary.

Description/schedule of existing uses(s) of the site x ☐

Description of proposed use(s) of the site x ☐

1:1250 site location plan with the site outlined in red x ☐

Photographs and drawings of site and surroundings x ☐

Outline of proposal (plans to an appropriate scale) x ☐

Drawings showing proposed plans/elevations (plans to an appropriate scale) x ☐

Other (please specify) (see notes for guidance) ☐

I (the undersigned) confirm that pre-application advice is required, and the fee will be paid on the NHDC website once the pre-application reference number has been issued by the Technical Support team.

£ 508 (fee to be paid via NHDC website)

Please note: Large pre-app fees can be paid via BACS, please contact planning.control@north-herts.gov.uk to request the NHDC BACS details.

I also agree to pay any additional sums arising from the provision of the pre-application advice as requested, as outlined in the Pre-Application Advice Note.....

I acknowledge that the Council will release pre-application advice if requested under FOI/EIR legislation (if you do not wish the council to release pre-application advice please include a statement as to why. This will be considered upon any application under FOI/EIR legislation)

Signed *Andrew Barton*

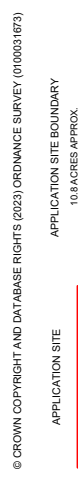
Company AXIS.

Date 5th March 2024

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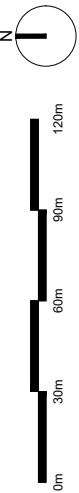
Summary required

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APPLICATION SITE APPLICATION SITE BOUNDARY
10.8 ACRES APPROX.



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NOTES
(1) N/A

EQUIPMENT LIST
(1) N/A

PROJECT NUMBER
PR823_SG7 5ES_002

DATE
23/02/24

DESIGNER
L. GALE

SCALE
1:2500

PROJECT TITLE
RADWELL BURY FARM

PROJECT TYPE
ENERGY DEVELOPMENT

CHECKED & APPROVED BY
C.VICK

REVISION
REV C

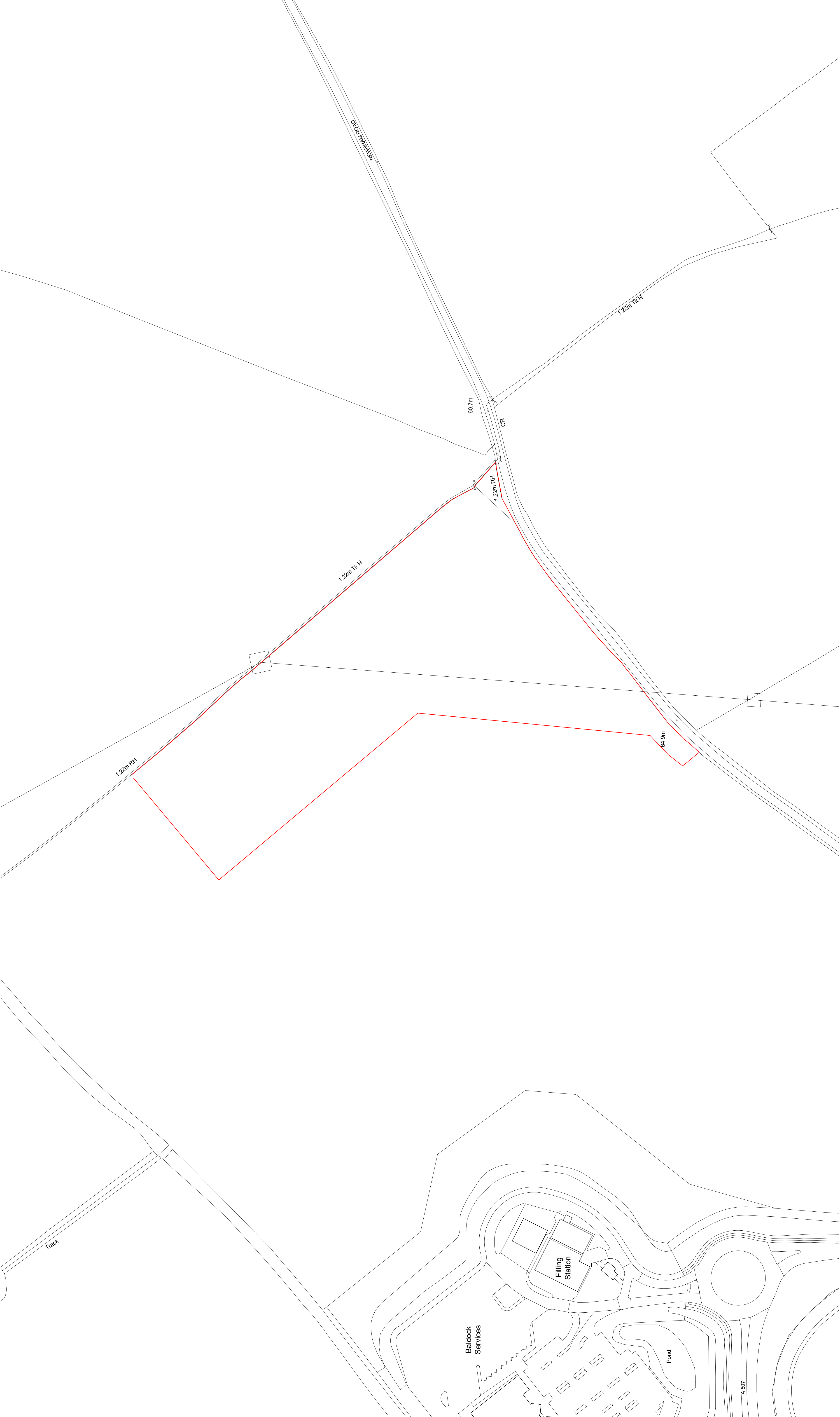
PROJECT ADDRESS
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DRAWING TYPE
AERIAL PLAN

PAPER SIZE
A3

PLANNING
DRAWING PURPOSE





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(1) N/A

EQUIPMENT LIST
(1) N/A

PROJECT NUMBER
PR823_SG7 5ES_003

PROJECT TITLE
RADWELL BURY FARM

PROJECT ADDRESS
RADWELL BURY FARM_SG7 5ES

DATE
23/02/24

PROJECT TYPE
ENERGY DEVELOPMENT

CHECKED BY & APPROVED BY
C.VICK

DESIGNER
L.GALE

REVISION
REV C

PAPER SIZE
A1

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(1) N/A

PR823 SG7 5ES 003

PROJECT TITLE
RADWELL BURY FARM

PROJECT ADDRESS

L. GALE

CHECKED BY & APPROVED BY
C.VICK

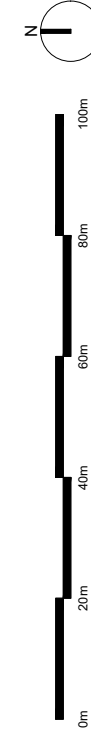
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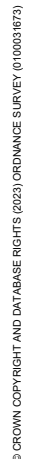
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REVISION
REV C

PAPER SIZE

DRAWING PURPOSE





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BATTERY CONTAINERS
INVERTER & TRANSFORMER MODULES
DNO ROOM
TRANSFORMER
PRIVATE SUBSTATION
WELFARE & CONTROL ROOM
STORAGE ROOM

PR853 SG7 5ES 101

RADWELL BURY FARM

RADWELL BURY FARM SG7 5ES

23/02/24

ENERGY DEVELOPMENT

PROPOSED PLAN

L. GALE

C. VICK

1:1250

REV C

A1

DRAWING PURPOSE





Preliminary Ecological Appraisal (PEA) & Ecological Constraints and Opportunities Plan (ECOP)

Radwell Bury Farm, Baldock, North Hertfordshire, SG7 5EN (Central OS Grid Reference: TL 23888 36684)

Clarkson and Woods Ltd. was commissioned by Balance Power Projects Limited to prepare this Preliminary Ecological Appraisal report (PEAr). Its aim is to concisely summarise findings from the initial ecological survey(s) and desk study for the Site. This will allow the client and project team to fully consider key ecological features and biodiversity enhancement opportunities during scheme design and the planning process.

Information about on-site ecological features is important for informing planning applications, layout design, biodiversity enhancement opportunities and factoring in necessary mitigation requirements. Such measures are best considered as early as possible during scheme design. Certain ecological features may also have timing implications for the completion of baseline assessments and planning submission.

Note that this document is **not** prepared for direct submission to the Local Planning Authority except as part of pre-application advice. It is intended for early circulation amongst key members of the project team so that ecological requirements are fully considered. However, recommendations are provided to inform any future applications. These would need to be supported by a detailed Ecological Impact Assessment (EclA) report.

This report contains detail of badger setts which should be treated as confidential and must not be circulated outside the project team/ LPA.

PEA Methodology

This PEA comprises two elements:

- **The Desk Study** collates information from various sources. These include a paid data search from the Herts Environmental Records Centre (HERC) pertaining to the Site and surrounding 2km for species of conservation concern and locally protected wildlife sites. Other data sources have included MAGIC.gov.uk and Clarkson and Woods' own in-house database of species records.
- **A Habitat and Protected Species Walkover Survey** was completed on the 9th October 2023 and involved an experienced surveyor(s) recording the details of on-site habitats and their suitability for protected species.

Results are provided in the tables and figures on the following pages, divided into the following sections:

- 1) **Protected sites:** Sites with statutory or non-statutory designations with qualifying features relating to biodiversity.
- 2) **Habitats:** On-site and adjacent habitats.
- 3) **Species:** Protected species and other species of conservation concern.
- 4) **Biodiversity Net Gain.**



1. Protected Sites

Table 1: Assessment of Protected Sites Within the Search Area¹

Protected Site and Designation	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation and Opportunities for Enhancements. <u>Requirements for further assessment are highlighted.</u>
Designated Sites for Nature Conservation		
None identified. The closest site with statutory designations to the Site is Ashwell Springs Site of Special Scientific Interest (SSSI). This is located 4.1km to the northeast of the Site and qualifies as a SSSI because of its freshwater habitats and rare invertebrate communities. This site is considered beyond the Zone of Influence (Zol) for the scheme.	Not applicable.	Not applicable.
Local and Non-statutory Designated Sites for Nature Conservation (Figure 1)		
Radwell (A507) Road Banks (Local Wildlife Site): 0km to the west of Site. HERC data search indicates the site supports areas of species-rich calcareous grassland with records of bee orchid (<i>Ophrys apifera</i>), pyramidal orchid (<i>Anacamptis pyramidalis</i>) and common broomrape (<i>Orobanche minor</i>).	Potential for habitat degradation during construction operations.	Avoidance: Provision of 10m buffer zone. Safeguard Local Wildlife Site by incorporating a working 10m buffer adjacent this field boundary as part of design proposals and during construction.

¹ 5km for sites with international designations (SPA, SAC, Ramsar); 2km for national designations (SSSIs and NNRS); 1km for Local sites including LNRs



Protected Site and Designation	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation and Opportunities for Enhancements. <u>Requirements for further assessment are highlighted.</u>
Radwell Lake (Local Wildlife Site): 0.59km southwest of Site. HERC data search indicates this is an old mill pond with marshy ground, ornamental gardens and mixed copse woodland of importance to wildfowl.	None identified. Considered beyond the Zone of Influence for the proposed scheme.	None identified. Scoped out from further assessment and mitigation.
Radwell Meadows Northwestern Field (Local Wildlife Site): 0.88km southwest of Site. HERC data search indicates this is an area of semi-improved grassland with both neutral and calcareous indicator species.	None identified. Considered beyond the Zone of Influence for the proposed scheme.	None identified. Scoped out from further assessment and mitigation.
Hertfordshire Ecological Network (Figure 2)		
Hertfordshire Ecological Network: Parts of the Site (and areas directly adjacent to it) were listed as part of a Local Nature Partnership (LNP) project, a county-wide network of sites led by Herts & Middlesex Wildlife Trust. This is mentioned within Policy SP9 of North Hertfordshire's Local Plan 2011 – 2031.	The only area within the RLB for the Site (ID 08580 in Figure 2) has been categorised as an area with high potential for enhancing the existing network.	Avoidance and enhancement: Development footprints or working areas should avoid this parcel where possible. Although local policy does not impose specific restrictions for developing this area, the LPA would likely take a more favourable view of the application if this area was enhanced as part of the existing ecological network by new woodland planting.

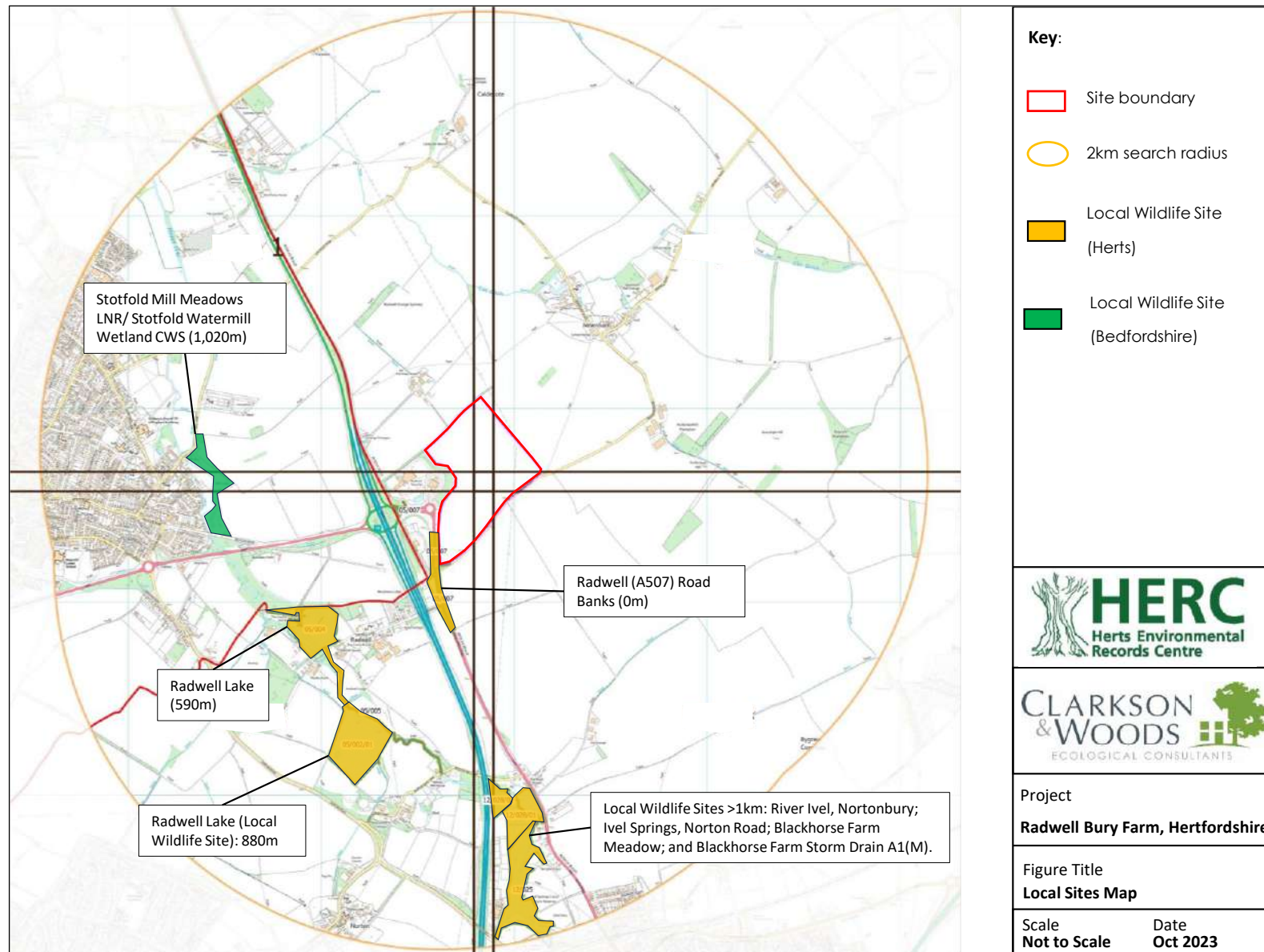


Figure 1: Locally designated sites within 2km of the Site (copyright HERC 2023)

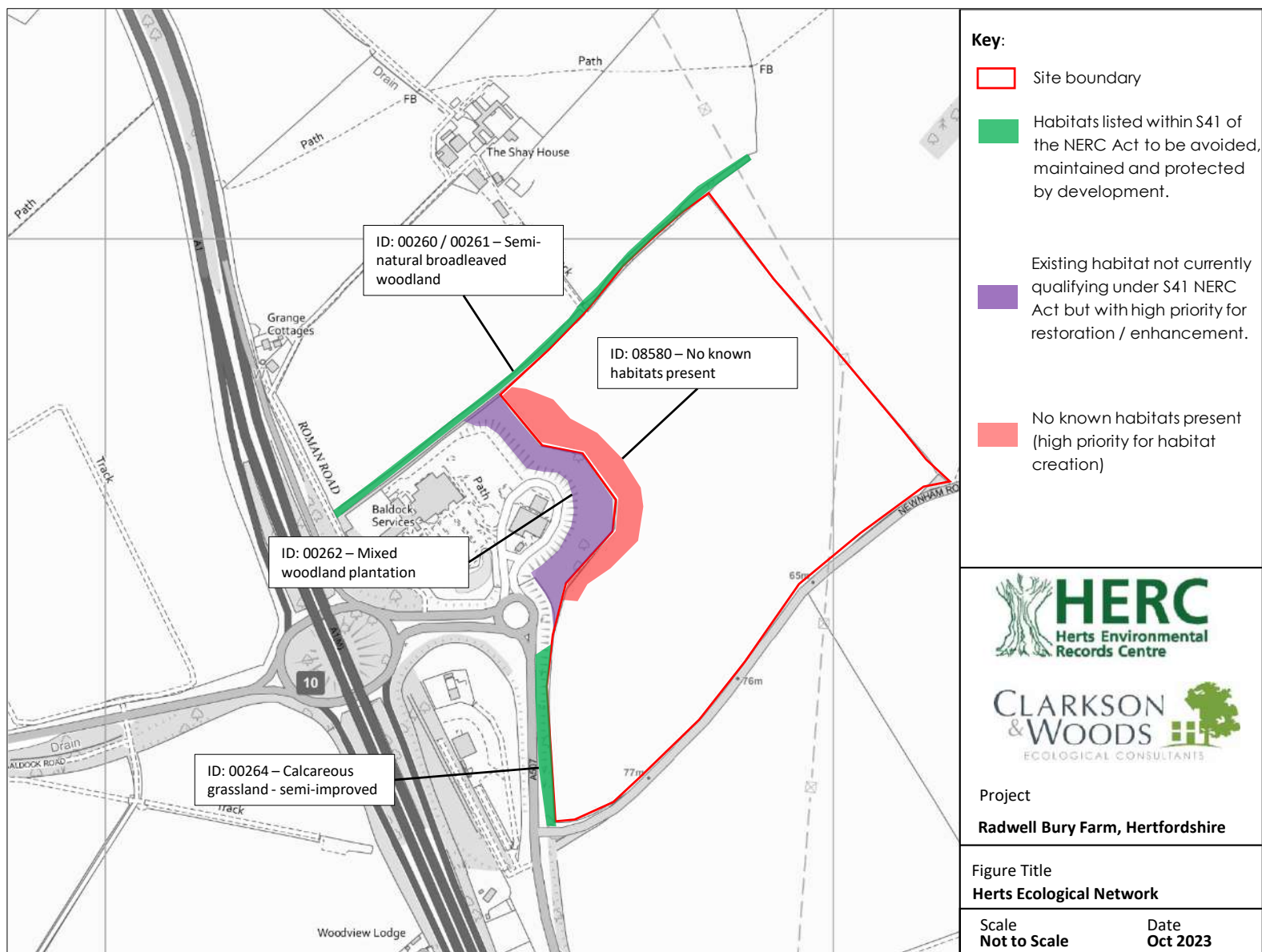


Figure 2: Parcels of the Herts Ecological Network within or directly adjacent the Site



2. Habitats

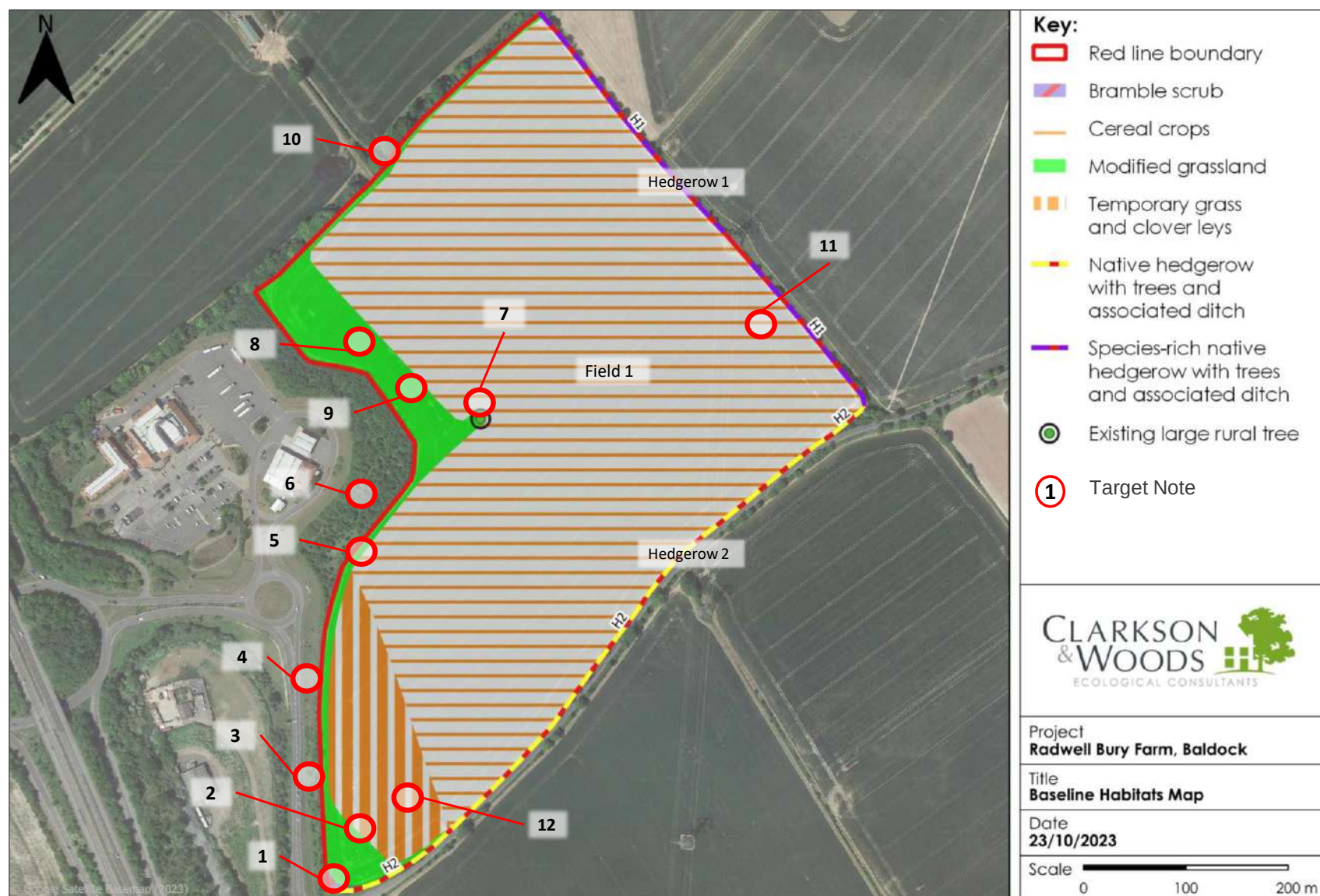


Figure 3: Baseline Habitats (See Table 2 below for Target Notes)



Figure 4: Indicative area of proposed 132kV sub-station



Table 2: Target Notes to accompany Baseline Habitats Map in Figure 3

Note that some Target Notes relate to off-site habitats. These have been included in Figure 3 and described here for context.

Ref	Description
Field 1	Arable field of winter-sown wheat on rotation with potato crop. Had recently been ploughed at time of survey. BNG Metric 4.0 does not associate this habitat type with a condition, fixing it as 'N/A'.
Hedgerow 1	Species-rich native hedgerow with trees (associated with ditch). Assessed as being in 'Good' condition using BNG Metric 4.0.
Hedgerow 2	Native hedgerow with trees (associated with bank). Assessed as being in 'Moderate' condition using BNG Metric 4.0.
TN1	Patch of dense scrub on steep gradient in the south-west corner of Field 1. Categorised as 'h3d Bramble scrub' using UKHab 2.0. Bramble <i>Rubus fruticosus</i> was dominant, with less frequent species including ash <i>Fraxinus excelsior</i> , dog rose <i>Rosa canina</i> , dogwood <i>Cornus sanguinea</i> and field maple <i>Acer campestre</i> . BNG Metric 4.0 does not associate this habitat type with a condition, fixing it as 'N/A'.
TN2	Fox scat
TN3	Woodland plantation on western side of boundary fence, planted on steep gradient alongside the A507. Trees of similar age, estimated to be approximately 10 to 15 years old. Canopy dominated by field maple, with frequent ash and pedunculate oak <i>Quercus robur</i>. The shrub layer was dense and included frequent dog rose, dogwood, elder <i>Sambucus nigra</i> and hawthorn <i>Crataegus monogyna</i>. The woodland was heavily shaded with very little ground flora at the time of survey, being dominated by bramble and ivy <i>Hedera helix</i>. Categorised as 'w1g Other broadleaved woodland' using UKHab 2.0, with '29 Plantation' as secondary category. Classified as 'Moderate' condition using BNG Metric 4.0.
TN4	Area of overgrown grassland as part of roadside verge with scattered scrub including dogwood, hawthorn and wild privet <i>Ligustrum vulgare</i> . Categorised as 'G4 Modified grassland' (6-8 sp/m ²) using UKHab 2.0, with a secondary category as '10 Scattered scrub'. Condition not assessed in detail as outside of RLB.



Ref	Description
TN5	5m strip of recently cut grassland between boundary fence and Field 1, expanding to 20 – 30m wide in places. Uniform sward with no recorded scrub or invasive species. Dominated by red fescue <i>Festuca rubra</i> with less frequent cock's-foot <i>Dactylis glomerata</i>. Very low density of forbs, but included species such as common bird's-foot-trefoil <i>Lotus corniculatus</i>, daisy <i>Bellis perennis</i> and yarrow <i>Achillea millefolium</i>. The species composition and aerial images of the area suggested these grassy areas had been recent planted, and this was verified by the landowner after the survey (pers comm). Considered unsuitable for basking reptiles at the time of survey, but would become suitable over time unless managed regularly. Categorised as 'G4 Modified grassland' (approx. 5 sp/m²) using UKHab 2.0. Classified as 'Poor' condition using BNG Metric 4.0.
TN6	Woodland plantation on western side of boundary fence. Assessed as the same habitat category and condition as TN3, with a similar species composition and trees of similar age.
TN7	Mature beech tree. Bat suitability 'Low' as a precaution, since no obvious PRFs but presence of knot holes higher up in canopy. Categorised as secondary category '32 Scattered' (i.e. individual / rural tree) tree (over Modified Grassland as part of TN5) using UKHab 2.0. Classified as 'Good' condition using BNG Metric 4.0.
TN8	Less managed / uncut areas of Modified Grassland. The composition and structure of the sward the same as TN5, and in the same 'Poor' condition in accordance with Metric 4.0. Considered suitable for species such as widespread reptiles, nesting birds and small mammals. A hare was also observed at TN9.
TN9	Hare observed



Ref	Description
TN10	Linear belt of woodland to the north of RLB, although there was no physical fence-line at the time of survey. Trees of mixed age, including mature oak trees >100 years old. Canopy layer dominated by ash and pedunculate oak with occasional sycamore <i>Acer pseudoplatanus</i>. The shrub layer was relatively sparse and included abundant elm <i>Ulmus</i> sp with frequent blackthorn <i>Prunus spinosa</i>, hawthorn and spreading <i>Rhododendron ponticum</i>. The woodland was heavily shaded with very little ground flora at the time of survey, dominated by bramble and ivy with <i>Rhododendron</i> saplings and occasional garlic mustard <i>Alliaria petiolata</i>. Several mature trees observed to host PRFs suitable for roosting bats. Trees were not subjected to a detailed ground-level inspection, so the whole belt has been categorised as 'Low' to 'Moderate' suitability for roosting bats as a precaution. Woodland belt categorised as 'w1f7 Other Lowland mixed deciduous woodland' using UKHab 2.0. (i.e. Lowland Mixed Deciduous Woodland Priority Habitat). Classified as 'Moderate' condition using BNG Metric 4.0.
TN11	Area of disturbed ground at south-east edge of arable field (Field 1) with ground protection panelling to support vehicle movements. Necessary for National Grid work associated with electricity pylons.
TN12	Distinct area sown with a ley mix of perennial rye-grass <i>Lolium perenne</i> and clover <i>Trifolium</i> sp. No other species were recorded. The habitat was consistent with 'Temporary grass and clover leys (C1b)' using UK Habitat Classification 2.0. BNG Metric 4.0 fixes this habitat type's condition as 'N/A'.



Table 3: Assessment of On-Site Habitats

Map Ref	Habitat and Description	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation and Opportunities for Enhancements. <u>Requirements for further assessment are highlighted.</u>
Habitats			
Field 1 and TN12	<u>Arable land</u> 22.59 ha arable field, broken down into two distinct parcels. A smaller parcel at the southwest corner (1.89 ha) is consistent with 'Temporary grass and clover leys (C1b)' using UK Habitat Classification. BNG Metric 4.0 fixes this habitat type's condition as 'N/A'. Most of Field 1 (20.7 ha) is consistent with 'Other Cereal Crops (C1c7)' using UK Habitat Classification. BNG Metric 4.0 fixes this habitat type's condition as 'N/A'. This habitat is <i>not</i> a Habitat of Principal Importance (HPI) in England under S41 of the NERC Act (also known as Priority Habitats).	Arable fields are not inherently valuable as a habitat and have a very low score for Biodiversity Net Gain (BNG). Protected species suitability: Arable land may be used by ground-nesting birds. BNG: Any areas lost would need to be compensated to achieve Biodiversity Net Gain (BNG). Arable land is a habitat of 'Low' distinctiveness in the most recent BNG Metric 4.0 with a score of 2 units / ha.	Enhancement opportunity: Any arable land not developed could be used for the creation and management of more diverse habitats such as wildflower grassland and tree / scrub planting. Such habitats could be integrated into the scheme's landscape proposals.



Map Ref	Habitat and Description	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation and Opportunities for Enhancements. <u>Requirements for further assessment are highlighted.</u>
TN5; TN8	<u>Modified grassland</u> Uncultivated strips of grassland along the western boundary of Field 1 between 5m to 30m wide. These amount to an approximate area of 2.14 ha. These grassland areas are consistent with Modified Grassland (g4) using UK Habitat Classification. All were assessed as being in 'Poor' condition using BNG Metric 4.0. This habitat is not a HPI.	The grassland margins themselves are not important ecological features, but their function as buffer habitats for off-site woodland means they have indirect value. No areas of modified grassland are understood to be removed, and the habitat itself is unlikely to be affected by construction operations. Protected species suitability: Depending on their continued management, areas of modified grassland are likely to be suitable for nesting birds and widespread reptiles such as slow-worm and grass snake. BNG: In theory, any areas lost would need to be compensated in accordance with a BNG assessment. Modified grassland is a habitat of 'Low' distinctiveness in the most recent BNG Metric 4.0 with a score of 2 units / ha.	Avoidance / enhancement: As discussed under Table 1 and Figure 2 above, portions of the modified grassland (and several off-site habitats adjacent to this habitat) are included in the county's Ecological Network. Development should prioritise safeguarding these features where possible and consider opportunities for enhancement to improve the network. See Table 4 for nesting bird and widespread reptile restrictions.



Map Ref	Habitat and Description	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation and Opportunities for Enhancements. <u>Requirements for further assessment are highlighted.</u>
TN1	<u>Scrub</u> A small (0.025 ha) patch of dense bramble scrub was recorded at the southwest corner of Field 1. This habitat is consistent with 'h3d Bramble scrub' using UKHab 2.0. BNG Metric 4.0 does not associate this habitat type with a condition, fixing it as 'N/A'. This habitat is not a HPI.	No areas of dense scrub are understood to be removed, and the habitat itself is unlikely to be affected by construction operations. Protected species suitability (Table 4): Nesting birds; widespread reptiles. BNG: In theory, any areas lost would need to be compensated in accordance with a BNG assessment. Dense bramble scrub is a habitat of 'Moderate' distinctiveness in the most recent BNG Metric 4.0 with a score of 4 units / ha.	None identified (see Table 4 for nesting birds, dormice and widespread reptile restrictions).



Map Ref	Habitat and Description	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation and Opportunities for Enhancements. <u>Requirements for further assessment are highlighted.</u>
TN7	<u>Individual trees</u> Mature beech tree categorised as secondary category '32 Scattered' (i.e. individual / rural tree) tree (over Modified Grassland) using UKHab 2.0. Classified as being in 'Good' condition using BNG Metric 4.0.	This tree is not understood to be directly affected by proposals. However, depending on the final layout, access and haul routes, there is potential for degradation or physical damage, including compaction of Root Protection Areas (RPAs). Protected species suitability (Table 3): Roosting bats; nesting birds. BNG: In theory, if this tree were to be removed it would need to be compensated in accordance with a BNG assessment. This individual tree is a habitat of 'Moderate' distinctiveness in the most recent BNG Metric 4.0 with a score of 12 units / ha.	Mature trees provide features of value for biodiversity, are important landscape features and may contribute to green corridors. Avoidance: The final layout design must take account of root protection zones in accordance with BS 5837: Trees in relation to design, demolition and construction. Mitigation during construction: Minimise potential impacts during construction through, dust etc. (e.g., through Construction Environmental Management Plan [CEMP]).



H1; H2	Hedgerows Two hedgerows were recorded along the northeast (H1) and southeast (H2) boundaries. Both species-rich and species-poor hedgerows are HPIs. H1 is species-rich and classified as being in 'Good' condition using BNG Metric 4.0. H2 is species-poor and classified as being in 'Moderate' condition.	It is understood that a portion of H2 may be removed to accommodate access vehicles. Both hedgerows may be subjected to physical damage or degradation during construction. Protected species suitability (Table 4): Hedgerows were suitable for badgers, nesting birds and bat dispersal. BNG: Any lengths of hedgerow removed would need to be compensated in accordance with a BNG assessment. H1 is a linear habitat of 'High' distinctiveness in the most recent BNG Metric 4.0 (scoring 6 units / km), and H2 is a habitat of 'Moderate' distinctiveness (scoring 4 units / ha).	Hedgerows provide features of value for biodiversity, are important landscape features and contribute to green corridors. Avoidance: A minimum 6m wide buffer zone is recommended to safeguard hedgerows in line with BS5837. It is recommended that all hedgerows are retained and 6m buffers provided between their bases and the development footprint / working areas. Any gaps created or widened for access should be minimised. Mitigation during construction: Minimise potential impacts during construction via dust deposition or pollution impacts (e.g., through Construction Environmental Management Plan [CEMP]). Ensure hedgerows are not illuminated during construction or operation. Compensation: Replace any hedgerow losses with equivalent or greater lengths or enhance sub-optimal lengths of hedgerow. Enhancement opportunities: Opportunity to enhance H2 with additional planting. This could provide a net gain in hedgerow biodiversity units and screen the Site from adjacent areas. Introduce a greater variety of woody species to enhance both hedgerows' diversity. Potential to replant with locally appropriate species.
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3. Species

Table 4: Assessment of On-Site Habitats for Protected Species Suitability

Species and Description	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation and Opportunities for Enhancements. <u>Requirements for further assessment are highlighted.</u>
<u>Badger</u> There are four badger setts within the eastern hedgerow (Hedgerow 1), including an active main sett (Sett 1), with possible annex setts and outlier setts further south along the hedgerow. Sett locations are shown in Figure 5 and described in Table 5. The desk study also identified several badger records. Most were associated with roadkill and casualties along the A1. The closest badger sett was reported as being 1km to the north of the Site.	Badgers and their setts are protected under the Protection of Badgers Act 1992. Site clearance and construction operations have the potential to damage underground tunnels by vehicle movements and ground operations. As a guide, any work within 30m of sett entrances could disturb badgers within the sett, or block or damage tunnels that radiate from the entrance.	Avoidance: It is strongly recommended that a 30m protection buffer for badgers is factored into scheme design at an early stage. This would include the development footprint itself, as well as access / haul routes, electrical services and drainage work. Mitigation (construction): Measures to be incorporated into the CEMP. Since hares have been recorded on Site, any open trenches or holes during construction should be covered at night, or a soil ramp or wooden plank installed, to ensure that animals like badger or hare do not become trapped. Further assessment / mitigation: If the above protection buffers are not feasible, then it is likely that a badger licence from Natural England would be needed in order to temporarily or permanently close setts. Depending on the nature of the impact, this would probably require more expansive survey effort of the wider area and the establishment of on-Site sett activity.



Species and Description	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation and Opportunities for Enhancements. <u>Requirements for further assessment are highlighted.</u>
<u>Hazel Dormouse</u> The on-Site hedgerows and adjacent woodland have some suitability for dormouse. Such suitability is considered to be quite low/ sub-optimal due to the site's poor connectivity to larger areas of mature woodland and the absence of local dormouse records within 2km. Since dormouse cannot be scoped out without detailed survey effort, their presence has been assumed on a precautionary basis.	Dormouse is a European Protected Species (EPS) and may be affected if sections of hedgerow are removed for access or to facilitate underground utilities or drainage operations.	Avoidance: It is recommended that vehicle access for construction / operation utilises existing gaps wherever possible. Hedgerows must also be physically protected in accordance with BS 5837: Trees in relation to design, demolition and construction. It is recommended that all hedgerows are retained and 6m buffers provided between their bases and the development footprint / working areas. Mitigation: Sections up to 10m sections may be removed from hedgerows and up to 30m from a 1km length of hedgerow, as long as this is preceded by a fingertip search for dormouse nests to ensure that animals will not be disturbed or physically harmed during operations. This would need to be detailed as part of an ecological Method Statement (MS). Further assessment: If more than 10m of hedgerow at any point (or 30m within a 1km length of hedgerow) needs to be removed, then a more detailed assessment for dormice should be considered so this ecological feature can be appropriately assessed prior to a full or outline planning application. Such survey effort can take place between April and November of any given year, but can take up to 5 months to complete.



Species and Description	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation and Opportunities for Enhancements. <u>Requirements for further assessment are highlighted.</u>
<u>Bats</u> The mature tree at TN7 and mature trees along the adjacent woodland belt (TN10) have suitability for roosting bats. The surrounding hedgerow network and connecting woodland belts are also suitable for commuting and foraging behaviour.	Bats and their roosts are protected under the Habitat Regulations 2019 (as amended). However, it is unlikely that current proposals will impact bats, assuming that: 1) mature trees with potential roosting features are safeguarded; 2) the proposals will not fragment the network of hedgerows or ditches; and 3) no significant new lighting is proposed, the scheme is unlikely to impact bats.	Avoidance: It is recommended that vehicle access for construction / operation utilises existing gaps wherever possible. Hedgerows must also be physically protected in accordance with BS 5837: Trees in relation to design, demolition and construction. It is recommended that all hedgerows are retained and 6m buffers provided between their bases and the development footprint / working areas. Mitigation (construction-phase): Any temporary construction-phase lighting outside the winter months (April to October) to be directed away from hedgerows to avoid disrupting bat commuting paths. Further assessment: Should any large / mature trees require removal along the woodland belt at TN10, they must be surveyed for their suitability for bat roosts. Enhancement opportunities: Creating more diverse grassland or shrub / tree planting to replace any of the existing arable land would enhance the Site's suitability as a foraging resource. Restoring any defunct sections of hedgerows is also likely to improve their suitability as bat dispersal routes. Installing tree-mounted bat boxes would provide additional roosting opportunities.
<u>Otter and water vole</u> Scoped out due to absence of suitable habitat.	None identified	None identified



Species and Description	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation and Opportunities for Enhancements. <u>Requirements for further assessment are highlighted.</u>
<u>European hare</u> Recorded within arable fields.	European hare is a Species of Conservation Concern and listed on Schedule 41 of the NERC Act. No specific impacts identified, provided that appropriate precautions are made during construction to prevent entrapment.	Mitigation (construction): Measures to be incorporated into the CEMP. Since hares have been recorded on Site, any open trenches or holes during construction should be covered at night, or a soil ramp or wooden plank installed, to ensure that animals like badger or hare do not become trapped.
<u>Reptiles</u> Small parcels of uncultivated land along the west of the site (associated with Target Notes 5 and 8) could be used by reptiles such as slow-worm <i>Anguis fragilis</i> . The data search returned 2 records of grass snake (<i>Natrix helvetica</i>) 1.4km to the north of the Site.	Reptiles are protected under the Wildlife and Countryside Act (WCA) (1981). It is unlikely that current proposals would impact widespread reptiles. However, should any overgrown or uncultivated land be removed or damaged as a result of construction operations, this would present the risk of killing and injury during Site clearance.	Pre-construction survey: A detailed survey and assessment for reptiles is not considered necessary at this stage because the extent of suitable habitat is outside of the development footprint. However, as a precaution, it is recommended that a pre-construction survey is completed during the summer (no later than 31 st August) prior to site clearance to re-appraise the working area for its habitat suitability. Should suitable habitat be present, this should allow sufficient time to prescribe and implement a pragmatic mitigation strategy ahead of works. Enhancement: Creating an area of diverse grassland as a replacement for any areas of arable land would enhance the site's suitability for reptiles.



Species and Description	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation and Opportunities for Enhancements. <u>Requirements for further assessment are highlighted.</u>
<u>Great Crested Newt</u> The desk study identified three ponds (see Figure 6 and Table 6) within 500m of the proposed development area. If these are used by great crested newts (GCN), then they may also be present on Site. Most of the Site is of low quality for GCN, but the hedgerows and areas of modified grassland may be used for shelter and foraging, and they may disperse over the arable land at night. Several GCN records 2.75km to the southwest in 2021 were reported by HERC's data search. Although the A1 is likely to be a significant ecological barrier to GCN dispersal from this location, it does demonstrate the presence of this species in the local area.	GCN is a European Protected Species (EPS) and may be killed or injured during construction activities if present on-site. Since no GCN or ponds have been recorded within 250m of the development footprint, such impacts are considered highly unlikely and no specific mitigation measures or further assessment is considered essential at this stage.	Further assessment: Under the existing proposals, no specific mitigation or further assessment is considered necessary. However, in the event that ground work is proposed within 250m of any of the identified ponds, it is recommended that such pond(s) are surveyed for the presence of GCN eDNA. This can only be completed in the spring between mid-April to mid-June of any given year.



Species and Description	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation and Opportunities for Enhancements. <u>Requirements for further assessment are highlighted.</u>
<u>Wild birds</u> All hedgerows, trees and areas of scattered scrub represent suitable bird nesting habitat. Ground-nesting birds may also be present within areas of arable land and grassland / uncultivated margins.	All nesting birds are protected under the WCA 1981. Habitat removal has the potential to damage or remove active birds' nests. Tracking vehicles across the open field/ storing materials here may impact ground-nesting birds. Certain species are also protected under Schedule 1 of the WCA from disturbance when nesting.	Avoidance: The nesting bird season for most UK species runs from March to August (inclusive). Therefore, vegetation clearance should avoid this period. Pre-construction survey: Ahead of any vehicles, materials or personnel being brought onto site, an ecologist will conduct a survey for ground-nesting birds to confirm their absence. Any nests found will be protected with an appropriate buffer zone. As a last resort, and if the suggested timing restrictions cannot be met, an ecologist must be appointed to perform a nesting bird inspection prior to clearance of any vegetation. Enhancement: Use landscape proposals to create suitable bird nesting habitat amongst new trees and shrubs. Integrate new nesting opportunities into boundary features.
<u>Other species of conservation concern</u> Although not recorded, the Site is suitable for other species listed on the Hertfordshire Biodiversity Action Plan (BAP), including song thrush and stag beetle.	None identified	Enhancement opportunities for these species in the final layout may include buried / rotting wood piles for stag beetles and bird nest boxes for song thrush.
<u>Non-native invasive species</u>	None identified.	Not applicable.

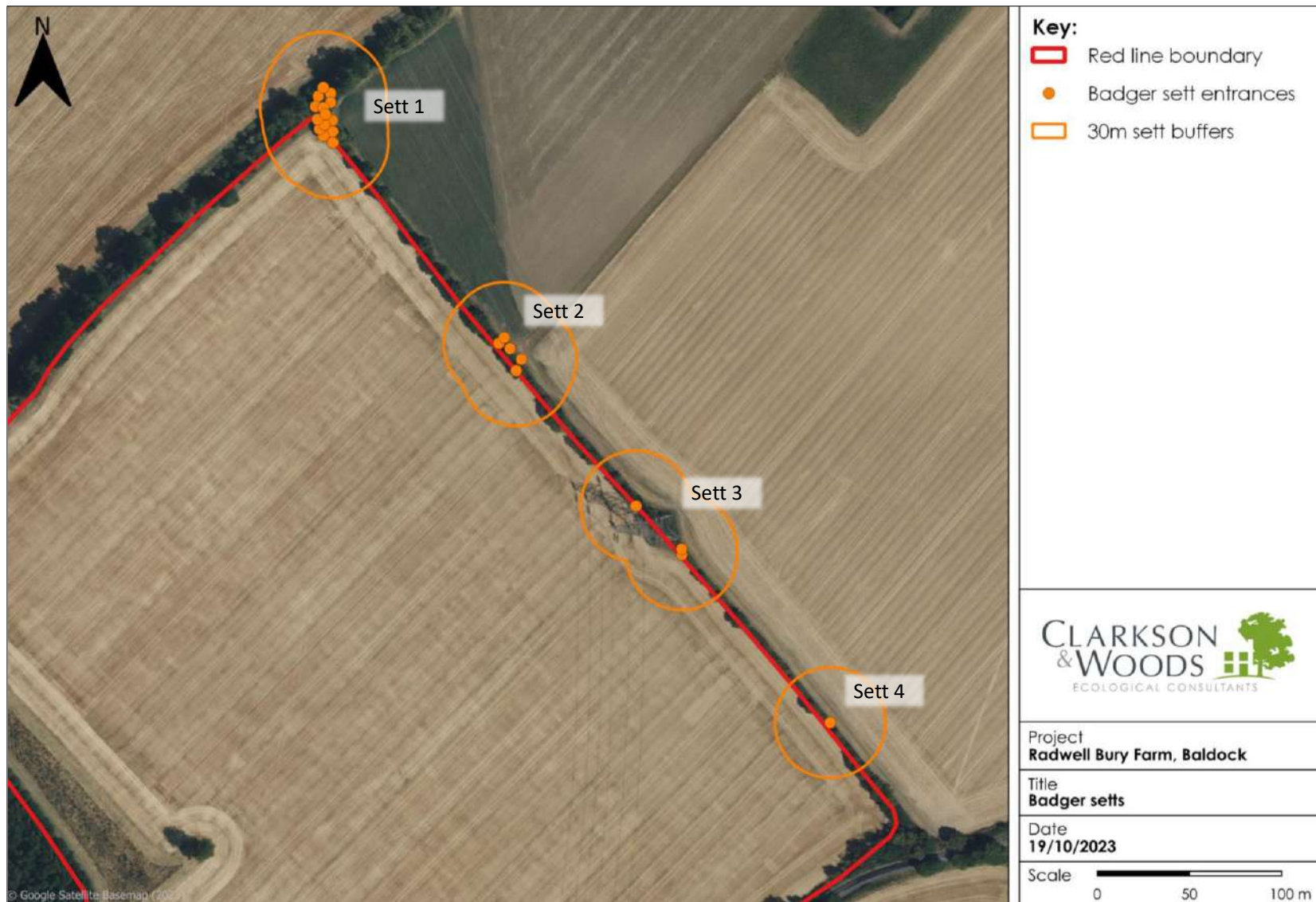


Figure 5: Badger Setts (CONFIDENTIAL)

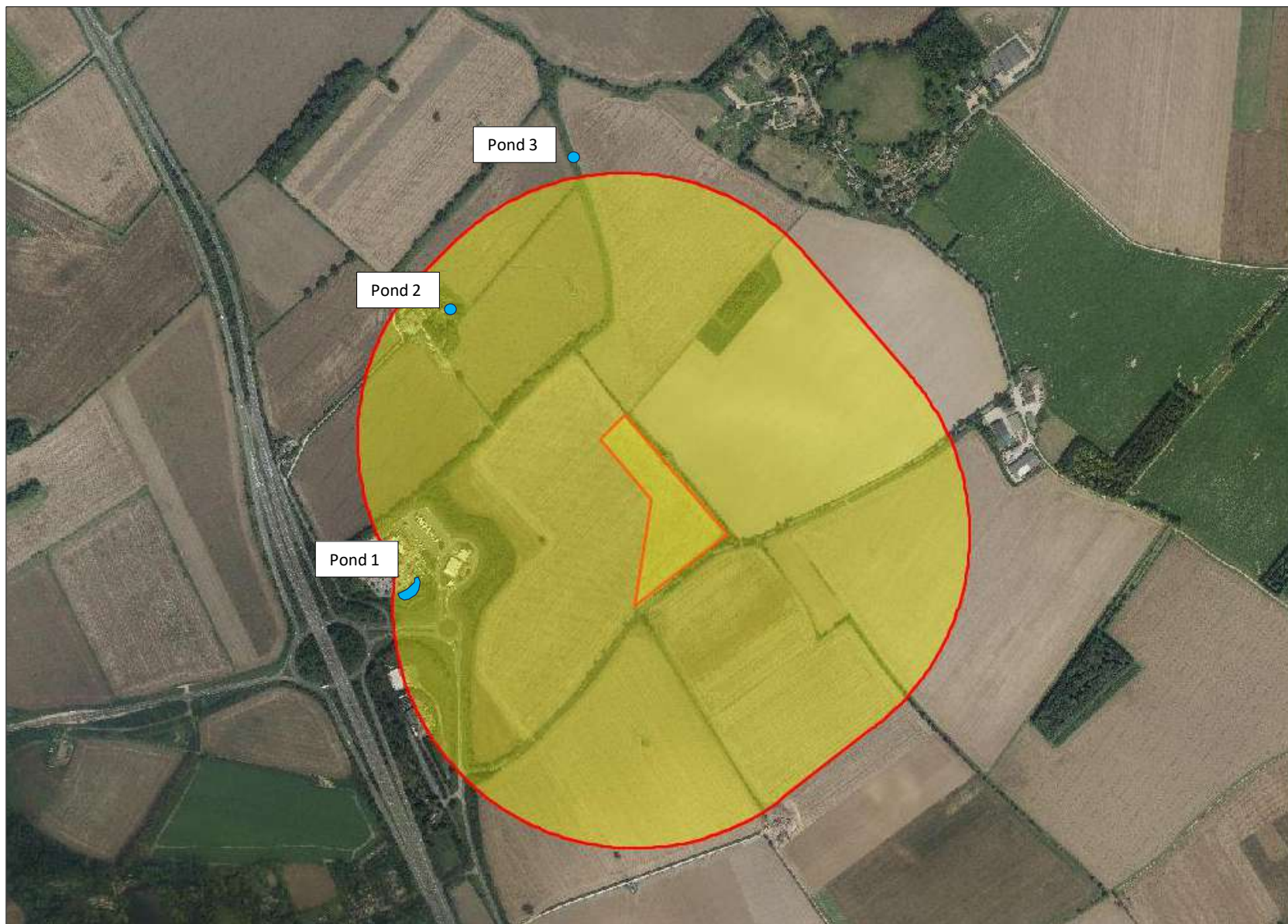


Figure 6: Ponds within 500m of the Site (red circle indicates 500m buffer around development area)



Table 5: Badger Sett Descriptions

No.	Description
Sett 1	Likely main sett with at least 4 well-used and 7 partially-used entrances (3 were disused). Holes were mostly dug into hedge bank towards field and joined by well-used badger track.
Sett 2	Possible annexe sett along field boundary comprising 4 x disused badger holes, and 4 x partially-used holes. A single dung pit was also recorded.
Sett 3	Badger sett dug into Hedgerow 1 towards Field 1, comprising 6 x disused badger holes and 4 x partially-used holes.
Sett 4	Single disused badger entrance dug into Hedgerow 1 towards Field 1.

Table 6: Ponds In Proximity to Site

Pond	Distance to RLB	Distance to Proposed Development Area
Pond 1	113m	470m
Pond 2	200m	385m
Pond 3	390m	600m



Figure 7: Ecological Constraints Map

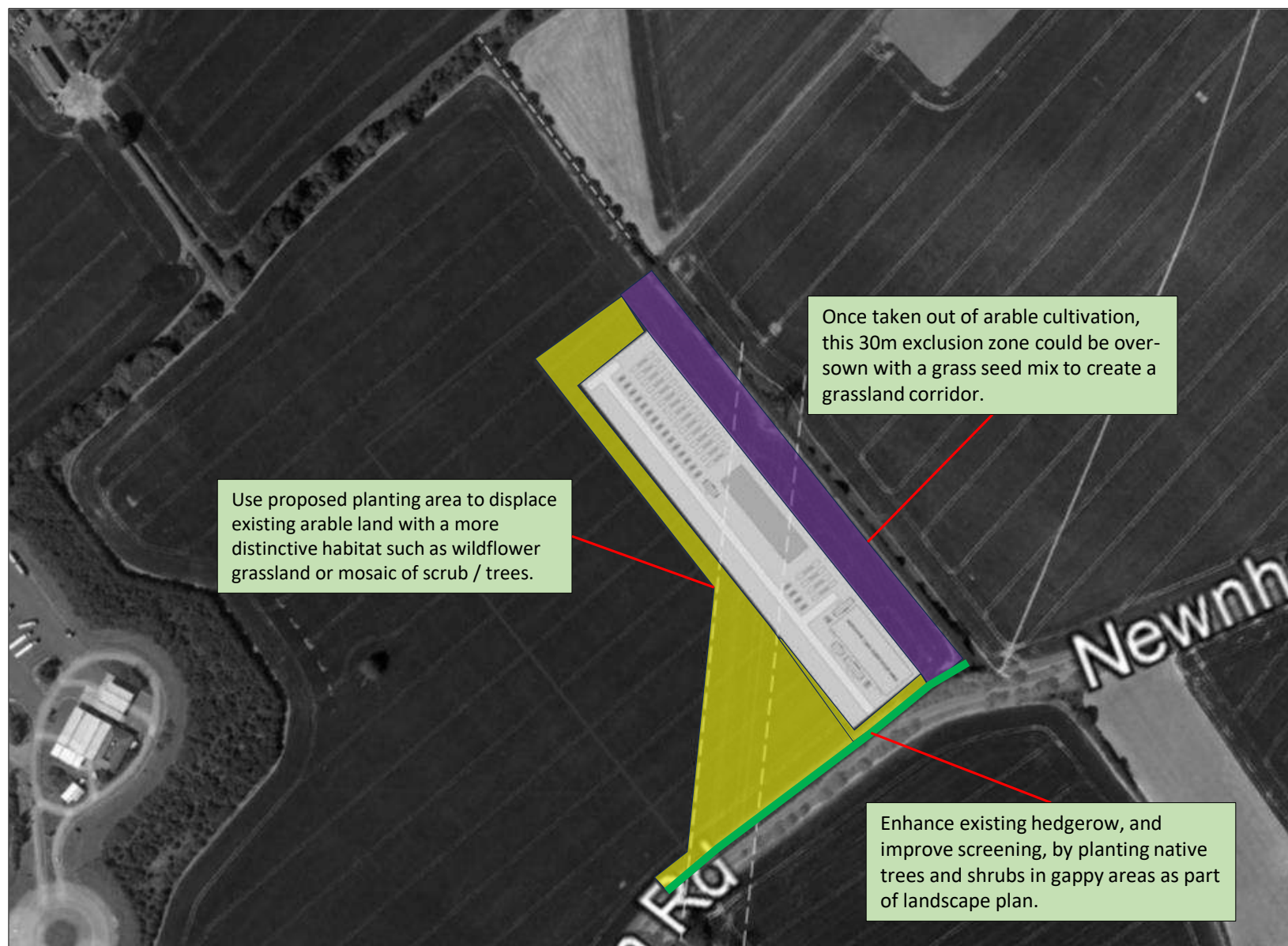


Figure 8: Ecological Enhancement Opportunities Map



Further Ecological Survey Work

The timeline below shows the further ecological survey work that may be required to accompany a planning application and to inform suitable mitigation (depending on final proposals). Many of these surveys are seasonally constrained and consultation with the LPA's ecologist is advised.

TASK	Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Dec
Badger sett survey to confirm the location and status of badger setts. Assessment would be required to inform a licence application if impacts within 30m exclusion zones for badger cannot be avoided.												
Dormouse nest tube survey: If more than 10m of hedgerow at any single point (or 30m within a 1km length) needs to be removed, then a more detailed assessment for dormice must be considered so that dormice can be screened-out prior to a full or outline planning application. Such survey effort can take place between April and November of any given year, but can take up to 5 months to complete.												
Ground-level tree assessment for roosting bats: Should any large / mature trees require removal along the woodland belt at TN10, they must be surveyed for their suitability for bat roosts. This may take place at any time of year, but if night-time emergence surveys are required then these can only take place between May to August (inclusive).												
Great crested newt assessment: Although not required at this stage, should groundwork be proposed within 250m of nearby ponds then it is recommended that an eDNA survey of these ponds is completed during spring.												



4. Biodiversity Net Gain

A draft Biodiversity Impact Assessment (BIA) score has been calculated for the Site using the Natural England Biodiversity Metric (v4.0). This metric has been used to calculate the biodiversity value of habitats within the application Site, both before and after development, and as a proxy measure to determine if the development is likely to result in an on-site habitat biodiversity net loss or gain.

Since most of the survey area is unlikely to be affected by proposals, this indicative BNG assessment has been limited to the development area shown in Figure 4 only. The biodiversity value of the existing Site is low, due to the presence of low value arable land. According to the calculator, the habitat biodiversity value of the proposed development area is **8.28** for non-linear Habitat Units and **10.86** for linear hedgerow habitats.

The draft proposals (shown in Figure 4 above) were used to provide an approximate BNG calculation to understand the minimum parameters for achieving a 10% Net Gain. The Metric's output (Figure 9) reports that a gain of **12.40%** for area-based habitats (fields) and **10.99%** for linear habitats (hedgerows) would be achievable under the following conditions:

- 1.58 ha of the arable land is displaced by buildings and hardstanding with no biodiversity value.
- The 0.97 ha belt of land within the 30m badger exclusion zone will not be developed or cultivated but oversown with a grass seed mix. For the purposes of this assessment, it has been assumed that this 30m belt will be classified as 'Modified grassland' of 'Poor' condition.
- Approximately 1.59 ha is shown on the proposals map as "planting area" around the sub-station. For the purposes of this assessment, it has been assumed that this area will be sown with a reasonably diverse grassland seed mix and managed to generate an area of 'Modified grassland' of 'Good' condition. This is considered a feasible and realistic goal to achieve 10% net gain, although this could be enhanced further with more distinct habitat types such as a highly diverse seed mix with more optimal management strategy, or diverse scrub / tree mosaic.
- It has been assumed that up to 10m of Hedgerow 2 may be removed for access. To achieve 10% net gain for linear habitats, it has been assumed that the remainder of Hedgerow 2 would be enhanced to 'Good' condition.
- This calculation assumed no removal / loss of Hedgerow 1 or additional hedgerow planting.

It should be noted that the calculation has been made on the above assumptions. The BNG score would need to be re-calculated once final landscaping and development plans have been received and included within the Ecological Impact Assessment (EciA) report to inform planning.



Radwell Bury Farm, Baldock		Return to results menu	
Headline Results			
Scroll down for final results			
On-site baseline	Habitat units	8.28	
	Hedgerow units	10.98	
	Watercourse units	0.00	
On-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	9.31	
	Hedgerow units	12.19	
	Watercourse units	0.00	
On-site net change (units & percentage)	Habitat units	1.03	12.40%
	Hedgerow units	1.21	10.99%
	Watercourse units	0.00	0.00%
Off-site baseline	Habitat units	0.00	
	Hedgerow units	0.00	
	Watercourse units	0.00	
Off-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	0.00	
	Hedgerow units	0.00	
	Watercourse units	0.00	
Off-site net change (units & percentage)	Habitat units	0.00	0.00%
	Hedgerow units	0.00	0.00%
	Watercourse units	0.00	0.00%
Combined net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	1.03	
	Hedgerow units	1.21	
	Watercourse units	0.00	
Spatial risk multiplier (SRM) deductions	Habitat units	0.00	
	Hedgerow units	0.00	
	Watercourse units	0.00	
FINAL RESULTS			
Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	1.03	
	Hedgerow units	1.21	
	Watercourse units	0.00	
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	12.40%	
	Hedgerow units	10.99%	
	Watercourse units	0.00%	
Trading rules satisfied?	Yes ✓		

Figure 9: Biodiversity Impact Assessment Draft Headline Results Showing Net Gain



Summary / Conclusion

The primary ecological features to be considered as part of scheme design are the hedgerows and badger setts along the eastern hedgerow (Hedgerow 1). The presence of low value arable land means the Site lends itself well to biodiversity enhancements and net gain potential. However, it is important that badger setts and hedgerows are safeguarded as much as possible at this early stage to minimise mitigation and requirements for net gain compensatory habitat as the project commences. Further assessment for badgers may be required if impacts cannot be completely avoided. Although not considered essential at this stage, further assessment for dormouse and GCN may be required under certain conditions laid out in the table in this report.

Survey completed by Andrew Ross Msc MCIEEM

Report prepared by Andrew Ross

Report reviewed by Mike Hockey BSc MCIEEM

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Land at Radwell Bury Farm – Battery Energy Storage System (BESS)

Noise Impact Assessment for Planning Application

16th February 2024

Version	Comments	Date	Authored By	Checked By	Project Number
1	Noise Assessment	16/02/2024	Jon Maguire BSc (Hons) MIOA	Victor Valeron BEng MSc MIOA	23-417

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1. INTRODUCTION

1.1. Overview

inacoustic has been commissioned to assess the impact of potential noise arising from a proposed Battery Energy Storage System (BESS) facility on land at Radwell Bury Farm, Baldock, SG7 5TR.

This report details the existing background sound climate at the nearest noise-sensitive receptors, as well as the potential sound emissions associated with the Proposed Development.

The assessment considers the potential noise generation from the plant associated with the Proposed Development, with respect to existing sound levels in the area. The assessment methodology contained in British Standard 4142:2014+A1:2019 *Method for rating and assessing industrial and commercial sound* has been used.

Accordingly, the following technical noise assessment has been produced to accompany the Planning Application to North Hertfordshire District Council and is based upon environmental noise measurements undertaken at the site and a subsequent 3-dimensional noise modelling exercise.

This noise assessment is necessarily technical in nature; therefore a glossary of terms is included in Appendix A to assist the reader.

1.2. Scope and Objectives

The scope of the noise assessment can be summarised as follows:

- A sound monitoring survey was undertaken at discrete locations representative of the closest noise-sensitive receptors to the Site;
- A 3-dimensional noise modelling exercise, in order to quantify the potential noise generation of the proposed site uses;
- An assessment of potential noise impacts with respect to the prevailing acoustic conditions at existing off-site receptors; and
- Recommendation of mitigation measures, where necessary, to comply with the requirements of the National Planning Practice Guidance in England: Noise¹.

¹ Department for Communities and Local Government (DCLG), 2019. National Planning Practice Guidance for England: Noise. DCLG England: Noise. DCLG.

2. LEGISLATION AND POLICY FRAMEWORK

The development proposals for the Site are guided by the following policy directives and guidance:

2.1. National Policy

2.1.1. National Planning Policy Framework, 2023

The *National Planning Policy Framework* (NPPF)² sets out the UK Government's planning policies for England. Planning policy requires that applications for planning permission must be determined in accordance with the development plan, unless material considerations indicate otherwise.

The NPPF is also a material consideration in planning decisions. It sets out the Government's requirements for the planning system and how these are expected to be addressed.

Under Section 15; *Conserving and Enhancing the Natural Environment*, in Paragraph 180, the following is stated:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

- e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability."*

Paragraph 191 of the document goes on to state:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason"*

Paragraph 191 refers to the Noise Policy Statement for England, which is considered overleaf.

² Department for Levelling Up, Housing & Communities (DLUHC), December 2023. National Planning Policy Framework. HMSO. London.

2.1.2. Noise Policy Statement for England, 2010

The underlying principles and aims of existing noise policy documents, legislation and guidance are clarified in *DEFRA: 2010: Noise Policy Statement for England* (NPSE)³. The NPSE sets out the “*Long Term Vision*” of Government noise policy as follows:

“Promote good health and good quality of life through the effective management of noise within the context of Government policy on sustainable development”.

The NPSE outlines three aims for the effective management and control of environmental, neighbour and neighbourhood noise:

- *“Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life”.*

The guidance states that it is not possible to have a single objective noise-based measure that defines “*Significant Observed Adverse Effect Level (SOAEL)*” that is applicable to all sources of noise in all situations and that not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

2.1.3. National Planning Practice Guidance in England: Noise, 2019

Further guidance in relation to the NPPF and the NPSE has been published in the *National Planning Practice Guidance in England: Noise* (NPPG Noise)⁴, which summarises the noise exposure hierarchy, based on the likely average response. The following three observed effect levels are identified below:

- **Significant Observed Adverse Effect Level:** This is the level of noise exposure above which significant adverse effects on health and quality of life occur;
- **Lowest Observed Adverse Effect Level:** This is the level of noise exposure above which adverse effects on health and quality of life can be detected; and
- **No Observed Adverse Effect Level:** This is the level of noise exposure below which no effect at all on health or quality of life can be detected.

Criteria related to each of these levels are reproduced in Table 1.

³ Department for Environment, Food and Rural Affairs (DEFRA), 2010. Noise Policy Statement for England. DEFRA.

⁴ Department for Communities and Local Government (DCLG), 2019. National Planning Practice Guidance for England: Noise. DCLG.

TABLE 1: SIGNIFICANCE CRITERIA FROM NPPG IN ENGLAND: NOISE

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not Noticeable	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Noticeable and Not Intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and Disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and Very Disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

2.2. Assessment Criteria

2.2.1. BS4142:2014+A1:2019

BS4142:2014+A1:2019 *Methods for Rating and Assessing Industrial and Commercial Sound* sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS4142:2014+A1:2019 for assessing the effect of sound on residential receptors is to compare the measured or predicted sound level from the source in question, the $L_{Aeq,T}$ *specific sound level*, immediately outside the dwelling with the $L_{A90,T}$ background sound level.

Where the sound contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the specific sound level to obtain the $L_{Ar,Tr}$ *rating sound level*. The effect of uncertainty in sound measurements, data and calculations should also be considered when necessary.

BS4142:2014+A1:2019 states: *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs"*. An estimation of the impact of the specific sound can be obtained by the difference of the rating sound level and the background sound level and considering the following:

- *"Typically, the greater this difference, the greater the magnitude of the impact."*
- *"A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context."*
- *"A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context."*
- *"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

During the daytime, the assessment is typically carried out over a reference time period of 1-hour, with a reference period of 15-minutes used for the night-time assessment. The periods associated with day or night, for the purposes of the Standard, are considered to be 07.00 to 23.00 and 23.00 to 07.00, respectively.

2.2.2. Relative Change in Ambient Noise Level

The IEMA Guidelines⁵ define 'Noise Impact' as the difference in the acoustic environment before and after the implementation of the proposals, also known as the magnitude of change. In circumstances where a noise environment may be altered by addition or removal of a noise source, considered to be largely anonymous or within the prevailing acoustic character of an area, for example, changes to traffic quantum or patterns, it is normal to consider this relative change in ambient noise level. The assessment, therefore, considers this phenomenon to add context.

The impact scale adopted in this assessment is shown in Table 2 below, which relates to established human responses to noise, in line with 'Table 7-12 Effect Descriptors' of the IEMA Guidelines and set in the context of NPPG.

TABLE 2: IMPACT SCALE FOR COMPARISON OF FUTURE NOISE AGAINST EXISTING NOISE

Noise Level Change dB(A)	Subjective Response	Significance	NPPG Context
Less than 1.0	No perceptible	Negligible	NOEL
1.0 - 2.9	Barely perceptible	Minor impact	NOAEL
3.0 - 4.9	Noticeable	Moderate impact	LOAEL
5.0 - 9.9	Up to a doubling or halving of loudness	Substantial impact	SOAEL
10.0 or more	More than a doubling or halving of loudness	Major impact	UAEL

The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(A) change in noise represents a doubling or halving of the perception of loudness. The difference between the minimum perceptible change and the doubling or halving of the perceived noise level is split to provide greater definition to the assessment of changes in noise level.

It is considered that the criteria specified in Table 2 provide a good indication as to the likely significance of changes in noise levels in this case and can be used to inform the context in which the sound occurs in order to assess the impact of noise from the proposed development.

⁵ Institute of Environmental Management & Assessment (IEMA), Version 1.2 (November 2014). Guidelines for Environmental Noise Impact Assessment

3. SITE DESCRIPTION

3.1. Site and Surrounding Area

The Proposed Development will be located on Land at Radwell Bury Farm, Baldock, SG7 5TR.

The site is located on farmland immediately east of the A1(M).

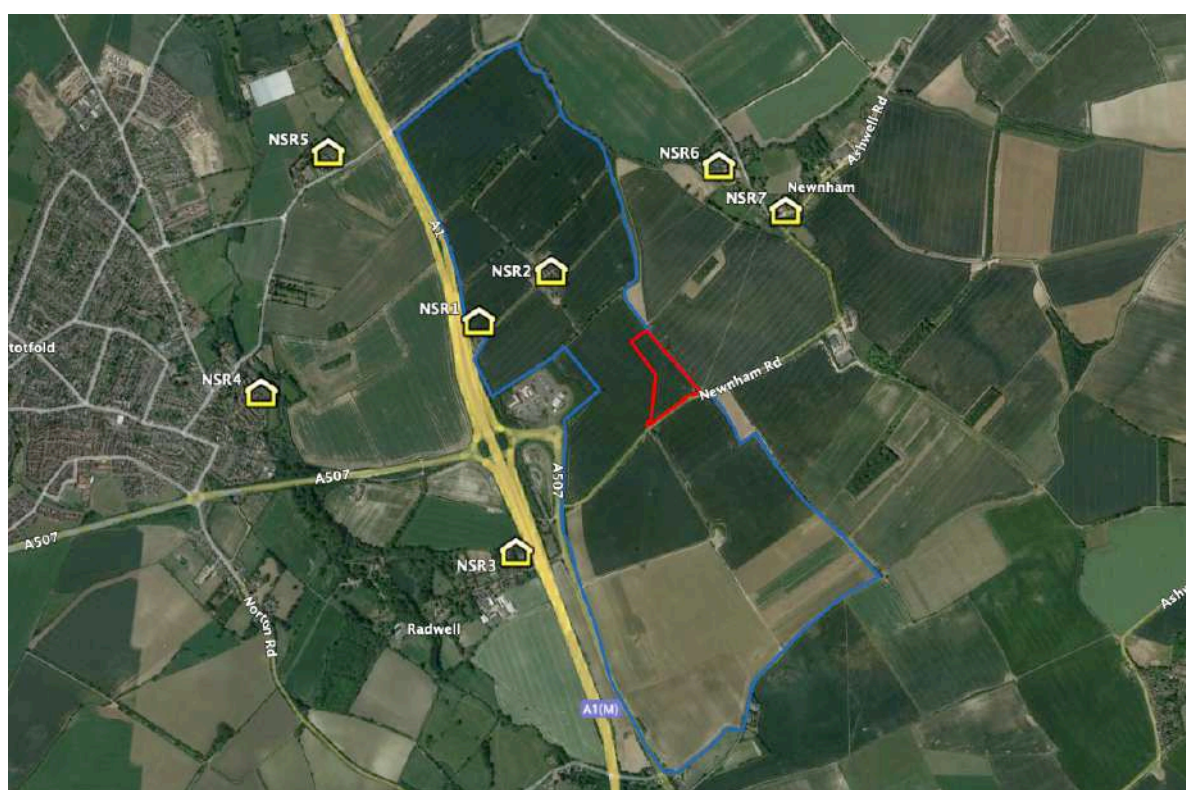
To the east is Baldock Services and to the south and north lies more open farmland. Further west is the village of Stotfold and further south is Newham Road.

The closest noise-sensitive receptors (NSR) is the residential dwelling to the north-west of the site (NSR2 at approximately 500 meters from the site boundary).

The ambient sound environment in the area is influenced predominantly by road traffic from the A1(M).

The Proposed Development site (in red) and the surrounding area can be seen in Figure 1.

FIGURE 1: PROPOSED DEVELOPMENT SITE AND SURROUNDING AREA



3.2. Proposed Development Overview

BESS is an emissions-free capacity resource that is fast, highly flexible, and ready to provide power services to the grid. It is different from other energy generators as it uses the electrical power grid as a fuel, and can either deliver or withdraw power from the grid depending on what is needed.

The energy storage process does not inherently have any sound emissions associated with it, however, to ensure the batteries remain at the correct temperature, cooling systems are used. Similarly, the inverter stations used to transform the energy from DC to AC and vice versa are cooled by systems that can generate noise.

Batteries can be charged/discharged over short periods of time with systems operating at full duty. Inversely, they can be charged/discharged over longer periods of time by operating at lower duty. The rest of the time, the systems are on a stand-by mode. Therefore, battery storage developments do not operate continuously at full duty during long periods of time.

It is proposed that there will be 48 No. containerised battery units and 12 No. inverter/transformer stations on Site. It is assumed that battery units will be served by an integrated cooling system on each side of the container, being the main sources of noise from these units.

An overview of the proposed site layout can be seen below in Figure 2 overleaf.

4. BASELINE SOUND SURVEY

4.1. Overview

The prevailing background sound conditions in the area have been determined by an environmental noise survey conducted during both daytime and night-time periods between 8th and 17th of August 2023.

4.2. Measurement Details

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring, and, in accordance with the principles of BS 7445⁶.

All acoustic measurement equipment used during the noise survey conformed to Type 1 specification of British Standard 61672⁷. A full inventory of this equipment is shown in Table 3 below.

TABLE 3: INVENTORY OF SOUND MEASUREMENT EQUIPMENT

Measurement Position	Make, Model & Description	Serial Number	Certificate Number	Calibration Expiry Date
MP1	Rion NL-52 Sound Level Meter	01009671	1141898	20/03/2025
	Rion NH-25 Preamplifier	9976		
	Rion UC-59 Microphone	18146		
MP2	Rion NL-52 Sound Level Meter	00965097	1141900	20/03/2025
	Rion NH-25 Preamplifier	65324		
	Rion UC-59 Microphone	10223		
MP3	NTI XL2 Sound Level Meter	A2A-14510-EO	1141897	20/03/2025
	MA220 Preamplifier	7614		
	MC230A Microphone	A21028		
All	Cirrus CR:515 Calibrator	72886	1141301	07/03/2024

The sound measurement equipment used during the survey was field calibrated at the start and end of the measurement period. A calibration laboratory has calibrated the field calibrator used within the twelve months preceding the measurements. A drift of less than 0.2 dB in the field calibration was found to have occurred on the sound level meter.

The weather conditions during the survey were conducive to environmental noise measurement.

The microphones were fitted with protective windshields for the measurements, which are described in

Table 4, with an aerial photograph indicating their locations shown in Figure 3.

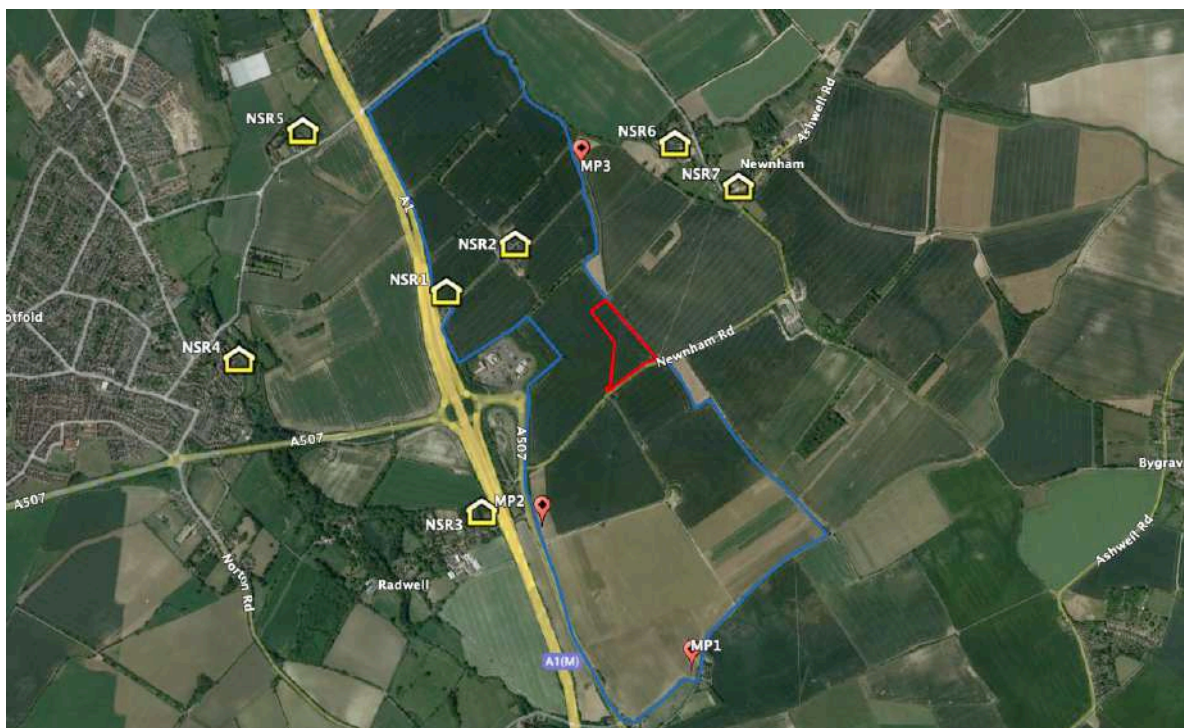
⁶ British Standard 7445: 2003: Description and measurement of environmental noise. BSI

⁷ British Standard 61672: 2013: Electroacoustics. Sound level meters. Part 1 Specifications. BSI.

TABLE 4: MEASUREMENT POSITION DESCRIPTIONS

Measurement Position	Description
MP1	A largely unattended daytime and night-time measurement of sound under free-field conditions, at a height of 1.5 metres above local ground level, located at the northern boundary of the Site. The microphone was located at 52° 0'9.09"N, 0°11'24.12"W. The sound environment at this location was influenced by road traffic on the A1(M) with some contributions from the A507. Due to equivalent distance to the A1(M), this monitoring position is deemed representative of the sound environment at NSR2 and NSR5.
MP2	A largely unattended daytime and night-time measurement of sound under free-field conditions, at a height of 1.5 metres above local ground level, located beyond the southern boundary of the Site. The microphone was located at approximately 100 metres from the A1(M), 52° 0'29.16"N, 0°11'53.93"W. The sound environment at this location was influenced by consistent road traffic on the A1(M). Due to equivalent distance to the A1(M), this monitoring position is deemed representative of the sound environment at NSR1 and NSR3.
MP3	A largely unattended daytime and night-time measurement of sound under free-field conditions, at a height of 1.5 metres above local ground level, located beyond the southern boundary of the Site. The microphone was located at approximately 750 metres east of the A1(M). 52° 1'18.74"N, 0°11'49.02"W The sound environment at this location was influenced by traffic noise from the A1(M), with underlying contributions from the bird song and wind induced vegetation noise. This area is generally quieter than the other two measurement positions. Due to equivalent distance to the A1(M), this monitoring position is deemed representative of the sound environment at NSR4, NSR6 and NSR7.

FIGURE 3: MEASUREMENT POSITIONS



4.3. Sound Indices

The parameters reported are the average Equivalent Continuous Sound Level, $L_{Aeq,T}$, the statistical index (typical) Background Sound Level, $L_{A90,T}$, as well as the typical Maximum Sound Pressure Level, L_{AFmax} . An explanation of the sound units presented is given in Appendix A.

The measured L_{Aeq} , L_{AFmax} , and L_{AF90} sound levels are presented as time histories in a graph in Appendix B. Furthermore, the statistical distribution of the measured background sound levels to derive the typical representative $L_{A90,T}$ values are presented in a graphical format in Appendix C.

4.4. Summary Results

The summarised results of the environmental sound measurements, during the day and night-time periods, can be seen below in Table 5. Values have been rounded to the nearest whole number.

TABLE 5: SOUND MEASUREMENT RESULTS

Measurement Position	Period	$L_{Aeq,T}$ (dB)	$L_{AF90,T}$ (dB)	L_{AFmax} (dB)
MP1	Day	52	46	67
	Night	48	36	63
MP2	Day	66	54	85
	Night	61	39	79
MP3	Day	48	42	66
	Night	45	35	61

5. OPERATIONAL NOISE ASSESSMENT

5.1. Noise Modelling

5.1.1. Source Data

The A-weighted sound power levels associated with the Proposed Development can be seen below in Table 6. At this stage, these are considered robust candidate source noise levels to be achieved by scheme design.

TABLE 6: SOUND SOURCE DATA

Plant	Quantity	Sound Power Level per unit, L_{wA} (dB)*	Indicative Sound Pressure Level at 10m, L_{pA} (dB)*
MV Skid (Inverter Unit & Transformer)	12	93	65
Battery Cooling System	48	84	56
Auxiliary Transformer	2	71	43
HV Substation Transformer	1	91	60

** Some suppliers provide their data in terms of Sound Pressure Level (SPL) at a given distance rather than Sound Power Level (SWL/ L_w). However, SPL depends on i) the environment the measurements are taken in, ii) the dimensions and shape of the plant and iii) the distance from the source to the measurement position, etc. SWL is a more objective metric for noise assessments, as it represents the total sound energy radiated by a sound source and can therefore being used in the noise modelling to predict the SPL at any distance, under various environmental conditions. Thus, our noise specifications are provided primarily as derived SWL to enable a transparent and robust comparison between different suppliers. Indicative SPL at 10m distance from the plant are also provided for reference.*

Confirmation from the selected plant manufacturers that the above noise levels can be achieved should always be sought prior to plant procurement.

It is noted that some cooling systems may perform at lower duty during the night, when ambient temperature is lower, if provided with variable fan speed. However, this assessment assumes nominal fan speed both during the day and during the night, for a reasonable worst-case scenario.

These input parameters are intended as acoustic specifications, to determine the likely sources of noise impact and whether attenuation is likely to be required, such that acoustic feasibility is demonstrated for the purposes of planning consideration.

5.1.2. Calculation Process

Calculations were carried out using Cadna/A, which undertakes its calculations in accordance with guidance given in ISO9613⁸, which considers a worst-case downwind propagation to all receptors.

⁸ ISO 9613-1:1993 and ISO 9613-2:1996: Acoustics - Attenuation of sound during propagation outdoors. Part 1: Calculation of the absorption of sound by the atmosphere and Part 2: General method of calculation

5.1.3. Model Assumptions

Given that the land between proposed development and nearest receptors is largely soft, the ground factor has been set to 0.5, within the calculation software, with 2 orders of reflection. Full octave frequency spectra have been used in the calculations. It has been assumed that all plant will operate simultaneously, representing a worst-case scenario, although this is an unlikely occurrence as all of the units are independent of each other and usually operate as per demand and for a short period of time.

In order to accurately model the land surrounding the development, an AutoCAD DXF drawing was produced, which was based on data provided by the Ordnance Survey, along with associated LIDAR Composite DTM topographic contours sourced from the Defra Data Services Platform.

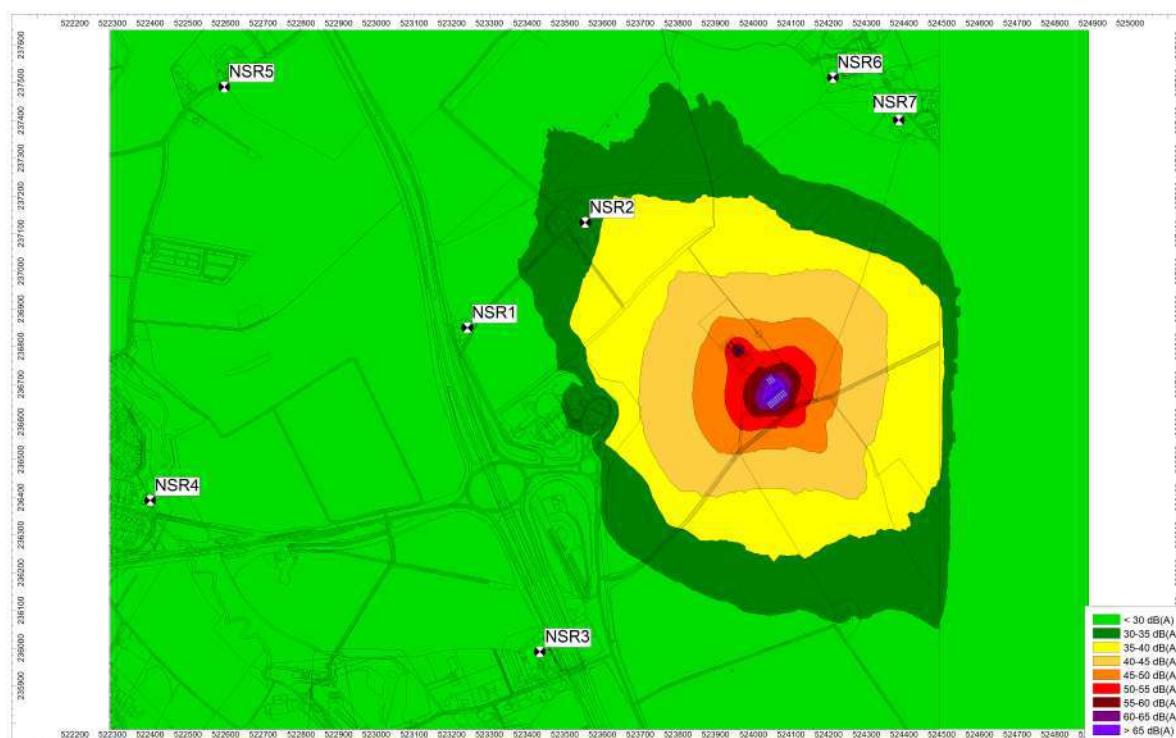
5.1.4. Mitigation by Design

Table 6 shows the maximum sound power level at source, which will be allowable in order to achieve compliance at the nearest receptors, which are in line with the acoustic performance achieved by typical technology available from various manufacturers, without specific noise mitigations.

5.1.5. Specific Sound Level Map

The sound map at 4m above ground, showing the specific sound level emissions from the Proposed Development can be seen in Figure 4.

FIGURE 4: SPECIFIC SOUND LEVEL MAP



5.1.6. Specific Sound Level Summary

A summary of the predicted specific sound levels at the closest NSRs, based on the sound map shown in Figure 4 can be seen below in Table 7.

TABLE 7: PREDICTED SPECIFIC SOUND LEVEL SUMMARY

NSR	Specific Sound Level (dB)
1	26
2	34
3	23
4	18
5	18
6	26
7	26

5.2. Assessment

5.2.1. Rating Penalty Principle

Section 9 of BS4142:2014+A1:2019 describes how the rating sound level should be derived from the specific sound level, by determining a rating penalty. BS4142:2014+A1:2019 states:

“Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level. This can be approached in three ways:

- a) subjective method;*
- b) objective method for tonality;*
- c) reference method.”*

Given that the Proposed Development is not operational, the subjective method has been adopted to derive the rating sound level from the specific sound level. This is discussed in Section 9.2 of BS4142:2014+A1:2019, which states:

“Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.

Correct the specific sound level if a tone, impulse or other characteristics occurs, or is expected to be present, for new or modified sound sources.”

BS4142:2014+A1:2019 defines four characteristics that should be considered when deriving a rating penalty, namely; tonality; impulsivity; intermittency; and other sound characteristics, which are defined as:

Tonality

A rating penalty of +2 dB is applicable for a tone which is *“just perceptible”*, +4 dB where a tone is *“clearly perceptible”*, and +6 dB where a tone is *“highly perceptible”*.

Impulsivity

A rating penalty of +3 dB is applicable for impulsivity which is *“just perceptible”*, +6 dB where it is *“clearly perceptible”*, and +9 dB where it is *“highly perceptible”*.

Intermittency

BS4142:2014+A1:2019 states that when the *“specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time ... if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.”*

Other Sound Characteristics

BS4142:2014+A1:2019 states that where *“the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.”*

5.2.2. Rating Penalty Assessment

Considering the content of Section 5.2.1, an assessment of the various sound sources associated with the Proposed Development, in terms of whether any rating penalties are applicable, has been detailed in Table 8 below.

TABLE 8: RATING PENALTY ASSESSMENT

Sound Characteristic	Penalty	Discussion
Tonality	0 dB	The primary source of noise generation from energy storage projects is the fans serving the inverters and battery cooling systems, that typically generate aerodynamic broadband sound, which should be achieved by design. As such no rating penalty correction should be applied for Tonality.
Impulsivity	0 dB	Inverters and battery cooling systems operate continuously without the audibility or prominence of sudden sounds. As such, no rating penalty correction should be applied for Impulsivity.
Intermittency	0 dB	Inverters and battery cooling systems operate continuously during the battery charging/discharging process, which takes longer than 100% of the BS4142 reference time interval (1 hour during the day and 15 minutes during the night). The cooling system will then switch off during the cool down period, but gradually and not simultaneously on all units, with no identifiable on/off character. As clarified by the Association of Noise Consultants (ANC) Technical Note on BS 4142:2014+A1:2019, dated March 2020, if a source is considered to be ON for 100% of the reference time interval, an Intermittency correction should not, therefore, be applied.
Other Sound Characteristics	0 dB	BESS systems do not have acoustic features present such as a whine, hiss, screech, non-tonal hum, rattle or rasp that can attract attention. By its electrical nature, HV Transformers will typically emit a distinct 100Hz tone at source that can be identified as a ‘hum’. However, the noise from the transformers is much lower than from the cumulative noise of all inverters and batteries themselves. The noise specifications provided in this assessment ensure that the specific noise level from the HV Transformer at the closest receptor is more than 10 dB below the existing night-time ambient noise level, ensuring that transformer noise, including any potential 100Hz ‘hum’, will not be audible at the receptor location, due to the lower sensitivity of the human ear at low frequencies and masking from the residual acoustic environment. As such, no rating penalty correction should be applied for ‘Other Sound Characteristics’.

In summary, no rating penalty has been included in the assessment.

5.2.3. Uncertainty

BS4142:2014+A1:2019 requires that the level of uncertainty in the measured data and associated calculations is considered in the assessment. The Standard recommends that steps should be taken to reduce the level of uncertainty.

Measurement Uncertainty

BS4142:2014+A1:2019 states that measurement uncertainty depends on a number of factors, including the following, which are applicable to the Proposed Development:

- “ ...
- b) the complexity and level of variability of the residual acoustic environment;*
 - “ ...
 - d) the location(s) selected for taking the measurements;*
 - “ ...
 - g) the measurement time intervals;*
 - h) the range of times when the measurements have been taken;*
 - i) the range of suitable weather conditions during which measurements have been taken;*
 - “ ...
 - k) the level of rounding of each measurement recorded; and*
 - l) the instrumentation used.”*

Each of the measurement uncertainty factors outlined above have been considered and discussed in Table 9 below.

TABLE 9: MEASUREMENT UNCERTAINTY FACTORS

Measurement Uncertainty Factor Reference	Level of Uncertainty	Discussion
b)	0 dB	Residual acoustic environment is relatively constant, hence no correction for a complex residual acoustic environment.
d)	0 dB	Measuring at locations representative of the closest affected receptors to the site has enabled the determination of robust background sound levels.
g)	0 dB	Measurement time intervals were set in accordance with BS4142:2014+A1:2019, hence no further correction needs to be made.
h)	0 dB	Measurements were undertaken over a continuous 10-day period, including midweek and weekend periods.
i)	0 dB	No periods of significant wind or precipitation were noted.
k)	0 dB	Measured values were rounded to 0.1 dB, therefore rounding would not have had a significant impact on the overall typical background sound levels.
l)	0 dB	The acoustic measurement equipment accorded with Type 1 specification of British Standard 61672, and were deployed with appropriate wind shields.

In summary, no uncertainty budget has been considered in the assessment, to account for measurement uncertainty.

Calculation Uncertainty

BS4142:2014+A1:2019 states that calculation uncertainty depends on a number of factors, including the following, which are applicable to the Proposed Development:

- “ ...
- b) uncertainty in the operation or sound emission characteristics of the specific sound source and any assumed sound power levels;*
 - c) uncertainty in the calculation method;*
 - d) simplifying the real situation to “fit” the model (user influence on modelling); and*
 - e) error in the calculation process.”*

Each of the calculation uncertainty factors outlined above have been considered and discussed in Table 10 below.

TABLE 10: CALCULATION UNCERTAINTY FACTORS

Calculation Uncertainty Factor Reference	Level of Uncertainty	Discussion
b)	0 dB	Sound source levels are based on robust candidate plant data, to be achieved by the design.
c)	0 dB	Calculations were undertaken in accordance with ISO 9613-2, which is considered a “ <i>validated method</i> ” by BS4142:2014+A1:2019.
d)	0 dB	The real situation has not been simplified for the purposes of this assessment.
e)	±1 dB	ISO 9613-2 indicates that there is a ±3 dB accuracy to the prediction method, therefore, an uncertainty factor of ±1 dB is considered appropriate and proportional, given the separation distances involved.

In summary, an uncertainty budget of ±1 dB has been considered in the assessment, to account for calculation uncertainty.

The overall uncertainty is considered to be small enough that it would not affect the conclusions of the assessment. It is also noted that because the assessment considers a worst-case scenario, such as downwind sound propagation (which in reality cannot happen at all NSRs at the same time) the relevance of the uncertainty is further reduced.

5.2.4. BS4142:2014+A1:2019 Assessment

The rating sound level, as calculated from the predicted specific sound level, has been assessed in accordance with BS4142:2014+A1:2019, at the closest NSRs, and can be seen in Table 11 and Table 12 for the daytime and night-time respectively.

TABLE 11: BS4142 ASSESSMENT – DAYTIME (07:00-23:00)

NSR	Specific Sound Level (dB)	Rating Penalty (dB)	Rating Sound Level (dB)	Daytime Background Sound Level (dB)	Excess of Rating over Background Sound Level (dB)
1	26	-	26	54	-28
2	34	-	34	46	-12
3	23	-	23	54	-31
4	18	-	18	42	-24
5	18	-	18	46	-28
6	26	-	26	42	-16
7	26	-	26	42	-15

TABLE 12: BS4142 ASSESSMENT – NIGHT-TIME (23:00-07:00)

NSR	Specific Sound Level (dB)	Rating Penalty (dB)	Rating Sound Level (dB)	Night-time Background Sound Level (dB)	Excess of Rating over Background Sound Level (dB)
1	26	-	26	39	-13
2	34	-	34	36	-2
3	23	-	23	39	-16
4	18	-	18	35	-17
5	18	-	18	36	-18
6	26	-	26	35	-9
7	26	-	26	35	-9

It can be seen that the Proposed Development is predicted to have rating sound levels that do not exceed the prevailing background sound level at the nearest NSRs, which in BS4142:2014+A1:2019 terms represent a 'Low Impact', depending on the context, which is discussed below.

5.2.5. Discussion on Context

The results set out in Table 11 and Table 12 identify that the operation of the scheme, as proposed, can occur without affecting the amenity of the closest residential receptors to the site during the daytime and night-time, on the basis of a worst-case operational scenario.

BS4142:2014+A1:2019, however, recognises the importance of the context in which a sound occurs when assessing impacts.

It is noted that the assessment considers a worst-case scenario, with all batteries charging/discharging at the same time and downwind noise propagation to all receptors. It also considers cooling fans operating at nominal duty during the day and during the night. At night, when cooling demand is lower, inverters and battery unit fans may operate at lower duty if the system is provided with variable fan speed, although this has not been considered in the assessment.

As such, the calculated noise levels from the Proposed Development are likely to be an overprediction based on a worst-case scenario which is unlikely to happen in reality for any prolonged period of time.

6. CONCLUSION

inacoustic has been commissioned to assess the impact of potential noise arising from a proposed Battery Energy Storage System (BESS) facility on land at Radwell Bury Farm, Baldock, SG7 5TR

This technical noise assessment has been produced to accompany a Planning Application to North Hertfordshire District Council and is based upon environmental noise measurements undertaken at the site and a subsequent 3-dimensional noise modelling exercise.

The assessment considers the potential noise generation from the plant associated with the Proposed Development, with respect to existing sound levels in the area.

The assessment methodology contained in British Standard 4142: 2014+A1:2019 *Method for rating and assessing industrial and commercial sound* has been used in conjunction with supplementary acoustic guidance.

The assessment identifies that the Proposed Development will give rise to rating sound levels that do not exceed the measured background sound level in the area during the daytime and night-time, thus giving rise to a 'Low Impact'.

Consequently, the assessment demonstrates that the Proposed Development will give rise to noise impacts that would be within the range of NOAEL of the NPPG England guidance.

For ease of reference, the definition of *No Observed Adverse Effect Level* in PPGNoise is reproduced below:

"Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life."

Since the Proposed Development conforms to British Standard and National Planning Policy requirements, it is recommended that noise should not be a considered constraint to the approval of this Planning Application, providing that the plant is constructed and operated in accordance with the acoustic assumptions and recommendations set out within this report.

7. APPENDICES

7.1. Appendix A – Definition of Terms

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10 ⁻⁶ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

TABLE 13: TYPICAL SOUND LEVELS FOUND IN THE ENVIRONMENT

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source.

A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not be normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the L_{A10} , the noise level exceeded for 10% of the measurement period. The L_{A90} is the level exceeded for 90% of the time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq} .

This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound.

To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS 4142 specifies background noise measurement periods of 1 hour during the day and 15 minutes during the night. The noise levels are commonly symbolised as $L_{A90,1\text{hour}}$ dB and $L_{A90,15\text{mins}}$ dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125 ms.

7.2. Appendix B – Sound Measurement Results

FIGURE 5: MEASURED TIME HISTORY – MP1

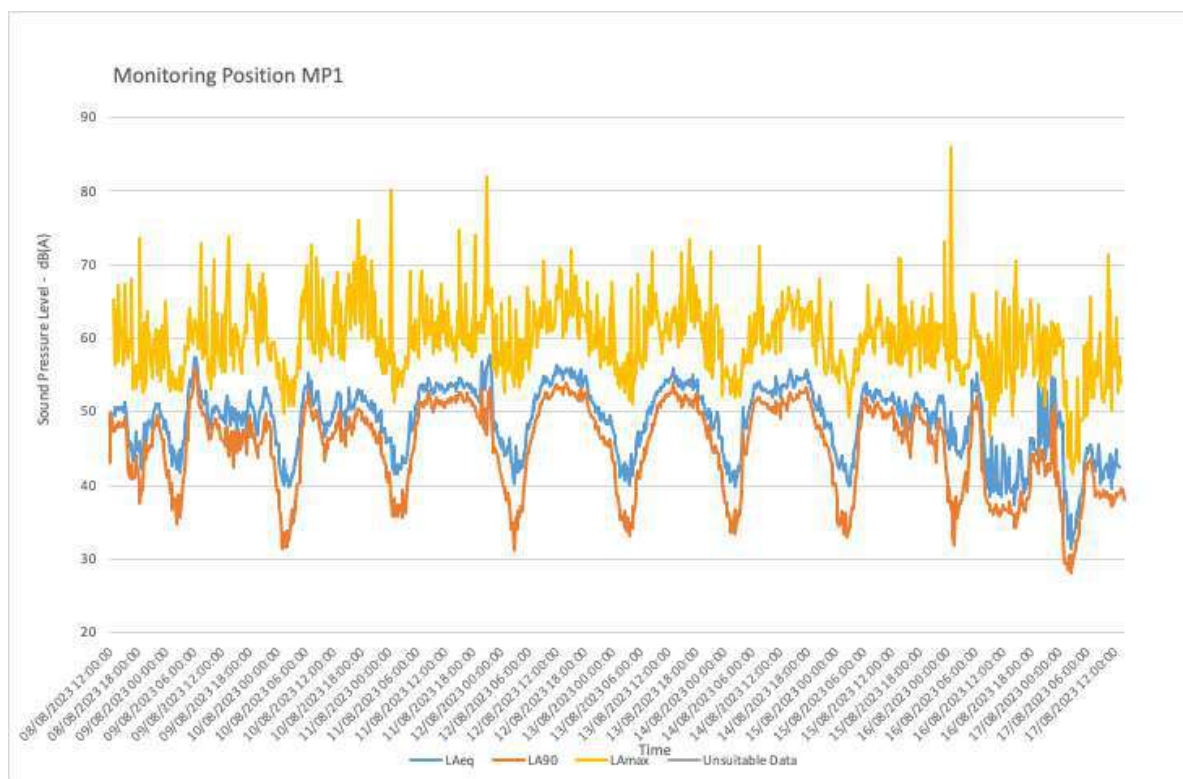


FIGURE 6: MEASURED TIME HISTORY – MP2

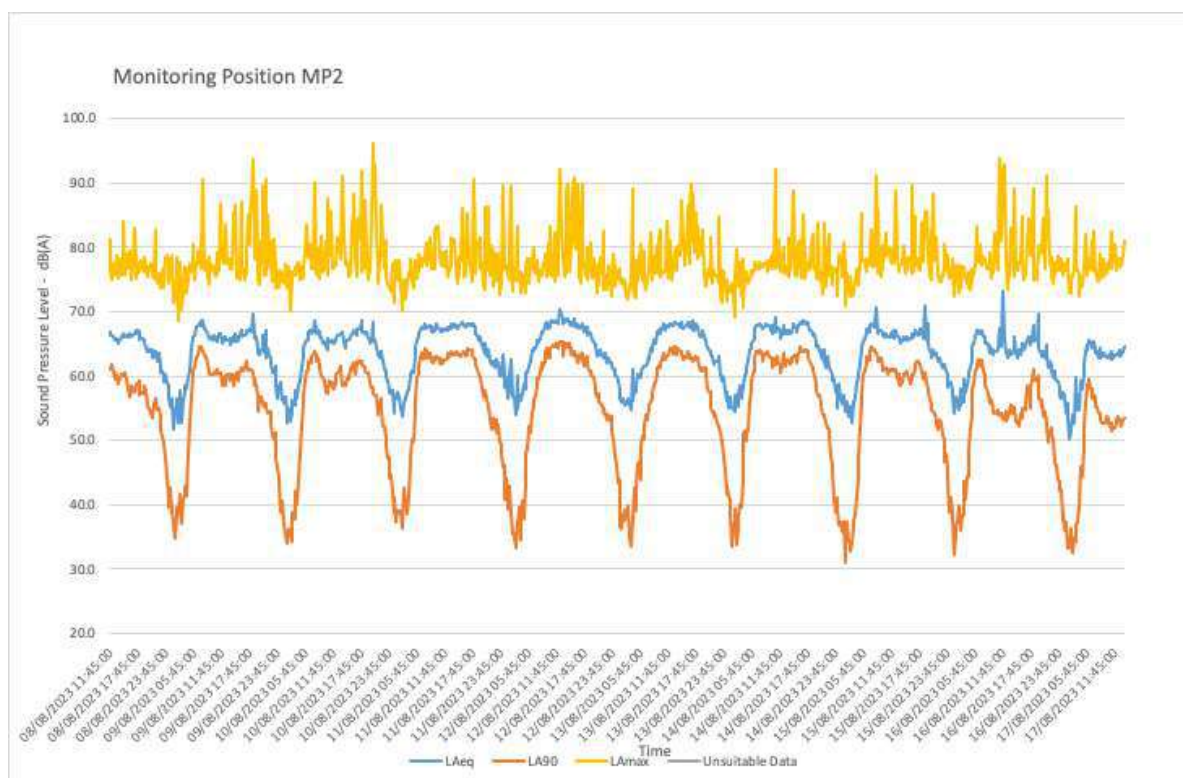
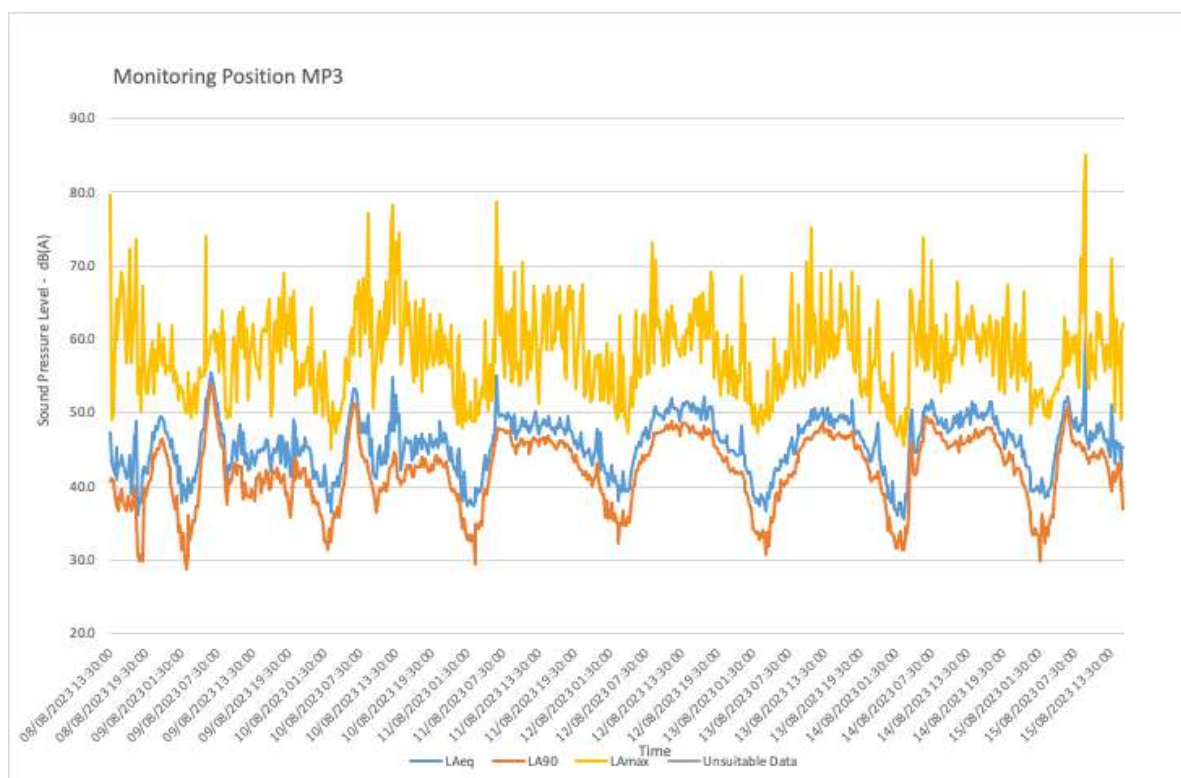


FIGURE 7: MEASURED TIME HISTORY – MP3



7.3. Appendix C – Statistical Analysis

FIGURE 8: STATISTICAL ANALYSIS OF L_{A90} BACKGROUND – DAYTIME – MP1

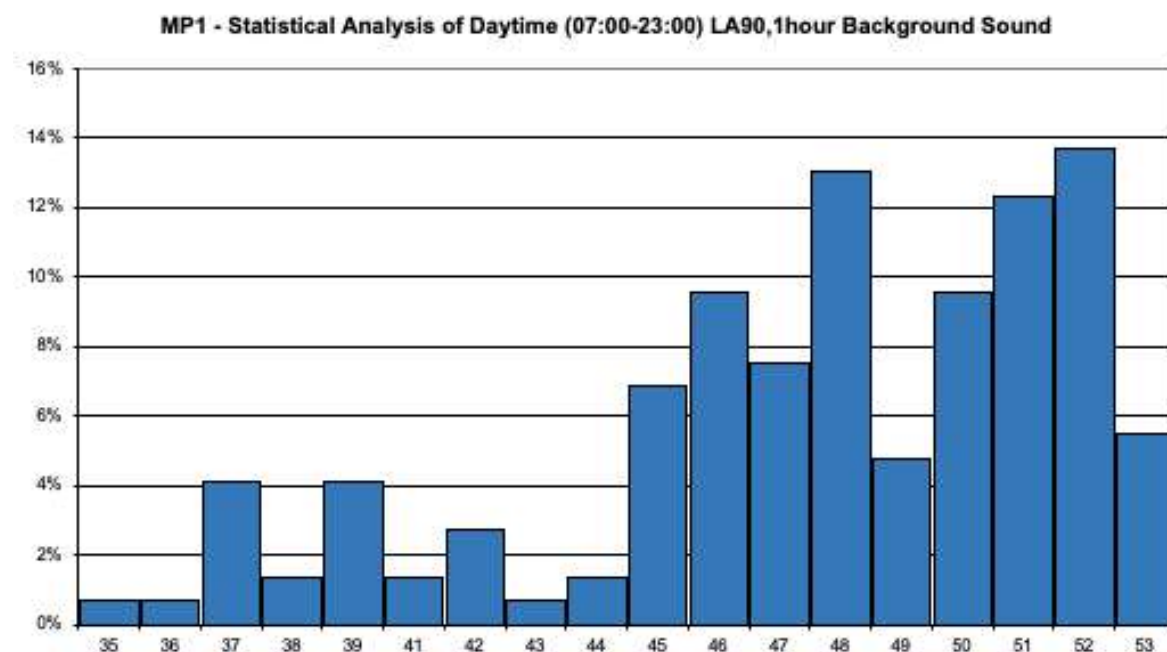


FIGURE 9: STATISTICAL ANALYSIS OF L_{A90} BACKGROUND – NIGHT-TIME – MP1

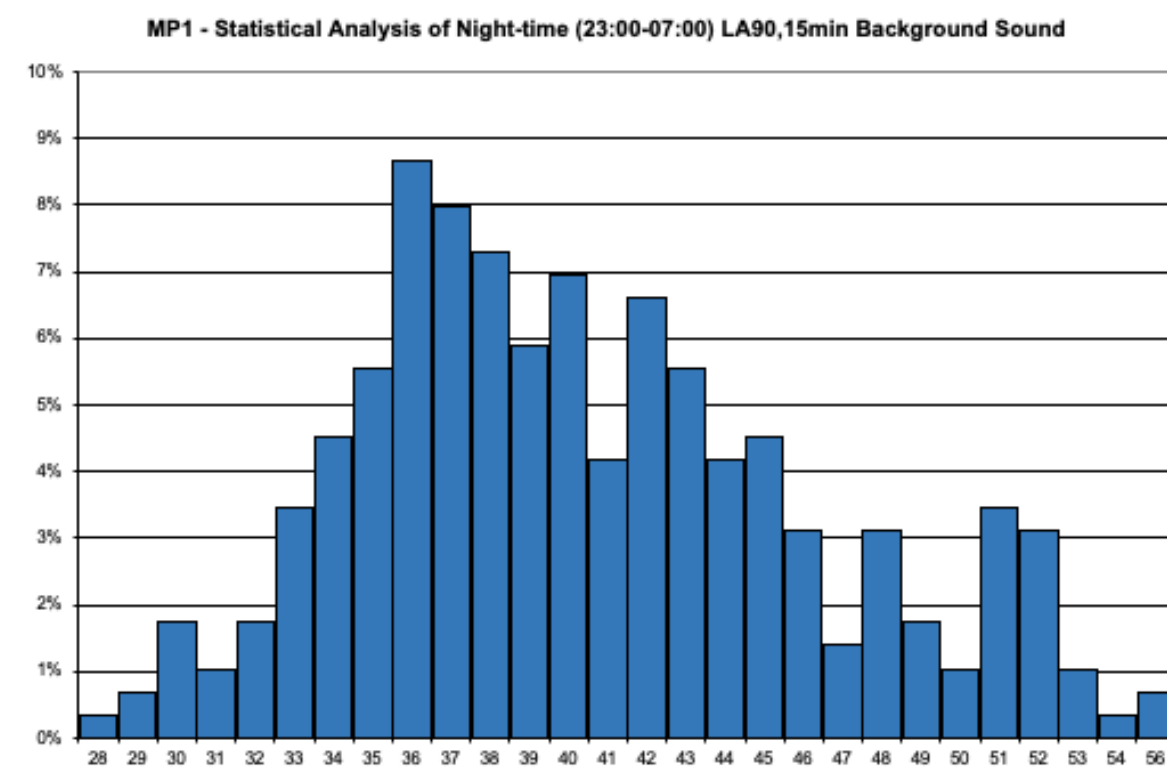


FIGURE 10: STATISTICAL ANALYSIS OF L_{A90} BACKGROUND – DAYTIME – MP2

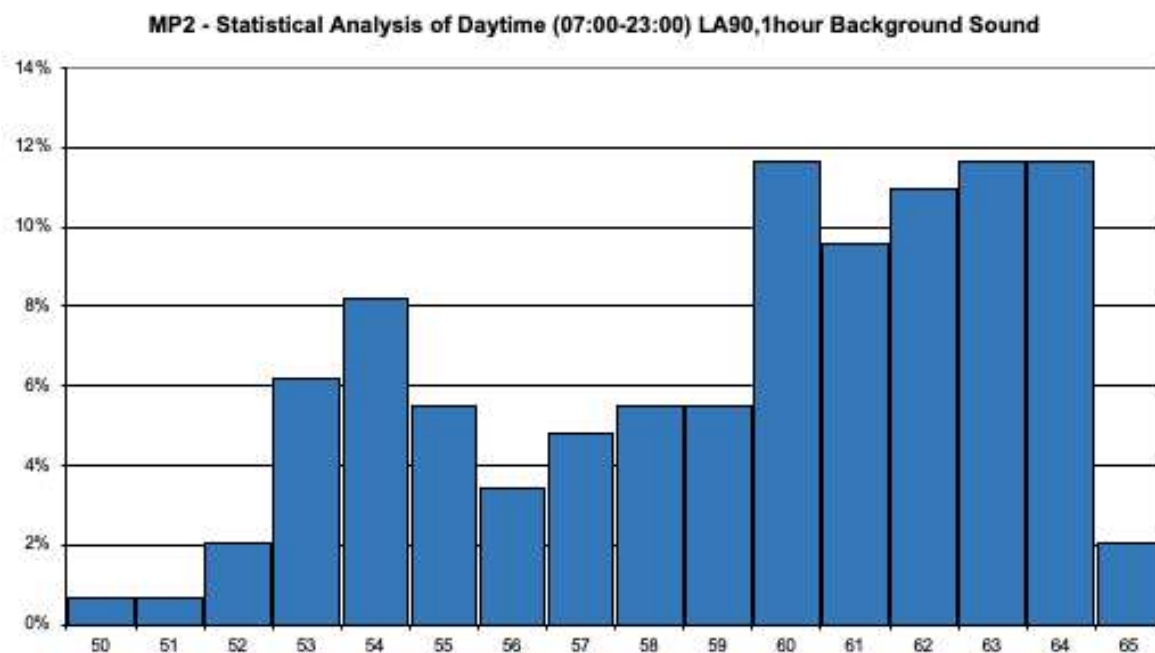


FIGURE 11: STATISTICAL ANALYSIS OF L_{A90} BACKGROUND – NIGHT-TIME – MP2

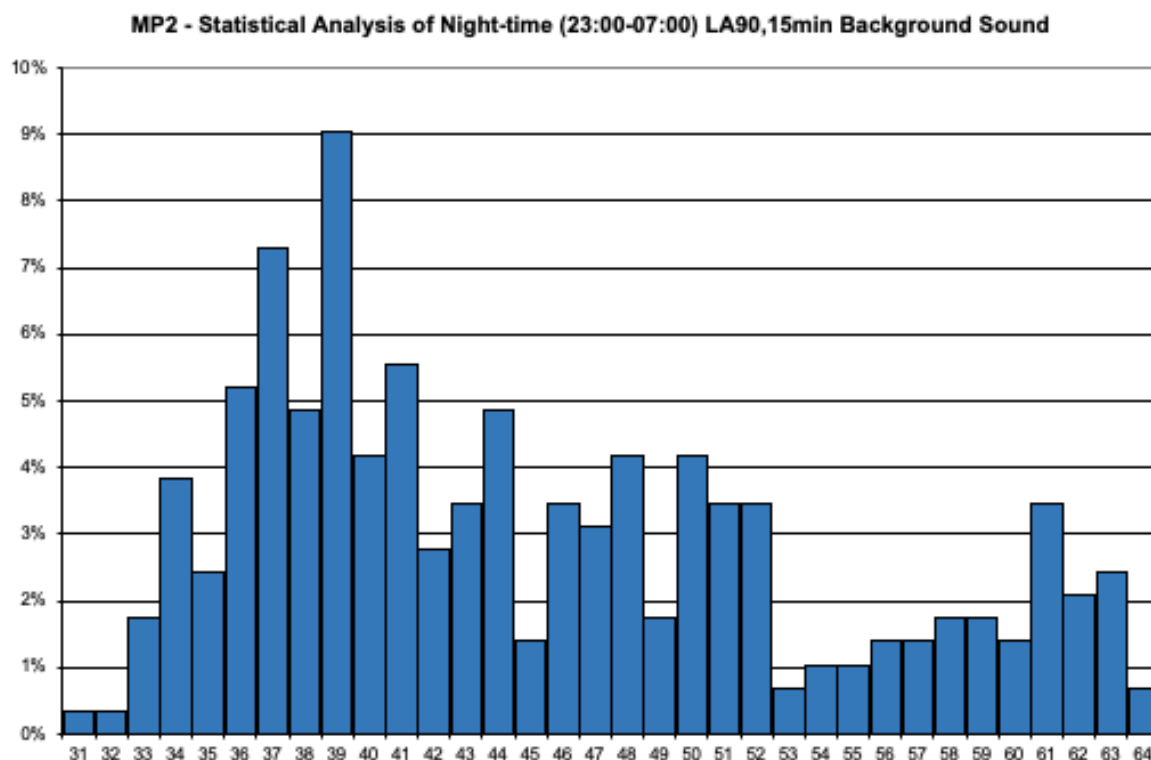


FIGURE 12: STATISTICAL ANALYSIS OF L_{A90} BACKGROUND – DAYTIME – MP3

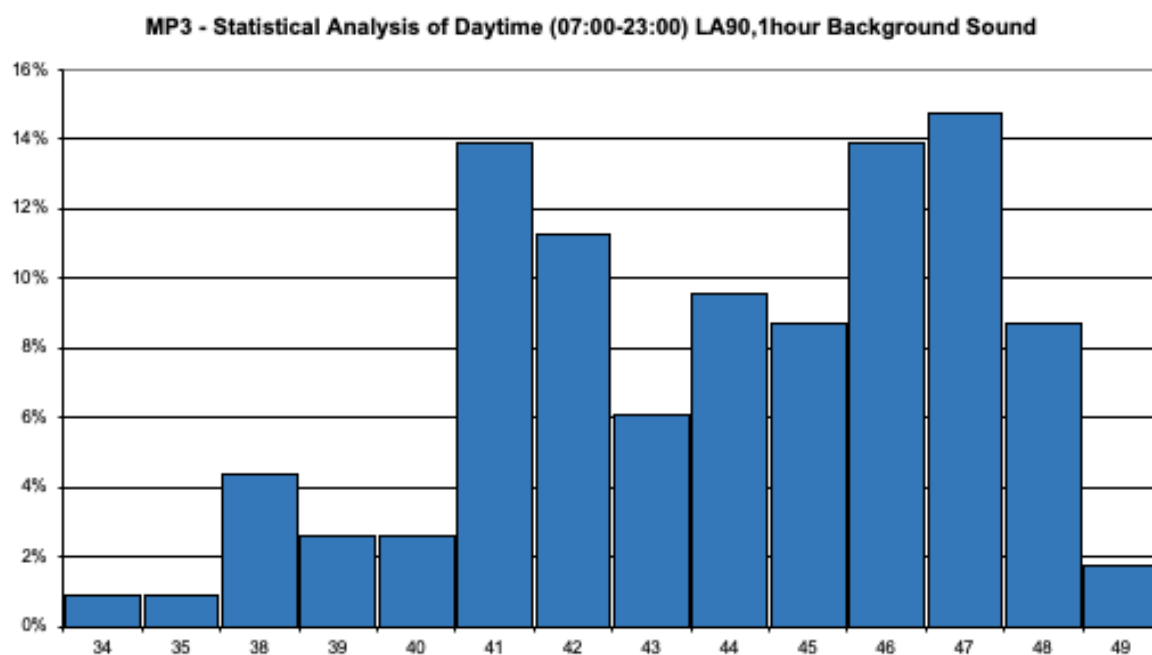
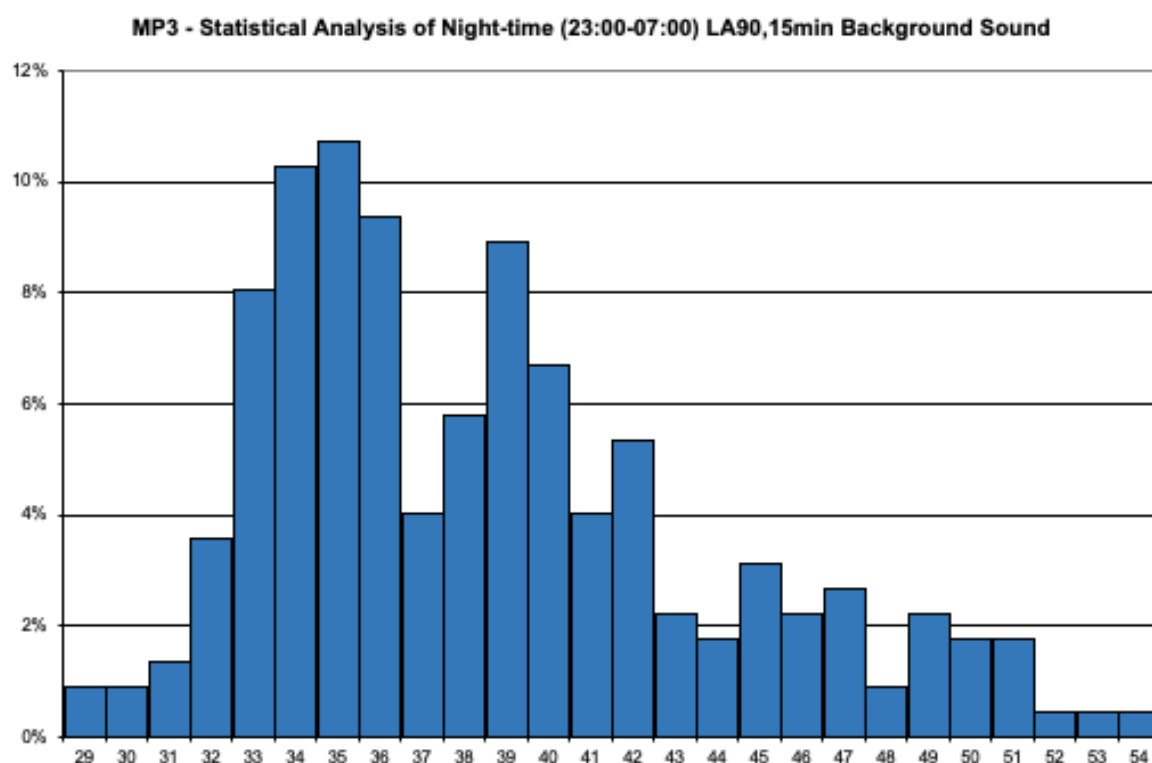


FIGURE 13: STATISTICAL ANALYSIS OF L_{A90} BACKGROUND – NIGHT-TIME – MP3



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RIDGE

DESK TOP STUDY

RADWELL BURY FARM

BALANCE POWER

February 2024



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1. INTRODUCTION

1.1. Brief

Ridge and Partners LLP (Ridge) have been commissioned by Balance Power (the Client) to undertake a Desk Top Study for land at Radwell Bury Farm, SG7 5TR (hereafter referred to as 'the site'). A site location plan is included as Figure 1.

Ridge were briefed to use information provided by the client to obtain an environmental database search relating to the site and carry out a walkover survey to assess and report on the findings with respect to potential ground contamination and potential associated future liabilities in accordance with guidance outlined in Land Contamination Risk Management (LCRM 2023), published by the Environment Agency.

This report is prepared in line with the agreed brief and is subject to report conditions shown in Appendix 1.

1.2. Proposals

Proposals are yet to be fully defined but are likely to comprise of a battery storage facility with an access road from Newnham Road to the south of the site. The development is also likely to include storage rooms, a control room, and a welfare room.

1.3. Legal Context and Methodology

Part IIA of the Environmental Protection Act provides a risk-based approach to the identification and remediation of land where contamination poses an unacceptable risk to human health or the environment, but the regime does not take into account future uses. New developments are therefore controlled by the planning regime, with reference to the National Planning Policy Framework (NPPF, 2023), rather than directly by Part IIA of the Environmental Protection Act.

This report has been prepared in accordance with published Environment Agency guidance – Land Contamination Risk Management (LCRM, 2020), which supersedes CLR 11. CLR 11 adopted and refined the well-recognised methodology and terminology that has been used in contaminated land risk assessment for a number of years.

LCRM advocates a tiered approach to risk assessment, as necessary. This document constitutes a **Preliminary Risk Assessment** under that guidance.

Further details regarding Legal Context and Methodology are included as Appendix 2.

1.4. End Use Classification

For the Preliminary Risk Assessment the end use classification of 'commercial/industrial' will be applied.

A change in the site use from the one currently proposed may result in the need for re-assessment of risk criteria, as such the conclusions and recommendations resulting from the risk assessment could change significantly.

1.5. Report Scope and Limitation

This report is based upon a review of historical and current information, a site walkover survey, geological and hydrogeological mapping and information from an environmental database search. The assessment is based on the proposed end use outlined in Section 1.2. The outcomes of this assessment could change if the end uses change.

The information contained in this report is intended for the use of **Balance Power**. Ridge can take no responsibility for the use of this information by any other party or for uses other than that described in this report.

2. SITE CONDITIONS

An engineer from Ridge visited on 2 February 2024 to conduct a walkover survey of the site and the surrounding areas for the purpose of identifying any potential contamination or evidence of previous contaminative processes. The descriptions below relate to site conditions at the time of the inspection only.

A photographic log is included as Appendix 3.

2.1. Site Location

The site is centred on easting 524071 and northing 236682 to the north of Baldock. The centre of the site is situated at approximately 59m AOD (Above Ordnance Datum).

The site is a rough rectangular shape with the longest axis north-west to south-east of approximately 300m, and with a smaller rectangle extending to the south-west along Newnham Road. The site has an area of approximately 4ha.

2.2. Current Site Use

The site is currently an open field showing evidence of ongoing agricultural use, such as ploughing. A large electricity pylon is seen in the eastern area of the site. No buildings are present on site.

2.3. Access

A double gate on Newnham Road provides access to the south-east of the site. There are also other entrances to adjacent fields to the north-west and east.

2.4. Structures

Apart from the large electricity pylon, no structures are present on site.

2.5. Boundaries

Newnham Road comprises the southern site boundary, whilst mixed trees and shrubs form the eastern border. No physical boundaries are present to the west.

2.6. Topography

A topographic survey revealed a general decrease in elevation towards the eastern and northern areas of the site, with the east sitting at around 58-59mAOD and the north being even lower at 55-56mAOD. The south-western area of site ranges from around 64-65mAOD, and the central areas of the site tend to range from 57 to 59mAOD.

2.7. Surroundings

At the time of the walkover, dry ditches run along the northern and eastern boundaries, and beyond which are similar agricultural fields. Baldock Services are seen further to the west, which include a Shell petrol station.

2.8. Trees & Vegetation

Mixed deciduous trees and hedges run along the southern and eastern edges of the site, whilst the fields are predominantly filled with grass (at the time of the walkover).

2.9. Utilities

Power cables run north-east to south-west over the centre of the site. No manhole covers were noted during the site walkover.

2.10. Miscellaneous

A gravel into unmade track is present in the sites eastern corner.

2.11. Potential Sources of Contamination – Walkover Survey

Shell petrol station at Baldock Services, although due to the considerable distance from the site this is unlikely to be a significant source.

3. SITE HISTORY AND HISTORICAL CONTAMINATIVE SOURCES

3.1. Review of Historical Maps

Ordnance Survey Maps provided within a Groundsure Report package have been obtained to provide details of the history of the site and surrounding areas. A chronological description of the maps is shown in the table below. The descriptions focus on potentially contaminative land uses within 50-100m and potentially infilled features within 250m of the development site boundary. Note, potential contaminative sources and features outside these distances from the site have been discussed only where they are considered to be relevant. Copies of the maps are included as Appendix 4.

MAPPING (SCALE)	OBSERVATIONS	
	ON-SITE	OFF-SITE
1877 (1:2,500)	The site is shown as an open field bordered by trees to its south and similar fields elsewhere.	The area surrounding the site consists of similar open fields. A track or road is seen adjacent to the site's south.
1882-1884 (1:10,560)	No changes visible.	Radwell Grange is seen 444m north-west. Newnham is seen 700m north-east, whilst Radwell is seen 820m south-west.
1899-1959 (1:10,560)	No changes visible.	No significant changes visible.
1967 (1:2,500)	A large electricity pylon has appeared on top of the sites eastern border. The electricity wire extends north to south over the centre of the site. The site appears to be congruent with the present day layout.	The electricity wires above the site extend to the south towards another pylon 49m south.
1968 (1:2,500 & 1:10,560)	No changes visible.	The Roman Road 363m west has expanded significantly, and is now labelled A1.
1969 (1:2,500 & 1:10,560)	No changes visible.	The small road adjacent to the site's south has been marked as Newnham Road.
1982-2001 (1:2,500 & 1:10,000)	No changes visible.	No significant changes visible.
2010 (1:10,000)	No changes visible.	Baldock Service Area is marked 329m west of site.
2024 (1:10,000)	No changes visible.	Radwell Grange is renamed to The Shay House.

Table 3.1: Historical Map Review

3.2. Review of Satellite Images

A review of publicly available satellite images has been carried out to provide information in relation to the site.

- The earliest image available for review (1999) shows the site to be an open agricultural field with a small road bordering it to the south. Electricity pylons run north-east to south-west of the centre of the site. The surrounding fields seem to be of similar land use.
- Except for agricultural changes in the field, no significant changes are noted in the following images from 2009, 2015, 2017, and 2020.

3.3. Internet Search

Historical maps between 1830 to 1880 from the National Library of Scotland show no history of land use on the site or immediate surrounding area. The town of Radwell is seen to the south-west, whilst Newnham is seen to the north-east.

3.4. Potential Sources of Contamination – Historical Map Review

No potential sources have been identified during the historical map review.

Potential contamination sources not considered to represent a significant risk to the site are detailed in the table below. The features will not be considered further.

POTENTIAL SOURCES NOT CONSIDERED FURTHER	
FEATURE	JUSTIFICATION
Electricity pylon, on site, 1967-present	Low contamination potential
Baldock Service Area, 329m W, 2010-present	Significant distance from site.
Radwell Grange, 444m NW, 1882-present	Significant distance from site.

Table 3.2: Potential Sources not considered further.

4. PHYSICAL SETTING

4.1. Geology and Hydrogeology

The following observations are taken from the British Geological Survey (BGS) GeoIndex (2023) and the Geo Insight Groundsure Report (Appendix 5).

The site is underlain by three different bedrock geologies which are all variations of chalk. Superficial geology is seen in the north of the site, being head deposits of clay, silt, sand and gravel. The map below shows how each of these lithologies underlie the sites area.



Image 4.1: Combined geological map of the area, showing bedrock geologies of the Zig Zag Chalk Formation (light green), Totterhoe Stone Member (green), West Melbury Marly Chalk Formation (yellow), and superfical head deposits (pink).

Tables 4.1 & 4.2 below identify the expected composition of the published strata and aquifer classification.

SUPERFICIAL GEOLOGY [1]	
Unit Name	Head – clay, silt, sand, and gravel
Geology Description	Head is poorly sorted and poorly stratified, angular rock debris and/or clayey hillwash and soil creep, mantling a hillslope and deposited by solifluction and gelifluction processes.
Aquifer	Secondary Undifferentiated
Aquifer Description	Assigned where it is not possible to attribute either category A or B to a rock type. In general, these layers have previously been designated as both minor and nonaquifer.

Table 4.1: Superficial Geology

BEDROCK GEOLOGY [2]

Unit Name	Zig Zag Chalk Formation
Geology Description	Mostly firm, pale grey to off-white blocky chalk with a lower part characterised by rhythmic alternations of marls and marly chinks with firm white chalk. Thin silty chalk beds act as markers in the sequence. Parent unit of the Totternhoe Stone Member.
Aquifer	Principal
Aquifer Description	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers.

BEDROCK GEOLOGY [3]

Unit Name	Totternhoe Stone Member
Geology Description	A distinctly harder unit in the Grey Chalk Subgroup ("Lower Chalk"). Typically brownish-grey, fine-grained calcarenite. Has been described as "sandy" because of coarse fossil fragments - not because of quartz sand grains. Thin to thickly bedded. Fossiliferous.
Aquifer	Principal
Aquifer Description	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers.

BEDROCK GEOLOGY [4]

Unit Name	West Melbury Marly Chalk Formation
Geology Description	Buff, grey and off-white, soft, marly chalk and hard grey limestone arranged in couplets.
Aquifer	Principal
Aquifer Description	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers.

*Table 4.2: Bedrock Geology***4.1.1. Groundwater Vulnerability**

Both superficial and bedrock geologies are believed to be of high vulnerability, along with a high leaching class. There are also records of significant soluble rocks – problems unlikely except with considerable surface or subsurface water flow.

4.1.2. Artificial Ground, Landslips and Faults

There are no records within 250m of the site.

4.1.3. Radon

The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level. No Radon Protective Measures are considered necessary for new properties or extensions to existing ones.

4.1.4. Ground Workings and Mining

There are no records of artificial or made ground within 500m of the site, however it is highlighted that chalk mining has occurred in geology similar to that on site. It is also stated that underground mine workings are uncommon. This does not necessarily mean that chalk mining has occurred on site, as supported by the lack of any land use following historical map review or any other mining records on site.

4.1.5. BGS Borehole Records

No records within 250m of the site.

4.1.6. Natural Ground Subsidence

The BGS has provided the following information as summarised in Table 4.3 below.

PROCESS	RISK LEVEL	DETAILS
Ground Dissolution of Soluble Rocks	Very Low	Soluble rocks are present within the ground. Few dissolution features are likely to be present. Potential for difficult ground conditions or localised subsidence are at a level where they need not be considered.
Collapsible Deposits	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.
Landslides	Very Low	Slope instability problems are unlikely to be present. No special actions
Running Sands	Very Low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.
Shrink Swell Clay	Very Low	Ground conditions predominantly low plasticity.
Compressible Deposits	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits.

Table 4.3: Ground Subsidence Records

4.1.7. BGS Estimated Background Soil Chemistry

Estimated background concentrations on site are as follows: arsenic 15mg/kg; cadmium 1.8mg/kg; chromium 40-60mg/kg; nickel 15-30mg/kg, lead 100mg/kg.

4.2. Hydrology

4.2.1. Surface Water Features

There are no surface water features recorded within 250m of the site boundary. The site is however in a river catchment, known as the Cat Ditch.

4.2.2. Flooding

There are no Environment Agency floodplain zones present within 50m of the site boundary. The site is therefore in Flood Zone 1, indicating a less than 0.1% annual probability of flooding.

There is a low risk of surface water flooding in the sites northern section where there is a topographical depression. Outside the site, parts of the field to the north-east have a greater risk of surface water flooding, being a 1 in 30 year return period. This follows an off site overland flood route.

The northern section of the site also has a moderate risk of groundwater flooding, whereas the rest of the site has a low risk.

4.3. Controlled Waters

4.3.1. Abstraction Licenses

There are no abstractions within 500m of the site, inclusive of potable abstractions.

4.3.2. Source Protection Zones

The southern half of the site is in a Type 3 SPZ. This zone is defined as the total area needed to support the abstraction or discharge from the protected groundwater source. This SPZ3 is related to the inner SPZ1 to the south and east of site.

4.4. Designated Environmentally Sensitive Sites

Other than the London Green Belt (9m SE), there are no designated features within 1000m of the site.

4.5. Agricultural Designations

The site is listed as Grade 2 agricultural land. This is very good quality agricultural land. Land with minor limitations which affect crop yield, cultivations or harvesting.

4.6. Nitrate Vulnerable Zones

The site is classified as two Nitrate Vulnerable Zones (NVZ), known as the Great Ouse NVZ (surface water) and the Anglian Chalk NVZ (groundwater).

Nitrate vulnerable zones are areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC).

5. ENVIRONMENTAL RECORDS REVIEW

The following information has been obtained from public archive via the data supplier Groundsure or by direct application. The full Enviro Insight Groundsure Report is included as Appendix 5. The subsequent review focusses on records within 50m of the outlined development site for above ground features or within 250m for potentially infilled features, or those which are considered relevant to the proposed development. Ridge have not included data from Groundsure's own review of historical maps.

5.1. Groundsure Record Search

The following observations are taken from the Enviro Insight Report (Appendix 5).

5.1.1. Historical Industrial Land Uses

There are no records relating to historical industrial land uses within 350m of the site.

5.1.2. Historical Petrol Stations and Garages

There are no records of petrol stations or garages within 500m of the site.

5.1.3. Historical Tank Database

There are no records of historical tanks within 500m of the site boundary.

5.1.4. Historical Energy Features

There are no records of historical energy features within 500m of the site boundary.

5.1.5. Waste and Landfill

No historical or current records of landfills or waste sites within 500m of the site.

There is however a storing of waste exemption 281m north-west.

5.1.6. Environmental Permits, Incidents, Registers and Consents

No pertinent records within 350m of the site.

5.1.7. Current Industrial Land Uses

Two pylons are noted to be within 250m of the site, being 1m north and 57m south.

There is also a Shell petrol station 375m west.

5.2. Local Authority Consultation

5.2.1. Planning History – Hertfordshire Building Control

Hertfordshire Building Control were contacted for pertinent information relating to the site and immediate surroundings on 6 February 2024, however were unable to provide any relevant information.

5.2.2. Contaminated Land Officer – Hertfordshire Council

The council were contacted for pertinent information relating to the site and immediate surroundings on 6 February 2024. A response had not been approved at the time of writing this report – if prudent information is supplied it will be submitted within a report addendum.

5.3. Potential Sources of Contamination – Records Review

No potential sources have been identified within the records review.

Potential contamination sources not considered to represent a significant risk to the site are detailed below. These features will not be considered further within the risk assessment.

POTENTIAL SOURCES NOT CONSIDERED FURTHER	
FEATURE	JUSTIFICATION
Electricity pylon, 1m N & 57m S	Low contamination potential
Storing of waste exemption, 281m NW	Significant distance from site.
Shell petrol station, 375m W	Significant distance from site.

Table 5.1: Potential Sources not considered further.

6. PRELIMINARY CONCEPTUAL SITE MODEL

The preliminary conceptual site model represents an assessment of the current status of the site and the likelihood of a pollutant linkage for each identified potential combination of contaminant, pathway and receptor.

It should be noted that there may be risk from short term exposure from contaminated soil to site workers. The Preliminary Contamination Conceptual Model deals with long term exposure to key receptors. Acute risks can be easily mitigated by good environmental management of the site during site works. Standard health and safety precautions (as per HSE guidance¹) should be adopted by all workers involved with site enabling and construction works. Therefore, this receptor is not considered in the contamination conceptual model.

6.1. Potential Sources

No on site sources of contamination have been identified. No off site sources of contamination have been identified that are considered feasible to impact the site.

It should be noted that sources of contamination may become apparent during any future investigation and development of the site.

6.2. Pollutant Linkages

With no credible sources identified there cannot be plausible contaminant linkages as these require a source, pathway and receptor.

At this stage, no potential on or off site contamination sources have been identified, and therefore the development proposal is unlikely to impact identified receptors. If an on site contamination source is identified following groundworks or further investigation the conceptual model and risk assessment should be revisited.

¹ HSE (1991). "Protection of Workers and the General Public During Development of Contaminated Land". London HMSO.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. Contamination

With no credible sources identified there cannot be plausible contaminant linkages as these require a source, pathway and receptor.

7.1.1. Further Investigation

A specific contamination investigation is not required due to the lack of contamination sources, however a contamination screening is advised during any geotechnical investigations or groundworks.

A contamination screening should comprise the collection of three or four soil samples for analysis of a generic contamination suite to verify the low risk levels assessed within this preliminary risk assessment.

7.1.2. Watching Brief

A Watching Brief should be carried out by the Site Supervisor during construction and groundworks in case any areas of contamination are identified.

Ridge should be contacted in the first instance if any suspected contaminated soils are identified.

7.2. Geotechnical

A review of key geotechnical aspects is provided below.

7.2.1. Expected Ground Conditions

The desk-based information reviewed within this report indicates that a veneer of topsoil is likely to be present over superficial head deposits comprising of clay, silt, sand, and gravel in the sites northern area. The predominant bedrock geology is of a firm, marly chalk, however in the northern area two slight variations of this chalk are seen.

7.2.2. Foundations

With reference to the published geology and the proposed development, it is considered likely that shallow foundations can be utilised for the proposed development. The solution may need to be deepened where soft or loose ground is encountered.

Any solution in the northern part of site may need to account for differences in underlying geology, both superficial and bedrock, although all three bedrock geologies seen on site are variations of chalk.

7.2.3. Drainage

Based on the expected geology traditional soakaways are likely to be viable. Soakage testing in line with BRE365 should be carried out to confirm this.

7.2.4. Other Considerations

The site is bordered by trees and bushes to its east and south. If soils are shrinkable, foundations may need to be deepened adjacent to existing or proposed trees.

7.2.5. Earthworks / Site Levels

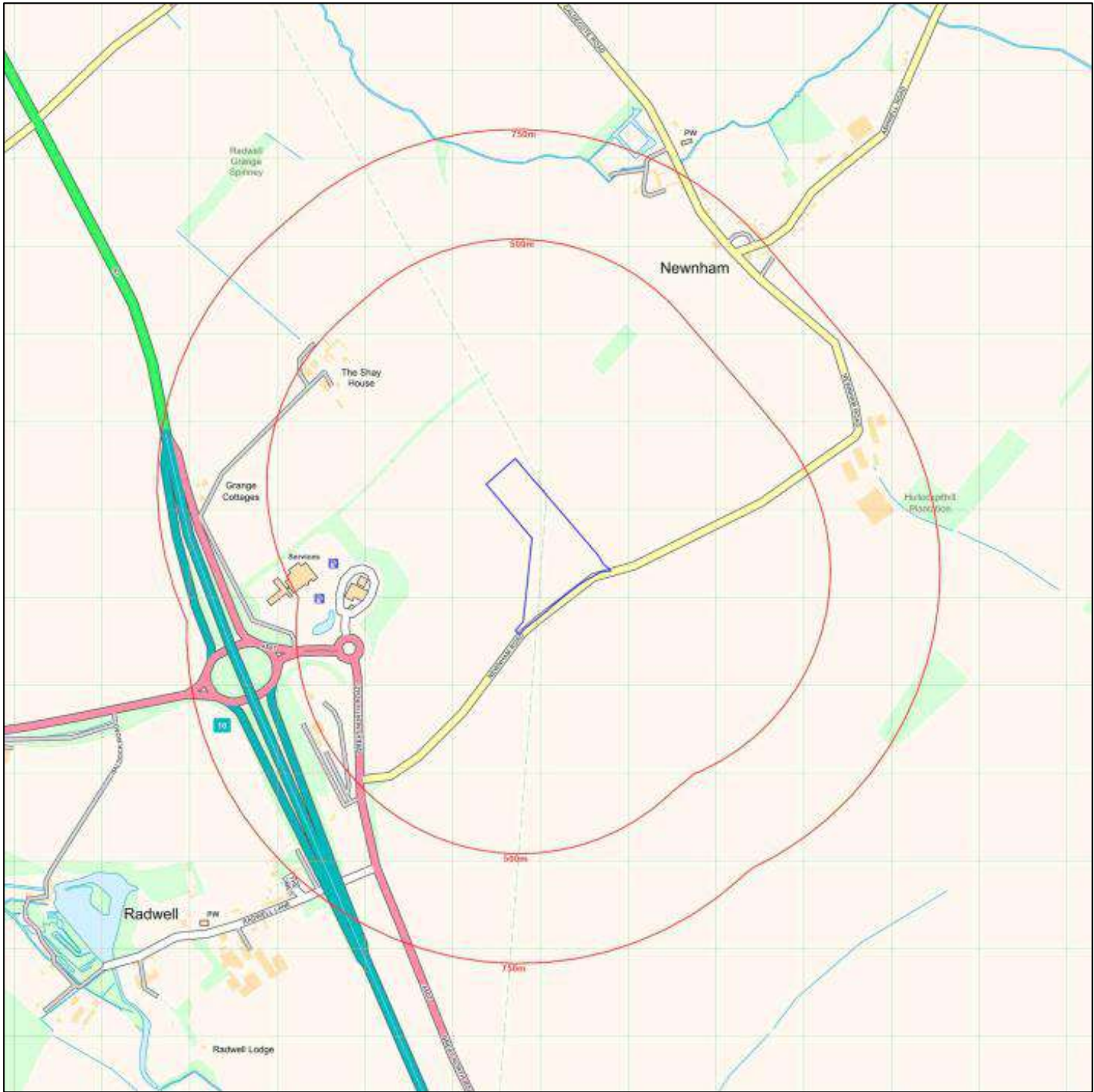
A general decrease in elevation is seen towards the eastern and northern areas of the site, with the east sitting at around 58-59mAOD and the north being even lower at 55-56mAOD. The south-western area of site ranges from around 64-65mAOD.

Care should be taken to ensure that excessive earthworks are not required nor retaining situations created.

7.3. Unexploded Ordnance

The site is not considered to be in an area at risk from UXO.

FIGURE 1 – SITE LOCATION PLAN



Project	Radwell Bury Farm			Title	Site Location Plan
Job Number	5024440	Client	Balance Power	RIDGE PROPERTY & CONSTRUCTION CONSULTANTS 1 Royal Court Kings Worthy Winchester SO23 7TW	
Drawing	5024440-Fig1	Revision	-		
Drawn	OS	Date	February 2024		
Checked by	MS	Scale	NTS		
				Ridge and Partners LLP www.ridge.co.uk	TEL: 01962 834400

APPENDIX 1 – REPORT CONDITIONS

Report Conditions

This report is produced solely for the benefit of **Balance Power** and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the Site.

This report is based on a visual Site inspection, study of readily accessible referenced historical records, information supplied by those parties noted in the text and preliminary discussions with local and Statutory Authorities. Some of the opinions are based on unconfirmed data and information and are presented in good faith without exhaustive clarification. Where ground contamination is suspected but no physical Site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to detailed activities related to the Site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, not revealed by this research cannot be discounted.

Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categoric assurances that they will be accepted by Authorities or Funds etc. without question, as such bodies may have unpublished, often more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to Ridge and Partners LLP. In time improved practices or amended legislation may necessitate a re-assessment.

The report is necessarily limited to those aspects of land contamination specifically reported on and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents that may occur. The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous use and abuse of the Site and adjacent Sites. The report concentrates on the Site as defined in the report and provides an opinion on surrounding Sites. If migrating pollution or contamination (past or present) exists, this can only practically be better assessed following extensive on and off Site intrusive investigations and monitoring.

APPENDIX 2 – LEGAL CONTEXT AND METHODOLOGY

Legal Context

Part IIA of the Environmental Protection Act 1990 (inserted by Section 57 of the Environment Act 1995) provides a regime for the control of specific threats to health or the environment from land contamination. In accordance with the Act and the statutory guidance document 'The Contaminated Land (England) Regulations 2000', the definition of contaminated land is intended to embody the concept of risk assessment. Within the meaning of the Act, land is only "contaminated land" where it appears to the Regulatory Authority, by reason of substances within or under the land, that:

"Significant harm is being caused, or there is a significant possibility of such harm being caused; or Pollution of controlled waters is being, or is likely to be, caused."

Inherent in this definition is the requirement for contamination risk assessment to be undertaken on a site-specific basis, as the potential for harm is determined by the Site's end use and its specific environmental setting. The guidance defines "risk" as the combination of:

- The probability, or frequency, of occurrence of a defined hazard (for example, exposure of a property to a substance with the potential to cause harm); and
- The magnitude (including the seriousness) of the consequences.

While Part IIA of the Environmental Protection Act provides a risk-based approach to the identification and remediation of land where contamination poses an unacceptable risk to human health or the environment, the regime does not take into account future uses. New developments are therefore controlled by the planning regime, with reference to the National Planning Policy Framework (NPPF, 2023), rather than directly by Part IIA of the Environmental Protection Act.

The NPPF is based on the principal that the site should be suitable for its new use, taking account of ground conditions, including from natural hazards or former activities and states that "Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner". The NPPF also links the planning and Part IIA regimes by stating that "after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990". Key components of the Part IIA regime, such as the definition of Contaminated Land and the associated risk-based assessment approach, are therefore considered to also be applicable to the planning regime.

Methodology

This report has been prepared in accordance with published Environment Agency guidance – Land Contamination Risk Management (LCRM, 2020), which supersedes CLR 11. CLR 11 adopted and refined the well-recognised methodology and terminology that has been used in contaminated land risk assessment for a number of years.

In the context of land contamination, there are three essential elements to any risk:

A **contaminant source** – a substance that is in, on or under the land and has the potential to cause harm or to cause pollution of controlled waters.

A **receptor** – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body.

A **pathway** – a route or means by which a receptor can be exposed to, or affected by, a contaminant.

Each of these elements can exist independently, but they create a risk only where they are linked together, so that a particular contaminant affects a particular receptor through a particular pathway. This kind of linked combination of contaminant–pathway–receptor is described as a pollutant linkage.

An important thread throughout the overall process of risk assessment is the need to formulate and develop a conceptual model for the site, which supports the identification and assessment of pollutant linkages. A conceptual model represents the characteristics of the site in diagrammatic or written form that shows the possible relationships between contaminants, pathways and receptors (pollutant linkages).

APPENDIX 3 – PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG

RIDGE

SITE: RADWELL BURY FARM
PROJECT NUMBER: 5024440

Photo No.	Date	
1	02/02/24	
Photo Title Overview of the site looking towards the south-east		

Photo No.	Date	
2	02/02/24	
Photo Title View along the eastern boundary of site.		

PHOTOGRAPHIC LOG

RIDGE

SITE: RADWELL BURY FARM
PROJECT NUMBER: 5024440

Photo No.	Date	
3	02/02/24	
Photo Title View of site facing west.		

Photo No.	Date	
4	02/02/24	
Photo Title View of site looking towards the southern boundary of site.		

PHOTOGRAPHIC LOG

SITE: RADWELL BURY FARM
PROJECT NUMBER: 5024440



Photo No.	Date	
5	02/02/24	
Photo Title View facing east showing the pylon on the eastern boundary of site.		

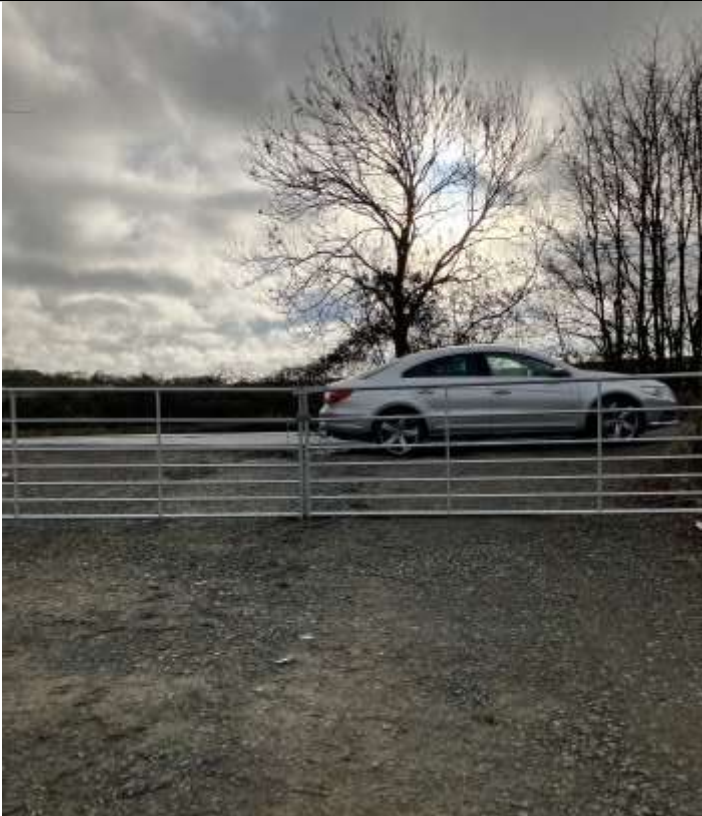
Photo No.	Date	
6	02/02/24	
Photo Title View of southern boundary of site.		

PHOTOGRAPHIC LOG

SITE: RADWELL BURY FARM
PROJECT NUMBER: 5024440

RIDGE

Photo No.	Date	
7	02/02/24	
Photo Title View of gate on northern boundary of site.		

Photo No.	Date	
8	02/02/24	
Photo Title View of gate on southern boundary of site.		

PHOTOGRAPHIC LOG

SITE: RADWELL BURY FARM
PROJECT NUMBER: 5024440



Photo No.	Date	
9	02/02/24	
Photo Title View of the hedgerows on northern boundary of site.		

Photo No.	Date	
10	02/02/24	
Photo Title View of south-eastern corner of site.		

APPENDIX 4 – HISTORICAL MAPS

Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: County Series

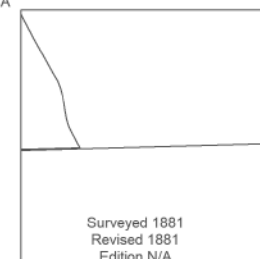
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Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1881
Revised 1881
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1881
Revised 1881
Edition N/A
Copyright N/A
Levelled N/A

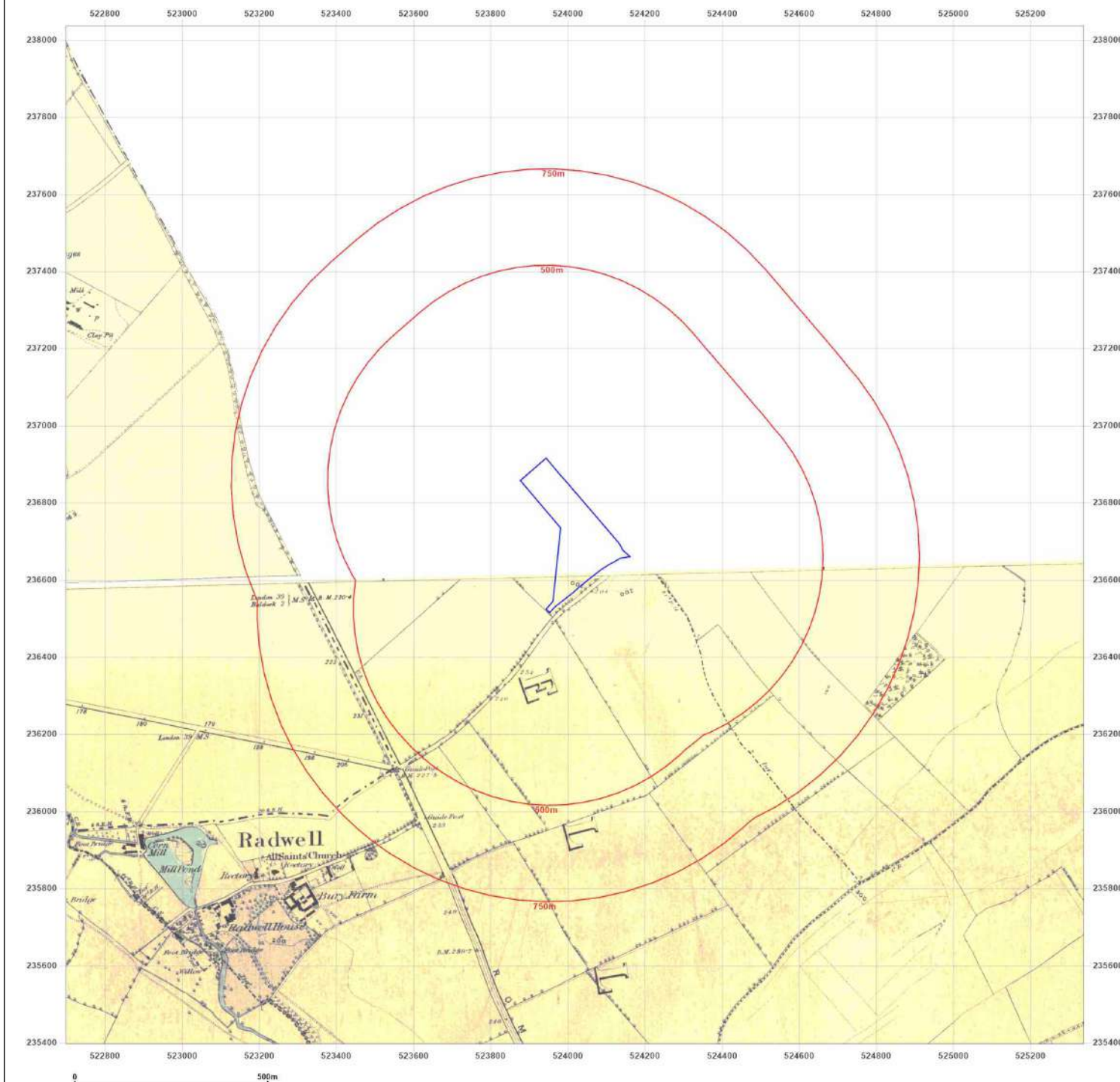


Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

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Production date: 30 January 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

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Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: County Series

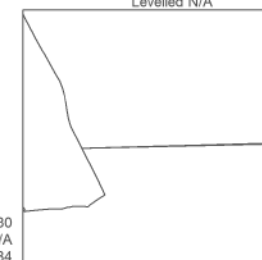
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Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1877
Revised 1877
Edition 1882
Copyright N/A
Levelled N/A



Surveyed 1880
Revised N/A
Edition 1884
Copyright N/A
Levelled N/A

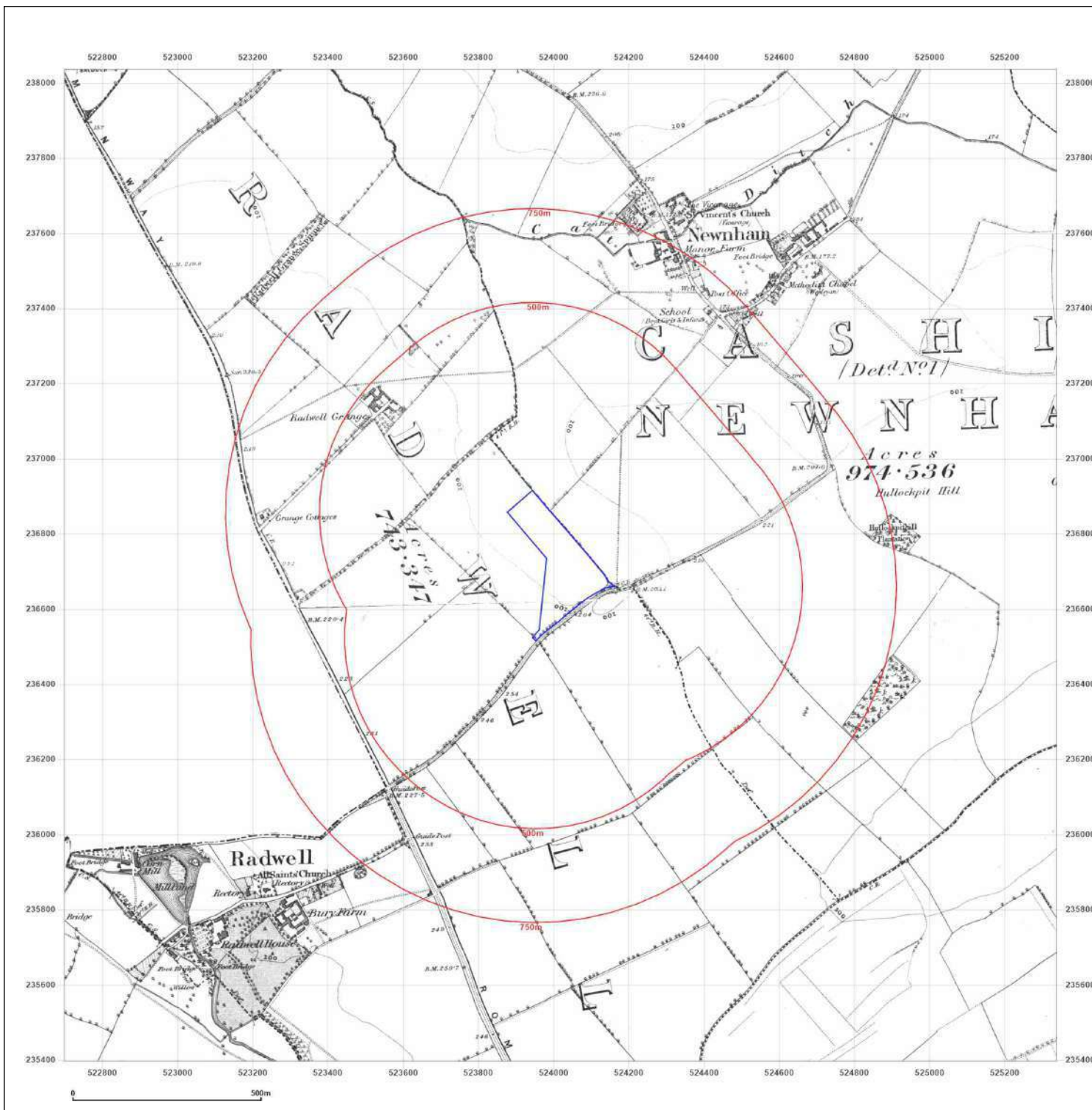


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W: www.groundsure.com

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Production date: 30 January 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:

Radwell Bury Farm (524000,
236716), SG 5TR

Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: County Series

Map date: 1899

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1877
Revised 1899
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1879
Revised 1899
Edition N/A
Copyright N/A
Levelled N/A

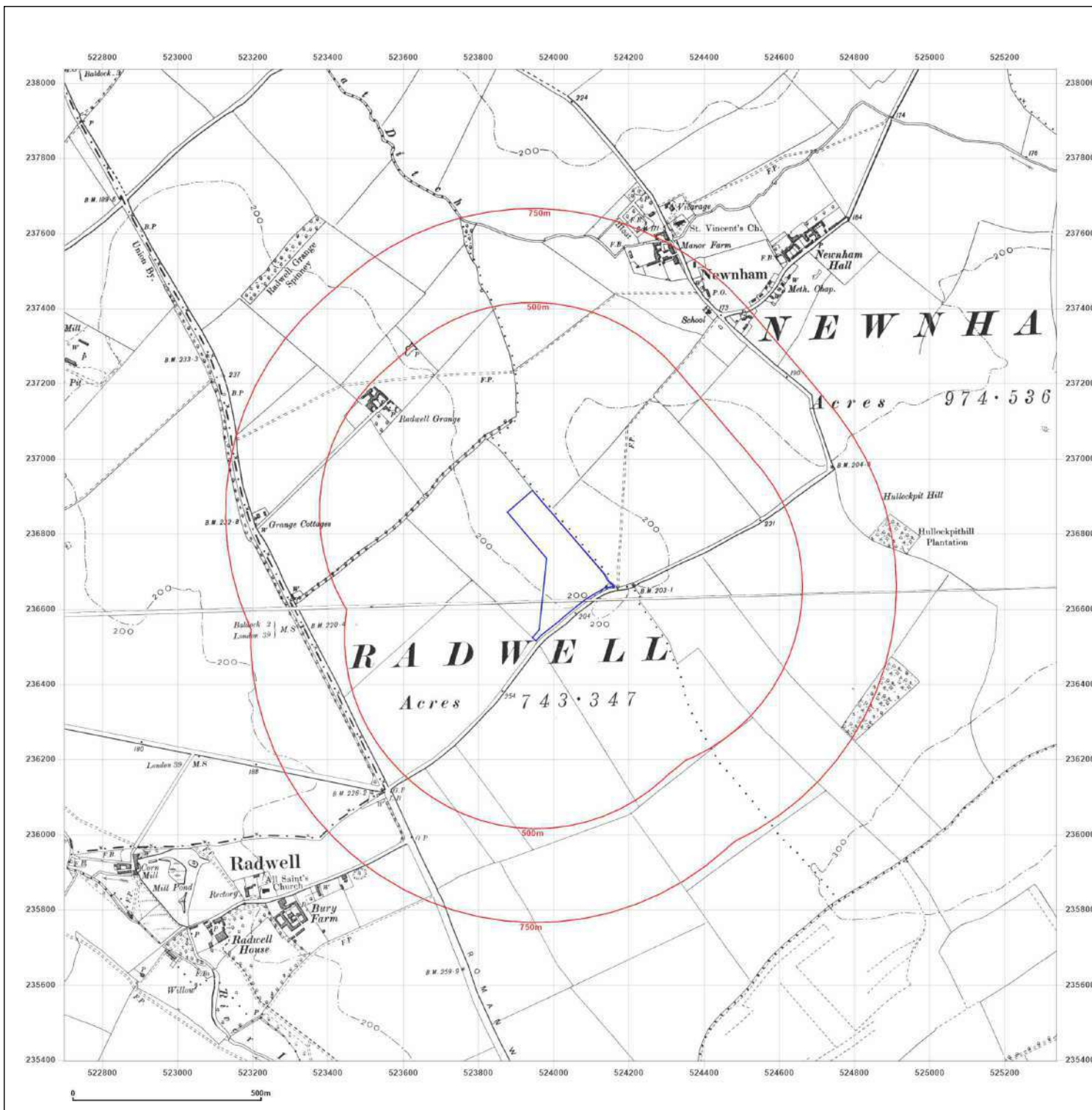


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Production date: 30 January 2024

Map legend available at:
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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: County Series

Map date: 1900

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1881
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1881
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

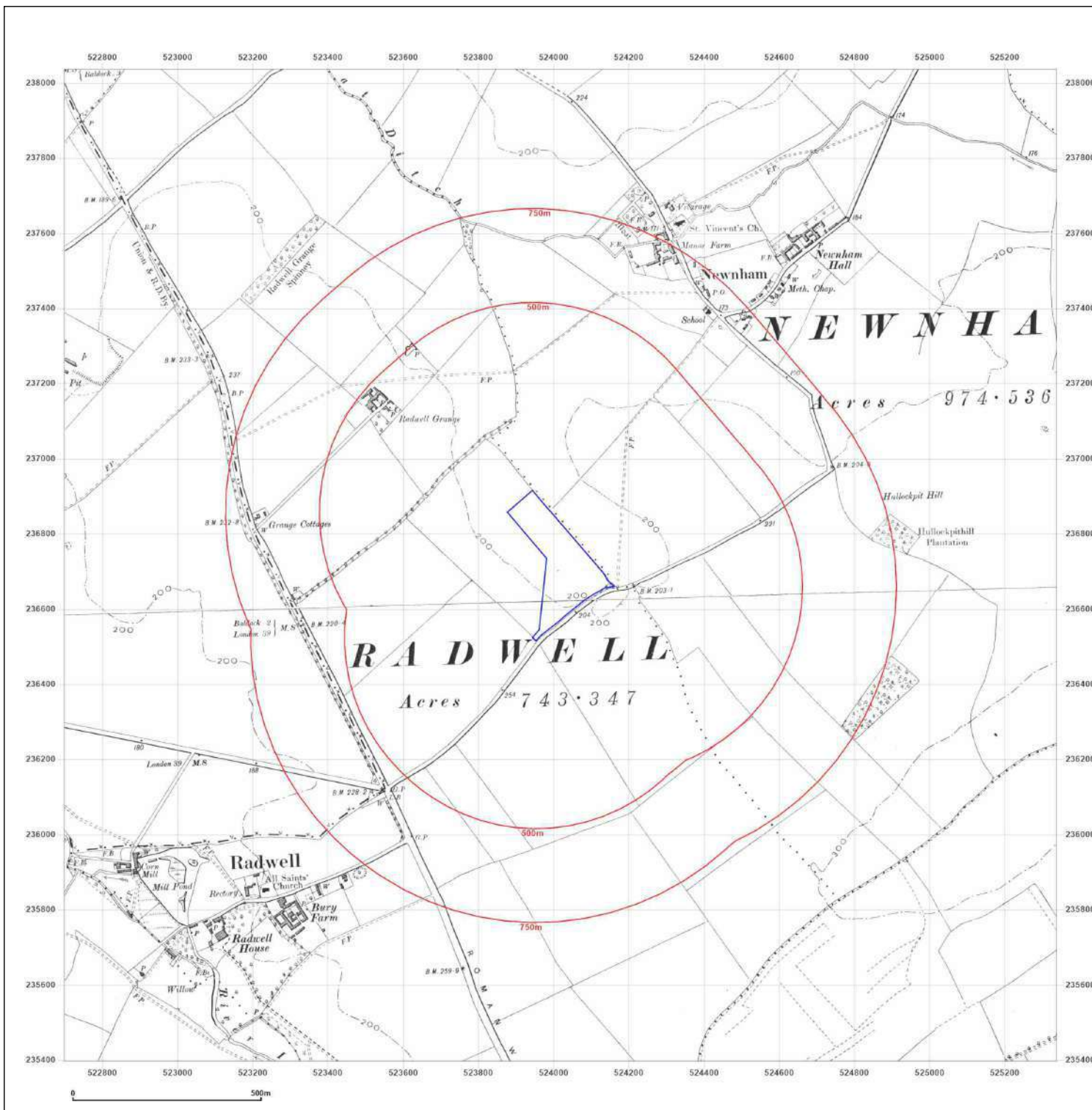


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Production date: 30 January 2024

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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: County Series

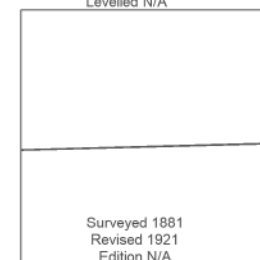
Map date: 1921-1922

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1881
Revised 1922
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1881
Revised 1921
Edition N/A
Copyright N/A
Levelled N/A

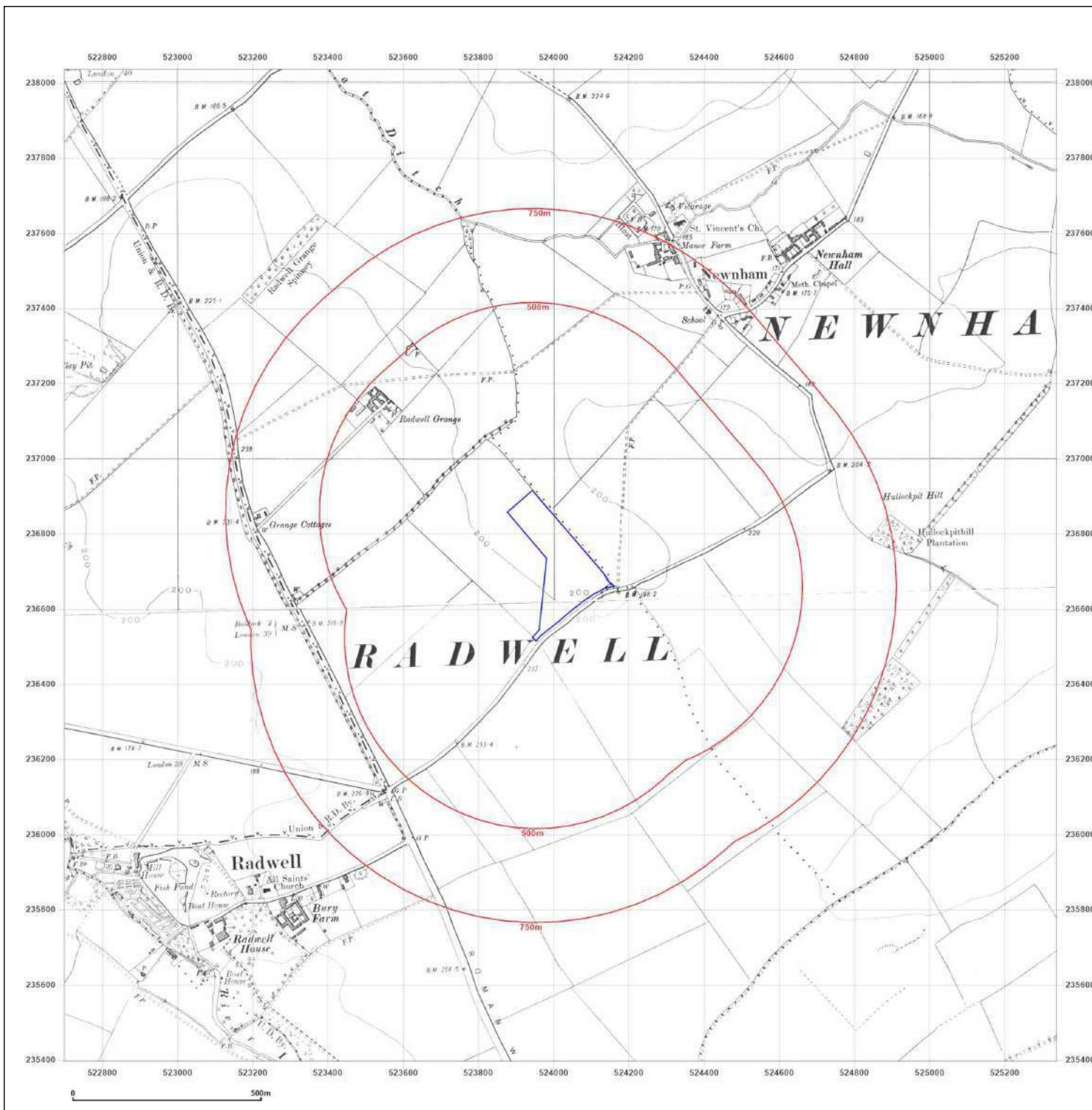


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Production date: 30 January 2024

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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

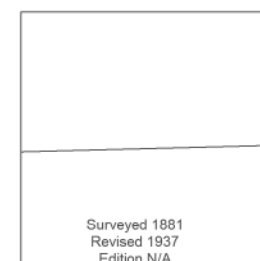
Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: County Series

Map date: 1937

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1881
Revised 1937
Edition N/A
Copyright N/A
Levelled N/A

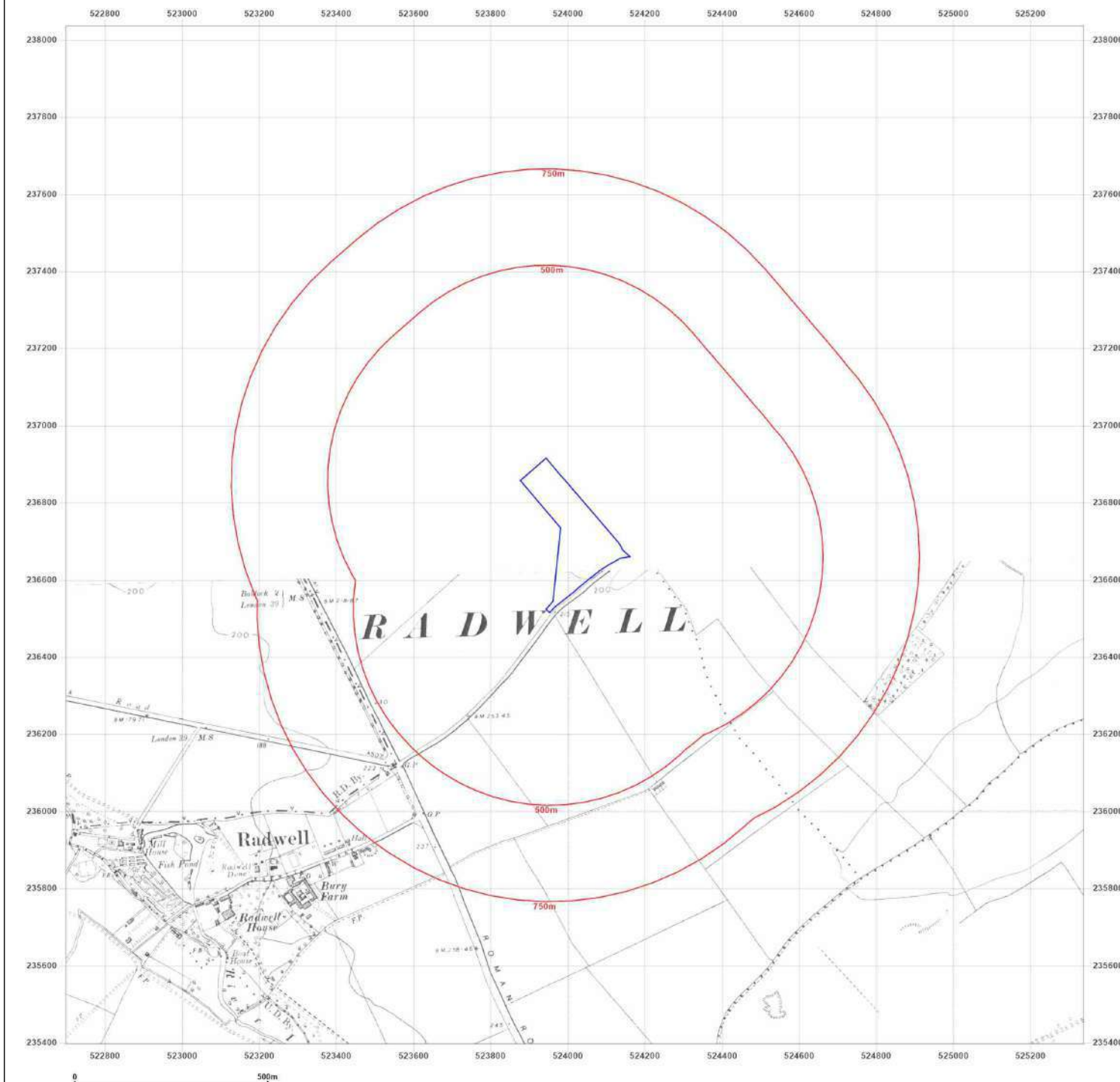


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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

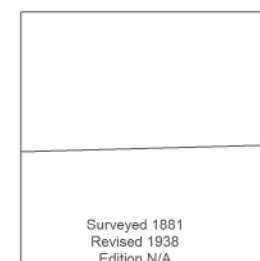
Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1881
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

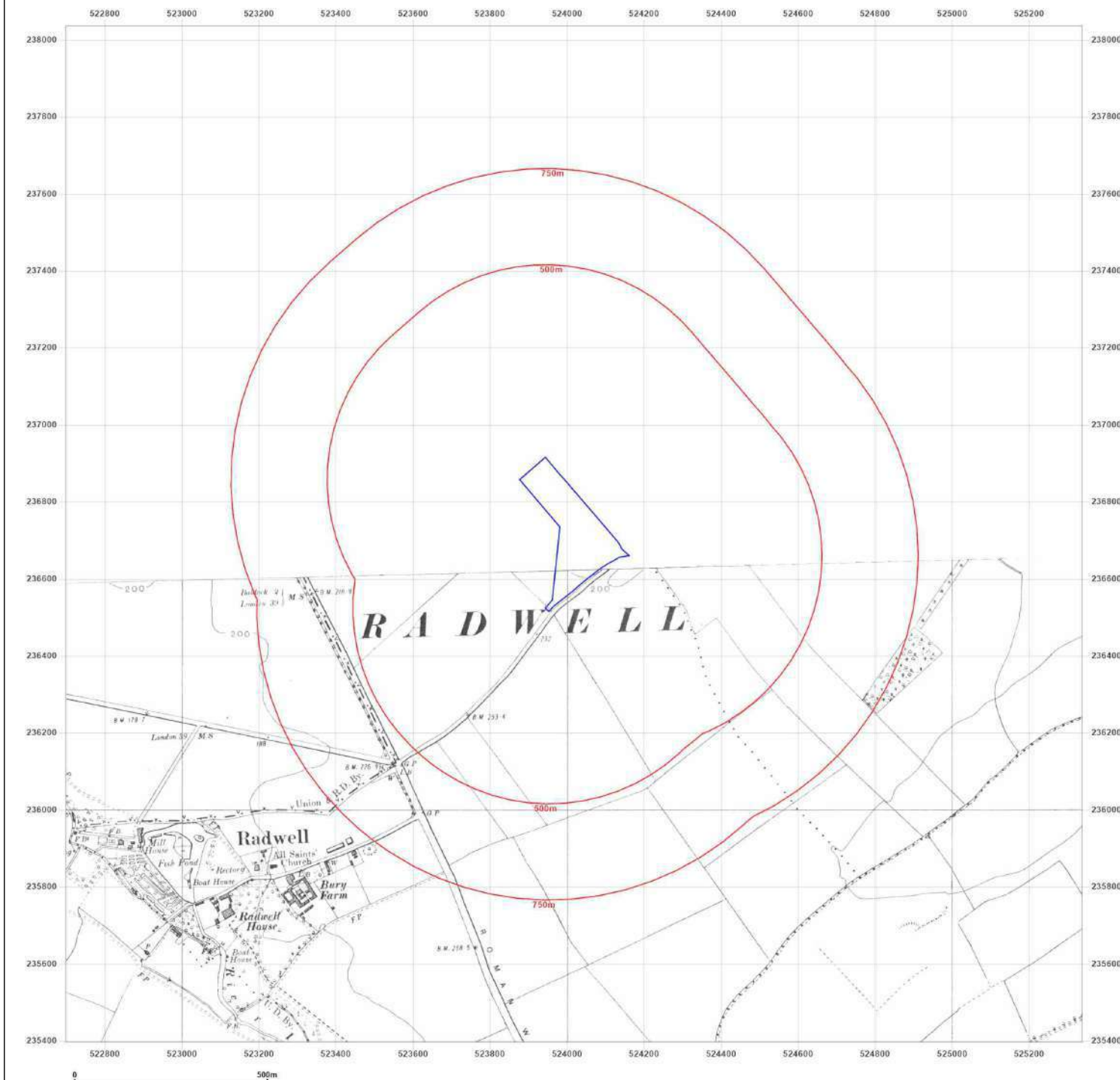


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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: County Series

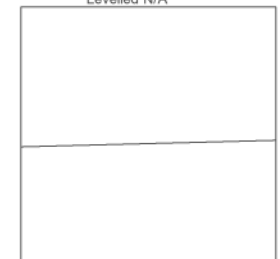
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Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1881
Revised 1948
Edition N/A
Copyright N/A
Levelled N/A

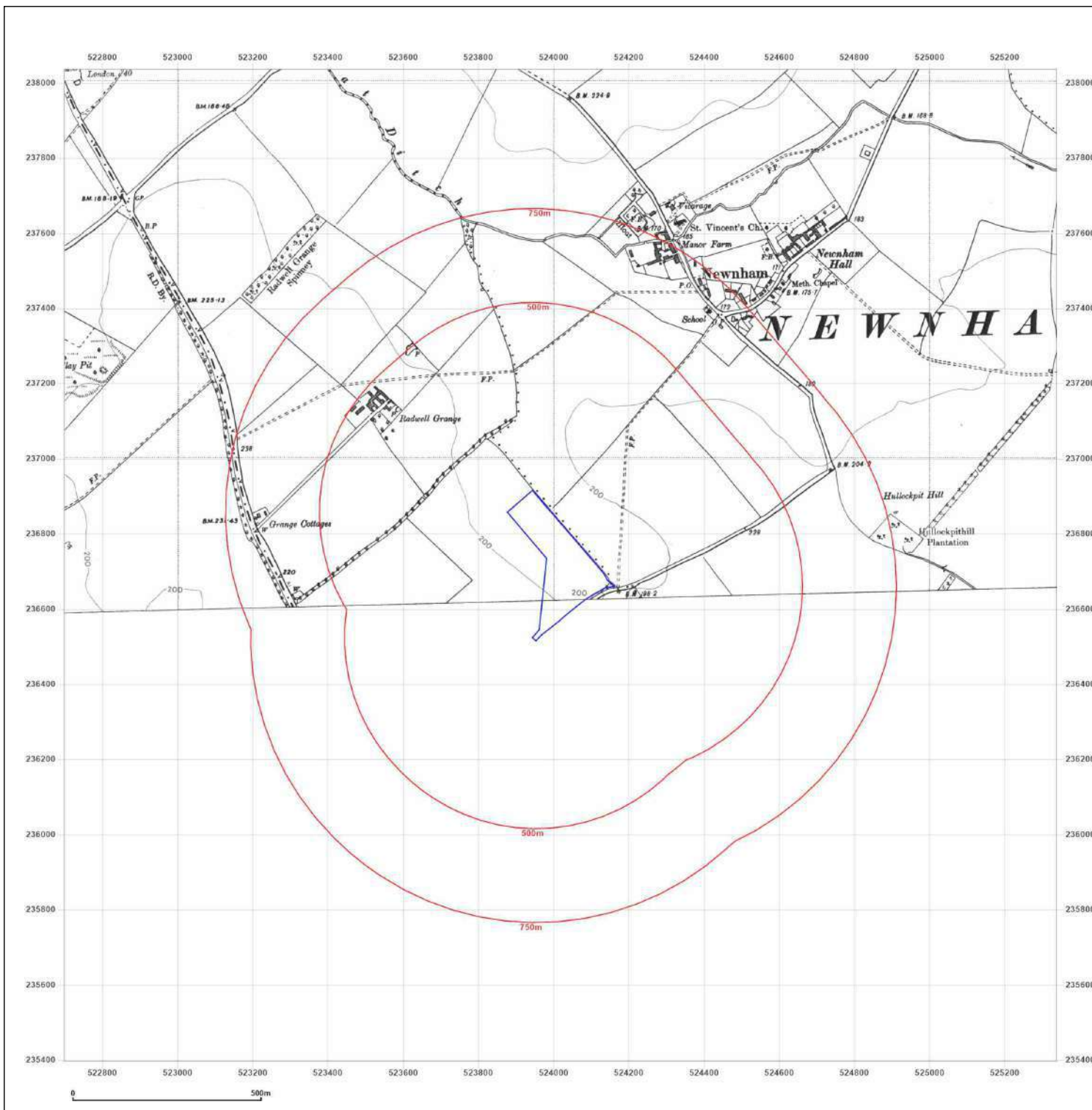


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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: Provisional

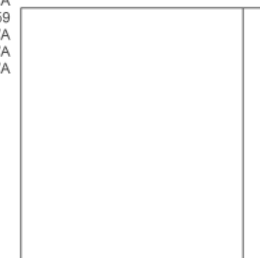
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Scale: 1:10,560

Printed at: 1:10,560



Surveyed N/A
Revised 1959
Edition N/A
Copyright N/A
Levelled N/A

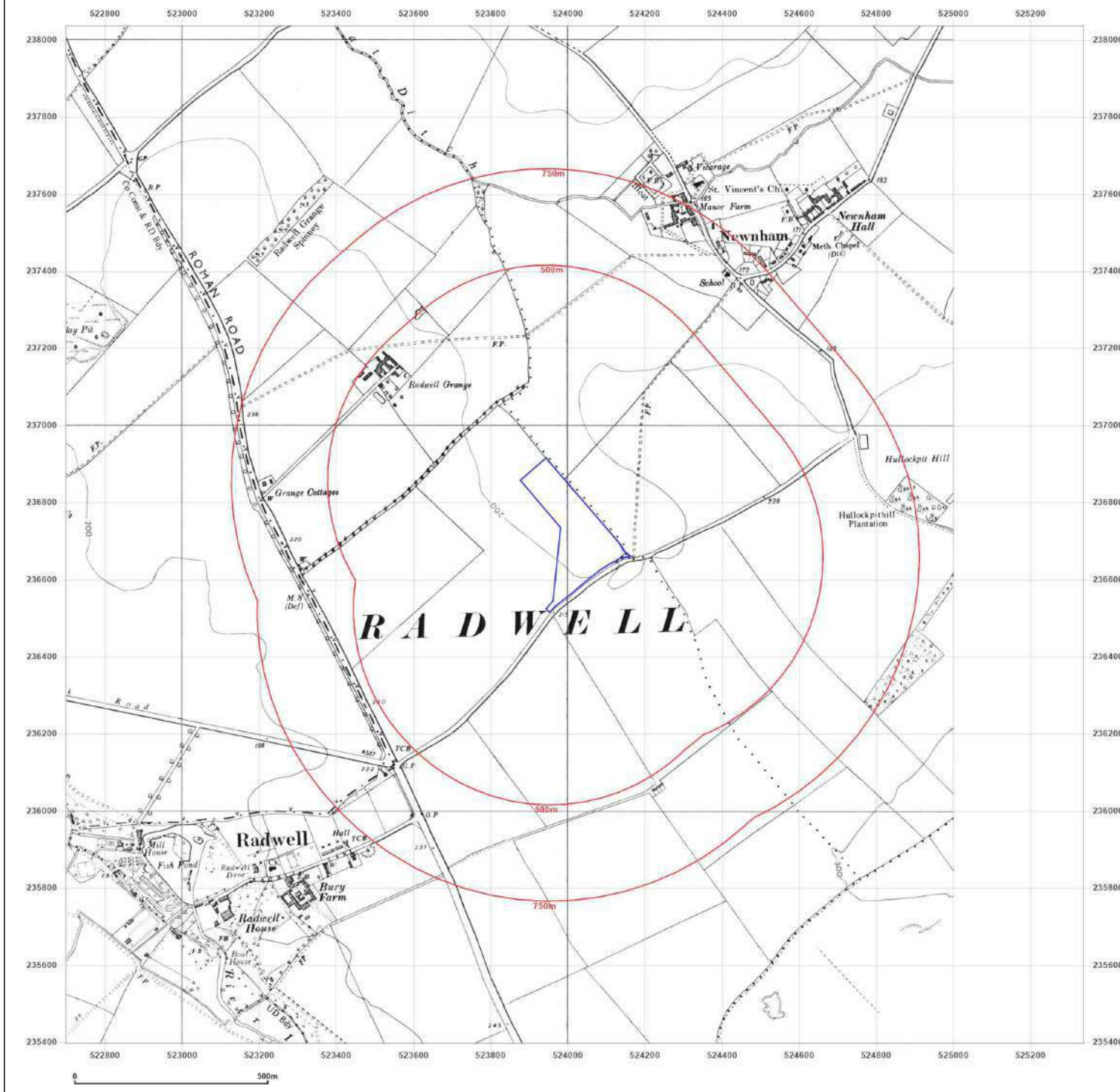


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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: Provisional

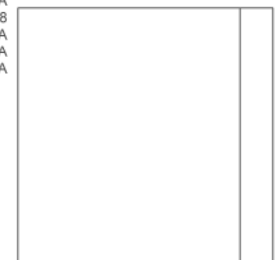
Map date: 1968

Scale: 1:10,560

Printed at: 1:10,560



Surveyed N/A
Revised 1968
Edition N/A
Copyright N/A
Levelled N/A

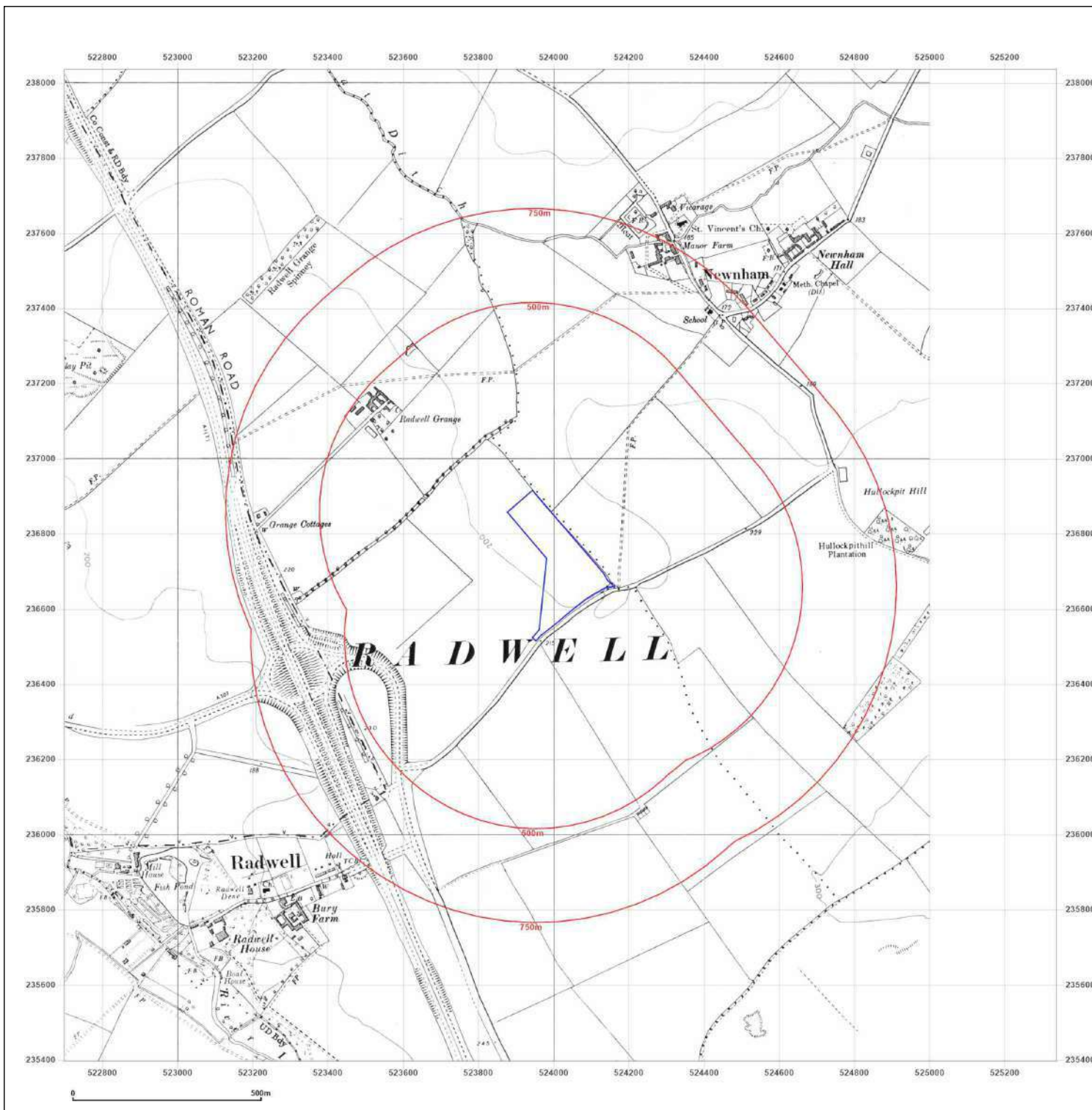


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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569

Report Ref: GS-3D2-J4K-KL4-XYD

Grid Ref: 524018, 236716

Map Name: National Grid

Map date: 1982-1985

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1983
Revised 1985
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1974
Revised 1982
Edition N/A
Copyright N/A
Levelled N/A

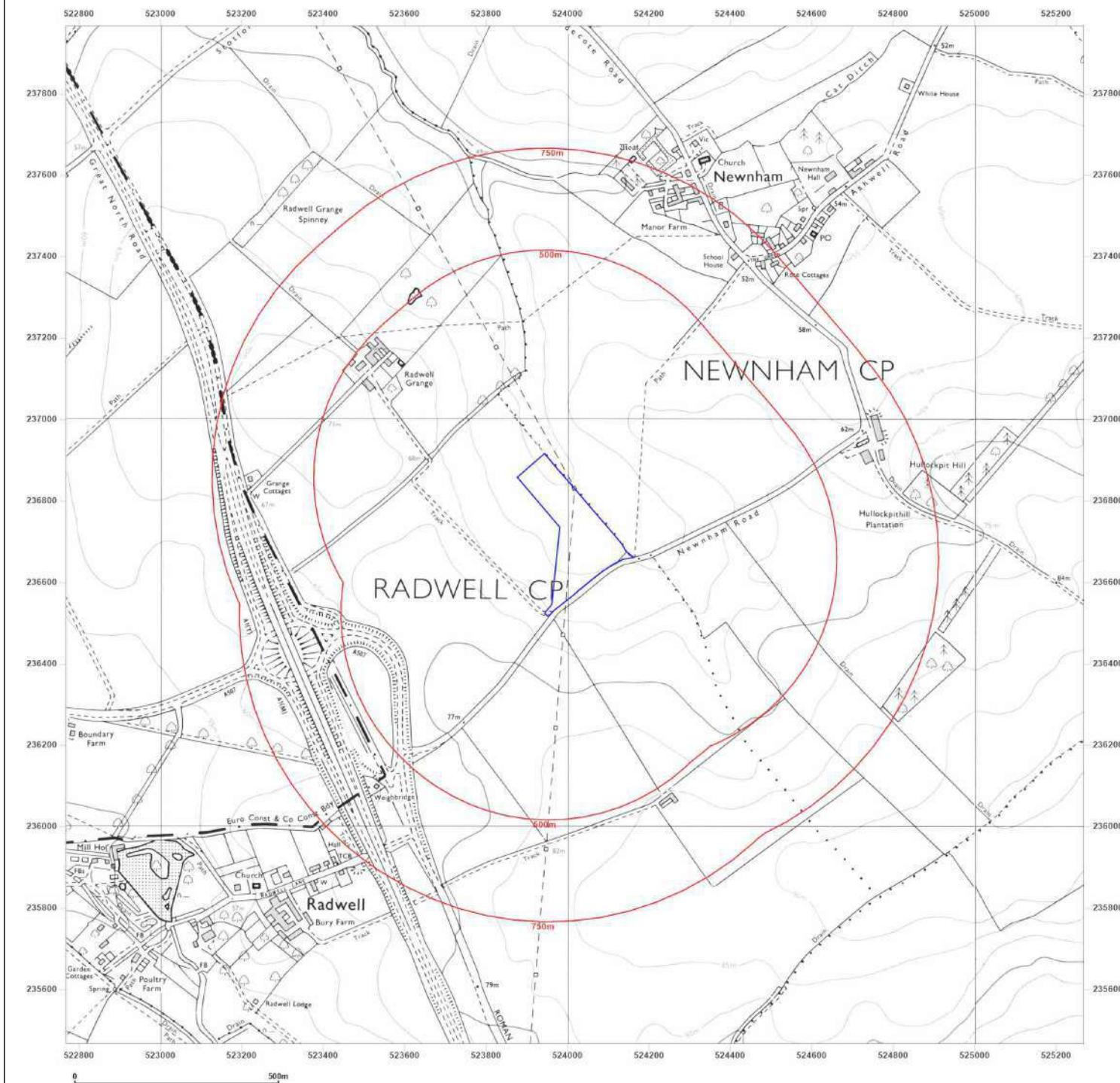


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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000

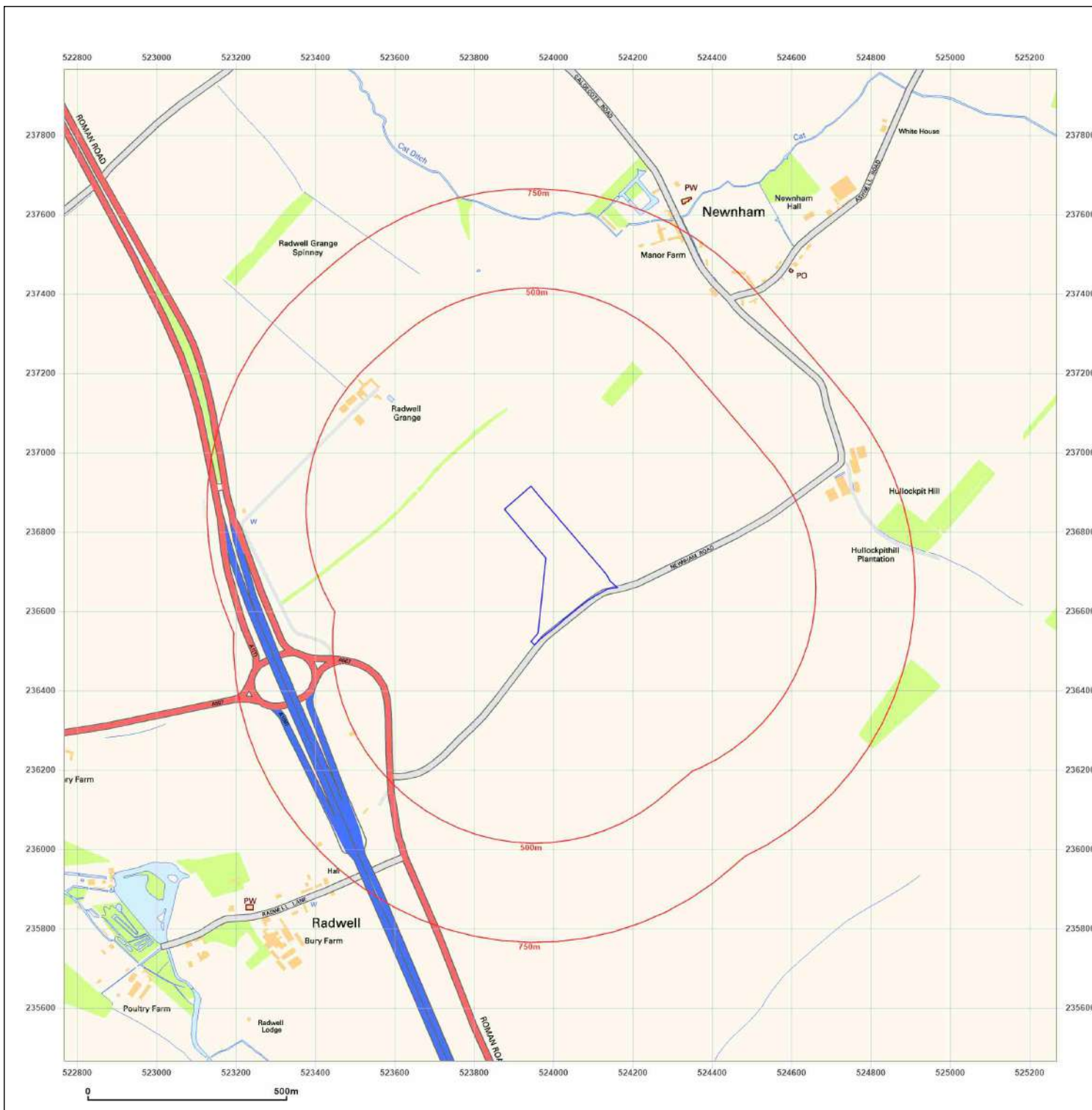


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Production date: 30 January 2024

Map legend available at:
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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000

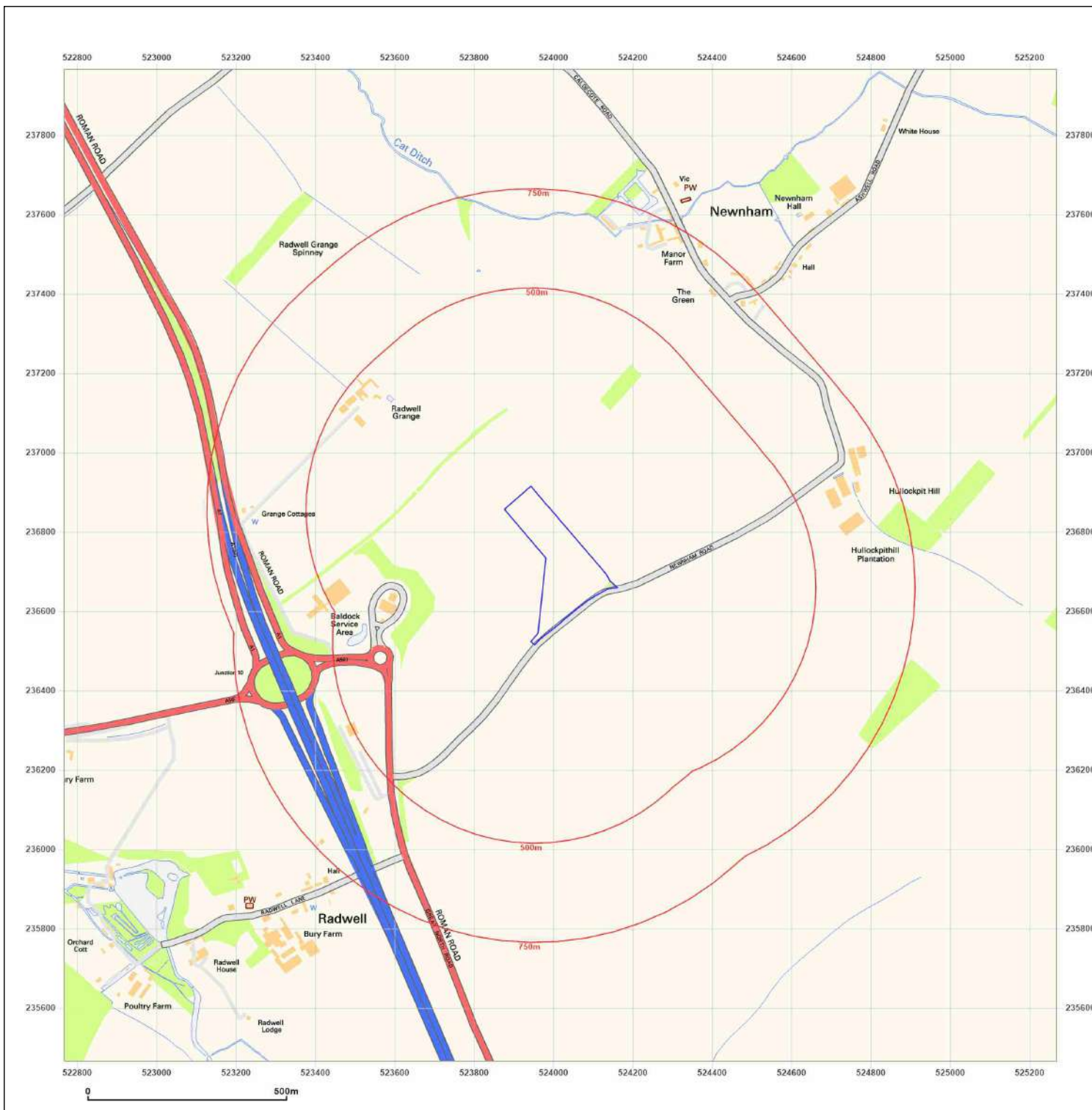


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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

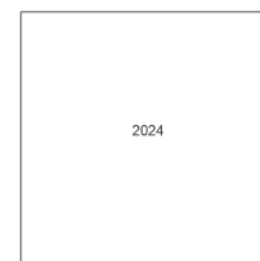
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Report Ref: GS-3D2-J4K-KL4-XYD
Grid Ref: 524018, 236716

Map Name: National Grid

Map date: 2024

Scale: 1:10,000

Printed at: 1:10,000

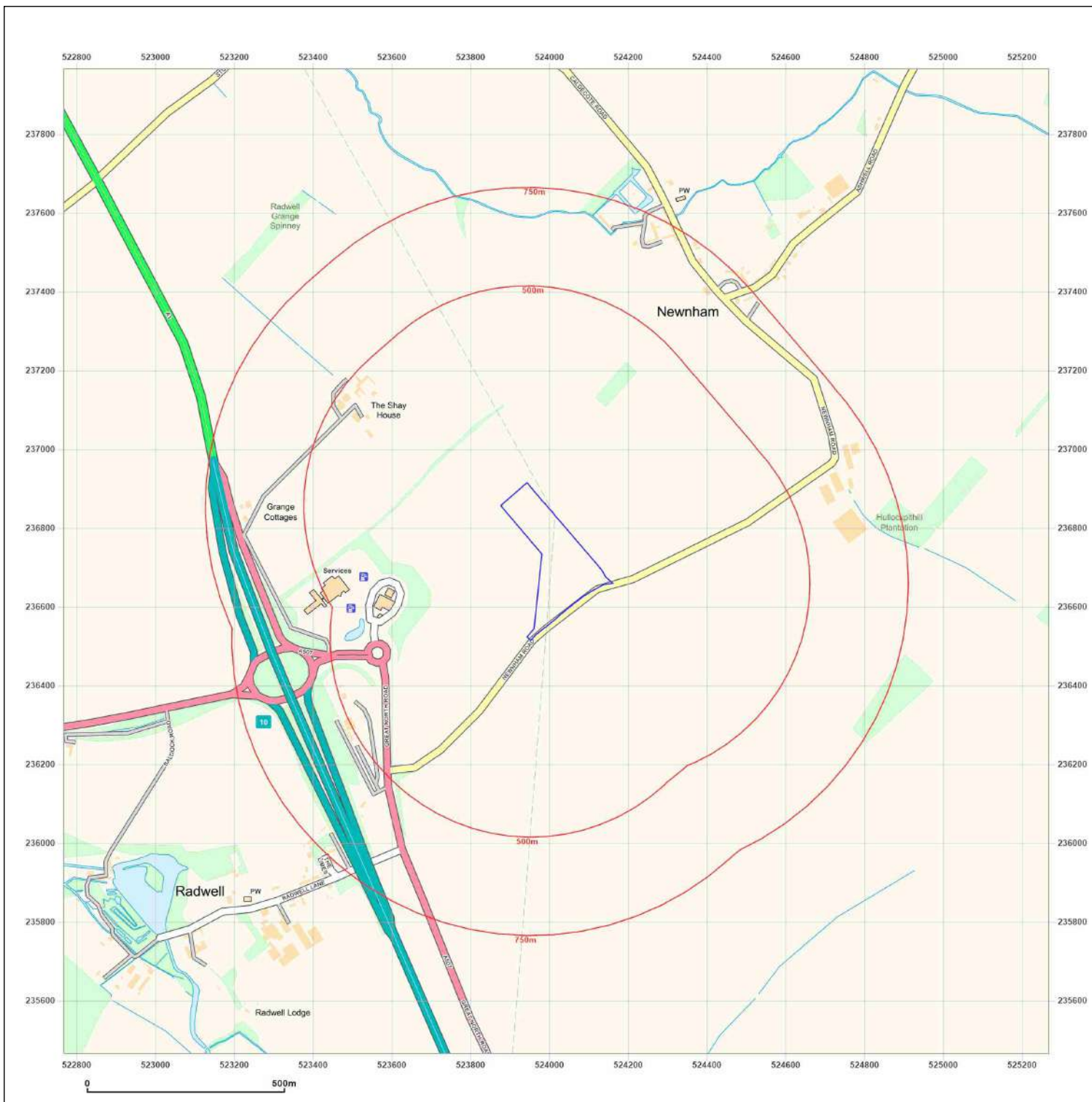


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Site Details:

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Client Ref: Radwell_Bury_Farm_S23-3569

Report Ref: GS-3D2-J4K-KL4-XYD_2500

Grid Ref: 524018, 236715

Map Name: County Series

Map date: 1877

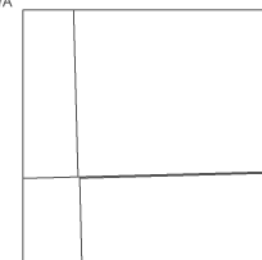
Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A

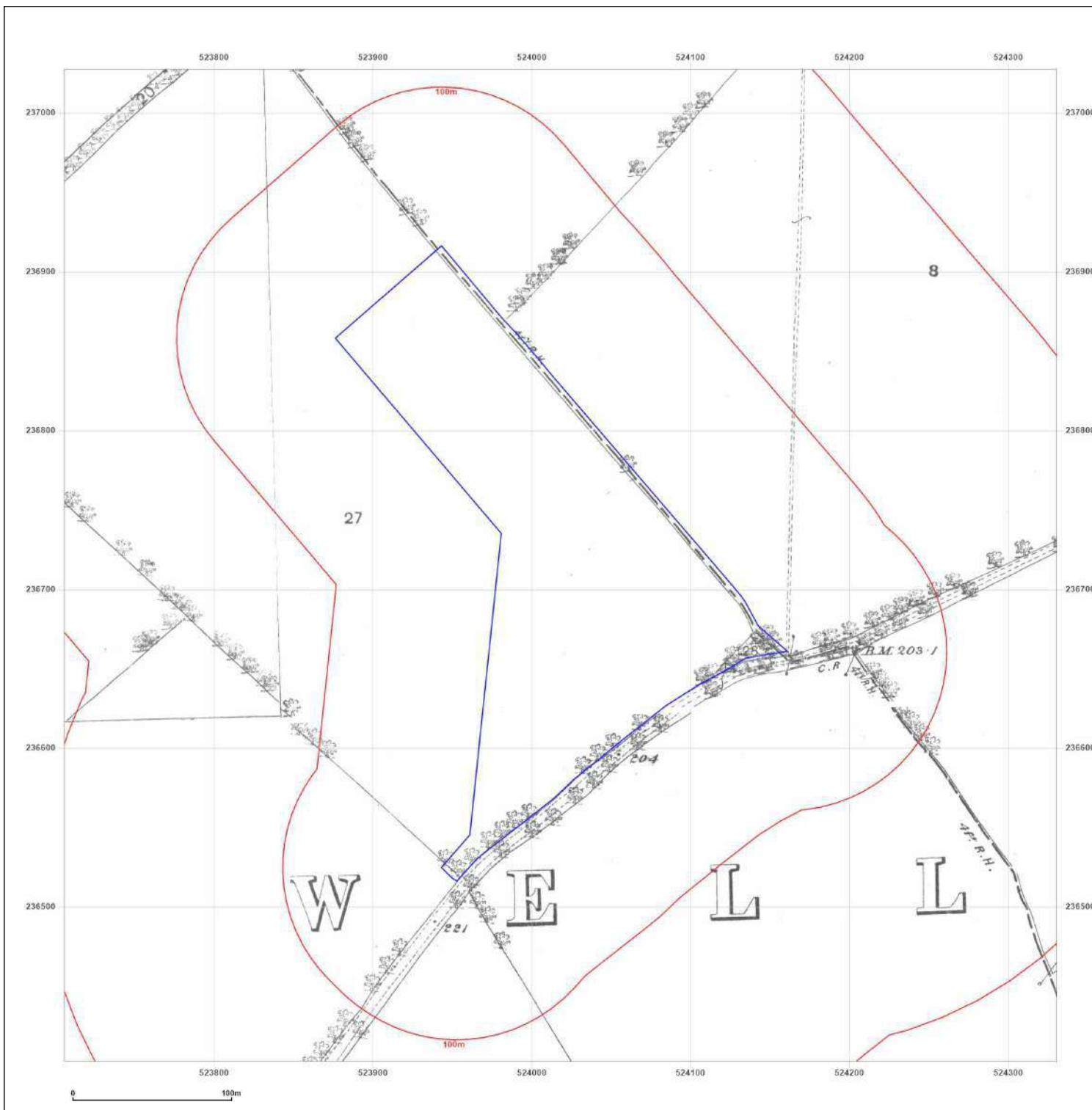


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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569

Report Ref: GS-3D2-J4K-KL4-XYD_2500

Grid Ref: 524018, 236715

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

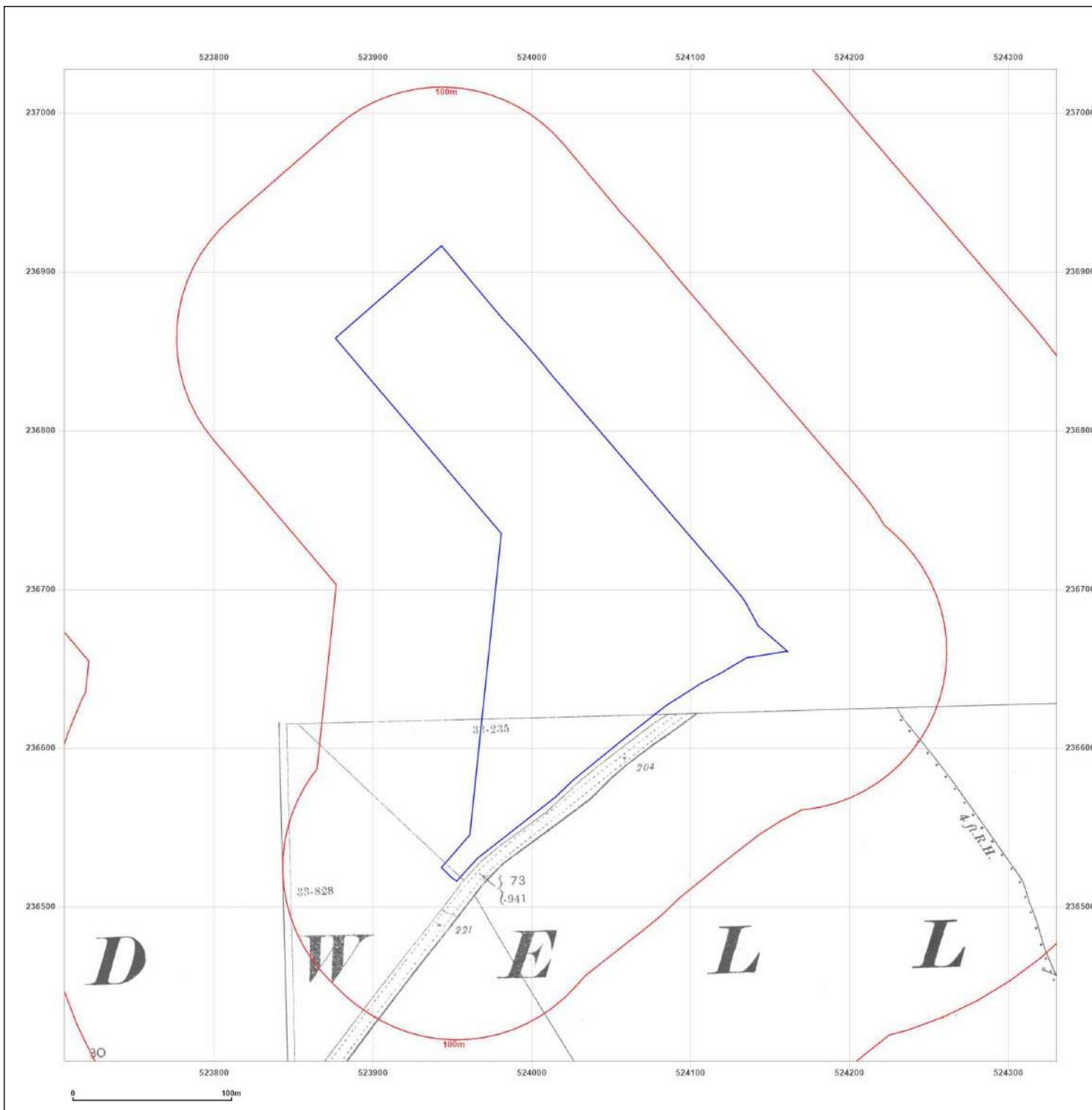


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Production date: 30 January 2024

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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD_2500
Grid Ref: 524018, 236715

Map Name: County Series

Map date: 1898-1901

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

Surveyed 1901
Revised 1901
Edition N/A
Copyright N/A
Levelled N/A

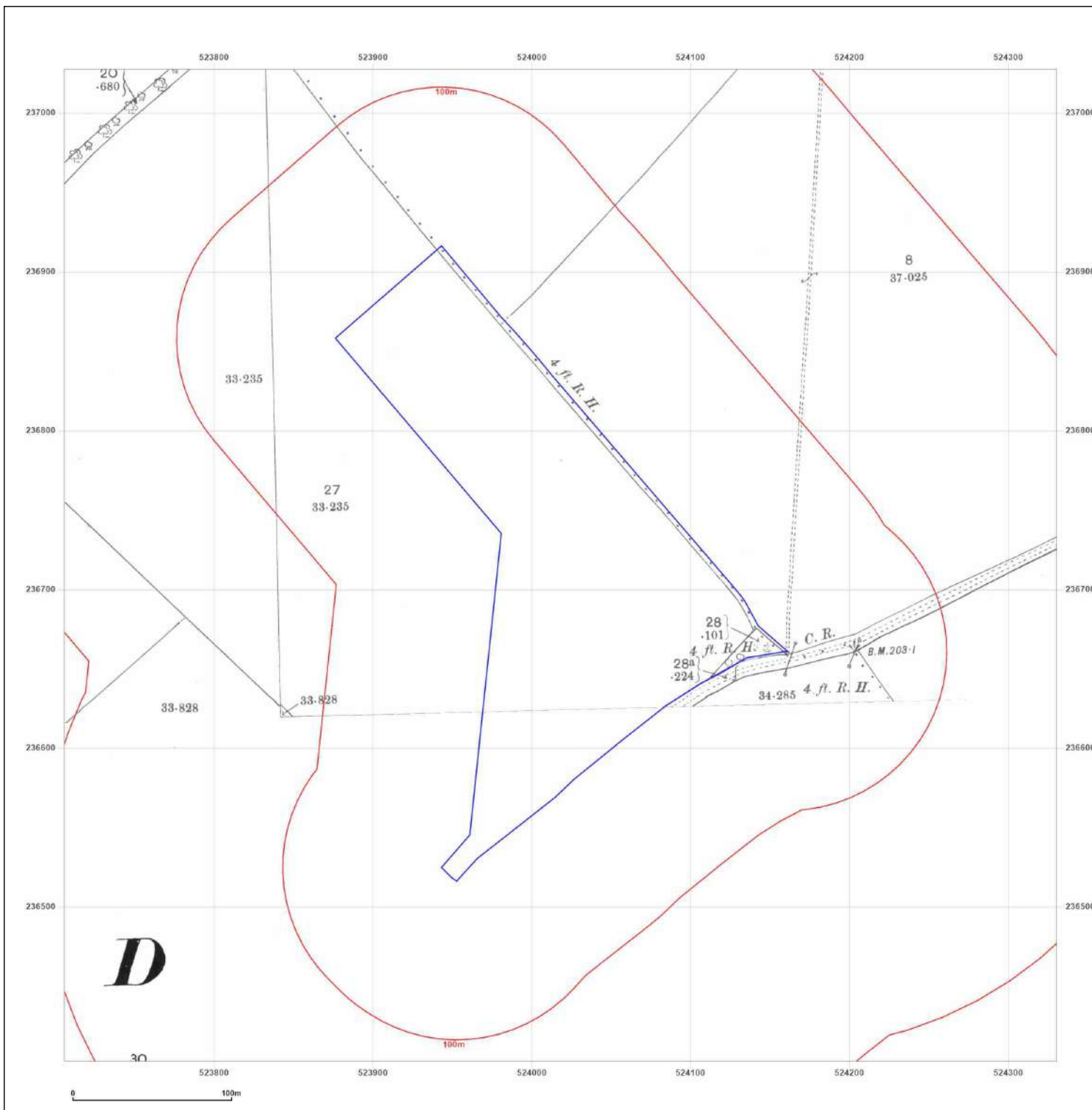


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Production date: 30 January 2024

Map legend available at:
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Site Details:

Radwell Bury Farm (524000,
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Client Ref: Radwell_Bury_Farm_S23-3569

Report Ref: GS-3D2-J4K-KL4-XYD_2500

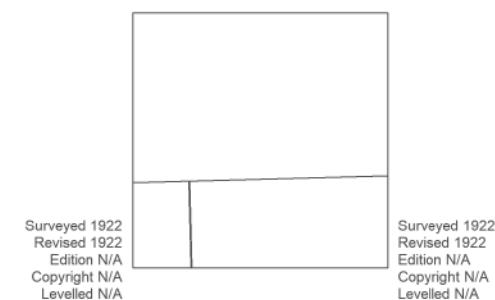
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Map Name: County Series

Map date: 1922

Scale: 1:2,500

Printed at: 1:2,500

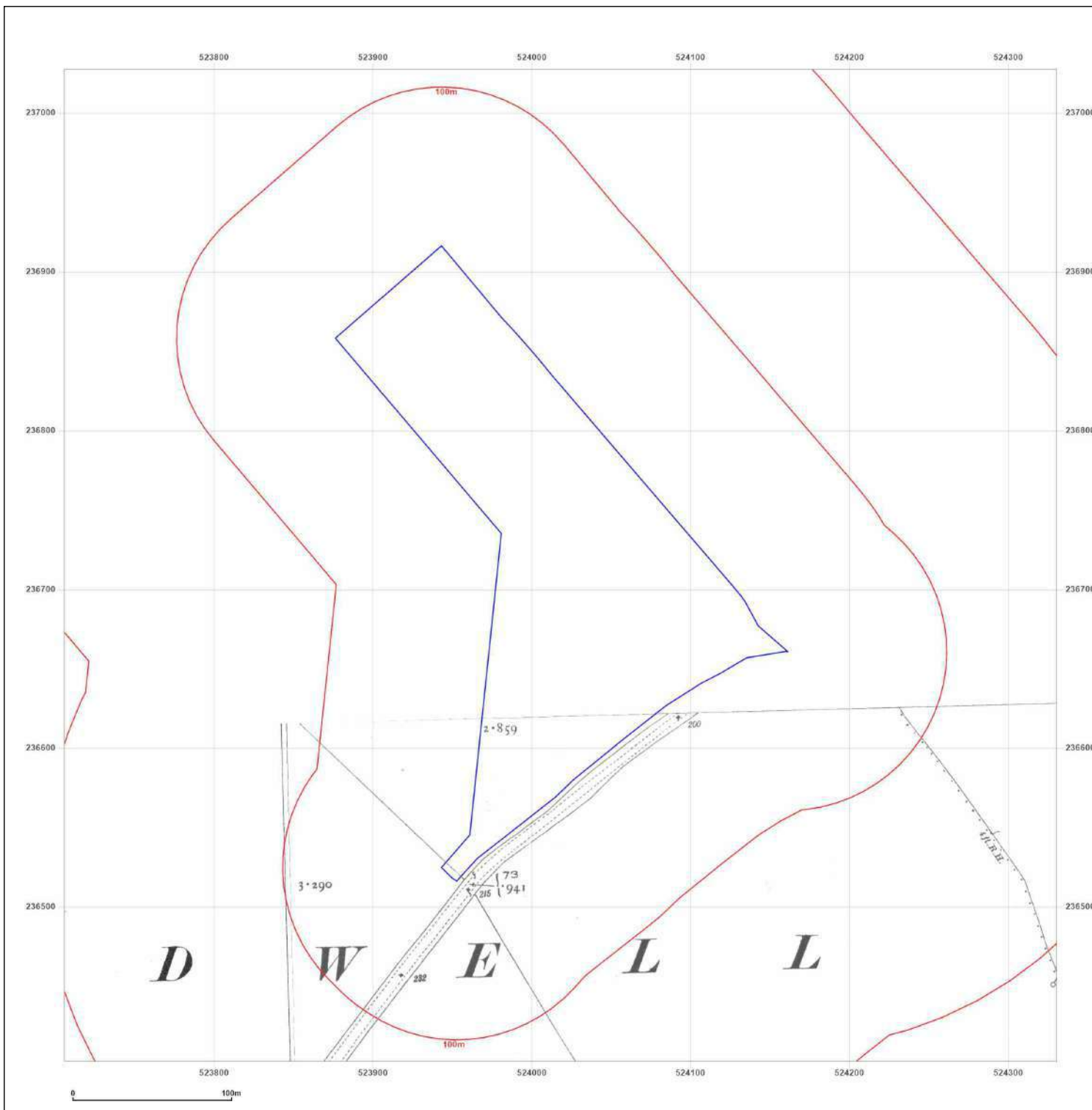


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Production date: 30 January 2024

Map legend available at:
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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569

Report Ref: GS-3D2-J4K-KL4-XYD_2500

Grid Ref: 524018, 236715

Map Name: County Series

Map date: 1924

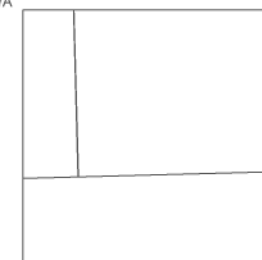
Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1924
Revised 1924
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1924
Revised 1924
Edition N/A
Copyright N/A
Levelled N/A

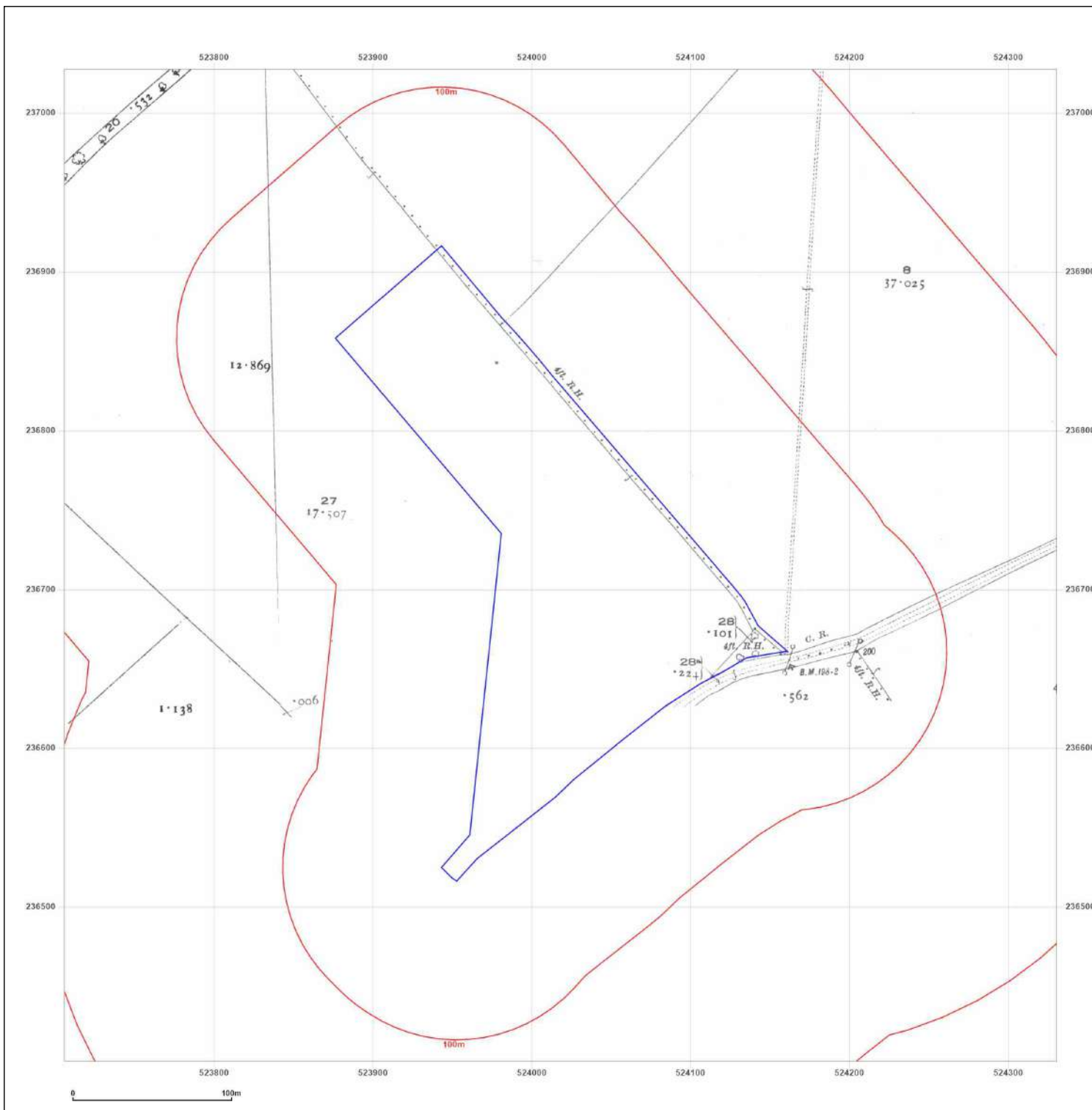


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Production date: 30 January 2024

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Site Details:

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Client Ref: Radwell_Bury_Farm_S23-3569

Report Ref: GS-3D2-J4K-KL4-XYD_2500

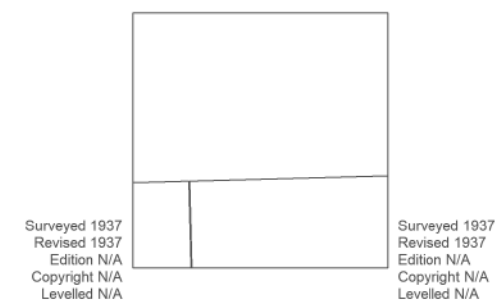
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Map Name: County Series

Map date: 1937

Scale: 1:2,500

Printed at: 1:2,500

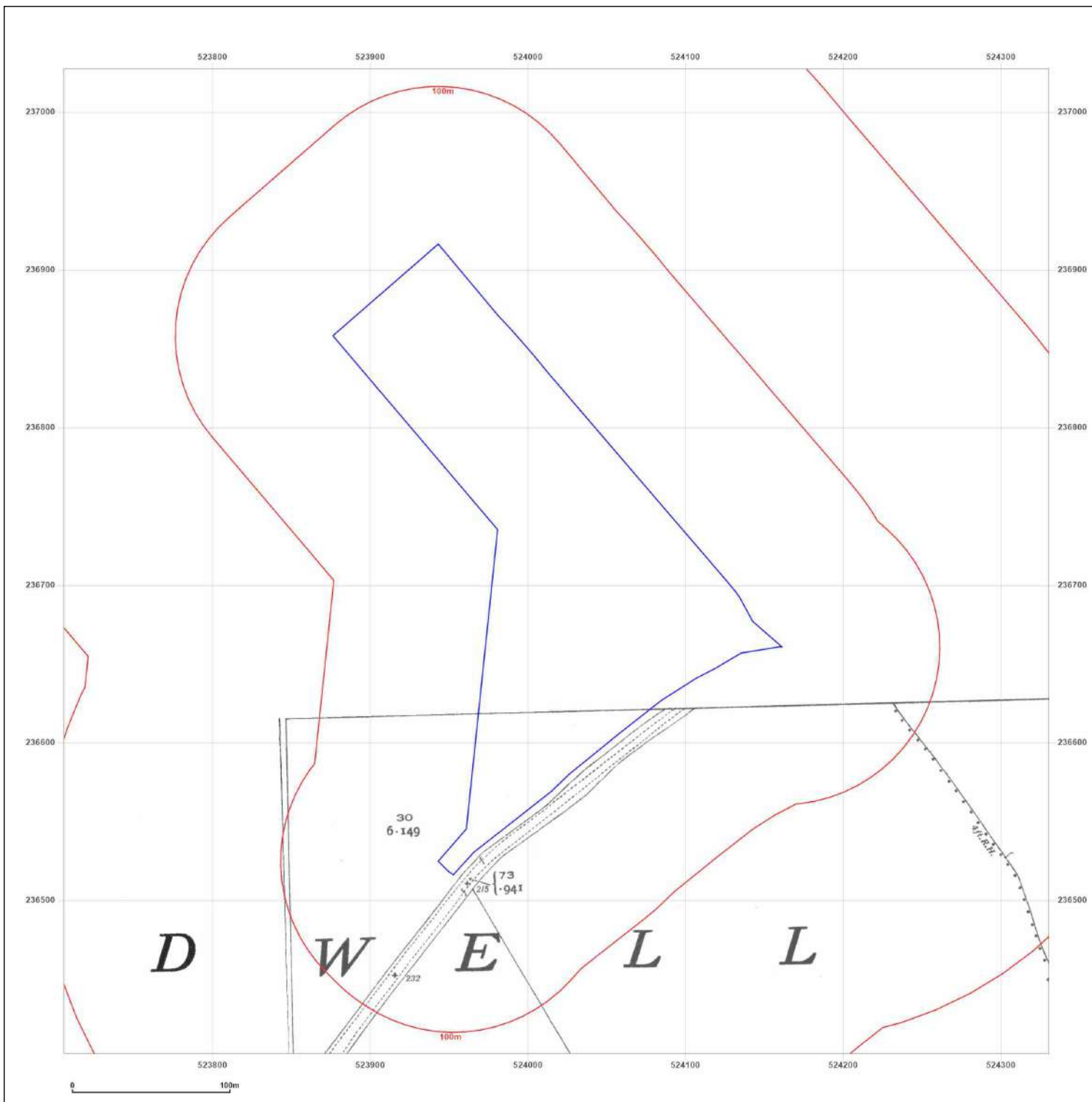


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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569

Report Ref: GS-3D2-J4K-KL4-XYD_2500

Grid Ref: 524018, 236715

Map Name: National Grid

Map date: 1967

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1967
Revised 1967
Edition N/A
Copyright 1968
Levelled 1964

Surveyed 1967
Revised 1967
Edition N/A
Copyright 1969
Levelled 1964

Surveyed 1967
Revised 1967
Edition N/A
Copyright 1968
Levelled 1964

Surveyed 1967
Revised 1967
Edition N/A
Copyright 1969
Levelled 1964

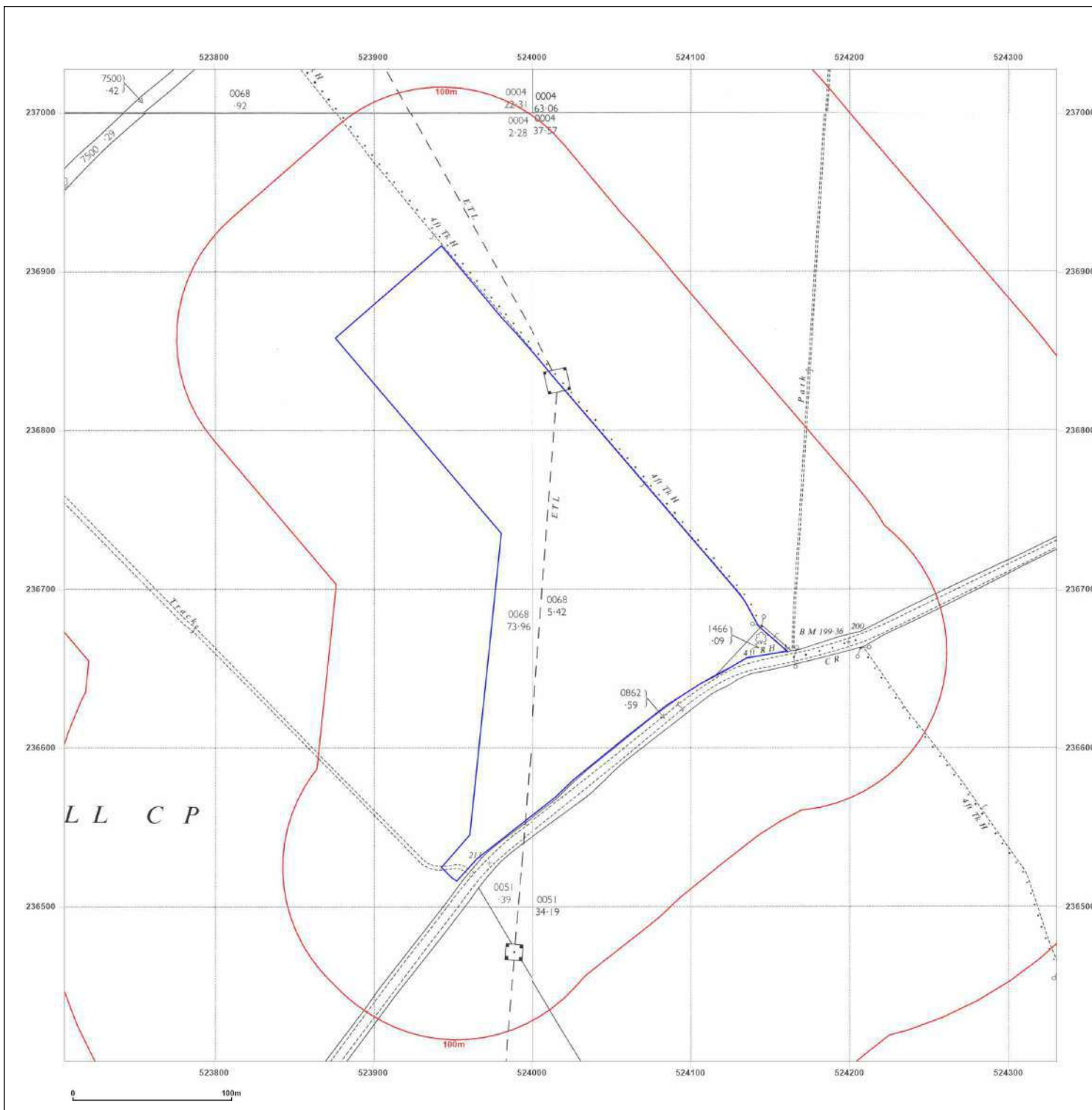


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Production date: 30 January 2024

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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD_2500
Grid Ref: 524018, 236715

Map Name: National Grid

Map date: 1968-1969

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
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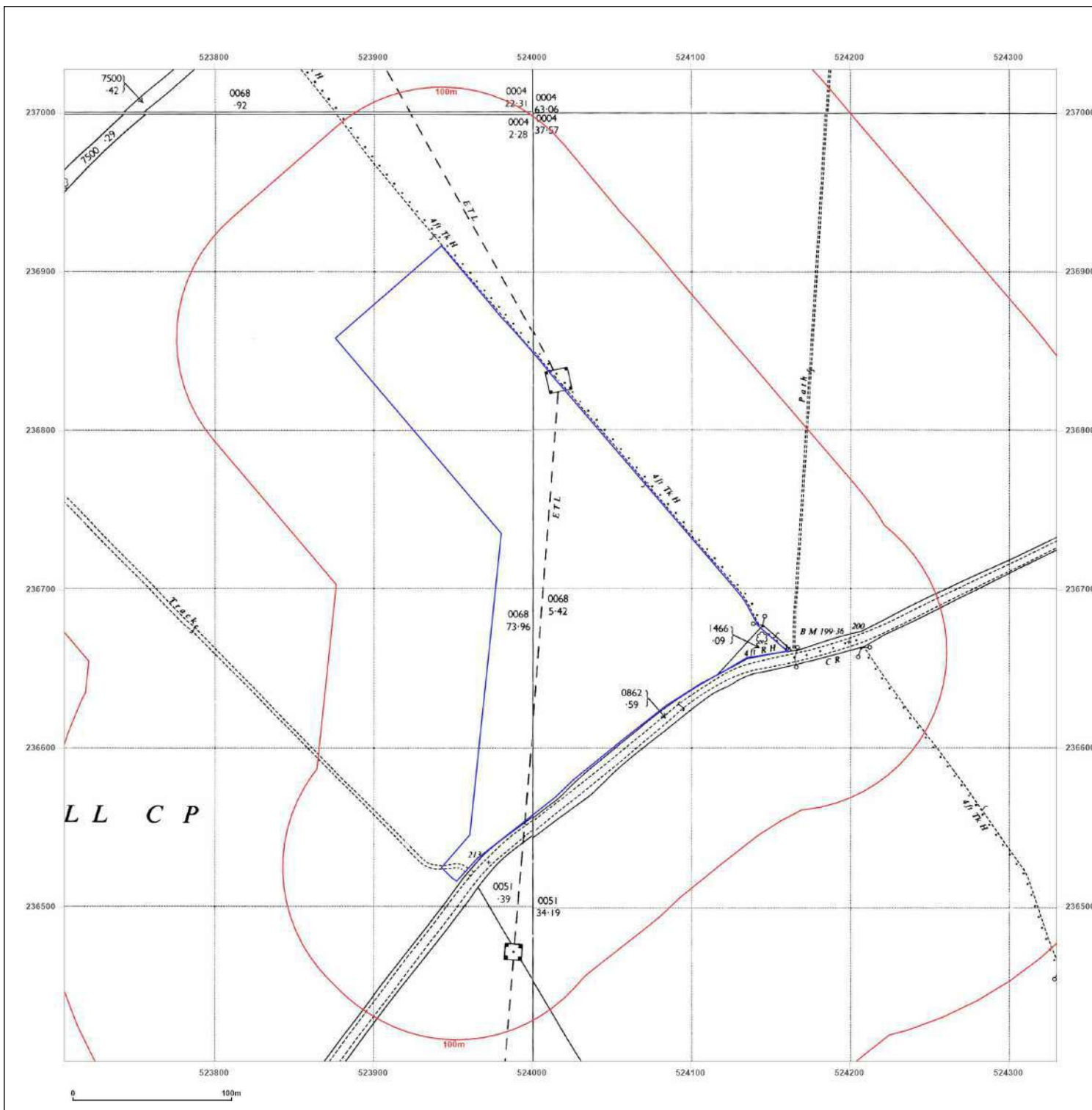


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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569
Report Ref: GS-3D2-J4K-KL4-XYD_2500
Grid Ref: 524018, 236715

Map Name: National Grid

Map date: 1973

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1973
Revised 1973
Edition N/A
Copyright 1974
Levelled 1972

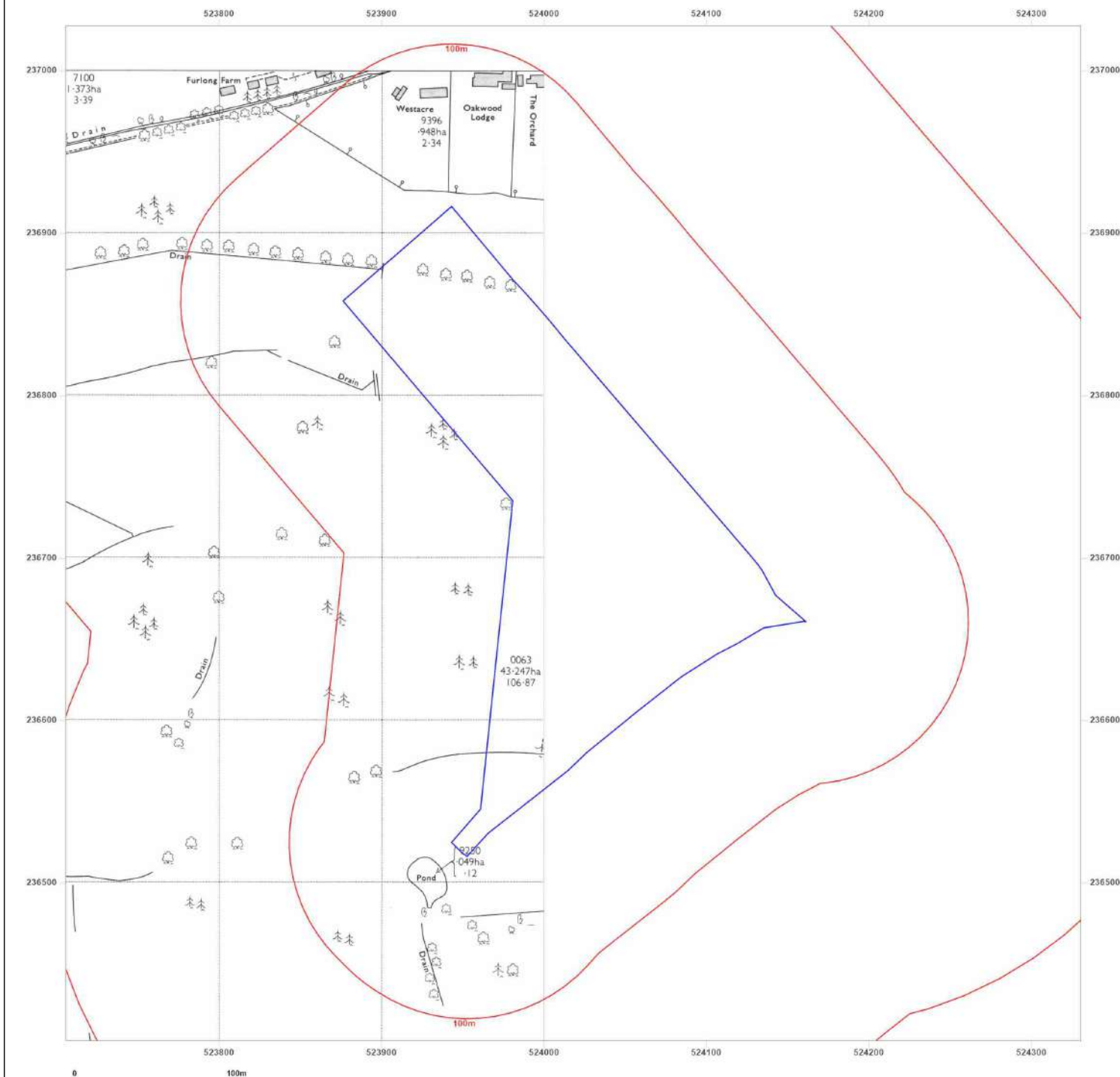


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Production date: 30 January 2024

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Site Details:

Radwell Bury Farm (524000,
236716), SG7 5TR

Client Ref: Radwell_Bury_Farm_S23-3569

Report Ref: GS-3D2-J4K-KL4-XYD_2500

Grid Ref: 524018, 236715

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1993
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1993
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
Revised N/A
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Copyright 1993
Levelled N/A

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Revised N/A
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Copyright 1993
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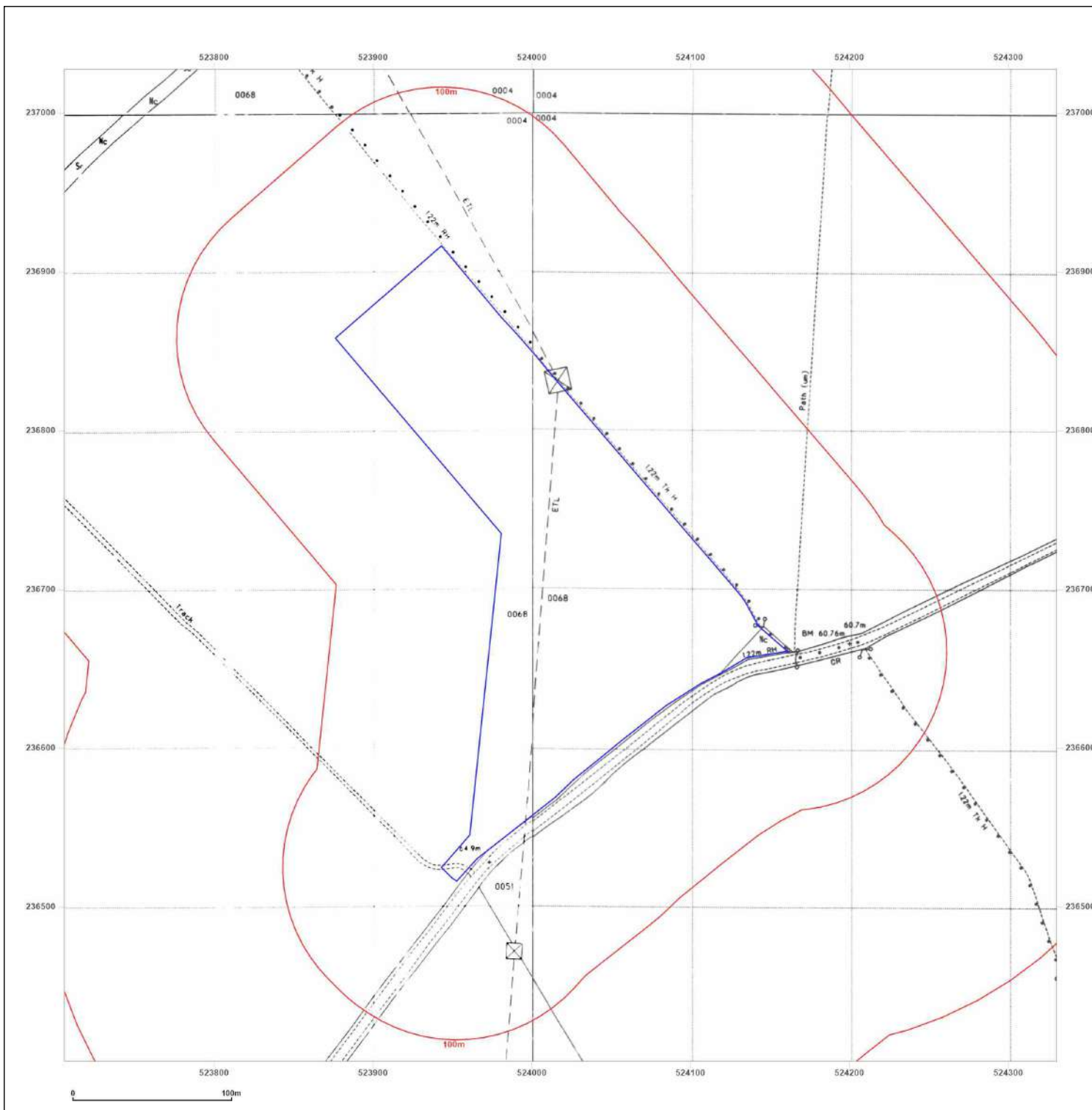


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APPENDIX 5 – GROUNDSURE REPORT

Radwell Bury Farm (524000, 236716), SG7 5TR

Order Details

Date: 30/01/2024
Your ref: Radwell_Bury_Farm_S23-3569
Our Ref: GS-WGF-QKR-9LP-AR5

Site Details

Location: 524048 236624
Area: 4.0 ha
Authority: [North Hertfordshire District Council](#) ↗



Summary of findings

[p. 2](#) >

Aerial image

[p. 9](#) >

OS MasterMap site plan

[p.14](#) >

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Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
15 >	1.1 >	Historical industrial land uses >	0	0	0	1	-
16	1.2	Historical tanks	0	0	0	0	-
16	1.3	Historical energy features	0	0	0	0	-
16	1.4	Historical petrol stations	0	0	0	0	-
16	1.5	Historical garages	0	0	0	0	-
17	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped >	On site	0-50m	50-250m	250-500m	500-2000m
18 >	2.1 >	Historical industrial land uses >	0	0	0	2	-
19	2.2	Historical tanks	0	0	0	0	-
19	2.3	Historical energy features	0	0	0	0	-
19	2.4	Historical petrol stations	0	0	0	0	-
19	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
20	3.1	Active or recent landfill	0	0	0	0	-
20	3.2	Historical landfill (BGS records)	0	0	0	0	-
21	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
21	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
21	3.5	Historical waste sites	0	0	0	0	-
21	3.6	Licensed waste sites	0	0	0	0	-
21 >	3.7 >	Waste exemptions >	0	0	0	7	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
23 >	4.1 >	Recent industrial land uses >	0	1	1	-	-
24 >	4.2 >	Current or recent petrol stations >	0	0	0	1	-
24	4.3	Electricity cables	0	0	0	0	-
24	4.4	Gas pipelines	0	0	0	0	-
24	4.5	Sites determined as Contaminated Land	0	0	0	0	-



24	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
25	4.7	Regulated explosive sites	0	0	0	0	-
25	4.8	Hazardous substance storage/usage	0	0	0	0	-
25	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
25	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
25 >	4.11 >	<u>Licensed pollutant release (Part A(2)/B) ></u>	0	0	0	1	-
26	4.12	Radioactive Substance Authorisations	0	0	0	0	-
26	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
26	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
26	4.15	Pollutant release to public sewer	0	0	0	0	-
27	4.16	List 1 Dangerous Substances	0	0	0	0	-
27 >	4.17 >	<u>List 2 Dangerous Substances ></u>	0	0	0	1	-
27	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
27	4.19	Pollution inventory substances	0	0	0	0	-
28	4.20	Pollution inventory waste transfers	0	0	0	0	-
28	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	<u>Hydrogeology ></u>	On site	0-50m	50-250m	250-500m	500-2000m
29 >	5.1 >	<u>Superficial aquifer ></u>	Identified (within 500m)				
31 >	5.2 >	<u>Bedrock aquifer ></u>	Identified (within 500m)				
32 >	5.3 >	<u>Groundwater vulnerability ></u>	Identified (within 50m)				
33 >	5.4 >	<u>Groundwater vulnerability- soluble rock risk ></u>	Identified (within 0m)				
34	5.5	Groundwater vulnerability- local information	None (within 0m)				
35 >	5.6 >	<u>Groundwater abstractions ></u>	0	0	0	0	10
38 >	5.7 >	<u>Surface water abstractions ></u>	0	0	0	0	12
40	5.8	Potable abstractions	0	0	0	0	0
41 >	5.9 >	<u>Source Protection Zones ></u>	1	0	0	0	-
41	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	<u>Hydrology ></u>	On site	0-50m	50-250m	250-500m	500-2000m
42	6.1	Water Network (OS MasterMap)	0	0	0	-	-



42	6.2	Surface water features	0	0	0	-	-
43 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
43 >	6.4 >	WFD Surface water bodies >	0	0	0	-	-
43 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
45	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
45	7.2	Historical Flood Events	0	0	0	-	-
45	7.3	Flood Defences	0	0	0	-	-
46	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
46	7.5	Flood Storage Areas	0	0	0	-	-
47	7.6	Flood Zone 2	None (within 50m)				
47	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding >					
48 >	8.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
50 >	9.1 >	Groundwater flooding >	Moderate (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
51	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
52	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
52	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
52	10.4	Special Protection Areas (SPA)	0	0	0	0	0
52	10.5	National Nature Reserves (NNR)	0	0	0	0	0
53 >	10.6 >	Local Nature Reserves (LNR) >	0	0	0	0	2
53	10.7	Designated Ancient Woodland	0	0	0	0	0
53	10.8	Biosphere Reserves	0	0	0	0	0
53	10.9	Forest Parks	0	0	0	0	0
54	10.10	Marine Conservation Zones	0	0	0	0	0
54 >	10.11 >	Green Belt >	0	1	0	0	0
54	10.12	Proposed Ramsar sites	0	0	0	0	0



54	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
55	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
55	10.15	Nitrate Sensitive Areas	0	0	0	0	0
55 >	10.16 >	<u>Nitrate Vulnerable Zones ></u>	4	0	0	0	6
57	10.17	SSSI Impact Risk Zones	0	-	-	-	-
57	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
58	11.1	World Heritage Sites	0	0	0	-	-
58	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
58	11.3	National Parks	0	0	0	-	-
58	11.4	Listed Buildings	0	0	0	-	-
59	11.5	Conservation Areas	0	0	0	-	-
59	11.6	Scheduled Ancient Monuments	0	0	0	-	-
59	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	<u>Agricultural designations ></u>	On site	0-50m	50-250m	250-500m	500-2000m
60 >	12.1 >	<u>Agricultural Land Classification ></u>	Grade 3 (within 250m)				
61	12.2	Open Access Land	0	0	0	-	-
61	12.3	Tree Felling Licences	0	0	0	-	-
61	12.4	Environmental Stewardship Schemes	0	0	0	-	-
62 >	12.5 >	<u>Countryside Stewardship Schemes ></u>	2	2	1	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
63	13.1	Priority Habitat Inventory	0	0	0	-	-
63	13.2	Habitat Networks	0	0	0	-	-
63	13.3	Open Mosaic Habitat	0	0	0	-	-
63	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	<u>Geology 1:10,000 scale ></u>	On site	0-50m	50-250m	250-500m	500-2000m
64 >	14.1 >	<u>10k Availability ></u>	Identified (within 500m)				
65	14.2	Artificial and made ground (10k)	0	0	0	0	-
66	14.3	Superficial geology (10k)	0	0	0	0	-

66	14.4	Landslip (10k)	0	0	0	0	-
67	14.5	Bedrock geology (10k)	0	0	0	0	-
67	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
68 >	15.1 >	50k Availability >	Identified (within 500m)				
69 >	15.2 >	Artificial and made ground (50k) >	0	0	0	1	-
70	15.3	Artificial ground permeability (50k)	0	0	-	-	-
71 >	15.4 >	Superficial geology (50k) >	1	0	3	4	-
72 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
72	15.6	Landslip (50k)	0	0	0	0	-
72	15.7	Landslip permeability (50k)	None (within 50m)				
73 >	15.8 >	Bedrock geology (50k) >	3	0	2	0	-
74 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
74	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
75	16.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence >					
76 >	17.1 >	Shrink swell clays >	Very low (within 50m)				
77 >	17.2 >	Running sands >	Very low (within 50m)				
79 >	17.3 >	Compressible deposits >	Negligible (within 50m)				
80 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
81 >	17.5 >	Landslides >	Very low (within 50m)				
83 >	17.6 >	Ground dissolution of soluble rocks >	Very low (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
85	18.1	BritPits	0	0	0	0	-
86	18.2	Surface ground workings	0	0	0	-	-
86	18.3	Underground workings	0	0	0	0	0
86	18.4	Underground mining extents	0	0	0	0	-
86	18.5	Historical Mineral Planning Areas	0	0	0	0	-



86 >	18.6 >	Non-coal mining >	1	0	0	0	2
87	18.7	JPB mining areas	None (within 0m)				
87	18.8	The Coal Authority non-coal mining	0	0	0	0	-
87	18.9	Researched mining	0	0	0	0	-
88	18.10	Mining record office plans	0	0	0	0	-
88	18.11	BGS mine plans	0	0	0	0	-
88	18.12	Coal mining	None (within 0m)				
88	18.13	Brine areas	None (within 0m)				
88	18.14	Gypsum areas	None (within 0m)				
89	18.15	Tin mining	None (within 0m)				
89	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
90	19.1	Natural cavities	0	0	0	0	-
90	19.2	Mining cavities	0	0	0	0	0
90	19.3	Reported recent incidents	0	0	0	0	-
90	19.4	Historical incidents	0	0	0	0	-
91	19.5	National karst database	0	0	0	0	-
Page	Section	Radon >					
92 >	20.1 >	Radon >	Less than 1% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
94 >	21.1 >	BGS Estimated Background Soil Chemistry >	10	7	-	-	-
95	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
95	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
96	22.1	Underground railways (London)	0	0	0	-	-
96	22.2	Underground railways (Non-London)	0	0	0	-	-
96	22.3	Railway tunnels	0	0	0	-	-
96	22.4	Historical railway and tunnel features	0	0	0	-	-
96	22.5	Royal Mail tunnels	0	0	0	-	-



97	22.6	Historical railways	0	0	0	-	-
97	22.7	Railways	0	0	0	-	-
97	22.8	Crossrail 1	0	0	0	0	-
97	22.9	Crossrail 2	0	0	0	0	-
97	22.10	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 07/04/2020

Site Area: 4.0ha



Recent site history - 2017 aerial photograph



Capture Date: 11/08/2017

Site Area: 4.0ha



Recent site history - 2015 aerial photograph



Capture Date: 16/04/2015

Site Area: 4.0ha



Recent site history - 2009 aerial photograph



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Capture Date: 29/06/2009

Site Area: 4.0ha



Recent site history - 1999 aerial photograph

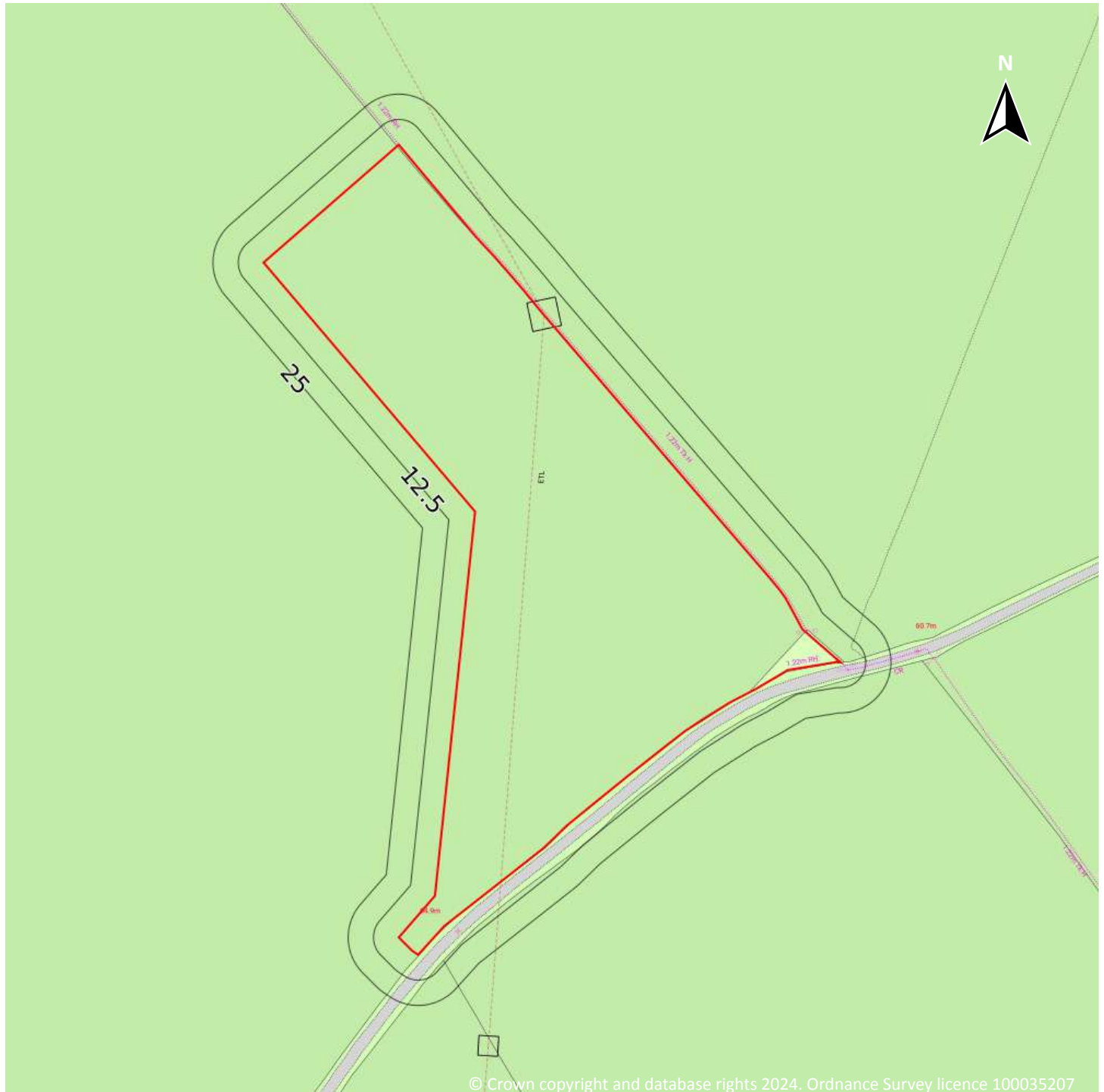


Capture Date: 09/06/1999

Site Area: 4.0ha



OS MasterMap site plan

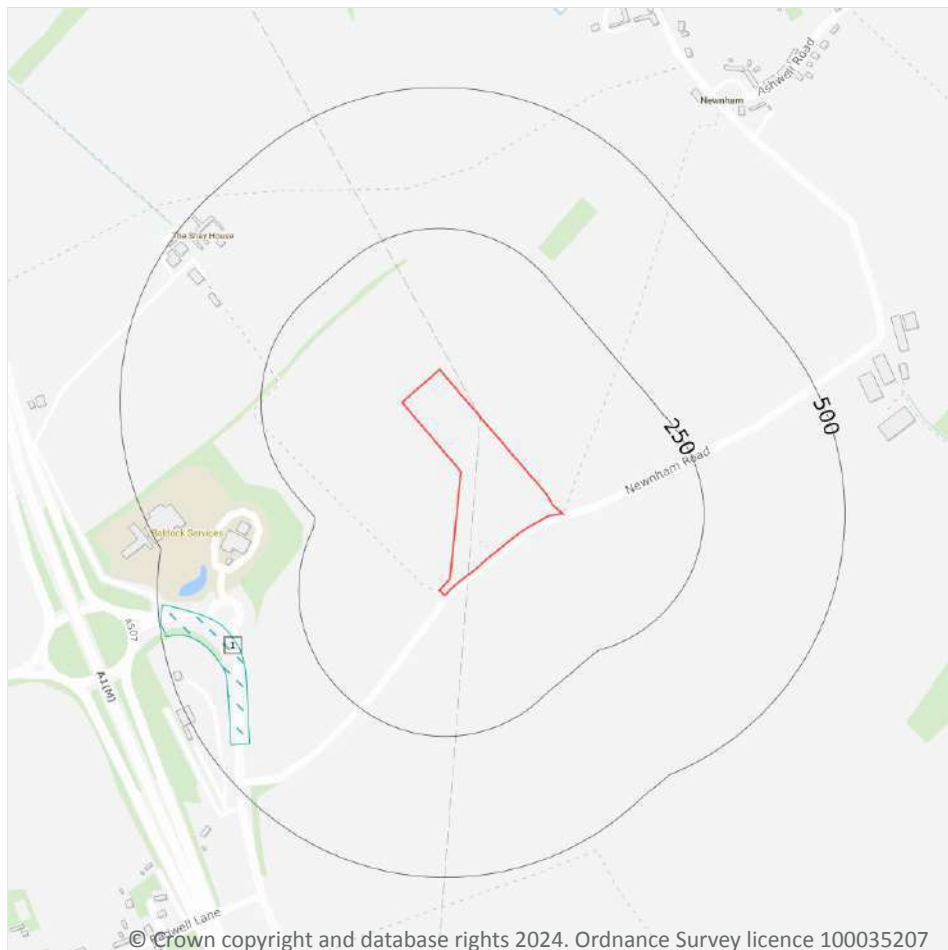


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Site Area: 4.0ha



1 Past land use



— Site Outline
Search buffers in metres (m)
 Historical industrial land uses

1.1 Historical industrial land uses

Records within 500m

1

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
1	369m SW	Cuttings	1969 - 1985	2092574



This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

0

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

0

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

0

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.



This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

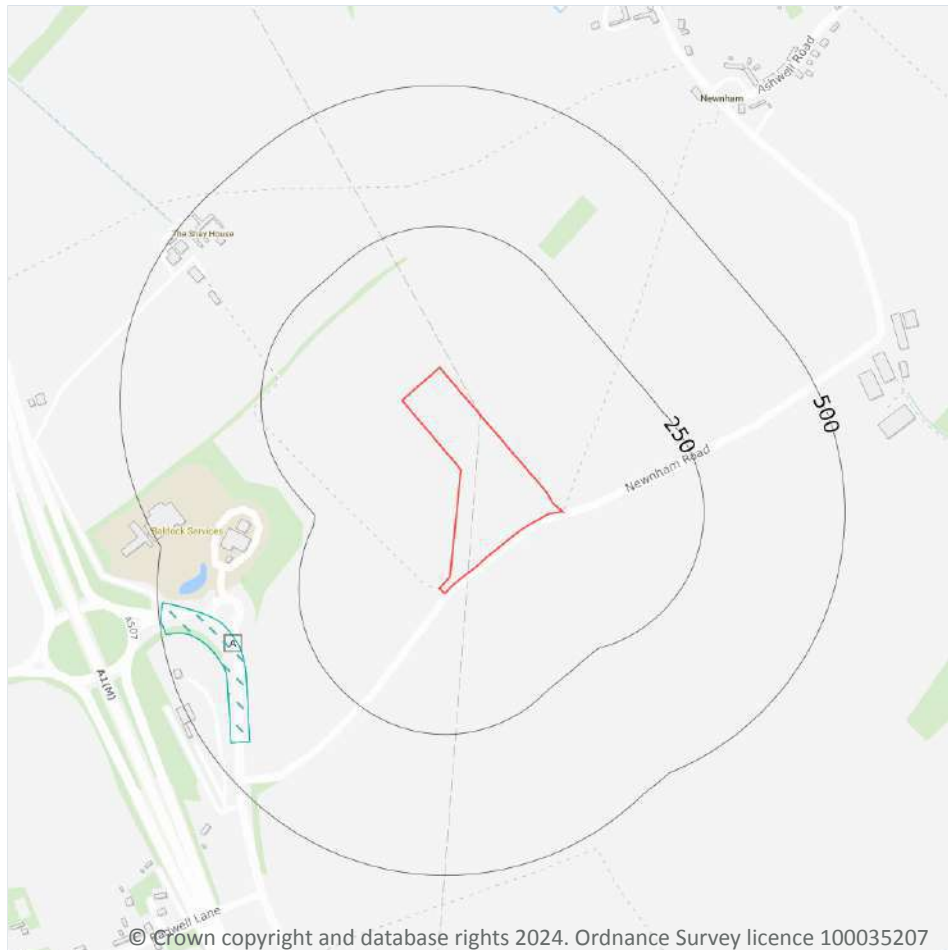
0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.



2 Past land use - un-grouped



— Site Outline

Search buffers in metres (m)

Historical industrial land uses

2.1 Historical industrial land uses

Records within 500m

2

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 18](#) >

ID	Location	Land Use	Date	Group ID
A	369m SW	Cuttings	1985	2092574
A	369m SW	Cuttings	1969	2092574

This data is sourced from Ordnance Survey / Groundsure.



2.2 Historical tanks

Records within 500m**0**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m**0**

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m**0**

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

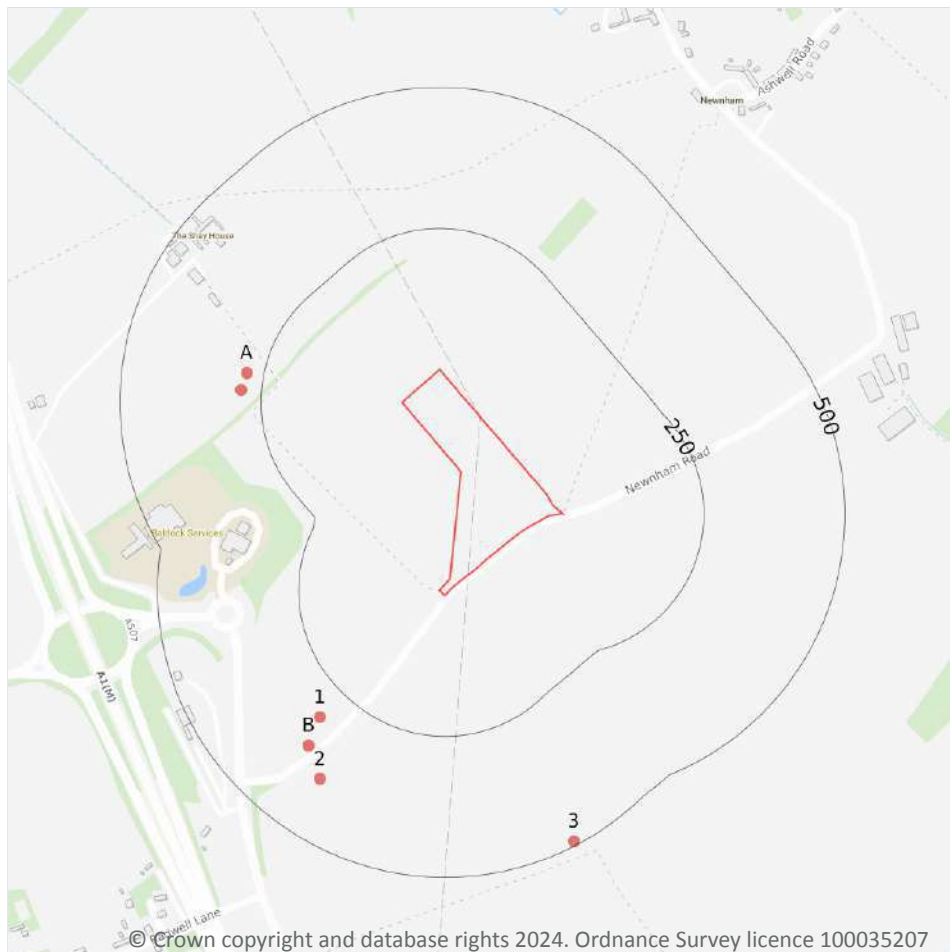
Records within 500m**0**

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



— Site Outline
Search buffers in metres (m)
● Waste exemptions

3.1 Active or recent landfill

Records within 500m

0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m

0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.



3.3 Historical landfill (LA/mapping records)

Records within 500m

0

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m

0

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m

0

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m

0

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m

7

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on [page 20](#) >

ID	Location	Site	Reference	Category	Sub-Category	Description
A	281m NW	-	WEX232792	Storing waste exemption	On a Farm	Storage of sludge

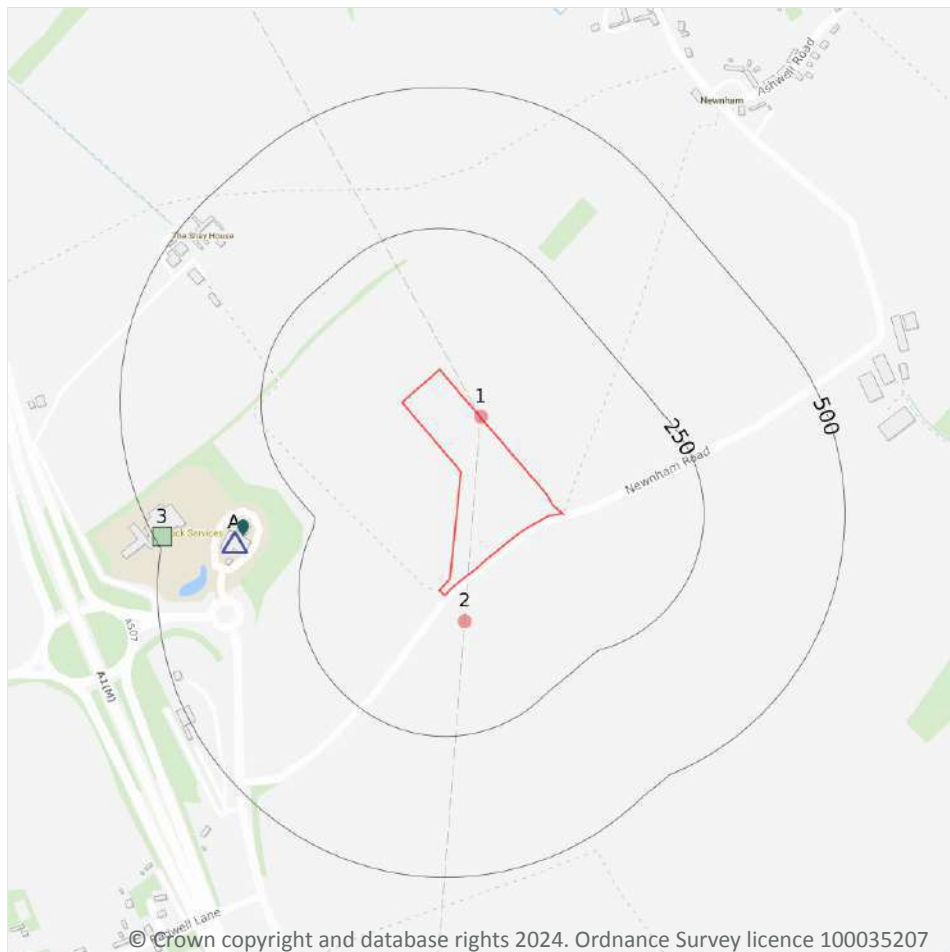


ID	Location	Site	Reference	Category	Sub-Category	Description
A	287m W	-	WEX373941	Storing waste exemption	On a farm	Storage of sludge
1	310m SW	-	WEX248694	Storing waste exemption	On a farm	Storage of sludge
B	360m SW	Land at Grid Reference: TL23713625	EPR/SE5141NP /A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of sludge
B	360m SW	Land At TL23713625	EPR/FE5040EJ/ A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of sludge
2	395m SW	-	WEX248680	Storing waste exemption	On a farm	Storage of sludge
3	492m S	-	WEX161438	Storing waste exemption	On a Farm	Storage of sludge

This data is sourced from the Environment Agency and Natural Resources Wales.



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- △ Current or recent petrol stations
- Licensed pollutant release (Part A(2)/B)
- List 2 Dangerous Substances

4.1 Recent industrial land uses

Records within 250m

2

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 23](#) >

ID	Location	Company	Address	Activity	Category
1	1m N	Pylon	Hertfordshire, SG7	Electrical Features	Infrastructure and Facilities
2	57m S	Pylon	Hertfordshire, SG7	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.



4.2 Current or recent petrol stations

Records within 500m**1**

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on [page 23](#) >

ID	Location	Company	Address	LPG	Status
A	375m W	SHELL	A1(m) J10, Baldock Road, Baldock, Hertfordshire, SG7 5TR	No	Open

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m**0**

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m**0**

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m**0**

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m**0**

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.



4.7 Regulated explosive sites

Records within 500m

0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m

0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m

0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m

0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m

1

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on [page 23](#) >

ID	Location	Address	Details	
A	358m W	Extra MSA Forecourts (formerly Shell), Baldock Services, A1/A507 Interchange Radwell, Baldock, Hertfordshire, SG7 5TR	Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0
----------------------------	----------

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	0
----------------------------	----------

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0
----------------------------	----------

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	0
----------------------------	----------

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.



4.16 List 1 Dangerous Substances

Records within 500m**0**

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m**1**

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

Features are displayed on the Current industrial land use map on [page 23 >](#)

ID	Location	Name	Status	Receiving Water	Authorised Substances
3	488m W	Baldock Services	Not Active	Na	pH

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m**0**

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m**0**

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.



4.20 Pollution inventory waste transfers

Records within 500m

0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.21 Pollution inventory radioactive waste

Records within 500m

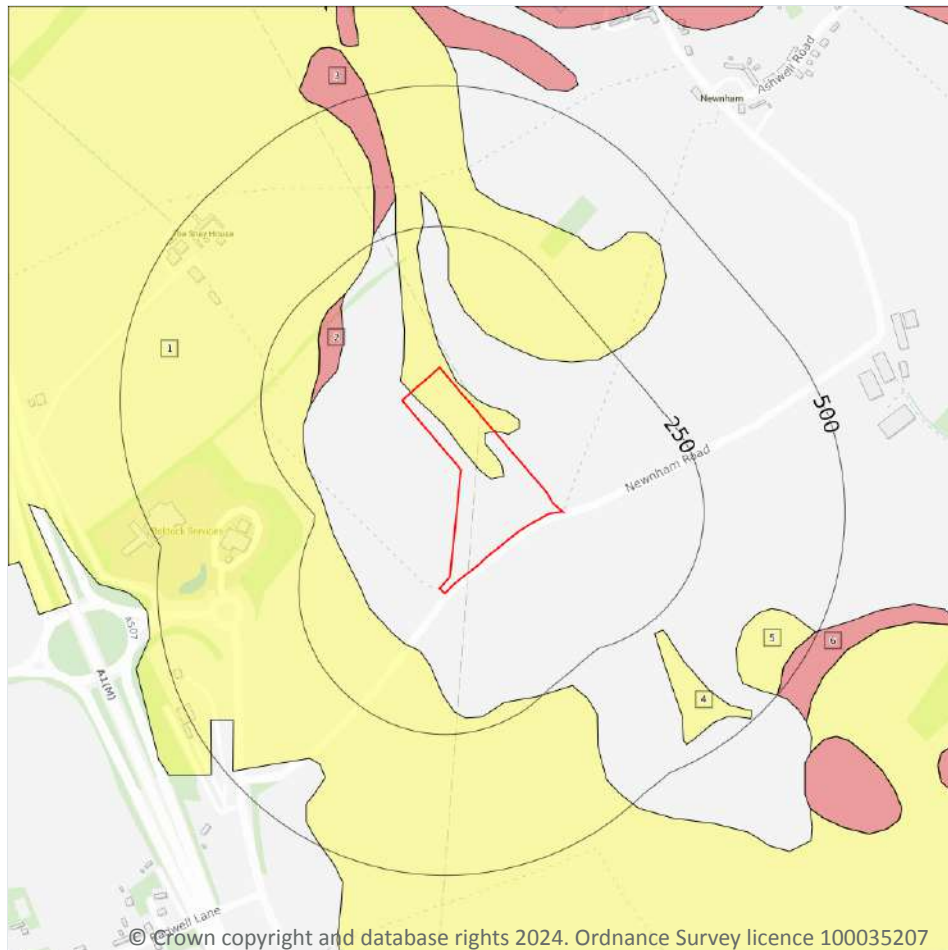
0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.



5 Hydrogeology - Superficial aquifer



- Site Outline**
- Search buffers in metres (m)**
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive
 - Unknown

5.1 Superficial aquifer

Records within 500m

6

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on [page 29 >](#)

ID	Location	Designation	Description
1	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	127m NW	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

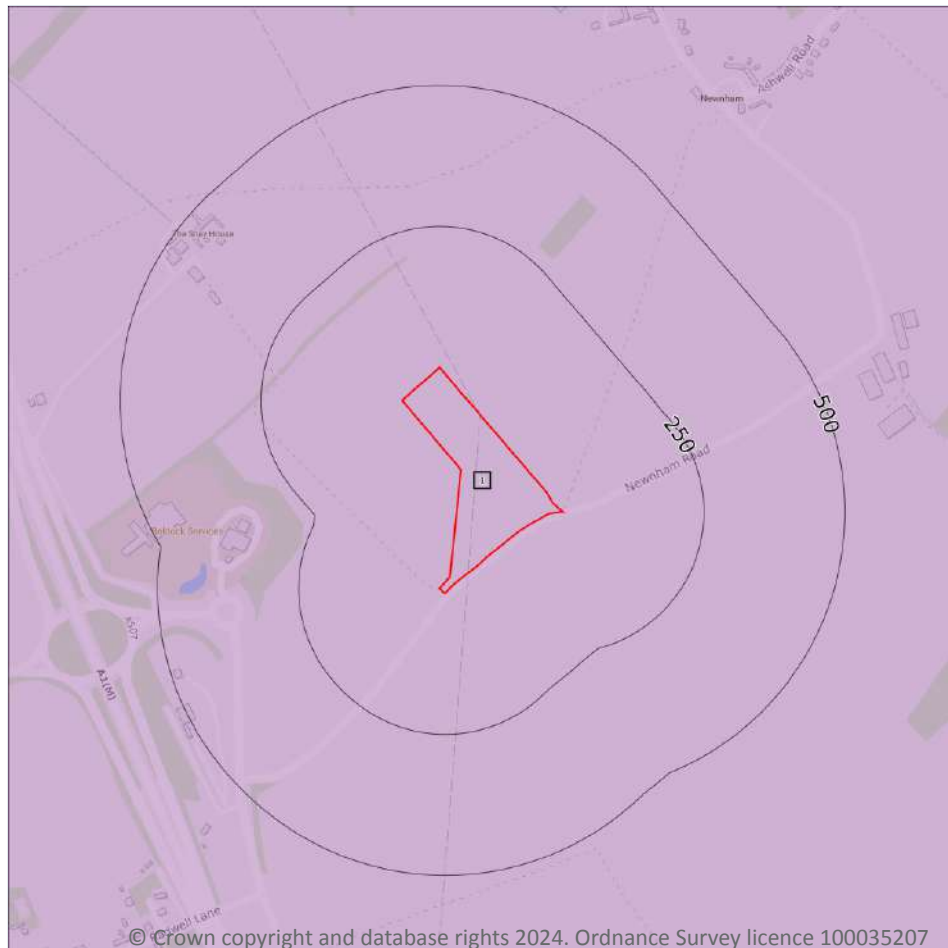


ID	Location	Designation	Description
3	263m NW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
4	270m SE	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
5	380m SE	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
6	478m 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

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive

5.2 Bedrock aquifer

Records within 500m

1

Aquifer status of groundwater held within bedrock geology.

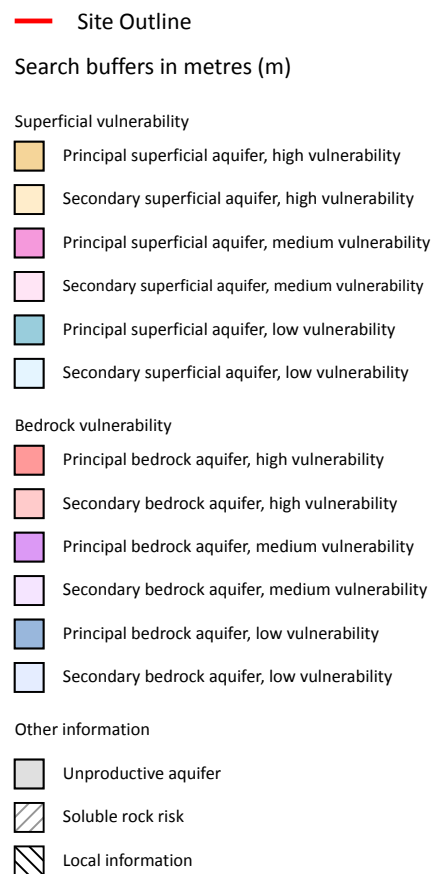
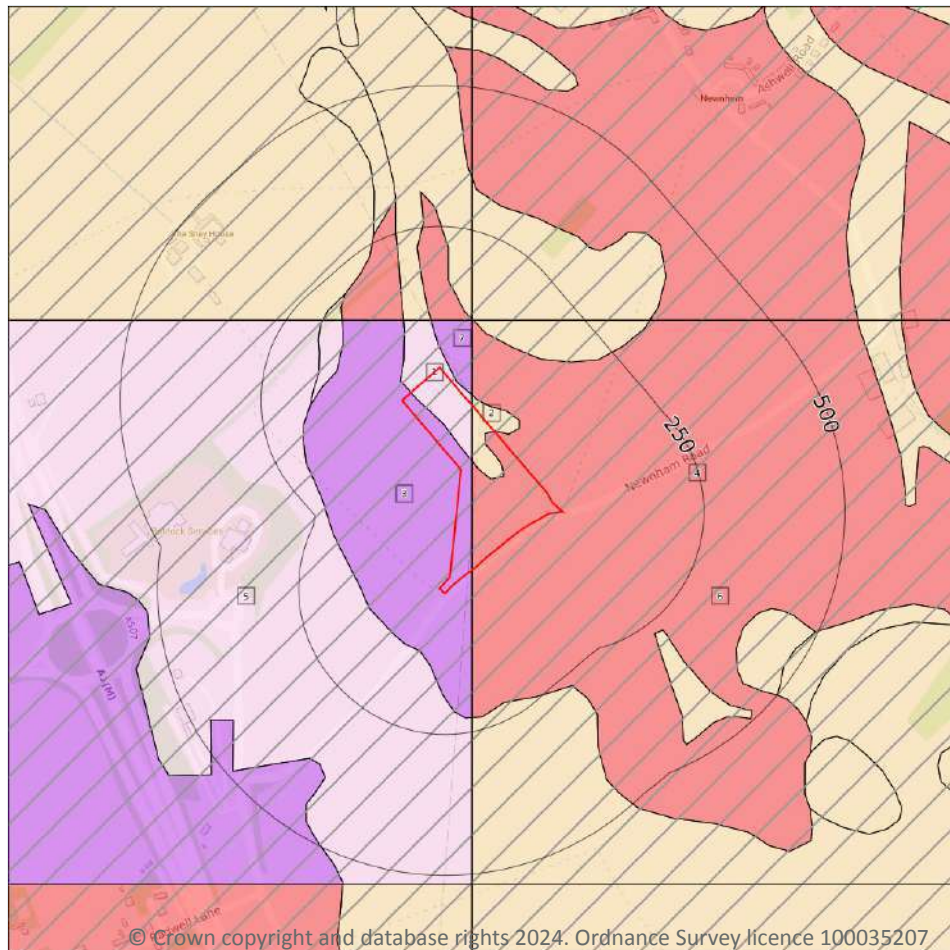
Features are displayed on the Bedrock aquifer map on [page 31](#) >

ID	Location	Designation	Description
1	On site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

5

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on [page 32](#) >



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40- 70% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Medium Aquifer type: Principal Flow mechanism: Well connected fractures
2	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: High Aquifer type: Secondary Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures
3	On site	Summary Classification: Principal bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40- 70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Medium Aquifer type: Principal Flow mechanism: Well connected fractures
4	On site	Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures
7	6m N	Summary Classification: Principal bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40- 70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Medium Aquifer type: Principal Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site

2

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.



ID	Maximum soluble risk category	Percentage of grid square covered by maximum risk
5	Significant soluble rocks are likely to be present. Problems unlikely except with considerable surface or subsurface water flow.	61.0%
6	Significant soluble rocks are likely to be present. Problems unlikely except with considerable surface or subsurface water flow.	39.0%

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

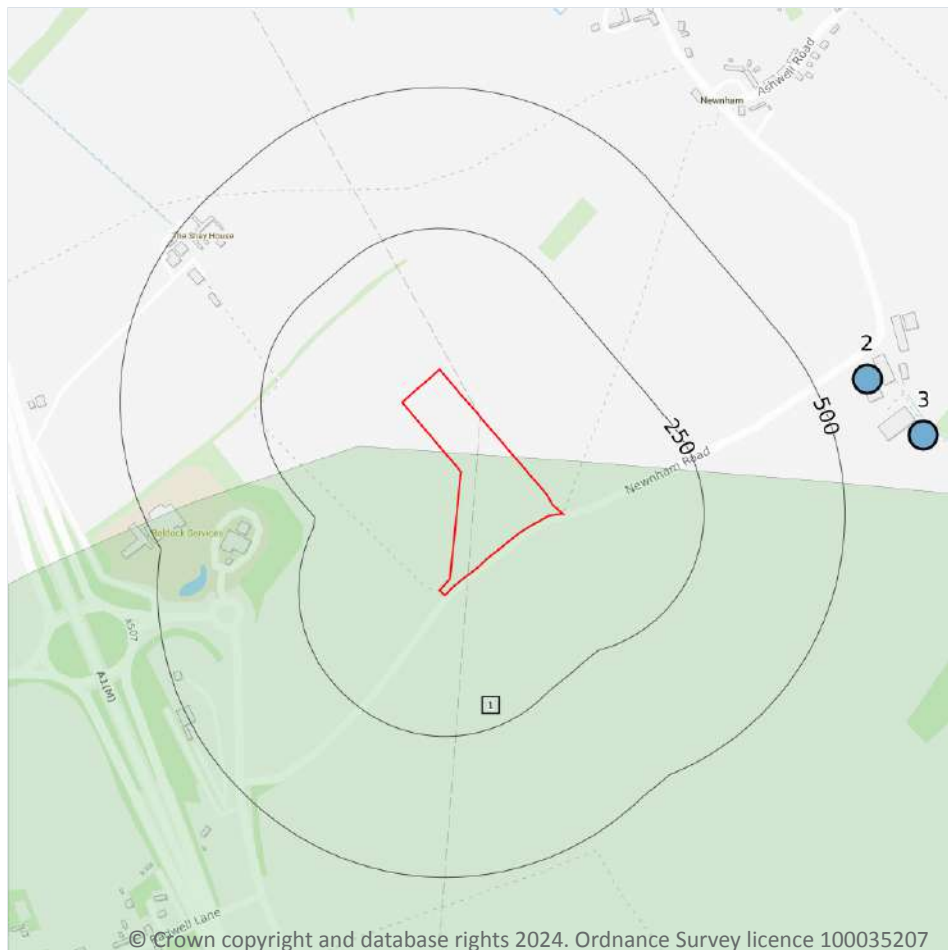
Records on site	0
-----------------	---

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk ↗.

This data is sourced from the British Geological Survey and the Environment Agency.



Abstractions and Source Protection Zones



- Site Outline
- Search buffers in metres (m)
- 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
- Source Protection Zone 1c
Inner catchment - confined aquifer
- Source Protection Zone 2c
Outer catchment - confined aquifer
- Source Protection Zone 3c
Total catchment - confined aquifer
- Drinking water abstraction licences
Polygon features
- Drinking water abstraction licences
Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m

10

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on [page 35 >](#)

ID	Location	Details	
-	928m SW	Status: Historical Licence No: 6/33/14/*G/0035 Details: General Farming & Domestic Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE AT RADWELL Data Type: Point Name: D NORTHERN & SONS Easting: 523350 Northing: 235810	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/01/1968 Expiry Date: - Issue No: 100 Version Start Date: 01/01/1968 Version End Date: -
-	1002m W	Status: Active Licence No: 6/33/14/*G/0026 Details: Spray Irrigation - Direct Direct Source: GROUND WATER SOURCE OF SUPPLY Point: WELL W OF RADWELL Data Type: Point Name: MEREDITH HARDY FARM PARTNERSHIP Easting: 522900 Northing: 236630	Annual Volume (m ³): 4591 Max Daily Volume (m ³): 111.6 Original Application No: - Original Start Date: 01/04/1968 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1997 Version End Date: -
-	1002m W	Status: Active Licence No: 6/33/14/*G/0026 Details: General Farming & Domestic Direct Source: GROUND WATER SOURCE OF SUPPLY Point: WELL W OF RADWELL Data Type: Point Name: MEREDITH HARDY FARM PARTNERSHIP Easting: 522900 Northing: 236630	Annual Volume (m ³): 4591 Max Daily Volume (m ³): 111.6 Original Application No: - Original Start Date: 01/04/1968 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1997 Version End Date: -
-	1025m NE	Status: Active Licence No: 6/33/14/*G/0028 Details: General Farming & Domestic Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE AT NEWNHAM Data Type: Point Name: A E & W A FARR LTD Easting: 524660 Northing: 237650	Annual Volume (m ³): 8018 Max Daily Volume (m ³): 52.73 Original Application No: - Original Start Date: 01/10/1967 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date: -
-	1385m SW	Status: Active Licence No: 6/33/14/*G/0026 Details: General Farming & Domestic Direct Source: GROUND WATER SOURCE OF SUPPLY Point: WELL W OF RADWELL Data Type: Point Name: MEREDITH HARDY FARM PARTNERSHIP Easting: 522860 Northing: 235660	Annual Volume (m ³): 4591 Max Daily Volume (m ³): 111.6 Original Application No: - Original Start Date: 01/04/1968 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1997 Version End Date: -



ID	Location	Details	
-	1385m SW	Status: Active Licence No: 6/33/14/*G/0026 Details: Spray Irrigation - Direct Direct Source: GROUND WATER SOURCE OF SUPPLY Point: WELL W OF RADWELL Data Type: Point Name: MEREDITH HARDY FARM PARTNERSHIP Easting: 522860 Northing: 235660	Annual Volume (m ³): 4591 Max Daily Volume (m ³): 111.6 Original Application No: - Original Start Date: 01/04/1968 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1997 Version End Date: -
-	1452m E	Status: Active Licence No: 6/33/14/*G/0071/R02 Details: Spray Irrigation - Direct Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE AT NEWNHAM Data Type: Point Name: A E & W A FARR LTD Easting: 525610 Northing: 236560	Annual Volume (m ³): 91000 Max Daily Volume (m ³): 1841 Original Application No: NPS/WR/023401 Original Start Date: 01/04/2018 Expiry Date: 31/03/2024 Issue No: 1 Version Start Date: 01/04/2018 Version End Date: -
-	1452m E	Status: Historical Licence No: 6/33/14/*G/0064 Details: Transfer between sources Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE AT NEWNHAM Data Type: Point Name: A E & W A FARR LTD Easting: 525610 Northing: 236560	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/05/1993 Expiry Date: 01/09/2002 Issue No: 100 Version Start Date: 01/05/1993 Version End Date: -
-	1452m E	Status: Historical Licence No: 6/33/14/*G/0071 Details: Spray Irrigation - Direct Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE AT NEWNHAM Data Type: Point Name: A E & W A FARR LTD Easting: 525610 Northing: 236560	Annual Volume (m ³): 91000 Max Daily Volume (m ³): 1841 Original Application No: - Original Start Date: 09/10/2003 Expiry Date: 31/03/2016 Issue No: 1 Version Start Date: 09/10/2003 Version End Date: -
-	1452m E	Status: Historical Licence No: 6/33/14/*G/0071/R01 Details: Spray Irrigation - Direct Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE AT NEWNHAM Data Type: Point Name: A E & W A FARR LTD Easting: 525610 Northing: 236560	Annual Volume (m ³): 91000 Max Daily Volume (m ³): 1841 Original Application No: - Original Start Date: 01/04/2016 Expiry Date: 31/03/2018 Issue No: 1 Version Start Date: 01/04/2016 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.



5.7 Surface water abstractions

Records within 2000m

12

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on [page 35 >](#)

ID	Location	Details	
2	589m E	Status: Historical Licence No: 6/33/14/*S/0065 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: UN-NAMED DRAIN - NEWNHAM 'C' Data Type: Point Name: A E & W A FARR LTD Easting: 524700 Northing: 236900	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/05/1993 Expiry Date: 30/09/2002 Issue No: 100 Version Start Date: 01/05/1993 Version End Date: -
3	653m E	Status: Historical Licence No: 6/33/14/*S/0065 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: UN-NAMED DRAIN - NEWNHAM 'B' Data Type: Point Name: A E & W A FARR LTD Easting: 524800 Northing: 236800	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/05/1993 Expiry Date: 30/09/2002 Issue No: 100 Version Start Date: 01/05/1993 Version End Date: -
-	907m N	Status: Historical Licence No: 6/33/14/*S/0065 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: CAT DITCH - NEWNHAM "4" Data Type: Point Name: A E & W A FARR LTD Easting: 524400 Northing: 237700	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/05/1993 Expiry Date: 30/09/2002 Issue No: 100 Version Start Date: 01/05/1993 Version End Date: -
-	1040m E	Status: Historical Licence No: 6/33/14/*S/0065 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: UN-NAMED DRAIN - NEWNHAM 'A' Data Type: Point Name: A E & W A FARR LTD Easting: 525200 Northing: 236600	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/05/1993 Expiry Date: 30/09/2002 Issue No: 100 Version Start Date: 01/05/1993 Version End Date: -



ID	Location	Details	
-	1158m SW	Status: Active Licence No: AN/033/0014/005 Details: Spray Irrigation - Storage Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: RADWELL LAKE AT RADWELL Data Type: Point Name: Northern of Radwell Easting: 522981 Northing: 235879	Annual Volume (m ³): 50000 Max Daily Volume (m ³): - Original Application No: NPS/WR/032118 Original Start Date: 23/12/2021 Expiry Date: 31/03/2028 Issue No: 1 Version Start Date: 23/12/2021 Version End Date: -
-	1233m SW	Status: Active Licence No: 6/33/14/*S/0027 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: TRIB OF RIVER IVEL AT RADWELL Data Type: Point Name: MEREDITH HARDY FARM PARTNERSHIP Easting: 522880 Northing: 235900	Annual Volume (m ³): 1091 Max Daily Volume (m ³): 98 Original Application No: - Original Start Date: 01/04/1968 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date: -
-	1259m SW	Status: Active Licence No: 6/33/14/*S/0027 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: RIVER IVEL AT RADWELL Data Type: Point Name: MEREDITH HARDY FARM PARTNERSHIP Easting: 523000 Northing: 235690	Annual Volume (m ³): 1091 Max Daily Volume (m ³): 98 Original Application No: - Original Start Date: 01/04/1968 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date: -
-	1289m SW	Status: Active Licence No: 6/33/14/*S/0027 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: RIVER IVEL AT RADWELL Data Type: Point Name: MEREDITH HARDY FARM PARTNERSHIP Easting: 522890 Northing: 235780	Annual Volume (m ³): 1091 Max Daily Volume (m ³): 98 Original Application No: - Original Start Date: 01/04/1968 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date: -
-	1302m NW	Status: Historical Licence No: 6/33/14/*S/0065 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: CAT DITCH - NEWNHAM '5' Data Type: Point Name: A E & W A FARR LTD Easting: 523400 Northing: 238100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/05/1993 Expiry Date: 30/09/2002 Issue No: 100 Version Start Date: 01/05/1993 Version End Date: -



ID	Location	Details	
-	1304m NE	Status: Historical Licence No: 6/33/14/*S/0065 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: CAT DITCH - NEWNHAM "3" Data Type: Point Name: A E & W A FARR LTD Easting: 524800 Northing: 237900	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/05/1993 Expiry Date: 30/09/2002 Issue No: 100 Version Start Date: 01/05/1993 Version End Date: -
-	1360m SW	Status: Active Licence No: 6/33/14/*S/0027 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: RIVER IVEL AT RADWELL Data Type: Point Name: MEREDITH HARDY FARM PARTNERSHIP Easting: 522740 Northing: 235890	Annual Volume (m ³): 1091 Max Daily Volume (m ³): 98 Original Application No: - Original Start Date: 01/04/1968 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date: -
-	1940m NE	Status: Historical Licence No: 6/33/14/*S/0065 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: CAT DITCH - NEWNHAM "2" Data Type: Point Name: A E & W A FARR LTD Easting: 525800 Northing: 237700	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/05/1993 Expiry Date: 30/09/2002 Issue No: 100 Version Start Date: 01/05/1993 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	0
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Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.



5.9 Source Protection Zones

Records within 500m**1**

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination. Features are displayed on the Abstractions and Source Protection Zones map on [page 35 >](#)

ID	Location	Type	Description
1	On site	3	Total catchment

This data is sourced from the Environment Agency and Natural Resources Wales.

5.10 Source Protection Zones (confined aquifer)

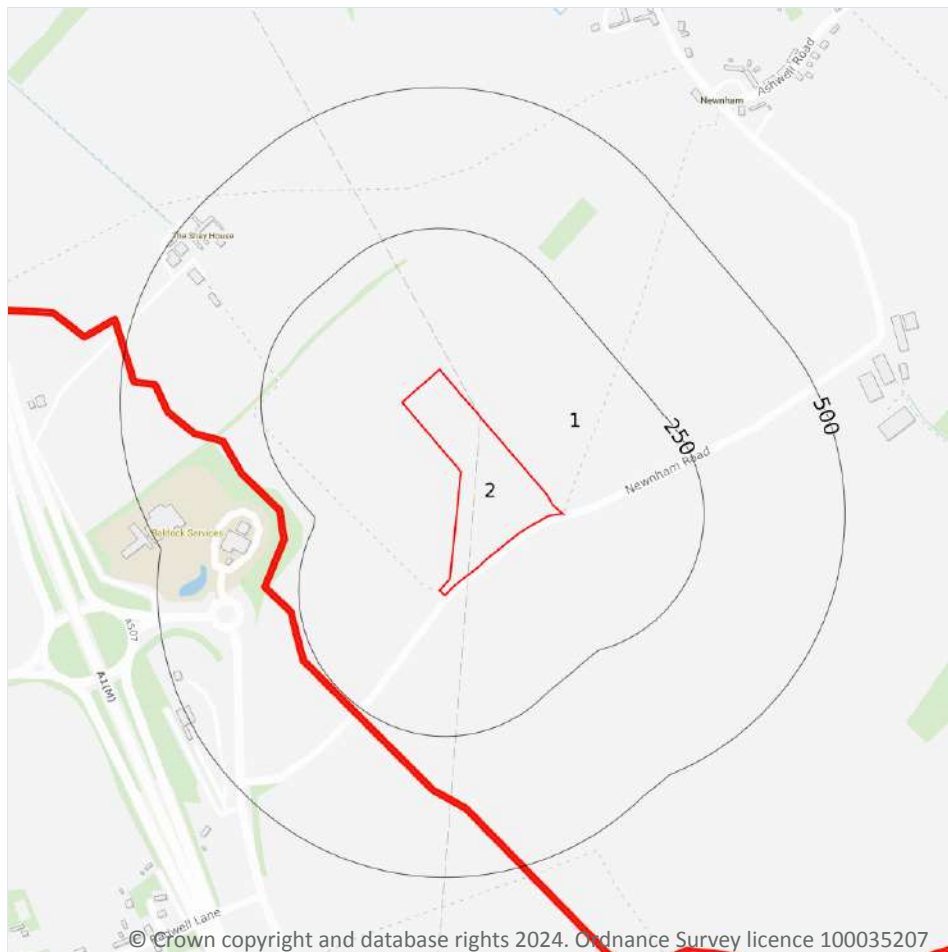
Records within 500m**0**

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.



6 Hydrology



- Site Outline
- Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- ⋯ WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

0

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

0

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.



This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1
------------------------	----------

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on [page 42 >](#)

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	On site	River	Cat Ditch	GB105033037740	Ivel	Ouse Upper and Bedford

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	1
---------------------------	----------

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on [page 42 >](#)

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	672m N	River	Cat Ditch	GB105033037740 ↗	Moderate	Fail	Good	2019

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	1
------------------------	----------

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.



Features are displayed on the Hydrology map on [page 42](#) >

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
2	On site	Upper Bedford Ouse Chalk	GB40601G603000 ↗	Poor	Poor	Poor	2019

This data is sourced from the Environment Agency and Natural Resources Wales.



7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m**0**

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m**0**

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m**0**

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.



7.4 Areas Benefiting from Flood Defences

Records within 250m

0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m

0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.



River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m

0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m

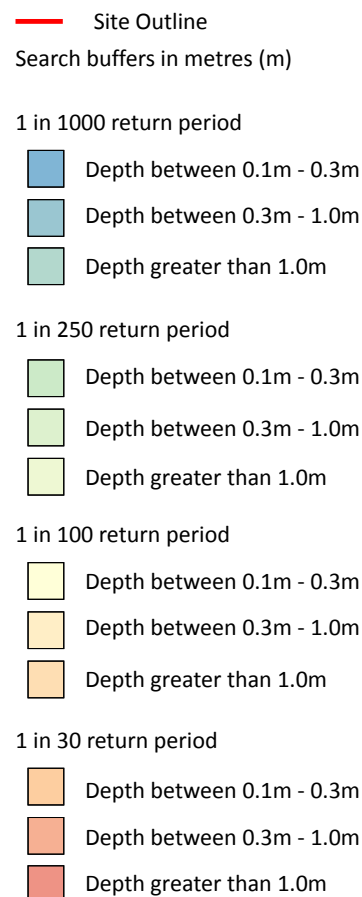
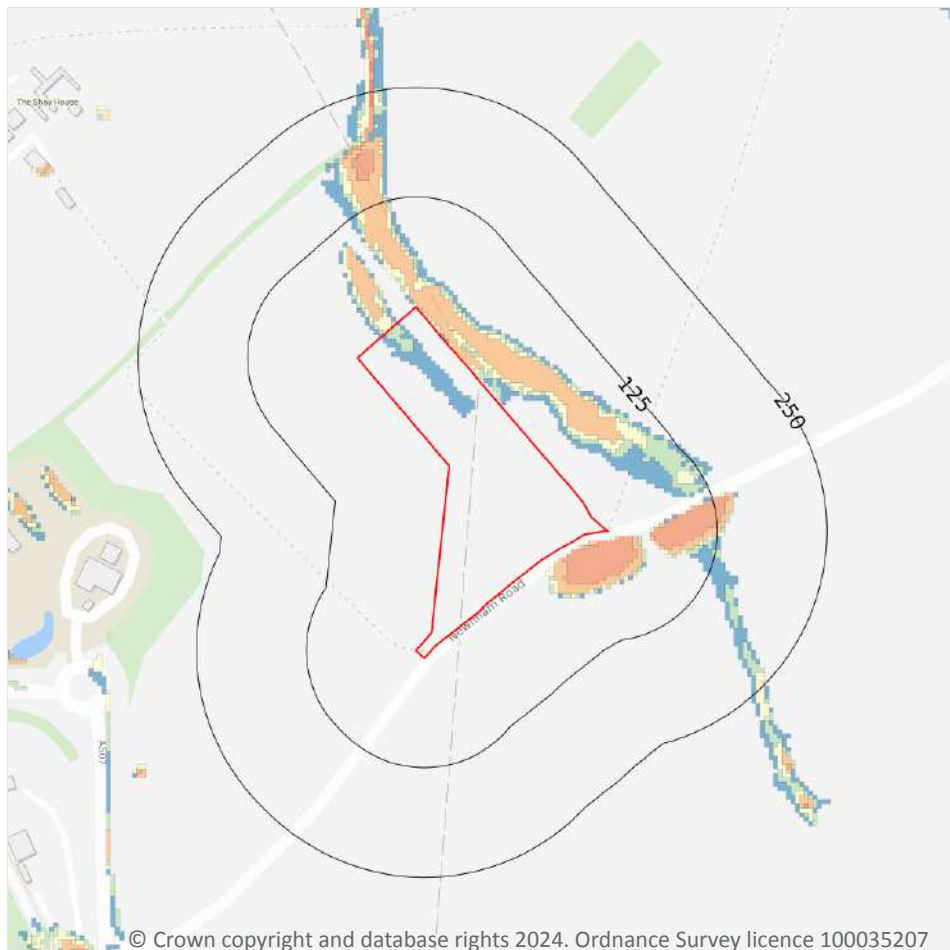
0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.



8 Surface water flooding



8.1 Surface water flooding

Highest risk on site

1 in 30 year, 0.1m - 0.3m

Highest risk within 50m

1 in 30 year, 0.3m - 1.0m

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on [page 48 >](#)

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

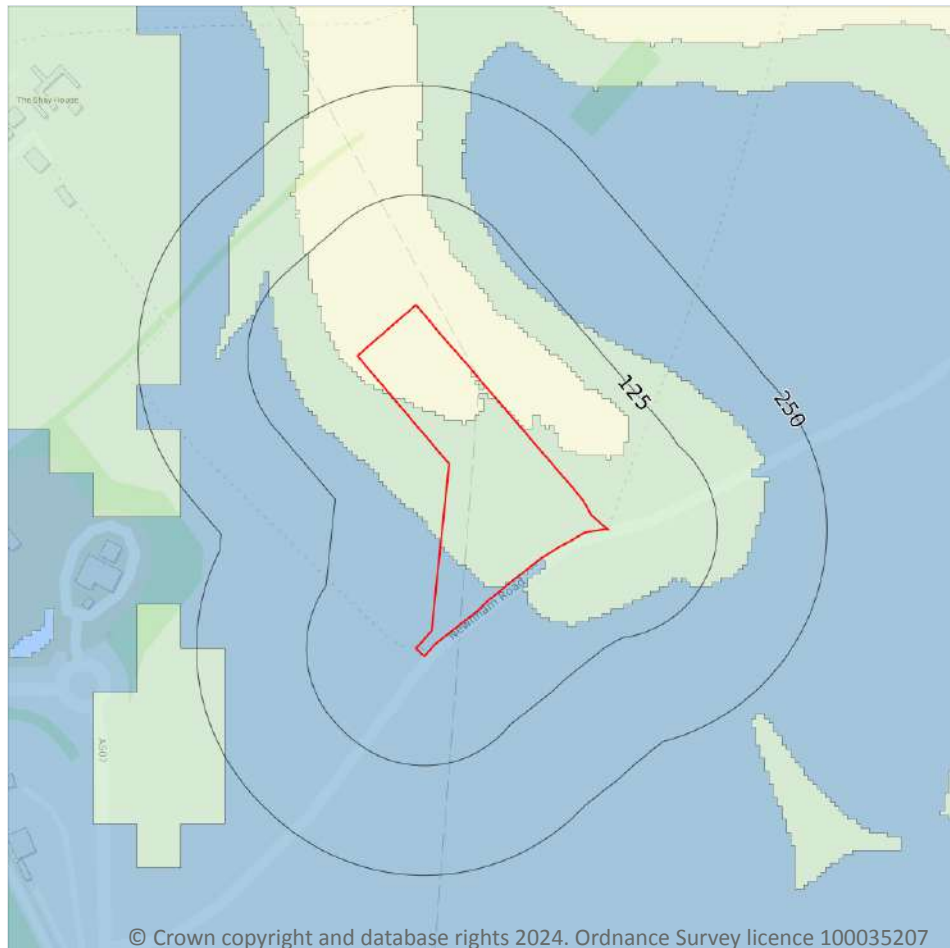
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.3m and 1.0m
1 in 250 year	Between 0.1m and 0.3m
1 in 100 year	Between 0.1m and 0.3m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



— Site Outline
Search buffers in metres (m)

- High
- Moderate - High
- Moderate
- Low
- Negligible

9.1 Groundwater flooding

Highest risk on site

Moderate

Highest risk within 50m

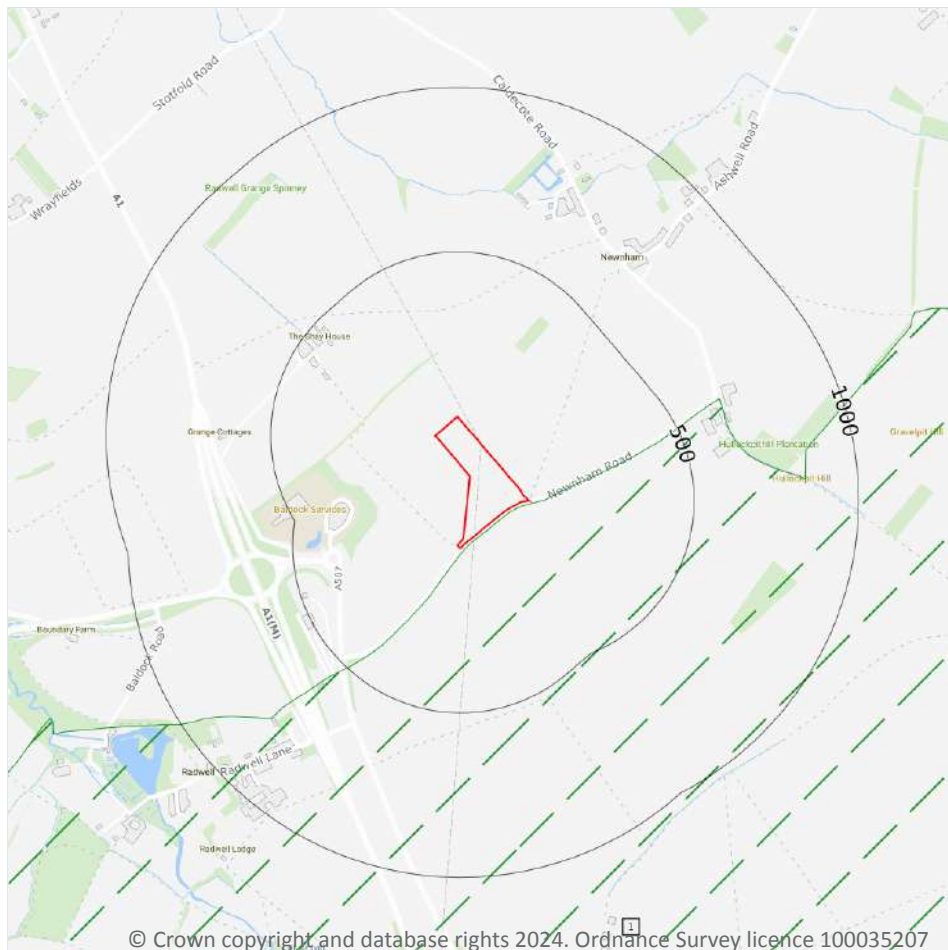
Moderate

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on [page 50 >](#)

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- + Local Nature Reserves (LNR)
- Green Belt

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10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m**0**

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m**0**

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m**0**

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m**0**

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m**2**

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

Features are displayed on the Environmental designations map on [page 51 >](#)

ID	Location	Name	Data source
-	1350m W	Stotfold Mill Meadows	Natural England
-	1766m S	Ivel Springs	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m**0**

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m**0**

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m**0**

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.



10.10 Marine Conservation Zones

Records within 2000m

0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m

1

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on [page 51](#) >

ID	Location	Name	Local Authority name
1	9m SE	London	North Hertfordshire

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m

0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m

0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.



10.14 Potential Special Protection Areas (pSPA)

Records within 2000m

0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m

0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m

10

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	Great Ouse NVZ	Surface Water	391	Existing
On site	Great Ouse NVZ	Surface Water	391	Existing
On site	Anglian Chalk	Groundwater	71	Existing
On site	Anglian Chalk	Groundwater	71	Existing
534m S	Great Ouse NVZ	Surface Water	391	Existing
534m S	Anglian Chalk	Groundwater	71	Existing
552m S	Great Ouse NVZ	Surface Water	391	Existing
552m S	Anglian Chalk	Groundwater	71	Existing



Location	Name	Type	NVZ ID	Status
1185m N	Ely Ouse and Cut-off channel NVZ	Surface Water	390	Existing
1282m N	Ely Ouse and Cut-off channel NVZ	Surface Water	390	Existing

This data is sourced from Natural England and Natural Resources Wales.



SSSI Impact Zones and Units

10.17 SSSI Impact Risk Zones

Records on site

0

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m

0

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

This data is sourced from Natural England and Natural Resources Wales.



11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m

0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m

0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m

0

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.



This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m

0

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m

0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.7 Registered Parks and Gardens

Records within 250m

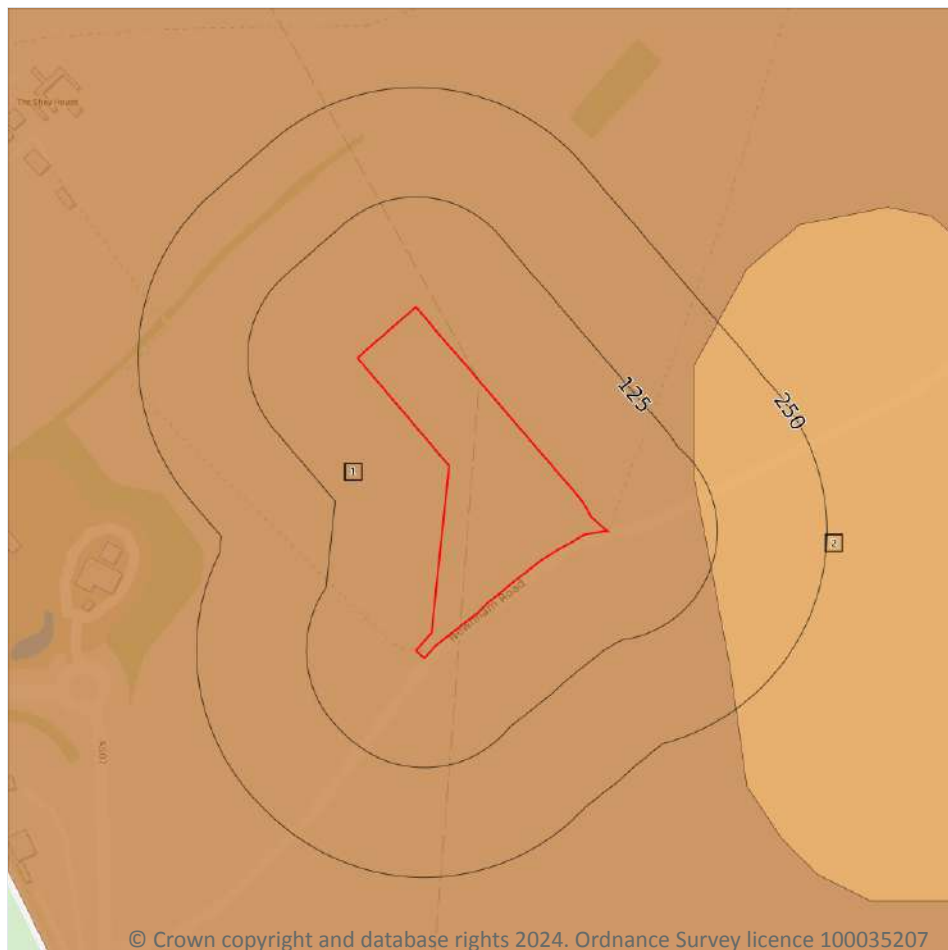
0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.



12 Agricultural designations



- Site Outline
- Search buffers in metres (m)
- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m

2

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on [page 60](#) >

ID	Location	Classification	Description
1	On site	Grade 2	Very good quality agricultural land. Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.
2	108m E	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m

0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m

0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m

0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.



12.5 Countryside Stewardship Schemes

Records within 250m

5

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

Location	Reference	Scheme	Start Date	End Date
On site	829115	Countryside Stewardship (Middle Tier)	01/01/2020	31/12/2024
On site	1120799	Countryside Stewardship (Middle Tier)	01/01/2022	31/12/2026
9m SE	829115	Countryside Stewardship (Middle Tier)	01/01/2020	31/12/2024
48m E	1120799	Countryside Stewardship (Middle Tier)	01/01/2022	31/12/2026
194m NW	829115	Countryside Stewardship (Middle Tier)	01/01/2020	31/12/2024

This data is sourced from Natural England.



13 Habitat designations

13.1 Priority Habitat Inventory

Records within 250m

0

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m

0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m

0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m

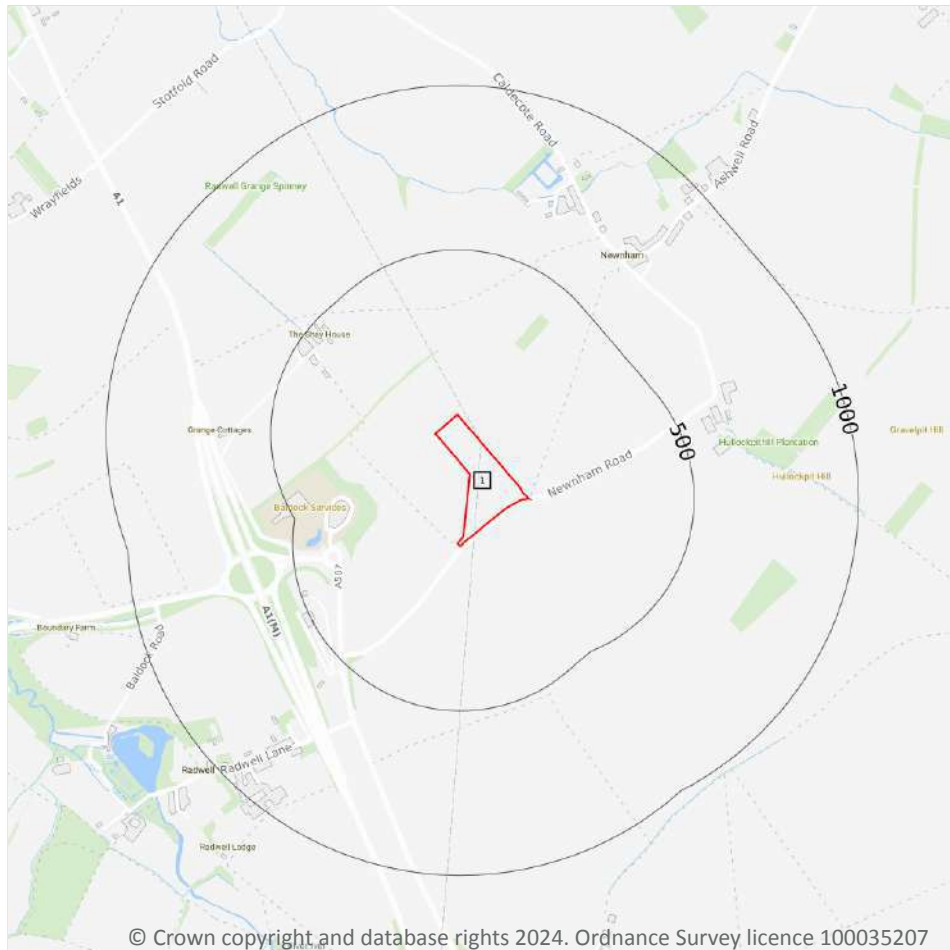
0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



- Site Outline
- Search buffers in metres (m)
- Full coverage
 - Partial coverage
 - No coverage

14.1 10k Availability

Records within 500m

1

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on [page 64](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Artificial and made ground

14.2 Artificial and made ground (10k)

Records within 500m

0

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m

0

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock

14.5 Bedrock geology (10k)

Records within 500m

0

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m

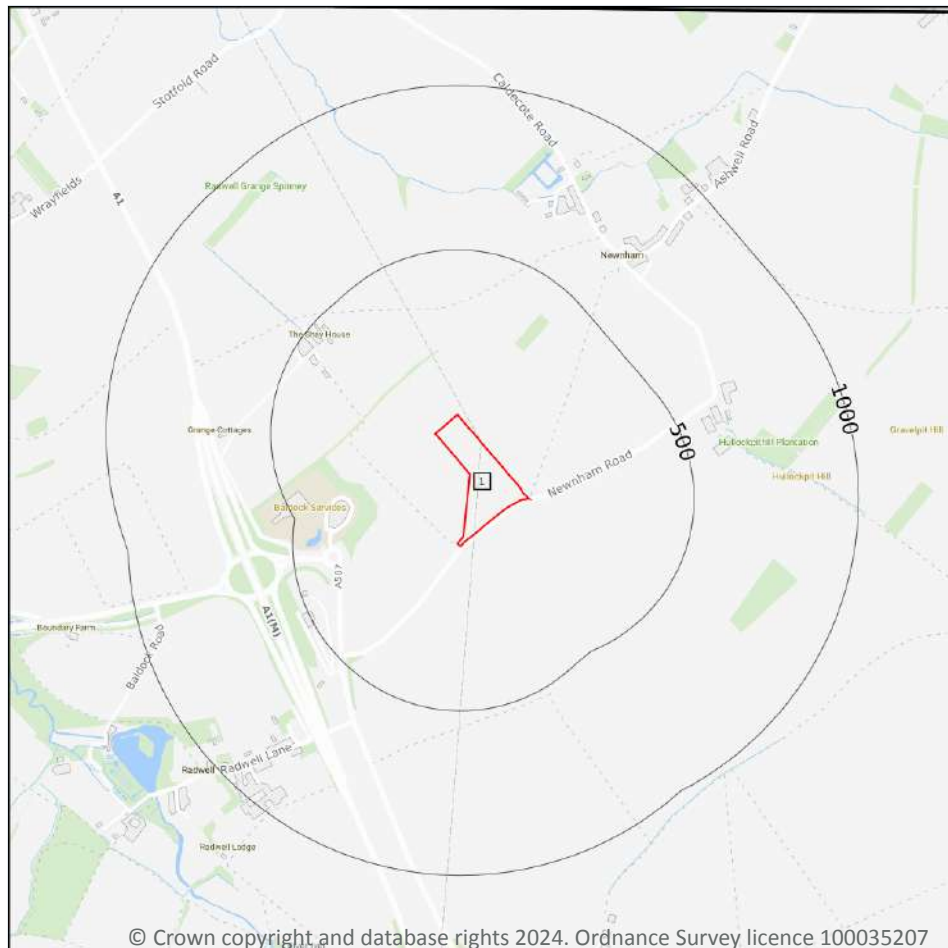
0

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



— Site Outline

Search buffers in metres (m)

□ Geological map tile

15.1 50k Availability

Records within 500m

1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on [page 68](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW221_hitchin_v4

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Artificial and made ground



- Site Outline
- Search buffers in metres (m)
- Made ground
 - Worked ground
 - Infilled ground
 - Disturbed ground
 - Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m

1

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on [page 69](#) >

ID	Location	LEX Code	Description	Rock description
1	499m W	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.



15.3 Artificial ground permeability (50k)

Records within 50m

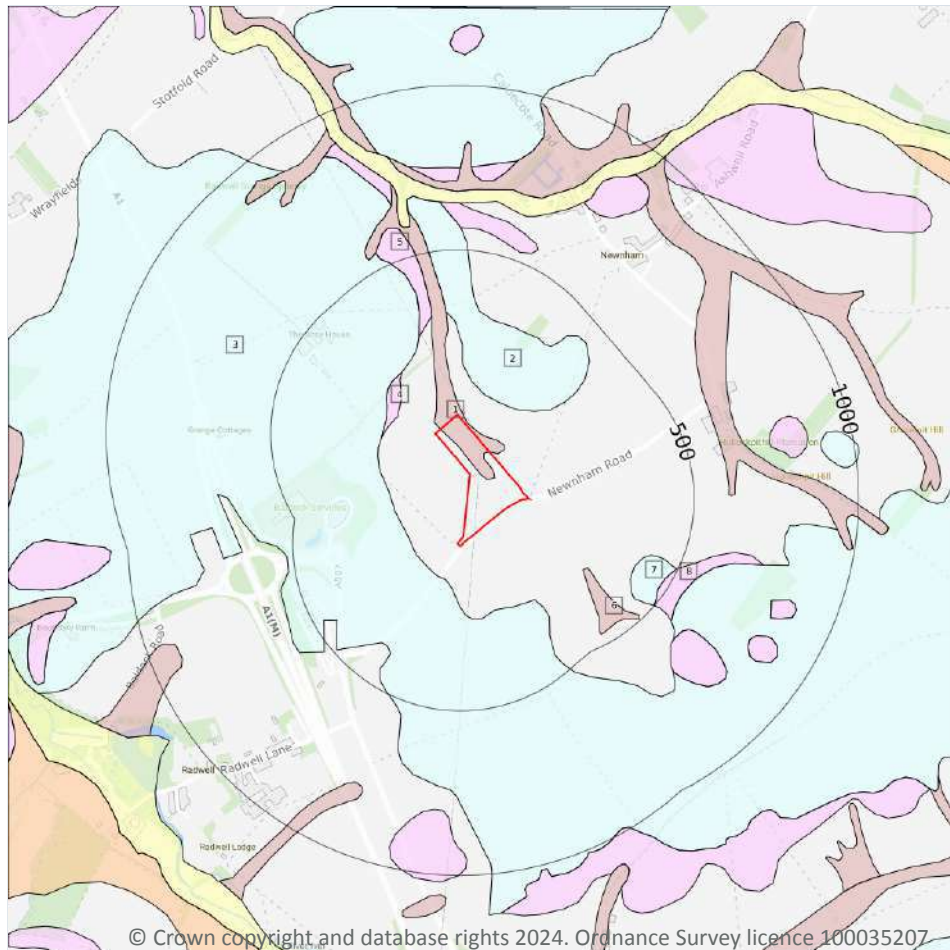
0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m

8

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on [page 71](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	HEAD-XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL
2	101m N	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON
3	112m S	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON



ID	Location	LEX Code	Description	Rock description
4	127m NW	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
5	263m NW	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL
6	270m SE	HEAD- XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL
7	380m SE	LOFT-DMTN	LOWESTOFT FORMATION	DIAMICTON
8	478m SE	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	1
---------------------------	----------

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Mixed	High	Very Low

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	0
----------------------------	----------

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

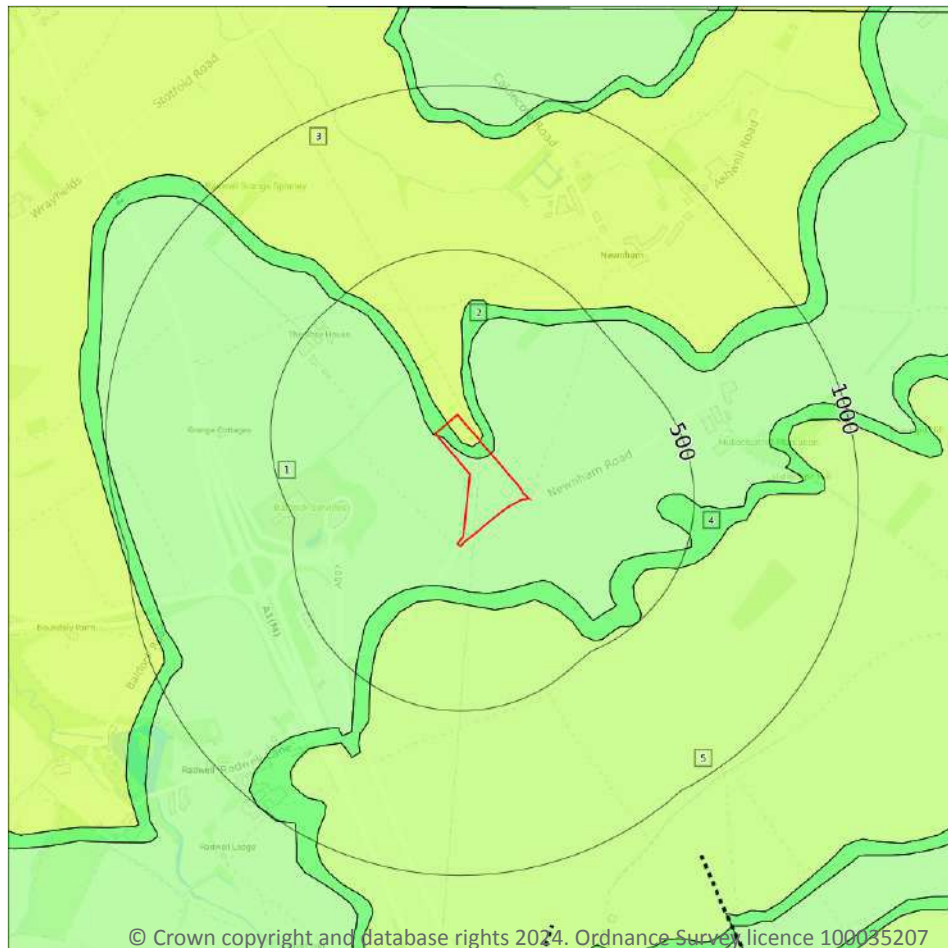
Records within 50m	0
---------------------------	----------

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m

5

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on [page 73](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	ZZCH-CHLK	ZIG ZAG CHALK FORMATION - CHALK	CENOMANIAN
2	On site	TTST-CHLK	TOTTERNHOE STONE MEMBER - CHALK	CENOMANIAN
3	On site	WMCH-CHLK	WEST MELBURY MARLY CHALK FORMATION - CHALK	CENOMANIAN

ID	Location	LEX Code	Description	Rock age
4	128m S	MR-CHLK	MELBOURN ROCK MEMBER - CHALK	CENOMANIAN
5	173m S	HNCK-CHLK	HOLYWELL NODULAR CHALK FORMATION AND NEW PIT CHALK FORMATION (UNDIFFERENTIATED) - CHALK	CENOMANIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m

3

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	Very High	Very High
On site	Fracture	Very High	Very High
On site	Fracture	Very High	High

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

0

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.



16 Boreholes

16.1 BGS Boreholes

Records within 250m

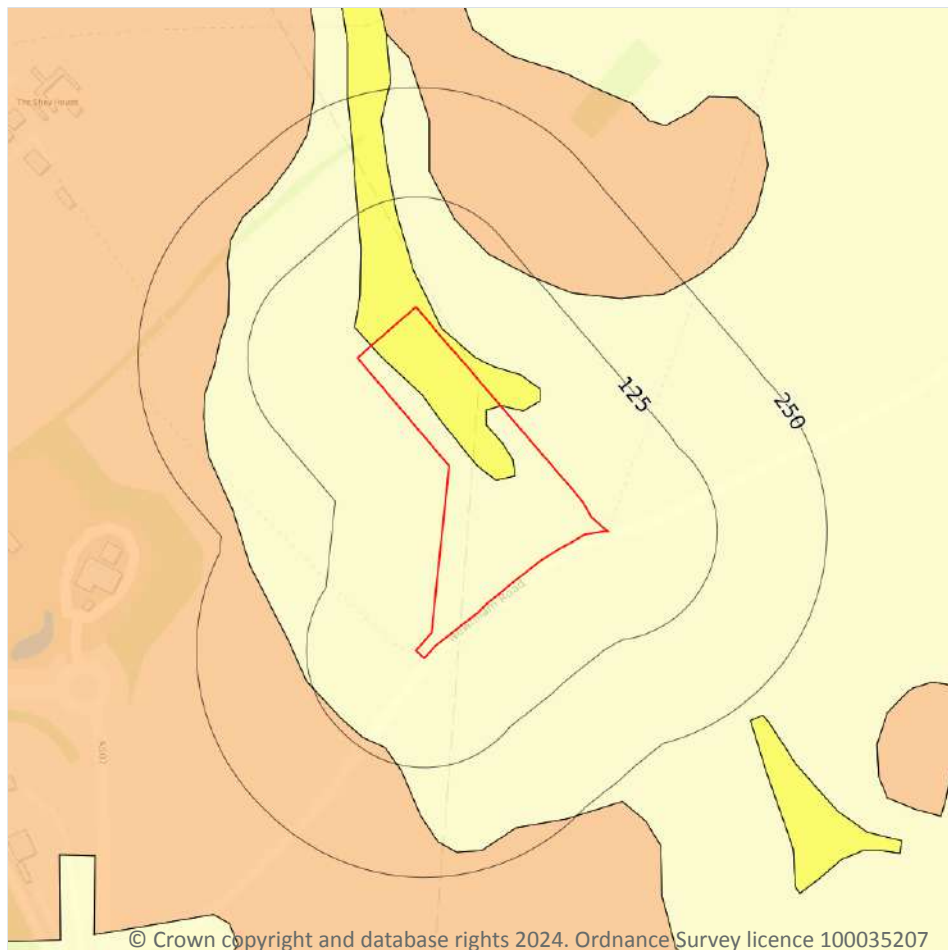
0

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.1 Shrink swell clays

Records within 50m

2

The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

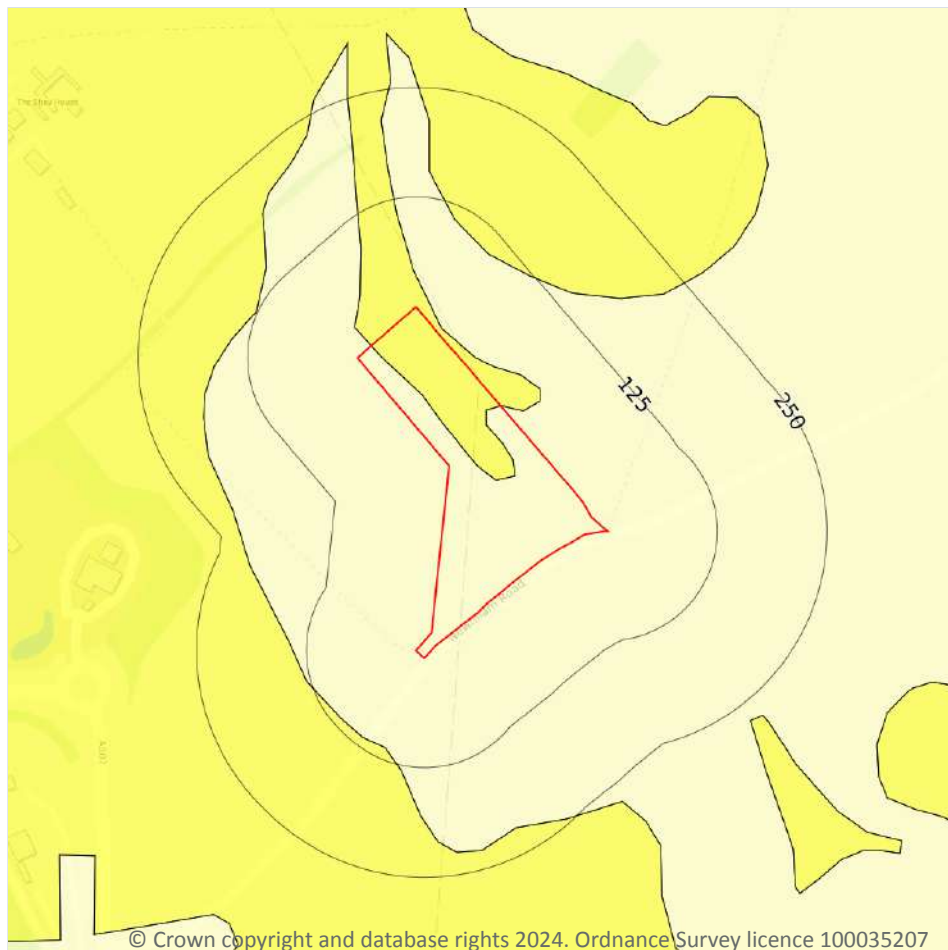
Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 76](#) >

Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
On site	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.2 Running sands

Records within 50m

2

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on [page 77 >](#)

Location	Hazard rating	Details
On site	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

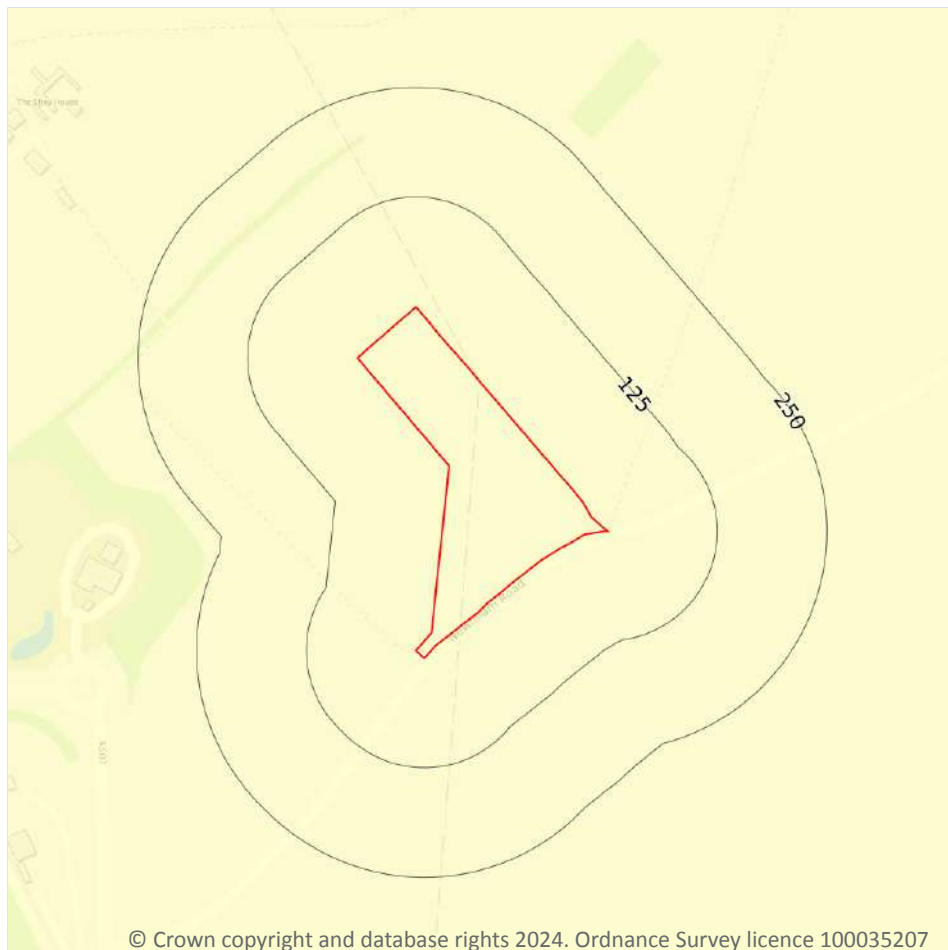


Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.3 Compressible deposits

Records within 50m

1

The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

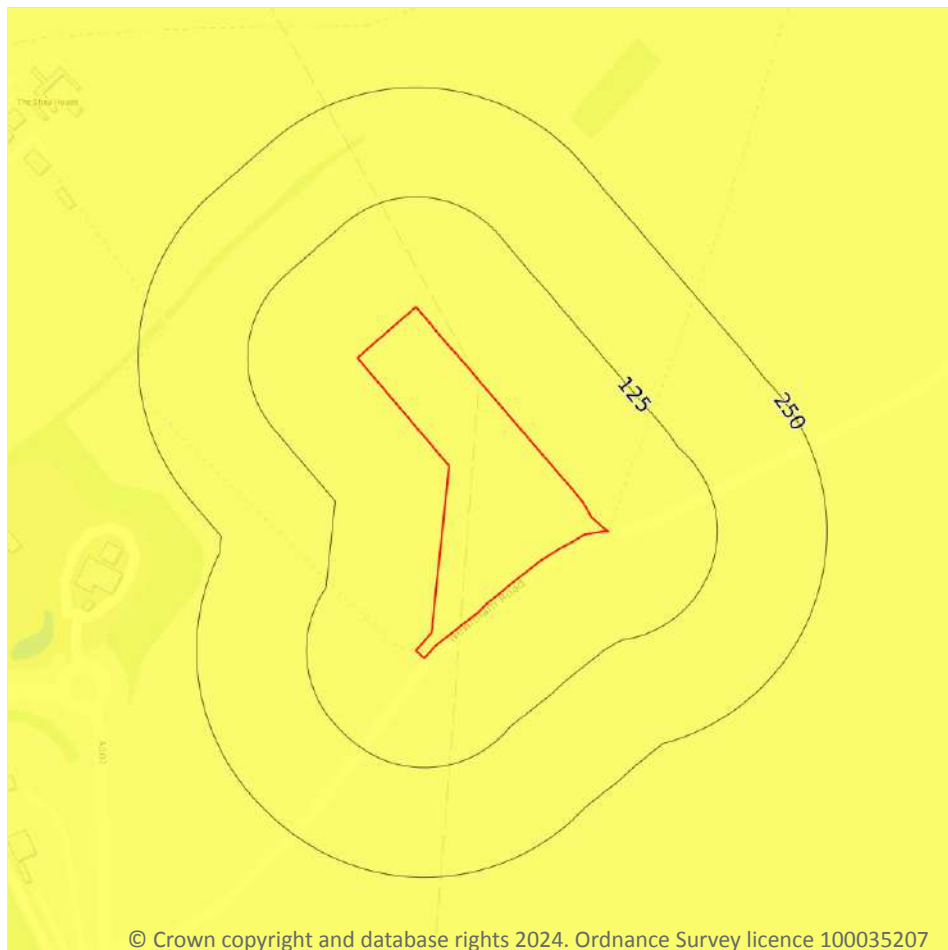
Features are displayed on the Natural ground subsidence - Compressible deposits map on [page 79 >](#)

Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☒ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.4 Collapsible deposits

Records within 50m

1

The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

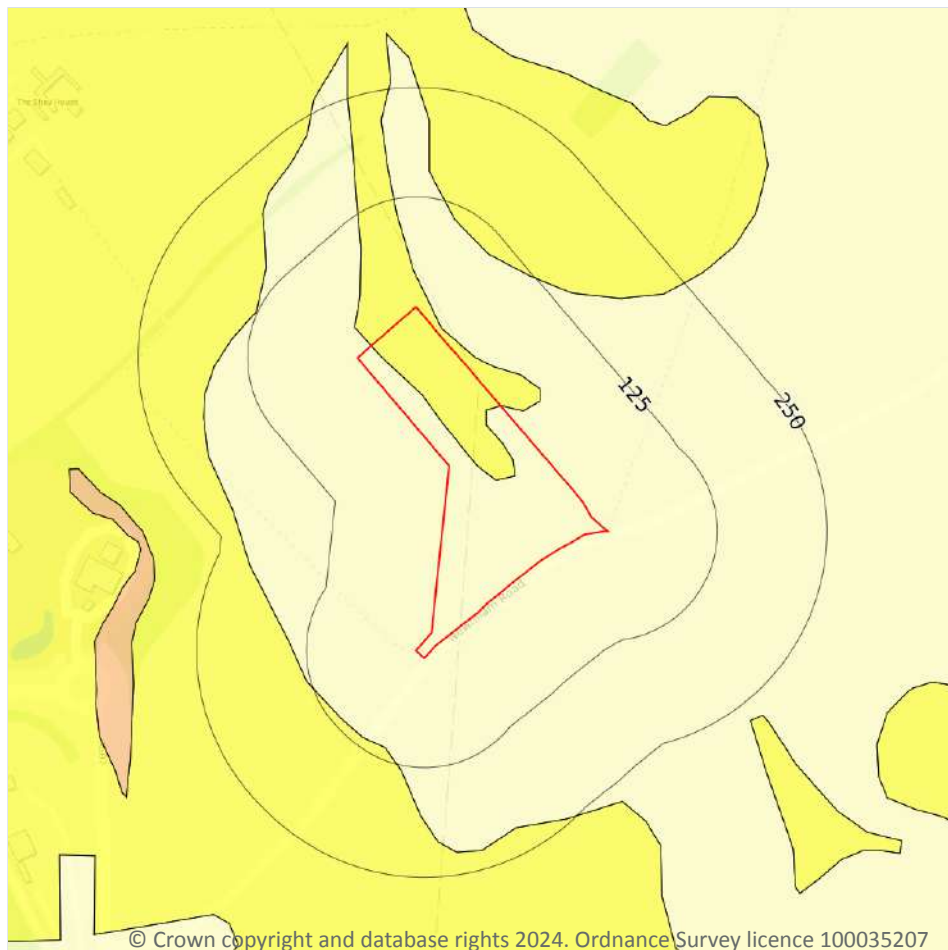
Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 80 >](#)

Location	Hazard rating	Details
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Landslides



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.5 Landslides

Records within 50m

2

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on [page 81](#) >

Location	Hazard rating	Details
On site	Negligible	Slope instability problems are not thought to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

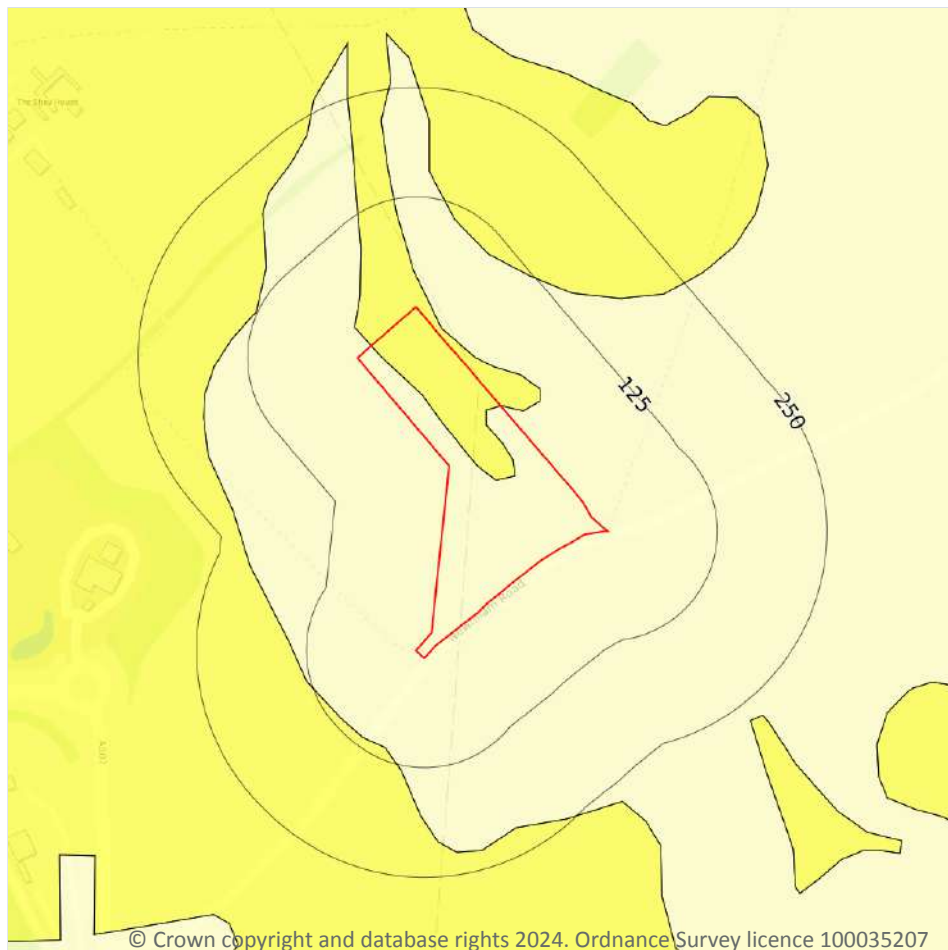


Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.6 Ground dissolution of soluble rocks

Records within 50m

2

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on [page 83](#)

Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

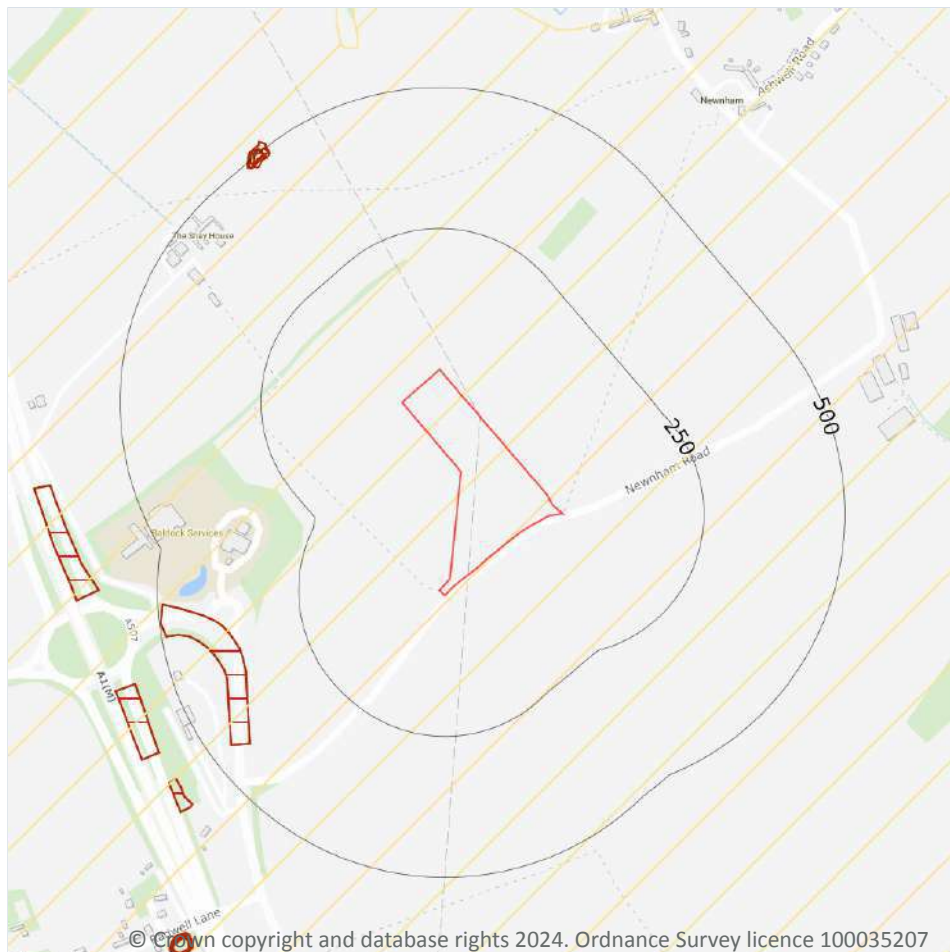


Location	Hazard rating	Details
On site	Very low	Soluble rocks are present within the ground. Few dissolution features are likely to be present. Potential for difficult ground conditions or localised subsidence are at a level where they need not be considered.

This data is sourced from the British Geological Survey.



18 Mining and ground workings



- Site Outline
- Search buffers in metres (m)
- BritPits
- Surface ground workings
- Underground workings
- Underground mining extents
- Historical mineral planning areas
- TCA non-coal mining
- Non Coal Mining
- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

18.1 BritPits

Records within 500m

0

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

This data is sourced from the British Geological Survey.

18.2 Surface ground workings

Records within 250m**0**

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

This data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m**0**

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

This data is sourced from Ordnance Survey/Groundsure.

18.4 Underground mining extents

Records within 500m**0**

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

This data is sourced from Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m**0**

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m**3**

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

Features are displayed on the Mining and ground workings map on [page 85](#) >



ID	Location	Name	Commodity	Class	Likelihood
1	On site	Not available	Chalk	A	Underground mine workings are uncommon, although the geology is similar to that worked elsewhere. Potential for difficult ground conditions are unlikely and are at a level where they need not be considered.
-	679m N	Not available	Chalk	A	Underground mine workings are uncommon, although the geology is similar to that worked elsewhere. Potential for difficult ground conditions are unlikely and are at a level where they need not be considered.
-	839m E	Not available	Chalk	A	Underground mine workings are uncommon, although the geology is similar to that worked elsewhere. Potential for difficult ground conditions are unlikely and are at a level where they need not be considered.

This data is sourced from the British Geological Survey.

18.7 JPB mining areas

Records on site

0

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.8 The Coal Authority non-coal mining

Records within 500m

0

This data provides an indication of the potential zone of influence of recorded underground non-coal mining workings. Any and all analysis and interpretation of Coal Authority Data in this report is made by Groundsure, and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the Coal Authority and permission should be sought from Groundsure prior to any re-use.

This data is sourced from The Coal Authority.

18.9 Researched mining

Records within 500m

0

This data indicates areas of potential mining identified from alternative or archival sources, including; BGS Geological paper maps, Lidar data, aerial photographs (from World War II onwards), archaeological data services, websites, Tithe maps, and various text/plans from collected books and reports. Some of this data is approximate and Groundsure have interpreted the resultant risk area and, where possible, specific areas of risk have been captured.



This data is sourced from Groundsure.

18.10 Mining record office plans

Records within 500m	0
---------------------	---

This dataset is representative of Mining Record Office and/or plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.11 BGS mine plans

Records within 500m	0
---------------------	---

This dataset is representative of BGS mine plans held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.12 Coal mining

Records on site	0
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Areas which could be affected by past, current or future coal mining.

This data is sourced from the Coal Authority.

18.13 Brine areas

Records on site	0
-----------------	---

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.14 Gypsum areas

Records on site	0
-----------------	---

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.



18.15 Tin mining

Records on site	0
-----------------	---

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

18.16 Clay mining

Records on site	0
-----------------	---

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).



19 Ground cavities and sinkholes

19.1 Natural cavities

Records within 500m

0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

19.2 Mining cavities

Records within 1000m

0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

19.3 Reported recent incidents

Records within 500m

0

This data identifies sinkhole information gathered from media reports and Groundsure's own records. This data goes back to 2014 and includes relative accuracy ratings for each event and links to the original data sources. The data is updated on a regular basis and should not be considered a comprehensive catalogue of all sinkhole events. The absence of data in this database does not mean a sinkhole definitely has not occurred during this time.

This data is sourced from Groundsure.

19.4 Historical incidents

Records within 500m

0

This dataset comprises an extract of 1:10,560, 1:10,000, 1:2,500 and 1:1,250 scale historical Ordnance Survey maps held by Groundsure, dating back to the 1840s. It shows shakeholes, deneholes and other 'holes' as noted on these maps. Dene holes are medieval chalk extraction pits, usually comprising a narrow shaft with a number of chambers at the base of the shaft. Shakeholes are an alternative name for suffusion sinkholes, most commonly found in the limestone landscapes of North Yorkshire but also extensively noted around the Brecon Beacons National Park.

Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.



This data is sourced from Groundsure.

19.5 National karst database

Records within 500m

0

This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

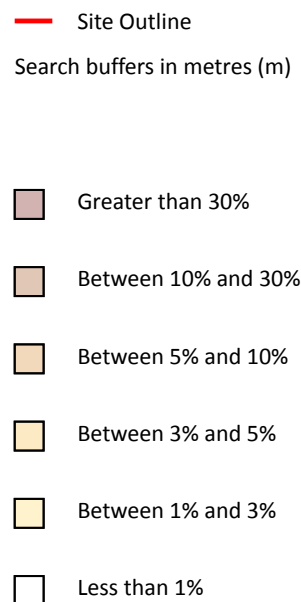
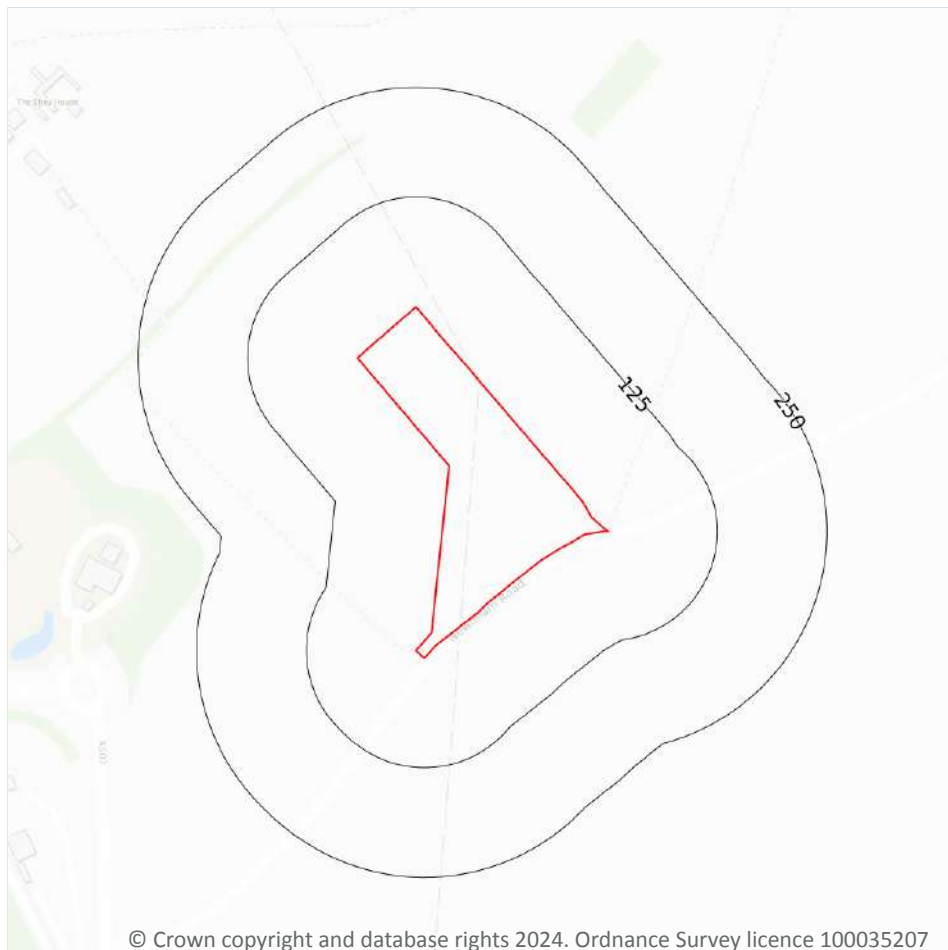
Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 800 caves, 1300 stream sinks, 5600 springs, 10,000 sinkholes.

The database is not yet complete, and not all records have been verified. The absence of data does not mean that karst features are not present at a site. A reliability rating is included with each record.

This data is sourced from the British Geological Survey.



20 Radon



20.1 Radon

Records on site

1

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on [page 92](#) >

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None



This data is sourced from the British Geological Survey and UK Health Security Agency.



21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m

17

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
6m NE	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
7m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
12m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
16m S	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
18m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
26m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg
45m S	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.



21.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

This data is sourced from the British Geological Survey.

21.3 BGS Measured Urban Soil Chemistry

Records within 50m

0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



22 Railway infrastructure and projects

22.1 Underground railways (London)

Records within 250m	0
---------------------	---

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

22.2 Underground railways (Non-London)

Records within 250m	0
---------------------	---

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m	0
---------------------	---

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m	0
---------------------	---

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

This data is sourced from Ordnance Survey/Groundsure.

22.5 Royal Mail tunnels

Records within 250m	0
---------------------	---

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.



This data is sourced from Groundsure/the Postal Museum.

22.6 Historical railways

Records within 250m	0
---------------------	---

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

22.7 Railways

Records within 250m	0
---------------------	---

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

22.8 Crossrail 1

Records within 500m	0
---------------------	---

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

22.9 Crossrail 2

Records within 500m	0
---------------------	---

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

22.10 HS2

Records within 500m	0
---------------------	---

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 Ltd.



Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see <https://www.groundsure.com/sources-reference> ↗.

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