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Site Condition Report – Three Maids AD Plant

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**On Behalf of Acorn Bioenergy Operations Limited**

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ETL724/2024

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6 March 2024

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## QUALITY CONTROL

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### Quality control sign off

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## Contents

Abbreviations .....	4
1. Introduction .....	5
2. Site Details.....	6
3. Condition of the Land at Permit Issue .....	9
4. Permitted Activities .....	14
Figures.....	15
Appendix A: Enviro Geo Insight Report (2023).....	22
Appendix B: Flood Risk Assessment and Surface Water Drainage Strategy and Technical Addendum SLR (2022) .....	120
Appendix C: Preliminary Land Quality Risk Assessment, SLR (2022) .....	254
Appendix D: Site Walkover Photographs 22 September 2022 (Earthcare Technical limited) .....	255
Appendix D: Google Earth Images of the site .....	258

## Abbreviations

ABL	Acorn Bioenergy Operations Limited
AD	Anaerobic Digestion/er
BGS	British Geological Survey
BUU	Biogas upgrade unit
CHP	Combined heat and power
CO <sub>2</sub>	Carbon dioxide
EVCS	Electric Vehicle Charging Station
EA	Environment Agency
EPR	Environmental Permitting Regulations
M AOD	metres above Ordnance Datum
NVZ	Nitrate Vulnerable Zone
PHI	Priority Habitat Inventory
PVRV	Pressure and vacuum relief valve
SCR	Site Condition Report
TPA	Tonnes per annum
UV	Ultra violet

## 1. Introduction

- 1.1.1 This document, comprising a Site Condition Report (SCR), has been prepared by Earthcare Technical Ltd on behalf of Acorn Bioenergy Operations Ltd in support of an application for a new bespoke Installation Environmental Permit for an anaerobic digestion (AD) plant including the use of resultant biogas for Three Maids AD Plant, located on agricultural land at Three Maids Farm, Three Maids Hill, Winchester, SO21 2QG, Centred on National Grid Reference (NGR): SU 46094 33959, herein termed 'the Site'. The plant will be operated by Acorn Bioenergy Operations Limited (ABL), herein termed 'the Operator'.
- 1.1.2 The permit application, which this SCR supports, is for a bespoke permit based upon Standard Rules Permit *SR2021 No 8: on-farm anaerobic digestion facility using farm wastes only, including use of the resultant biogas – installations. For a Part A installation with an anaerobic digestion capacity of over 100 tonnes of waste, or a combination of waste and non-waste each day and accepting no more than 100,000 tonnes per year.*
- 1.1.3 The Environmental Permitting Regulations Site Condition Report guidance for applicants H5,<sup>1</sup> defines a SCR as a document that describes and records the condition of the land and groundwater at a site at a point in time. When an operator applies to the Environment Agency (EA) to surrender the Environmental Permit, the SCR can be used to demonstrate that the land and water within the vicinity have been protected during the lifetime of the regulated facility and that the land is in a satisfactory state.
- 1.1.4 This report describes the site condition at the time of the permit application. It is designed to be updated and retained through the operational phase of the regulated facility, for use as a reference at the end of the operational phase, when the operator makes an application to surrender the Environmental Permit.
- 1.1.5 The SCR comprises information gathered during a site walkover by Earthcare Technical Limited (22 September 2022) and a desk top study utilising:
- Publicly available information.
  - Enviro Geo Insight Report, Groundsure (May 2023).
  - Preliminary Land Quality Risk Assessment, SLR (2022).
  - Flood Risk Assessment and Surface Water Drainage Strategy, SLR (2022).
  - EIA Screening Report, SLR (2022).
  - Three Maids Green Power AD Plant Construction Environmental Management Plan (CEMP), Acorn Bioenergy Ltd, March 2023.
- 1.1.6 Please refer to the following SCR template which has been replicated from the guidance for the purposes of consistency.

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<sup>1</sup> H5, Site condition report – guidance and templates, LIT8001 Version 3.0 April 2013.

## 2. Site Details

<b>Name of applicant</b>	Acorn Bioenergy Operations Limited
<b>Activity address</b>	The AD Plant is to be located on agricultural land at Three Maids Farm, Three Maids Hill, Winchester, SO21 2QG.
<b>National grid reference</b>	SU 46094 33959
<b>Site footprint</b>	The proposed site footprint (permitted area) is approximately 4.5 hectares (11.1 acres)
<b>Current infrastructure</b>	There is a below ground power cable to the western edge of the site serving the adjacent solar park to the north.
<b>Proposed infrastructure</b>	<ul style="list-style-type: none"> <li>• New gateway and access road from the A272</li> <li>• Liquid feedstock reception point</li> <li>• Liquid feedstock pre-treatment system (macerate and screen)</li> <li>• Liquid feedstock tank with mixing system (8m height x 8m diameter) (400 m<sup>3</sup>)</li> <li>• Manure reception building (24.623 x 20.154 x 12.24 m to eaves, 13.53 m to ridge) containing:             <ul style="list-style-type: none"> <li>- Fast acting roller shutter doors</li> <li>- Air handling and emissions abatement plant</li> <li>- Dedicated manure conveyor feed hopper</li> <li>- Pre-mix system</li> </ul> </li> <li>• Straw treatment building (41.6 m x 23 m x 7 m to eaves, 8.2 m to ridge) containing:             <ul style="list-style-type: none"> <li>- Bale conveyor</li> <li>- Destringer</li> <li>- Bale opener</li> <li>- Bale breaker</li> <li>- Straw mill with water injection</li> <li>- 7.9 m x 12.9 m storage bay for crushed wet straw</li> <li>- 2 No. straw extruders with 1 No. feed hopper</li> </ul> </li> <li>• 1 No. set down bay for prepared extruded straw</li> <li>• 2 No. silage clamps:             <ul style="list-style-type: none"> <li>- Clamp 1 – 123.75 m x 42.5 m wide x 3.52m high (28,534 m<sup>3</sup> capacity)</li> <li>- Clamp 2 – 118.75 m. x 40m x 3.52 high ( 25,080 m<sup>3</sup>)</li> </ul> </li> <li>• 1 No. Silage leachate tank with leak detection (50m<sup>3</sup>)</li> <li>• 2 No. Feed hoppers (external) (150 m<sup>3</sup> each)</li> <li>• 5 No. Digesters:             <ul style="list-style-type: none"> <li>- 2 No. Primary digesters ( 5,840 m<sup>3</sup> each)</li> <li>- 2 No. Secondary digesters ( 6,430 m<sup>3</sup> each)</li> <li>- 1 No. Tertiary digester ( 6,430 m<sup>3</sup>)</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• 3 No. pasteurisation tanks (35 m<sup>3</sup> each)</li> <li>• Suspension buffer tank (400 m<sup>3</sup>)</li> <li>• Separator covered bunker:             <ul style="list-style-type: none"> <li>- 2 No. Separators</li> <li>- Separated fibre storage bay (W x L x H) 18m x 13.2 m x 6.4 m</li> </ul> </li> <li>• 2 No. Buffer water tanks (400 m<sup>3</sup> each)</li> <li>• 1 No. Process water buffer tank (100 m<sup>3</sup>)</li> <li>• 1 No. Digestate storage bag with leak detection (7,344 m<sup>3</sup> capacity)</li> <li>• 1 No. Digestate off-take bay with sump (3m<sup>3</sup>)</li> <li>• Emergency flare – 8.7m stack height</li> <li>• Biogas Upgrade Unit (BUU) (includes a gatekeeper as there is no Grid Entry Unit).</li> <li>• Biogas booster on inlet to BUU</li> <li>• Carbon dioxide capture unit</li> <li>• 2. No. carbon dioxide storage tanks (50 m<sup>3</sup> each)</li> <li>• 2 No. dual fuel combined heat and power (CHP) engines with 7 m stacks (TEDOM Quanto 1200 1.2MWe)</li> <li>• 1 No. 300 kW chiller between 2 Primary digesters.</li> <li>• 1 No. chiller on BUU</li> <li>• 2 No. condensate sumps</li> <li>• 1 No. 550 kW dual fuel emergency boiler</li> <li>• 1 No. diesel emergency generator (770 kVA)</li> <li>• 2 No. compressors (compressing gas before injecting into road tankers)</li> <li>• 4 No. biomethane / carbon dioxide off-take vehicle bays</li> <li>• 1 No. secondary containment bund</li> <li>• Full surface water interceptor and cellular storage system for clean surface water (266 m<sup>3</sup> at 95% void space)</li> <li>• 3. No pump containers (1 No. inside bund &amp; 2 No. outside bund)</li> <li>• Site boundary fence</li> <li>• Parking area</li> <li>• Access road</li> <li>• Weighbridge</li> <li>• Site office</li> <li>• Cesspit (55m<sup>3</sup>)</li> </ul>
<p><b>Document reference and dates for Site Condition Report at permit application</b></p>	<p>Application SCR (this report):                  Site Condition Report – Three Maids AD Plant February 2024 V1.0 (ETL724/THRM/SCR/V1.0)</p>

<b>Document References for site plans (including location and boundaries)</b>	<p>Figure 1: Site Location Plan (ETL724/THRM/SiteLocation/EPR01)</p> <p>Figure 2: Permit Boundary &amp; Emission Point Plan (Acorn-29348-C-202-E Site Emissions Plan)</p> <p>Figure 3: Site Layout Plan (GGP-29348-C-101-C6)</p> <p>Figure 4: Proposed Drainage Layout (GGP-29348-C-110-C3)</p> <p>Figure 5: Drainage Catchment Plan (GGP-29348-C-103-EA1)</p> <p>Figure 6: Human Receptor Plan, Earthcare Technical (ETL724/THRM/HumanReceptors/EPR02)</p> <p>(See Figures)</p>
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### 3. Condition of the Land at Permit Issue

<p>Environmental setting including:</p> <ul style="list-style-type: none"> <li>• Geology</li> <li>• Hydrogeology</li> <li>• Surface waters</li> <li>• Flood risk</li> </ul>	<p><b>Geology</b></p> <p>The site is at an elevation of approximately 101m above Ordnance Datum (m AOD) and falls generally in a southeastern direction to 87.75m AOD. The site is broadly rectangular and slopes down towards the A34.</p> <p>As detailed in Section 15 of the Enviro Geo Insight Report (Appendix A):</p> <ul style="list-style-type: none"> <li>• The soil type is classified as freely draining, shallow lime-rich soils over chalk and limestone with a loamy texture.</li> <li>• The bedrock geology comprises principally Chalk (Seaford Chalk Formation) and limestone (Stockbridge Rock Member) of very high permeability. There are superficial drift deposits in the northeastern corner of the site of clay, silt, sand, and gravel of high permeability and at very low to negligible risk of shrink swell clays.</li> <li>• Though soluble rocks are present within the ground. Few dissolution features are likely to be present and is of very low risk.</li> <li>• There is no made or artificial ground on site.</li> <li>• Chalk pits are present locally but there are none on site.</li> <li>• There are no BGS borehole records within 250m of the site.</li> </ul> <p><b>Hydrogeology</b></p> <p>As detailed in Section 5 of the Enviro Geo Insight Report (Appendix A):</p> <ul style="list-style-type: none"> <li>• The soil surface is high leaching class with an infiltration value of &gt;70%</li> <li>• The site bedrock geology has well connected fractures and puts the Principal aquifer at high vulnerability risk.</li> <li>• There is an area of superficial aquifer in the northeastern corner of the site corresponding to superficial drift deposits of secondary undifferentiated superficial aquifer also classified as high vulnerability.</li> <li>• Therefore, Groundwater is at high vulnerability to pollutants released at ground level across the entire site.</li> <li>• The site is not within a Groundwater Source Protection Zone.</li> <li>• There are two groundwater abstractions within 2km of the site. The first location is 792m east Licence No. 11/42/22.5/73 for a maximum daily volume of 36.4 m<sup>3</sup> for general agricultural use and the second 1578m to the northwest Licence No.33/240 of processing use and with no stated limit.</li> </ul> <p><b>Surface Water</b></p> <p>There is a gully ditch to the A34 to the eastern boundary of the site. The Nun's Walk Stream surface water body Catchment area</p>
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	<p>part of the wider Itchen Catchment falls to the southeastern area of the site with the stream itself some 2.83 Km south east.</p> <p>The site is not located within a Drinking Water Surface Water Safeguard Zone or a Drinking Water Protected area for surface water.</p> <p>There are no surface water abstraction licences within 2km of the site.</p> <p><b>Flood Risk</b></p> <p>Flood risk for this site is <i>very low</i>. The site is in a Flood zone 1 which means that overall, there is a low probability of flooding from rivers or sea.<sup>2</sup></p> <p>The south eastern corner of the site is shown to be at a higher risk of flooding of <i>medium to low</i>. This is shown in Section 8 of the Enviro Geo Insight Report (Appendix A) and further detail is provided in the SLR Flood Risk Assessment and Surface Water Drainage Strategy report (Appendix B).</p> <p>The Groundwater Flood risk addendum prepared to support the planning application concluded that there is <i>'little or no risk of groundwater flooding or obstruction to infiltration for the proposed drainage scheme from historical data.'</i> The report also stated, <i>'The topography of the land, and the position of the site, the risk of groundwater flooding to the site is low to negligible'</i>.</p> <p>Ground investigation work was carried out 21 of September 2022 that included the drilling of five boreholes, five trial pits and the collection of soils samples from various locations across the site. As part of this work groundwater monitoring was requested and all wells were found to be dry to 5.57-9.55m.</p>
<p>Pollution history including:</p> <ul style="list-style-type: none"> <li>● Pollution incidents that may have affected land.</li> <li>● Historical land uses and associated contaminants</li> <li>● Any visual/ olfactory evidence of existing contamination</li> <li>● Evidence of damage to pollution prevention measures</li> </ul>	<p><b>Pollution incidents that may have affected land.</b></p> <p>As detailed in Sections 4.18 of the Enviro Geo Insight Report (Appendix A) in 2003 there was 1 recorded Category 3 pollution incident 386m N of the site of Diesel of minor impact. Only Category 1 and 2 pollution incidents have been recorded since 2006 and none are recorded within 500m of the site.</p> <p>A Local Environment Agency Officer informed the applicant of an incident of chloride contamination to groundwater 1.5Km north of the site at Larkwhistle Farm Oil Well, Crawley Down, Winchester SO21 2RJ, but at depths which would not interact with site groundwater levels.</p> <p><b>Permitted activities that may have affected land.</b></p> <p>As detailed in Section 3 of the Enviro Geo Insight Report (Appendix A), there are no active or historical landfills within 500m of the site.</p> <p>T &amp; M Recycling Ltd hold an environmental permit for an Inert Waste Recycling Facility, (EPR/WE0609AB) 29m south of the AD</p>

<sup>2</sup> <https://flood-map-for-planning.service.gov.uk/> Accessed 06 Jun 2023

	<p>Plant site area, issued on the 13 August 2021. Planning was granted for the scheme on Appeal, 22 June 2022 (APP/Q1770/W/21/3279319). The site is currently not in existence.</p> <p>This land use has been superseded as planning permission was granted 18 December 2023, (Ref:23/01594/FUL) for the Development of an Electric Vehicle Charging Station (EVCS) with associated means of access, internal parking and roadways, siting of ancillary power generation, storage and distribution infrastructure, landscaping and engineering works, erection of ancillary restaurant, outdoor seating and play area adjacent to the Three Maids AD site area.</p> <p>There is a further waste site 222m east for the treatment of waste to produce soil held by Pringle Reclaim Ltd and issued 1 July 2022 (EPR/WE6248AB). There are 2 non-agricultural waste exemptions 178m east for use of waste in construction and for Screening and blending of waste and 1 on farm exemption for the use of waste in construction 349m east and 382m east.</p> <p>There is one historic record of a licensed discharge to controlled waters within 500m of the site. This is located 266m south and related to sewage discharges, the licence was revoked in 1997.</p> <p><b>Historical / current land uses</b></p> <p>The proposed site is located on greenfield land. A site walkover was conducted by SLR Consulting to inform the Preliminary Land Quality Risk Assessment, (Appendix C) March 2022. A site walkover was conducted by Earthcare Technical September 2022). There was some evidence of physical contaminants in the gateway of the site access, but otherwise only wind-blown rubbish was found in small quantities along the site fence line. From the first available maps dated 1870 onwards the site shown to be undeveloped agricultural land with a track running through it from 1870 to the mid-1980s. In 1956 mixed woodland is mapped in the northern and western portions of the site which is no longer mapped in 1963.</p> <p>Aerial photographs between 2005 and 2008 show the site to contain racetracks, thought to be part of the nearby PCE Motopark at that time. The site is agricultural land ALC Grade 3, bordered on the east and west by the A34 and A272, with the Three Maids Roundabout directly to the south.</p> <p><b>Potential contaminants associated with previous site use</b></p> <p>As detailed in Section 4.5 of the Enviro Geo Insight Report (Appendix A) there are no records of sites determined as Contaminated Land within 500m of the study site.</p> <p>As detailed in Section 4.16 and 4.17 of the Enviro Geo Insight Report (Appendix A) there are no records of discharges of List 1 or List 2 Dangerous Substances within 500m of the site.</p>
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	<p>The Preliminary Land Quality Risk Assessment (Appendix C), concludes that:</p> <p><i>‘The site consists of a broadly rectangular arable field. Historically the site has been used as agricultural land, and at some points mixed woodland was present in the north and west of the site. A track/gallop ran through the site from north to south and the site was used as a racetrack for the nearby motopark. There was no evidence of potentially significant sources of contamination identified on site during the walkover or from published information.</i></p> <p><i>Groundwater is sensitive at the site given the presence of a secondary undifferentiated aquifer in the superficial deposits and a principal chalk aquifer in the bedrock, although the nearest groundwater abstraction is approximately 750m to the east.</i></p> <p><i>Surface water sensitivity is considered low due to no surface water features having been identified within 1km of the site.</i></p> <p><i>Qualitative risk assessment indicates that the site represents a low risk of contamination impacts to human health and controlled waters associated with the proposed development as no potentially significant sources have been identified. Given the lack of potential contamination sources it is likely that on site soils can be excavated and reused as part of the proposed development.’</i></p> <p><b>Any visual / olfactory evidence of existing contamination</b></p> <p>At the time of the site walkover carried out by Earthcare Technical Limited (22 September 2022), there was some plastic and rubble waste visible in the gateway of the site entrance and northern perimeter in a small area but no further evidence of land contamination within the proposed permitted area.</p> <p><b>Evidence of damage to pollution prevention measures</b></p> <p>At the time of the site walkover carried out by Earthcare Technical Limited (22 September 2022), the site remained in agricultural use. There was no evidence of any usage other than agricultural and there was no evidence of contamination of any sort.</p>
<p>Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports</p>	<p>Please see above under ‘Any visual / olfactory evidence of existing contamination’ and Preliminary Land Quality Risk Assessment, SLR (2022) (Appendix C).</p> <p>There is no evidence indicating potential historical contamination of the site.</p>
<p>Baseline soil and groundwater reference data</p>	<p>Please refer to section 20 of the Enviro Geo Insight Report (Appendix A), which contains information on BGS Estimated Background Soil Chemistry. The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in</p>

	topsoil. No ground investigation and analysis of soils for potential contaminants has been carried out.
Supporting information	<ul style="list-style-type: none"><li>• Enviro Geo Insight Report (Appendix A)</li><li>• Flood Risk Assessment and Surface Water Drainage Strategy, SLR (2022) (Appendix B)</li><li>• Preliminary Land Quality Risk Assessment, SLR (2022) (Appendix C)</li><li>• Site Photographs (Appendix D)</li><li>• Google Earth Images (Appendix E)</li></ul>

#### 4. Permitted Activities

<p>Proposed Permitted activities</p>	<p>Schedule 1 5.4 A(1)(b)(i) - Biological Treatment (Anaerobic digestion / more than 100 tonnes per day treatment capacity) of the Environmental Permitting Regulations 2016 (as amended).</p> <p>Directly Associated Activities (DAAs):</p> <ul style="list-style-type: none"> <li>• Storage of waste pending recovery or disposal</li> <li>• Physical and chemical treatment of waste</li> <li>• Gas combustion to produce heat and power</li> <li>• Treating biogas and biomethane</li> <li>• Recovering, treating and storing carbon dioxide</li> <li>• Using an emergency flare</li> <li>• Storage of raw material and waste generated on site</li> <li>• Surface water collection, storage and discharge</li> <li>• Dirty water collection and storage</li> <li>• Air treatment and release</li> </ul>
<p>Non – permitted activities</p>	<p>None</p>
<p>Document references for :</p> <ul style="list-style-type: none"> <li>• Plan showing activity layout; and</li> <li>• Environmental risk assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Site Layout Plan (GGP-29348-C-101-C6-Site Layout Plan)</li> <li>• Environmental Risk Assessment (Appendix A of Three Maids EMS Manual V1.0 <b>(THR-OD-01)</b>)</li> </ul>

## Figures

Figure 1: Site Location Plan (ETL724/THRM/SiteLocation/EPR01)

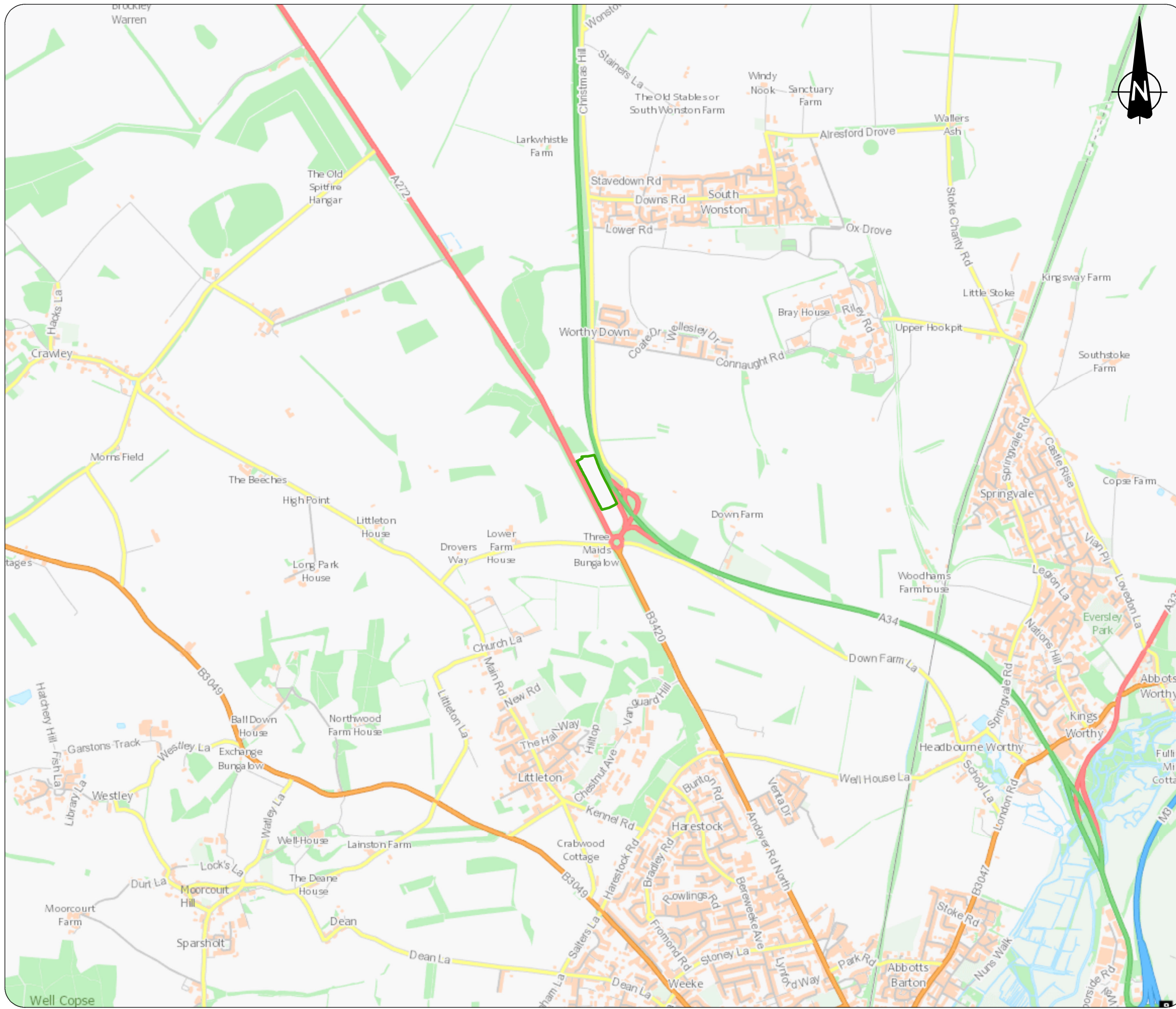
Figure 2: Permit Boundary & Emission Point Plan (Acorn-29348-C-202-E Site Emissions Plan)

Figure 3: Site Layout Plan (GGP-29348-C-101-C6)

Figure 4: Proposed Drainage Layout (GGP-29348-C-110-C3)

Figure 5: Drainage Catchment Plan (GGP-29348-C-103-EA1)

Figure 6: Human Receptor Plan, Earthcare Technical (ETL724/THRM/HumanReceptors/EPR02)



REVISIONS					
REV	DATE	DESCRIPTION	DWN	CHK	APP
-	2002 2024	First Issue	JJ	MF	MF

**LEGEND**

Permit Boundary

0 250 500 750 1,000 1,250 m  
Scale at A3: 1:25,000

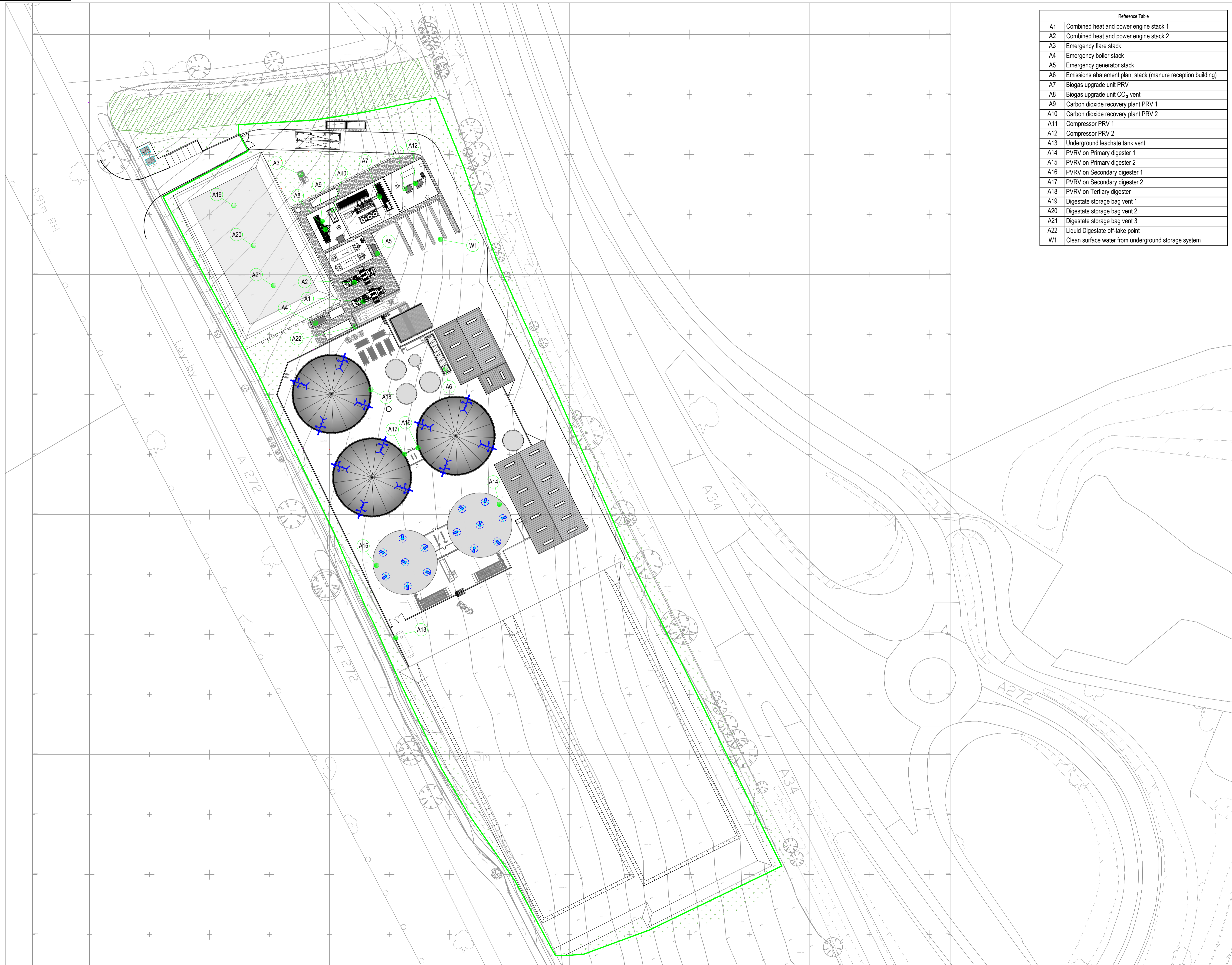
<b>Client</b> Acorn Bioenergy Operations Limited
<b>Project</b> Three Maids AD Permit Application
<b>Title</b> Site Location Plan

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Drawn JJ	Checked MF	Approved MF	Revision
Date February 2024	Scale 1:25,000	Sheet Size A3	
Drawing Number ETL724/THRM/SiteLocation/EPR01		File Reference ETL274.mxd	

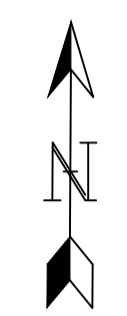




Reference Table	
A1	Combined heat and power engine stack 1
A2	Combined heat and power engine stack 2
A3	Emergency flare stack
A4	Emergency boiler stack
A5	Emergency generator stack
A6	Emissions abatement plant stack (manure reception building)
A7	Biogas upgrade unit PRV
A8	Biogas upgrade unit CO <sub>2</sub> vent
A9	Carbon dioxide recovery plant PRV 1
A10	Carbon dioxide recovery plant PRV 2
A11	Compressor PRV 1
A12	Compressor PRV 2
A13	Underground leachate tank vent
A14	PVRV on Primary digester 1
A15	PVRV on Primary digester 2
A16	PVRV on Secondary digester 1
A17	PVRV on Secondary digester 2
A18	PVRV on Tertiary digester
A19	Digestate storage bag vent 1
A20	Digestate storage bag vent 2
A21	Digestate storage bag vent 3
A22	Liquid Digestate off-take point
W1	Clean surface water from underground storage system

- NOTES:-
- All dimensions must be checked on site and not scaled from this drawing.
  - The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
  - All levels shown on this drawing are relative to Agreed Topographic survey
  - This drawing is to be read in conjunction with 29348/100 Series Drawings.
  - All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.

- Perimeter Fence
- Permitted Area Boundary (4.453ha)
- Emission Release Location
- 15m Woodland Easement



Rev	Date	Description	DR	CH
E	21/02/24	Issued For Information	SJC	JHC
D	14/02/24	Issued For Information	SJC	JHC
C	01/02/24	Issued For Approval	SJC	JHC
B	31/01/24	Issued For Approval	SJC	JHC
A	17/01/24	Issued For Approval	SJC	JHC

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Client  
Job Title  
AD Plant.  
Three Maids

Drawing Title  
Site Emissions Plan.

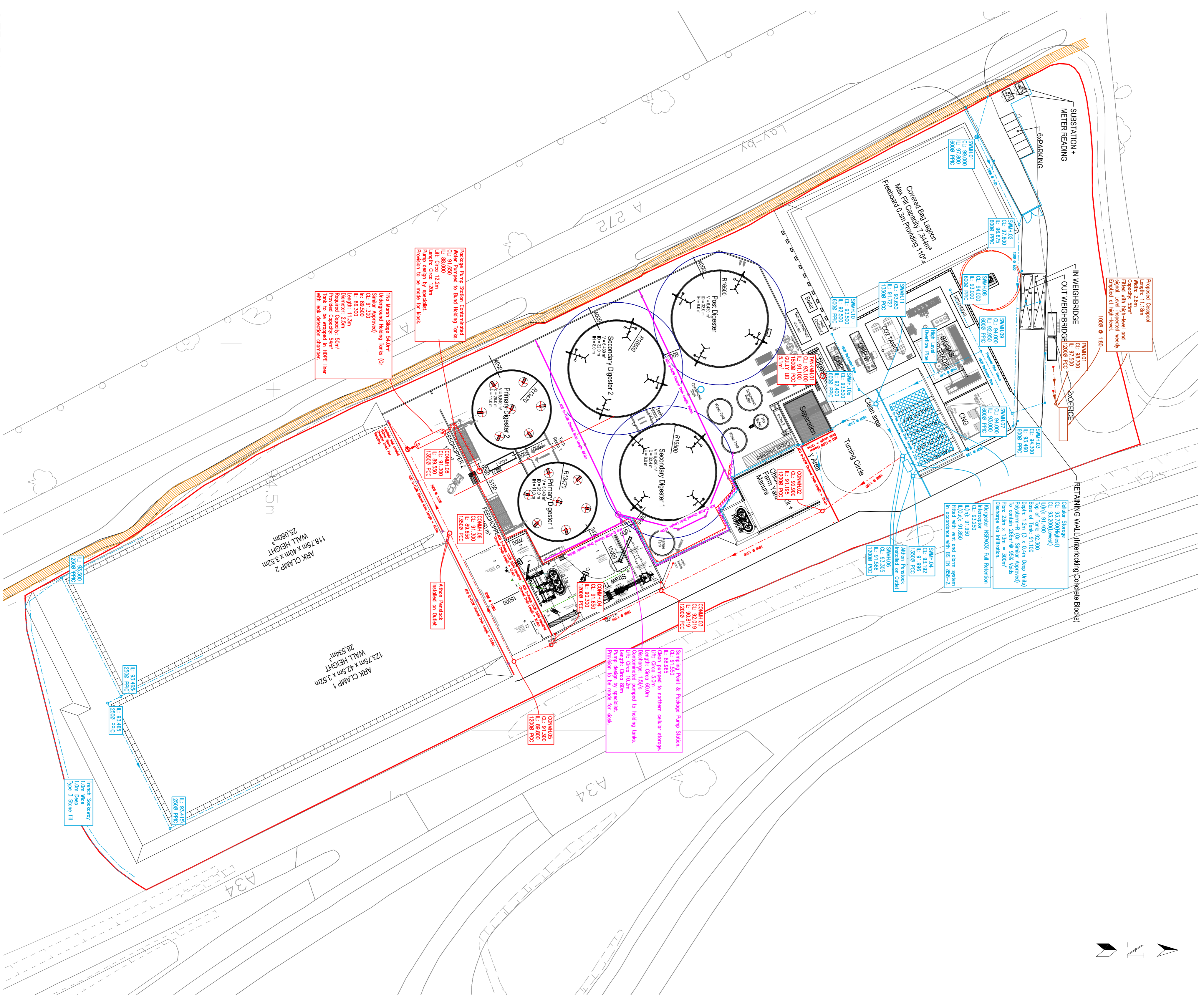
Status	Approval	
Scale	As Shown	Date Jan '24
Drawn By	SJC	Checked JHC Approved JHC

Dwg. No.	29348/202	Rev	E
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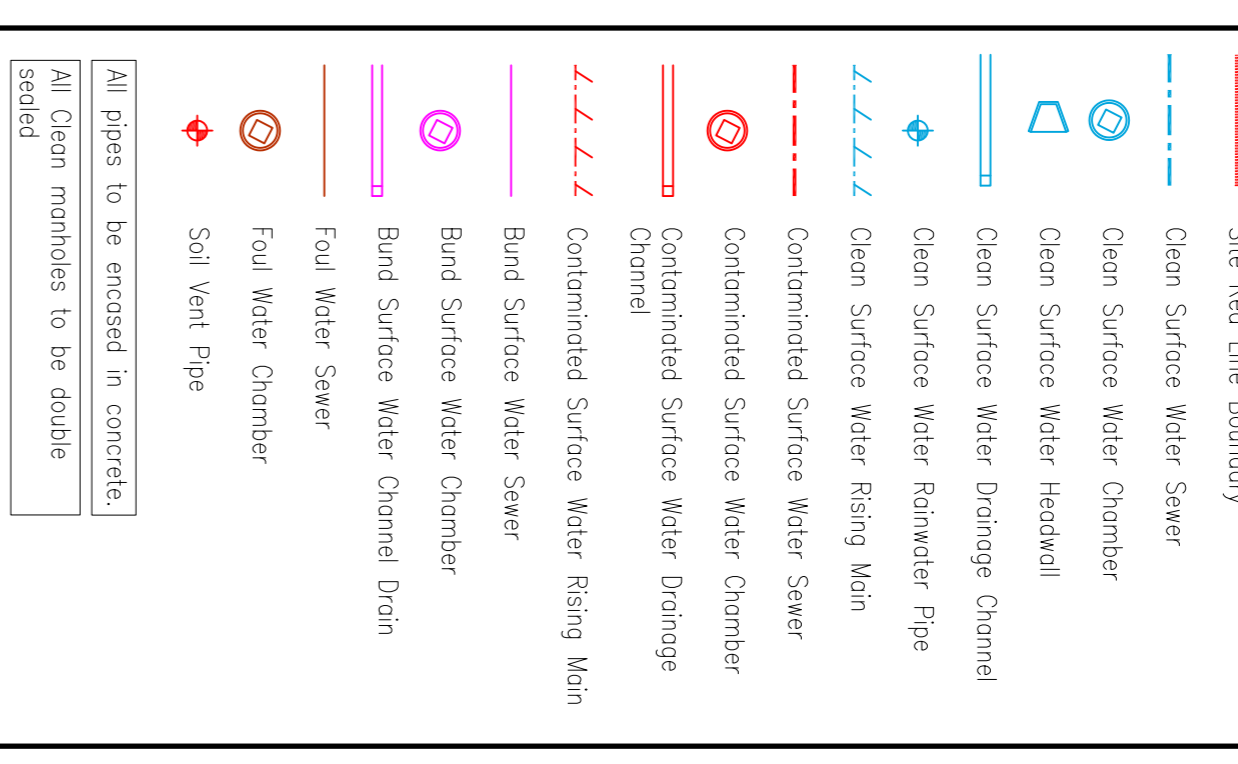
SITE PLAN  
Scale: 1:750 @ A1

NOT FOR CONSTRUCTION





- NOTES:**
1. All dimensions must be checked on site and not scaled from this drawing.
  2. The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
  3. All levels shown on this drawing are relative to Agreed Topographic survey.
  4. This drawing is to be read in conjunction with 23348/100 Series Drawings.
  5. All existing 'mvert' levels are to be confirmed by contractor prior to construction. Connection subject to approval.



Rev	Date	Description	By	Chk
EAI	26/02/24	ISSUED FOR COMMENT	RS	JHC

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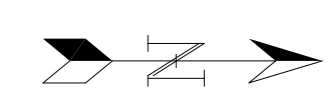
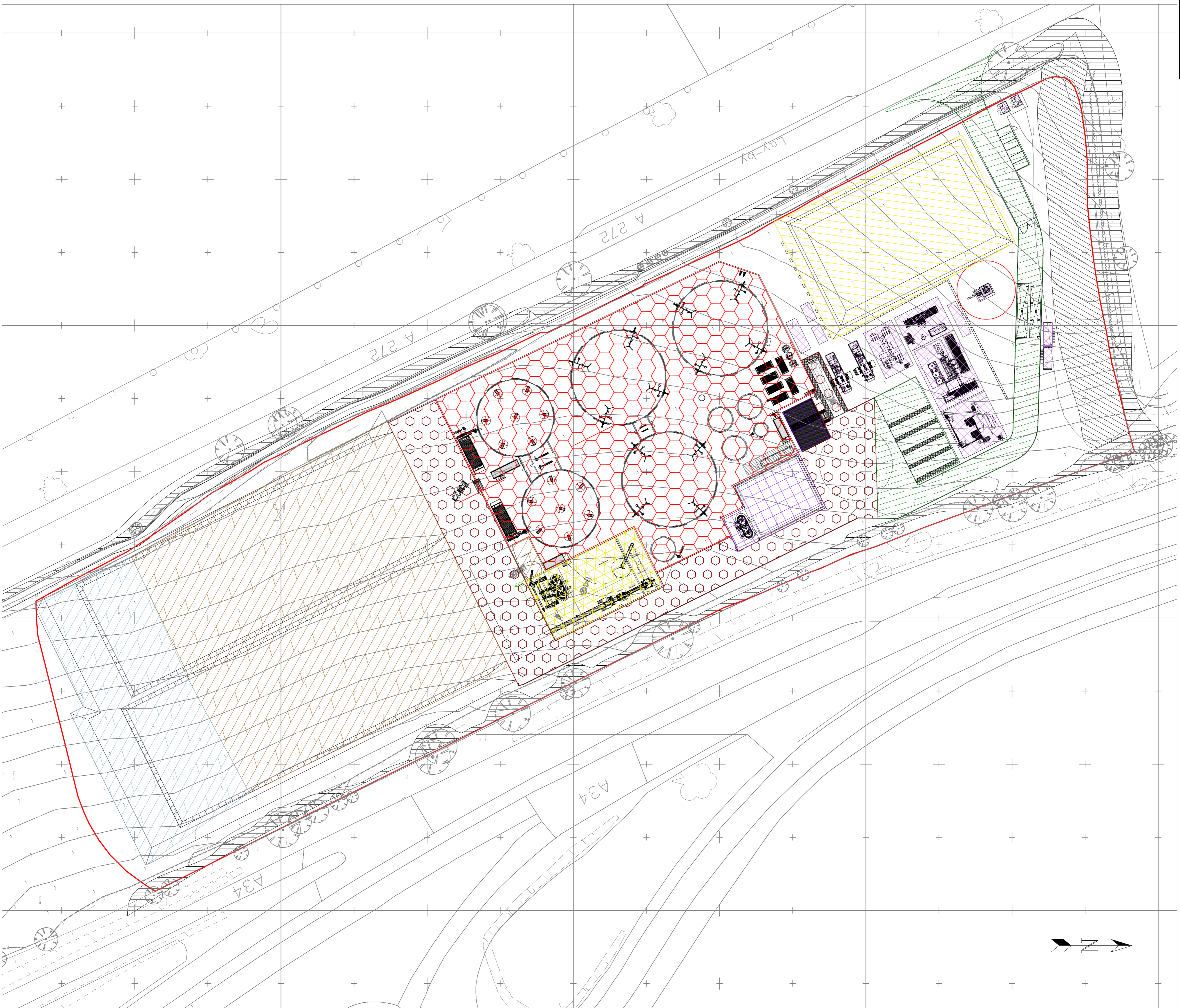
**acorn**

Job Title  
**AD Plant.  
 Three Molds**

Drawing Title  
**Proposed Drainage Layout**

Scale	1:750 @ A0	Date	DEC '23
Drawn By	W. BARKER	Checked	JHC
Approved	JHC	Approved	JHC
Drawn No.	293348/C/110	Rev	EAI

FOR EA PERMIT



- NOTES:**
1. All dimensions must be checked on site and not scaled from this drawing.
  2. The Contractor shall make a survey of the site and shall be responsible for obtaining all necessary permissions for the construction of the structure as indicated.
  3. All levels shown on this drawing are relative to Agreed topographic survey.
  4. This drawing is to be read in conjunction with 29348/100 Series Drawings.
  5. All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.

- Site Red Line Boundary
- Denotes Digestive Lagoon Area – 3,042m<sup>2</sup>
- Denotes Clean w/Petrochemicals Hardstanding Runoff Area – 2,461m<sup>2</sup>
- Denotes Clean Equipment Runoff Area – 1,457m<sup>2</sup>
- Denotes Clean/Contaminated Bund Runoff Area – 8,323m<sup>2</sup>
- Denotes Dirty Slope Clamp Runoff Area – 9,220m<sup>2</sup>
- Denotes Contaminated Hardstanding Runoff Area – 3,745m<sup>2</sup>
- Denotes Clean Roof Runoff Area – 804m<sup>2</sup>
- Denotes Clean Slope Clamp Cover Runoff Area – 3,698m<sup>2</sup>
- Denotes Clean Runoff Snow Building – 956m<sup>2</sup>

Rev	Date	Description	By	App'd
EA1	26/02/24	EA PERMIT	JHC	CH

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**acorn**

Job Title  
**AD Plant.  
 Three Maids**

Drawing Title  
**Drainage Catchment Plan**

Status  
 EA PERMIT

Scale  
 AS NOTED @ A1

Date  
 DEC '23

Drawn By  
 WG

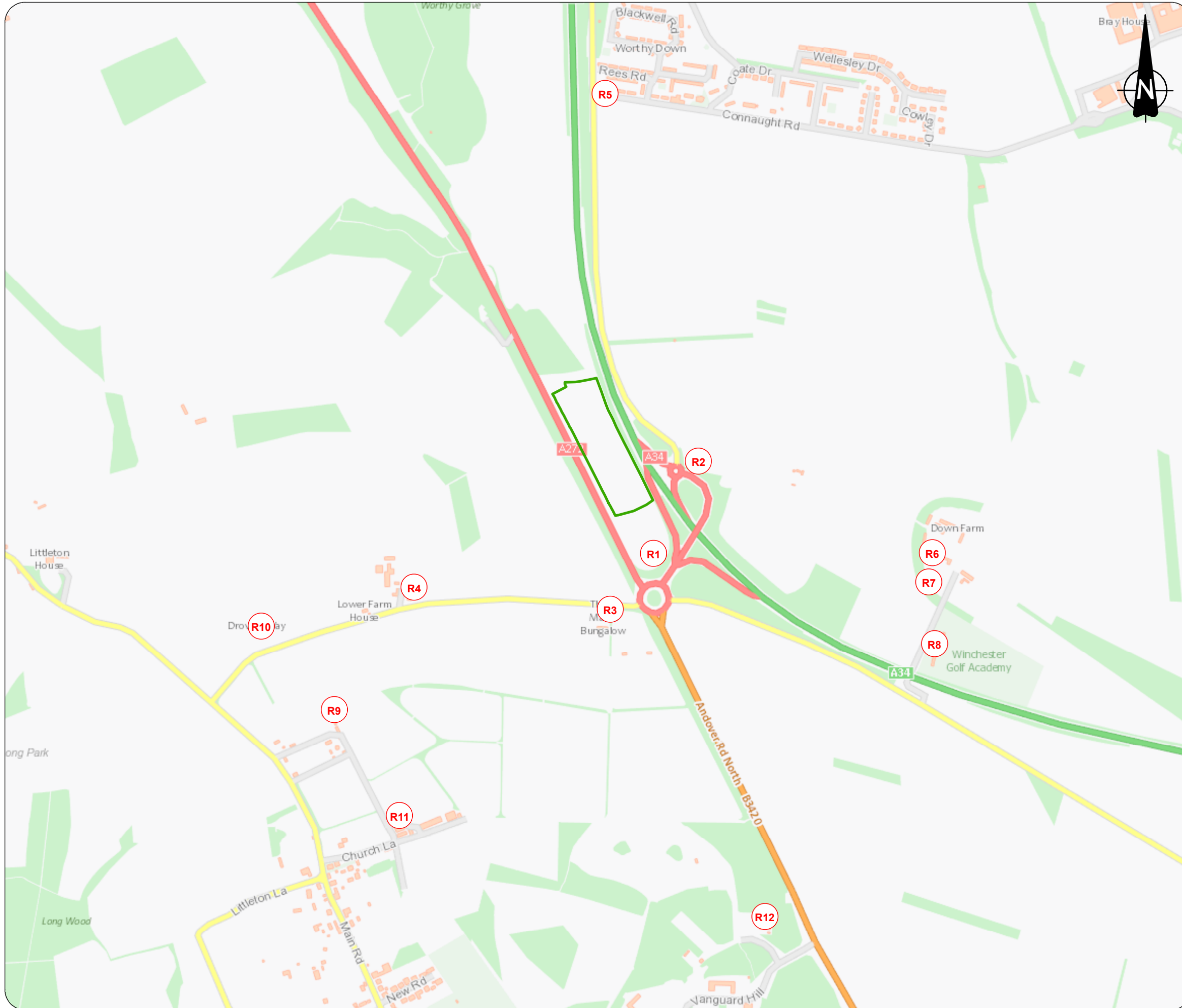
Created  
 JHC

Approved  
 JHC

Drawn By	WG	Created	JHC	Approved	JHC
Draw No.	29348/C/103	Rev	EA1		

**SITE PLAN**  
 Scale: 1:750 @ A1

**FOR EA PERMIT**



REVISIONS					
REV	DATE	DESCRIPTION	DWN	CHK	APP
-	2002 2024	First Issue	JJ	MF	MF

**LEGEND**

- Permit Boundary
- R Human Receptors

0 100 200 300 400 500 m  
Scale at A3: 1:10,000

<b>Client</b> Acorn Bioenergy Operations Limited
<b>Project</b> Three Maids AD Permit Application
<b>Title</b> Human Receptor Locations Plan

**Earthcare**  
TECHNICAL

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Drawn JJ	Checked MF	Approved MF	Revision
Date February 2024	Scale 1:10,000	Sheet Size A3	
Drawing Number ETL724/THRM/HumanReceptors/EPR02		File Reference ETL274.mxd	

## **Appendix A: Enviro Geo Insight Report (2023)**

Three Maids Green Power AD Plant, Three Maids Hill, Winchester , SO21 2QG

## Order Details

**Date:** 30/05/2023  
**Your ref:** ETL724  
**Our Ref:** GS-VSW-VVH-A1T-LAL

## Site Details

**Location:** 446060 133987  
**Area:** 5.54 ha  
**Authority:** [Winchester City Council](#) ↗



[Summary of findings](#)

[p. 2 >](#)

[Aerial image](#)

[p. 8 >](#)

[OS MasterMap site plan](#)

[p.13 >](#)

[groundsure.com/insightuserguide](https://groundsure.com/insightuserguide) ↗

Contact us with any questions at:

[info@groundsure.com](mailto:info@groundsure.com) ↗

01273 257 755

## Summary of findings

Page	Section	<a href="#">Past land use &gt;</a>	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">14</a> >	<a href="#">1.1</a> >	<a href="#">Historical industrial land uses &gt;</a>	0	0	4	14	-
<a href="#">15</a> >	<a href="#">1.2</a> >	<a href="#">Historical tanks &gt;</a>	0	0	0	0	-
<a href="#">16</a> >	<a href="#">1.3</a> >	<a href="#">Historical energy features &gt;</a>	0	0	0	0	-
<a href="#">16</a> >	<a href="#">1.4</a> >	<a href="#">Historical petrol stations &gt;</a>	0	0	0	0	-
<a href="#">16</a> >	<a href="#">1.5</a> >	<a href="#">Historical garages &gt;</a>	0	0	0	0	-
<a href="#">16</a> >	<a href="#">1.6</a> >	<a href="#">Historical military land &gt;</a>	0	0	0	0	-
Page	Section	<a href="#">Past land use - un-grouped &gt;</a>	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">17</a> >	<a href="#">2.1</a> >	<a href="#">Historical industrial land uses &gt;</a>	0	0	4	17	-
<a href="#">18</a> >	<a href="#">2.2</a> >	<a href="#">Historical tanks &gt;</a>	0	0	0	0	-
<a href="#">19</a> >	<a href="#">2.3</a> >	<a href="#">Historical energy features &gt;</a>	0	0	0	0	-
<a href="#">19</a> >	<a href="#">2.4</a> >	<a href="#">Historical petrol stations &gt;</a>	0	0	0	0	-
<a href="#">19</a> >	<a href="#">2.5</a> >	<a href="#">Historical garages &gt;</a>	0	0	0	0	-
Page	Section	<a href="#">Waste and landfill &gt;</a>	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">20</a> >	<a href="#">3.1</a> >	<a href="#">Active or recent landfill &gt;</a>	0	0	0	0	-
<a href="#">20</a> >	<a href="#">3.2</a> >	<a href="#">Historical landfill (BGS records) &gt;</a>	0	0	0	0	-
<a href="#">21</a> >	<a href="#">3.3</a> >	<a href="#">Historical landfill (LA/mapping records) &gt;</a>	0	0	0	0	-
<a href="#">21</a> >	<a href="#">3.4</a> >	<a href="#">Historical landfill (EA/NRW records) &gt;</a>	0	0	0	0	-
<a href="#">21</a> >	<a href="#">3.5</a> >	<a href="#">Historical waste sites &gt;</a>	0	1	0	0	-
<a href="#">21</a> >	<a href="#">3.6</a> >	<a href="#">Licensed waste sites &gt;</a>	0	1	1	0	-
<a href="#">22</a> >	<a href="#">3.7</a> >	<a href="#">Waste exemptions &gt;</a>	0	0	2	5	-
Page	Section	<a href="#">Current industrial land use &gt;</a>	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">24</a> >	<a href="#">4.1</a> >	<a href="#">Recent industrial land uses &gt;</a>	0	0	1	-	-
<a href="#">25</a> >	<a href="#">4.2</a> >	<a href="#">Current or recent petrol stations &gt;</a>	0	0	0	0	-
<a href="#">25</a> >	<a href="#">4.3</a> >	<a href="#">Electricity cables &gt;</a>	0	0	0	0	-
<a href="#">25</a> >	<a href="#">4.4</a> >	<a href="#">Gas pipelines &gt;</a>	0	0	0	0	-
<a href="#">25</a> >	<a href="#">4.5</a> >	<a href="#">Sites determined as Contaminated Land &gt;</a>	0	0	0	0	-





<a href="#">25</a> >	<a href="#">4.6</a> >	<a href="#">Control of Major Accident Hazards (COMAH)</a> >	0	0	0	0	-
<a href="#">26</a> >	<a href="#">4.7</a> >	<a href="#">Regulated explosive sites</a> >	0	0	0	0	-
<a href="#">26</a> >	<a href="#">4.8</a> >	<a href="#">Hazardous substance storage/usage</a> >	0	0	0	0	-
<a href="#">26</a> >	<a href="#">4.9</a> >	<a href="#">Historical licensed industrial activities (IPC)</a> >	0	0	0	0	-
<a href="#">26</a> >	<a href="#">4.10</a> >	<a href="#">Licensed industrial activities (Part A(1))</a> >	0	0	0	0	-
<a href="#">26</a> >	<a href="#">4.11</a> >	<a href="#">Licensed pollutant release (Part A(2)/B)</a> >	0	0	0	0	-
<a href="#">27</a> >	<a href="#">4.12</a> >	<a href="#">Radioactive Substance Authorisations</a> >	0	0	0	0	-
<a href="#">27</a> >	<a href="#">4.13</a> >	<a href="#">Licensed Discharges to controlled waters</a> >	0	0	0	1	-
<a href="#">27</a> >	<a href="#">4.14</a> >	<a href="#">Pollutant release to surface waters (Red List)</a> >	0	0	0	0	-
<a href="#">27</a> >	<a href="#">4.15</a> >	<a href="#">Pollutant release to public sewer</a> >	0	0	0	0	-
<a href="#">28</a> >	<a href="#">4.16</a> >	<a href="#">List 1 Dangerous Substances</a> >	0	0	0	0	-
<a href="#">28</a> >	<a href="#">4.17</a> >	<a href="#">List 2 Dangerous Substances</a> >	0	0	0	0	-
<a href="#">28</a> >	<a href="#">4.18</a> >	<a href="#">Pollution Incidents (EA/NRW)</a> >	0	0	0	1	-
<a href="#">28</a> >	<a href="#">4.19</a> >	<a href="#">Pollution inventory substances</a> >	0	0	0	0	-
<a href="#">29</a> >	<a href="#">4.20</a> >	<a href="#">Pollution inventory waste transfers</a> >	0	0	0	0	-
<a href="#">29</a> >	<a href="#">4.21</a> >	<a href="#">Pollution inventory radioactive waste</a> >	0	0	0	0	-
Page	Section	<a href="#">Hydrogeology</a> >	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">30</a> >	<a href="#">5.1</a> >	<a href="#">Superficial aquifer</a> >	Identified (within 500m)				
<a href="#">31</a> >	<a href="#">5.2</a> >	<a href="#">Bedrock aquifer</a> >	Identified (within 500m)				
<a href="#">32</a> >	<a href="#">5.3</a> >	<a href="#">Groundwater vulnerability</a> >	Identified (within 50m)				
<a href="#">34</a> >	<a href="#">5.4</a> >	<a href="#">Groundwater vulnerability- soluble rock risk</a> >	Identified (within 0m)				
<a href="#">35</a> >	<a href="#">5.5</a> >	<a href="#">Groundwater vulnerability- local information</a> >	None (within 0m)				
<a href="#">36</a> >	<a href="#">5.6</a> >	<a href="#">Groundwater abstractions</a> >	0	0	0	0	2
<a href="#">37</a> >	<a href="#">5.7</a> >	<a href="#">Surface water abstractions</a> >	0	0	0	0	0
<a href="#">37</a> >	<a href="#">5.8</a> >	<a href="#">Potable abstractions</a> >	0	0	0	0	0
<a href="#">38</a> >	<a href="#">5.9</a> >	<a href="#">Source Protection Zones</a> >	0	0	0	0	-
<a href="#">38</a> >	<a href="#">5.10</a> >	<a href="#">Source Protection Zones (confined aquifer)</a> >	0	0	0	0	-
Page	Section	<a href="#">Hydrology</a> >	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">39</a> >	<a href="#">6.1</a> >	<a href="#">Water Network (OS MasterMap)</a> >	0	0	0	-	-



39 >	6.2 >	<a href="#">Surface water features &gt;</a>	0	0	0	-	-
40 >	6.3 >	<a href="#">WFD Surface water body catchments &gt;</a>	1	-	-	-	-
40 >	6.4 >	<a href="#">WFD Surface water bodies &gt;</a>	0	0	0	-	-
40 >	6.5 >	<a href="#">WFD Groundwater bodies &gt;</a>	2	-	-	-	-
Page	Section	<a href="#">River and coastal flooding &gt;</a>	On site	0-50m	50-250m	250-500m	500-2000m
42 >	7.1 >	<a href="#">Risk of flooding from rivers and the sea &gt;</a>	None (within 50m)				
42 >	7.2 >	<a href="#">Historical Flood Events &gt;</a>	0	0	0	-	-
42 >	7.3 >	<a href="#">Flood Defences &gt;</a>	0	0	0	-	-
43 >	7.4 >	<a href="#">Areas Benefiting from Flood Defences &gt;</a>	0	0	0	-	-
43 >	7.5 >	<a href="#">Flood Storage Areas &gt;</a>	0	0	0	-	-
44 >	7.6 >	<a href="#">Flood Zone 2 &gt;</a>	None (within 50m)				
44 >	7.7 >	<a href="#">Flood Zone 3 &gt;</a>	None (within 50m)				
Page	Section	<a href="#">Surface water flooding &gt;</a>					
45 >	8.1 >	<a href="#">Surface water flooding &gt;</a>	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	<a href="#">Groundwater flooding &gt;</a>					
47 >	9.1 >	<a href="#">Groundwater flooding &gt;</a>	Low (within 50m)				
Page	Section	<a href="#">Environmental designations &gt;</a>	On site	0-50m	50-250m	250-500m	500-2000m
48 >	10.1 >	<a href="#">Sites of Special Scientific Interest (SSSI) &gt;</a>	0	0	0	0	0
49 >	10.2 >	<a href="#">Conserved wetland sites (Ramsar sites) &gt;</a>	0	0	0	0	0
49 >	10.3 >	<a href="#">Special Areas of Conservation (SAC) &gt;</a>	0	0	0	0	0
49 >	10.4 >	<a href="#">Special Protection Areas (SPA) &gt;</a>	0	0	0	0	0
49 >	10.5 >	<a href="#">National Nature Reserves (NNR) &gt;</a>	0	0	0	0	0
50 >	10.6 >	<a href="#">Local Nature Reserves (LNR) &gt;</a>	0	0	0	0	0
50 >	10.7 >	<a href="#">Designated Ancient Woodland &gt;</a>	0	0	1	0	5
50 >	10.8 >	<a href="#">Biosphere Reserves &gt;</a>	0	0	0	0	0
51 >	10.9 >	<a href="#">Forest Parks &gt;</a>	0	0	0	0	0
51 >	10.10 >	<a href="#">Marine Conservation Zones &gt;</a>	0	0	0	0	0
51 >	10.11 >	<a href="#">Green Belt &gt;</a>	0	0	0	0	0
51 >	10.12 >	<a href="#">Proposed Ramsar sites &gt;</a>	0	0	0	0	0



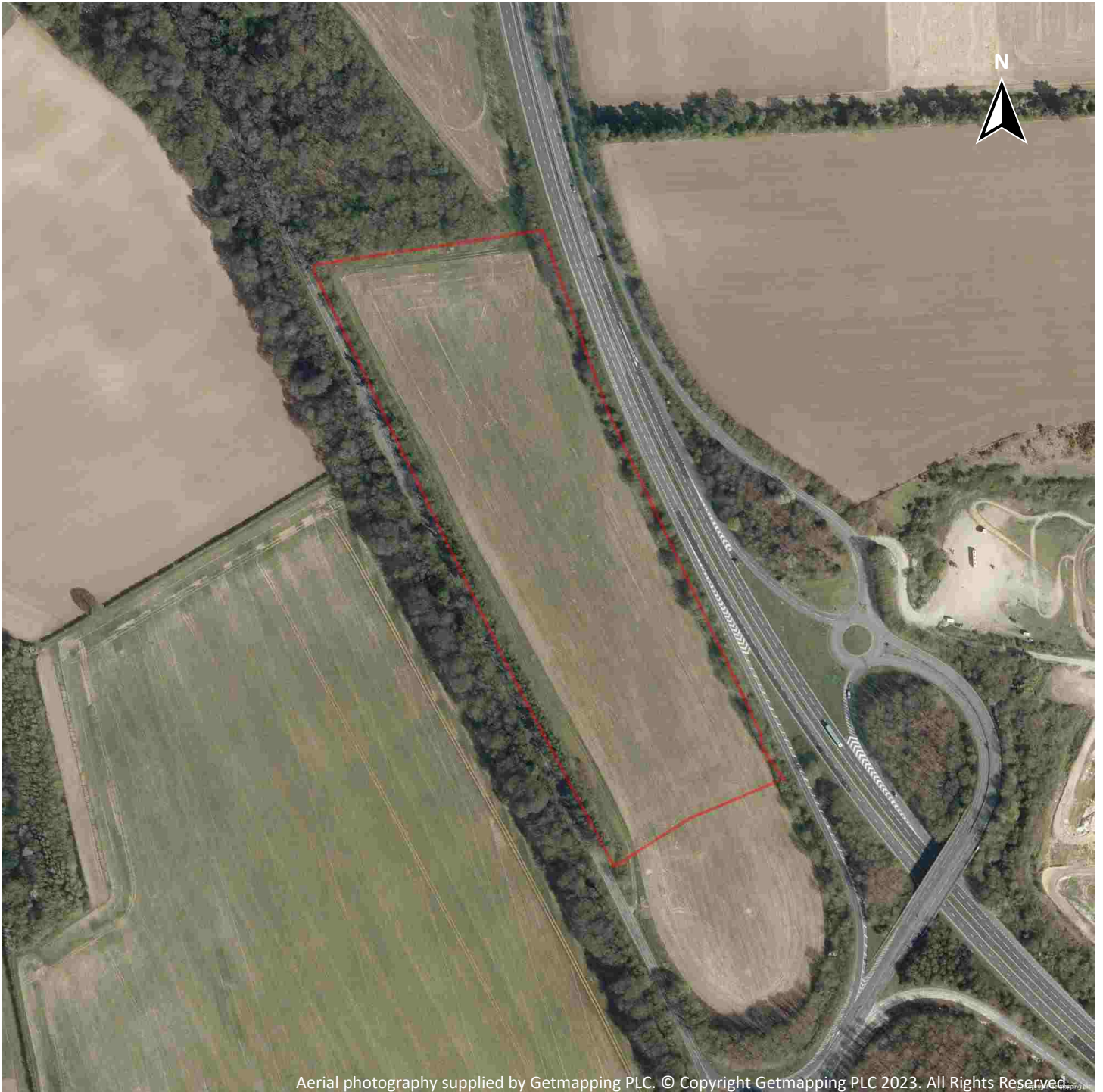
<a href="#">51</a> >	<a href="#">10.13</a> >	<a href="#">Possible Special Areas of Conservation (pSAC)</a> >	0	0	0	0	0
<a href="#">52</a> >	<a href="#">10.14</a> >	<a href="#">Potential Special Protection Areas (pSPA)</a> >	0	0	0	0	0
<a href="#">52</a> >	<a href="#">10.15</a> >	<a href="#">Nitrate Sensitive Areas</a> >	0	0	0	0	0
<a href="#">52</a> >	<a href="#">10.16</a> >	<a href="#">Nitrate Vulnerable Zones</a> >	3	0	0	0	5
<a href="#">54</a> >	<a href="#">10.17</a> >	<a href="#">SSSI Impact Risk Zones</a> >	1	-	-	-	-
<a href="#">55</a> >	<a href="#">10.18</a> >	<a href="#">SSSI Units</a> >	0	0	0	0	0
Page	Section	<a href="#">Visual and cultural designations</a> >	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">56</a> >	<a href="#">11.1</a> >	<a href="#">World Heritage Sites</a> >	0	0	0	-	-
<a href="#">56</a> >	<a href="#">11.2</a> >	<a href="#">Area of Outstanding Natural Beauty</a> >	0	0	0	-	-
<a href="#">56</a> >	<a href="#">11.3</a> >	<a href="#">National Parks</a> >	0	0	0	-	-
<a href="#">56</a> >	<a href="#">11.4</a> >	<a href="#">Listed Buildings</a> >	0	0	0	-	-
<a href="#">57</a> >	<a href="#">11.5</a> >	<a href="#">Conservation Areas</a> >	0	0	0	-	-
<a href="#">57</a> >	<a href="#">11.6</a> >	<a href="#">Scheduled Ancient Monuments</a> >	0	0	0	-	-
<a href="#">57</a> >	<a href="#">11.7</a> >	<a href="#">Registered Parks and Gardens</a> >	0	0	0	-	-
Page	Section	<a href="#">Agricultural designations</a> >	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">58</a> >	<a href="#">12.1</a> >	<a href="#">Agricultural Land Classification</a> >	Grade 3 (within 250m)				
<a href="#">59</a> >	<a href="#">12.2</a> >	<a href="#">Open Access Land</a> >	0	0	0	-	-
<a href="#">59</a> >	<a href="#">12.3</a> >	<a href="#">Tree Felling Licences</a> >	1	6	8	-	-
<a href="#">60</a> >	<a href="#">12.4</a> >	<a href="#">Environmental Stewardship Schemes</a> >	0	0	0	-	-
<a href="#">60</a> >	<a href="#">12.5</a> >	<a href="#">Countryside Stewardship Schemes</a> >	0	1	0	-	-
Page	Section	<a href="#">Habitat designations</a> >	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">61</a> >	<a href="#">13.1</a> >	<a href="#">Priority Habitat Inventory</a> >	1	1	6	-	-
<a href="#">62</a> >	<a href="#">13.2</a> >	<a href="#">Habitat Networks</a> >	0	0	0	-	-
<a href="#">62</a> >	<a href="#">13.3</a> >	<a href="#">Open Mosaic Habitat</a> >	0	0	0	-	-
<a href="#">62</a> >	<a href="#">13.4</a> >	<a href="#">Limestone Pavement Orders</a> >	0	0	0	-	-
Page	Section	<a href="#">Geology 1:10,000 scale</a> >	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">63</a> >	<a href="#">14.1</a> >	<a href="#">10k Availability</a> >	Identified (within 500m)				
<a href="#">64</a> >	<a href="#">14.2</a> >	<a href="#">Artificial and made ground (10k)</a> >	0	2	2	2	-
<a href="#">66</a> >	<a href="#">14.3</a> >	<a href="#">Superficial geology (10k)</a> >	1	0	0	0	-

<a href="#">67</a> >	<a href="#">14.4</a> >	<a href="#">Landslip (10k)</a> >	0	0	0	0	-
<a href="#">68</a> >	<a href="#">14.5</a> >	<a href="#">Bedrock geology (10k)</a> >	2	1	0	0	-
<a href="#">69</a> >	<a href="#">14.6</a> >	<a href="#">Bedrock faults and other linear features (10k)</a> >	0	0	0	0	-
Page	Section	<a href="#">Geology 1:50,000 scale</a> >	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">70</a> >	<a href="#">15.1</a> >	<a href="#">50k Availability</a> >	Identified (within 500m)				
<a href="#">71</a> >	<a href="#">15.2</a> >	<a href="#">Artificial and made ground (50k)</a> >	0	0	0	1	-
<a href="#">72</a> >	<a href="#">15.3</a> >	<a href="#">Artificial ground permeability (50k)</a> >	0	0	-	-	-
<a href="#">73</a> >	<a href="#">15.4</a> >	<a href="#">Superficial geology (50k)</a> >	1	0	0	0	-
<a href="#">74</a> >	<a href="#">15.5</a> >	<a href="#">Superficial permeability (50k)</a> >	Identified (within 50m)				
<a href="#">74</a> >	<a href="#">15.6</a> >	<a href="#">Landslip (50k)</a> >	0	0	0	0	-
<a href="#">74</a> >	<a href="#">15.7</a> >	<a href="#">Landslip permeability (50k)</a> >	None (within 50m)				
<a href="#">75</a> >	<a href="#">15.8</a> >	<a href="#">Bedrock geology (50k)</a> >	2	1	0	0	-
<a href="#">76</a> >	<a href="#">15.9</a> >	<a href="#">Bedrock permeability (50k)</a> >	Identified (within 50m)				
<a href="#">76</a> >	<a href="#">15.10</a> >	<a href="#">Bedrock faults and other linear features (50k)</a> >	0	0	0	0	-
Page	Section	<a href="#">Boreholes</a> >	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">77</a> >	<a href="#">16.1</a> >	<a href="#">BGS Boreholes</a> >	0	0	0	-	-
Page	Section	<a href="#">Natural ground subsidence</a> >					
<a href="#">78</a> >	<a href="#">17.1</a> >	<a href="#">Shrink swell clays</a> >	Very low (within 50m)				
<a href="#">79</a> >	<a href="#">17.2</a> >	<a href="#">Running sands</a> >	Very low (within 50m)				
<a href="#">81</a> >	<a href="#">17.3</a> >	<a href="#">Compressible deposits</a> >	Negligible (within 50m)				
<a href="#">82</a> >	<a href="#">17.4</a> >	<a href="#">Collapsible deposits</a> >	Very low (within 50m)				
<a href="#">83</a> >	<a href="#">17.5</a> >	<a href="#">Landslides</a> >	Moderate (within 50m)				
<a href="#">85</a> >	<a href="#">17.6</a> >	<a href="#">Ground dissolution of soluble rocks</a> >	Low (within 50m)				
Page	Section	<a href="#">Mining, ground workings and natural cavities</a> >	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">87</a> >	<a href="#">18.1</a> >	<a href="#">Natural cavities</a> >	0	0	0	0	-
<a href="#">88</a> >	<a href="#">18.2</a> >	<a href="#">BritPits</a> >	0	0	0	1	-
<a href="#">88</a> >	<a href="#">18.3</a> >	<a href="#">Surface ground workings</a> >	0	0	2	-	-
<a href="#">88</a> >	<a href="#">18.4</a> >	<a href="#">Underground workings</a> >	0	0	0	0	0
<a href="#">89</a> >	<a href="#">18.5</a> >	<a href="#">Historical Mineral Planning Areas</a> >	0	0	0	0	-



<a href="#">89</a> >	<a href="#">18.6</a> >	<a href="#">Non-coal mining</a> >	1	0	0	0	2
<a href="#">89</a> >	<a href="#">18.7</a> >	<a href="#">Mining cavities</a> >	0	0	0	0	0
<a href="#">90</a> >	<a href="#">18.8</a> >	<a href="#">JPB mining areas</a> >	None (within 0m)				
<a href="#">90</a> >	<a href="#">18.9</a> >	<a href="#">Coal mining</a> >	None (within 0m)				
<a href="#">90</a> >	<a href="#">18.10</a> >	<a href="#">Brine areas</a> >	None (within 0m)				
<a href="#">90</a> >	<a href="#">18.11</a> >	<a href="#">Gypsum areas</a> >	None (within 0m)				
<a href="#">90</a> >	<a href="#">18.12</a> >	<a href="#">Tin mining</a> >	None (within 0m)				
<a href="#">91</a> >	<a href="#">18.13</a> >	<a href="#">Clay mining</a> >	None (within 0m)				
Page	Section	<a href="#">Radon</a> >					
<a href="#">92</a> >	<a href="#">19.1</a> >	<a href="#">Radon</a> >	Less than 1% (within 0m)				
Page	Section	<a href="#">Soil chemistry</a> >	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">94</a> >	<a href="#">20.1</a> >	<a href="#">BGS Estimated Background Soil Chemistry</a> >	12	6	-	-	-
<a href="#">95</a> >	<a href="#">20.2</a> >	<a href="#">BGS Estimated Urban Soil Chemistry</a> >	0	0	-	-	-
<a href="#">95</a> >	<a href="#">20.3</a> >	<a href="#">BGS Measured Urban Soil Chemistry</a> >	0	0	-	-	-
Page	Section	<a href="#">Railway infrastructure and projects</a> >	On site	0-50m	50-250m	250-500m	500-2000m
<a href="#">96</a> >	<a href="#">21.1</a> >	<a href="#">Underground railways (London)</a> >	0	0	0	-	-
<a href="#">96</a> >	<a href="#">21.2</a> >	<a href="#">Underground railways (Non-London)</a> >	0	0	0	-	-
<a href="#">96</a> >	<a href="#">21.3</a> >	<a href="#">Railway tunnels</a> >	0	0	0	-	-
<a href="#">96</a> >	<a href="#">21.4</a> >	<a href="#">Historical railway and tunnel features</a> >	0	0	0	-	-
<a href="#">96</a> >	<a href="#">21.5</a> >	<a href="#">Royal Mail tunnels</a> >	0	0	0	-	-
<a href="#">97</a> >	<a href="#">21.6</a> >	<a href="#">Historical railways</a> >	0	0	0	-	-
<a href="#">97</a> >	<a href="#">21.7</a> >	<a href="#">Railways</a> >	0	0	0	-	-
<a href="#">97</a> >	<a href="#">21.8</a> >	<a href="#">Crossrail 1</a> >	0	0	0	0	-
<a href="#">97</a> >	<a href="#">21.9</a> >	<a href="#">Crossrail 2</a> >	0	0	0	0	-
<a href="#">97</a> >	<a href="#">21.10</a> >	<a href="#">HS2</a> >	0	0	0	0	-

## Recent aerial photograph



Capture Date: 05/04/2020

Site Area: 5.54ha



## Recent site history - 2017 aerial photograph



Capture Date: 20/06/2017

Site Area: 5.54ha



## Recent site history - 2013 aerial photograph



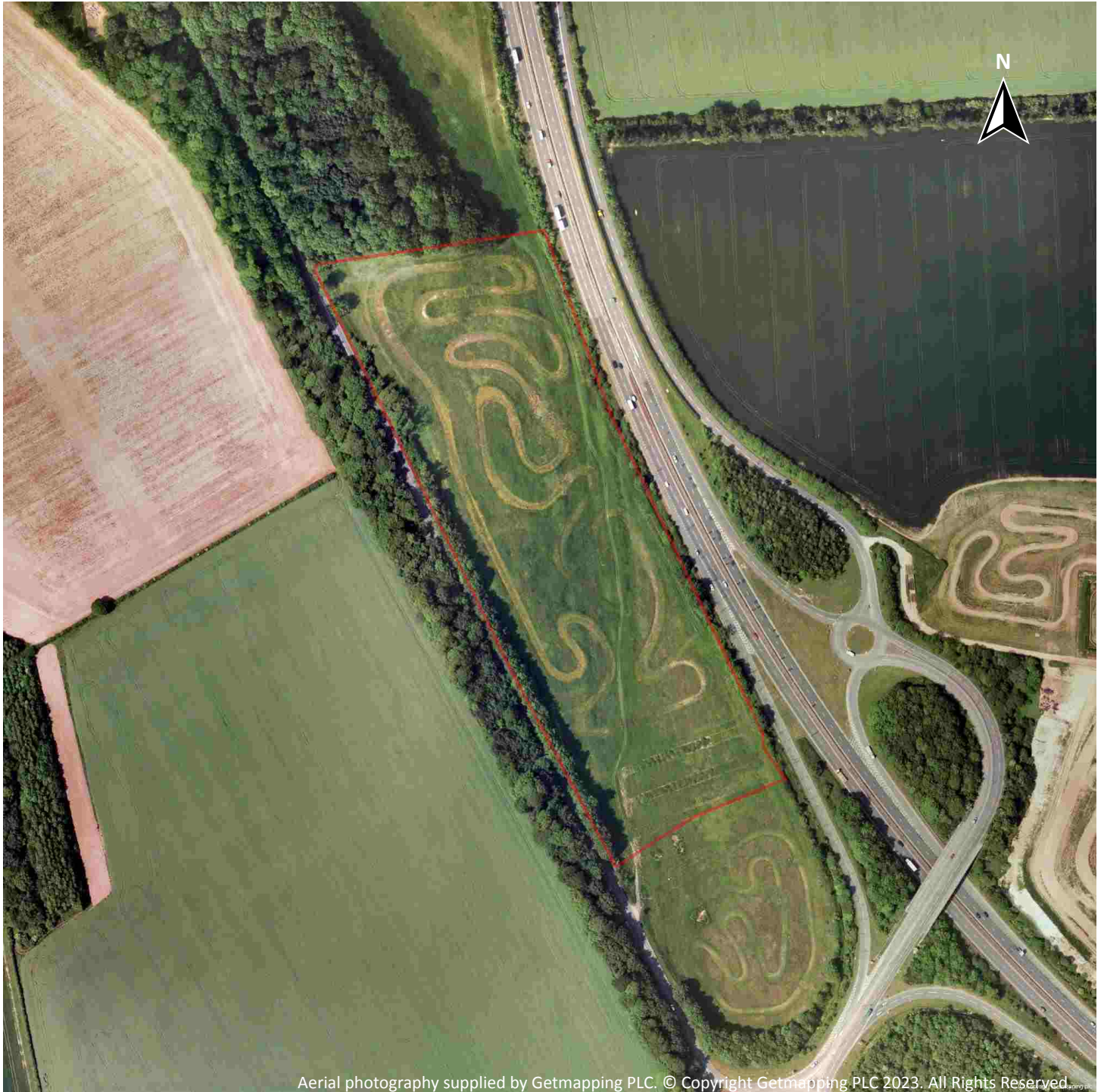
Capture Date: 03/06/2013

Site Area: 5.54ha





## Recent site history - 2005 aerial photograph

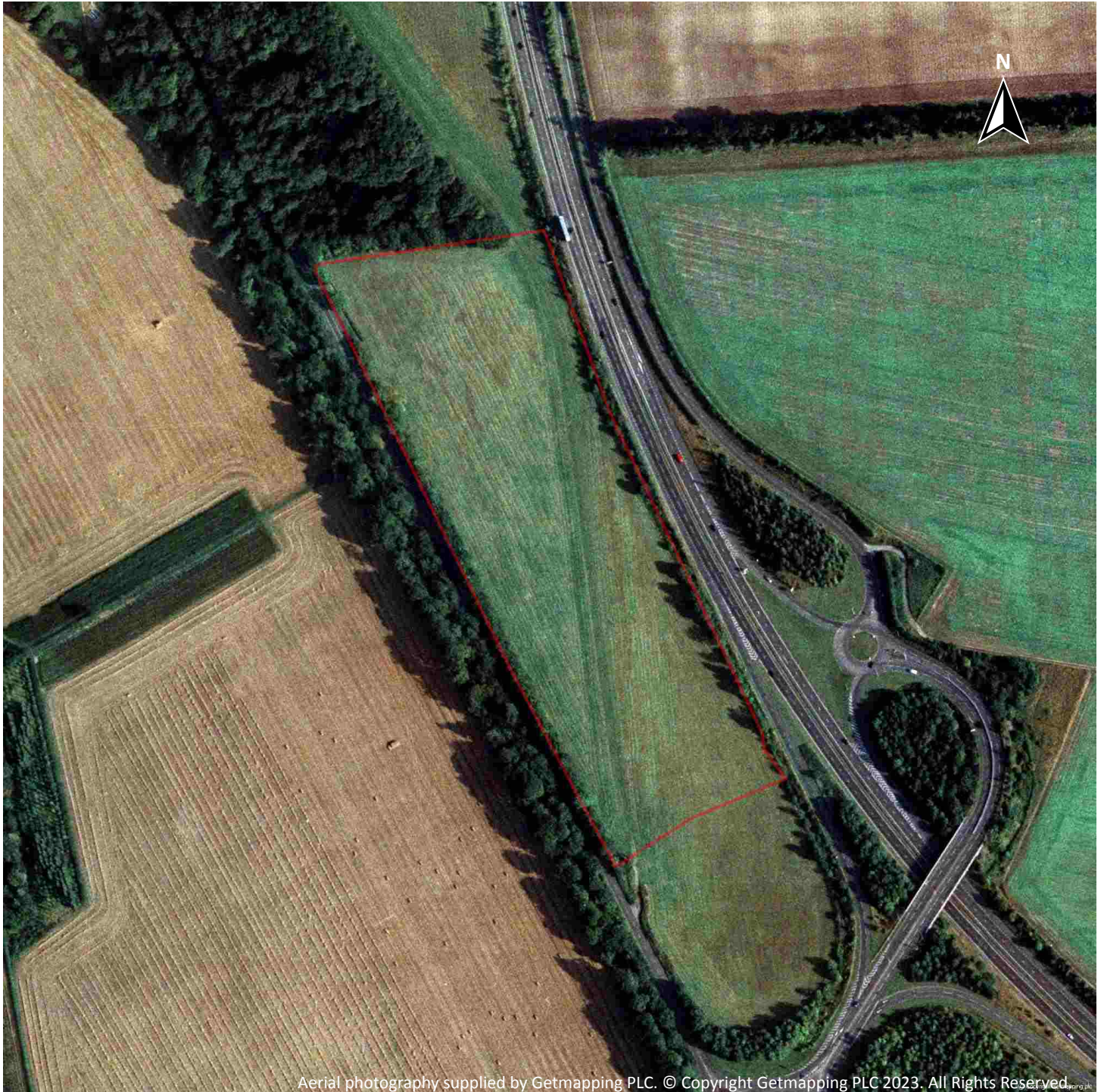


Capture Date: 07/06/2005

Site Area: 5.54ha



## Recent site history - 1999 aerial photograph



Capture Date: 04/09/1999

Site Area: 5.54ha



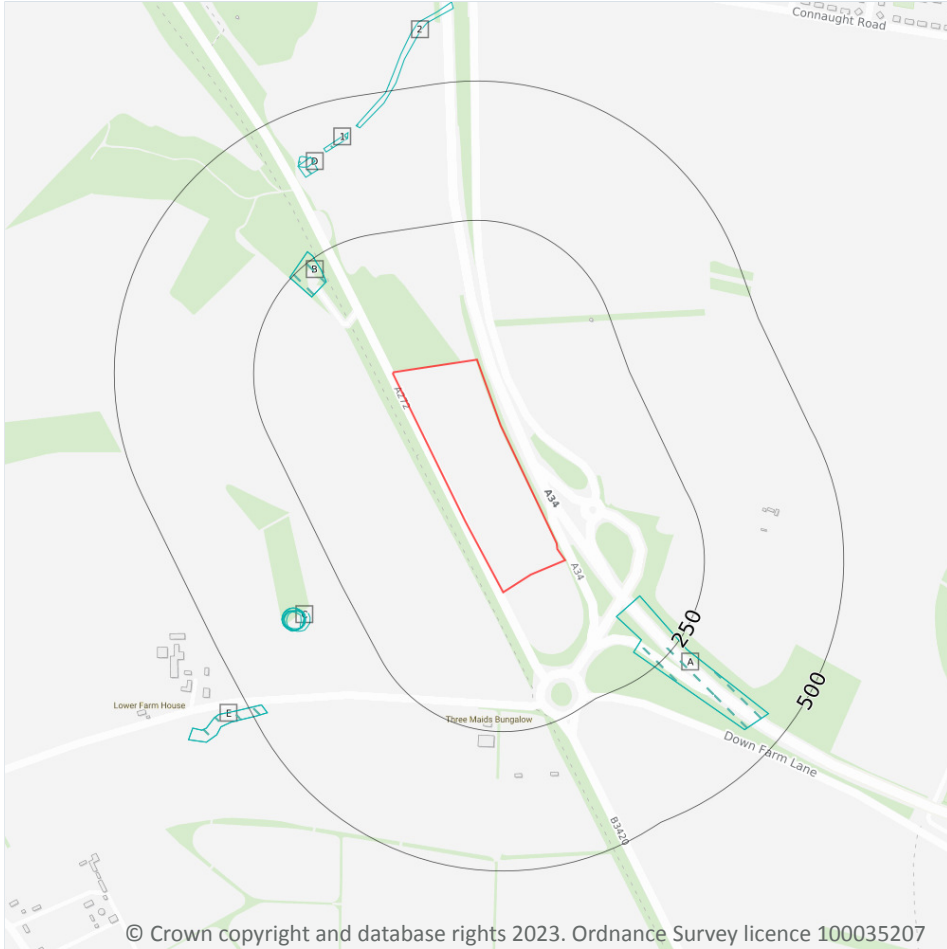
## OS MasterMap site plan



Site Area: 5.54ha



# 1 Past land use



**Site Outline**

**Search buffers in metres (m)**

- Historical industrial land uses

## 1.1 Historical industrial land uses

**Records within 500m** **18**

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 14 >](#)

ID	Location	Land use	Dates present	Group ID
A	137m SE	Cuttings	1987	1939714

ID	Location	Land use	Dates present	Group ID
A	137m SE	Cuttings	1975	1941591
B	200m NW	Gas Valve Compound	1975	1904155
B	200m NW	Gas Valve Compound	1987	1936851
C	326m SW	Chalk Pit	1895 - 1897	1966983
C	332m SW	Unspecified Pit	1932	1956945
C	334m SW	Unspecified Pit	1966	1940527
C	335m SW	Unspecified Pit	1969 - 1975	1895644
C	335m SW	Unspecified Pit	1987	1946480
C	335m SW	Unspecified Pit	1961	1952729
C	336m SW	Old Chalk Pit	1908	1856396
C	340m SW	Unspecified Pit	1871	1968302
D	384m NW	Unspecified Pit	1975	1877126
D	399m NW	Unspecified Ground Workings	1961	1852354
1	413m NW	Unspecified Ground Workings	1961	1852355
2	443m N	Unspecified Ground Workings	1961	1852356
E	475m SW	Unspecified Pit	1969 - 1975	1915621
E	475m SW	Unspecified Pit	1987	1959650

*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

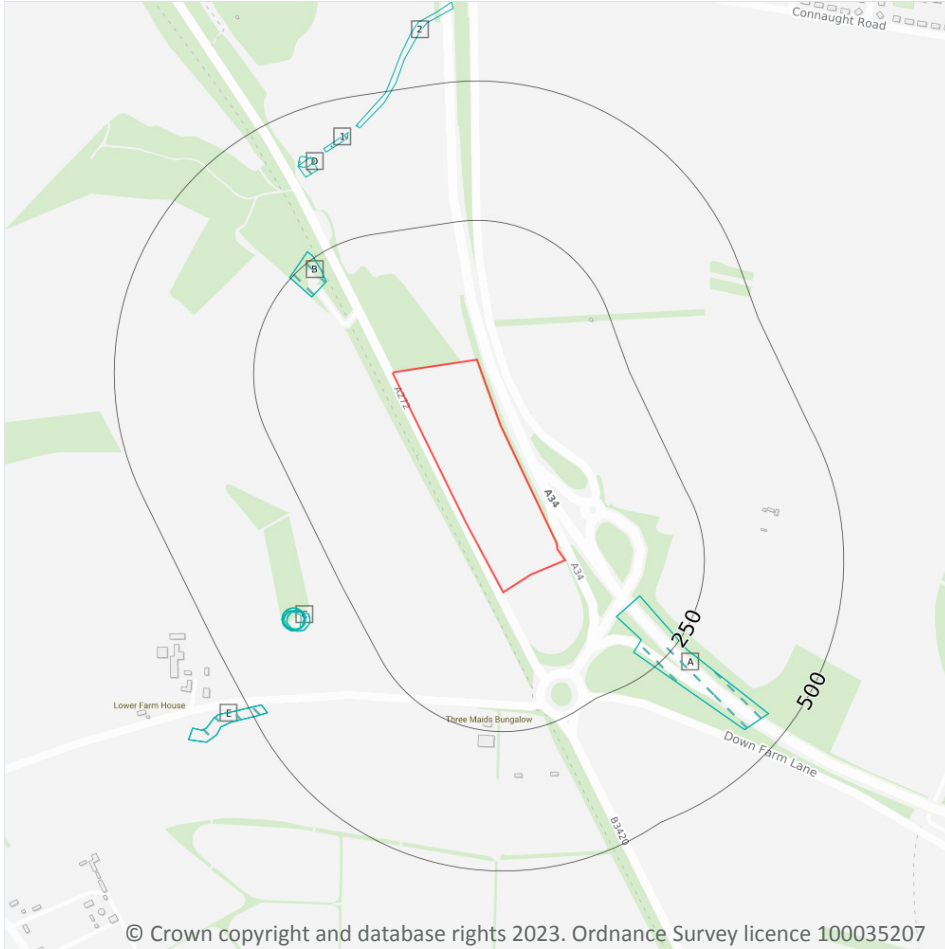
0


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

21

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 17](#) >

ID	Location	Land Use	Date	Group ID
A	137m SE	Cuttings	1987	1939714
A	137m SE	Cuttings	1975	1941591
B	200m NW	Gas Valve Compound	1987	1936851

ID	Location	Land Use	Date	Group ID
B	200m NW	Gas Valve Compound	1975	1904155
C	326m SW	Chalk Pit	1897	1966983
C	327m SW	Chalk Pit	1895	1966983
C	332m SW	Unspecified Pit	1932	1956945
C	334m SW	Unspecified Pit	1966	1940527
C	335m SW	Unspecified Pit	1987	1946480
C	335m SW	Unspecified Pit	1961	1952729
C	335m SW	Unspecified Pit	1969	1895644
C	335m SW	Unspecified Pit	1975	1895644
C	336m SW	Old Chalk Pit	1908	1856396
C	340m SW	Unspecified Pit	1871	1968302
D	384m NW	Unspecified Pit	1975	1877126
D	399m NW	Unspecified Ground Workings	1961	1852354
1	413m NW	Unspecified Ground Workings	1961	1852355
2	443m N	Unspecified Ground Workings	1961	1852356
E	475m SW	Unspecified Pit	1987	1959650
E	475m SW	Unspecified Pit	1969	1915621
E	475m SW	Unspecified Pit	1975	1915621

*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

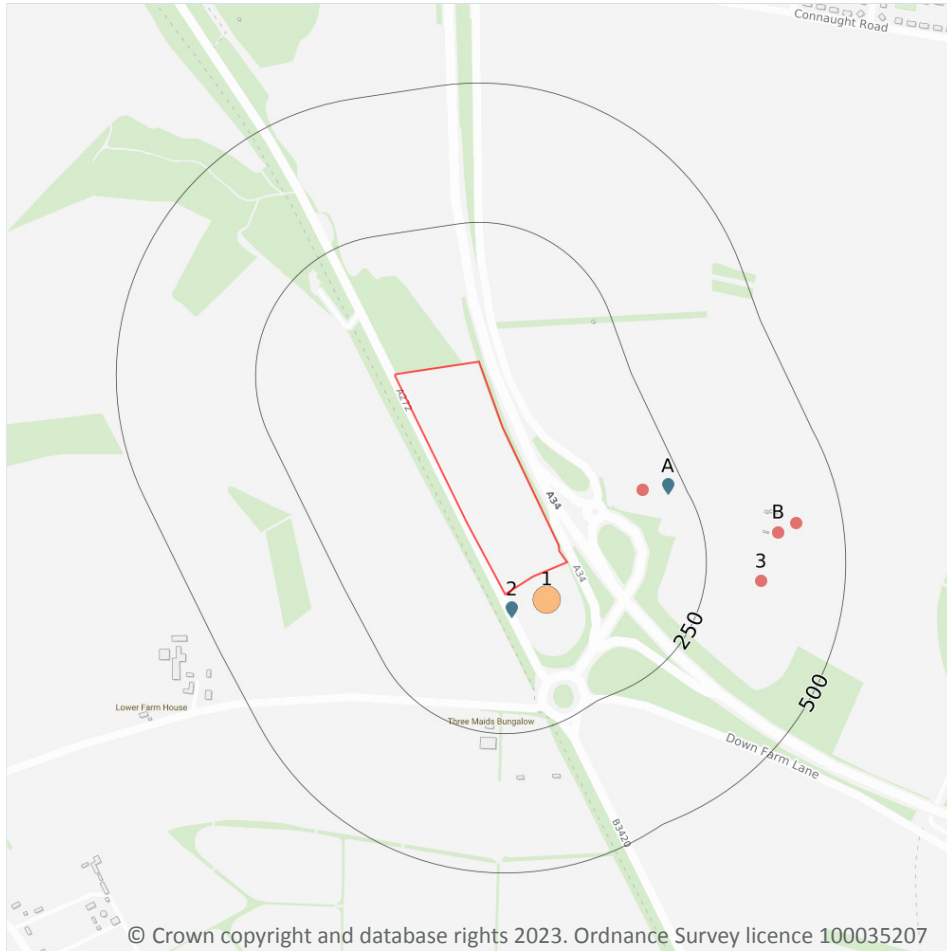
0

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



### 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

1

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

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

ID	Location	Address	Further Details	Date
1	22m SE	Site Address: Land at Three Maids Hill, Off A272, Winchester, Hampshire, SO21 2QU	Type of Site: Waste Recycling Facility Planning application reference: HCC/2020/0428 Description: Scheme comprises development of an inert waste recycling facility . This project also includes associated infrastructure works and access roads. Data source: Historic Planning Application Data Type: Point	14/08/2020

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

### 3.6 Licensed waste sites

Records within 500m

2

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

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

ID	Location	Details		
2	29m S	Site Name: Inert Waste Recycling Facility Site Address: TMR RECYCLING LTD, Inert Waste Recycling Facility, Three Maids Hill, Winchester, SO21 2QG Correspondence Address: -	Type of Site: Physical Treatment Facility Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: - EPR reference: EA/EPR/WE0609AB/A001 Operator: TMR RECYCLING LTD Waste Management licence No: 120366 Annual Tonnage: -	Issue Date: 13/08/2021 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued
A	222m E	Site Name: Pringle Reclaim Site Address: PRINGLE RECLAIM LTD, Pringle Reclaim Ltd, Christmas Hill, Winchester, SO22 6RG Correspondence Address: -	Type of Site: Treatment of waste to produce soil 75,000 tpy Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: - EPR reference: EA/EPR/WE6248AB/A001 Operator: PRINGLE RECLAIM LTD Waste Management licence No: 120672 Annual Tonnage: -	Issue Date: 01/07/2022 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued

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

### 3.7 Waste exemptions

<b>Records within 500m</b>	<b>7</b>
----------------------------	----------

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 >](#)

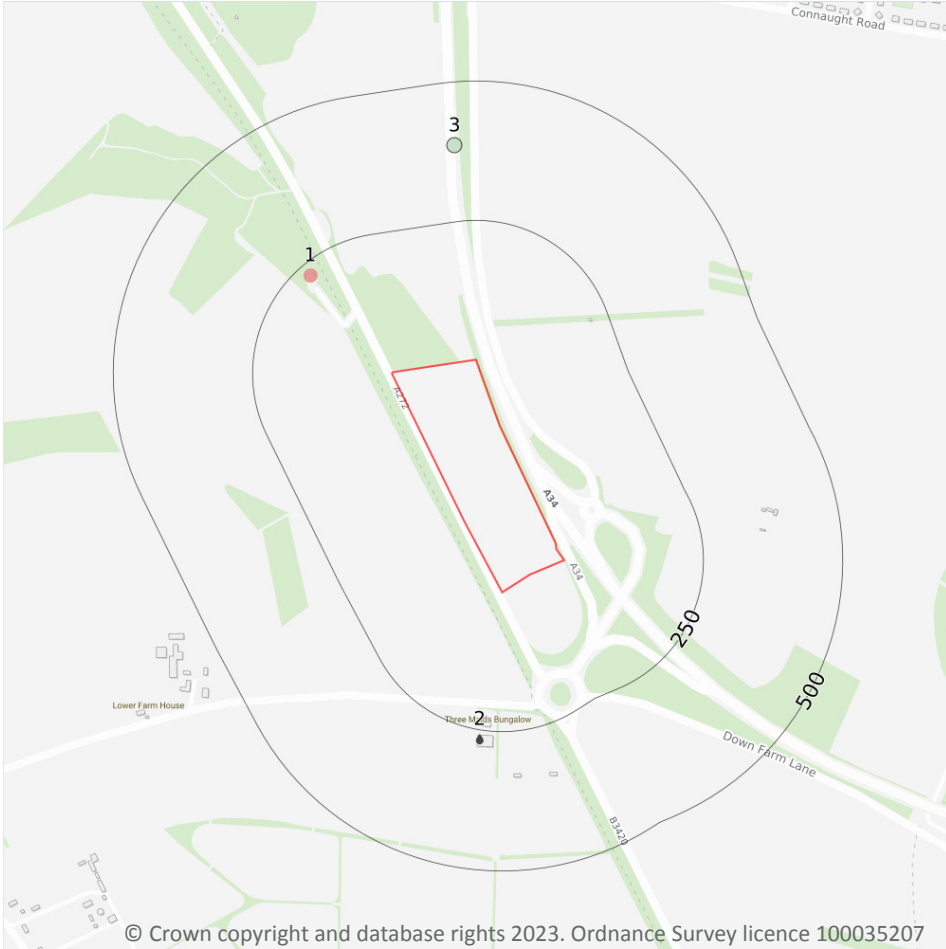
ID	Location	Site	Reference	Category	Sub-Category	Description
A	178m E	-	WEX276390	Using waste exemption	Not on a farm	Use of waste in construction
A	178m E	-	WEX276390	Treating waste exemption	Not on a farm	Screening and blending of waste
3	349m E	-	WEX252634	Using waste exemption	On a Farm	Use of waste in construction



ID	Location	Site	Reference	Category	Sub-Category	Description
B	382m E	Down Farm WINCHESTER Hampshire SO22 6RG	EPR/JF0603W G/A001	Using waste exemption	Agricultural Waste Only	Use of waste in construction
B	382m E	Down Farm WINCHESTER Hampshire SO22 6RG	EPR/JF0603W G/A001	Using waste exemption	Agricultural Waste Only	Spreading waste on non- agricultural land to confer benefit
B	382m E	Down Farm WINCHESTER Hampshire SO22 6RG	EPR/JF0603W G/A001	Using waste exemption	Agricultural Waste Only	Use of waste for a specified purpose
B	415m E	-	WEX252486	Using waste exemption	On a Farm	Use of waste in construction

*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
- Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

### 4.1 Recent industrial land uses

Records within 250m

1

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 24](#) >

ID	Location	Company	Address	Activity	Category
1	228m NW	Gas Valve Compound	Hampshire, SO21	Gas Features	Infrastructure and Facilities

*This data is sourced from Ordnance Survey.*

## 4.2 Current or recent petrol stations

Records within 500m

0

Open, closed, under development and obsolete petrol stations.

*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

0

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.

*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

1

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

Features are displayed on the Current industrial land use map on [page 24 >](#)

ID	Location	Address	Details	
2	266m S	J.SMITH ESQ., J.SMITH ESQ., STAFF COTTAGE, LITTLETON STUD LITTLETON, WINCHESTER HAMPSHIRE	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P01377 Permit Version: 1 Receiving Water: INTO LAND	Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995 Issue date: 01/03/1989 Effective Date: 01/03/1989 Revocation Date: 31/03/1997

*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

0

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.

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

#### 4.18 Pollution Incidents (EA/NRW)

Records within 500m

1

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

Features are displayed on the Current industrial land use map on [page 24 >](#)

ID	Location	Details	
3	386m N	Incident Date: 11/11/2003 Incident Identification: 200890 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)

*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

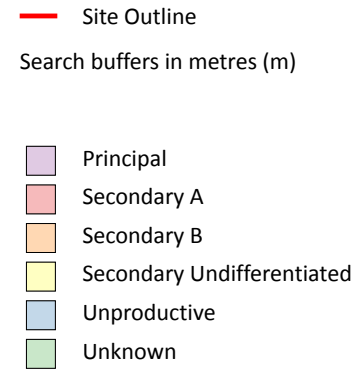
0

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



### 5.1 Superficial aquifer

Records within 500m

1

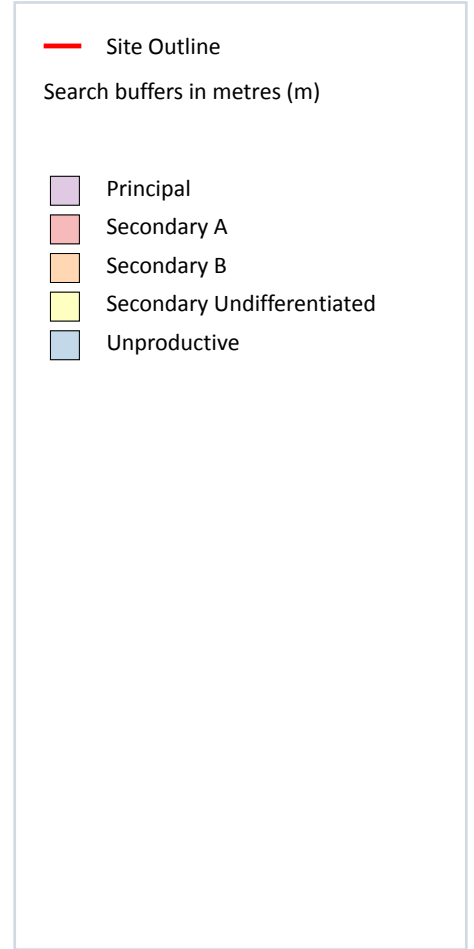
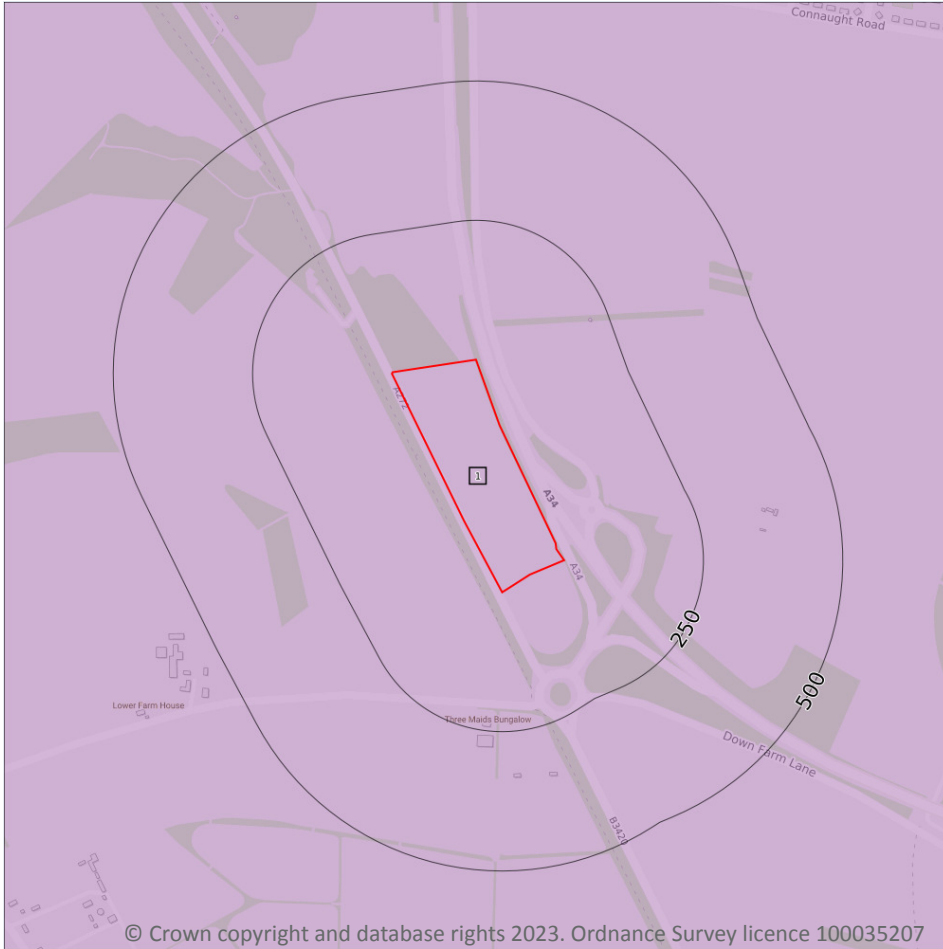
Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on [page 30](#) >

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

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

## Bedrock aquifer



### 5.2 Bedrock aquifer

Records within 500m

1

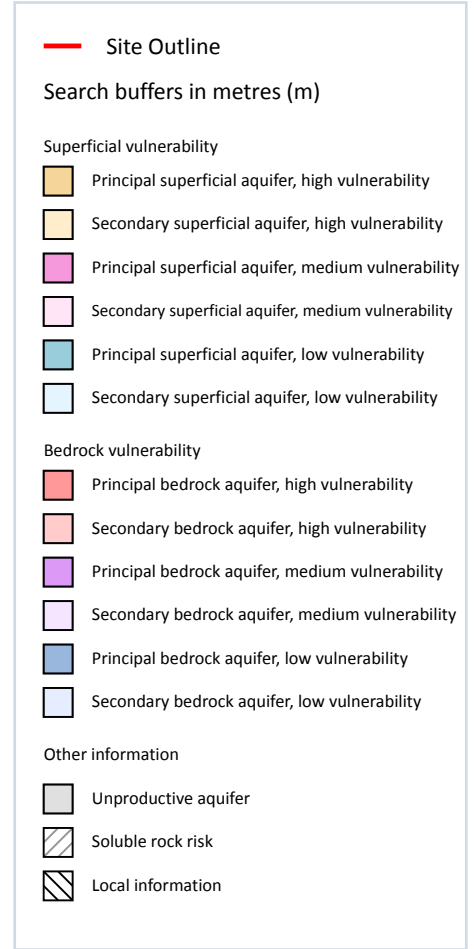
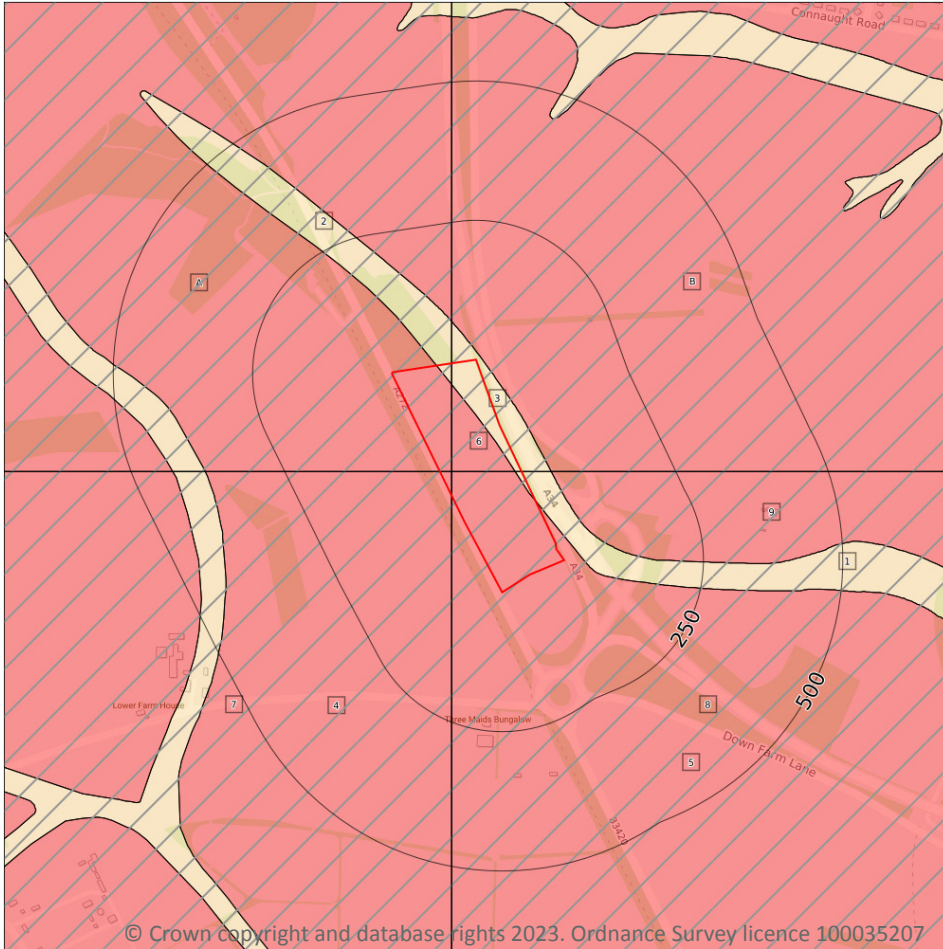
Aquifer status of groundwater held within bedrock geology.

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

ID	Location	Designation	Description
1	On site	Principal	<b>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</b>

*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

9

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	<b>Summary Classification:</b> Secondary superficial aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, Productive Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> High <b>Aquifer type:</b> Secondary <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures
2	On site	<b>Summary Classification:</b> Secondary superficial aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, Productive Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> High <b>Aquifer type:</b> Secondary <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures
3	On site	<b>Summary Classification:</b> Secondary superficial aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, Productive Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> High <b>Aquifer type:</b> Secondary <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures
4	On site	<b>Summary Classification:</b> Principal bedrock aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, No Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> - <b>Aquifer type:</b> - <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures
5	On site	<b>Summary Classification:</b> Principal bedrock aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, No Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> - <b>Aquifer type:</b> - <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures
6	On site	<b>Summary Classification:</b> Principal bedrock aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, No Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> - <b>Aquifer type:</b> - <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures
A	On site	<b>Summary Classification:</b> Principal bedrock aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, No Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> - <b>Aquifer type:</b> - <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
B	9m N	Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures
9	48m E	Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High 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

<b>Records on site</b>	<b>4</b>
------------------------	----------

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
7	<b>Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.</b>	<b>8.0%</b>
8	<b>Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.</b>	<b>6.0%</b>
A	<b>Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.</b>	<b>9.0%</b>
B	<b>Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.</b>	<b>11.0%</b>

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](mailto:enquiries@environment-agency.gov.uk) ↗.

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



## Abstractions and Source Protection Zones



### 5.6 Groundwater abstractions

Records within 2000m

2

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 36 >](#)

ID	Location	Details	
-	792m E	Status: Active Licence No: 11/42/22.5/73 Details: General Farming & Domestic Direct Source: Southern Region Groundwater Point: UPPER & DOWN FARMS POINT A, HEADBOURNE WORTHY Data Type: Point Name: Trustees Of The Late Mrs E G Brown Easting: 446980 Northing: 133690	Annual Volume (m <sup>3</sup> ): 2682 Max Daily Volume (m <sup>3</sup> ): 36.4 Original Application No: WR.4058 Original Start Date: 23/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date: -
-	1578m NW	Status: Historical Licence No: 33/240 Details: General Washing/Process Washing Direct Source: Southern Region Groundwater Point: POINT B AT LARKWHISTLE FARM Data Type: Point Name: Pentex Oil UK Ltd Easting: 445150 Northing: 135570	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 11/04/2001 Expiry Date: 31/03/2013 Issue No: 2 Version Start Date: 24/06/2003 Version End Date: -

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

## 5.7 Surface water abstractions

<b>Records within 2000m</b>	<b>0</b>
-----------------------------	----------

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.

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

## 5.8 Potable abstractions

<b>Records within 2000m</b>	<b>0</b>
-----------------------------	----------

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

0

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

*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

<b>Records on site</b>	<b>1</b>
------------------------	----------

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 39 >](#)

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	On site	River	Nun's Walk Stream	GB107042022730	Itchen	Test and Itchen

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

### 6.4 WFD Surface water bodies

<b>Records identified</b>	<b>1</b>
---------------------------	----------

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 39 >](#)

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	2830m SE	River	Nun's Walk Stream	<a href="#">GB107042022730 ↗</a>	Moderate	Fail	Good	2019

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

### 6.5 WFD Groundwater bodies

<b>Records on site</b>	<b>2</b>
------------------------	----------

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 39](#) >

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
2	On site	River Test Chalk	<a href="#">GB40701G501200</a> ↗	Poor	Poor	Good	2019
3	On site	River Itchen Chalk	<a href="#">GB40701G505000</a> ↗	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

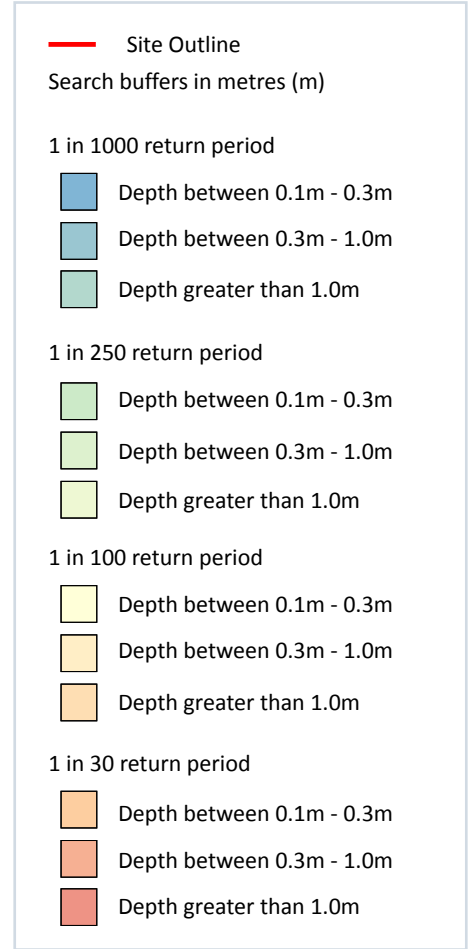
0

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, 0.3m - 1.0m**

**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 45 >](#)

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.

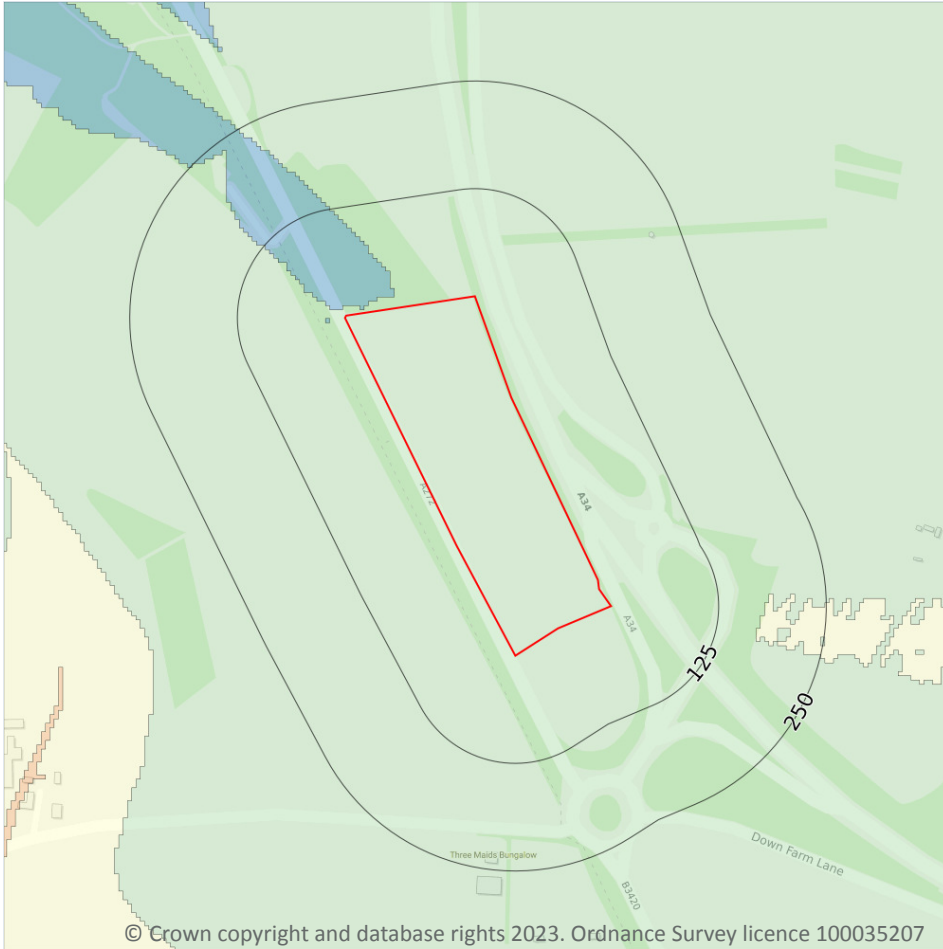
The table below shows the maximum flood depths for a range of return periods for the site.

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

*This data is sourced from Ambiental Risk Analytics.*



## 9 Groundwater flooding



### 9.1 Groundwater flooding

Highest risk on site

Low

Highest risk within 50m

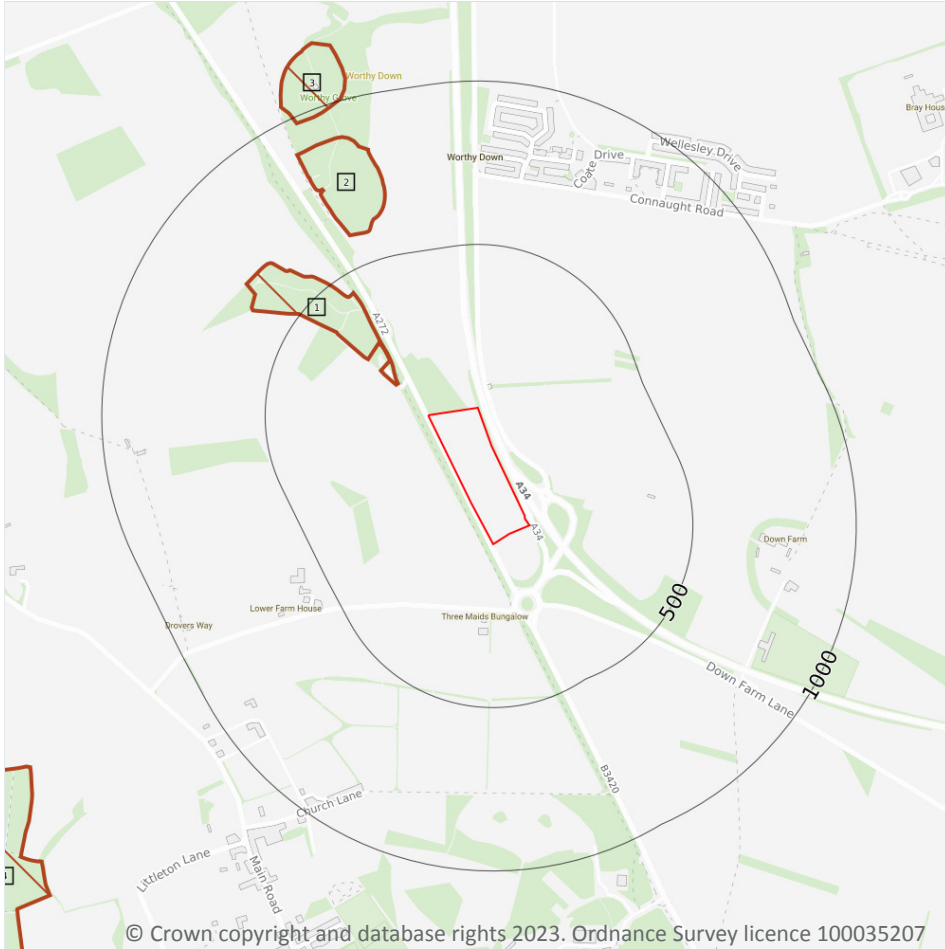
Low

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 47 >](#)

*This data is sourced from Ambiental Risk Analytics.*

## 10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Designated Ancient Woodland

### 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

0

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.

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

## 10.7 Designated Ancient Woodland

Records within 2000m

6

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.

Features are displayed on the Environmental designations map on [page 48 >](#)

ID	Location	Name	Woodland Type
1	135m NW	Worthy Copse	Ancient & Semi-Natural Woodland
2	592m NW	South Worthy Grove	Ancient & Semi-Natural Woodland
3	978m NW	Unknown	Ancient & Semi-Natural Woodland
4	1571m SW	Long Wood	Ancient & Semi-Natural Woodland
-	1900m SW	Unknown	Ancient Replanted Woodland
-	1981m SW	Unknown	Ancient Replanted Woodland

*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

0

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

*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)

<b>Records within 2000m</b>	<b>0</b>
-----------------------------	----------

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

<b>Records within 2000m</b>	<b>0</b>
-----------------------------	----------

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

<b>Records within 2000m</b>	<b>8</b>
-----------------------------	----------

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.

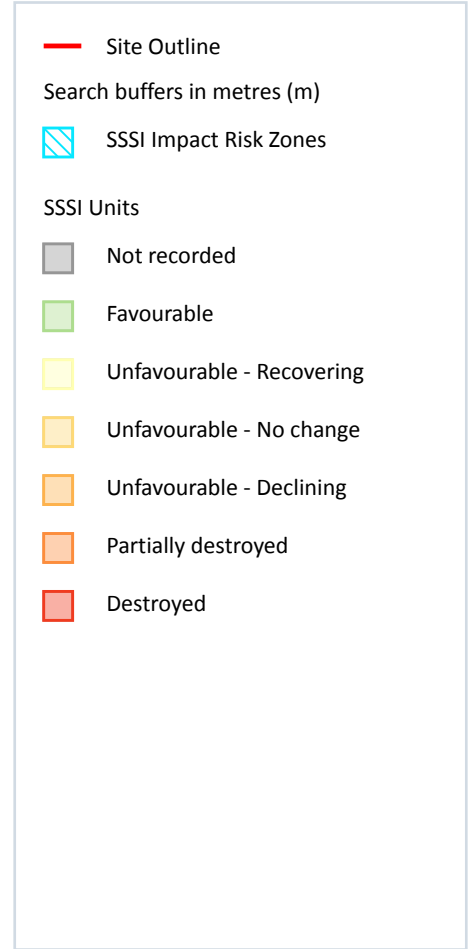
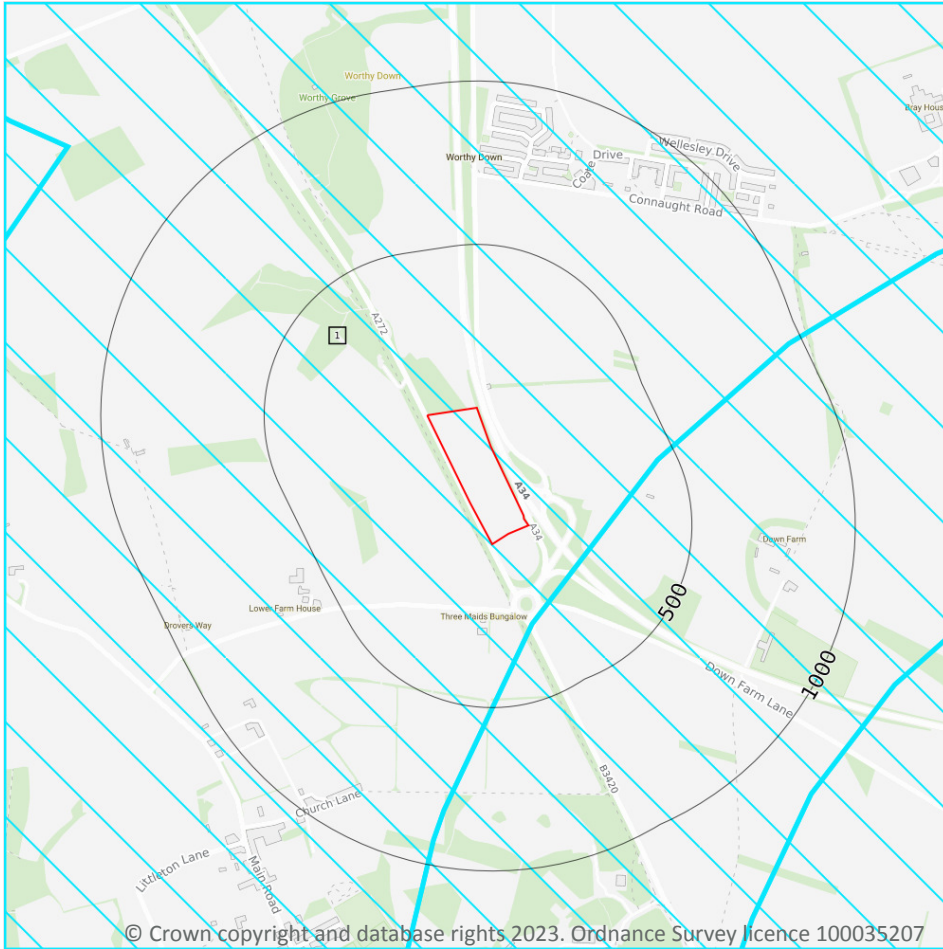
Location	Name	Type	NVZ ID	Status
On site	Nun's Walk Stream NVZ	Surface Water	812	Existing
On site	Hampshire Chalk	Groundwater	143	Existing
On site	Hamble Estuary Eutrophic NVZ (TraC)	Eutrophic Water	3	Existing
1781m N	Hampshire Chalk	Groundwater	143	Existing
1781m N	Hamble Estuary Eutrophic NVZ (TraC)	Eutrophic Water	3	Existing
1801m W	Hampshire Chalk	Groundwater	143	Existing
1801m W	Hamble Estuary Eutrophic NVZ (TraC)	Eutrophic Water	3	Existing
1981m NE	Nun's Walk Stream NVZ	Surface Water	812	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

1

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.

Features are displayed on the SSSI Impact Zones and Units map on [page 54](#) >

ID	Location	Type of developments requiring consultation
1	On site	<p><b>Infrastructure - Airports, helipads and other aviation proposals.</b></p> <p><b>Air pollution - Any industrial/agricultural development that could cause air pollution (incl: industrial processes, livestock &amp; poultry units with floorspace &gt; 500m<sup>2</sup>, slurry lagoons &amp; digestate stores &gt; 750m<sup>2</sup>, manure stores &gt; 3500t).</b></p> <p><b>Combustion - General combustion processes &gt;50mw energy input. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.</b></p> <p><b>Discharges - Any discharge of water or liquid waste that is discharged to ground (ie to seep away) or to surface water, such as a beck or stream.</b></p> <p><b>Notes: Nutrient impact area. for new development with overnight accommodation reg 63 of the conservation of habitats and species regulations 2017 must be applied and additional measures required. Ipa to refer to natural england's nutrient neutrality advice.</b></p>

*This data is sourced from Natural England.*

## 10.18 SSSI Units

<b>Records within 2000m</b>	<b>0</b>
-----------------------------	----------

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

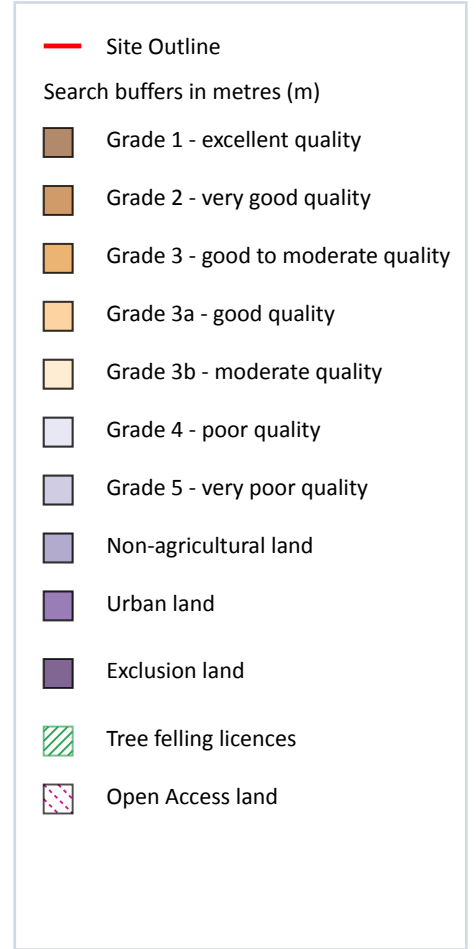
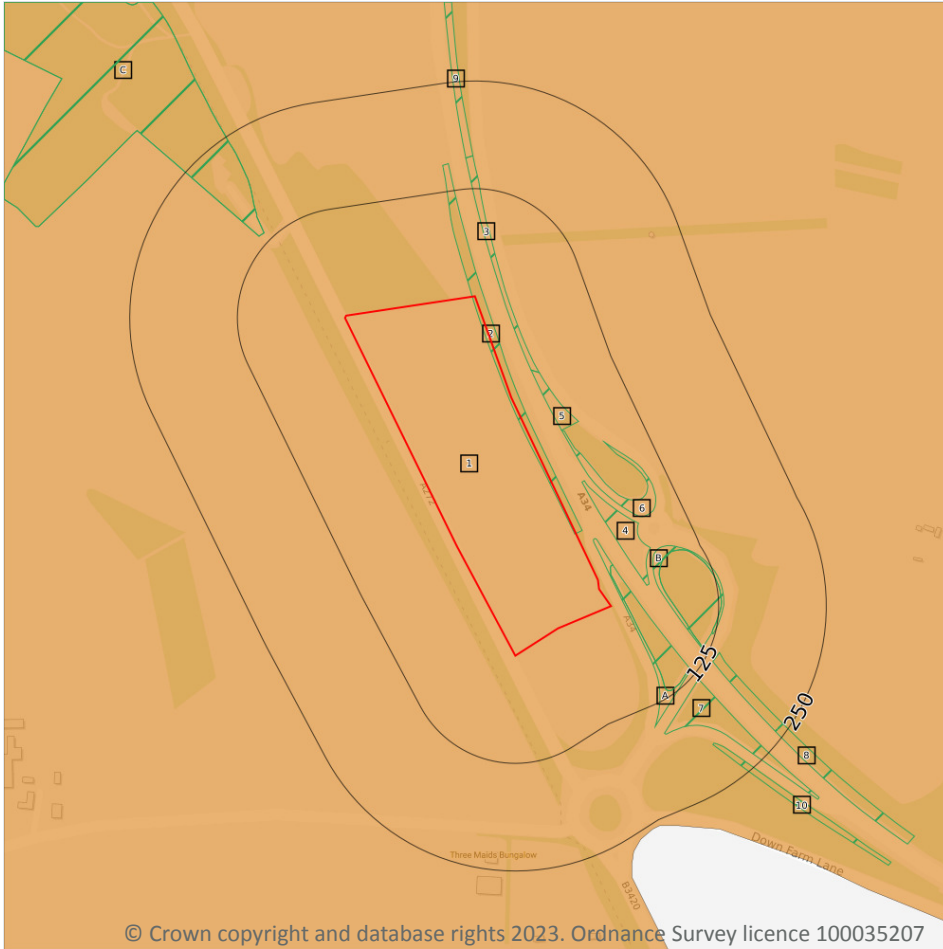
0

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



### 12.1 Agricultural Land Classification

Records within 250m

1

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 58](#) >

ID	Location	Classification	Description
1	On site	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

15

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.

Features are displayed on the Agricultural designations map on [page 58 >](#)

ID	Location	Description	Reference	Application date
<b>2</b>	<b>On site</b>	<b>Selective Fell/Thin (Unconditional)</b>	<b>018/366/15-16</b>	-
A	15m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
A	16m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
3	30m N	Selective Fell/Thin (Unconditional)	018/366/15-16	-
4	32m E	Selective Fell/Thin (Unconditional)	018/366/15-16	-
5	32m NE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
6	37m NE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
B	59m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
B	64m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
7	133m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
8	135m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
C	135m NW	Selective Fell/Thin (Unconditional)	019/295/07-08	15/01/2008
C	135m NW	Selective Fell/Thin (Unconditional)	019/582/11-12	10/05/2012
9	161m N	Selective Fell/Thin (Unconditional)	018/366/15-16	-
10	199m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-

*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

1

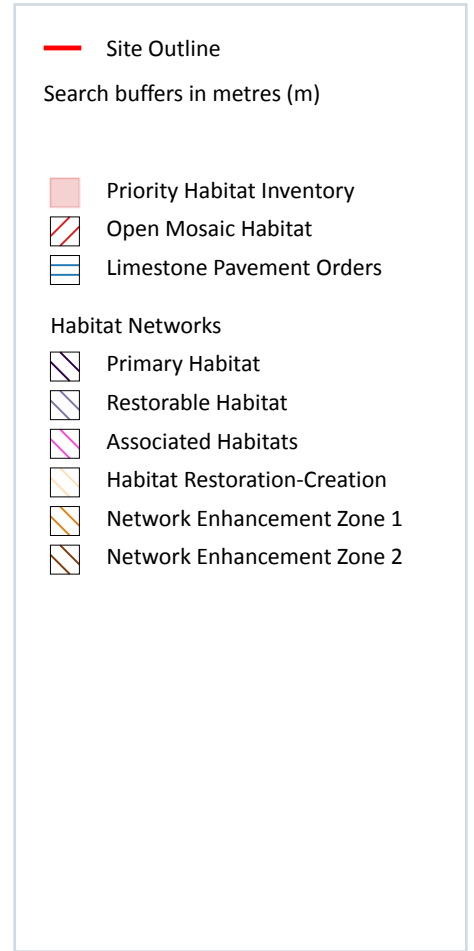
Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

Location	Reference	Scheme	Start Date	End Date
32m S	1050938	Countryside Stewardship (Middle Tier)	01/01/2021	31/12/2025

*This data is sourced from Natural England.*



## 13 Habitat designations



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### 13.1 Priority Habitat Inventory

Records within 250m

8

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

Features are displayed on the Habitat designations map on [page 61](#) >

ID	Location	Main Habitat	Other habitats
1	On site	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	6m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	64m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	135m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

ID	Location	Main Habitat	Other habitats
5	164m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
6	175m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
7	184m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
8	235m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

*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**

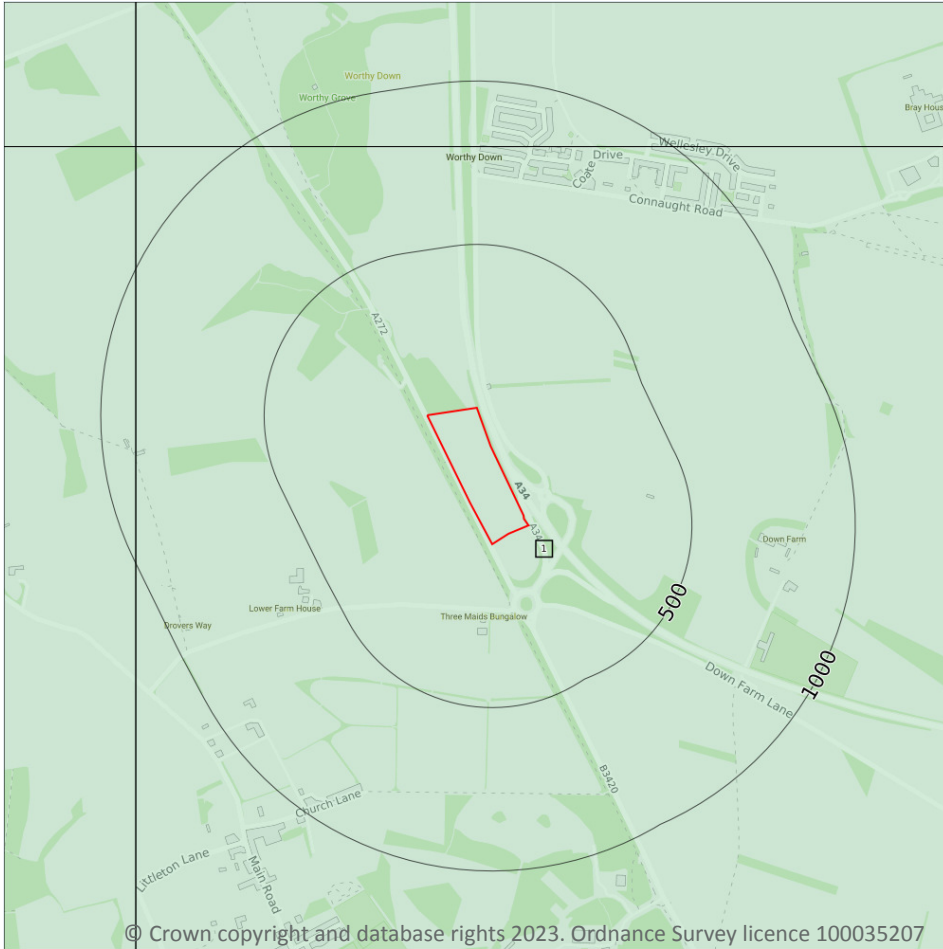
**0**

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

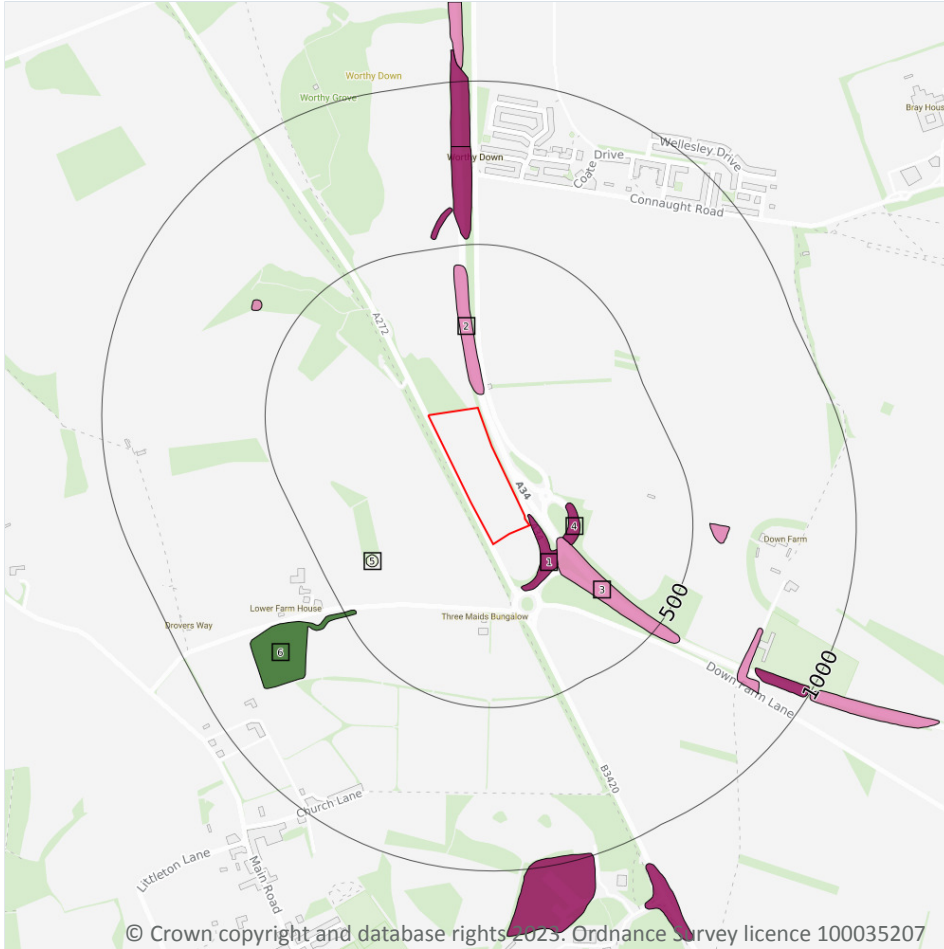
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on [page 63](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	No coverage	SU43SE

This data is sourced from the British Geological Survey.

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



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

### 14.2 Artificial and made ground (10k)

Records within 500m

6

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.

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

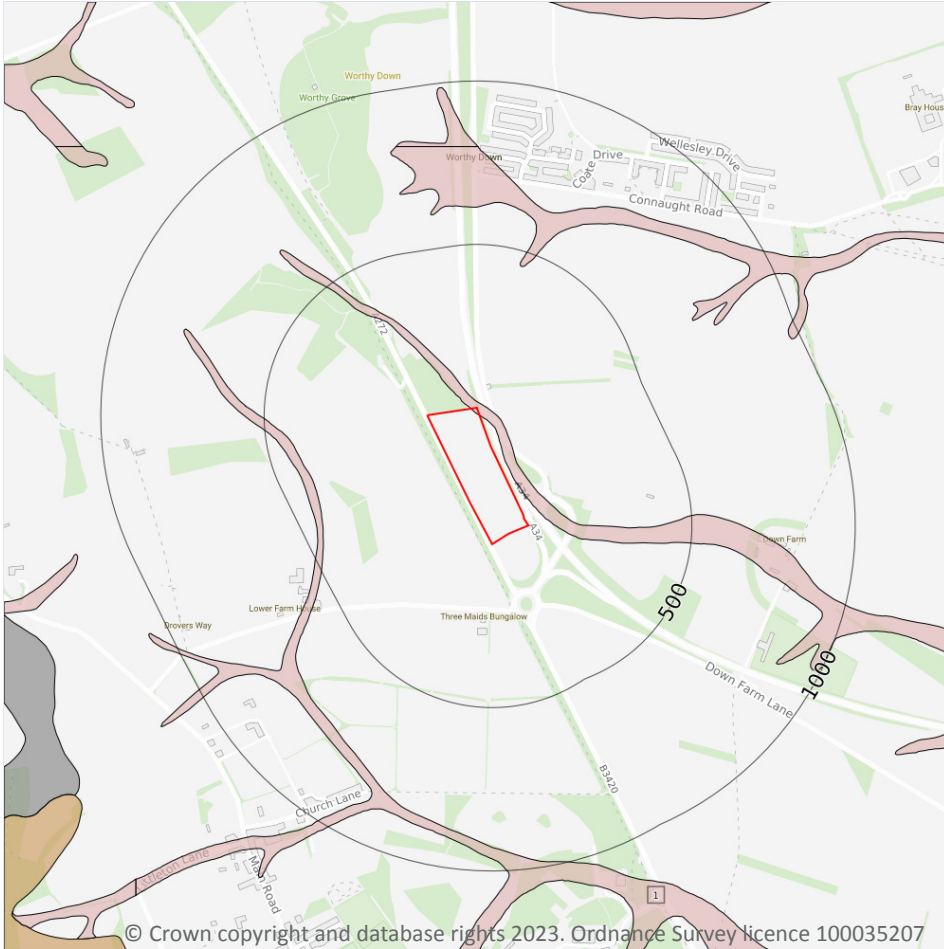
ID	Location	LEX Code	Description	Rock description
1	4m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2	41m N	WGR-VOID	Worked Ground (Undivided)	Void
3	95m SE	WGR-VOID	Worked Ground (Undivided)	Void
4	108m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

ID	Location	LEX Code	Description	Rock description
5	333m SW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
6	467m SW	LSGR-UKNOWN	Landscaped Ground (Undivided)	Unknown/unclassified Entry

*This data is sourced from the British Geological Survey.*



## Geology 1:10,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (10k)
- Superficial geology (10k)  
Please see table for more details.

### 14.3 Superficial geology (10k)

Records within 500m

1

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.

Features are displayed on the Geology 1:10,000 scale - Superficial map on [page 66](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	HEAD-DMTN	Head - Diamicton	Diamicton

*This data is sourced from the British Geological Survey.*



## 14.4 Landslip (10k)

Records within 500m

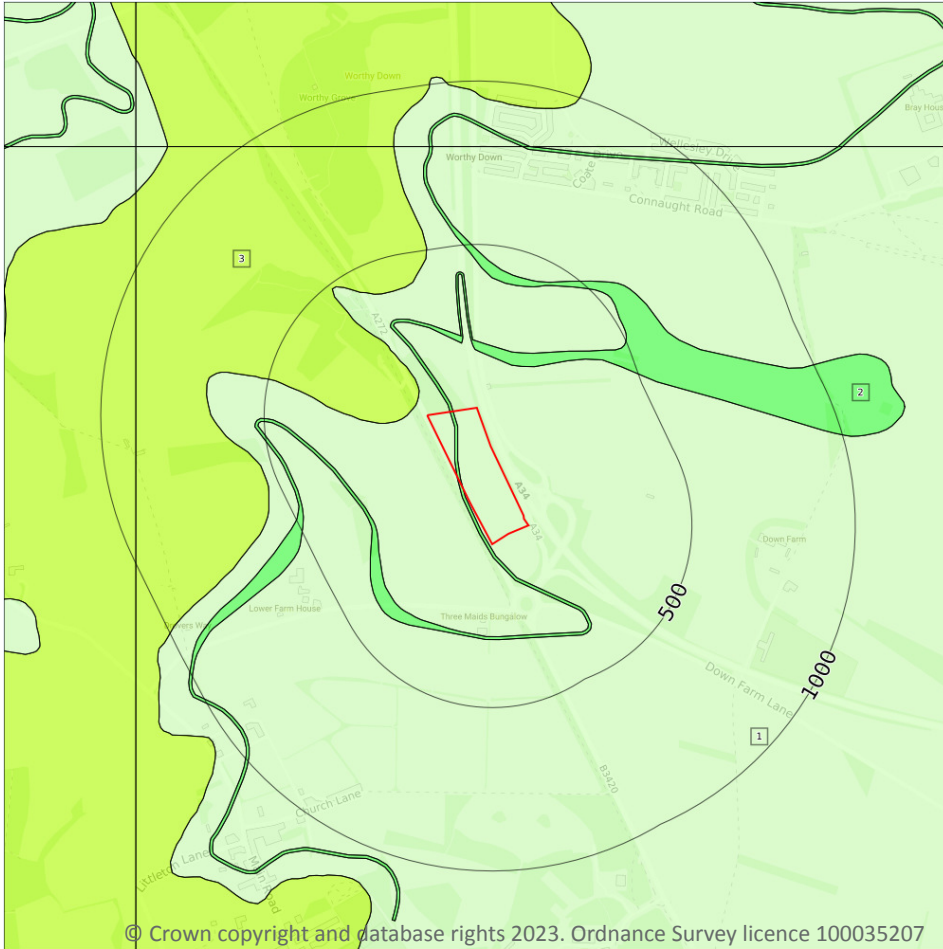
0

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



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (10k)
- Bedrock geology (10k)  
Please see table for more details.

### 14.5 Bedrock geology (10k)

Records within 500m

3

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.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on [page 68](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	SECK-CHLK	Seaford Chalk Formation - Chalk	Santonian Age - Coniacian Age
2	On site	STRK-LMST	Stockbridge Rock Member - Limestone	Santonian Age
3	48m NW	NCK-CHLK	Newhaven Chalk Formation - Chalk	Campanian Age - Santonian Age

This data is sourced from the British Geological Survey.

## 14.6 Bedrock faults and other linear features (10k)

Records within 500m

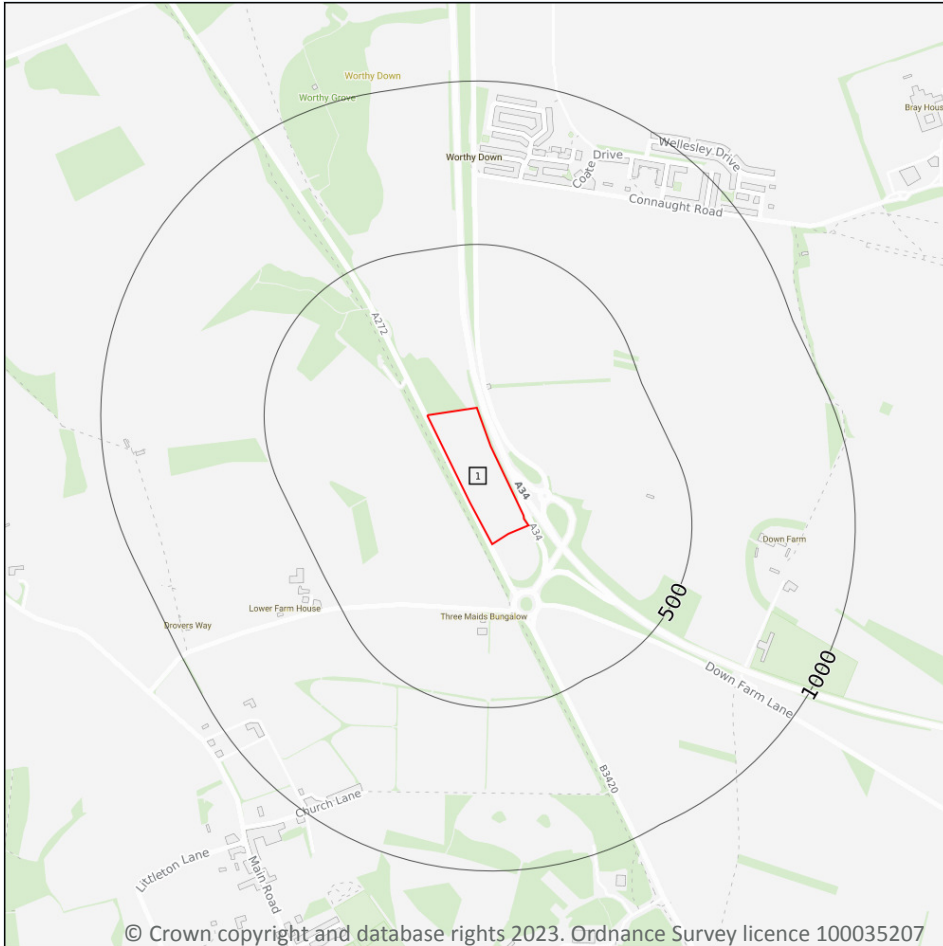
0

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.

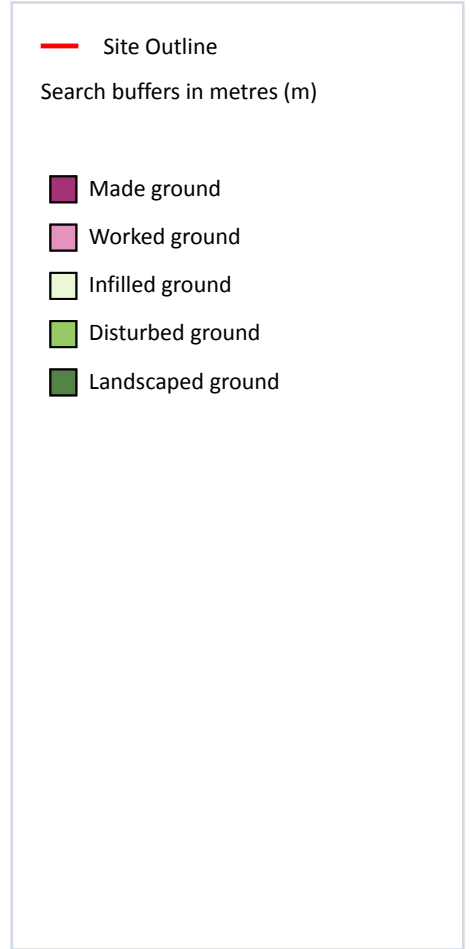
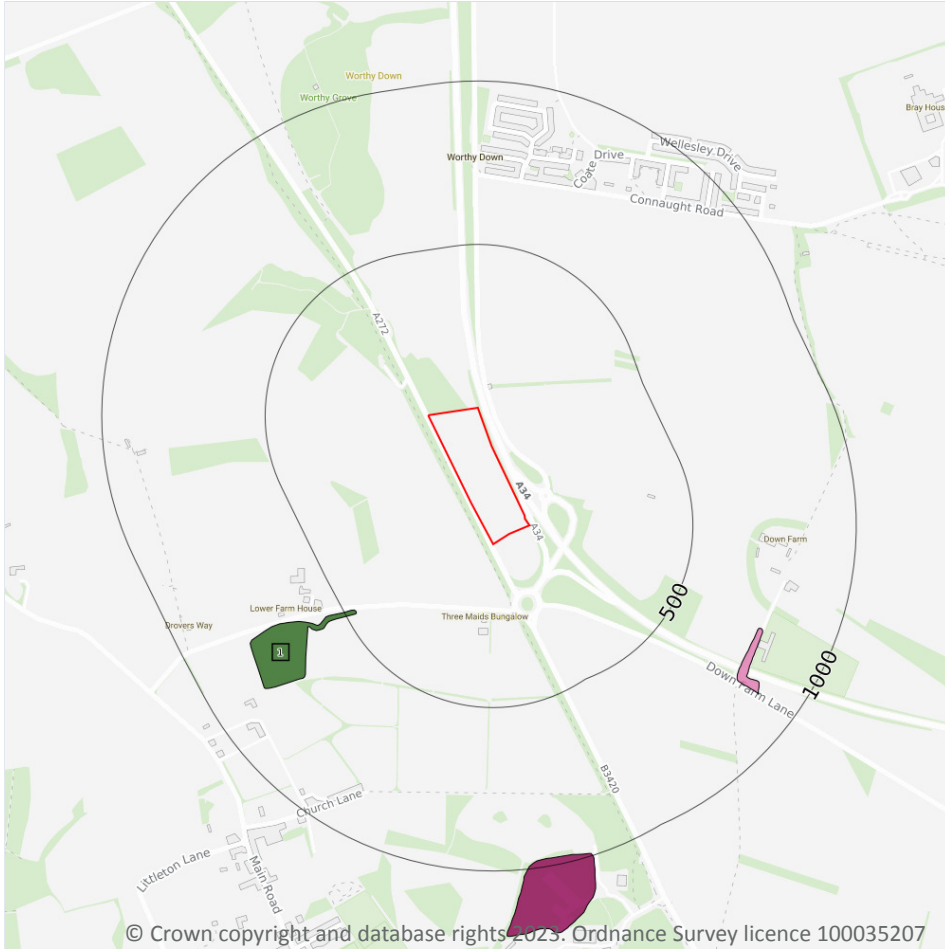
Features are displayed on the Geology 1:50,000 scale - Availability map on [page 70](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	No coverage	EW299_winchester_v4

*This data is sourced from the British Geological Survey.*



## Geology 1:50,000 scale - Artificial and made 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 71 >](#)

ID	Location	LEX Code	Description	Rock description
1	467m SW	LSGR-ARTGR	LANDSCAPED GROUND (UNDIVIDED)	ARTIFICIALLY MODIFIED GROUND

*This data is sourced from the British Geological Survey.*

### 15.3 Artificial ground permeability (50k)

Records within 50m

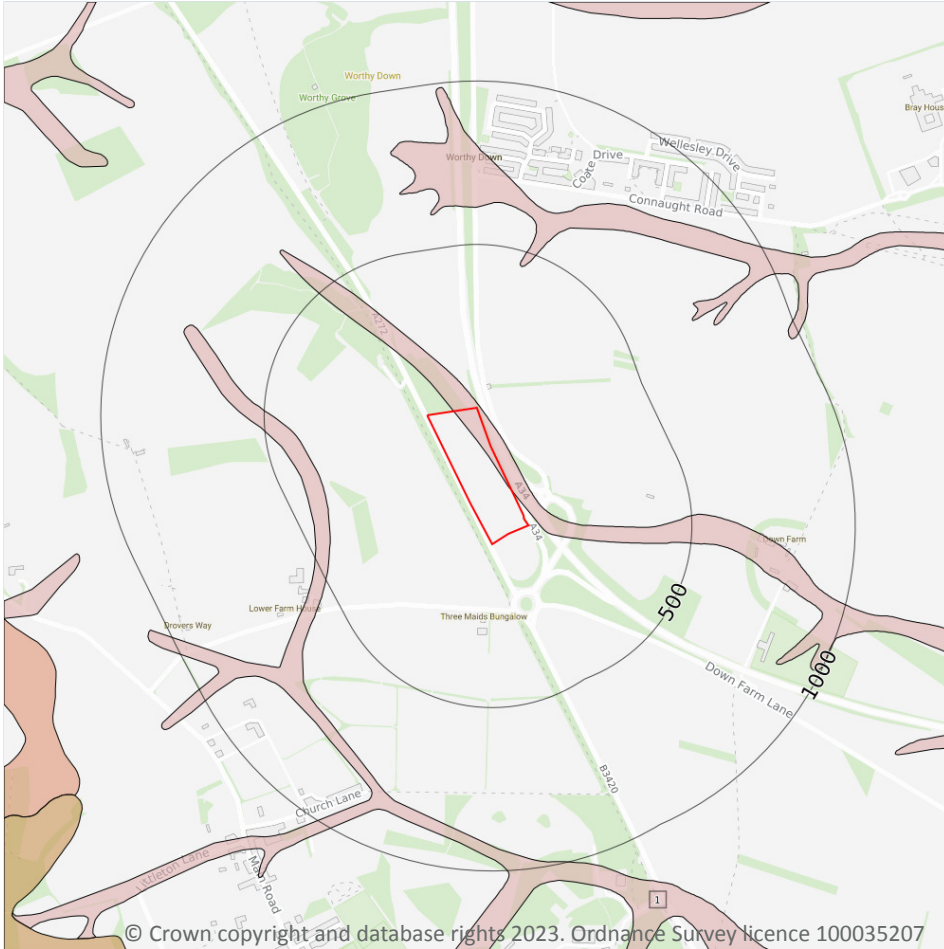
0

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

1

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 73](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	HEAD- XCZSV	HEAD	CLAY, SILT, 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)

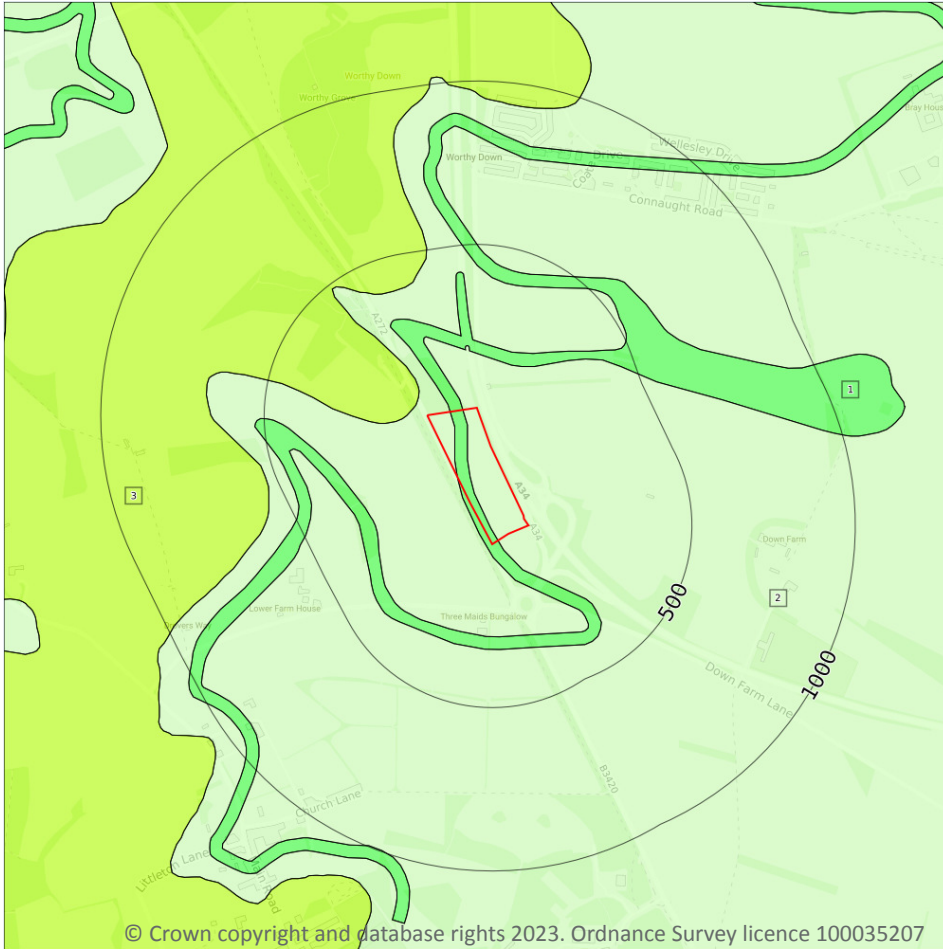
**Records within 50m** **0**

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

3

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 75 >](#)

ID	Location	LEX Code	Description	Rock age
1	On site	STRK-LMST	STOCKBRIDGE ROCK MEMBER - LIMESTONE	SANTONIAN
2	On site	SECK-CHLK	SEAFORD CHALK FORMATION - CHALK	CONIACIAN
3	48m NW	NCK-CHLK	NEWHAVEN CHALK FORMATION - CHALK	SANTONIAN

*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
48m NW	Fracture	Very High	Very 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

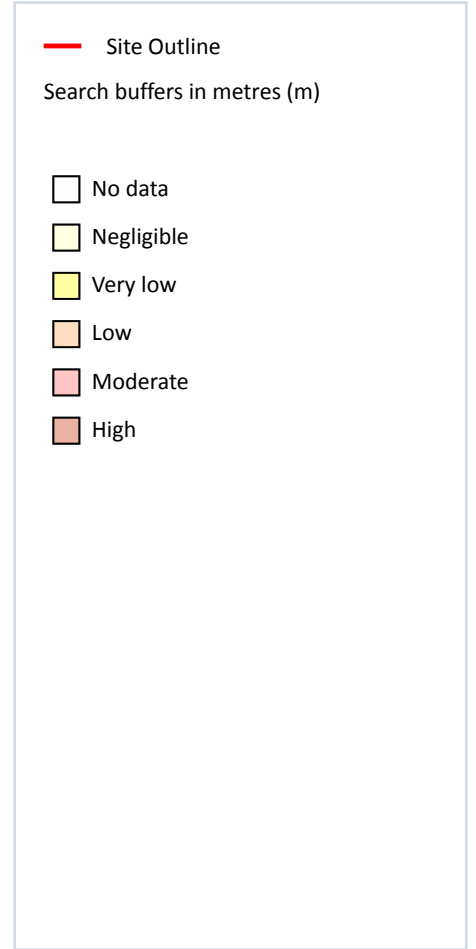
0

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



### 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 78 >](#)

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 79 >](#)

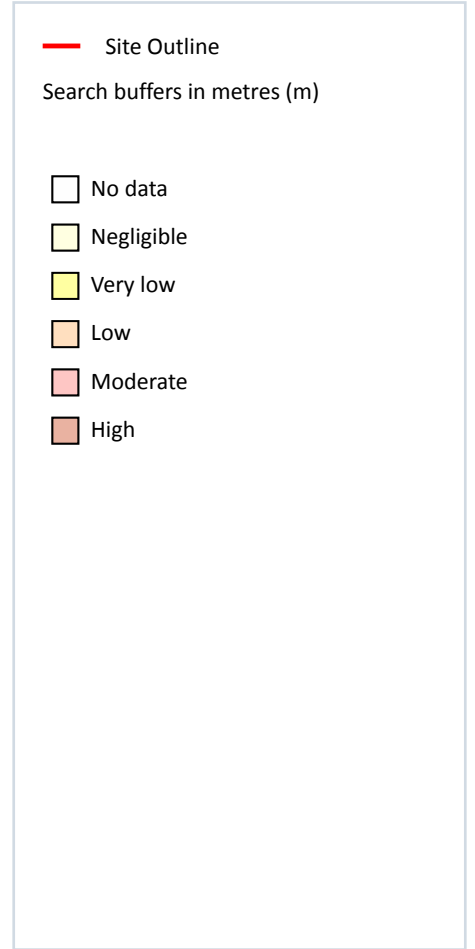
Location	Hazard rating	Details
On site	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

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



### 17.3 Compressible deposits

Records within 50m

1

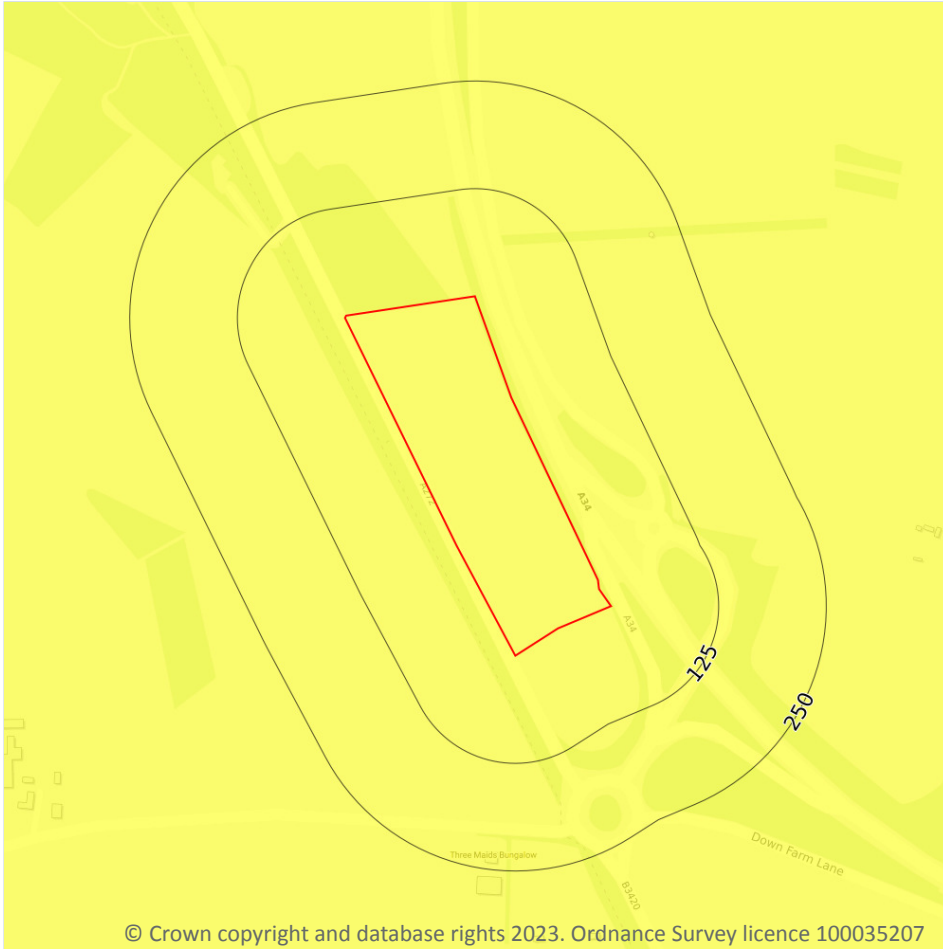
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

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

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 82 >](#)

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

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### 17.5 Landslides

Records within 50m

5

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.

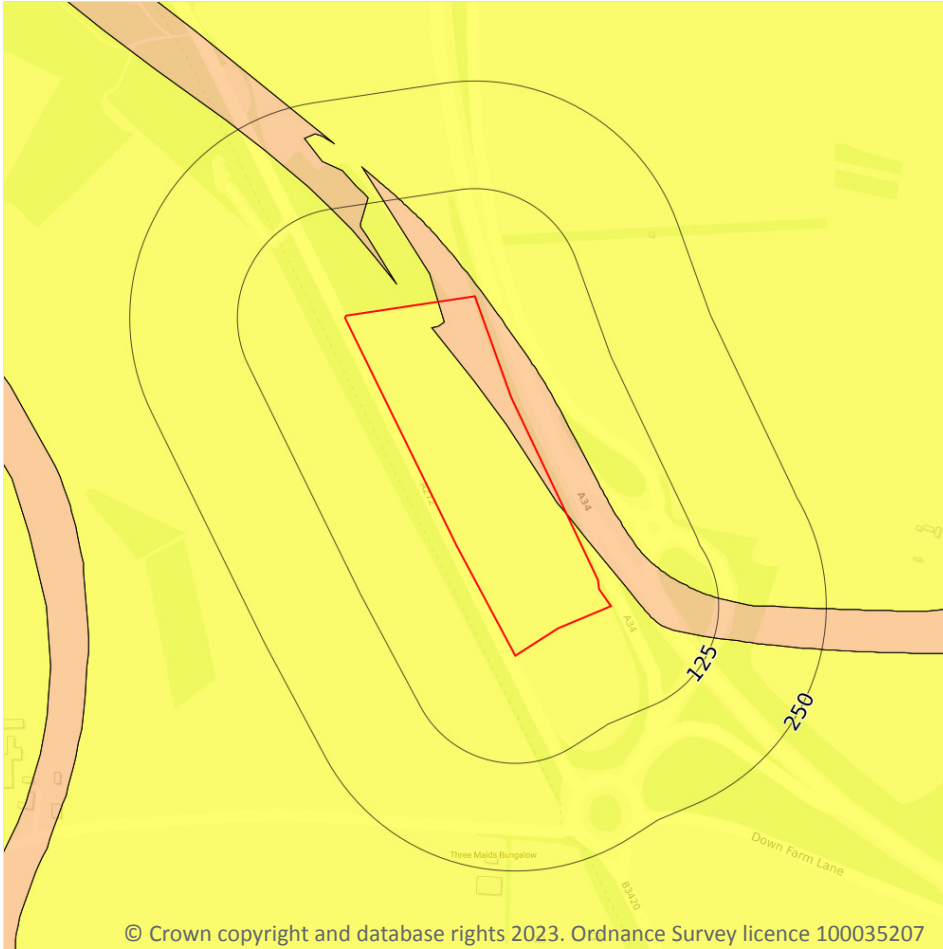
Features are displayed on the Natural ground subsidence - Landslides map on [page 83 >](#)

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.
On site	Low	Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.
9m N	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.
15m N	Moderate	Slope instability problems are probably present or have occurred in the past. Land use should consider specifically the stability of the site.

*This data is sourced from the British Geological Survey.*

## Natural ground subsidence - Ground dissolution of soluble rocks



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### 17.6 Ground dissolution of soluble rocks

Records within 50m

3

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 85](#)

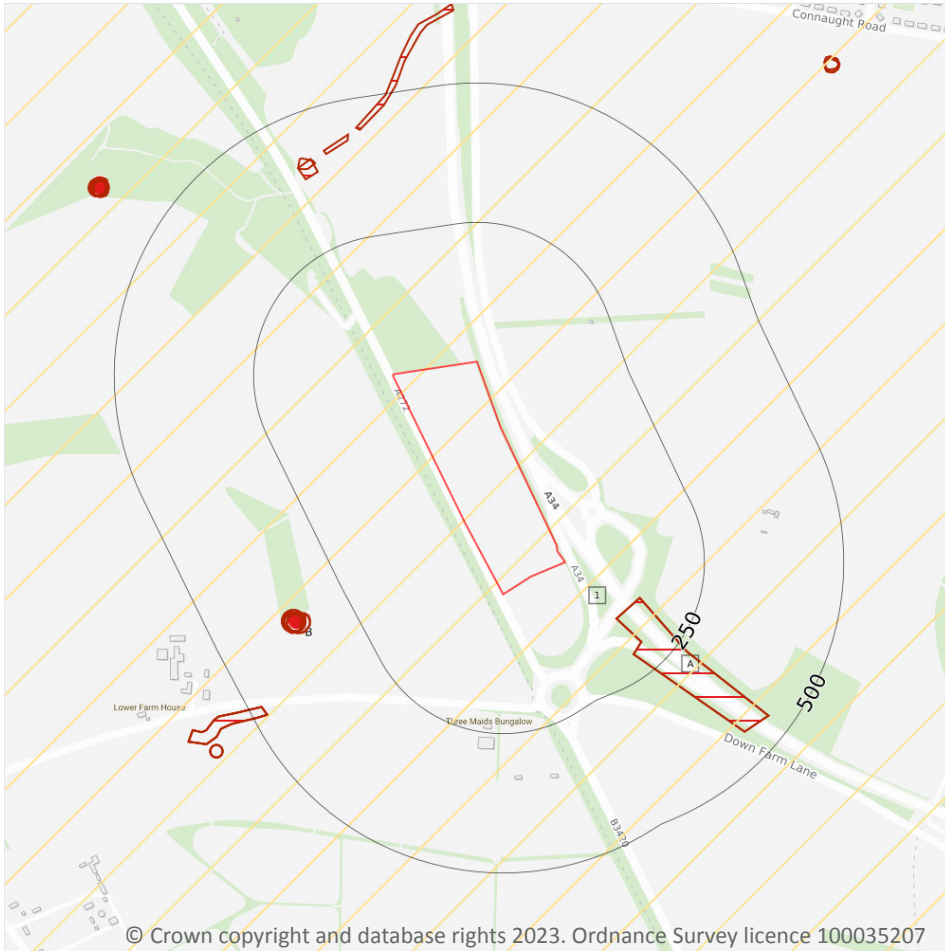
Location	Hazard rating	Details
On site	Very low	Soluble rocks are present within the ground. Few dissolution features are likely to be present. Potential for difficult ground conditions or localised subsidence are at a level where they need not be considered.

Location	Hazard rating	Details
On site	Low	<b>Soluble rocks are present within the ground. Some dissolution features may be present. Potential for difficult ground conditions are at a level where they may be considered, localised subsidence need not be considered except in exceptional circumstances.</b>
29m NW	Low	Soluble rocks are present within the ground. Some dissolution features may be present. Potential for difficult ground conditions are at a level where they may be considered, localised subsidence need not be considered except in exceptional circumstances.

*This data is sourced from the British Geological Survey.*



## 18 Mining, ground workings and natural cavities



### 18.1 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.*

## 18.2 BritPits

Records within 500m

1

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.

Features are displayed on the Mining, ground workings and natural cavities map on [page 87 >](#)

ID	Location	Details	Description
B	347m SW	Name: Littleton Chalk Pit Address: Littleton, WINCHESTER, Hampshire Commodity: Limestone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

*This data is sourced from the British Geological Survey.*

## 18.3 Surface ground workings

Records within 250m

2

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.

Features are displayed on the Mining, ground workings and natural cavities map on [page 87 >](#)

ID	Location	Land Use	Year of mapping	Mapping scale
A	137m SE	Cuttings	1987	1:10000
A	137m SE	Cuttings	1975	1:10000

*This is data is sourced from Ordnance Survey/Groundsure.*

## 18.4 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 is data is sourced from Ordnance Survey/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, ground workings and natural cavities map on [page 87 >](#)

ID	Location	Name	Commodity	Class	Likelihood
1	On site	Not available	Chalk	A	<b>Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered</b>
-	799m N	Not available	Chalk	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
-	893m W	Not available	Chalk	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered

*This data is sourced from the British Geological Survey.*

## 18.7 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.*



## 18.8 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.*

## 18.9 Coal mining

Records on site 0

Areas which could be affected by past, current or future coal mining.

*This data is sourced from the Coal Authority.*

## 18.10 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.*

## 18.11 Gypsum areas

Records on site 0

Generalised areas that may be affected by gypsum extraction.

*This data is sourced from British Gypsum.*

## 18.12 Tin mining

Records on site 0

Generalised areas that may be affected by historical tin mining.

*This data is sourced from Groundsure.*



## 18.13 Clay mining

Records on site

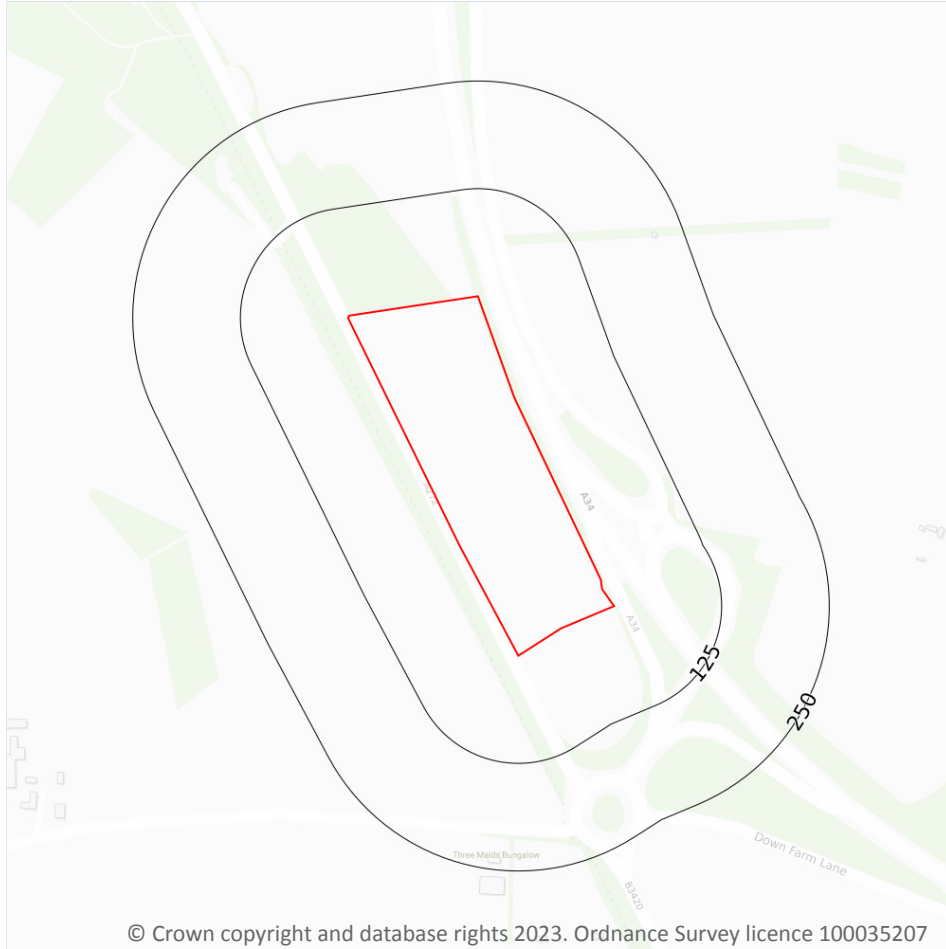
0

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

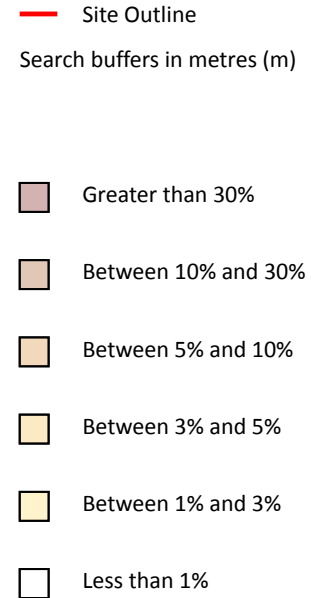
*This data is sourced from the Kaolin and Ball Clay Association (UK).*



## 19 Radon



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### 19.1 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.*



## 20 Soil chemistry

### 20.1 BGS Estimated Background Soil Chemistry

Records within 50m

18

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 km<sup>2</sup>. 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 km<sup>2</sup>; 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	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
3m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
9m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
14m SW	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
29m NW	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
48m NW	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
48m E	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg

*This data is sourced from the British Geological Survey.*



## 20.2 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 km<sup>2</sup>).

*This data is sourced from the British Geological Survey.*

## 20.3 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 km<sup>2</sup>.

*This data is sourced from the British Geological Survey.*



## 21 Railway infrastructure and projects

### 21.1 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.*

### 21.2 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.*

### 21.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

*This data is sourced from the Ordnance Survey.*

### 21.4 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.*

### 21.5 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.*

## 21.6 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.*

## 21.7 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.*

## 21.8 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.*

## 21.9 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.*

## 21.10 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

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## **Appendix B: Flood Risk Assessment and Surface Water Drainage Strategy and Technical Addendum SLR (2022)**

# PROPOSED ANAEROBIC DIGESTION FACILITY AT THREE MAIDS HILL, WINCHESTER

## **Flood Risk Assessment and Surface Water Drainage Strategy**

Prepared for: Acorn Bioenergy Ltd

Client Ref: 11923

SLR Ref: 404.11923.00004.0004  
Version No: 01  
August 2022



## BASIS OF REPORT

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## CONTENTS

<b>1.0 INTRODUCTION .....</b>	<b>8</b>
1.1 Terms of Reference.....	8
1.2 Administrative Context .....	8
1.3 Site Location.....	8
1.4 Background and Aims .....	9
<b>2.0 SITE DETAILS .....</b>	<b>11</b>
2.1 Existing Site Description.....	11
2.2 Topography.....	11
2.3 Geological and Hydrogeological Context .....	12
2.3.1 Geology .....	12
2.3.2 Hydrogeology.....	13
2.3.3 Infiltration Testing .....	13
2.4 Hydrological Context.....	13
2.4.1 Local Hydrology .....	13
2.4.2 Existing Site Drainage .....	13
<b>3.0 DEVELOPMENT PROPOSAL.....</b>	<b>14</b>
3.1 Proposed Development Summary .....	14
3.2 Anticipated Lifetime of Development .....	14
3.3 Flood Risk Vulnerability.....	14
3.4 Planning Context.....	14
3.4.1 National Planning Policy.....	14
3.4.2 County Planning Policy.....	14
3.4.3 Local Planning Policy .....	15
<b>4.0 ASSESSMENT OF FLOOD RISK.....</b>	<b>17</b>
4.1 Potential sources of flooding .....	17
4.1.1 Flooding from Rivers or Fluvial Flooding.....	17
4.1.2 Flooding from Sea or Tidal Flooding.....	17
4.1.3 Flooding from Surface Water or Pluvial Flooding.....	17
4.1.4 Flooding from Groundwater .....	18
4.1.5 Flooding from Sewers.....	19
4.1.6 Flooding from Reservoirs, Canals and other Artificial Sources .....	19
4.1.7 Flooding from Infrastructure Failure .....	19
4.2 Flood Risk Summary .....	19

4.3	Flood Zone .....	20
<b>5.0</b>	<b>POLICY STATUS FOR PROPOSED DEVELOPMENT .....</b>	<b>21</b>
5.1	Flood Risk Compatibility .....	21
5.2	Sequential Test .....	21
5.3	Exception Test.....	21
<b>6.0</b>	<b>CLIMATE CHANGE.....</b>	<b>23</b>
6.1	Peak River Flow & Sea Level Allowances .....	23
6.2	Peak Rainfall Intensity Allowance.....	24
<b>7.0</b>	<b>DRAINAGE PHILOSOPHY .....</b>	<b>25</b>
7.1	Summary .....	25
7.1.1	Contaminated Water.....	25
7.1.2	Clean Water .....	25
<b>8.0</b>	<b>SURFACE WATER DRAINAGE STRATEGY .....</b>	<b>26</b>
8.1	Context.....	26
8.2	Sustainable Drainage Systems .....	26
8.3	Proposed Drained Area.....	27
8.4	Proposed Discharge Arrangement.....	28
8.5	Proposed Outline SuDS Strategy .....	28
8.5.1	Site Control .....	29
8.6	Water Quantity Design Standard .....	29
8.6.1	Control of Runoff Volume .....	29
8.6.2	Control of Peak Rate of Runoff .....	30
8.7	Water Quality Design Standard.....	30
8.8	Attenuation Volume Estimate.....	32
8.8.1	Northern Catchment .....	32
8.8.2	Southern Catchment .....	33
8.9	Design Exceedance Arrangement .....	35
<b>9.0</b>	<b>PRINCIPAL OPERATION AND MAINTENANCE REQUIREMENTS.....</b>	<b>36</b>
9.1	Bioretention System .....	36
9.2	Below Ground Crate System .....	37
9.3	Underground Piped Systems.....	38
<b>10.0</b>	<b>CONCLUSIONS.....</b>	<b>39</b>
10.1	Flood Risk .....	39
10.2	Drainage Philosophy.....	39

10.3 Surface Water Drainage Strategy .....	39
--	----

## DOCUMENT REFERENCES

### TABLES

Table 2-1 Infiltration Testing Results .....	13
Table 4-1 Potential Sources of Flooding .....	20
Table 5-1 Flood Risk Vulnerability and Flood Zone ‘Compatibility’ .....	21
Table 6-1 Peak River Flow Climate Change Allowances in the Test and Itchen Management Catchment (1981-2000 baseline) .....	23
Table 6-2 Peak River Rainfall Climate Change Allowances in the Test and Itchen Management Catchment .....	24
Table 8-1 Suitability of Surface Water Disposal Methods .....	28
Table 8-2 Summary of Surface Water Management Strategy SuDS Options .....	29
Table 8-3 Pollution Hazard Potential for Proposed Development .....	31
Table 8-4 Indicative SuDS Mitigation Indices for Discharges to Groundwater <sup>1</sup> .....	31
Table 8-5 SuDS Performance: Water Quality Indices Assessment (Discharge to Groundwater) .....	32
Table 8-6 Northern Catchment: Drainage Performance and Sizing A. Bioretention System .....	33
Table 8-7 Southern Catchment: Drainage Performance and Sizing A. Bioretention System .....	34
Table 9-1 Typical Bioretention System Operation and Maintenance Requirements .....	36
Table 9-2 Typical Below Ground Crate System Operation and Maintenance Requirements .....	37
Table 9-3 Typical Pipe System Operation and Maintenance Requirements .....	38

### FIGURES

Figure 1-1 Site Location Plan .....	9
Figure 1-2 Extract of the Flood Map for Planning .....	10
Figure 2-1 Satellite Imagery of the Site .....	11
Figure 2-2 Topographic Contours of the Site .....	12
Figure 4-1 Environment Agency Surface Water Flood Risk .....	18
Figure 8-1 Four Pillars of SuDS (after CIRIA Report C753) .....	26
Figure 8-2 SuDS Management Train .....	27

### DRAWINGS

Drawing SW1: Proposed Areas  
Drawing SW2: Surface Water Drainage Strategy

### APPENDICES

Appendix 01: Infiltration Testing Details  
Appendix 02: Details of the Proposed Development Layout  
Appendix 03: AD Plant Dirty Water Usage Strategy

## Appendix 04: Post Development Runoff Calculations

## EXECUTIVE SUMMARY

SLR Consulting Ltd has prepared this Flood Risk Assessment (FRA) and Surface Water Drainage Strategy (SWDS) on behalf of Acorn Bioenergy Ltd to support the planning application for the construction of an Anaerobic Digestion (AD) facility at Three Maids Hill, Winchester, SO21 2QG (the 'Site'). A summary of the key findings from the FRA and SWDS are provided below.

Subject	Element	Findings
Site name		Three Maids Hill, Winchester, SO21 2QG
	Date Inspected	10 <sup>th</sup> June 2022 site visit undertaken by an experienced hydrologist.
Existing Site	Description	The Site (approx. 4.52ha) is centred on National Grid Reference (NGR) 446069, 133921, some 1.5km north of the outskirts of Winchester. The Site is currently arable land and is bound to the west and east by the A272 and A34 respectively.
	Topography	The Site generally falls in a general south easterly direction from an elevation of approximately 101.00m AOD in the north western corner to 87.75m AOD in the south eastern corner.
	Geology & Hydrogeology	Published British Geological Survey (BGS) maps indicate that the site bedrock geology across most of the Site consists of the Seaford Chalk Formation – Chalk with Stockbridge Rock Member – Limestone within the eastern part of the Site. Superficial deposits of Head – Clay, silt, sand and gravel is shown to be present within the north eastern part of the Site. Soil composition across the Site is described as 'shallow lime-rich soils over chalk or limestone'. Groundwater vulnerability across the Site is therefore designated as ' <i>Medium to High</i> '. The Site does not lie within a groundwater Source Protection Zone (SPZ).
	Hydrology	OS 1:25,000 scale mapping indicates there are no water bodies within or along the boundary of the Site. A small surface water ditch exists adjacent to the eastern boundary of the Site.
	Drainage	The Site is currently undeveloped and is no evidence to suggest it is served by a formal drainage system. Incident rainfall is therefore expected to 'drain' via a combination of evaporation, transpiration and infiltration into the underlying strata.
Proposals	Description	The proposed development would consist of an AD facility. It is anticipated that the c. 3.49ha of the Site would comprise impermeable hardstanding and lagoons that do not allow infiltration. The AD facility would process agricultural crops and manures in the region of c.83,600 tonnes per annum. The AD Plant facility will capture as much rainwater as possible for use in the process. Based on annual average estimates, rainwater capture is expected to be sufficient for up to 100% of the process water demand. The AD facility would generate biomethane, carbon dioxide and digestate. The biomethane would be tankered from the Site to a central 'hub' where it would be injected into the UK gas grid. The carbon dioxide would be sold and the digestate would be spread to local farmland as fertiliser. The AD facility would have the capacity to produce in the region of c. 9,753,325Nm <sup>3</sup> per annum of biomethane (subject to change).
	Lifetime	The proposed AD plant has an anticipated operational lifespan of 25 years. A 25-year operational period is therefore assumed for this application.
	Vulnerability	Table 2: Flood risk vulnerability classification at PPG Paragraph 066, ' <i>waste treatment</i> ' are classified as ' <i>Less Vulnerable</i> '.



	<b>Fluvial</b>	The Site is located within <b>Flood Zone 1</b> which is described as having a low risk of flooding. Climate change is unlikely to increase the risk of fluvial flooding at this site over the 25-year lifetime of the proposed development.
	<b>Tidal</b>	The Site is remote from any tidal extent and at low risk of tidal flooding.
	<b>Surface Water</b>	Environment Agency mapping indicates the Site to be at predominantly at <i>very low</i> risk of flooding from surface water. The south eastern corner of the Site is however shown to be at <i>medium to low</i> risk of flooding from this source. It is proposed that all vulnerable elements of the development be located away from the flooding in the south eastern corner of the Site. The flood risk to the proposed development is therefore very low.
	<b>Groundwater</b>	There is potential for groundwater flooding from the bedrock and superficial deposits. However, any emerging groundwater would flow overland following the local topography. Overland flow would therefore be conveyed in a south easterly direction to the low-lying area to the south east of the Site. Floodwater would accumulate within this area to a level of approximately 88.00m AOD before 'spilling' in a westerly direction, away from the Site, following local topography.
	<b>Sewers and Artificial Sources</b>	Flooding from any sewers within the A272 adjacent to the Site would flow overland following the local topography and propagate onto the Site. The resulting overland flow would follow the same mechanism of propagation as for emerging groundwater. Additionally, there are no other infrastructure likely to pose a flood risk at the Site.
<b>Planning Requirements</b>	<b>Sequential Test and Exception Test</b>	The Sequential Test and Exception Test are deemed to have been passed as the Site is within Flood Zone 1 and the proposed development has been classified as Less Vulnerable, appropriate in Flood Zone 1.
<b>Summary</b>	<b>Design Flood Event</b>	The design flood event (DFE) is the defended 1 % AEP fluvial event. A climate change allowance has been considered for peak rainfall intensity (20%) at the Site with no anticipated adverse impact. No mitigation is required.
	<b>Development Levels/ Layout</b>	Finished floor levels should ideally be at least 150mm above external hardstanding areas to prevent progression of water into the infrastructure. It is proposed that all elements of the proposed development be either located outside the surface water flood risk area or, where this is not possible, be protected from flooding (e.g. by land raising, elevated infrastructure or bunding). These mitigations have been incorporated in the scheme.
	<b>Safe Access and Egress</b>	Mitigation not required.
	<b>Floodplain Compensation</b>	Mitigation not required.
	<b>Surface Water Drainage Strategy</b>	Infiltration testing has been undertaken to confirm the viability of a discharge to ground. The testing confirmed that infiltration is viable as the primary mean of discharge surface water runoff resulting from the proposed development. In line with best practice, Sustainable Drainage Systems (SuDS) in the form of bioretention systems, have been incorporated to control offsite discharge of runoff, provide water treatment and, where possible, biodiversity and amenity enhancement. Attenuation storage required will be provided within below ground crate systems and, to a lesser degree, the bioretention systems.
	<b>Residual Risk</b>	Exceedance flood events in excess of the design standard have been considered in the development layout which mimic existing flow paths.
	<b>Conclusion</b>	This Flood Risk Assessment and Surface Water Drainage Strategy concludes that the requirements of national, county, and local planning policy can be achieved at the Site given the nature of development proposed.

## 1.0 INTRODUCTION

### 1.1 Terms of Reference

In February 2022, SLR Consulting Limited (SLR) was appointed by Acorn Bioenergy Ltd (the applicant) to prepare a Flood Risk Assessment (FRA) and Surface Water Drainage Strategy (SWDS) to support a planning application for the proposed Anaerobic Digestion (AD) facility at Three Maids Hill, Winchester, SO21 2QG (the 'Site').

This FRA and SWDS have been prepared by SLR, under the direction of a Technical Director for Hydrology at SLR who specialises in flood risk and associated planning matters. Reporting has been completed in accordance with guidance presented within the National Planning Policy Framework<sup>1</sup> (NPPF) and its associated Planning Practice Guidance<sup>2</sup> (PPG), taking due account of current best practice documents relating to assessment of flood risk published by the British Standards Institution BS8533<sup>3</sup>.

### 1.2 Administrative Context

The proposed development falls completely within the planning jurisdiction of Winchester City Council and Hampshire County Council who act as the Lead Local Flood Authority (LLFA) for the area.

### 1.3 Site Location

The Site is centred on National Grid Reference (NGR) 446069, 133921, some 1.5km north of the outskirts of Winchester. A site location plan is provided as **Figure 1-1**.

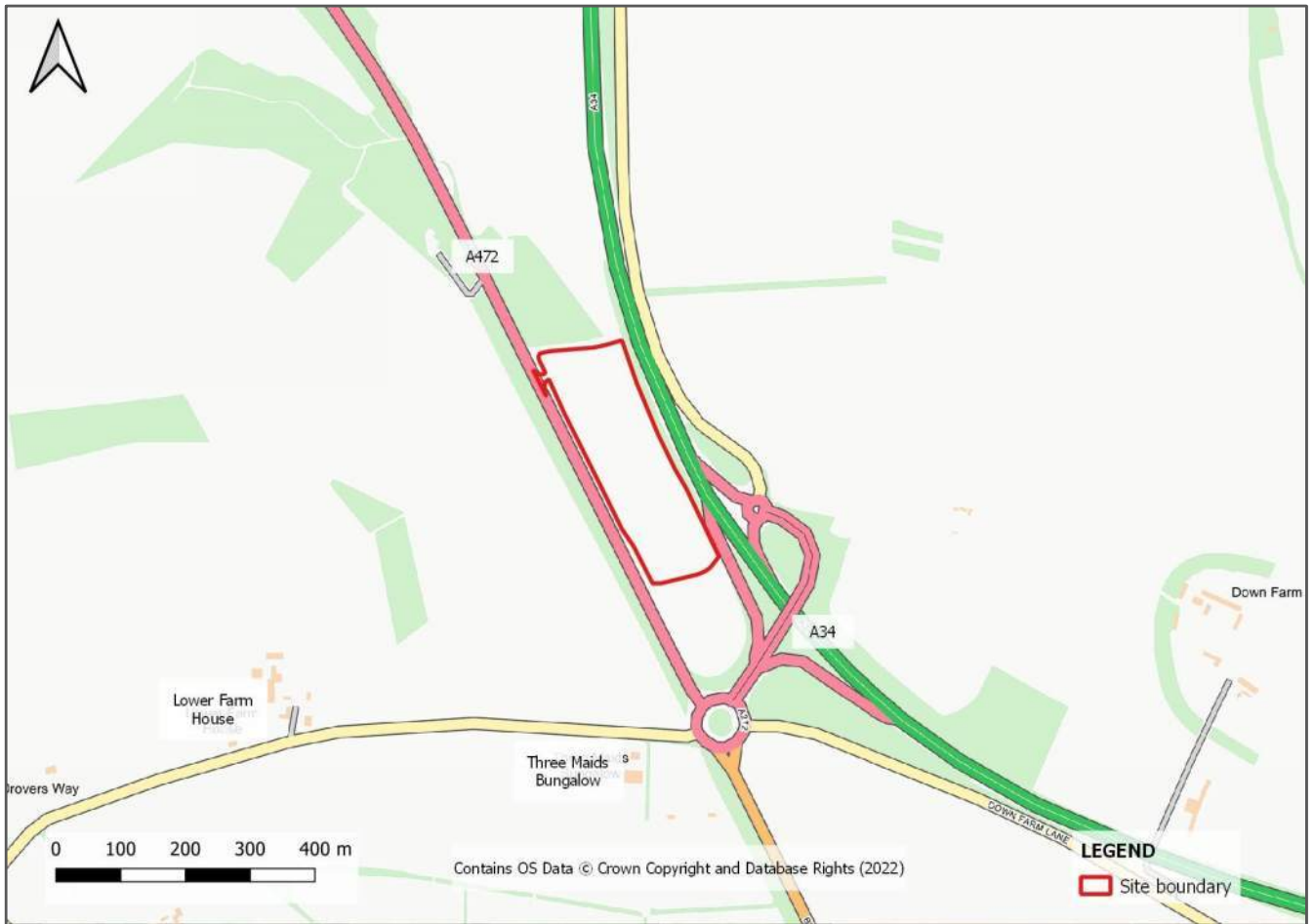
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1 National Planning Policy Framework: Communities and Local Government (Updated July 2021)

2 Planning Practice Guidance: Communities and Local Government (Updated June 2021)

3 BS8533:2017, Assessing and managing flood risk in development: Code of Practice (December 2017)

**Figure 1-1**  
**Site Location Plan**

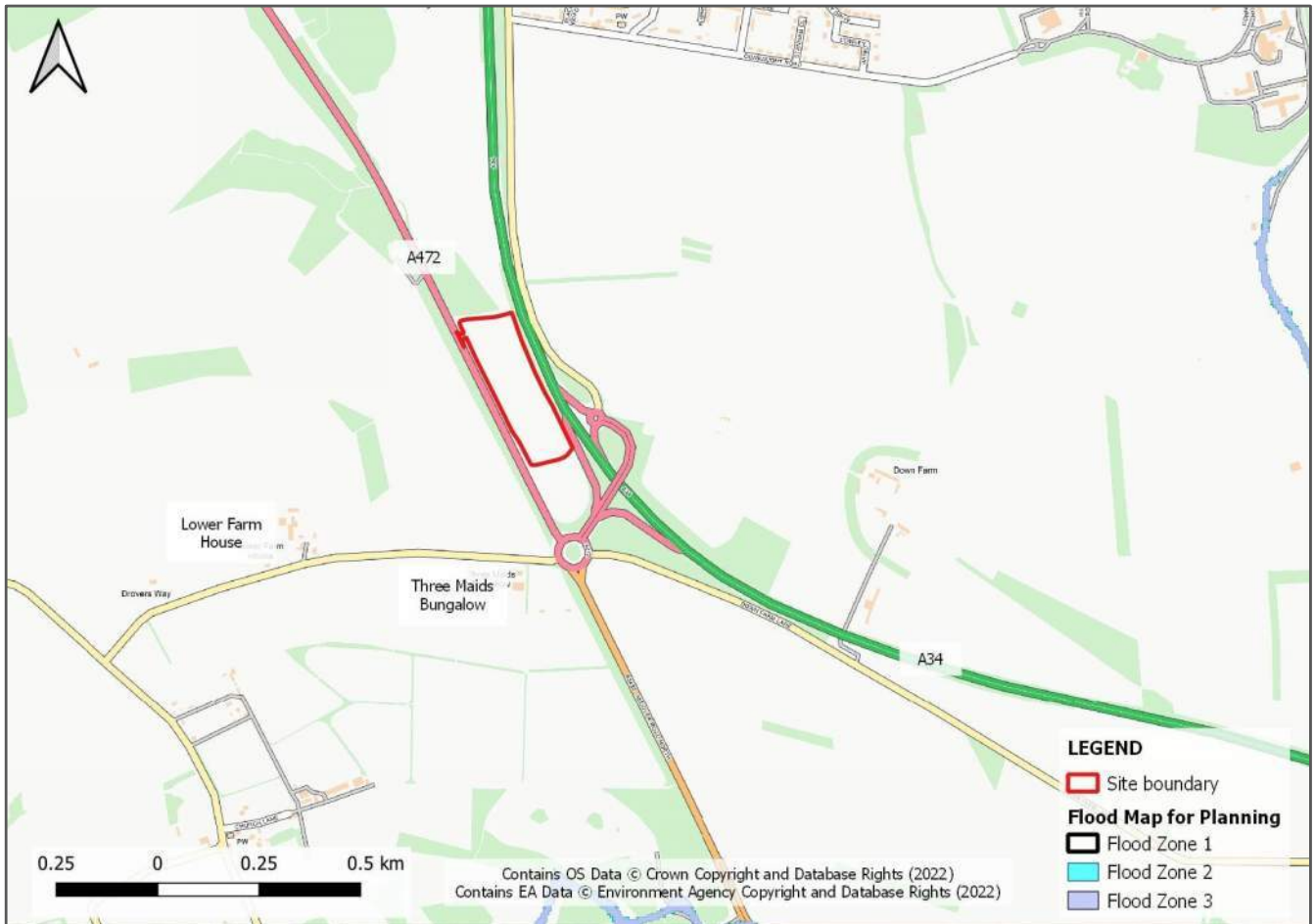


## 1.4 Background and Aims

With reference to the *Flood Map for Planning (Rivers and Sea)*<sup>4</sup> the Site does not lie within an area considered to be at risk of fluvial or tidal flooding. An extract of the Flood Map for Planning is provided by **Figure 1-2**.

4 Government Digital Service (Accessed on 4 February 2022) <https://flood-map-for-planning.service.gov.uk/>

**Figure 1-2**  
**Extract of the Flood Map for Planning**



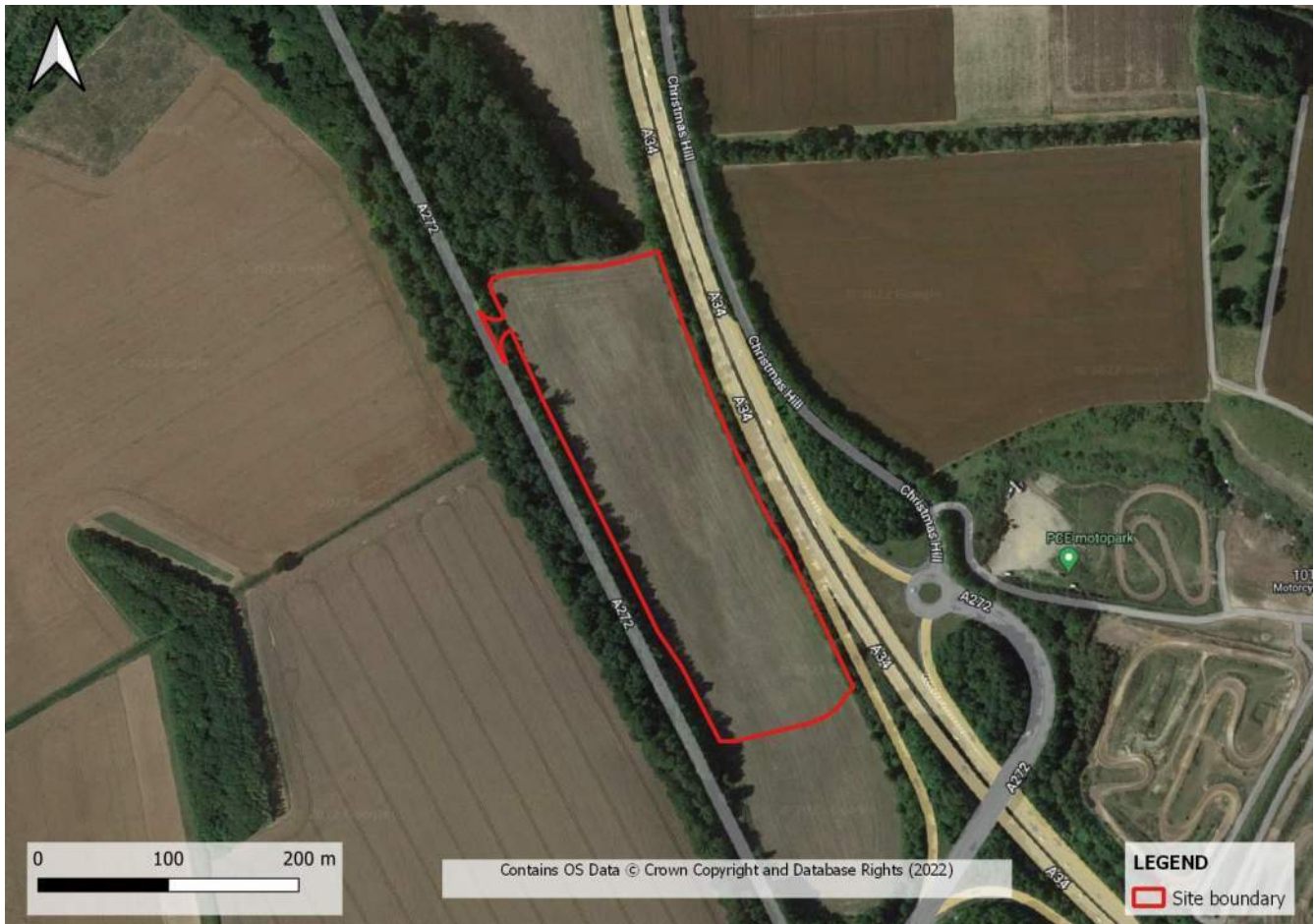
However, as the Site covers an area greater than 1 hectare (ha), with reference to footnote 55 of the National Planning Policy Framework (NPPF), any planning application for development at the Site needs to be accompanied by a site-specific FRA.

## 2.0 SITE DETAILS

### 2.1 Existing Site Description

A site visit was undertaken by an experienced hydrologist on 10<sup>th</sup> June 2022 that confirmed the Site is currently arable land and is bound to the west and east by the A272 and A34 respectively; refer to **Figure 2-1**.

**Figure 2-1**  
Satellite Imagery of the Site



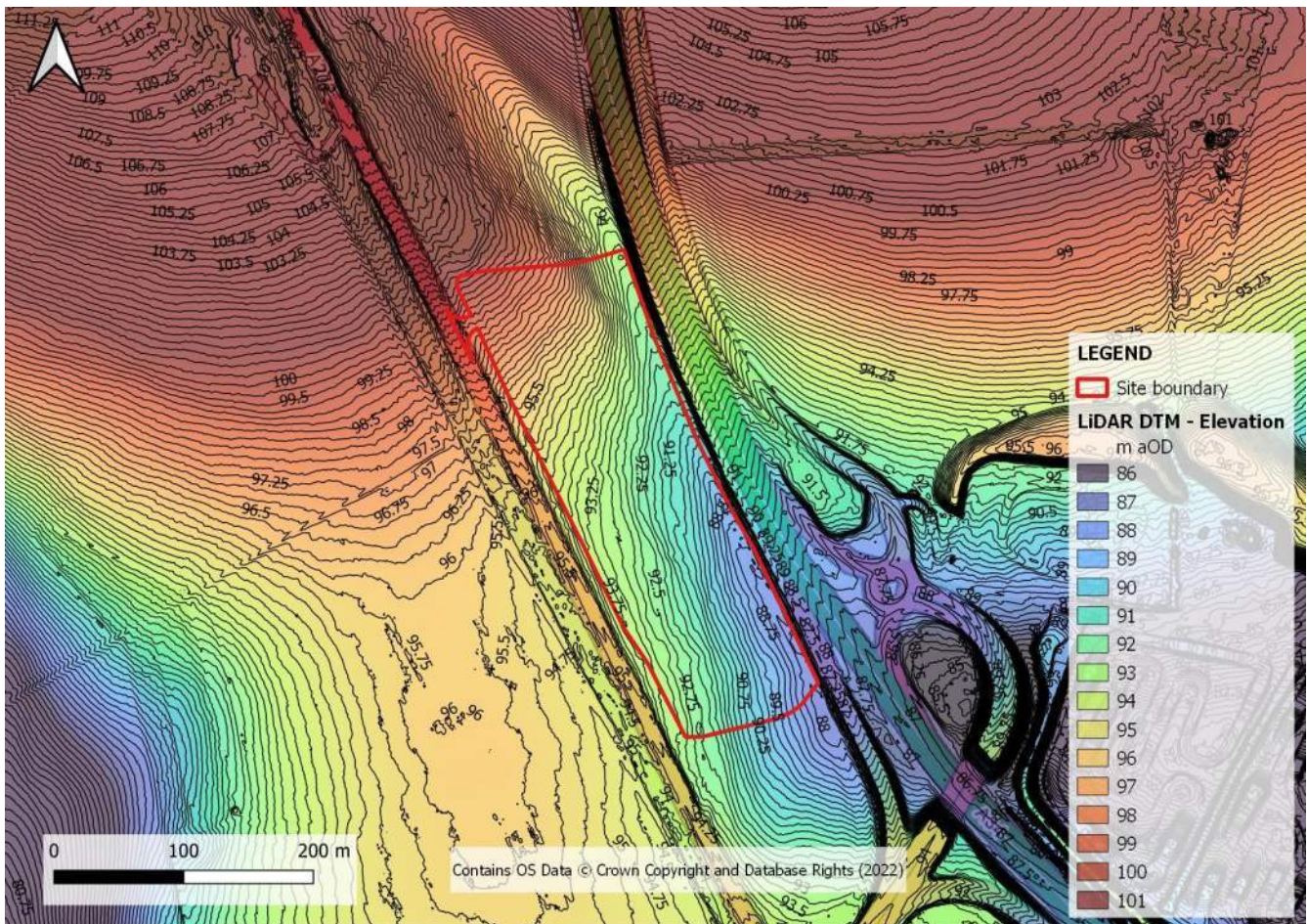
### 2.2 Topography

Topographic data for the Site was provided by Parish Land Surveys with the wider locality provided by 1m resolution Light Detection and Ranging (LiDAR) aerial photogrammetric data, downloaded from the Environment Agency open data website<sup>5</sup>.

This data has been used to generate contours, as shown on **Figure 2-2**, which indicate that the Site generally falls in a general south easterly direction from an elevation of approximately 101.00m Above Ordnance Datum (AOD) in the north west corner to 87.75m AOD in the south east corner.

5 Environment Agency open data website (Accessed on 4 February 2022) <https://environment.data.gov.uk/>

Figure 2-2  
Topographic Contours of the Site



## 2.3 Geological and Hydrogeological Context

### 2.3.1 Geology

Published British Geological Survey (BGS) online geology maps<sup>6</sup> indicate that the bedrock geology across a significant part of the Site consists of the *Seaford Chalk Formation – Chalk with Stockbridge Rock Member – Limestone* within the eastern part of the Site.

Superficial deposits of *Head – Clay, silt, sand and gravel* is shown to be present within the north east part of the Site.

Soil composition<sup>7</sup> across the Site is described as '*shallow lime-rich soils over chalk or limestone*'.

Ground investigation was undertaken on the Site with the excavation of two trial pits for infiltration testing. Geological descriptions were taken for both trial pits which are provided in **Appendix 01**. Clay was present in the upper 0-0.5m of the trial pits underlain by chalk.

6 British Geological Survey, Geindex (Accessed on 4 February 2022) <http://mapapps.bgs.ac.uk/geologyofbritain3d/>

7 Soilscales, Cranfield Soil and Agrifood Institute, Cranfield University, DEFRA, (Accessed on 4 February 2022) <http://www.landis.org.uk/soilscales/>

### 2.3.2 Hydrogeology

Review of the online MAGIC mapping<sup>8</sup> indicates that the *Seaford Chalk Formation* and *Stockbridge Rock Member* are designated as *Principal* aquifers which are ‘*layers of rock or drift deposits that have high intergranular and/or fracture permeability – meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifers*’.

However, the superficial deposits are designated as a *Secondary (undifferentiated)* aquifer which is ‘*assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type*’.

Groundwater vulnerability across the Site is therefore designated as *Medium to High*<sup>8</sup>.

The Site does not lie within a groundwater Source Protection Zone (SPZ).

### 2.3.3 Infiltration Testing

Infiltration testing was carried out on 29 April 2022 with one test undertaken in each of the two pits. The locations of the trial pits are provided in **Appendix 01**, with the results of the testing summarised in **Table 2-1** and details included in **Appendix 01**. This confirms that the infiltration of surface water flows to ground would be viable at the Site.

**Table 2-1**  
**Infiltration Testing Results**

Test	TP01	TP02
1	$2.03 \times 10^{-5} \text{ ms}^{-1}$	$3.67 \times 10^{-4} \text{ ms}^{-1}$

## 2.4 Hydrological Context

### 2.4.1 Local Hydrology

With reference to the Ordnance Survey 1:25,000 scale mapping, there are no water bodies shown within or along the boundary of the Site. However, during the site visit a small surface water ditch was evident adjacent to the eastern boundary of the Site.

### 2.4.2 Existing Site Drainage

As discussed at Section 2.1, the Site is currently undeveloped and is not therefore expected to be served by a formal drainage system. Incident rainfall is therefore expected to ‘drain’ via a combination of evaporation, transpiration and infiltration into the underlying strata.

8 Magic Map, DEFRA (Accessed on 4 February 2022) <https://magic.defra.gov.uk/MagicMap.aspx>

## 3.0 DEVELOPMENT PROPOSAL

### 3.1 Proposed Development Summary

The proposed development would consist of approximately 3.5ha of impermeable hardstanding located on farmland some 1.5km north of the outskirts of Winchester. The Site would be accessed directly off the A272.

The proposed development would accept in the region of 83,600 tonnes per annum of feedstock from local farms. The feedstock material would undergo a process of controlled decomposition (anaerobic digestion) within the proposed facility. The process produces biogas which is then upgraded to biomethane before being transported by tanker to a central gas injection point. Rainwater would be collected on site for use in the process.

The AD facility would have the capacity to produce approximately 19,864,000Nm<sup>3</sup> of biogas per annum; this results in approximately 9,753,000Nm<sup>3</sup> of upgraded biomethane.

The gas upgrading process would also result in the production of CO<sub>2</sub> as a natural by-product. The AD plant will be fitted with the equipment required to capture the clean CO<sub>2</sub> to a food grade level standard; which makes it suitable for almost all industrial and commercial applications in the UK.

The proposed development layout has been considered in detail and designed sequentially so that potentially vulnerable equipment has been afforded the appropriate protection for operational purposes.

Details of the proposed development layout is enclosed at **Appendix 02**.

### 3.2 Anticipated Lifetime of Development

The proposed AD plant has an anticipated operational lifespan of 25 years. A 25-year operational period is therefore assumed for this application.

### 3.3 Flood Risk Vulnerability

With reference to *Table 2: Flood risk vulnerability classification* at PPG Paragraph 066, 'waste treatment' are classified as 'Less Vulnerable'.

### 3.4 Planning Context

#### 3.4.1 National Planning Policy

This FRA report has been completed in accordance with the guidance presented in the NPPF<sup>1</sup> and with reference to PPG<sup>2</sup>. The NPPF states that Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) and develop policies to manage flood risk from all sources taking account of advice from the Environment Agency. It is crucial that Local Planning Authorities consider the risks posed by flooding within their boundary when determining planning applications.

#### 3.4.2 County Planning Policy

In addition to national planning policy and associated guidance, Hampshire County Council, as the LLFA for the area, have produced a Local Flood Water Management Strategy<sup>9</sup> (LFWMS) which sets out 'how local flood risks will be managed in the county' and sets out their 'approach in the form of a vision, a set of seven principles and tailored policies' in relation to flood risk.

<sup>9</sup> Hampshire County Council, October 2020. Local Flood Water Management Strategy (Accessed on 17 August 2022 at <https://documents.hants.gov.uk/flood-water-management/local-flood-water-management-strategy.pdf>)



Policy 4 of the LFWMS reads ‘To ensure successful and sustainable growth Hampshire County Council will support the planning process by encouraging resilient development.’ Under this policy Hampshire County Council describe their approach to advising on drainage systems in new developments:

- *Promoting and encouraging the use of surface water SuDS techniques above the use of underground pipes or storage.*
- *Ensuring that post development run off rates and volumes are equal to or less than pre-development amounts.*
- *Ensuring sufficient attenuation of surface water flood water, up to a 1 in 100-year event plus the appropriate extra percentage for expected climate change is provided.*
- *Ensuring that the drainage system consider the required water quality and is designed appropriately for the development use and the associated discharge point, including the wider sensitivity of those locations.*
- *Ensuring Local Planning Authorities are aware of historic flood events in the area including surface water and groundwater events*
- *Ensuring that responsibility and processes for ongoing maintenance of SuDS are considered in the planning process*

A Surface Water Checklist Guidance document has been produced to advise developers and applicants and define the information Hampshire County Council requires to assess planning applications in relation to Surface Water Drainage. It has been developed with reference to the National Planning Policy Guidance as well as utilising best practice information as set out in the Non Statutory Technical Guidance and CIRIA SuDS Manual (C753).

Hampshire County Council has created a check list for developers in order to assist them in providing the correct information in regard to surface water management and signposting where to find it. Please complete this check list and include with your Flood Risk Assessment when applying to your Local Planning Authority for planning permission.

### 3.4.3 Local Planning Policy

The Site is located within the Winchester City Council planning jurisdiction, for which guidance to development is provided within the Winchester District Local Plan Par 1 Joint Core Strategy Adopted March 2013. The policy below relates to the assessment of flood risk at the proposed development.

#### **Policy CP17 – Flooding, Flood Risk and the Water Environment**

*‘The Local Planning Authority will support development which meets all the following criteria:-*

- *avoids flood risk to people and property by:-*
  - *applying a Sequential Test to the location, and the Exception Test if required, and applying the sequential approach at the site level<sup>10</sup>;*
  - *managing flood risk from new development to ensure risk is not increased elsewhere and that opportunities to reduce the causes and impacts of flooding within the District through development are taken;*
  - *safeguarding land and designated structures and features from development that is required for current and future flood management;*

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10 As set out in the National Planning Policy Framework

- *including sustainable water management systems such as Sustainable Drainage Systems (SuDS) which should be designed to meet the relevant standards so as to gain approval by the SuDS Approval Body;*
- *does not cause unacceptable deterioration to water quality or have an unacceptable impact on water quantity (including drinking water supplies) by:-*
  - *protecting surface water and groundwater through suitable pollution prevention measures;*
  - *using opportunities to improve water quality where possible;*
  - *optimising water efficiency;*
- *is located at a sufficient distance from existing wastewater treatment works to allow adequate odour dispersion, or takes appropriate odour control measures;*
- *ensures that water supply, surface water drainage and wastewater infrastructure to service new development are provided and connect to the nearest point of adequate capacity.*

*The Local Planning Authority will support the development or expansion of water supply, surface water drainage and wastewater treatment facilities where they are needed to serve existing or new development or in the interests of securing long term supply, provided that the need for such facilities is consistent with other policies such as the development strategy, flood risk, contamination and protection of the natural and built environment.'*

The national and local policies relating to the management of flood risk, including the design of a sustainable surface water drainage strategy, for the Site have been considered in the following Sections of this FRA.

## 4.0 ASSESSMENT OF FLOOD RISK

This report has been prepared in accordance with the advice and requirements prescribed in current best practice documents relating to management of flood risk in development published by the Construction Industry Research and Information Association (CIRIA)<sup>11</sup> and BS85333<sup>3</sup>.

A screening study has been completed to identify whether there are any potential sources of flooding at the Site which may warrant further consideration. If required any potential flooding issues identified in the screening study would then be considered in subsequent sections of the assessment.

### 4.1 Potential sources of flooding

There are a number of potential sources of flooding and these include:

- Flooding from rivers or fluvial flooding;
- Flooding from the sea or tidal flooding;
- Flooding from surface water or pluvial flooding;
- Flooding from groundwater;
- Flooding from sewers;
- Flooding from reservoirs, canals, and other artificial sources; and
- Flooding from infrastructure failure.

The flood risk from each of these potential sources is discussed below.

#### 4.1.1 Flooding from Rivers or Fluvial Flooding

With reference to the *Flood Map for Planning (Rivers and Sea)*<sup>4</sup>, the Site lies within an area having less than 0.1% Annual Exceedance Probability (AEP) of flooding from this source.

The flood risk from this source is therefore low and is not considered further.

#### 4.1.2 Flooding from Sea or Tidal Flooding

The Site is located in excess of 20km away from the coast and is elevated to levels above 87.75m AOD a discussed at Section 2.2.

The flood risk from this source is therefore negligible and is not considered further.

#### 4.1.3 Flooding from Surface Water or Pluvial Flooding

An extract from the *Long Term Flood Risk Information*<sup>12</sup> mapping showing areas potentially at risk of flooding from surface water has been provided as Figure 4–1.

The surface water flood risk categories are defined as:

- **Very Low:** less than 1 in 1,000 (0.1% AEP) chance of flooding in any given year;
- **Low:** less than 1 in 100 (1% AEP) but greater than or equal to 1 in 1,000 (0.1% AEP) chance of flooding in any given year;

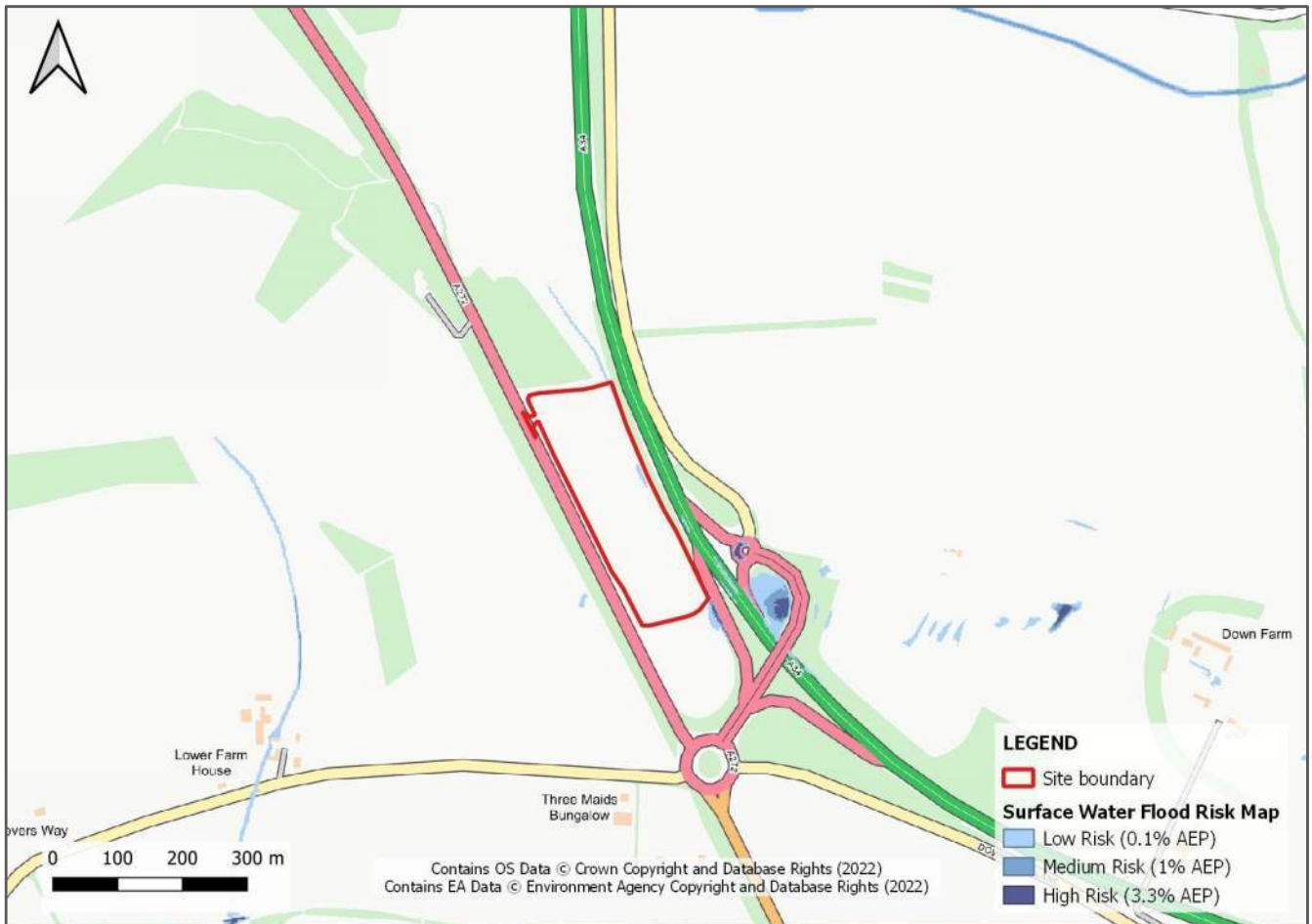
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11 CIRIA Report C624, Development and flood risk: guidance for the construction industry

12 Long Term Flood Risk, Government Digital Service (Accessed on 4 February 2022)  
<https://flood-warning-information.service.gov.uk/longterm-flood-risk/>

- **Medium:** between 1 in 100 (1% AEP) and 1 in 30 (3.3% AEP) chance of flooding in any given year; and
- **High:** greater than 1 in 30 (3.3% AEP) chance of flooding in any given year.

**Figure 4-1**  
**Environment Agency Surface Water Flood Risk**



**Figure 4-1** identifies the Site to be predominantly at *very low* risk of flooding from surface water with the exception of localised areas along the eastern boundary of the Site which are at *medium to low* risk of flooding from this source. However, a review of the LiDAR aerial photogrammetric data does not show any low lying area along the eastern boundary of the Site which would result in the flooding shown. This was confirmed with the Site topographic survey data.

It is proposed that all elements of the development be located away from the surface water flooding shown in the south east corner of the Site. The flood risk to the proposed development is therefore *very low*.

Additionally, the SWDS has been developed to prevent pooling by providing sufficient water drainage features. The flood risk from this source is therefore negligible and is not considered further.

#### 4.1.4 Flooding from Groundwater

Groundwater flooding can occur where sites are located on permeable ground, particularly where there are significant variations in local topography and geology. After a prolonged period of rainfall and groundwater recharge, a considerable rise in the water table can result in this intersecting the ground surface, resulting in

flooding. Due to the slow response of groundwater systems any resulting flows and inundation could persist for an extended period of time.

As discussed in Section 2.3.2, the *Seaford Chalk Formation* and *Stockbridge Rock Member* are designated as *Principal* aquifers and the superficial deposits of *Head* are designated as a *Secondary (undifferentiated)* aquifer. The geology underlying the Site therefore has the potential to allow groundwater to rise. However, any groundwater emerging about ground is expected to be conveyed as overland flow and follow the local topography.

A review of the LiDAR aerial photogrammetric data indicates a 'valley' feature adjacent to the eastern boundary of the Site. Overland flow would therefore be conveyed in a south easterly direction along the 'valley' feature, to the low-lying area to the south east of the Site. Floodwater would accumulate within this area to a level of approximately 88.00m AOD. Beyond this elevation, floodwater would 'spill' in a westerly direction, away from the Site, following local topography.

The flood risk from this source is therefore low and is not considered further.

#### 4.1.5 Flooding from Sewers

The Site is currently arable land and is therefore not anticipated to be served by any sewers.

It is possible that public sewers could be present within the A272. With reference to the LiDAR aerial photogrammetric data, the A272 is elevated relative to the Site. Any potential surcharged flows from sewer(s) within the A272 could propagate across the Site.

However, the resulting overland flow would follow the same mechanism of propagation as for emerging groundwater described at Section 4.1.4 and not cause notable flooding at the Site.

The flood risk from this source is therefore low and is not considered further.

#### 4.1.6 Flooding from Reservoirs, Canals and other Artificial Sources

Based upon *Long Term Flood Risk Information*<sup>12</sup> mapping, the Site lies outside an area denoted as being at risk of flooding from a breach (failure) of a raised reservoir embankment.

Also, with reference to 1:25000 scale OS Mapping, there are no canals or other artificial sources located upgradient of the Site.

The flood risk from this source is therefore non-existent and is not considered further.

#### 4.1.7 Flooding from Infrastructure Failure

With reference to 1:25000 scale OS Mapping, the Site is not located near to any hydrological infrastructure of which failure would increase the flood risk.

The flood risk from this source is therefore non-existent and is not considered further.

## 4.2 Flood Risk Summary

A summary of the potential sources of flooding and the flood risk arising from them is presented in **Table 4-1**.

**Table 4-1**  
**Potential Sources of Flooding**

Potential Source of flooding	Significant Flood Risk at the Site (Y/N)
Rivers or Fluvial Flooding	N
Sea or Tidal Flooding	N
Surface Water or Pluvial Flooding	N
Groundwater	N
Sewers	N
Reservoirs, Canals and other Artificial Sources	N
Infrastructure Failure	N

### 4.3 Flood Zone

The definition of flood zones is provided by *Table 1: Flood zones* at PPG Paragraph 065 and is summarised below:

- *Zone 1 - low probability* (Flood Zone 1). Land having a less than 1 in 1,000 annual probability of river or sea flooding.
- *Zone 2 - medium probability* (Flood Zone 2) Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
- *Zone 3a - high probability* (Flood Zone 3a) Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.
- *Zone 3b - the functional floodplain* (Flood Zone 3b) This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency.

Based on the screening study, the entire Site lies within Flood Zone 1.

## 5.0 POLICY STATUS FOR PROPOSED DEVELOPMENT

### 5.1 Flood Risk Compatibility

As discussed at Section 3.1, the proposed development is classified as a Less Vulnerable use and, with reference to Section 4.3, the Site has been assessed as being within Flood Zone 1.

Therefore, with reference to *Table 3: Flood risk vulnerability and flood zone 'compatibility'* at PPG Paragraph 067 (reproduced as **Table 5-1**), the proposed development would be considered an 'appropriate' form of development.

**Table 5-1**  
**Flood Risk Vulnerability and Flood Zone 'Compatibility'**

Flood Risk Vulnerability Classification (PPG Table 2)		Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone (PPG Table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	Exception Test Required	✓	✓	✓
	Zone 3a	Exception Test Required	x	Exception Test Required	✓	✓
	Zone 3b (functional floodplain)	Exception Test Required	x	x	x	✓

Key:                    ✓ Development is appropriate                    x Development should not be permitted

### 5.2 Sequential Test

NPPF Paragraph 162 advises that the aim the Sequential Test is to 'steer new development to areas with the lowest risk of flooding from any source'. Furthermore, it states:

*'Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding.'*

The *Flood Map for Planning (Rivers and Sea)*<sup>4</sup> (**Figure 1-2**) and the local SFRA provide the basis for applying this test. As discussed at Section 4.3, the Site is located entirely within Flood Zone 1 (i.e., has the lowest risk of flooding) and is situated on a slight downslope, allowing surface water to readily drain off the Site. It has therefore been deemed that the Sequential Test has been passed.

### 5.3 Exception Test

The Exception Test is required to show that the sustainability benefits of the proposed development to the community outweigh the flood risk. The sustainability benefits of the development are considered fully elsewhere in the planning application however, renewable energy generation is clearly a key element in reducing

carbon emissions. The Exception Test also must show that the development will be safe for its lifetime and will not increase the flood risk elsewhere.

As discussed at Section 3.3, PPG identified that the *Less Vulnerable* located within Flood Zone 1 is not required to pass the Exception Test as the development is already deemed appropriate.



## 6.0 CLIMATE CHANGE

In July 2021 the Environment Agency issued updated guidance on the impacts of climate change<sup>13</sup> on flood risk in the UK to support NPPF. This advice sets out that peak rainfall intensity, sea level, peak river flow, offshore wind speed and extreme wave heights are all expected to increase in the future as a result of climate change.

The guidance acknowledges that in relation to certain factors there is considerable uncertainty with respect to the absolute level of change that is likely to occur. As such, in these instances, the guidance provides estimates of possible changes that reflect a range of different emission scenarios.

PPG recommends that considerations for future climate change are included in FRAs for proposed developments. The consideration of climate change for this Site considers the possible changes in peak river flows and peak rainfall intensity.

Concerns relating to offshore wind speed, wave height and sea level are only of relevance in contexts that are in direct proximity to the open coast or other large open bodies of water. This is not the case for this Site and, therefore, potential changes in these are not considered further.

### 6.1 Peak River Flow & Sea Level Allowances

An extract of the Environment Agency's *Climate change allowances for peak river flow in England* map is reproduced in **Table 6-1** for the *Test and Itchen Management Catchment*.

**Table 6-1**  
**Peak River Flow Climate Change Allowances in the Test and Itchen Management Catchment (1981-2000 baseline)**

Management Catchment	Allowance Category	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2125)
Test and Itchen	Upper End	45%	61%	127%
	Higher Central	24%	28%	56%
	Central	16%	17%	35%

The Environment Agency advises that for Less Vulnerable uses in Flood Zone 2 and 3a within the Test and Itchen Management Catchment, the *Higher Central* allowance category should be applied to assess the impact of climate change on fluvial flood risk.

While the Site lies entirely within Flood Zone 1, the peak river flow allowances should still be applied to understand the impact of the climate change on the flood risk at the Site over the 25-year lifetime of development (to 2047). As such, and as a conservative approach, a *Higher Central* allowance of 28% has been assessed.

With reference to Section 4.3, the 1% AEP flood extent defines Flood Zone 3. With reference to the *Flood Map for Planning (Rivers and Sea)*<sup>4</sup>, the closest Flood Zone 3 is located some 950m to the south of the Site.

<sup>13</sup> Environment Agency, February 2016 (updated October 2021). Flood risk assessments: climate change allowances (Accessed on May 2022 at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>)

Comparison of this flood extent against the LiDAR aerial photogrammetric data indicates a 1% AEP flood level of approximately 57.25m AOD.

The *Flood Map for Planning (Rivers and Sea)* also generally shows little increase between the 1% AEP (Flood Zone 3) and the 0.1% (Flood Zone 2) flood levels.

As discussed at Section 2.2, the minimum ground elevation at the Site is approximately 87.75m AOD, some 30.50m above the 1% AEP flood level.

A 28% uplift to the 1% AEP peak fluvial flow is not therefore expected to result in an increase in the 1% AEP flood level greater than 30.50m and it is therefore expected that the Site would remain dry when accounting for the impact of climate change on the 1% AEP fluvial flood level.

## 6.2 Peak Rainfall Intensity Allowance

The most recent advice on climate change is provided by the Environment Agency<sup>14</sup>. An extract of *Combined Test and Itchen Management Catchment peak rainfall allowances* is reproduced as **Table 6-2**.

**Table 6-2**  
**Peak River Rainfall Climate Change Allowances in the Test and Itchen Management Catchment**

Management Catchment	Annual Exceedance Probability (%)	Allowance Category	Total potential change anticipated for the 2050s	Total potential change anticipated for the 2070s
Test and Itchen	3.3	Upper End	35%	40%
		Central	20%	25%
	1	Upper End	40%	45%
		Central	20%	25%

As discussed at Section 3.2, the proposed AD facility has an anticipated operational lifespan of 25 years (to 2047). The Environment Agency recommends that flood risk assessments for developments with a lifetime up to 2060, the central allowance for the 2050s epoch should be assessed. As detailed in **Table 6-2**, this equates to a 20% uplift.

<sup>14</sup> Environment Agency, February 2016 (updated May 2022). Flood risk assessments: climate change allowances (Accessed on 17 August 2022 at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>)

## 7.0 DRAINAGE PHILOSOPHY

### 7.1 Summary

The AD facility would capture as much rainwater as possible for use in the process. Based on annual average estimates, rainwater capture is expected to be sufficient for up to 100% of the process water demand.

Two primary drainage systems would be adopted, for the clean (surface water runoff) and contaminated (foul) water systems.

In accordance with Hampshire County Council Sustainable Drainage Systems (SuDS)<sup>15</sup> and Surface Water Checklist Guidance<sup>16</sup> documents, the Site has been designed to manage all flows up to and including the 1% AEP event plus an allowance for climate change (20% as discussed at Section 6.2), considered as the Design Flood Event (DFE).

Accordingly, the Site has been designed to have a clean lagoon (below ground crate system) to capture surface water runoff via a bioretention system. However, the invert level of this lagoon will be designed such as to ensure that sufficient capacity remains for the DFE, to allow for flood management.

Such an arrangement (which depends on management controls) would need to be agreed with the LLFA (planning) and Environment Agency (environmental permitting).

#### 7.1.1 Contaminated Water

Contaminated runoff, caused by silage residue, from the silage clamps and sections of hardstanding area will be collected through a series of drainage channels, pipes, and chambers and be brought into a below ground holding tank. From this tank, runoff will be pumped to three 400m<sup>3</sup> holding tanks within the containment bund where it will be reused within the process.

The process has a yearly demand of 62,000m<sup>3</sup>, equating to 2ls<sup>-1</sup> continuous flow. This offers a sustainable drainage system, compliant with the hierarchy.

The AD Plant Dirty Water Usage Strategy is outlined in **Appendix 03**.

#### 7.1.2 Clean Water

Surface water runoff will be collected from the remaining Site area, comprising building roofs and sections of hardstanding, and conveyed to the below ground crate system, via a bioretention system, using a network of ACO drains and underground pipes. It is anticipated that petrochemicals will be present within the surface water runoff from the hardstanding areas, which will be separated and removed through a full retention petrol interceptor.

Runoff will then be discharged to ground through the base of the bioretention and below ground crate systems.

The runoff from the containment bunds has the potential to become contaminated through process residue. This will be collected through a channel drain and discharged into a pump chamber where it will be sampled and pumped to the bioretention system (if clean) or reused in the process (if contaminated).

The SWDS is outlined at Section 8.0.

15 Hampshire County Council, June 2018. Sustainable Drainage Systems (SuDS) (Accessed on 17 August 2022 at <https://documents.hants.gov.uk/flood-water-management/SuDSLeafletJune2018v20.pdf>)

16 Hampshire County Council Surface Water Checklist Guidance document

## 8.0 SURFACE WATER DRAINAGE STRATEGY

### 8.1 Context

Without mitigation, the proposed development could lead to an increase in the rate and volume of surface water runoff generated due to the increase in impermeable coverage. To comply with current guidance and best practice, sustainable drainage systems (SuDS) are required to manage the quantum and quality of surface water runoff discharge off-Site.

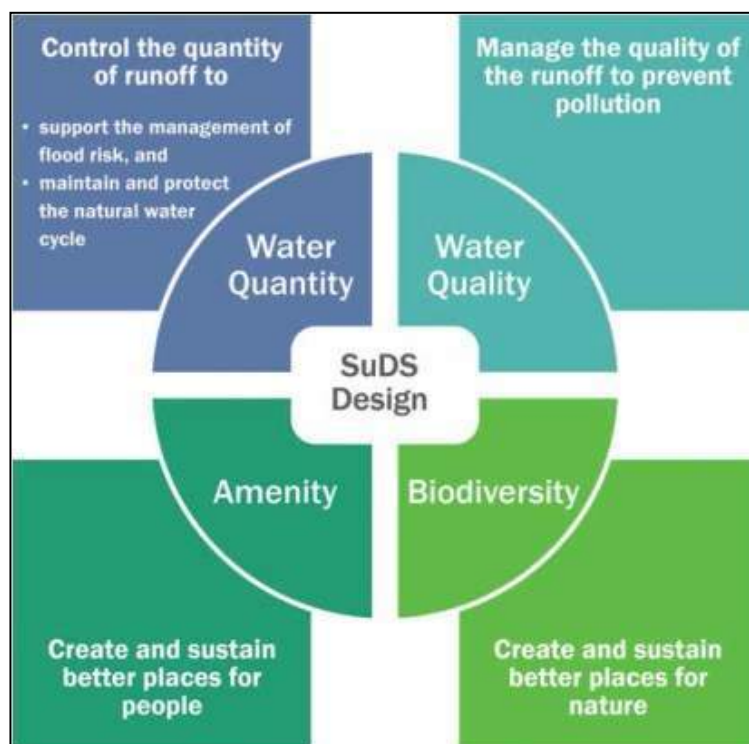
This SWDS sets out high level principles for managing storm water on the Site in line with best practice and has been produced in support of the planning application.

This Strategy is intended to demonstrate that, given the nature and quantum of development proposed, it is feasible to drain the Site in line with policy and best practice guidance.

### 8.2 Sustainable Drainage Systems

The current best practice guidance document, The SuDS Manual (CIRIA Report C753)<sup>17</sup>, promotes sustainable water management through the use of SuDS. There are four main categories of SuDS which are referred to as the ‘four pillars of SuDS’ as shown in **Figure 8-1**.

**Figure 8-1**  
**Four Pillars of SuDS (after CIRIA Report C753)**

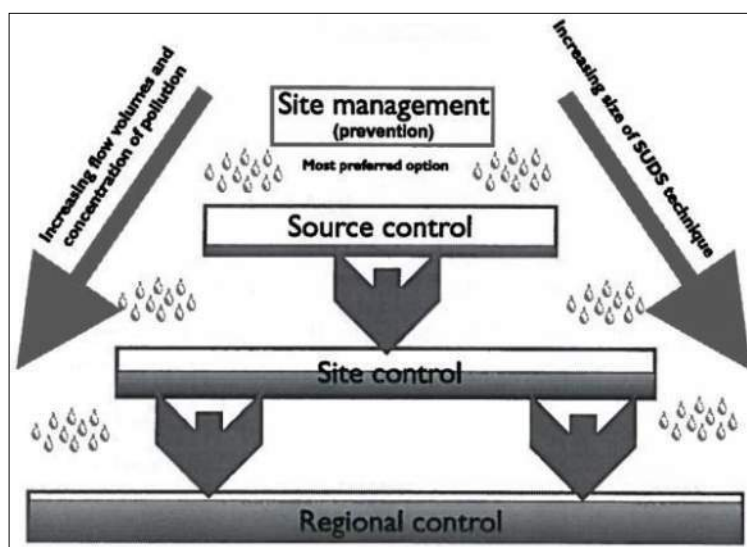


The SuDS Manual identifies a hierarchy of SuDS for managing runoff, which is commonly referred to as a ‘management train’ and is depicted in **Figure 8-2**:

<sup>17</sup> CIRIA (2015). Report C753, The SuDS Manual

- **Prevention** – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution (e.g. minimise areas of hard standing).
- **Source Control** – control of runoff at or very near its source (such as the use of rainwater harvesting).
- **Site Control** – management of water from several sub-catchments (including routing water from roofs and car parks to one/several large soakaways for the whole site).
- **Regional Control** – management of runoff from several sites, typically in a retention pond or wetland.

Figure 8-2  
SuDS Management Train



It is generally accepted that the implementation of SuDS, as opposed to conventional drainage systems, provides several benefits by:

- Reducing peak flows to watercourses or sewers and potentially reducing the risk of flooding downstream;
- Reducing the volumes and frequency of water flowing directly to watercourses or sewers from developed sites;
- Improving water quality over conventional surface water sewers by removing pollutants from diffuse pollutant sources;
- Reducing potable water demand through rainwater harvesting;
- Improving amenity through the provision of public open spaces and wildlife habitat; and replicating natural drainage patterns, including the recharge of groundwater so that base flows are maintained.

### 8.3 Proposed Drained Area

It is proposed that all impermeable surfaces of the proposed development comprising roofs, external hardstanding operational area, parking area and access road, be positively drained. All other impermeable areas drain to the dirty water system.

Section 3.2.7 of The SuDS Manual recommends that the potential increase in the *'impermeability of the contributing catchment through the design life of the drainage system should (...) be taken into account.'*

Section 24.7.2 of The SuDS Manual defines urban creep as:

*‘any increase in impervious area that is drained to an existing drainage system without planning permission being required, and therefore without any consideration of whether the capacity of the receiving sewerage system can accommodate the increased flow.’*

The SuDS Manual recommends that an allowance of 10% is made in respect of urban creep. However, as the proposed development is non-residential, the application of urban creep does not apply.

The post-development land use is shown in **Drawing SW1** and shows a total area of 1.77ha as contributing to surface water runoff.

## 8.4 Proposed Discharge Arrangement

With reference to The SuDS Manual, the hierarchy of preferred disposal options for surface water runoff from development sites in decreasing order of sustainability is as follows:

1. Infiltration to Ground;
2. Discharge to Surface Waters; or
3. Discharge to Sewer.

**Table 8-1** summarises the suitability of disposal methods suitability in the context of the Site and the proposed development.

**Table 8-1**  
**Suitability of Surface Water Disposal Methods**

Surface Water Disposal Method (in Order of Preference)	Suitability Description	Method Suitable? (Y / N)
Infiltration to Ground	Infiltration testing to BRE 365 was conducted on Site on 29 April 2022, the results of which are enclosed at <b>Appendix 01</b> . As a conservative approach, the design will account for the lowest of the infiltration rates of the trial pits. The infiltration rate, therefore, has been estimated to be $2.03 \times 10^{-5} \text{ms}^{-1}$ (equivalent to $0.073 \text{mhr}^{-1}$ ).  Infiltration to ground is considered viable and has therefore been used as the means of discharge of surface water runoff resulting from the proposed development.	Y
Discharge to Surface Waters	As discussed at Section 2.4.1, there are no surface water features at or within close vicinity of the Site. However, as infiltration to ground is considered feasible, and is the preferred means of discharge, this method has not been considered further.	N
Discharge to Sewer	As infiltration to ground is considered feasible and is the preferred means of discharge, a discharge to sewer has not been considered.	N

## 8.5 Proposed Outline SuDS Strategy

It is proposed to manage surface water runoff from the proposed development via the following ‘Site Control’ as summarised in **Table 8-2**.

A plan of the proposed SWDS is included as **Drawing SW2**.

**Table 8-2**  
**Summary of Surface Water Management Strategy SuDS Options**

SuDS Management Train Mechanism	Application	Potential Suitable SuDS Features
Source Control	For the interception of surface water runoff at the source such as property buildings, car parking and internal access roads / pavements.	
Conveyance	To convey surface water runoff from 'Source Control' mechanisms to 'Site Control'.	
Site Control	Provides the required surface water attenuation / storage prior to controlled discharge to the water environment.	<ul style="list-style-type: none"> <li>• Bioretention System</li> </ul>

Due to the likelihood of contamination from the hardstanding and other open areas of the Site, it is recommended that SuDS source control and conveyance features are not adopted on the Site. It is therefore proposed that ACO drains are used to intercept and convey runoff across the Site. 'Site Control' in the form of a bioretention system is considered to be viable and a beneficial option (in terms of water quality enhancements) and has been integrated into this SWDS as discussed at Section 8.7.

### 8.5.1 Site Control

It is proposed that surface water runoff be managed as two catchments, namely a northern and southern catchment as shown on **Drawing SW1**.

For both catchments, ACO drains and underground pipes will intercept and convey surface water runoff a below ground crate system, via a bioretention system, located as shown on **Drawing SW2**.

The below ground crate and bioretention systems will be designed to promote infiltration to ground and provide the required attenuation without flooding during rainfall events up to an including the 1% AEP rainfall event inclusive of an allowance for climate change (+20%) (refer to Section 6.2).

## 8.6 Water Quantity Design Standard

### 8.6.1 Control of Runoff Volume

Section 3.3.1 of The SuDS Manual sets out volume control criteria for:

- Frequent rainfall events.
- Extreme rainfall events.

#### Frequent rainfall events

The SuDS Manual requires 'the prevention of runoff from the [Site] for the majority of small (frequent) rainfall events (or for the initial depth of rainfall for larger events)'. This is known as *Interception* and 'Inception of about 5mm is normally achievable.'

With reference to Section 24.8 of The SuDS Manual:

*'Inception can be delivered using one or a combination of process:*

- *Rainwater harvesting*
- *Infiltration*
- *Evapotranspiration using temporary shallow ponding or storage within the soil or upper aggregate layers.'*

As summarised within **Table 8-1**, the SWDS has been developed based on infiltration to ground. Interception is therefore provided.

### Extreme rainfall events

For extreme rainfall events, the drainage system should be designed such that *'the volume of runoff from the Site (or development) area [does] not exceed the volume of runoff from the equivalent area in its natural undeveloped or "greenfield" state'*.

As summarised within **Table 8-1**, it is proposed that surface water runoff resulting from the proposed development is discharged to ground. The SWDS is therefore designed such that there is no offsite discharge during rainfall events up to and including the 1% AEP rainfall event +20% as discussed at Section 8.8.

### 8.6.2 Control of Peak Rate of Runoff

Section 3.3.2 of The SuDS Manual sets out peak rate of runoff criteria for:

- Events likely to impact on morphology, ecology or capacity of the receiving surface waters, or the capacity of receiving sewers.
- Extreme events.

#### Events likely to impact on morphology, ecology or capacity of the receiving surface waters, or the capacity of receiving sewers

The SWDS has therefore been designed such that there is no offsite discharge during rainfall events up to and including the 1% AEP rainfall event +20% as discussed at Section 8.8.

Therefore, it is considered that the proposed development would have no significant impact on the *'morphology, ecology or capacity of the receiving surface waters'* by virtue of the rate or volume of surface water runoff.

#### Extreme events

In line with Section 3.3.2 of The SuDS Manual, the SWDS *'should be designed so that peak runoff rates for extreme rainfall events (...) are constrained to the greenfield rates of runoff for the same event.'*

As summarised within **Table 8-1**, it is proposed that surface water runoff resulting from the proposed development discharges to ground. To manage peak runoff rate resulting from the proposed development, the SWDS has therefore been designed such that there is no offsite discharge during rainfall events up to and including the 1% AEP rainfall event +20% as discussed at Section 8.8.

## 8.7 Water Quality Design Standard

The drainage of built development has the potential to reduce water quality through increases in suspended solids, metals and hydrocarbons in the surface water runoff. The risks associated with a number of typically drained surfaces (land uses) are assessed in Section 26 of The SuDS Manual and expressed in Table 26.2 as a potential *'Pollution hazard level'*. A review of each of the land uses has been completed to reference to Table 26.2 of The SuDS Manual to determine the appropriate *Pollution Hazard Levels*.

With reference to The SuDS Manual, post development surface water runoff generated from a low traffic access road, office car parking and commercial yard would have a *'Medium' Pollution Hazard level*. More industrial areas of the Site would have a *'High' Pollution Hazard Level* however these are routing via the foul network and therefore are not assessed in the SuDS Strategy. The office roof would have *'Low' Pollution Hazard Level*.



**Table 8-3**  
**Pollution Hazard Potential for Proposed Development**

Land Use	Pollution Hazard Level	Pollution Hazard Indices		
		Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Commercial (Office) Roof	Low	0.3	0.2	0.05
Commercial Yard	Medium	0.7	0.6	0.7
Non-residential Car Parks				
General Access Roads				

As summarised within **Table 8-1**, surface water runoff is to be discharged to ground. The indicative SuDS mitigation indices for discharges to groundwater are provided by Table 26.3 of the SuDS Manual and are reproduced as **Table 8-4**.

**Table 8-4**  
**Indicative SuDS Mitigation Indices for Discharges to Groundwater<sup>1</sup>**

Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates	Indicative SuDS Mitigation Indices		
	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Bioretention underlain by a soil with good contaminant attenuation potential of at least 300mm in depth <sup>2</sup>	0.8	0.8	0.8

Notes:

<sup>1</sup> Refer to the appropriate notes associated with Table 26.4 of The SuDS Manual

<sup>2</sup> All runoff reaching the below ground crate system will be routed through a bioretention system which will provide the required treatment prior to discharge to ground.

A comparison of the *Pollution hazard indices* and *Mitigation indices* for the proposed 'Site Control' measures is provided in **Table 8-5**.

**Table 8-5**  
**SuDS Performance: Water Quality Indices Assessment (Discharge to Groundwater)**

Land Use	Index	SuDS Mitigation Indices Comparison		
		Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Commercial (Office) Roofs	Hazard	0.3	0.2	0.05
	Mitigation (bioretention system)	0.8	0.8	0.8
	<b>Water Quality Requirement Met? (Y/N)</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
Commercial Yard, Non-residential (Office) Car Parks & General Access Roads	Hazard	0.7	0.6	0.7
	Mitigation (bioretention system)	0.8	0.8	0.8
	<b>Water Quality Requirement Met? (Y/N)</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>

Table 8-5 shows the *Mitigation indices* are greater than the *Pollution Hazard Indices*, and therefore the water quality requirements are deemed to have been met.

## 8.8 Attenuation Volume Estimate

To effectively provide the required attenuation volume within the Site layout, the Site will be drained as two catchments, northern and southern.

Using the MicroDrainage ‘Source Control’ module, the attenuation volumes required for the proposed development in response to a range of AEP rainfall events up to and including the 1% AEP rainfall event inclusive of an allowance for climate change (+20%) have been estimated outlined below.

### 8.8.1 Northern Catchment

With reference to **Drawing SW1**, the area contributing to surface water runoff within the northern catchment is 0.86ha.

As shown on **Drawing SW2**, this area will drain to a bioretention system, located to the south east of the location of the buried propane, before being conveyed to a below ground crate system beneath the proposed turning circle.

**Table 8-6**  
**Northern Catchment: Drainage Performance and Sizing**  
**A. Bioretention System**

AEP (%)	Maximum Water Depth (m)	Maximum Attenuation Storage Required (m <sup>3</sup> )	Half Drain Time (minutes)
50	0	0	0
3.3+20%	0.261	31	2
1 +20%	0.486	58	3

**B. Below Ground Crate System**

AEP (%)	Maximum Water Depth (m)	Maximum Attenuation Storage Required (m <sup>3</sup> )	Half Drain Time (minutes)
50	0.286	125	225
3.3+20%	0.778	340	611
1 +20%	1.003	438	785

The proposed bioretention system will provide an effective storage of approximately **60m<sup>3</sup>** over an area of approximately 120m<sup>2</sup> and a depth of 0.5m.

It should be noted that the bioretention system has been designed with a 300mm freeboard which, when accounted for, provides total storage area of 96m<sup>3</sup> over a total depth of 0.8m.

The bioretention system has been designed with a filter material with a permeability coefficient of  $2.2 \times 10^{-3} \text{ms}^{-1}$  (corresponding to the permeability coefficient for *Medium sand, very well sorted*<sup>18</sup>). This layer should be 1.0m deep (recommended range of 0.75m and 1.0m as set out at Section 18.1 of The SuDS Manual), with a footprint of 120m<sup>2</sup>.

The below ground crate system, downstream of the bioretention system, will provide an effective storage of approximately **446m<sup>3</sup>** over an area of approximately 460m<sup>2</sup> over a depth of 1.02m. It should be noted that the below ground crate system has a porosity of 0.95.

### 8.8.2 Southern Catchment

With reference to **Drawing SW1**, the area contributing to surface water runoff within the northern catchment is 0.91ha.

As shown on **Drawing SW2**, this area will drain to a bioretention system, located to the south proposed clamps, before being conveyed to a below ground crate system beneath.

18 Geotechdata.info (Accessed on 17 August 2022) <https://www.geotechdata.info/parameter/permeability>

**Table 8-7**  
**Southern Catchment: Drainage Performance and Sizing**  
**A. Bioretention System**

AEP (%)	Maximum Water Depth (m)	Maximum Attenuation Storage Required (m <sup>3</sup> )	Half Drain Time (minutes)
50	0	0	0
3.3+20%	0.266	34	2
1 +20%	0.493	62	3

**B. Below Ground Crate System**

AEP (%)	Maximum Water Depth (m)	Maximum Attenuation Storage Required (m <sup>3</sup> )	Half Drain Time (minutes)
50	0.288	133	229
3.3+20%	0.784	361	622
1 +20%	1.010	466	800

The proposed bioretention system will provide an effective storage of approximately **63m<sup>3</sup>** over an area of approximately 126m<sup>2</sup> and a depth of 0.5m.

It should be noted that the bioretention system has been designed with a 300mm freeboard which, when accounted for, provides total storage area of 101m<sup>3</sup> over a total depth of 0.8m.

The bioretention system has been designed with a filter material with a permeability coefficient of 2.2x10<sup>-3</sup>ms<sup>-1</sup> (corresponding to the permeability coefficient for *Medium sand, very well sorted*<sup>18</sup>). This layer should be 1.0m deep (recommended range of 0.75m and 1.0m as set out at Section 18.1 of The SuDS Manual), with a footprint of 126m<sup>2</sup>.

The below ground crate system, beneath the bioretention system, will provide an effective storage of approximately **470m<sup>3</sup>** over an area of approximately 485m<sup>2</sup> over a depth of 1.02m. It should be noted that the below ground crate system has a porosity of 0.95.

Details of analysis are enclosed at **Appendix 04**.

With reference to the National Standards for sustainable drainage system<sup>19</sup> published by Defra:

*'Drainage systems must be designed so that (...) flooding from the drainage system does not occur:*

- a) *On any part of the site for a 1 in 30 year [3.33% AEP] rainfall event; and*
- b) *During a 1 in 100 year [1% AEP] rainfall event in any part of:*
  - *a building (including a basement); or*
  - *utility plant susceptible to water (e.g. pumping station or electricity substation); or*
- c) *On neighbouring sites during a 1 in 100 year [1% AEP] rainfall event.'*

The proposed SWDS meets the above criteria with no flooding during the range of AEP rainfall events assessed up to and including the 1% AEP rainfall event +20%.

<sup>19</sup> Defra, December 2011. National Standards for sustainable drainage systems - Designing, constructing, operating and maintaining drainage for surface runoff

## 8.9 Design Exceedance Arrangement

The proposed SWDS has also considered residual events i.e. those that are in excess of the design rainfall event.

As discussed at Section 2.2, ground levels across the Site fall in a general south easterly direction, and this will generally be retained for the proposed development, with no significant reprofiling proposed.

Therefore, should the design 1% AEP +20% rainfall event be exceeded, excess surface water runoff would follow pre-existing exceedance route and flow in a south easterly direction away from the Site.

## 9.0 PRINCIPAL OPERATION AND MAINTENANCE REQUIREMENTS

All surface water drainage and pollution control features associated with the Site will remain private and will be maintained by the Site operator. The following sections outline recommended maintenance requirements for the various aspects of the drainage system for the development. If necessary, these outline operation and maintenance plan will be refined when the Site is operational to suit specific conditions.

### 9.1 Bioretention System

A recommended operation and maintenance plan for the bioretention systems is summarised in **Table 9-1**.

**Table 9-1**  
**Typical Bioretention System Operation and Maintenance Requirements**

Maintenance Schedule	Required Action	Typical Frequency
Regular Inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	Quarterly
Regular Maintenance	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)
	Replace any plants, to maintain planting density	As required
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually
Occasional Maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
Remedial Actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years

## 9.2 Below Ground Crate System

A recommended operation and maintenance plan for the below ground crate systems is summarised in **Table 9-2**

Typical Below Ground Crate System Operation and Maintenance Requirements

**Table 9-2**  
**Typical Below Ground Crate System Operation and Maintenance Requirements**

Maintenance Schedule	Required Action	Minimum Frequency
Regular Maintenance	Inspect inlets, ditch and overflow pipework and identify any areas that are not operating correctly.	Monthly for 3 months, then annually.
	Check ditch for sedimentation, or other blockages and flow bypassing	Six monthly.
	Inspect inlets and overflow pipework for silt accumulation and establish appropriate silt removal frequencies.	Six monthly.
	Remove sediment from pre-treatment devices.	Annually, or as required.
Monitoring	Inspect / check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually.
	Survey inside of tank for sediment build-up and remove if necessary.	Every 5 years.
Remedial Actions	Remove or control tree roots where they are encroaching the sides of the crates, using recommended methods (e.g. NJUG, 2007 or BS 3998:2010). Clear silt and debris from the ditch to ensure correct operation.	As required.

## 9.3 Underground Piped Systems

A recommended operation and maintenance plan for the piped drainage network is summarised in **Table 9-3**.

**Table 9-3**  
**Typical Pipe System Operation and Maintenance Requirements**

Maintenance Schedule	Required Action	Minimum Frequency
Regular maintenance	Ensuring drainage intakes are clear of debris/silt.	Monthly (or as required)
Occasional maintenance	Clear gully pots.	6 monthly
	Jet clean sewer lines, gully tails and kerb channels to remove grease, grit, sediment and other debris to ensure conveyance capacity is not compromised.	Every 2 years
Intermittent maintenance	CCTV survey of sewer lines to identify any defects/signs of performance degradation such as: <ul style="list-style-type: none"> <li>• Cracked / deteriorating pipes;</li> <li>• Leaking joints/seals at manholes;</li> <li>• High water lines showing regular high stage in pipes (sign of lack of capacity or downstream constraint); and</li> <li>• Suspected infiltration or exfiltration.</li> </ul>	Every 2 – 5 years
Remedial actions	Repair defects using suitable methods. Effective temporary repairs may be sufficient in short term until scheduled/capital improvements can be made.	As required
Monitoring	Record areas of surface ponding / intake bypassing / surcharging (photos, inundated areas, depths) during extreme storm events and investigate the reasoning for this post-storm.	As required



## 10.0 CONCLUSIONS

SLR Consulting Limited (SLR) was appointed by Acorn Bioenergy Ltd (the applicant) to prepare a Flood Risk Assessment (FRA) and Surface Water Drainage Strategy (SWDS) to support a planning application for the proposed Anaerobic Digestion (AD) facility at Three Maids Hill, Winchester, SO21 2QG (the 'Site').

### 10.1 Flood Risk

Flood risk has been assessed in line with BS8533, taking account of national, county and local planning policy and guidance, and all potential sources of flooding to the Site have been considered.

A screening assessment, detailed at Section 4.0, has reviewed the flood risk posed by sources including fluvial, tidal, surface water, groundwater, sewer, reservoirs, canals and infrastructure failure. The screening assessment concluded that there is no significant risk of flooding at the Site and, therefore, in terms of both the Exception and Sequential Tests, the Site is suitable for development.

Allowances for changes to peak river flows have been considered. The Site has however, been assessed to be outside an area at risk of flooding over the 25-year lifetime of the proposed development. Additionally, in line with national policy, the development must make allowance for a 20% uplift in peak rainfall to accommodate for climate change, which has been included within the SWDS for the Site.

### 10.2 Drainage Philosophy

The AD facility would capture as much rainwater as possible for use in the process. Based on annual average estimates, rainwater capture is expected to be sufficient for up to 100% of the process water demand. Two primary drainage systems will be adopted, for the clean (surface water runoff) and contaminated (foul) water systems.

In accordance with Hampshire County Council 'Sustainable Drainage Guidance', the proposed clean water system will be designed to manage all flows up to and including the 1% AEP event +20% climate change.

Such an arrangement (which depends on management controls) will need to be agreed with the LLFA (planning) and Environment Agency (permitting).

### 10.3 Surface Water Drainage Strategy

The SWDS has been developed to demonstrate that the requirements of national, county and local planning policy can be achieved at the Site given the nature and the quantum of development proposed. The proposed development will seek to discharge surface water runoff to ground.

The majority of the required attenuation storage, based on an infiltration rate of  $2.03 \times 10^{-5} \text{ ms}^{-1}$ , will be provided within below ground crate systems. A degree of attenuation will also be provided within the bioretention systems, upstream of the below ground crate systems.

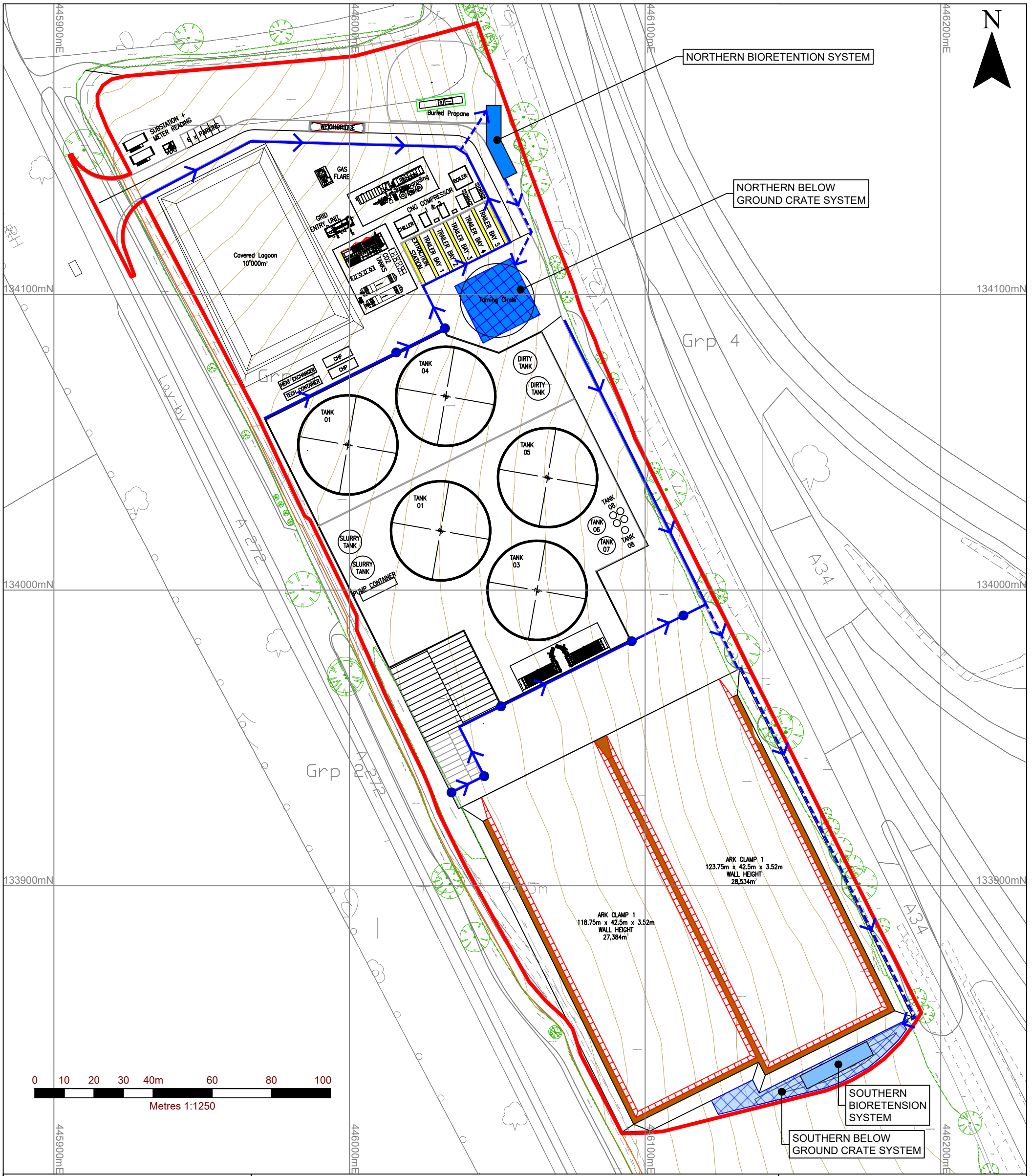
The primary purpose of the bioretention systems is to treat surface water runoff prior to its discharge to ground. As such, all flow reaching the below ground crate system will be routed through a bioretention system.

In common with most drainage strategies put forward in support of planning applications, the strategy presented here will be subject to detailed design and relevant approvals before construction commences.

## DRAWINGS

Drawing 01: SW1 Proposed Areas  
Drawing 02: SW2 Surface Water Drainage Strategy





**NOTES**

1. DRAWING GENERATED FROM INFORMATION SUPPLIED BY THE CLIENT, REF: GGP-29350-120-B-Astwick Farm-Proposed Paving Plan.DWG, DATED: JUNE 2022.

**LEGEND**

	SITE BOUNDARY (45,188m <sup>2</sup> )		NORTHERN SuDS FEATURE
	ANTICIPATED RAINWATER DOWN PIPE LOCATION		NORTHERN ATTENUATION FEATURE
	INTERCEPTION / CONVEYANCE FEATURES (ACCO DRAINS)		SOUTHERN SuDS FEATURE
	PIPED FEATURES		SOUTHERN ATTENUATION FEATURE



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**PROPOSED SURFACE WATER DRAINAGE STRATEGY PLAN**

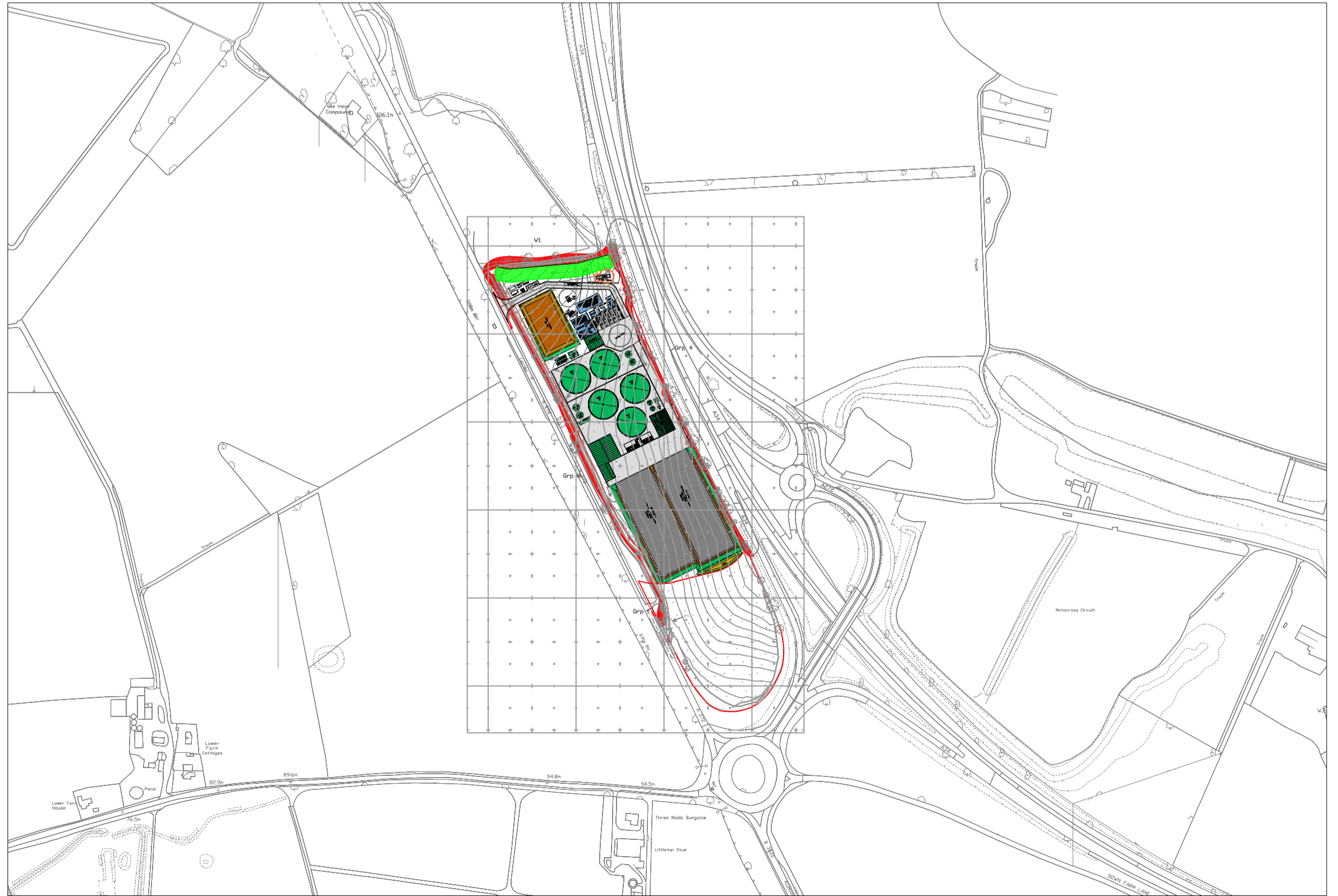
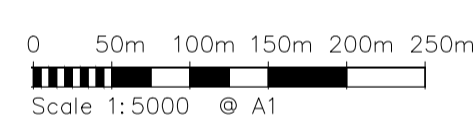
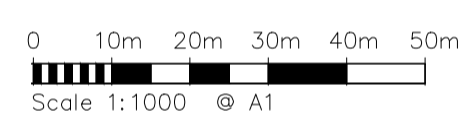
**SW2**

Scale 1:1250 @ A3 Date AUGUST 2022

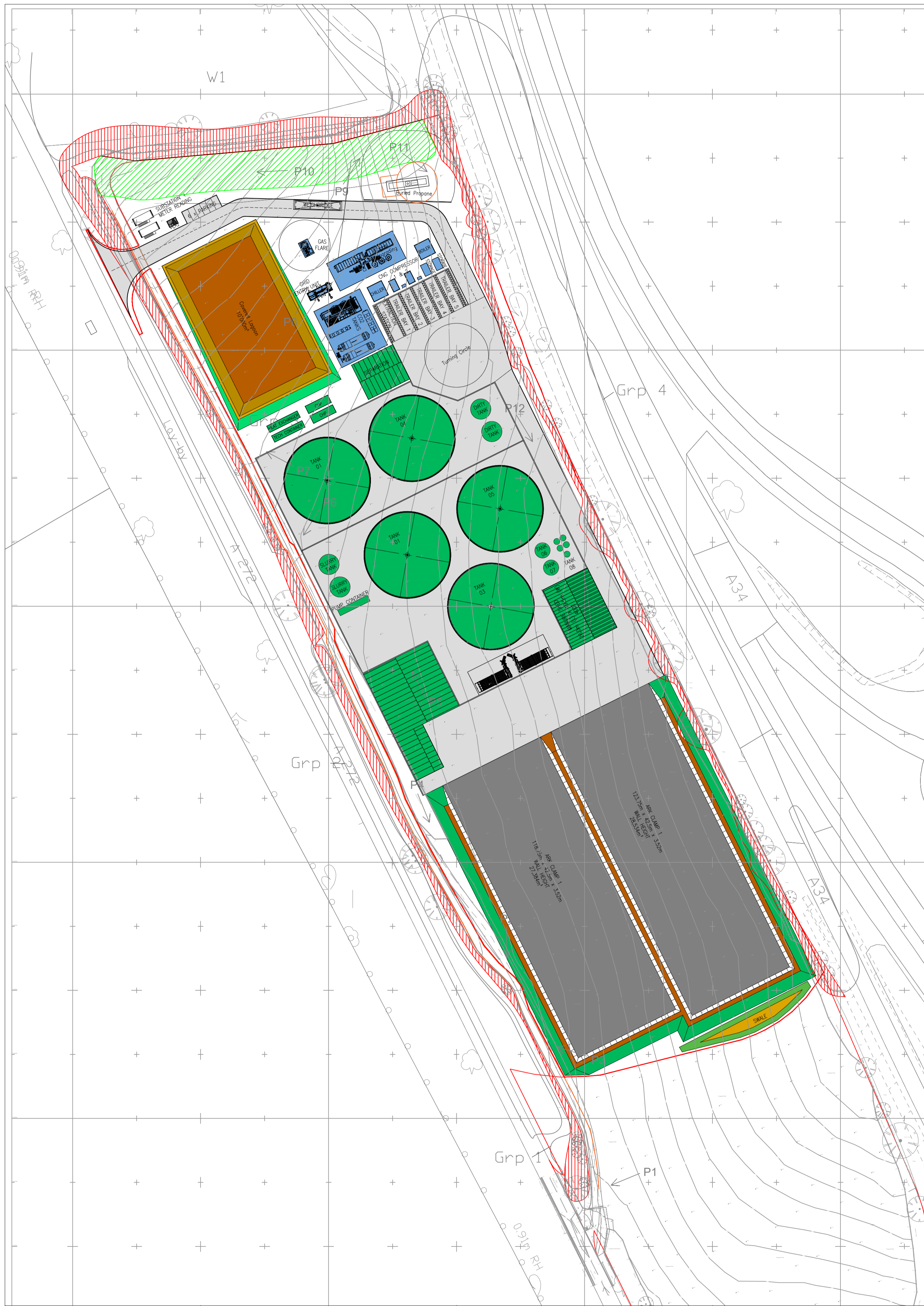
404.11923.00004.004.18.SW2.0B\_Prop\_SW\_Drainage.dwg

# APPENDIX 01

## Proposed Development Details



SITE LOCATION PLAN  
Scale: 1:5000 @ A1



SITE PLAN  
Scale: 1:1000 @ A1

- NOTES:
- All dimensions must be checked on site and not scaled from this drawing.
  - The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
  - All levels shown on this drawing are relative to Agreed Topographic survey
  - This drawing is to be read in conjunction with 29348/100 Series Drawings.
  - All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.

- Site Red Line Boundary (4.52ha)
- ▨ 15m Woodland Easement
- ▨ Tree Easement

Rev	Date	Description	DR	CH
E	07/09/22	Notes Revised	JHC	JHC
D	25/08/22	Notes Revised	DJC	JHC
C	27/07/22	Layout Revised	DJC	JHC
B	13/06/22	Issued For Approval	DJC	JHC
A	24/03/22	Issued For Planning	DJC	JHC

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Client

Job Title  
AD Plant.  
Three Maids

Drawing Title  
Site Layout Plan

Status	Approval	
Scale	As Noted	Date Feb '22
Drawn By	Daniel Cook	Checked JHC Approved JHC

Dwg. No.	Rev
29348/101A	E

**NOT FOR CONSTRUCTION**

## APPENDIX 02

### AD Dirty Water Usage Strategy

**ANAEROBIC DIGESTION PLANT DIRTY  
WATER USAGE STRATEGY**

**FOR**

**PROPOSED ANAEROBIC DIGESTION PLANT**

**ON BEHALF OF**



**Project ref:** 29346/DWS/JHC  
**Date First Issued:** 5<sup>th</sup> July 2022  
**Issue:** 01  
**Revision Date:** N/A  
**Prepared by:** J. Collins  
BSc. (Hons), MCIWEM  
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## **CONTENTS**

1. Introduction
2. Description of Proposed Site
3. Catchment Areas
4. Design Philosophy
5. Proposed Discharge Rates
6. Clean/Contaminated Bund Runoff
7. Contaminated Silage Clamp Runoff
8. Plant Water Demand Against Annual Average Rainfall

## **APPENDICES**

- I Bund Calculations
- II Silage Clamp 2l/s Calculations
- III Silage Clamp Amended Discharge Rate Calculations

Document Revision Box			
Revision	Date	Description	Author
<b>01</b>	5 <sup>th</sup> July 2022	Draft	JHC

## **1.0 Introduction**

GGP Consult has been instructed by Acorn Bioenergy Ltd to prepare a dirty water usage strategy drainage impact assessment to establish the storage requirements associated with the operation function of the proposed anaerobic digestion plant.

The calculations will detail how surface water from the site will be managed, in compliance with local policy and an environmental permit.

## **2.0 Description of Proposed Site**

It is typically proposed to develop an anaerobic digestion plant, consisting of 5nr digestate tank, silage clamps, a digestate lagoon, gas equipment, material storage buildings, a pond or similar, offices, parking and additional miscellaneous equipment.

## **3.0 Catchment Areas**

Various areas within the site will be subject to different operation functions, causing some areas being contaminated, some clean, and some with the potential to be contaminated. Therefore, to improve water quality and optimise site efficiency, the site is split into catchments and subject to different drainage philosophies.

## **4.0 Design Philosophy**

As stated within section 3.0, the site has been split into different catchments based on level of contamination. These catchments will be split into different drainage systems.

Two primary drainage systems will be adopted: clean and contaminated.

**Contaminated** runoff, caused by silage residue, from the silage clamps and sections of hardstanding area will be collected through a series of drainage channels, pipes, and chambers and be brought into a below ground holding tank. From this tank, runoff will be pumped to 3nr 400m<sup>3</sup> holding tanks within the bund where it will be reused within the process.

The process has a yearly demand of 62,000m<sup>3</sup>, equating to 2l/s continuous flow. This offers a sustainable drainage system, compliant with the hierarchy.

**Clean** runoff will be collected from buildings and sections of hardstanding and discharged into the pond or similar. Petrochemicals will be present within the clean hardstanding runoff, which will be mitigated through a full retention petrol interceptor.

Runoff will then be discharged into the adjacent watercourse at greenfield rates.

**Bund** runoff has the potential to become contaminated through process residue. This will be collected through a channel drain and discharged into a pump chamber where it will be sampled and pumped to a pond feature (if clean) or reused in the process (if contaminated).

## 5.0 Clean / Contaminated Bund Runoff

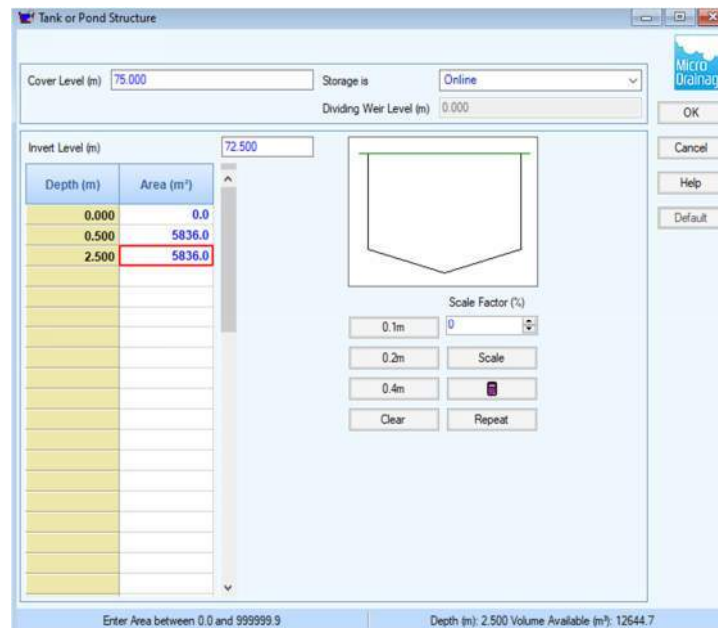
Rainfall collected within the bund has the potential to be contaminated through process residue. Therefore, runoff is collected and contained within the bund until it is sampled to determine if contamination is present.

If clean, runoff will be pumped to the pond or similar. If contaminated, runoff will be pumped into the process for reuse.

Runoff must be sampled prior to discharge, therefore, when the site is unmanned, the bund will store runoff until sampling can be undertaken. The longest period the site will be unmanned is over a 12hr night period. Therefore, the bund will be modelled within no outfall with the 12hr storm events will be taken as the critical event.

A typical bund has a slab level of between 72.500m - 73.000m AOD (AOD levels Site specific) with a top of wall level of 75.000m AOD. A internal area of 9,727m<sup>2</sup>, 3,889m<sup>2</sup> of which is taken by the tanks, resulting in an available bund area of 5,836m<sup>2</sup>.

These parameters have been used to model the bund within MicroDrainage 'Source Control'. An extract of the structure can be seen below.



The model has been run over a variety of storm events with the resultant volumes and depths detailed below.

Storm Event	Volume	Depth
1:1 Yr 12hr + 40%CC	305.6m <sup>3</sup>	340mm
1:2 Yr 12hr + 40%CC	368.0m <sup>3</sup>	362mm
1:10 Yr 12hr + 40%CC	518.8m <sup>3</sup>	405mm
1:30 Yr 12hr + 40%CC	651.6m <sup>3</sup>	437mm
1:100 Yr 12hr + 40%CC	836.4m <sup>3</sup>	475mm

The above results shall vary slightly based on site geographical area. However, the result shows the bund has more than sufficient capacity. The bund is typically designed for 110% of the largest tank i.e., 8,489m<sup>3</sup>

Refer to Appendix VI for the full bund calculations.

## 6.0 Contaminated Silage Clamp Runoff

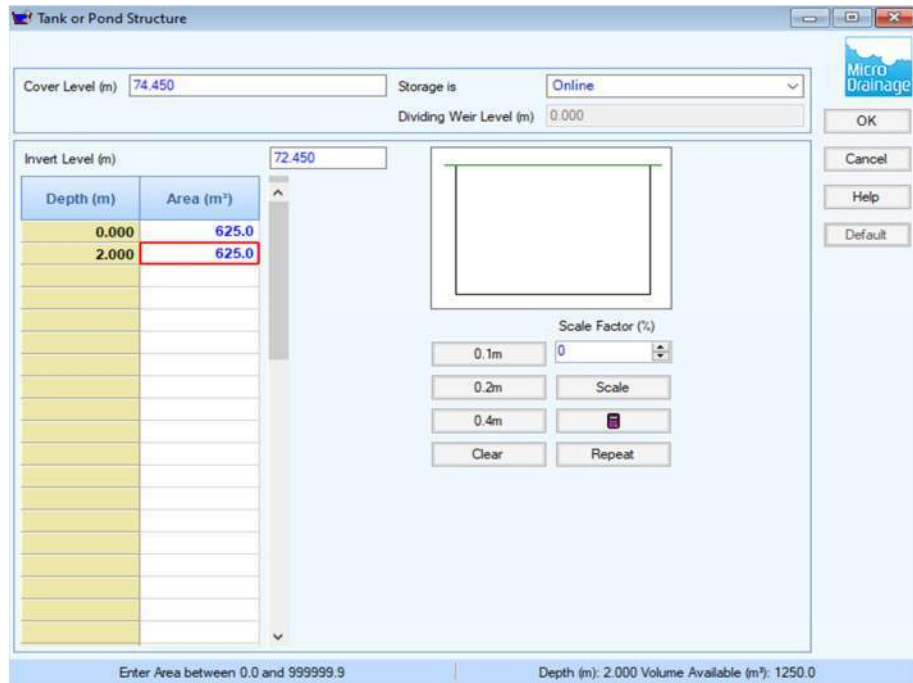
The runoff from the silage clamps will be contaminated with leachate from the crop. As the runoff has leachate within it, it has value to be reused within the process. Therefore, the site will use contaminated runoff as a main source of water.

Runoff will be collected through channel drains running along the front of the clamps where it will be brought to the south of the clamps and discharged into an underground holding tank of 50m<sup>3</sup>.

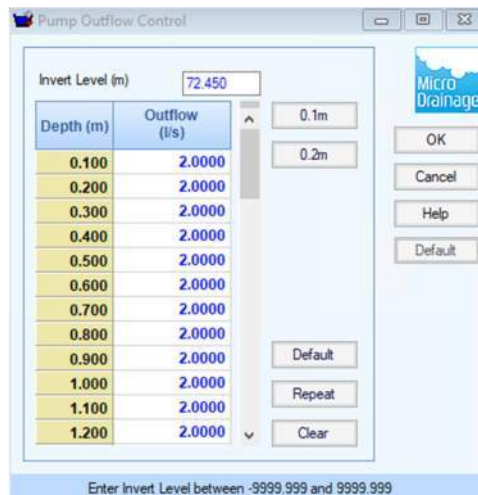
This will then be pumped into 3nr 400m<sup>3</sup> holding tanks within the bund where it will be used within the process at a rate of 2l/s/. This provides a total storage capacity of 1,250m<sup>3</sup>.

All the storage capacity will be modelled as a single tank with a pumped discharge of 2l/s.

An extract of the storage structure and pump structure is shown below.



**MicroDrainage 'Source Control' Tank Structure**



**MicroDrainage 'Source Control' Pump Overflow**

The model has been run over a variety of storm events with the resultant volumes and depths detailed below. During extreme storm events, the discharge into the process will be increased to prevent above ground flooding.

As the site for a maximum period of 12hrs, the peak and 12hr event will be analysed.

Storm Event	Volume	Discharge Rate	
1:1 Yr 12hr + 40%CC	492.7m <sup>3</sup>	2.0l/s	
1:1 Yr 36hr + 40%CC	546.5m <sup>3</sup>	2.0l/s	
1:2 Yr 12hr + 40%CC	605.9m <sup>3</sup>	2.0l/s	
1:2 Yr 36hr + 40%CC	678.1m <sup>3</sup>	2.0l/s	
1:10 Yr 12hr + 40%CC	880.9m <sup>3</sup>	2.0l/s	
1:10 Yr 48hr + 40%CC	1,011.4m <sup>3</sup>	2.0l/s	
1:30 Yr 12hr + 40%CC	1,124.4m <sup>3</sup>	2.0l/s	
1:30 Yr 48hr + 40%CC	1,305.6m <sup>3</sup>	2.0l/s	Flood
1:100 Yr 12hr + 40%CC	1,464.2m <sup>3</sup>	2.0l/s	Flood
1:100 Yr 48hr + 40%CC	1,712.9m <sup>3</sup>	2.0l/s	Flood

Refer to Appendix IX for silage clamp 2l/s calculations.

As shown within the above calculations, the contaminated drainage system floods within the peak 1:30 event and both 1:100 events.

In these extreme storm events, it is proposed to increase the discharge rate into the process. The calculations have been remodelled with higher discharge rates to determine what rates are required to prevent flooding.

Storm Event	Volume	Discharge Rate
1:30 Yr 36hr + 40%CC	1,231.2m <sup>3</sup>	2.5l/s
1:100 Yr 12hr + 40%CC	1,247.8m <sup>3</sup>	7.6l/s
1:100 Yr 12hr (Peak) + 40%CC	1,247.8m <sup>3</sup>	7.6l/s

Refer to Appendix X for amended pump rate calculations.

As shown above, during the peak 1:30 event, the process must increase the discharge to 2.5l/s and increase the 1:100 to 7.6l/s/ to prevent above ground flooding. It should also be noted that additional storage tank are likely to be available to hold further water.

## **10.0 Plant Water Demand Against Average Annual Rainfall**

The site has been designed to contain all flows up to and including the 1:100 year +40% CC below ground.

An assessment has been undertaken to compare the average annual rainfall (AAR) against the process' water demand to determine if the process demand is greater than the harvested water.

From reviewing the process, it is expected the process has a yearly operation demand of 62,000m<sup>3</sup>, equating to a continuous flow of 2l/s.

AAR = 0.667

Area (Total Catchment) = 46,347m<sup>2</sup>

CC = 40%

Total annual rainfall (including climate change) = 43,278.8m<sup>3</sup>


The rainfall generated within the contaminated catchment provides 43,278.8m<sup>3</sup> of water each year, 70% of the yearly demand.

As shown above, the plant has a greater demand than the yearly rainfall within the site with the addition of climate change. The attenuation capacity has been solely provided to satisfy local and national policy.

Therefore, the collected runoff is recycled within the process, satisfying sustainability and drainage hierarchy requirements.

## **APPENDIX I**

Bund Calculations

GGP Consult		Page 1
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Bund Calcs Hornage Farm, AD Plant	
Date 01/05/2022 File Bund Calcs No Outfall.SRCX	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Summary of Results for 1 year Return Period (+40%)

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	72.718	0.218	80.1	O K
30 min Summer	72.738	0.238	104.5	O K
60 min Summer	72.757	0.257	132.4	O K
120 min Summer	72.776	0.276	164.3	O K
180 min Summer	72.788	0.288	185.5	O K
240 min Summer	72.796	0.296	202.0	O K
360 min Summer	72.808	0.308	226.3	O K
480 min Summer	72.816	0.316	244.6	O K
600 min Summer	72.822	0.322	259.8	O K
720 min Summer	72.827	0.327	272.9	O K
960 min Summer	72.836	0.336	294.9	O K
1440 min Summer	72.848	0.348	329.2	O K
2160 min Summer	72.862	0.362	367.7	O K
2880 min Summer	72.871	0.371	397.3	O K
4320 min Summer	72.885	0.385	443.2	O K
5760 min Summer	72.895	0.395	479.2	O K
7200 min Summer	72.903	0.403	509.3	O K
8640 min Summer	72.910	0.410	535.4	O K
10080 min Summer	72.916	0.416	558.6	O K
15 min Winter	72.726	0.226	89.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	43.387	0.0	23
30 min Summer	28.301	0.0	38
60 min Summer	17.920	0.0	68
120 min Summer	11.119	0.0	128
180 min Summer	8.370	0.0	188
240 min Summer	6.835	0.0	248
360 min Summer	5.105	0.0	368
480 min Summer	4.138	0.0	488
600 min Summer	3.516	0.0	608
720 min Summer	3.078	0.0	728
960 min Summer	2.495	0.0	968
1440 min Summer	1.857	0.0	1448
2160 min Summer	1.383	0.0	2168
2880 min Summer	1.120	0.0	2888
4320 min Summer	0.833	0.0	4328
5760 min Summer	0.676	0.0	5768
7200 min Summer	0.574	0.0	7208
8640 min Summer	0.503	0.0	8648
10080 min Summer	0.450	0.0	10088
15 min Winter	43.387	0.0	23



2 Hallam Road, Priory Park East  
Hull, Humberside  
HU4 7DY

Bund Calcs  
Hornage Farm,  
AD Plant

Date 01/05/2022

Designed by DJC

File Bund Calcs No Outfall.SRCX

Checked by JHC




Innovyze

Source Control 2019.1

Summary of Results for 1 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m <sup>3</sup> )	Status
30 min Winter	72.747	0.247	117.1	O K
60 min Winter	72.767	0.267	148.3	O K
120 min Winter	72.787	0.287	184.0	O K
180 min Winter	72.799	0.299	207.8	O K
240 min Winter	72.807	0.307	226.2	O K
360 min Winter	72.819	0.319	253.4	O K
480 min Winter	72.828	0.328	273.9	O K
600 min Winter	72.834	0.334	290.9	O K
720 min Winter	72.840	0.340	305.6	O K
960 min Winter	72.849	0.349	330.3	O K
1440 min Winter	72.862	0.362	368.7	O K
2160 min Winter	72.875	0.375	411.9	O K
2880 min Winter	72.885	0.385	445.0	O K
4320 min Winter	72.900	0.400	496.4	O K
5760 min Winter	72.910	0.410	536.7	O K
7200 min Winter	72.919	0.419	570.4	O K
8640 min Winter	72.926	0.426	599.7	O K
10080 min Winter	72.932	0.432	625.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
30 min Winter	28.301	0.0	38
60 min Winter	17.920	0.0	68
120 min Winter	11.119	0.0	128
180 min Winter	8.370	0.0	188
240 min Winter	6.835	0.0	248
360 min Winter	5.105	0.0	368
480 min Winter	4.138	0.0	488
600 min Winter	3.516	0.0	608
720 min Winter	3.078	0.0	728
960 min Winter	2.495	0.0	968
1440 min Winter	1.857	0.0	1448
2160 min Winter	1.383	0.0	2168
2880 min Winter	1.120	0.0	2888
4320 min Winter	0.833	0.0	4328
5760 min Winter	0.676	0.0	5768
7200 min Winter	0.574	0.0	7208
8640 min Winter	0.503	0.0	8648
10080 min Winter	0.450	0.0	10088

GGP Consult		Page 3
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Bund Calcs Hornage Farm, AD Plant	
Date 01/05/2022 File Bund Calcs No Outfall.SRCX	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram


Total Area (ha) 0.985

Time (mins)		Area	Time (mins)		Area
From:	To:	(ha)	From:	To:	(ha)
0	4	0.492	4	8	0.493

Time Area Diagram

Total Area (ha) 0.000

Time (mins)		Area
From:	To:	(ha)
0	4	0.000

GGP Consult		Page 4
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Bund Calcs Hornage Farm, AD Plant	
Date 01/05/2022 File Bund Calcs No Outfall.SRCX	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	


Model Details

Storage is Online Cover Level (m) 75.000

Tank or Pond Structure

Invert Level (m) 72.500

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	0.0	0.500	5836.0	2.500	5836.0

GGP Consult		Page 1
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Bund Calcs Hornage Farm, AD Plant	
Date 01/05/2022 File Bund Calcs No Outfall.SRCX	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Summary of Results for 2 year Return Period (+40%)

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	72.737	0.237	103.6	O K
30 min Summer	72.758	0.258	134.3	O K
60 min Summer	72.778	0.278	167.5	O K
120 min Summer	72.797	0.297	204.7	O K
180 min Summer	72.809	0.309	228.9	O K
240 min Summer	72.817	0.317	247.5	O K
360 min Summer	72.828	0.328	275.2	O K
480 min Summer	72.836	0.336	296.3	O K
600 min Summer	72.843	0.343	313.7	O K
720 min Summer	72.848	0.348	328.6	O K
960 min Summer	72.857	0.357	353.5	O K
1440 min Summer	72.869	0.369	391.9	O K
2160 min Summer	72.882	0.382	434.5	O K
2880 min Summer	72.892	0.392	467.2	O K
4320 min Summer	72.905	0.405	517.7	O K
5760 min Summer	72.915	0.415	556.8	O K
7200 min Summer	72.923	0.423	589.3	O K
8640 min Summer	72.930	0.430	617.3	O K
10080 min Summer	72.935	0.435	642.1	O K
15 min Winter	72.746	0.246	116.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	56.082	0.0	23
30 min Summer	36.348	0.0	38
60 min Summer	22.680	0.0	68
120 min Summer	13.855	0.0	128
180 min Summer	10.330	0.0	188
240 min Summer	8.375	0.0	248
360 min Summer	6.209	0.0	368
480 min Summer	5.013	0.0	488
600 min Summer	4.246	0.0	608
720 min Summer	3.706	0.0	728
960 min Summer	2.991	0.0	968
1440 min Summer	2.210	0.0	1448
2160 min Summer	1.634	0.0	2168
2880 min Summer	1.318	0.0	2888
4320 min Summer	0.973	0.0	4328
5760 min Summer	0.785	0.0	5768
7200 min Summer	0.665	0.0	7208
8640 min Summer	0.580	0.0	8648
10080 min Summer	0.517	0.0	10088
15 min Winter	56.082	0.0	23

2 Hallam Road, Priory Park East  
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HU4 7DY

Bund Calcs  
Hornage Farm,  
AD Plant

Date 01/05/2022

Designed by DJC

File Bund Calcs No Outfall.SRCX

Checked by JHC




Innovyze

Source Control 2019.1

Summary of Results for 2 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m <sup>3</sup> )	Status
30 min Winter	72.768	0.268	150.4	O K
60 min Winter	72.789	0.289	187.7	O K
120 min Winter	72.809	0.309	229.3	O K
180 min Winter	72.821	0.321	256.4	O K
240 min Winter	72.829	0.329	277.2	O K
360 min Winter	72.841	0.341	308.2	O K
480 min Winter	72.849	0.349	331.8	O K
600 min Winter	72.856	0.356	351.3	O K
720 min Winter	72.862	0.362	368.0	O K
960 min Winter	72.871	0.371	395.9	O K
1440 min Winter	72.884	0.384	438.9	O K
2160 min Winter	72.897	0.397	486.6	O K
2880 min Winter	72.907	0.407	523.3	O K
4320 min Winter	72.921	0.421	579.8	O K
5760 min Winter	72.931	0.431	623.6	O K
7200 min Winter	72.939	0.439	660.0	O K
8640 min Winter	72.946	0.446	691.4	O K
10080 min Winter	72.952	0.452	719.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
30 min Winter	36.348	0.0	38
60 min Winter	22.680	0.0	68
120 min Winter	13.855	0.0	128
180 min Winter	10.330	0.0	188
240 min Winter	8.375	0.0	248
360 min Winter	6.209	0.0	368
480 min Winter	5.013	0.0	488
600 min Winter	4.246	0.0	608
720 min Winter	3.706	0.0	728
960 min Winter	2.991	0.0	968
1440 min Winter	2.210	0.0	1448
2160 min Winter	1.634	0.0	2168
2880 min Winter	1.318	0.0	2888
4320 min Winter	0.973	0.0	4328
5760 min Winter	0.785	0.0	5768
7200 min Winter	0.665	0.0	7208
8640 min Winter	0.580	0.0	8648
10080 min Winter	0.517	0.0	10088

GGP Consult		Page 3
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Bund Calcs Hornage Farm, AD Plant	
Date 01/05/2022 File Bund Calcs No Outfall.SRCX	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram


Total Area (ha) 0.985

Time (mins)		Area	Time (mins)		Area
From:	To:	(ha)	From:	To:	(ha)
0	4	0.492	4	8	0.493

Time Area Diagram

Total Area (ha) 0.000

Time (mins)		Area
From:	To:	(ha)
0	4	0.000

GGP Consult		Page 4
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Bund Calcs Hornage Farm, AD Plant	
Date 01/05/2022 File Bund Calcs No Outfall.SRCX	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	


Model Details

Storage is Online Cover Level (m) 75.000

Tank or Pond Structure

Invert Level (m) 72.500

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	0.0	0.500	5836.0	2.500	5836.0

GGP Consult		Page 1
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Bund Calcs Hornage Farm, AD Plant	
Date 01/05/2022 File Bund Calcs No Outfall.SRCX	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Summary of Results for 10 year Return Period (+40%)

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	72.771	0.271	155.0	O K
30 min Summer	72.795	0.295	200.2	O K
60 min Summer	72.817	0.317	248.2	O K
120 min Summer	72.838	0.338	300.1	O K
180 min Summer	72.850	0.350	332.7	O K
240 min Summer	72.858	0.358	356.9	O K
360 min Summer	72.870	0.370	393.3	O K
480 min Summer	72.878	0.378	421.1	O K
600 min Summer	72.885	0.385	443.8	O K
720 min Summer	72.890	0.390	463.2	O K
960 min Summer	72.899	0.399	495.2	O K
1440 min Summer	72.912	0.412	543.8	O K
2160 min Summer	72.925	0.425	596.7	O K
2880 min Summer	72.934	0.434	637.1	O K
4320 min Summer	72.948	0.448	698.4	O K
5760 min Summer	72.958	0.458	745.2	O K
7200 min Summer	72.965	0.465	783.5	O K
8640 min Summer	72.972	0.472	816.2	O K
10080 min Summer	72.977	0.477	844.9	O K
15 min Winter	72.781	0.281	173.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	83.912	0.0	23
30 min Summer	54.206	0.0	38
60 min Summer	33.604	0.0	68
120 min Summer	20.311	0.0	128
180 min Summer	15.011	0.0	188
240 min Summer	12.078	0.0	248
360 min Summer	8.874	0.0	368
480 min Summer	7.126	0.0	488
600 min Summer	6.008	0.0	608
720 min Summer	5.225	0.0	728
960 min Summer	4.190	0.0	968
1440 min Summer	3.067	0.0	1448
2160 min Summer	2.244	0.0	2168
2880 min Summer	1.797	0.0	2888
4320 min Summer	1.313	0.0	4328
5760 min Summer	1.051	0.0	5768
7200 min Summer	0.884	0.0	7208
8640 min Summer	0.767	0.0	8648
10080 min Summer	0.681	0.0	10088
15 min Winter	83.912	0.0	23



2 Hallam Road, Priory Park East  
Hull, Humberside  
HU4 7DY

Bund Calcs  
Hornage Farm,  
AD Plant

Date 01/05/2022

Designed by DJC

File Bund Calcs No Outfall.SRCX

Checked by JHC



Innovyze

Source Control 2019.1

Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m <sup>3</sup> )	Status
30 min Winter	72.807	0.307	224.2	O K
60 min Winter	72.829	0.329	278.0	O K
120 min Winter	72.851	0.351	336.1	O K
180 min Winter	72.863	0.363	372.6	O K
240 min Winter	72.872	0.372	399.7	O K
360 min Winter	72.884	0.384	440.5	O K
480 min Winter	72.893	0.393	471.7	O K
600 min Winter	72.900	0.400	497.1	O K
720 min Winter	72.905	0.405	518.8	O K
960 min Winter	72.915	0.415	554.6	O K
1440 min Winter	72.928	0.428	609.0	O K
2160 min Winter	72.941	0.441	668.3	O K
2880 min Winter	72.951	0.451	713.5	O K
4320 min Winter	72.965	0.465	782.2	O K
5760 min Winter	72.975	0.475	834.6	O K
7200 min Winter	72.983	0.483	877.5	O K
8640 min Winter	72.990	0.490	914.2	O K
10080 min Winter	72.995	0.495	946.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
30 min Winter	54.206	0.0	38
60 min Winter	33.604	0.0	68
120 min Winter	20.311	0.0	128
180 min Winter	15.011	0.0	188
240 min Winter	12.078	0.0	248
360 min Winter	8.874	0.0	368
480 min Winter	7.126	0.0	488
600 min Winter	6.008	0.0	608
720 min Winter	5.225	0.0	728
960 min Winter	4.190	0.0	968
1440 min Winter	3.067	0.0	1448
2160 min Winter	2.244	0.0	2168
2880 min Winter	1.797	0.0	2888
4320 min Winter	1.313	0.0	4328
5760 min Winter	1.051	0.0	5768
7200 min Winter	0.884	0.0	7208
8640 min Winter	0.767	0.0	8648
10080 min Winter	0.681	0.0	10088

2 Hallam Road, Priory Park East  
Hull, Humberside  
HU4 7DY

Bund Calcs  
Hornage Farm,  
AD Plant



Date 01/05/2022

Designed by DJC

File Bund Calcs No Outfall.SRCX

Checked by JHC

Innovyze

Source Control 2019.1

### Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	10	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

### Time Area Diagram


Total Area (ha) 0.985

Time (mins)		Area	Time (mins)		Area
From:	To:	(ha)	From:	To:	(ha)
0	4	0.492	4	8	0.493

### Time Area Diagram

Total Area (ha) 0.000

Time (mins)		Area
From:	To:	(ha)
0	4	0.000

GGP Consult		Page 4
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Bund Calcs Hornage Farm, AD Plant	
Date 01/05/2022 File Bund Calcs No Outfall.SRCX	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	


Model Details

Storage is Online Cover Level (m) 75.000

Tank or Pond Structure

Invert Level (m) 72.500

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	0.0	0.500	5836.0	2.500	5836.0

GGP Consult		Page 1
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Bund Calcs Hornage Farm, AD Plant	
Date 01/05/2022 File Bund Calcs No Outfall.SRCX	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Summary of Results for 30 year Return Period (+40%)

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	72.793	0.293	196.6	O K
30 min Summer	72.820	0.320	256.0	O K
60 min Summer	72.845	0.345	318.7	O K
120 min Summer	72.867	0.367	385.0	O K
180 min Summer	72.880	0.380	425.6	O K
240 min Summer	72.888	0.388	454.8	O K
360 min Summer	72.900	0.400	498.6	O K
480 min Summer	72.909	0.409	531.9	O K
600 min Summer	72.916	0.416	558.9	O K
720 min Summer	72.921	0.421	581.8	O K
960 min Summer	72.930	0.430	619.4	O K
1440 min Summer	72.943	0.443	675.9	O K
2160 min Summer	72.956	0.456	736.8	O K
2880 min Summer	72.965	0.465	782.7	O K
4320 min Summer	72.978	0.478	851.5	O K
5760 min Summer	72.988	0.488	903.4	O K
7200 min Summer	72.995	0.495	945.5	O K
8640 min Summer	73.001	0.501	981.2	O K
10080 min Summer	73.007	0.507	1012.2	O K
15 min Winter	72.805	0.305	220.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	106.449	0.0	23
30 min Summer	69.298	0.0	38
60 min Summer	43.136	0.0	68
120 min Summer	26.061	0.0	128
180 min Summer	19.202	0.0	188
240 min Summer	15.393	0.0	248
360 min Summer	11.248	0.0	368
480 min Summer	8.999	0.0	488
600 min Summer	7.565	0.0	608
720 min Summer	6.562	0.0	728
960 min Summer	5.240	0.0	968
1440 min Summer	3.812	0.0	1448
2160 min Summer	2.770	0.0	2168
2880 min Summer	2.207	0.0	2888
4320 min Summer	1.601	0.0	4328
5760 min Summer	1.274	0.0	5768
7200 min Summer	1.067	0.0	7208
8640 min Summer	0.922	0.0	8648
10080 min Summer	0.816	0.0	10088
15 min Winter	106.449	0.0	23

GGP Consult		Page 2
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Bund Calcs Hornage Farm, AD Plant
Date 01/05/2022 File Bund Calcs No Outfall.SRCX		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Summary of Results for 30 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m <sup>3</sup> )	Status
30 min Winter	72.833	0.333	286.7	O K
60 min Winter	72.858	0.358	356.9	O K
120 min Winter	72.881	0.381	431.3	O K
180 min Winter	72.894	0.394	476.6	O K
240 min Winter	72.903	0.403	509.4	O K
360 min Winter	72.916	0.416	558.4	O K
480 min Winter	72.925	0.425	595.7	O K
600 min Winter	72.932	0.432	625.9	O K
720 min Winter	72.937	0.437	651.6	O K
960 min Winter	72.947	0.447	693.7	O K
1440 min Winter	72.960	0.460	757.1	O K
2160 min Winter	72.973	0.473	825.2	O K
2880 min Winter	72.983	0.483	876.6	O K
4320 min Winter	72.997	0.497	953.7	O K
5760 min Winter	73.007	0.507	1011.8	O K
7200 min Winter	73.015	0.515	1059.0	O K
8640 min Winter	73.022	0.522	1098.9	O K
10080 min Winter	73.028	0.528	1133.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
30 min Winter	69.298	0.0	38
60 min Winter	43.136	0.0	68
120 min Winter	26.061	0.0	128
180 min Winter	19.202	0.0	188
240 min Winter	15.393	0.0	248
360 min Winter	11.248	0.0	368
480 min Winter	8.999	0.0	488
600 min Winter	7.565	0.0	608
720 min Winter	6.562	0.0	728
960 min Winter	5.240	0.0	968
1440 min Winter	3.812	0.0	1448
2160 min Winter	2.770	0.0	2168
2880 min Winter	2.207	0.0	2888
4320 min Winter	1.601	0.0	4328
5760 min Winter	1.274	0.0	5768
7200 min Winter	1.067	0.0	7208
8640 min Winter	0.922	0.0	8648
10080 min Winter	0.816	0.0	10088

GGP Consult		Page 3
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Bund Calcs Hornage Farm, AD Plant
Date 01/05/2022 File Bund Calcs No Outfall.SRCX		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram


Total Area (ha) 0.985

Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:
0	4 0.492	4	8 0.493

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area (ha)
From:	To:
0	4 0.000

GGP Consult		Page 4
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Bund Calcs Hornage Farm, AD Plant	
Date 01/05/2022 File Bund Calcs No Outfall.SRCX	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	


Model Details

Storage is Online Cover Level (m) 75.000

Tank or Pond Structure

Invert Level (m) 72.500

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	0.0	0.500	5836.0	2.500	5836.0

GGP Consult		Page 1
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Bund Calcs Hornage Farm, AD Plant	
Date 01/05/2022 File Bund Calcs No Outfall.SRCX	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Summary of Results for 100 year Return Period (+40%)

Outflow is too low. Design is unsatisfactory.

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	72.820	0.320	255.2	O K
30 min Summer	72.850	0.350	335.0	O K
60 min Summer	72.878	0.378	419.0	O K
120 min Summer	72.902	0.402	506.0	O K
180 min Summer	72.915	0.415	557.4	O K
240 min Summer	72.924	0.424	593.3	O K
360 min Summer	72.936	0.436	646.5	O K
480 min Summer	72.945	0.445	686.9	O K
600 min Summer	72.952	0.452	719.4	O K
720 min Summer	72.958	0.458	746.8	O K
960 min Summer	72.967	0.467	791.6	O K
1440 min Summer	72.980	0.480	857.9	O K
2160 min Summer	72.992	0.492	928.3	O K
2880 min Summer	73.001	0.501	980.7	O K
4320 min Summer	73.015	0.515	1058.1	O K
5760 min Summer	73.025	0.525	1115.7	O K
7200 min Summer	73.032	0.532	1161.8	O K
8640 min Summer	73.039	0.539	1200.5	O K
10080 min Summer	73.045	0.545	1233.9	O K
15 min Winter	72.832	0.332	285.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	138.153	0.0	23
30 min Summer	90.705	0.0	38
60 min Summer	56.713	0.0	68
120 min Summer	34.246	0.0	128
180 min Summer	25.149	0.0	188
240 min Summer	20.078	0.0	248
360 min Summer	14.585	0.0	368
480 min Summer	11.622	0.0	488
600 min Summer	9.738	0.0	608
720 min Summer	8.424	0.0	728
960 min Summer	6.697	0.0	968
1440 min Summer	4.839	0.0	1448
2160 min Summer	3.490	0.0	2168
2880 min Summer	2.766	0.0	2888
4320 min Summer	1.989	0.0	4328
5760 min Summer	1.573	0.0	5768
7200 min Summer	1.311	0.0	7208
8640 min Summer	1.129	0.0	8648
10080 min Summer	0.994	0.0	10088
15 min Winter	138.153	0.0	23



2 Hallam Road, Priory Park East  
Hull, Humberside  
HU4 7DY

Bund Calcs  
Hornage Farm,  
AD Plant

Date 01/05/2022

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Source Control 2019.1

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Volume (m <sup>3</sup> )	Status
30 min Winter	72.864	0.364	375.2	O K
60 min Winter	72.892	0.392	469.2	O K
120 min Winter	72.918	0.418	566.7	O K
180 min Winter	72.931	0.431	624.2	O K
240 min Winter	72.940	0.440	664.5	O K
360 min Winter	72.953	0.453	724.1	O K
480 min Winter	72.962	0.462	769.3	O K
600 min Winter	72.970	0.470	805.8	O K
720 min Winter	72.975	0.475	836.4	O K
960 min Winter	72.985	0.485	886.6	O K
1440 min Winter	72.998	0.498	960.9	O K
2160 min Winter	73.011	0.511	1039.7	O K
2880 min Winter	73.022	0.522	1098.4	O K
4320 min Winter	73.036	0.536	1185.1	O K
5760 min Winter	73.047	0.547	1249.6	O K
7200 min Winter	73.056	0.556	1301.3	O K
8640 min Winter	73.064	0.564	1344.6	O K
10080 min Winter	73.070	0.570	1382.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Time-Peak (mins)
30 min Winter	90.705	0.0	38
60 min Winter	56.713	0.0	68
120 min Winter	34.246	0.0	128
180 min Winter	25.149	0.0	188
240 min Winter	20.078	0.0	248
360 min Winter	14.585	0.0	368
480 min Winter	11.622	0.0	488
600 min Winter	9.738	0.0	608
720 min Winter	8.424	0.0	728
960 min Winter	6.697	0.0	968
1440 min Winter	4.839	0.0	1448
2160 min Winter	3.490	0.0	2168
2880 min Winter	2.766	0.0	2888
4320 min Winter	1.989	0.0	4328
5760 min Winter	1.573	0.0	5768
7200 min Winter	1.311	0.0	7208
8640 min Winter	1.129	0.0	8648
10080 min Winter	0.994	0.0	10088

2 Hallam Road, Priory Park East  
Hull, Humberside  
HU4 7DY

Bund Calcs  
Hornage Farm,  
AD Plant



Date 01/05/2022

Designed by DJC

File Bund Calcs No Outfall.SRCX

Checked by JHC

Innovyze

Source Control 2019.1

### Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

### Time Area Diagram


Total Area (ha) 0.985

Time (mins)	Area	Time (mins)	Area
From:	To: (ha)	From:	To: (ha)
0	4 0.492	4	8 0.493

### Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From:	To: (ha)
0	4 0.000

GGP Consult		Page 4
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Bund Calcs Hornage Farm, AD Plant	
Date 01/05/2022 File Bund Calcs No Outfall.SRCX	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 75.000

Tank or Pond Structure

Invert Level (m) 72.500

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	0.0	0.500	5836.0	2.500	5836.0

**APPENDIX II**

Silage Clamp 21/s Calculations

GGP Consult		Page 1
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs No Outfall....		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Summary of Results for 1 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	72.683	0.233	2.0	145.8	O K
30 min Summer	72.753	0.303	2.0	189.6	O K
60 min Summer	72.831	0.381	2.0	238.3	O K
120 min Summer	72.917	0.467	2.0	291.6	O K
180 min Summer	72.970	0.520	2.0	325.0	O K
240 min Summer	73.009	0.559	2.0	349.5	O K
360 min Summer	73.062	0.612	2.0	382.4	O K
480 min Summer	73.097	0.647	2.0	404.3	O K
600 min Summer	73.122	0.672	2.0	420.3	O K
720 min Summer	73.142	0.692	2.0	432.4	O K
960 min Summer	73.168	0.718	2.0	449.0	O K
1440 min Summer	73.193	0.743	2.0	464.2	O K
2160 min Summer	73.197	0.747	2.0	466.6	O K
2880 min Summer	73.191	0.741	2.0	463.0	O K
4320 min Summer	73.170	0.720	2.0	449.7	O K
5760 min Summer	73.143	0.693	2.0	433.1	O K
7200 min Summer	73.114	0.664	2.0	415.0	O K
8640 min Summer	73.084	0.634	2.0	396.4	O K
10080 min Summer	73.054	0.604	2.0	377.5	O K
15 min Winter	72.712	0.262	2.0	163.5	O K
30 min Winter	72.790	0.340	2.0	212.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	43.387	0.0	132.2	27
30 min Summer	28.301	0.0	160.4	41
60 min Summer	17.920	0.0	239.6	70
120 min Summer	11.119	0.0	290.8	130
180 min Summer	8.370	0.0	318.6	190
240 min Summer	6.835	0.0	333.3	250
360 min Summer	5.105	0.0	336.5	368
480 min Summer	4.138	0.0	334.1	488
600 min Summer	3.516	0.0	331.7	606
720 min Summer	3.078	0.0	329.4	726
960 min Summer	2.495	0.0	324.8	964
1440 min Summer	1.857	0.0	315.5	1442
2160 min Summer	1.383	0.0	640.0	1888
2880 min Summer	1.120	0.0	629.4	2280
4320 min Summer	0.833	0.0	590.5	3068
5760 min Summer	0.676	0.0	884.1	3880
7200 min Summer	0.574	0.0	939.5	4696
8640 min Summer	0.503	0.0	986.0	5536
10080 min Summer	0.450	0.0	1020.3	6360
15 min Winter	43.387	0.0	144.8	26
30 min Winter	28.301	0.0	169.0	41

GGP Consult		Page 2
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs No Outfall....		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Summary of Results for 1 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	72.878	0.428	2.0	267.5	O K
120 min Winter	72.975	0.525	2.0	327.8	O K
180 min Winter	73.035	0.585	2.0	365.9	O K
240 min Winter	73.081	0.631	2.0	394.1	O K
360 min Winter	73.142	0.692	2.0	432.4	O K
480 min Winter	73.183	0.733	2.0	458.3	O K
600 min Winter	73.214	0.764	2.0	477.7	O K
720 min Winter	73.238	0.788	2.0	492.7	O K
960 min Winter	73.273	0.823	2.0	514.2	O K
1440 min Winter	73.310	0.860	2.0	537.3	O K
2160 min Winter	73.324	0.874	2.0	546.5	O K
2880 min Winter	73.314	0.864	2.0	539.9	O K
4320 min Winter	73.282	0.832	2.0	520.2	O K
5760 min Winter	73.241	0.791	2.0	494.3	O K
7200 min Winter	73.194	0.744	2.0	465.0	O K
8640 min Winter	73.145	0.695	2.0	434.3	O K
10080 min Winter	73.095	0.645	2.0	403.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	17.920	0.0	266.1	70
120 min Winter	11.119	0.0	317.4	128
180 min Winter	8.370	0.0	337.8	186
240 min Winter	6.835	0.0	339.4	246
360 min Winter	5.105	0.0	337.2	362
480 min Winter	4.138	0.0	334.9	480
600 min Winter	3.516	0.0	332.8	596
720 min Winter	3.078	0.0	330.7	714
960 min Winter	2.495	0.0	326.5	944
1440 min Winter	1.857	0.0	318.1	1400
2160 min Winter	1.383	0.0	650.7	2060
2880 min Winter	1.120	0.0	636.7	2656
4320 min Winter	0.833	0.0	604.8	3324
5760 min Winter	0.676	0.0	990.2	4224
7200 min Winter	0.574	0.0	1051.1	5128
8640 min Winter	0.503	0.0	1098.9	6048
10080 min Winter	0.450	0.0	1118.7	6864

GGP Consult		Page 3
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs No Outfall....		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.818

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.606		0.606		0.606

Time Area Diagram


Total Area (ha) 0.000

<b>Time (mins)</b>	<b>Area (ha)</b>
<b>From:</b>	<b>To:</b>
0	4
	0.000

Time Area Diagram

Total Area (ha) 0.000

<b>Time (mins)</b>	<b>Area (ha)</b>
<b>From:</b>	<b>To:</b>
0	4
	0.000

GGP Consult		Page 4
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Silage Clamps Hornage Farm, AD Plant	
Date 01/05/2022 File Clamp Calcs No Outfall....	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 74.450

Tank or Pond Structure

Invert Level (m) 72.450

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	625.0	2.000	625.0

Pump Outflow Control

Invert Level (m) 72.450

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0000	0.900	2.0000	1.700	2.0000	2.500	2.0000
0.200	2.0000	1.000	2.0000	1.800	2.0000	2.600	2.0000
0.300	2.0000	1.100	2.0000	1.900	2.0000	2.700	2.0000
0.400	2.0000	1.200	2.0000	2.000	2.0000	2.800	2.0000
0.500	2.0000	1.300	2.0000	2.100	2.0000	2.900	2.0000
0.600	2.0000	1.400	2.0000	2.200	2.0000	3.000	2.0000
0.700	2.0000	1.500	2.0000	2.300	2.0000		
0.800	2.0000	1.600	2.0000	2.400	2.0000		



GGP Consult		Page 1
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs No Outfall....		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Summary of Results for 2 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	72.752	0.302	2.0	188.9	O K
30 min Summer	72.841	0.391	2.0	244.3	O K
60 min Summer	72.935	0.485	2.0	302.9	O K
120 min Summer	73.035	0.585	2.0	365.7	O K
180 min Summer	73.097	0.647	2.0	404.4	O K
240 min Summer	73.142	0.692	2.0	432.6	O K
360 min Summer	73.204	0.754	2.0	471.5	O K
480 min Summer	73.247	0.797	2.0	498.1	O K
600 min Summer	73.278	0.828	2.0	517.8	O K
720 min Summer	73.303	0.853	2.0	532.9	O K
960 min Summer	73.337	0.887	2.0	554.1	O K
1440 min Summer	73.371	0.921	2.0	575.4	O K
2160 min Summer	73.379	0.929	2.0	580.5	O K
2880 min Summer	73.369	0.919	2.0	574.3	O K
4320 min Summer	73.342	0.892	2.0	557.3	O K
5760 min Summer	73.311	0.861	2.0	538.1	O K
7200 min Summer	73.278	0.828	2.0	517.8	O K
8640 min Summer	73.245	0.795	2.0	496.9	O K
10080 min Summer	73.212	0.762	2.0	476.0	O K
15 min Winter	72.789	0.339	2.0	211.8	O K
30 min Winter	72.888	0.438	2.0	274.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	56.082	0.0	159.8	27
30 min Summer	36.348	0.0	171.3	41
60 min Summer	22.680	0.0	295.9	72
120 min Summer	13.855	0.0	337.1	130
180 min Summer	10.330	0.0	340.9	190
240 min Summer	8.375	0.0	339.8	250
360 min Summer	6.209	0.0	337.7	368
480 min Summer	5.013	0.0	335.7	488
600 min Summer	4.246	0.0	333.7	608
720 min Summer	3.706	0.0	331.7	726
960 min Summer	2.991	0.0	327.8	966
1440 min Summer	2.210	0.0	319.9	1444
2160 min Summer	1.634	0.0	653.0	2148
2880 min Summer	1.318	0.0	638.7	2460
4320 min Summer	0.973	0.0	604.7	3208
5760 min Summer	0.785	0.0	1027.1	4032
7200 min Summer	0.665	0.0	1084.4	4832
8640 min Summer	0.580	0.0	1122.5	5696
10080 min Summer	0.517	0.0	1105.7	6464
15 min Winter	56.082	0.0	168.9	27
30 min Winter	36.348	0.0	171.4	41

2 Hallam Road, Priory Park East  
 Hull, Humberside  
 HU4 7DY

Silage Clamps  
 Hornage Farm,  
 AD Plant



Date 01/05/2022  
 File Clamp Calcs No Outfall....

Designed by DJC  
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Innovyze

Source Control 2019.1

Summary of Results for 2 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	72.994	0.544	2.0	340.0	O K
120 min Winter	73.108	0.658	2.0	411.0	O K
180 min Winter	73.178	0.728	2.0	455.1	O K
240 min Winter	73.230	0.780	2.0	487.4	O K
360 min Winter	73.302	0.852	2.0	532.5	O K
480 min Winter	73.352	0.902	2.0	563.8	O K
600 min Winter	73.390	0.940	2.0	587.4	O K
720 min Winter	73.419	0.969	2.0	605.9	O K
960 min Winter	73.462	1.012	2.0	632.7	O K
1440 min Winter	73.510	1.060	2.0	662.8	O K
2160 min Winter	73.535	1.085	2.0	678.1	O K
2880 min Winter	73.530	1.080	2.0	674.9	O K
4320 min Winter	73.489	1.039	2.0	649.5	O K
5760 min Winter	73.446	0.996	2.0	622.5	O K
7200 min Winter	73.396	0.946	2.0	591.5	O K
8640 min Winter	73.344	0.894	2.0	558.6	O K
10080 min Winter	73.290	0.840	2.0	525.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	22.680	0.0	322.3	70
120 min Winter	13.855	0.0	342.3	128
180 min Winter	10.330	0.0	341.2	188
240 min Winter	8.375	0.0	340.2	246
360 min Winter	6.209	0.0	338.2	364
480 min Winter	5.013	0.0	336.3	480
600 min Winter	4.246	0.0	334.4	598
720 min Winter	3.706	0.0	332.6	716
960 min Winter	2.991	0.0	328.9	948
1440 min Winter	2.210	0.0	321.7	1408
2160 min Winter	1.634	0.0	656.2	2080
2880 min Winter	1.318	0.0	644.1	2736
4320 min Winter	0.973	0.0	616.3	3460
5760 min Winter	0.785	0.0	1147.9	4376
7200 min Winter	0.665	0.0	1201.3	5264
8640 min Winter	0.580	0.0	1196.1	6216
10080 min Winter	0.517	0.0	1151.8	7064

GGP Consult		Page 3
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs No Outfall....		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.818

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.606		0.606		0.606

Time Area Diagram


Total Area (ha) 0.000

<b>Time (mins)</b>	<b>Area (ha)</b>
<b>From:</b>	<b>To:</b>
0	4
	0.000

Time Area Diagram

Total Area (ha) 0.000

<b>Time (mins)</b>	<b>Area (ha)</b>
<b>From:</b>	<b>To:</b>
0	4
	0.000

GGP Consult		Page 4
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Silage Clamps Hornage Farm, AD Plant	
Date 01/05/2022 File Clamp Calcs No Outfall....	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 74.450

Tank or Pond Structure

Invert Level (m) 72.450

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	625.0	2.000	625.0

Pump Outflow Control

Invert Level (m) 72.450

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0000	0.900	2.0000	1.700	2.0000	2.500	2.0000
0.200	2.0000	1.000	2.0000	1.800	2.0000	2.600	2.0000
0.300	2.0000	1.100	2.0000	1.900	2.0000	2.700	2.0000
0.400	2.0000	1.200	2.0000	2.000	2.0000	2.800	2.0000
0.500	2.0000	1.300	2.0000	2.100	2.0000	2.900	2.0000
0.600	2.0000	1.400	2.0000	2.200	2.0000	3.000	2.0000
0.700	2.0000	1.500	2.0000	2.300	2.0000		
0.800	2.0000	1.600	2.0000	2.400	2.0000		


GGP Consult		Page 1
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs No Outfall....		Designed by DJC Checked by JHC
Innovyze	Source Control 2019.1	



Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	72.904	0.454	2.0	283.7	O K
30 min Summer	73.035	0.585	2.0	365.8	O K
60 min Summer	73.172	0.722	2.0	451.5	O K
120 min Summer	73.316	0.866	2.0	540.9	O K
180 min Summer	73.402	0.952	2.0	594.8	O K
240 min Summer	73.463	1.013	2.0	633.1	O K
360 min Summer	73.550	1.100	2.0	687.6	O K
480 min Summer	73.612	1.162	2.0	726.0	O K
600 min Summer	73.658	1.208	2.0	754.9	O K
720 min Summer	73.694	1.244	2.0	777.7	O K
960 min Summer	73.747	1.297	2.0	810.8	O K
1440 min Summer	73.808	1.358	2.0	848.5	O K
2160 min Summer	73.840	1.390	2.0	868.7	O K
2880 min Summer	73.837	1.387	2.0	866.7	O K
4320 min Summer	73.793	1.343	2.0	839.2	O K
5760 min Summer	73.747	1.297	2.0	810.8	O K
7200 min Summer	73.704	1.254	2.0	783.9	O K
8640 min Summer	73.663	1.213	2.0	757.8	O K
10080 min Summer	73.621	1.171	2.0	732.2	O K
15 min Winter	72.959	0.509	2.0	318.0	O K
30 min Winter	73.106	0.656	2.0	410.1	O K


Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	83.912	0.0	172.0	27
30 min Summer	54.206	0.0	171.5	42
60 min Summer	33.604	0.0	343.8	72
120 min Summer	20.311	0.0	342.8	132
180 min Summer	15.011	0.0	342.0	190
240 min Summer	12.078	0.0	341.2	250
360 min Summer	8.874	0.0	339.6	370
480 min Summer	7.126	0.0	338.2	490
600 min Summer	6.008	0.0	336.7	608
720 min Summer	5.225	0.0	335.3	728
960 min Summer	4.190	0.0	332.5	968
1440 min Summer	3.067	0.0	327.0	1446
2160 min Summer	2.244	0.0	663.9	2164
2880 min Summer	1.797	0.0	654.2	2880
4320 min Summer	1.313	0.0	630.7	3680
5760 min Summer	1.051	0.0	1291.3	4440
7200 min Summer	0.884	0.0	1253.6	5192
8640 min Summer	0.767	0.0	1210.6	5976
10080 min Summer	0.681	0.0	1163.6	6856
15 min Winter	83.912	0.0	172.0	27
30 min Winter	54.206	0.0	171.6	41

GGP Consult		Page 2
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Silage Clamps Hornage Farm, AD Plant	
Date 01/05/2022 File Clamp Calcs No Outfall....	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Summary of Results for 10 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	73.260	0.810	2.0	506.4	O K
120 min Winter	73.422	0.972	2.0	607.5	O K
180 min Winter	73.520	1.070	2.0	668.6	O K
240 min Winter	73.590	1.140	2.0	712.3	O K
360 min Winter	73.690	1.240	2.0	775.0	O K
480 min Winter	73.761	1.311	2.0	819.7	O K
600 min Winter	73.816	1.366	2.0	853.8	O K
720 min Winter	73.859	1.409	2.0	880.9	O K
960 min Winter	73.924	1.474	2.0	921.4	O K
1440 min Winter	74.003	1.553	2.0	970.5	O K
2160 min Winter	74.055	1.605	2.0	1003.4	O K
2880 min Winter	74.068	1.618	2.0	1011.4	O K
4320 min Winter	74.036	1.586	2.0	991.4	O K
5760 min Winter	73.971	1.521	2.0	950.8	O K
7200 min Winter	73.915	1.465	2.0	915.8	O K
8640 min Winter	73.857	1.407	2.0	879.2	O K
10080 min Winter	73.796	1.346	2.0	841.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	33.604	0.0	343.9	70
120 min Winter	20.311	0.0	343.0	130
180 min Winter	15.011	0.0	342.1	188
240 min Winter	12.078	0.0	341.3	246
360 min Winter	8.874	0.0	339.8	364
480 min Winter	7.126	0.0	338.3	482
600 min Winter	6.008	0.0	336.9	600
720 min Winter	5.225	0.0	335.5	718
960 min Winter	4.190	0.0	332.8	952
1440 min Winter	3.067	0.0	327.3	1420
2160 min Winter	2.244	0.0	664.8	2108
2880 min Winter	1.797	0.0	656.1	2796
4320 min Winter	1.313	0.0	636.6	4104
5760 min Winter	1.051	0.0	1303.8	4792
7200 min Winter	0.884	0.0	1274.4	5616
8640 min Winter	0.767	0.0	1240.4	6488
10080 min Winter	0.681	0.0	1202.5	7456

GGP Consult		Page 3
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Silage Clamps Hornage Farm, AD Plant	
Date 01/05/2022 File Clamp Calcs No Outfall....	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	10	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.818

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.606		0.606		0.606

Time Area Diagram


Total Area (ha) 0.000

<b>Time (mins)</b>	<b>Area (ha)</b>
<b>From:</b>	<b>To:</b>
0	4
	0.000

Time Area Diagram

Total Area (ha) 0.000

<b>Time (mins)</b>	<b>Area (ha)</b>
<b>From:</b>	<b>To:</b>
0	4
	0.000

GGP Consult		Page 4
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Silage Clamps Hornage Farm, AD Plant	
Date 01/05/2022 File Clamp Calcs No Outfall....	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 74.450

Tank or Pond Structure

Invert Level (m) 72.450

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	625.0	2.000	625.0

Pump Outflow Control

Invert Level (m) 72.450

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0000	0.900	2.0000	1.700	2.0000	2.500	2.0000
0.200	2.0000	1.000	2.0000	1.800	2.0000	2.600	2.0000
0.300	2.0000	1.100	2.0000	1.900	2.0000	2.700	2.0000
0.400	2.0000	1.200	2.0000	2.000	2.0000	2.800	2.0000
0.500	2.0000	1.300	2.0000	2.100	2.0000	2.900	2.0000
0.600	2.0000	1.400	2.0000	2.200	2.0000	3.000	2.0000
0.700	2.0000	1.500	2.0000	2.300	2.0000		
0.800	2.0000	1.600	2.0000	2.400	2.0000		



GGP Consult		Page 1
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs No Outfall....		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Summary of Results for 30 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	73.027	0.577	2.0	360.4	O K
30 min Summer	73.200	0.750	2.0	468.6	O K
60 min Summer	73.380	0.930	2.0	581.2	O K
120 min Summer	73.566	1.116	2.0	697.3	O K
180 min Summer	73.675	1.225	2.0	765.6	O K
240 min Summer	73.751	1.301	2.0	813.1	O K
360 min Summer	73.859	1.409	2.0	880.7	O K
480 min Summer	73.936	1.486	2.0	928.9	O K
600 min Summer	73.995	1.545	2.0	965.6	O K
720 min Summer	74.041	1.591	2.0	994.5	O K
960 min Summer	74.110	1.660	2.0	1037.5	O K
1440 min Summer	74.192	1.742	2.0	1088.7	O K
2160 min Summer	74.244	1.794	2.0	1121.5	O K
2880 min Summer	74.254	1.804	2.0	1127.3	O K
4320 min Summer	74.209	1.759	2.0	1099.3	O K
5760 min Summer	74.145	1.695	2.0	1059.4	O K
7200 min Summer	74.086	1.636	2.0	1022.8	O K
8640 min Summer	74.033	1.583	2.0	989.4	O K
10080 min Summer	73.983	1.533	2.0	958.2	O K
15 min Winter	73.096	0.646	2.0	403.9	O K
30 min Winter	73.290	0.840	2.0	525.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	106.449	0.0	172.0	27
30 min Summer	69.298	0.0	171.7	42
60 min Summer	43.136	0.0	344.0	72
120 min Summer	26.061	0.0	343.3	132
180 min Summer	19.202	0.0	342.6	190
240 min Summer	15.393	0.0	341.9	250
360 min Summer	11.248	0.0	340.7	370
480 min Summer	8.999	0.0	339.5	490
600 min Summer	7.565	0.0	338.4	610
720 min Summer	6.562	0.0	337.2	728
960 min Summer	5.240	0.0	335.0	968
1440 min Summer	3.812	0.0	330.6	1446
2160 min Summer	2.770	0.0	669.5	2164
2880 min Summer	2.207	0.0	662.2	2884
4320 min Summer	1.601	0.0	644.8	4276
5760 min Summer	1.274	0.0	1313.2	4848
7200 min Summer	1.067	0.0	1283.0	5552
8640 min Summer	0.922	0.0	1246.1	6312
10080 min Summer	0.816	0.0	1204.1	7064
15 min Winter	106.449	0.0	172.1	27
30 min Winter	69.298	0.0	171.7	41

GGP Consult		Page 2
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs No Outfall....		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Summary of Results for 30 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	73.493	1.043	2.0	651.7	O K
120 min Winter	73.702	1.252	2.0	782.7	O K
180 min Winter	73.826	1.376	2.0	860.0	O K
240 min Winter	73.913	1.463	2.0	914.1	O K
360 min Winter	74.037	1.587	2.0	991.6	O K
480 min Winter	74.126	1.676	2.0	1047.4	O K
600 min Winter	74.194	1.744	2.0	1090.1	O K
720 min Winter	74.249	1.799	2.0	1124.4	O K
960 min Winter	74.332	1.882	2.0	1176.1	Flood Risk
1440 min Winter	74.435	1.985	2.0	1240.6	Flood Risk
2160 min Winter	74.511	2.061	2.0	1288.2	FLOOD
2880 min Winter	74.539	2.089	2.0	1305.6	FLOOD
4320 min Winter	74.523	2.073	2.0	1295.4	FLOOD
5760 min Winter	74.458	2.008	2.0	1255.0	FLOOD
7200 min Winter	74.375	1.925	2.0	1202.9	Flood Risk
8640 min Winter	74.306	1.856	2.0	1160.0	Flood Risk
10080 min Winter	74.239	1.789	2.0	1117.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	43.136	0.0	344.1	72
120 min Winter	26.061	0.0	343.3	130
180 min Winter	19.202	0.0	342.6	188
240 min Winter	15.393	0.0	341.9	248
360 min Winter	11.248	0.0	340.7	366
480 min Winter	8.999	0.0	339.4	484
600 min Winter	7.565	0.0	338.2	602
720 min Winter	6.562	0.0	337.0	720
960 min Winter	5.240	0.0	334.7	956
1440 min Winter	3.812	0.0	330.1	1426
2160 min Winter	2.770	38.2	668.9	2124
2880 min Winter	2.207	55.6	661.9	2804
4320 min Winter	1.601	45.4	646.6	4152
5760 min Winter	1.274	5.0	1320.1	5424
7200 min Winter	1.067	0.0	1297.5	6480
8640 min Winter	0.922	0.0	1269.3	6752
10080 min Winter	0.816	0.0	1236.4	7672

GGP Consult		Page 3
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs No Outfall....		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.818

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.606		0.606		0.606

Time Area Diagram


Total Area (ha) 0.000

Time (mins)	Area
From:	To:
0	4
	0.000

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From:	To:
0	4
	0.000

GGP Consult		Page 4
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Silage Clamps Hornage Farm, AD Plant	
Date 01/05/2022 File Clamp Calcs No Outfall....	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 74.450

Tank or Pond Structure


Invert Level (m) 72.450

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	625.0	2.000	625.0

Pump Outflow Control

Invert Level (m) 72.450

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0000	0.900	2.0000	1.700	2.0000	2.500	2.0000
0.200	2.0000	1.000	2.0000	1.800	2.0000	2.600	2.0000
0.300	2.0000	1.100	2.0000	1.900	2.0000	2.700	2.0000
0.400	2.0000	1.200	2.0000	2.000	2.0000	2.800	2.0000
0.500	2.0000	1.300	2.0000	2.100	2.0000	2.900	2.0000
0.600	2.0000	1.400	2.0000	2.200	2.0000	3.000	2.0000
0.700	2.0000	1.500	2.0000	2.300	2.0000		
0.800	2.0000	1.600	2.0000	2.400	2.0000		

GGP Consult		Page 1
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Silage Clamps Hornage Farm, AD Plant	
Date 01/05/2022 File Clamp Calcs No Outfall....	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	73.200	0.750	2.0	468.5	O K
30 min Summer	73.433	0.983	2.0	614.4	O K
60 min Summer	73.676	1.226	2.0	766.1	O K
120 min Summer	73.922	1.472	2.0	920.1	O K
180 min Summer	74.063	1.613	2.0	1008.3	O K
240 min Summer	74.159	1.709	2.0	1068.0	O K
360 min Summer	74.294	1.844	2.0	1152.7	O K
480 min Summer	74.392	1.942	2.0	1213.9	Flood Risk
600 min Summer	74.467	2.017	2.0	1260.4	FLOOD
720 min Summer	74.526	2.076	2.0	1297.5	FLOOD
960 min Summer	74.615	2.165	2.0	1353.0	FLOOD
1440 min Summer	74.724	2.274	2.0	1421.4	FLOOD
2160 min Summer	74.802	2.352	2.0	1470.1	FLOOD
2880 min Summer	74.828	2.378	2.0	1486.0	FLOOD
4320 min Summer	74.800	2.350	2.0	1468.7	FLOOD
5760 min Summer	74.720	2.270	2.0	1418.4	FLOOD
7200 min Summer	74.635	2.185	2.0	1365.6	FLOOD
8640 min Summer	74.560	2.110	2.0	1318.5	FLOOD
10080 min Summer	74.492	2.042	2.0	1276.0	FLOOD
15 min Winter	73.290	0.840	2.0	524.9	O K
30 min Winter	73.552	1.102	2.0	688.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	138.153	0.0	172.1	27
30 min Summer	90.705	0.0	171.8	42
60 min Summer	56.713	0.0	344.3	72
120 min Summer	34.246	0.0	343.7	132
180 min Summer	25.149	0.0	343.1	192
240 min Summer	20.078	0.0	342.6	252
360 min Summer	14.585	0.0	341.6	370
480 min Summer	11.622	0.0	340.7	490
600 min Summer	9.738	10.4	339.8	610
720 min Summer	8.424	47.5	338.9	730
960 min Summer	6.697	103.0	337.2	970
1440 min Summer	4.839	171.4	333.8	1448
2160 min Summer	3.490	220.1	674.3	2168
2880 min Summer	2.766	236.0	668.9	2884
4320 min Summer	1.989	218.7	656.5	4324
5760 min Summer	1.573	168.4	1332.2	5592
7200 min Summer	1.311	115.6	1311.3	6128
8640 min Summer	1.129	68.5	1283.5	6832
10080 min Summer	0.994	26.0	1249.0	7568
15 min Winter	138.153	0.0	172.1	27
30 min Winter	90.705	0.0	171.8	42

2 Hallam Road, Priory Park East  
 Hull, Humberside  
 HU4 7DY

Silage Clamps  
 Hornage Farm,  
 AD Plant



Date 01/05/2022  
 File Clamp Calcs No Outfall....

Designed by DJC  
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Innovyze

Source Control 2019.1

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	73.824	1.374	2.0	858.9	O K
120 min Winter	74.102	1.652	2.0	1032.3	O K
180 min Winter	74.261	1.811	2.0	1132.0	O K
240 min Winter	74.370	1.920	2.0	1199.8	Flood Risk
360 min Winter	74.524	2.074	2.0	1296.5	FLOOD
480 min Winter	74.637	2.187	2.0	1366.8	FLOOD
600 min Winter	74.723	2.273	2.0	1420.8	FLOOD
720 min Winter	74.793	2.343	2.0	1464.2	FLOOD
960 min Winter	74.898	2.448	2.0	1530.1	FLOOD
1440 min Winter	75.033	2.583	2.0	1614.2	FLOOD
2160 min Winter	75.138	2.688	2.0	1680.1	FLOOD
2880 min Winter	75.185	2.735	2.0	1709.4	FLOOD
4320 min Winter	75.191	2.741	2.0	1712.9	FLOOD
5760 min Winter	75.135	2.685	2.0	1677.9	FLOOD
7200 min Winter	75.047	2.597	2.0	1623.1	FLOOD
8640 min Winter	74.945	2.495	2.0	1559.2	FLOOD
10080 min Winter	74.852	2.402	2.0	1501.3	FLOOD

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	56.713	0.0	344.3	72
120 min Winter	34.246	0.0	343.6	130
180 min Winter	25.149	0.0	343.0	190
240 min Winter	20.078	0.0	342.5	248
360 min Winter	14.585	46.5	341.4	366
480 min Winter	11.622	116.8	340.4	484
600 min Winter	9.738	170.8	339.3	604
720 min Winter	8.424	214.2	338.3	722
960 min Winter	6.697	280.1	336.4	958
1440 min Winter	4.839	364.2	332.5	1430
2160 min Winter	3.490	430.1	672.4	2128
2880 min Winter	2.766	459.4	666.5	2828
4320 min Winter	1.989	462.9	654.2	4196
5760 min Winter	1.573	427.9	1332.1	5536
7200 min Winter	1.311	373.1	1316.8	6840
8640 min Winter	1.129	309.2	1297.7	7960
10080 min Winter	0.994	251.3	1272.5	8080

GGP Consult		Page 3
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs No Outfall....		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.818

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.606		0.606		0.606

Time Area Diagram


Total Area (ha) 0.000

Time (mins)	Area (ha)
From:	To:
0	4
	0.000

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area (ha)
From:	To:
0	4
	0.000

GGP Consult		Page 4
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Silage Clamps Hornage Farm, AD Plant	
Date 01/05/2022 File Clamp Calcs No Outfall....	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 74.450

Tank or Pond Structure

Invert Level (m) 72.450

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	625.0	2.000	625.0

Pump Outflow Control

Invert Level (m) 72.450

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0000	0.900	2.0000	1.700	2.0000	2.500	2.0000
0.200	2.0000	1.000	2.0000	1.800	2.0000	2.600	2.0000
0.300	2.0000	1.100	2.0000	1.900	2.0000	2.700	2.0000
0.400	2.0000	1.200	2.0000	2.000	2.0000	2.800	2.0000
0.500	2.0000	1.300	2.0000	2.100	2.0000	2.900	2.0000
0.600	2.0000	1.400	2.0000	2.200	2.0000	3.000	2.0000
0.700	2.0000	1.500	2.0000	2.300	2.0000		
0.800	2.0000	1.600	2.0000	2.400	2.0000		



## **APPENDIX III**

### Silage Clamp Amended Discharge Rate Calculations


GGP Consult		Page 1
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs Adjusted Ou...		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Summary of Results for 30 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	73.026	0.576	2.5	359.8	O K
30 min Summer	73.198	0.748	2.5	467.6	O K
60 min Summer	73.377	0.927	2.5	579.5	O K
120 min Summer	73.560	1.110	2.5	694.0	O K
180 min Summer	73.667	1.217	2.5	760.7	O K
240 min Summer	73.741	1.291	2.5	806.6	O K
360 min Summer	73.843	1.393	2.5	870.9	O K
480 min Summer	73.915	1.465	2.5	915.9	O K
600 min Summer	73.969	1.519	2.5	949.3	O K
720 min Summer	74.010	1.560	2.5	975.0	O K
960 min Summer	74.068	1.618	2.5	1011.5	O K
1440 min Summer	74.130	1.680	2.5	1049.8	O K
2160 min Summer	74.152	1.702	2.5	1063.7	O K
2880 min Summer	74.132	1.682	2.5	1051.5	O K
4320 min Summer	74.055	1.605	2.5	1003.4	O K
5760 min Summer	73.985	1.535	2.5	959.1	O K
7200 min Summer	73.921	1.471	2.5	919.4	O K
8640 min Summer	73.861	1.411	2.5	881.9	O K
10080 min Summer	73.803	1.353	2.5	845.7	O K
15 min Winter	73.095	0.645	2.5	403.3	O K
30 min Winter	73.289	0.839	2.5	524.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	106.449	0.0	215.0	27
30 min Summer	69.298	0.0	214.6	42
60 min Summer	43.136	0.0	430.0	72
120 min Summer	26.061	0.0	429.1	132
180 min Summer	19.202	0.0	428.2	190
240 min Summer	15.393	0.0	427.4	250
360 min Summer	11.248	0.0	425.8	370
480 min Summer	8.999	0.0	424.3	490
600 min Summer	7.565	0.0	422.8	608
720 min Summer	6.562	0.0	421.4	728
960 min Summer	5.240	0.0	418.5	968
1440 min Summer	3.812	0.0	412.6	1446
2160 min Summer	2.770	0.0	835.2	2164
2880 min Summer	2.207	0.0	824.4	2880
4320 min Summer	1.601	0.0	796.5	3640
5760 min Summer	1.274	0.0	1619.5	4376
7200 min Summer	1.067	0.0	1572.4	5120
8640 min Summer	0.922	0.0	1516.3	5960
10080 min Summer	0.816	0.0	1455.2	6760
15 min Winter	106.449	0.0	215.1	27
30 min Winter	69.298	0.0	214.6	41

GGP Consult		Page 2
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Silage Clamps Hornage Farm, AD Plant	
Date 01/05/2022 File Clamp Calcs Adjusted Ou...	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Summary of Results for 30 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	73.490	1.040	2.5	650.0	O K
120 min Winter	73.697	1.247	2.5	779.4	O K
180 min Winter	73.818	1.368	2.5	855.2	O K
240 min Winter	73.902	1.452	2.5	907.7	O K
360 min Winter	74.021	1.571	2.5	981.9	O K
480 min Winter	74.105	1.655	2.5	1034.5	O K
600 min Winter	74.169	1.719	2.5	1074.1	O K
720 min Winter	74.218	1.768	2.5	1105.1	O K
960 min Winter	74.291	1.841	2.5	1150.4	O K
1440 min Winter	74.374	1.924	2.5	1202.3	Flood Risk
<b>2160 min Winter</b>	<b>74.420</b>	<b>1.970</b>	<b>2.5</b>	<b>1231.2</b>	<b>Flood Risk</b>
2880 min Winter	74.419	1.969	2.5	1230.7	Flood Risk
4320 min Winter	74.351	1.901	2.5	1187.9	Flood Risk
5760 min Winter	74.252	1.802	2.5	1126.3	O K
7200 min Winter	74.169	1.719	2.5	1074.4	O K
8640 min Winter	74.085	1.635	2.5	1021.8	O K
10080 min Winter	74.000	1.550	2.5	968.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	43.136	0.0	430.1	70
120 min Winter	26.061	0.0	429.1	130
180 min Winter	19.202	0.0	428.2	188
240 min Winter	15.393	0.0	427.4	248
360 min Winter	11.248	0.0	425.8	364
480 min Winter	8.999	0.0	424.2	482
600 min Winter	7.565	0.0	422.7	600
720 min Winter	6.562	0.0	421.2	718
960 min Winter	5.240	0.0	418.2	952
1440 min Winter	3.812	0.0	412.2	1420
<b>2160 min Winter</b>	<b>2.770</b>	<b>0.0</b>	<b>835.3</b>	<b>2108</b>
2880 min Winter	2.207	0.0	825.6	2792
4320 min Winter	1.601	0.0	803.2	4072
5760 min Winter	1.274	0.0	1637.7	4680
7200 min Winter	1.067	0.0	1599.6	5552
8640 min Winter	0.922	0.0	1555.0	6480
10080 min Winter	0.816	0.0	1505.7	7368

GGP Consult		Page 3
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs Adjusted Ou...		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.818

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.606		0.606		0.606

Time Area Diagram

Total Area (ha) 0.000

<b>Time (mins)</b>	<b>Area</b>
<b>From: To:</b>	<b>(ha)</b>
0	4 0.000

Time Area Diagram

Total Area (ha) 0.000

<b>Time (mins)</b>	<b>Area</b>
<b>From: To:</b>	<b>(ha)</b>
0	4 0.000

GGP Consult		Page 4
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs Adjusted Ou...		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Model Details

Storage is Online Cover Level (m) 74.450

Tank or Pond Structure

Invert Level (m) 72.450

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	625.0	2.000	625.0

Pump Outflow Control

Invert Level (m) 72.450

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.5000	0.900	2.5000	1.700	2.5000	2.500	2.5000
0.200	2.5000	1.000	2.5000	1.800	2.5000	2.600	2.5000
0.300	2.5000	1.100	2.5000	1.900	2.5000	2.700	2.5000
0.400	2.5000	1.200	2.5000	2.000	2.5000	2.800	2.5000
0.500	2.5000	1.300	2.5000	2.100	2.5000	2.900	2.5000
0.600	2.5000	1.400	2.5000	2.200	2.5000	3.000	2.5000
0.700	2.5000	1.500	2.5000	2.300	2.5000		
0.800	2.5000	1.600	2.5000	2.400	2.5000		

GGP Consult		Page 1
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs Adjusted Ou...		Designed by DJC Checked by JHC
Innovyze	Source Control 2019.1	



Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
15 min Summer	73.188	0.738	7.6	461.6	O K
30 min Summer	73.416	0.966	7.6	603.5	O K
60 min Summer	73.644	1.194	7.6	746.3	O K
120 min Summer	73.862	1.412	7.6	882.3	O K
180 min Summer	73.973	1.523	7.6	952.1	O K
240 min Summer	74.040	1.590	7.6	993.5	O K
360 min Summer	74.117	1.667	7.6	1041.6	O K
480 min Summer	74.156	1.706	7.6	1066.3	O K
600 min Summer	74.172	1.722	7.6	1076.5	O K
720 min Summer	74.174	1.724	7.6	1077.5	O K
960 min Summer	74.149	1.699	7.6	1062.2	O K
1440 min Summer	74.063	1.613	7.6	1008.1	O K
2160 min Summer	73.949	1.499	7.6	936.9	O K
2880 min Summer	73.850	1.400	7.6	874.8	O K
4320 min Summer	73.666	1.216	7.6	760.3	O K
5760 min Summer	73.497	1.047	7.6	654.3	O K
7200 min Summer	73.340	0.890	7.6	556.5	O K
8640 min Summer	73.198	0.748	7.6	467.6	O K
10080 min Summer	73.070	0.620	7.6	387.6	O K
15 min Winter	73.279	0.829	7.6	518.0	O K
30 min Winter	73.534	1.084	7.6	677.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
15 min Summer	138.153	0.0	469.7	26
30 min Summer	90.705	0.0	605.1	41
60 min Summer	56.713	0.0	773.3	70
120 min Summer	34.246	0.0	933.8	130
180 min Summer	25.149	0.0	1028.4	190
240 min Summer	20.078	0.0	1094.2	248
360 min Summer	14.585	0.0	1188.8	366
480 min Summer	11.622	0.0	1252.3	486
600 min Summer	9.738	0.0	1284.2	604
720 min Summer	8.424	0.0	1282.8	724
960 min Summer	6.697	0.0	1271.9	960
1440 min Summer	4.839	0.0	1243.2	1216
2160 min Summer	3.490	0.0	1713.3	1580
2880 min Summer	2.766	0.0	1810.1	1972
4320 min Summer	1.989	0.0	1952.6	2776
5760 min Summer	1.573	0.0	2058.9	3584
7200 min Summer	1.311	0.0	2144.1	4336
8640 min Summer	1.129	0.0	2215.5	5104
10080 min Summer	0.994	0.0	2277.1	5848
15 min Winter	138.153	0.0	524.4	26
30 min Winter	90.705	0.0	649.2	41

GGP Consult		Page 2
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs Adjusted Ou...		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m <sup>3</sup> )	Status
60 min Winter	73.793	1.343	7.6	839.4	O K
120 min Winter	74.042	1.592	7.6	995.1	O K
180 min Winter	74.173	1.723	7.6	1076.8	O K
240 min Winter	74.253	1.803	7.6	1126.6	O K
360 min Winter	74.350	1.900	7.6	1187.4	Flood Risk
480 min Winter	74.405	1.955	7.6	1221.7	Flood Risk
600 min Winter	74.434	1.984	7.6	1240.0	Flood Risk
720 min Winter	74.446	1.996	7.6	1247.8	Flood Risk
960 min Winter	74.440	1.990	7.6	1243.6	Flood Risk
1440 min Winter	74.360	1.910	7.6	1193.5	Flood Risk
2160 min Winter	74.207	1.757	7.6	1097.8	O K
2880 min Winter	74.070	1.620	7.6	1012.4	O K
4320 min Winter	73.799	1.349	7.6	842.9	O K
5760 min Winter	73.541	1.091	7.6	681.8	O K
7200 min Winter	73.305	0.855	7.6	534.2	O K
8640 min Winter	73.094	0.644	7.6	402.4	O K
10080 min Winter	72.912	0.462	7.6	288.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m <sup>3</sup> )	Discharge Volume (m <sup>3</sup> )	Time-Peak (mins)
60 min Winter	56.713	0.0	866.1	70
120 min Winter	34.246	0.0	1045.6	128
180 min Winter	25.149	0.0	1150.1	186
240 min Winter	20.078	0.0	1219.5	244
360 min Winter	14.585	0.0	1292.9	360
480 min Winter	11.622	0.0	1292.0	476
600 min Winter	9.738	0.0	1287.4	592
720 min Winter	8.424	0.0	1282.8	708
960 min Winter	6.697	0.0	1273.0	932
1440 min Winter	4.839	0.0	1250.2	1362
2160 min Winter	3.490	0.0	1918.9	1696
2880 min Winter	2.766	0.0	2027.3	2160
4320 min Winter	1.989	0.0	2182.5	3032
5760 min Winter	1.573	0.0	2306.3	3872
7200 min Winter	1.311	0.0	2401.4	4680
8640 min Winter	1.129	0.0	2481.7	5376
10080 min Winter	0.994	0.0	2550.7	6056

GGP Consult		Page 3
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY		Silage Clamps Hornage Farm, AD Plant
Date 01/05/2022 File Clamp Calcs Adjusted Ou...		Designed by DJC Checked by JHC
Innovyze		Source Control 2019.1



Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.818

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
From:	To:	From:	To:	From:	To:
0	4	4	8	8	12
	0.606		0.606		0.606

Time Area Diagram

Total Area (ha) 0.000


<b>Time (mins)</b>	<b>Area (ha)</b>
<b>From:</b>	<b>To:</b>
0	4
	0.000

Time Area Diagram

Total Area (ha) 0.000

<b>Time (mins)</b>	<b>Area (ha)</b>
<b>From:</b>	<b>To:</b>
0	4
	0.000



GGP Consult		Page 4
2 Hallam Road, Priory Park East Hull, Humberside HU4 7DY	Silage Clamps Hornage Farm, AD Plant	
Date 01/05/2022 File Clamp Calcs Adjusted Ou...	Designed by DJC Checked by JHC	
Innovyze	Source Control 2019.1	

Model Details

Storage is Online Cover Level (m) 74.450

Tank or Pond Structure

Invert Level (m) 72.450

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	625.0	2.000	625.0

Pump Outflow Control

Invert Level (m) 72.450

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.6000	1.200	7.6000	3.000	7.6000	7.000	7.6000
0.200	7.6000	1.400	7.6000	3.500	7.6000	7.500	7.6000
0.300	7.6000	1.600	7.6000	4.000	7.6000	8.000	7.6000
0.400	7.6000	1.800	7.6000	4.500	7.6000	8.500	7.6000
0.500	7.6000	2.000	7.6000	5.000	7.6000	9.000	7.6000
0.600	7.6000	2.200	7.6000	5.500	7.6000	9.500	7.6000
0.800	7.6000	2.400	7.6000	6.000	7.6000		
1.000	7.6000	2.600	7.6000	6.500	7.6000		

## APPENDIX 03

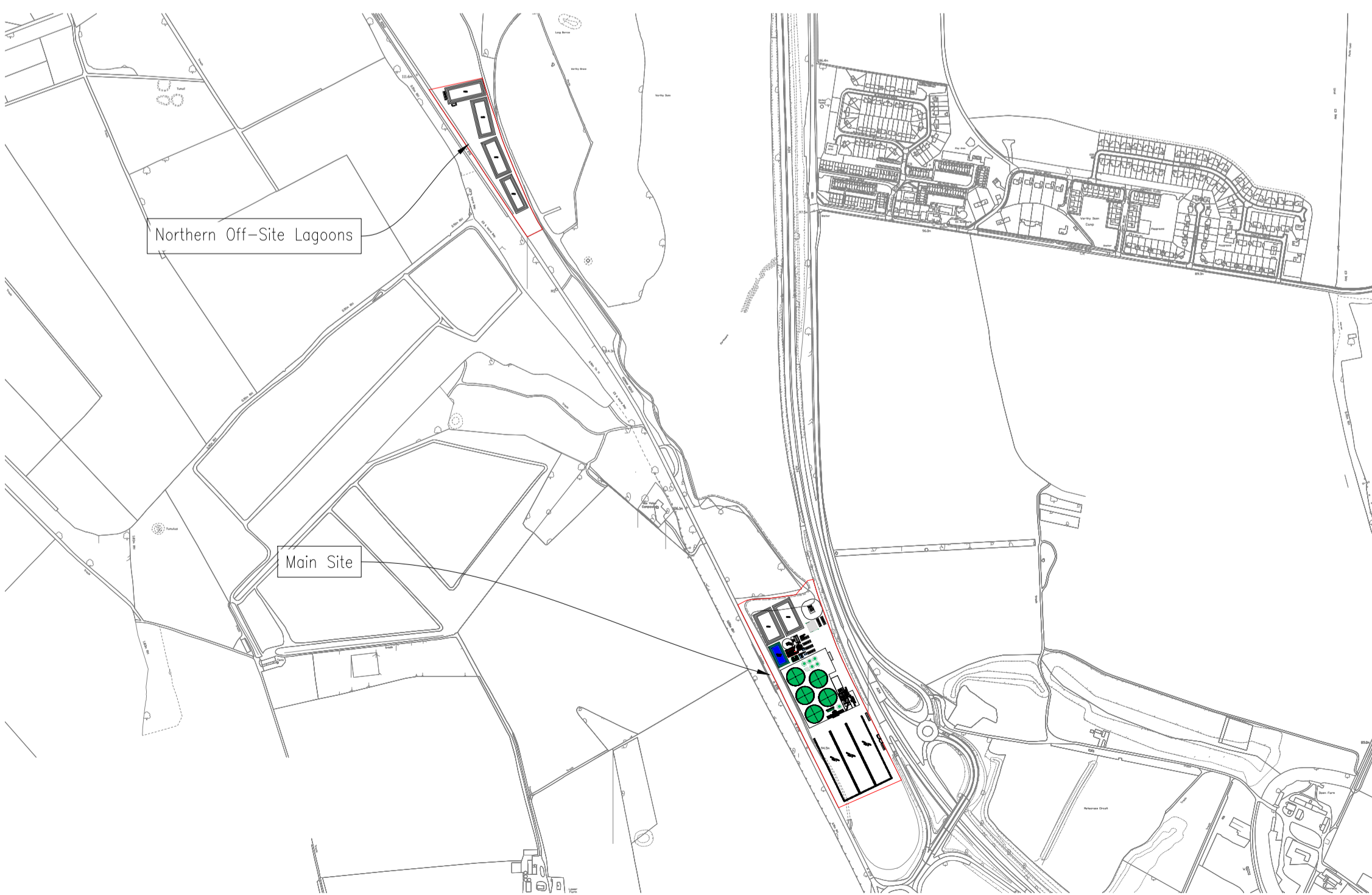
### Infiltration Testing Details



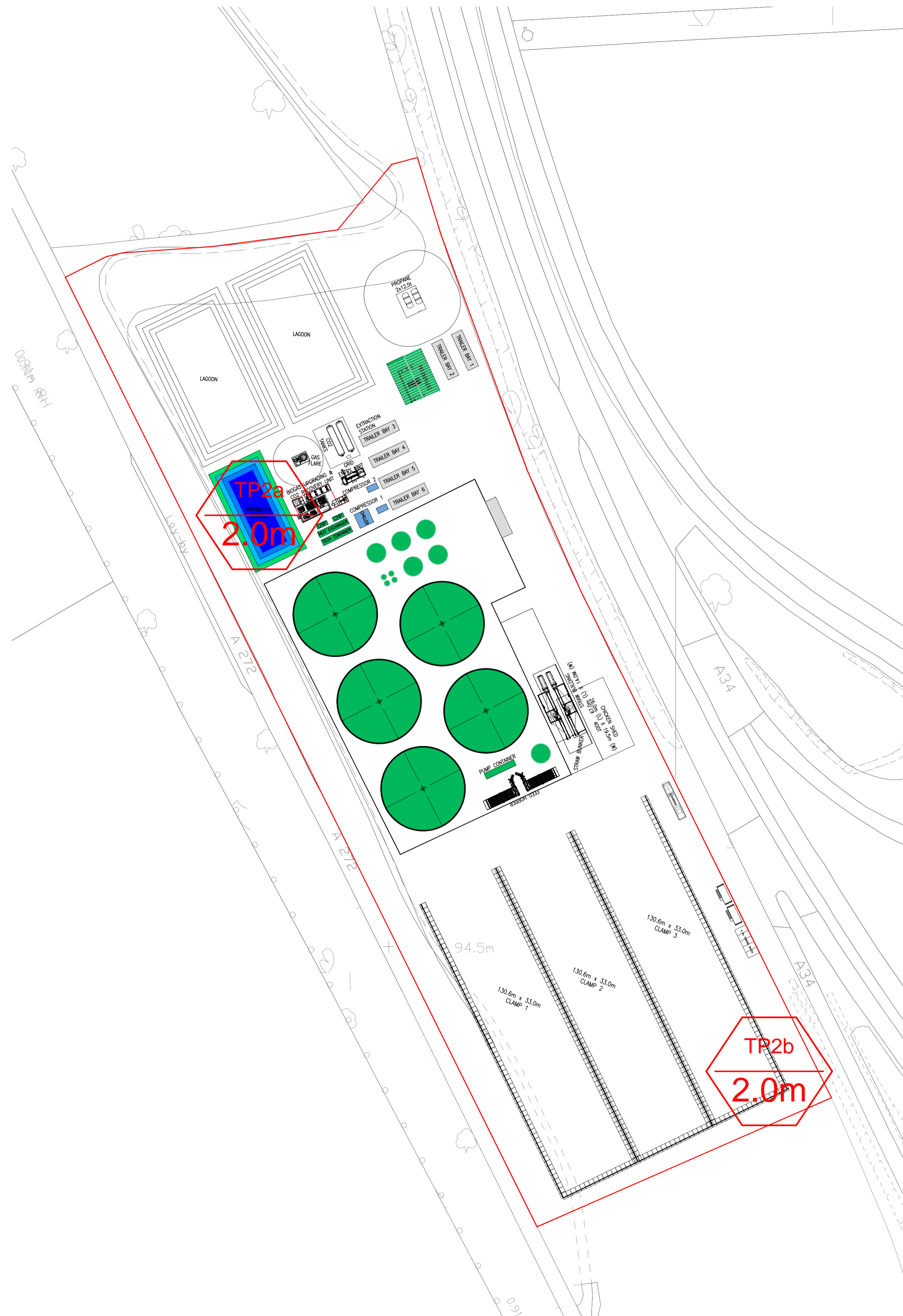




Northern Off-Site Lagoons  
Scale: 1:1000 @ A1



Site Location Plan  
Scale: NTS @ A1



Site General Arrangement  
Scale: 1:1000 @ A1

- NOTES:
1. All dimensions must be checked on site and not scaled from this drawing.
  2. The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
  3. All levels shown on this drawing are relative to Agreed Topographic survey
  4. This drawing is to be read in conjunction with P92506/100 Series Drawings.
  5. All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.

Site Red Line Boundary (6.6ha)

B	07/03/22	ISSUED FOR APPROVAL	DJC	JHC
A	24/02/22	ISSUED FOR APPROVAL	DJC	JHC
Rev	Date	Description	DR	CH

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Client

acorn

Job Title  
**Three Maids AD Plant**

Drawing Title  
**General Arrangement**

Status  
**APPROVAL**

Scale: 1:1000 @ A1      Date: Feb '22

Drawn By: *Daniel Cook*      Checked: JHC      Approved: JHC

Dwg. No.: **P92506/100**      Rev: **02**  
Scale: 1:1000 @ A1

**NOT FOR CONSTRUCTION**

**SOP FORM 3.3.3 - SOIL INFILTRATION RATE TEST**

(See B.R.E. Digest 365, 1991, Soakaway Design.)

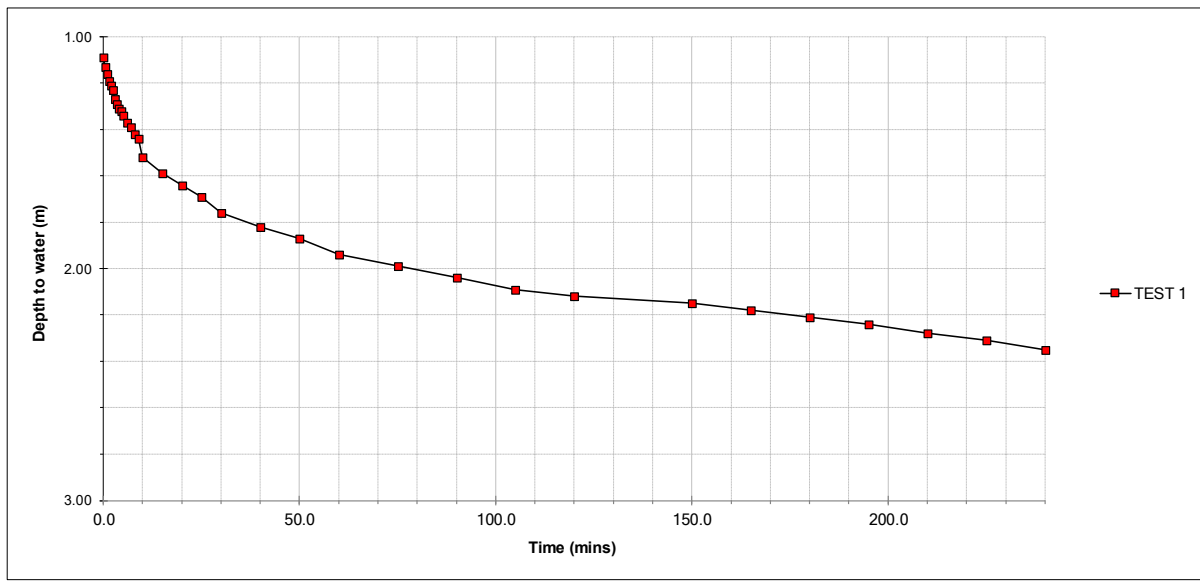


**Project:** Three Maids  
**Project No.:** 404.11923.00004  
**Date of Test:** 29/04/2022

**Trial Pit No.:** TP01  
**TP Length:** 2.10 m  
**TP Width:** 0.70 m  
**TP Depth:** 2.60 m  
**Groundwater Level:** N/A mbgl

Remarks -	TEST 1		TEST 2		TEST 3	
	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
	0.0	1.09				
	0.5	1.13				
	1.0	1.16				
	1.5	1.19				
	2.0	1.21				
	2.5	1.23				
	3.0	1.27				
	3.5	1.29				
	4.0	1.31				
	4.5	1.32				
	5.0	1.34				
	6.0	1.37				
	7.0	1.39				
	8	1.42				
	9	1.44				
	10	1.52				
	15	1.59				
	20	1.64				
	25	1.69				
	30	1.76				
	40	1.82				
	50	1.87				
	60	1.94				
	75	1.99				
	90	2.04				
	105	2.09				
	120	2.12				
	150	2.15				
	165	2.18				
	180	2.21				
	195	2.24				
	210	2.28				
	225	2.31				
	240	2.35				
Effective Storage Depth	m	1.51				
75% Effective Storage Depth	m	1.13				
(i.e. depth below GL)	m	1.47				
25% Effective Storage Depth	m	0.38				
(i.e. depth below GL)	m	2.22				
Effective Storage Depth 75%-25%	m	0.76				
Time to fall to 75% effective depth	mins	11.70				
Time to fall to 25% effective depth	mins	172.00				
V (75%-25%)	m3	1.11				
a (50%)	m2	5.70				
t (75%-25%)	mins	160.30				
<b>SOIL INFILTRATION RATE</b>	m/s	<b>2.03E-05</b>				

**DESIGN SOIL INFILTRATION RATE, f** **2.03E-05**



**SOP FORM 3.3.3 - SOIL INFILTRATION RATE TEST**

(See B.R.E. Digest 365, 1991, Soakaway Design.)

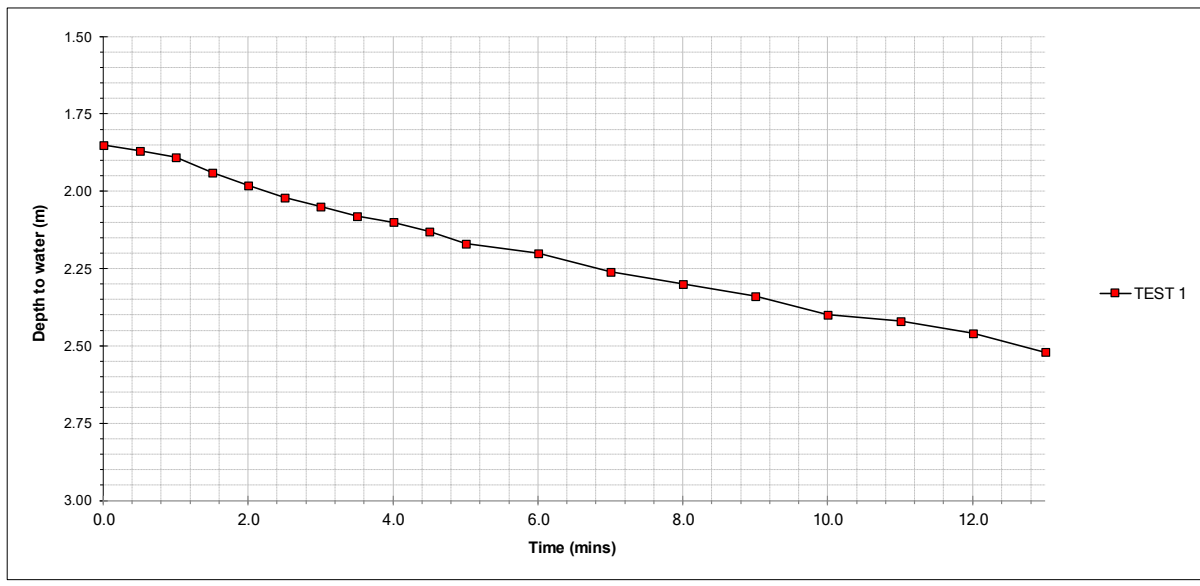


**Project:** Three Maids  
**Project No.:** 404.11923.00004  
**Date of Test:** 29/04/2022

**Trial Pit No.:** TP02  
**TP Length:** 2.30 m  
**TP Width:** 0.70 m  
**TP Depth:** 2.60 m  
**Groundwater Level:** mbgl

Remarks -	TEST 1		TEST 2		TEST 3	
	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
	0.0	1.85				
	0.5	1.87				
	1.0	1.89				
	1.5	1.94				
	2.0	1.98				
	2.5	2.02				
	3.0	2.05				
	3.5	2.08				
	4.0	2.10				
	4.5	2.13				
	5.0	2.17				
	6.0	2.20				
	7.0	2.26				
	8.0	2.30				
	9.0	2.34				
	10.0	2.4				
	11.0	2.42				
	12.0	2.46				
	13.0	2.52				
Effective Storage Depth	m	0.75				
75% Effective Storage Depth (i.e. depth below GL)	m	0.56				
25% Effective Storage Depth (i.e. depth below GL)	m	2.04				
Effective Storage Depth 75%-25%	m	0.19				
Time to fall to 75% effective depth	mins	2.20				
Time to fall to 25% effective depth	mins	9.30				
V (75%-25%)	m3	0.60				
a (50%)	m2	3.86				
t (75%-25%)	mins	7.10				
<b>SOIL INFILTRATION RATE</b>	m/s	<b>3.67E-04</b>				

**DESIGN SOIL INFILTRATION RATE, f** **3.67E-04**



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**At:** Hampshire County Council  
Swm.consultee@hants.gov.uk

**From:** Andrew Dannatt  
**At:** SLR Consulting  
adannatt@slrconsulting.com

**Date:** 21<sup>st</sup> October 2022  
**Ref:** HCC 22/02037/FUL  
SLR 404.V11923.00004.0004

**Subject:** CONSTRUCTION AND OPERATION OF AN ANAEROBIC DIGESTION FACILITY, ANCILLARY INFRASTRUCTURE, LANDSCAPE PLANTING AND THE CONSTRUCTION OF A NEW ACCESS ROAD AND ACCESS FROM THE A272 AT LAND TO THE EAST OF THE A272 ANDOVER ROAD LITTLETON HAMPSHIRE.

## 1.0 INTRODUCTION

Thank you for your letter in response to the Flood Risk Assessment and Surface Water Drainage Strategy produced on behalf of Acorn Ltd pr the proposed Anaerobic Digestion Plant at Three Maids, SO21 2QG. This Technical Memorandum has been produced to discuss the two issues raised regarding potential groundwater flooding and infiltration testing used in development of the submitted Surface Water Drainage Strategy.

## 2.0 GROUNDWATER FLOOD RISK

It is accepted that groundwater flooding occurs due to water rising from the underlying aquifer or from water flowing from springs. This is known to occur after long periods of sustained high rainfall, and the areas most at risk are often low-lying where the water table is more likely to be at shallow depth. Groundwater flooding usually occurs in areas underlain by major aquifers but can be associated with more localised floodplain sands and gravels. The geology of Hampshire is dominated by chalk and the principal chalk aquifer lies beneath the site.

The Environment Agency (Solent & South Downs area) covers Hampshire, the Isle of Wight, West Sussex, and East Sussex is part of the Environment Agency's Southeast region. The Environment Agency monitors groundwater levels at several sites across the Solent & South Downs area using a telemetry system. The telemetry system allows the Environment Agency to monitor the data in real-time. Each monitoring borehole has a set of trigger levels, which give an indication of high groundwater levels and whether groundwater flooding is likely. A series of four trigger levels for each boreholes give an indication of high groundwater levels or when groundwater has reached levels high enough to flood basements/cellars and property.

The Environment Agency monitoring borehole at Harestock lies approximately 2km south of the site.



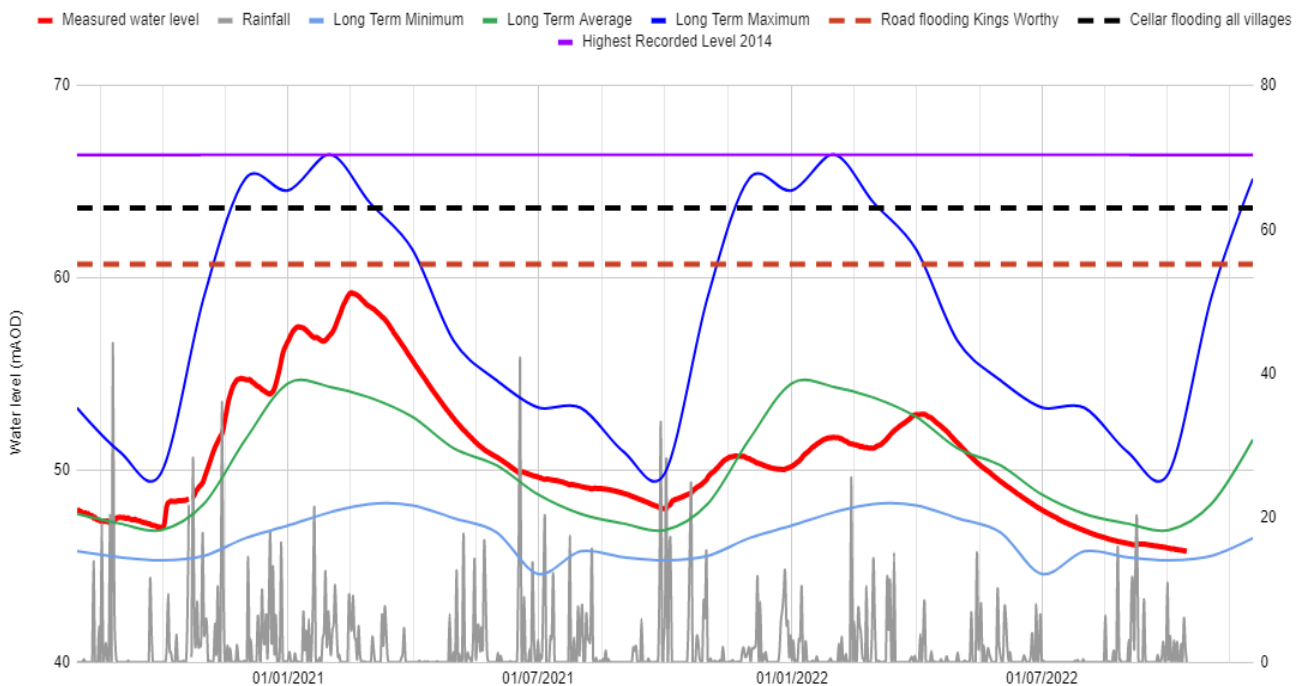
## 2.1 Maximum Historical Groundwater Levels

**Figure 2-1** below shows maximum recorded water levels (2014) in this area for winter months of 66.4m Above Ordinance Datum (AOD).

The site topography (**Appendix 01**) identifies elevations within the proposed site boundary. The Site ranges in elevation from 101.00m AOD to 87.75m AOD. The proposed SuDS features outlined within the Flood Risk Assessment and Surface Water Drainage Strategy (SLR August 2022), propose invert levels of geo-cellular creates and bioretention systems; of which the lowest is at invert level 85.23m AOD.

**Figure 2-1**  
**Harestock Groundwater Levels**  
Environment Agency Borehole Logs<sup>1</sup>

### Groundwater levels at Harestock



Section 13.2 of the CIRIA SuDS manual C753 allows for minimum depth of 1m for viable infiltration systems as a design consideration.

The minimum depth for SuDS features of 84.23m AOD is therefore 17.83 metres higher than the highest recorded groundwater levels. On this basis it is therefore concluded that there is little or no

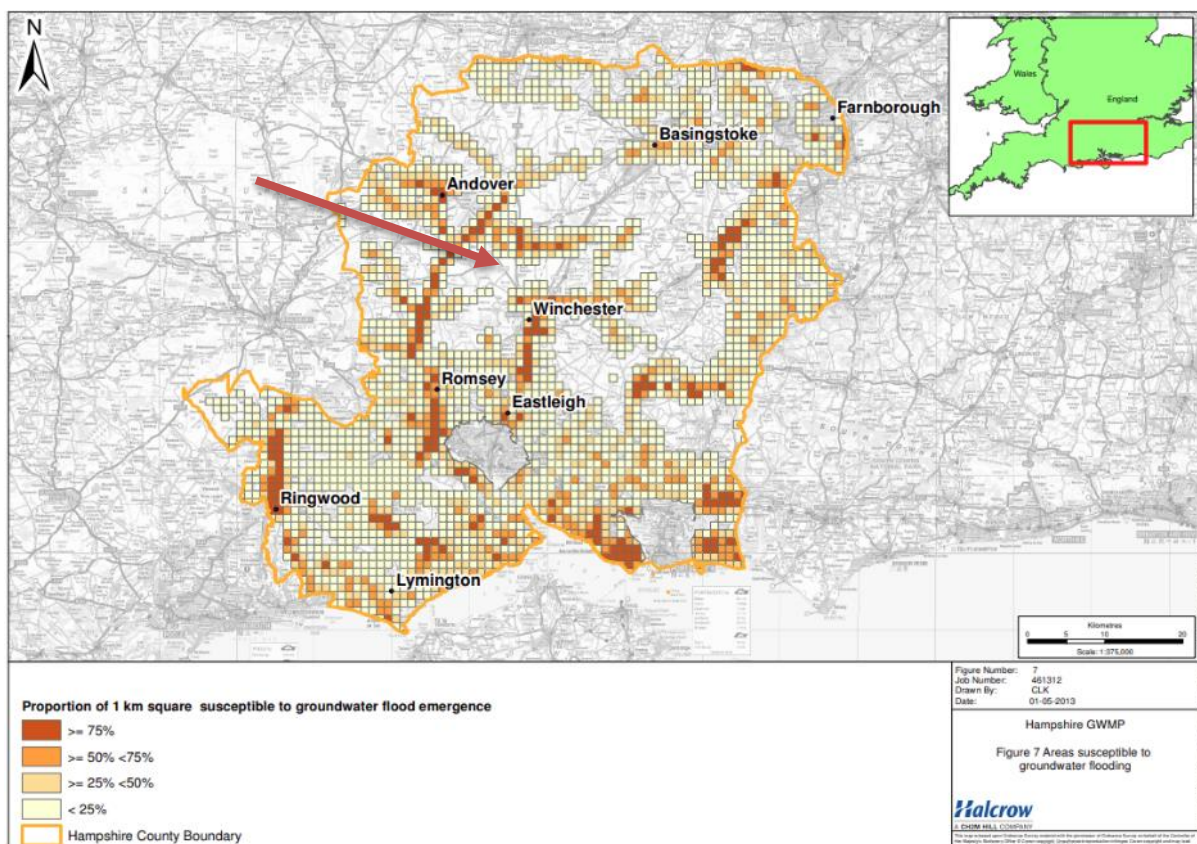
<sup>1</sup> Groundwater levels, 2022. *Littleton, Worthys, Easton (Harestock)*, [Accessed 14/10/222] Available from: <https://sites.google.com/view/groundwatergraphs/home/groundwater-data/hampshire/littleton-worthys-easton-harestock>

risk of groundwater flooding or obstruction to infiltration for the proposed drainage scheme from historical data.

## 2.2 Groundwater Flood Risk

The Hampshire Groundwater Management Plan (GWMP) identifies areas susceptible to groundwater flooding and indicates that there is 0% risk to the Site as indicated in **Figure 2-2** - the Site is indicated by the red arrow. This correlates with the Groundsure report for the site, which states that there is a low-risk of groundwater flooding to the site during a 1 in 100-year event.

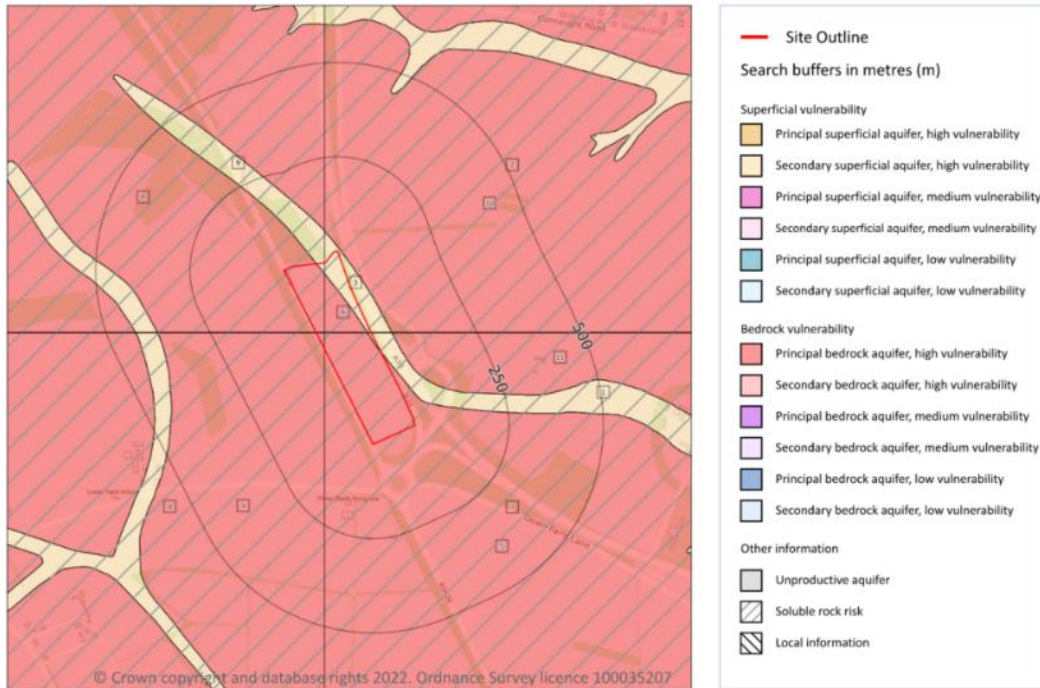
**Figure 2-2**  
Extract from GWMP – Hampshire<sup>2</sup>



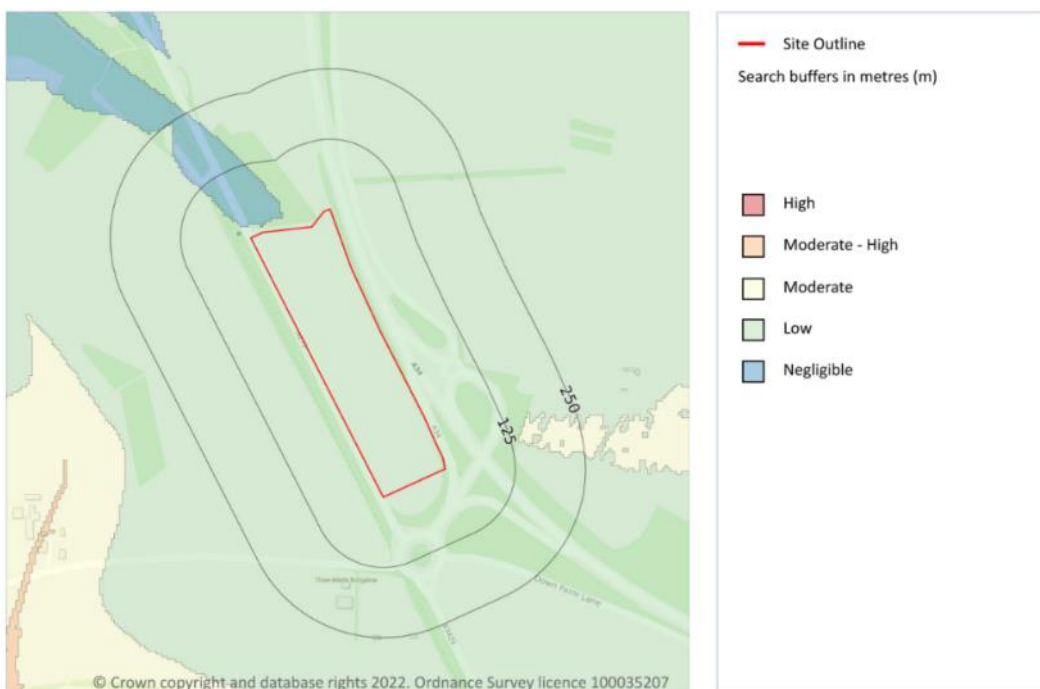
Additionally, the British Geological Survey (BGS) Aquifer Maps **Figure 2-3** indicate that the site is within the area of a Principal Aquifer. The topography of the land, and the position of the site, the risk of groundwater flooding to the site is low to negligible.

<sup>2</sup> Hampshire County Council, October 2013. 'Hampshire Groundwater Management Plan': Figure 7. Accessed: 18/10/22]. Available from: [Groundwater Management Plan \(GWMP\) for Hampshire | Hampshire County Council \(hants.gov.uk\)](https://www.hants.gov.uk/groundwater-management-plan-gwmp-for-hampshire)

**Figure 2-3**  
 Extract from Groundsure Report – Groundwater Aquifer Designation



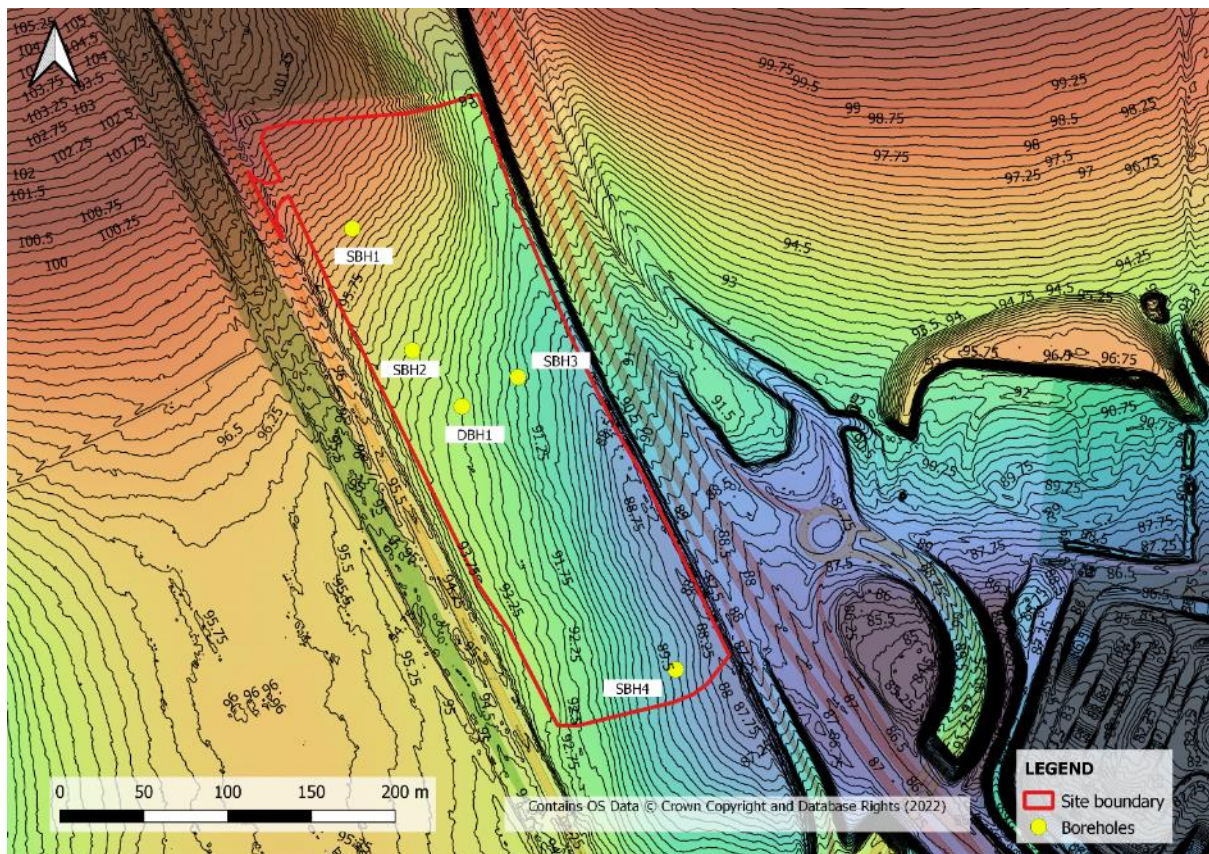
**Figure 2-4**  
 Extract from Groundsure Report – Groundwater Vulnerability Map



### 3.0 SITE INVESTIGATION

Site investigation works were instructed for the 21<sup>st</sup> of September 2022 that included the drilling of five boreholes, five trial pits and the collection of soils samples from various locations across the site. As part of this work groundwater monitoring was requested. **Figure 3-1** shows the location of the of the borehole monitoring carried out on 21<sup>st</sup> September 2022.

**Figure 3-1**  
**Three Maids Borehole Locations**



The results from the testing are presented in **Table 3-1**. A location plan for the complete site investigation is shown in **Appendix 02**, with the relevant borehole record shown in **Appendix 03**.

**Table 3-1**  
**Borehole Monitoring Data Summary**

Borehole Data Three Maids		
Borehole number	Well depth (m bgl)	Groundwater
SBH1	5.71	Dry
SBH2	5.57	Dry
SBH3	6.15	Dry
SBH4	5.97	Dry
DBH1	9.55	Dry

It was found that all monitoring wells were dry.

#### 4.0 INFILTRATION TESTING

As stated, infiltration testing from the site included one trial pit and test that yielded a viable result for the outline design of SuDS features which has been completed (rate used was  $20.3 \times 10^{-5}$ ). Further infiltration testing to BRE Digest 365 standards has been requested which would involve three tests at both locations for SuDS features.

Further testing to BRE Digest 365 standard in two pit locations that coincide with the proposed SuDS features will be undertaken on the 2<sup>nd</sup> to 3<sup>rd</sup> of November to establish a conservative estimate for infiltration rates. Locations for the proposed trial pit works can be seen in **Appendix 04**.

#### 5.0 SUMMARY

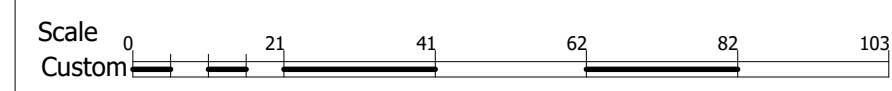
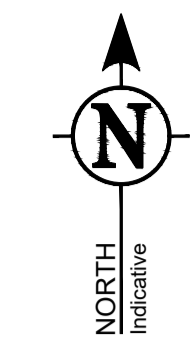
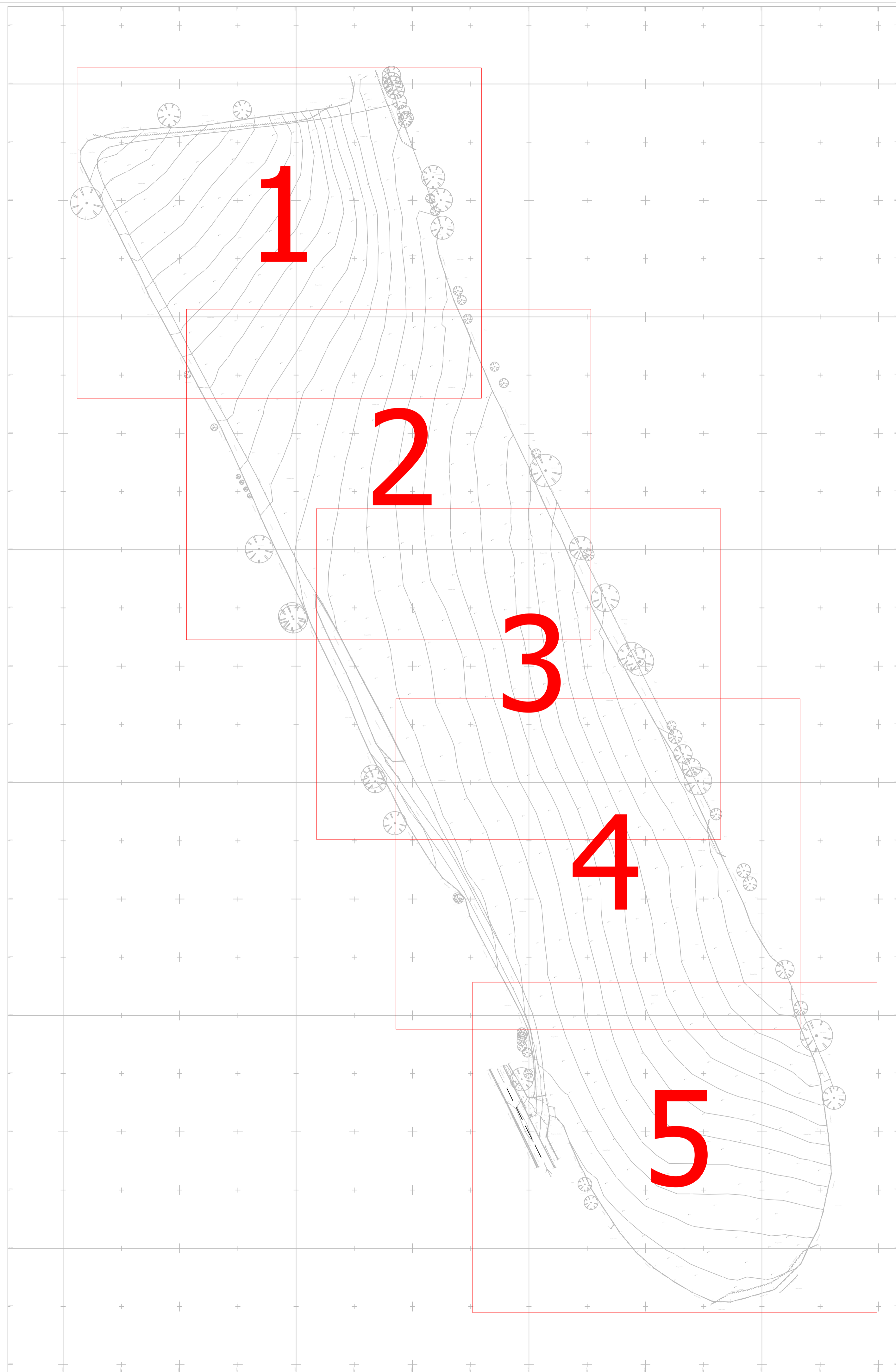
Research of groundwater flood risk from recent and historical data, up to maximum recorded levels in 2014 for winter groundwater levels in the Harestock area, approximately 2km south of the site has concluded that winter groundwater levels have historically been over 17m below the level of the 1 metre viability zone for the proposed SuDS features at the site. This has been further confirmed with reference to the site BGS data, Groundsure data, and recent site groundwater monitoring on 21<sup>st</sup> of September that shows no risk of flooding.

As requested, further BRE Digest 365 compliant infiltration testing has been commissioned to confirm infiltration rates within the site boundary utilising the lowest valid result. This value will confirm the proposed surface water drainage strategy to employ the use of SuDS within the scheme utilising infiltration as the primary mitigation method.

Once a viable and conservative result is obtained, an update to the Surface Water Drainage Strategy will be presented to confirm the design calculations for the proposed drainage scheme.

## APPENDIX 01

### Topography



ABBREVIATIONS	
AV	Air Valve
BCN X	Basin (No. if known)
B	Banhole
BL X	Li Bulb (No. if known)
B	Bulb
BMP	Boundary Marker
BS	Bus Stop
BT	Small Telecoms
CATV	Small Cable TV
CCTV	Small CCTV
MH	Small Electrical Manhole
EP	Electric Pole
ER	Earth Rod
FEED X	Feeder Pillar (No. if known)
FH	Fire Hydrant
FL P	Flag Pole
IL X	Pipe Invert Level
KI	Kerb Inlet (Water onto Rd)
KO	Kerb Outlet (Water off Rd)
LP X	Lampost (No. if known)
Mast	Telecoms Mast
MH	Manhole
MP	Marker Post
PBX	Post Box
	Trees - Scaled With Canopy and Girth - Category is Approx and Girth is Taken at 1.5m Above Ground - Level is Ground Level at Trunk
	Individual Bushes Scaled for Size Ground Level at Centre
	Safety Fence FF@GL
	Safety Fences are Shown at Front Face FF at Ground Level GL
	To Reduce Clutter and Improve Clarity All Other Salient Features Can be Identified by Their CAD Layer or By Annotation in CAD Layer NOTES

**DRAWING NOTES**

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REV	Survey Date	Created By	First Issue	Comments
-	04.02.22	PLS	08.02.22	Full Topographical Survey

Scale at A1	Project Number
NTS	PLS - 1008

Drawing Status
<input checked="" type="checkbox"/> Topographical Survey
<input type="checkbox"/> Revised Survey
<input type="checkbox"/> Drainage Survey

**Parish Land Surveys Ltd,**  
Aylsham Business Park, Richard Oakes  
Road, Aylsham, Norfolk, NR11 6FD

**office: 01603 898950**  
**mob: 07810 726138**  
**email: nick@parishlandsurveys.co.uk**  
**web: www.parishlandsurveys.co.uk**

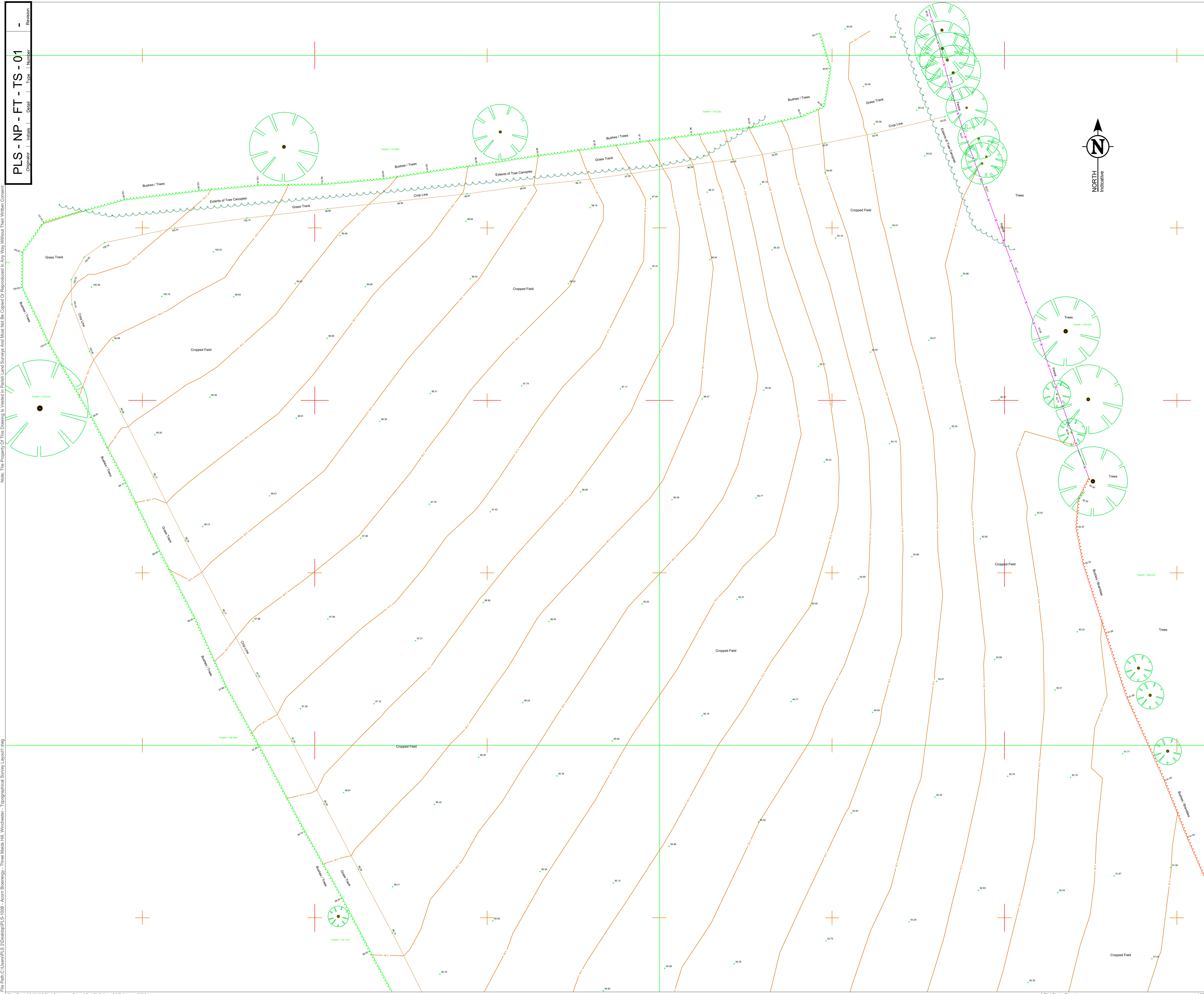
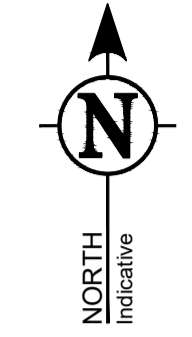
Client  
**Acorn Bioenergy**

Project  
**Three Maids Hill, Winchester,  
S021 2QG**

Title  
**Topographical Survey  
PDF OVERVIEW PLAN**



ABBREVIATIONS	
AV	Air Valve
BCN X	Basin (No. if known)
BL X	Buried
B	Li Bulb (No. if Known)
B	Bulb
BMP	Boundary Marker
BS	Bus Stop
BT	Small Telecoms
CATV	Small Cable TV
CCTV	Small CCTV
MH	Small Electrical Manhole
EP	Electric Pole
ER	Earth Rod
FEED X	Feeder Pillar (No. if Known)
FH	Fire Hydrant
FL P	Flag Pole
IP	Pipe Invert Level
KO	Kerb Inlet (Water onto Rd)
KO	Kerb Outlet (Water off Rd)
LP X	Lampost (No. if Known)
Mast	Telecoms Mast
MH	Manhole
MP	Marker Post
BOX	Post Box
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	Individual Bushes Scaled for Size Ground Level at Centre
	Safety Fence FF@SL
	Safety Fences are Shown at Front Face FF at Ground Level GL
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-	04.02.22	PLS	08.02.22	Full Topographical Survey

Scale at A1	Project Number
<b>1:250</b>	<b>PLS - 1008</b>

<input checked="" type="checkbox"/> Topographical Survey
<input type="checkbox"/> Revised Survey
<input type="checkbox"/> Drainage Survey

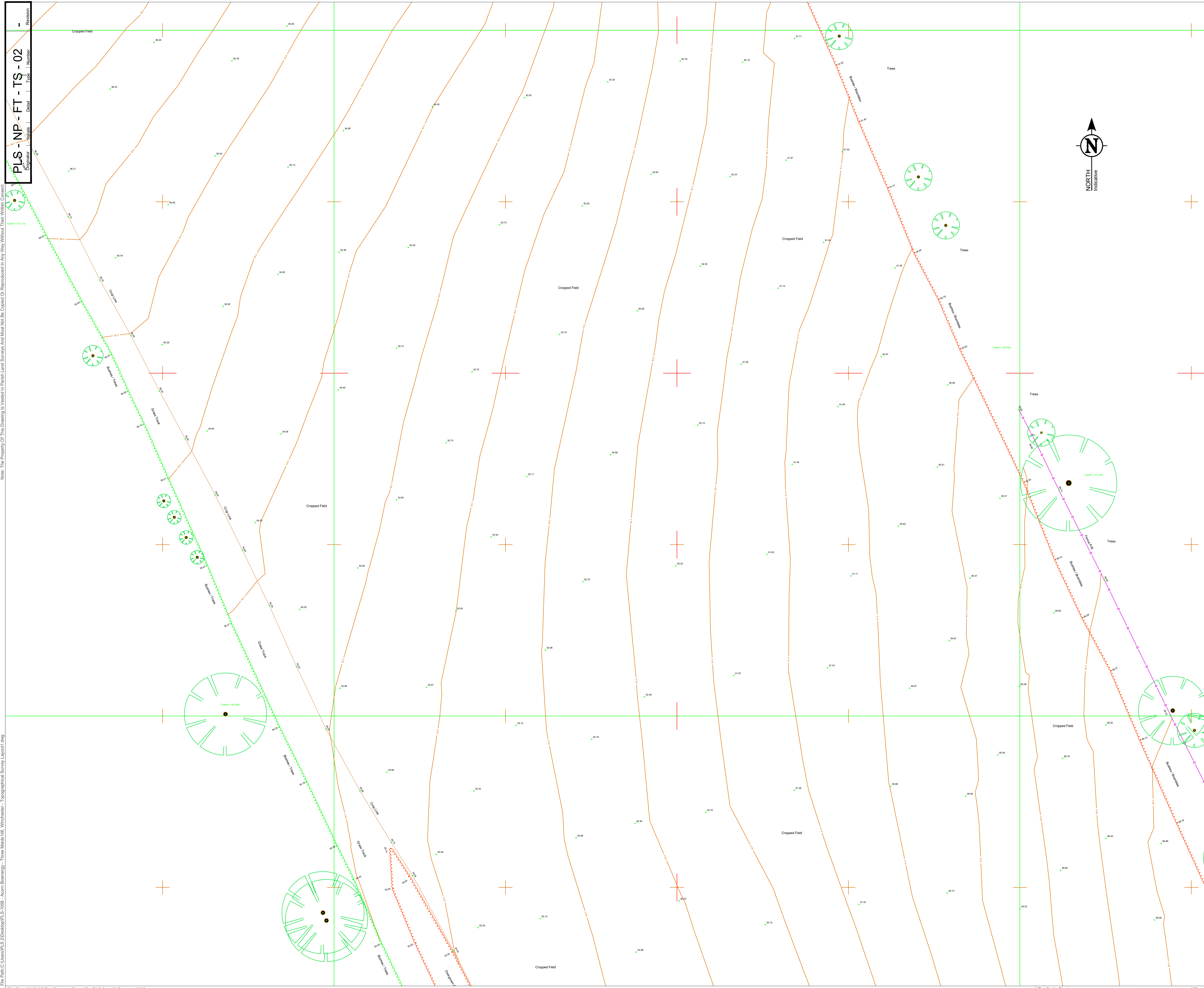
**Parish Land Surveys Ltd,**  
**Aylsham Business Park, Richard Oakes**  
**Road, Aylsham, Norfolk, NR11 6FD**

**office: 01603 898950**  
**mob: 07810 726138**  
**email: nick@parishlandsurveys.co.uk**  
**web: www.parishlandsurveys.co.uk**

Client  
**Acorn Bioenergy**

Project  
**Three Maids Hill, Winchester,**  
**S021 2QG**

Title  
**Topographical Survey**  
**PDF PLAN 1**



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 Plot Date: 08.02.22 Plot Style: --- Saved By: PLS 2 on 08 February 2022



ABBREVIATIONS	
AV	Air Valve
BCN X	Basin (No. if known)
BL X	Li Babinet (No. if Known)
B	Bullard
BMP	Boundary Marker
BS	Bus Stop
BT	Small Telecoms
CATV	Small Cable TV
CCTV	Small CCTV
MH	Small Electrical Manhole
EP	Electric Pole
ER	Earth Rod
FEED X	Feeder Pillar (No. if Known)
FH	Fire Hydrant
FL P	Flag Pole
LI X	Pipe Invert Level
KI	Kerb Inlet (Water onto Rd)
KO	Kerb Outlet (Water off Rd)
LP X	Lampost (No. if Known)
Mast	Telecoms Mast
MH	Manhole
NP	Marker Post
PO BOX	Post Box
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Scale at A1	Project Number
<b>1:250</b>	<b>PLS - 1008</b>

Drawing Status
<input checked="" type="checkbox"/> Topographical Survey
<input type="checkbox"/> Revised Survey
<input type="checkbox"/> Drainage Survey

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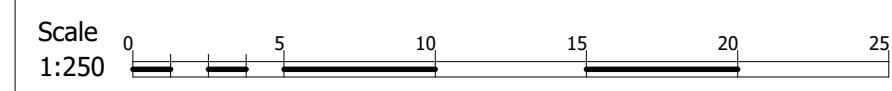
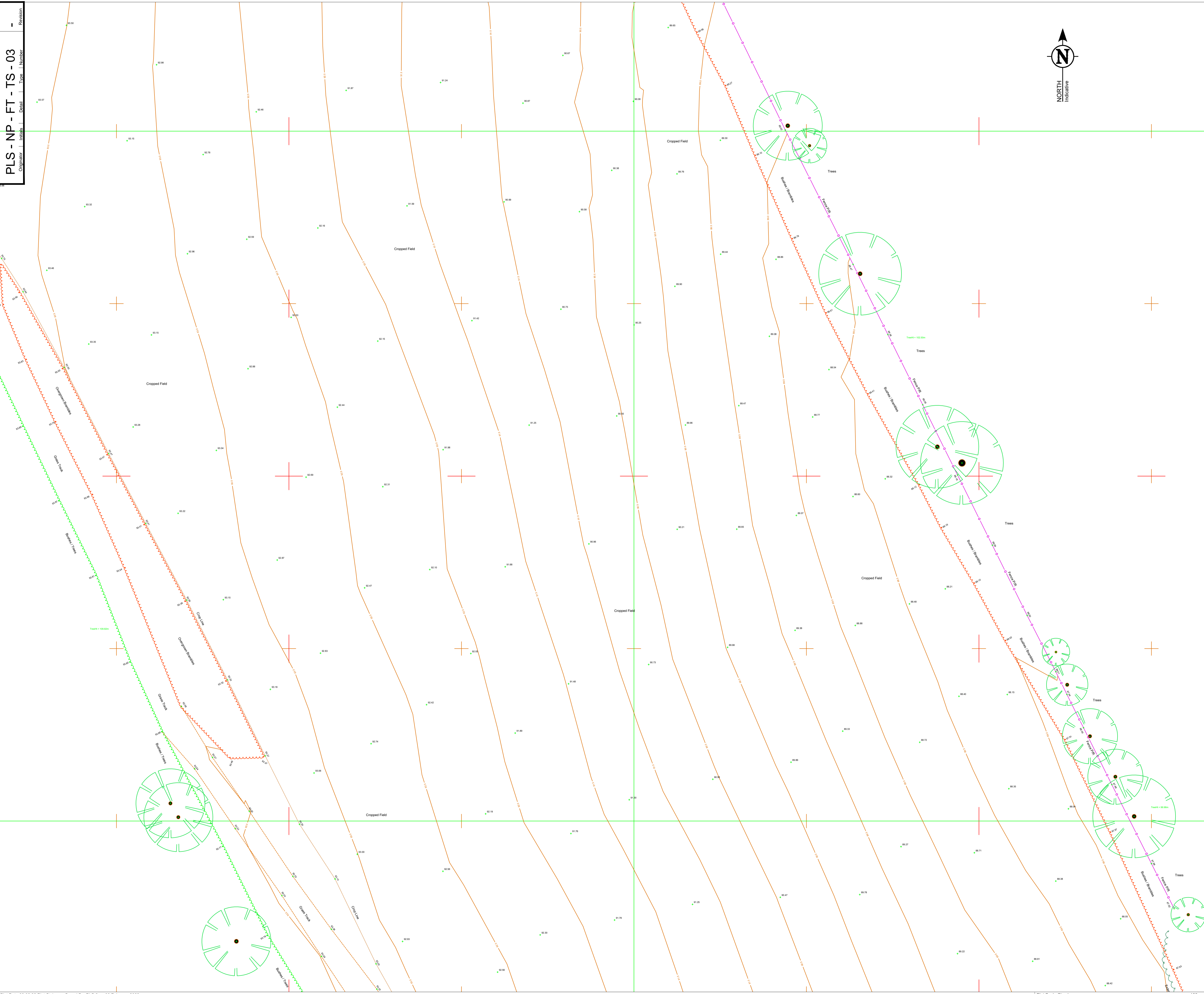
**office: 01603 898950**  
**mob: 07810 726138**  
**email: nick@parishlandsurveys.co.uk**  
**web: www.parishlandsurveys.co.uk**

Client  
**Acorn Bioenergy**

Project  
**Three Maids Hill, Winchester,  
 S021 2QG**

Title  
**Topographical Survey  
 PDF PLAN 2**

<b>PLS - NP - FT - TS - 02</b>	-
Originator	Revision



ABBREVIATIONS	
AV	Air Valve
BCN X	Basin (No. if known)
BN	Boundary
BL X	Li Bulbar (No. if Known)
B	Bulbar
BMP	Boundary Marker
BS	Bus Stop
BT	Small Telecoms
CATV	Small Cable TV
CCTV	Small CCTV
MH	Small Electrical Manhole
EP	Electric Pole
ER	Earth Rod
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Scale at A1	Project Number
<b>1:250</b>	<b>PLS - 1008</b>

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<input type="checkbox"/> Revised Survey
<input type="checkbox"/> Drainage Survey

**Parish Land Surveys Ltd,**  
 Aylsham Business Park, Richard Oakes  
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**office: 01603 898950**  
**mob: 07810 726138**  
**email: nick@parishlandsurveys.co.uk**  
**web: www.parishlandsurveys.co.uk**

Client  
**Acorn Bioenergy**

Project  
**Three Maids Hill, Winchester,  
 S021 2QG**

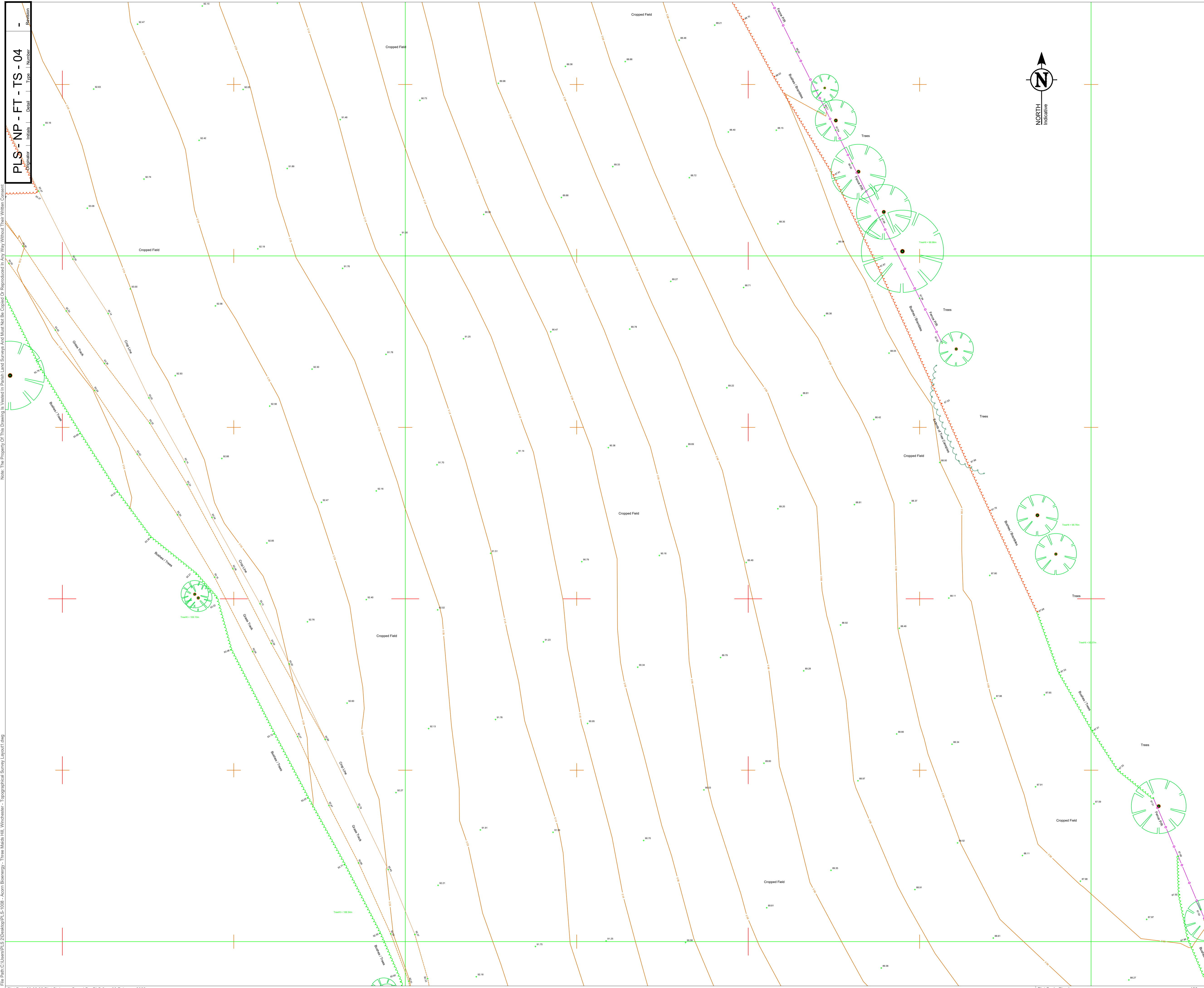
Title  
**Topographical Survey  
 PDF PLAN 3**

PLS - NP - FT - TS - 04

Originator Initials Detail Type Number Revision

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Plot Date: 08.02.22 Plot Style: --- Saved By: PLS 2 on 08 February 2022



ABBREVIATIONS	
AV	Air Valve
BCN X	Basin (No. if known)
B	Banhole
BL X	Li Ballard (No. if known)
B	Bullard
BMP	Boundary Marker
BS	Bus Stop
BT	Small Telecoms
CATV	Small Cable TV
CCTV	Small CCTV
MH	Small Electrical Manhole
EP	Electric Pole
ER	Earth Rod
FEED X	Feeder Pillar (No. if known)
FH	Fire Hydrant
FL P	Flag Pole
IL X	Pipe Invert Level
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Scale at A1	Project Number
<b>1:250</b>	<b>PLS - 1008</b>

Drawing Status
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<input type="checkbox"/> Revised Survey
<input type="checkbox"/> Drainage Survey

**Parish Land Surveys Ltd,**  
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**Road, Aylsham, Norfolk, NR11 6FD**

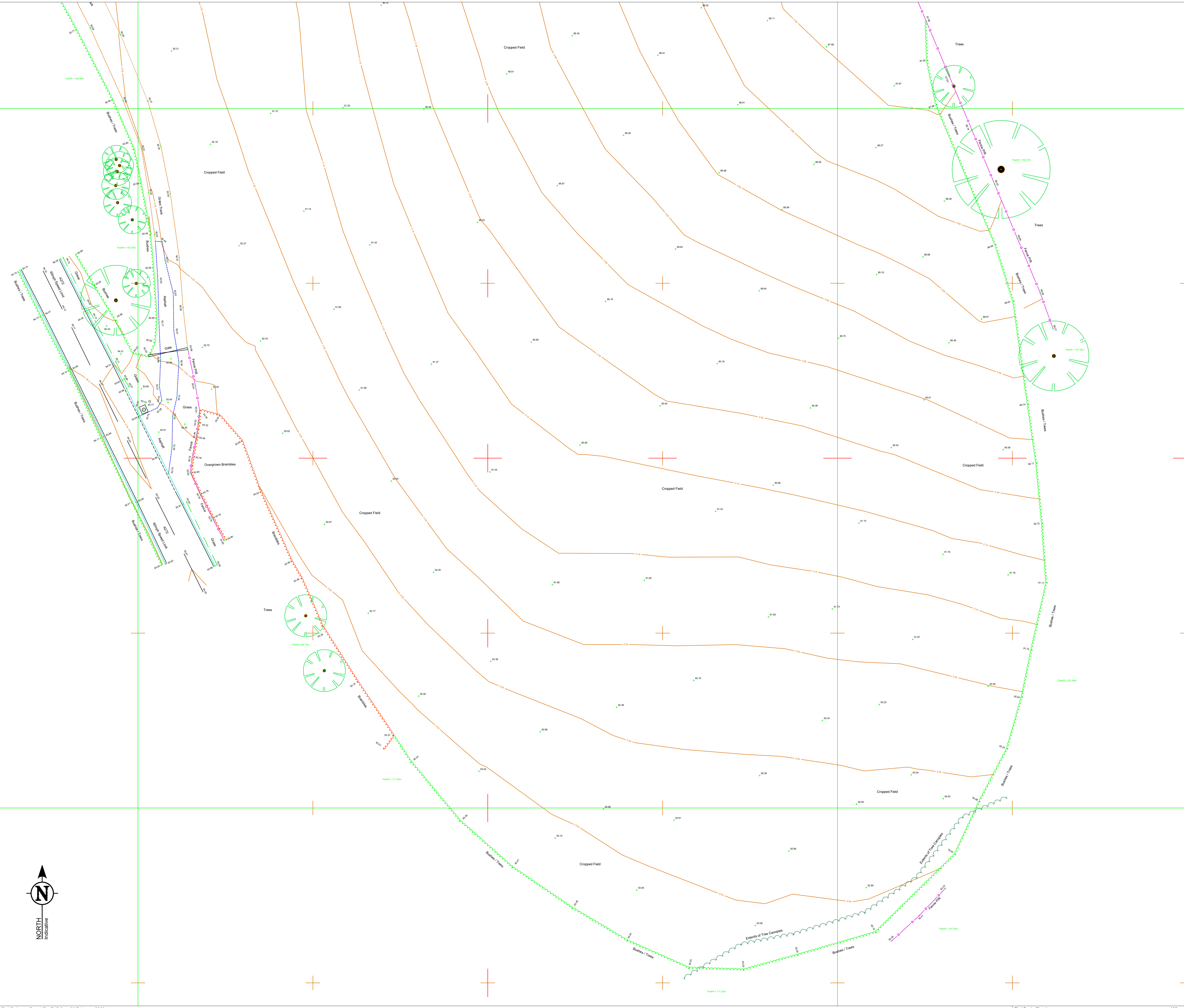
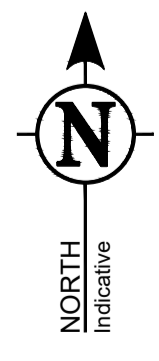
**office: 01603 898950**  
**mob: 07810 726138**  
**email: nick@parishlandsurveys.co.uk**  
**web: www.parishlandsurveys.co.uk**

Client  
**Acorn Bioenergy**

Project  
**Three Maids Hill, Winchester,**  
**S021 2QG**

Title  
**Topographical Survey**  
**PDF PLAN 4**

PLS - NP - FT - TS - 04	-
Originator Initials Detail Type Number Revision	



ABBREVIATIONS	
AV	Air Valve
BCN X	Basin (No. if known)
BL X	Li Bulb (No. if known)
B	Bulb
BMP	Boundary Marker
BS	Bus Stop
BT	Small Telecoms
CATV	Small Cable TV
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REV	Survey Date	Created By	First Issue	Comments
-	04.02.22	PLS	08.02.22	Full Topographical Survey

Scale at A1	Project Number
<b>1:250</b>	<b>PLS - 1008</b>

Drawing Status	
<input checked="" type="checkbox"/>	Topographical Survey
<input type="checkbox"/>	Revised Survey
<input type="checkbox"/>	Drainage Survey

**Parish Land Surveys Ltd,**  
 Aylsham Business Park, Richard Oakes  
 Road, Aylsham, Norfolk, NR11 6FD

**office: 01603 898950**  
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**email: nick@parishlandsurveys.co.uk**  
**web: www.parishlandsurveys.co.uk**

Client  
**Acorn Bioenergy**

Project  
**Three Maids Hill, Winchester,  
 S021 2QG**

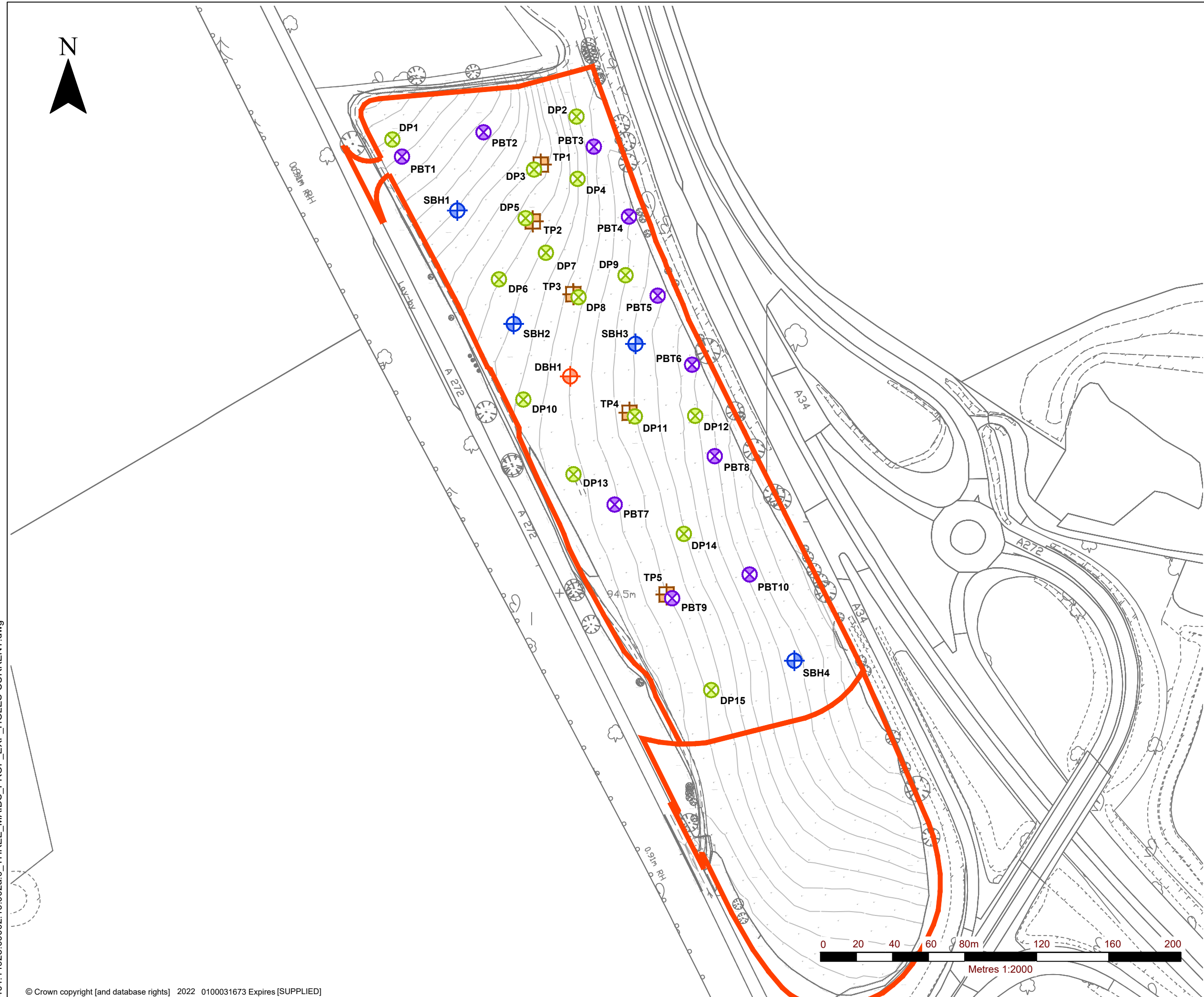
Title  
**Topographical Survey  
 PDF PLAN 5**

## APPENDIX 02

### Borehole Locations






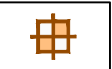


404.11923.00002.19.002a.0\_THREE\_MAIDS\_PROP\_EXP\_HOLES-CURRENT.dwg



NOTES

1. DRAWING IS BASED ON CLIENT SUPPLIED DRAWING, REF: SITE LAYOUT PLAN, 29348 / 101 REV A, DATED: FEBRUARY 2022.

LEGEND

-  SITE BOUNDARY
-  BORHOLE (10m)
-  BOREHOLE (6m)
-  TRIAL PIT
-  DYNAMIC PROBE (TO DEPTH OF 4m BGL)
-  PLATE BEARING TEST



**SLR** SUITE 5, BRINDLEY COURT  
GRESLEY ROAD  
SHIRE BUSINESS PARK  
WORCESTER WR4 9FD  
T: +44 (0)1905 751310  
F: +44 (0)1905 751311  
www.slrconsulting.com

THREE MAIDS  
GROUND INVESTIGATION REPORT  
PROPOSED EXPLORATORY HOLE  
PLAN - CURRENT LAYOUT

DRAWING 02a

Scale 1:2000 @ A3 Date SEPTEMBER 2022

## APPENDIX 03

### Borehole Logs



<b>BOREHOLE LOG</b>				BOREHOLE No <b>DBH1</b>	
Client: <b>Acorn Bioenergy</b>					
Project No: 404.11923.00004.00		Date: 21/09/2022	Ground Level:		Co-ordinates: E446031 N134020
Project: <b>Three Maids</b>					Sheet  1 of 1



SAMPLES & TESTS					Water	STRATA			Instrument Backfill
Depth	Type No	Test Type	Test Result	SPT N Value 10 20 30 40		Reduced Level	Legend	Depth (Thickness)	
0.20	ES	HS	0ppm				0.30	Soft dark brown slightly gravelly, slightly clayey SAND. Sand is fine to coarse. Gravel is angular to sub-rounded, fine to coarse of flint and occasional chalk (TOPSOIL).	
1.00 - 1.50	B	HS	0ppm				(3.90)	High density white CHALK recovered as sandy clayey gravelly cobbles. Gravel is angular to sub-rounded, fine to coarse of medium weak chalk and frequent flint (Grade Dc). 1.25 - 1.30 Flint band. 1.40 - 1.45 Flint band.	
1.20 - 1.65	SPTLS	SPT	N=35	35					
1.50	ES	HS	0ppm				(3.90)		
2.20 - 2.65	SPTLS	SPT	N=13	13					
		HS	0ppm				(3.90)		
3.20 - 3.65	SPTLS	SPT	N=13	13					
3.50 - 4.00	B	HS	0ppm				(4.20)	Low to medium density white CHALK recovered as sandy clayey gravelly cobbles. Gravel is angular to sub-rounded, fine to coarse of weak chalk and occasional flint (Grade Dc).	
4.20 - 4.65	SPTLS	SPT	N=11	11					
		HS	0ppm				(4.20)		
5.00	ES	HS	0ppm						
5.20 - 5.65	SPTLS	SPT	N=12	12			(5.80)	7.40 - 7.45 Flint band.	
		HS	0ppm						
6.00 - 6.50	B	HS	0ppm				(5.80)		
6.70 - 7.15	SPTLS	SPT	N=22	22					
		HS	0ppm				(5.80)		
7.50	ES	HS	0ppm						
8.15 - 8.60	SPTLS	SPT	N=23	23			(10.00)	Borehole Complete at 10.00m	
		HS	0ppm						
9.00 - 10.00	B	HS	0ppm				(10.00)		
9.60 - 10.05	SPTLS	SPT	N=23	23					
10.00	ES	HS	0ppm				(10.00)		

Boring Progress and Water Observations						Chiselling			Water Added		General Remarks
Date	Time	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	
											Service traced and CAT scanned. Hand pit to 1.2m. Installed with 50mm monitoring well with top hat cover.

All dimensions in metres Scale 1:66		Contractor: Geotechnical Engineering Ltd Plant: Commachio 305		Method: Rotary cored Hole Size: 150mm		Logged By: DG-J	Approved By:
SLR Consulting, Mill Barn 28 Hollingworth Court Turkey Mill, Maidstone ME14 5PP LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015							

<b>BOREHOLE LOG</b>				BOREHOLE No <b>SBH1</b>	
Client: <b>Acorn Bioenergy</b>					
Project No: 404.11923.00004.00		Date: 21/09/2022	Ground Level:		Co-ordinates: E445968 N134112
Project: <b>Three Maids</b>					Sheet 1 of 1



SAMPLES & TESTS					Water	STRATA			Instrument Backfill
Depth	Type No	Test Type	Test Result	SPT N Value 10 20 30 40		Reduced Level	Legend	Depth (Thickness)	
0.00 - 0.20	B						0.25	Soft dark brown slightly gravelly, slightly clayey SAND. Sand is fine to coarse. Gravel is angular to sub-rounded, fine to coarse of flint and occasional chalk (TOPSOIL).	
0.15	ES	HS	0ppm						
1.10	ES	HS	0ppm	11				High density white CHALK recovered as sandy clayey gravelly cobbles. Gravel is angular to sub-rounded, fine to coarse of medium weak chalk and frequent flint (Grade Dc).	
1.20 - 1.65	SPTLS	SPT	N=11				(3.05)		
		HS	0ppm						
2.00 - 2.45	SPTLS	SPT	N=21	21				2.65 - 2.72 Flint band.	
		HS	0ppm						
		HS	0ppm						
3.00 - 3.45	SPTLS	SPT	N=24	24					
		HS	0ppm						
		HS	0ppm						
4.00 - 4.45	SPTLS	SPT	N=27	27					
		HS	0ppm						
4.50	D	HS	0ppm						
4.50 - 5.00	ES						(2.70)		
5.00 - 5.45	SPTLS	SPT	N=20	20					
		HS	0ppm						
		HS	0ppm						
6.00 - 6.45	SPTLS	SPT	N=26	26			6.00		
		HS	0ppm					Borehole Complete at 6.00m	

Boring Progress and Water Observations						Chiselling			Water Added		General Remarks
Date	Time	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	
											Service traced and CAT scanned. Hand pit to 1.2m. Installed with 50mm monitoring well with top hat cover.

All dimensions in metres Scale 1:66		Contractor: Geotechnical Engineering Ltd Plant: Commachio 305		Method: Rotary cored Hole Size: 150mm		Logged By: DG-J	Approved By:
SLR Consulting, Mill Barn 28 Hollingworth Court Turkey Mill, Maidstone ME14 5PP LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015							

<b>BOREHOLE LOG</b>				BOREHOLE No <b>SBH2</b>	
Client: <b>Acorn Bioenergy</b>					
Project No: 404.11923.00004.00 20		Date: 22/09/2022	Ground Level:		Co-ordinates: E445999 N134049
Project: <b>Three Maids</b>					Sheet  1 of 1



SAMPLES & TESTS					Water	STRATA			Instrument Backfill
Depth	Type No	Test Type	Test Result	SPT N Value 10 20 30 40		Reduced Level	Legend	Depth (Thickness)	
0.30	ES	HS	0ppm				0.40	Soft dark brown slightly gravelly, slightly clayey SAND. Sand is fine to coarse. Gravel is angular to sub-rounded, fine to coarse of flint and occasional chalk (TOPSOIL).	
1.20 - 1.65	SPTLS	SPT	N=21 0ppm	21			(3.70)	High density white CHALK recovered as sandy clayey gravelly cobbles. Gravel is angular to sub-rounded, fine to coarse of medium weak chalk and frequent flint (Grade Dc). <i>1.20 - 1.30 Flint band.</i>	
2.00 - 2.45	SPTLS	SPT	N=32 0ppm	32					
2.90	ES	SPT	N=16 0ppm	16			(1.90)	Low to medium density white CHALK recovered as sandy clayey gravelly cobbles. Gravel is angular to sub-rounded, fine to coarse of weak chalk and occasional flint (Grade Dc). <i>4.35 - 4.40 Flint band.</i>	
3.00 - 3.45	SPTLS	HS	0ppm						
4.00 - 4.45	SPTLS	SPT	N=21 0ppm	21			4.10		
5.00 - 5.45	SPTLS	SPT	0ppm				6.00		
5.80	ES	SPT	N=46 0ppm	46					
6.00 - 6.45	SPTLS	HS	0ppm					Borehole Complete at 6.00m	
7									
8									
9									

Boring Progress and Water Observations						Chiselling			Water Added		General Remarks
Date	Time	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	
											Service traced and CAT scanned. Hand pit to 1.2m. Installed with 50mm monitoring well with top hat cover.

All dimensions in metres Scale 1:66		Contractor: Geotechnical Engineering Ltd Plant: Commachio 305		Method: Rotary cored Hole Size: 150mm		Logged By: DG-J	Approved By:
SLR Consulting, Mill Barn 28 Hollingworth Court Turkey Mill, Maidstone ME14 5PP LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015							

<b>BOREHOLE LOG</b>				BOREHOLE No <b>SBH3</b>	
Client: <b>Acorn Bioenergy</b>					
Project No: 404.11923.00004.00		Date: 23/09/2022	Ground Level:		Co-ordinates: E446155 N133862
Project: <b>Three Maids</b>					Sheet 1 of 1



SAMPLES & TESTS					Water	STRATA			Instrument Backfill
Depth	Type No	Test Type	Test Result	SPT N Value 10 20 30 40		Reduced Level	Legend	Depth (Thickness)	
0.20	ES	HS	0ppm				0.40	Soft dark brown slightly gravelly, slightly clayey SAND. Sand is fine to coarse. Gravel is angular to sub-rounded, fine to coarse of flint and occasional chalk (TOPSOIL).	
1.20 - 1.65	SPTLS	SPT	N=24	● 24			(3.30)	High density white CHALK recovered as sandy clayey gravelly cobbles. Gravel is angular to sub-rounded, fine to coarse of medium weak chalk and frequent flint (Grade Dc). <i>1.20 - 1.25 Flint band.</i>	
1.40	ES	HS	0ppm						
2.00 - 2.45	SPTLS	SPT	N=23	● 23			3.70	Low to medium density white CHALK recovered as sandy clayey gravelly cobbles. Gravel is angular to sub-rounded, fine to coarse of weak chalk and occasional flint (Grade Dc).	
	ES	HS	0ppm						
3.00 - 3.45	SPTLS	SPT	N=21	● 21			6.00	<i>5.90 - 5.95 Flint band.</i> Borehole Complete at 6.00m	
3.50	ES	HS	0ppm						
4.00 - 4.45	SPTLS	SPT	N=14	● 14			(2.30)		
	ES	HS	0ppm						
5.00 - 5.45	SPTLS	SPT	N=38	● 38			6.00		
	ES	HS	0ppm						
6.00 - 6.45	SPTLS	SPT	N=30	● 30					
7									
8									
9									

Boring Progress and Water Observations						Chiselling			Water Added		General Remarks
Date	Time	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	
											Service traced and CAT scanned. Hand pit to 1.2m. Installed with 50mm monitoring well with top hat cover.

All dimensions in metres Scale 1:66		Contractor: Geotechnical Engineering Ltd Plant: Commachio 305		Method: Rotary cored Hole Size: 150mm		Logged By: DG-J	Approved By:
SLR Consulting, Mill Barn 28 Hollingworth Court Turkey Mill, Maidstone ME14 5PP LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015							

<b>BOREHOLE LOG</b>				BOREHOLE No <b>SBH4</b>	
Client: <b>Acorn Bioenergy</b>					
Project No: 404.11923.00004.00		Date: 23/09/2022	Ground Level:		Co-ordinates: E446067 N134038
Project: <b>Three Maids</b>					Sheet 1 of 1



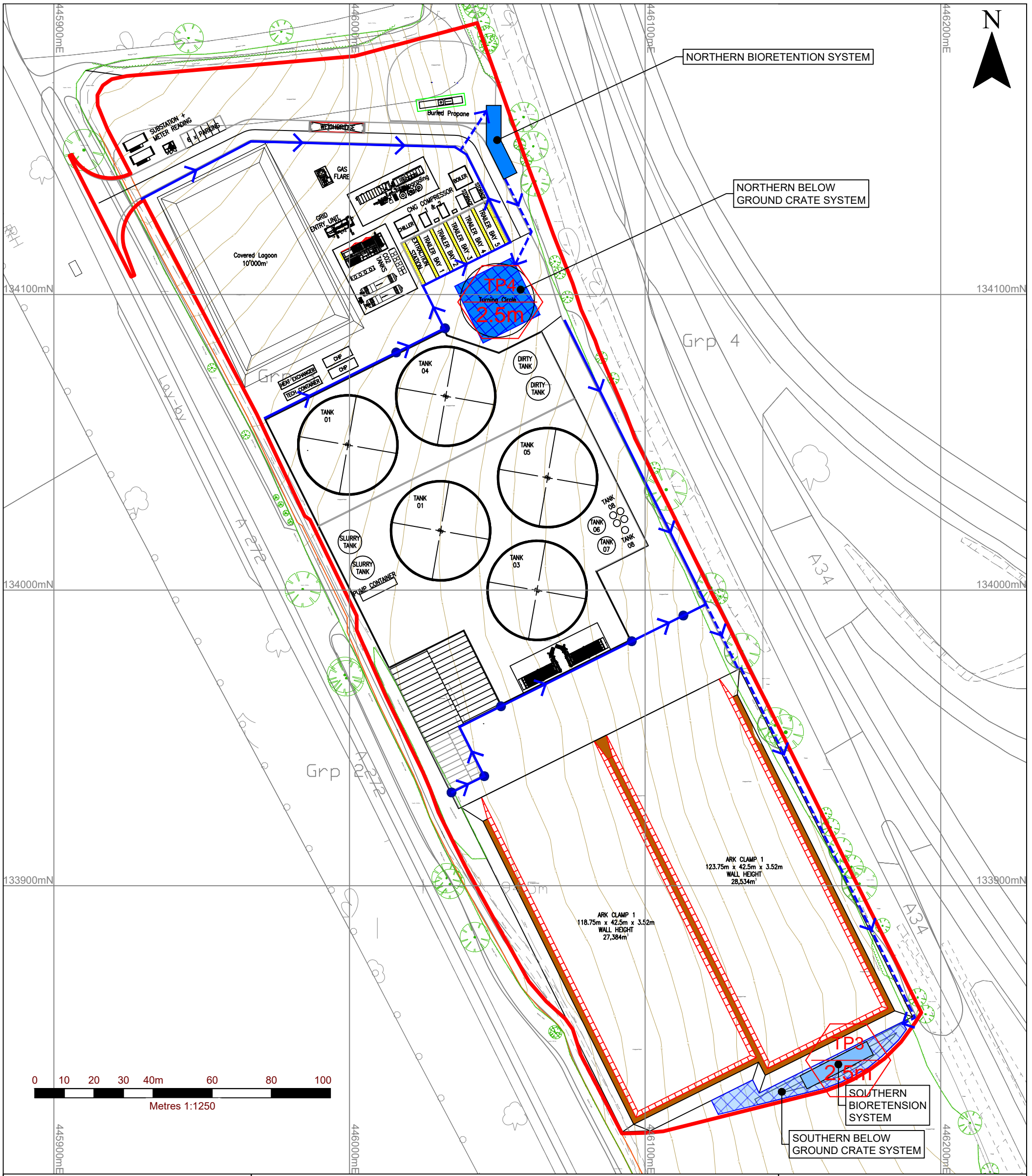
SAMPLES & TESTS					Water	STRATA			Instrument Backfill
Depth	Type No	Test Type	Test Result	SPT N Value 10 20 30 40		Reduced Level	Legend	Depth (Thickness)	
0.15	ES	HS	0ppm				0.30	Soft dark brown slightly gravelly, slightly clayey SAND. Sand is fine to coarse. Gravel is angular to sub-rounded, fine to coarse of flint and occasional chalk (TOPSOIL).	
0.90	ES	HS	0ppm				(3.20)	High density white CHALK recovered as sandy clayey gravelly cobbles. Gravel is angular to sub-rounded, fine to coarse of medium weak chalk and frequent flint (Grade Dc).	
1.20 - 1.65	SPTLS	SPT	N=14	14					
2.00 - 2.45	SPTLS	SPT	N=21	21			(3.50)	Low to medium density white CHALK recovered as sandy clayey gravelly cobbles. Gravel is angular to sub-rounded, fine to coarse of weak chalk and occasional flint (Grade Dc).  4.40 - 4.50 Flint band.	
		HS	0ppm						
3.00 - 3.45	SPTLS	SPT	N=15	15			(2.50)		
		HS	0ppm						
4.00 - 4.45	SPTLS	SPT	N=18	18			(6.00)	Borehole Complete at 6.00m	
		HS	0ppm						
5.00 - 5.45	SPTLS	SPT	N=30	30					
		HS	0ppm						
6.00	ES	SPT	N=13	13					
6.00 - 6.45	SPTLS	HS	0ppm						
7									
8									
9									

Boring Progress and Water Observations						Chiselling			Water Added		General Remarks
Date	Time	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	
											Service traced and CAT scanned. Hand pit to 1.2m. Installed with 50mm monitoring well with top hat cover.

All dimensions in metres Scale 1:66		Contractor: Geotechnical Engineering Ltd Plant: Commachio 305		Method: Rotary cored Hole Size: 150mm		Logged By: DG-J	Approved By:
SLR Consulting, Mill Barn 28 Hollingworth Court Turkey Mill, Maidstone ME14 5PP LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015							

## APPENDIX 04

### Proposed Trial Pit Locations



**NOTES**

1. DRAWING GENERATED FROM INFORMATION SUPPLIED BY THE CLIENT, REF: GGP-29350-120-B-Astwick Farm-Proposed Paving Plan.DWG, DATED: JUNE 2022.

**LEGEND**

	SITE BOUNDARY (45,188m <sup>2</sup> )		NORTHERN SuDS FEATURE
	ANTICIPATED RAINWATER DOWN PIPE LOCATION		NORTHERN ATTENUATION FEATURE
	INTERCEPTION / CONVEYANCE FEATURES (ACCO DRAINS)		SOUTHERN SuDS FEATURE
	PIPED FEATURES		SOUTHERN ATTENUATION FEATURE



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**THREE MAIDS HILL**  
 SURFACE WATER DRAINAGE STRATEGY  
 PROPOSED SURFACE WATER DRAINAGE STRATEGY PLAN

**SW2**

Scale 1:1250 @ A3 Date AUGUST 2022

404.11923.00004.004.18.SW2.0B\_Prop\_SW\_Drainage.dwg

## **Appendix C: Preliminary Land Quality Risk Assessment, SLR (2022)**



# PROPOSED ANAEROBIC DIGESTION FACILITY AT THREE MAIDS HILL, WINCHESTER

**Preliminary Land Quality Risk Assessment**

Prepared for: Acorn Bioenergy Limited

Client Ref:11923



## BASIS OF REPORT

This document has been prepared by SLR Consulting Limited with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it by agreement with Acorn Bioenergy (the Client) as part of all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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## CONTENTS

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Appointment.....	1
1.2	Proposed Development .....	1
1.3	Background and Objectives.....	1
1.4	Scope of Works .....	2
1.5	Sources of Information .....	3
<b>2.0</b>	<b>SITE DESCRIPTION.....</b>	<b>4</b>
2.1	Summary Site Details .....	4
2.2	Site Walkover .....	4
<b>3.0</b>	<b>SITE HISTORY.....</b>	<b>7</b>
3.1	Review of Historical Maps and Photographs.....	7
3.2	Previous Planning Permissions.....	7
3.3	Summary .....	8
<b>4.0</b>	<b>SITE ENVIRONMENTAL SETTING .....</b>	<b>9</b>
4.1	Geography and Geology.....	9
4.2	Regulatory Searches.....	10
<b>5.0</b>	<b>CONCEPTUAL SITE MODEL AND PRELIMINARY QUALITATIVE RISK ASSESSMENT .....</b>	<b>11</b>
5.1	Conceptual Site Model.....	11
5.1.1	Sources.....	11
5.1.2	Receptors.....	11
5.1.3	Pathways.....	11
5.2	Qualitative Risk Assessment.....	12
<b>6.0</b>	<b>CONCLUSIONS .....</b>	<b>13</b>
6.1	Conclusions .....	13
6.2	Recommendations .....	13
6.2.1	Land Quality .....	13
6.2.2	Soil Materials Management .....	13

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## DOCUMENT REFERENCES

### TABLES

Table 2-1 – Site Details .....	4
Table 4-1 – Site Setting .....	9

### FIGURES

Figure 1-1 Site Boundary Plan .....	2
Figure 2-1 Site looking northwest .....	5
Figure 2-2 Site looking southeast .....	5
Figure 2-3 Crushed brick and concrete gravel .....	6
Figure 2-4 Evidence of fly tipped material .....	6

### APPENDICES

- Appendix 01: Proposed Development
- Appendix 02: EnviroGeoInsight Report
- Appendix 03: Historical Ordnance Survey Maps

## 1.0 Introduction

### 1.1 Appointment

SLR Consulting was commissioned by Acorn Bioenergy to carry out a Preliminary Land Quality Risk Assessment (PLQRA) of the proposed development located at Three Maids Hill, Winchester, SO21 2QG.

A PLQRA has been requested to inform the planning process in respect of the proposed development of the application site. The proposed development would involve installation of an anaerobic digestion facility. Further details of the proposed development are provided below in Section 1.2.

### 1.2 Proposed Development

The application proposal is as follows:

*“The construction and operation of an anaerobic digestion facility, ancillary infrastructure and the construction of a new access road and access from the A272”.*

The proposed development would import and treat in the region of 83,600 tonnes of feedstock per annum from the applicant’s landholding and local farms, which would undergo a process of controlled decomposition (anaerobic digestion) within the Anaerobic Digestion (AD) facility. This anaerobic digestion generates biogas which is upgraded on site into biomethane, before being removed by tanker to a central facility for injection into the national grid. The AD facility would have the capacity to produce approximately 19,864,629 Nm<sup>3</sup> of biogas per annum.

The development proposals are presented in Appendix 01.

### 1.3 Background and Objectives

The PLQRA was commissioned following a screening report by SLR. The purpose of the assessment is to demonstrate whether the site is suitable for its proposed development taking account of potential contamination related risks.

This report assesses the potential for contamination risk and is based upon details of the development proposals provided to SLR by Acorn Bioenergy (Appendix 01). This report provides details of the findings of the PLQRA, comprising a desk top study of published information and walkover undertaken at the site in March 2022.

The site and survey boundaries can be seen on Figure 1-1 Site Boundary Plan.

Figure 1-1 Site Boundary Plan



## 1.4 Scope of Works

The PLQRA scope of work comprised the following tasks:

- A site walkover to:
  - Assess visual evidence of contamination and identify potential sources of contamination.
  - Review the potential for pollution to have occurred at the site.
  - Identify the surrounding land use.
- Review of land use history using available historical maps. Extracts of the maps are used to illustrate the historical land use of the site and surrounding area.
- Assessment of site sensitivity and environmental setting including a review of geological and hydrogeological records (e.g. geological maps, groundwater sensitivity and vulnerability maps etc). The quality of nearby surface waters and underlying groundwater is assessed, as well as any data available on pollution incidents, abstractions and discharges.
- Collection of information from public registers and regulators that is available via the GroundSure database, which can be obtained more quickly than through direct contact with the regulators and other public bodies.
- Data assimilation and risk assessment involving an assessment of potential sources (e.g. chemical storage, spillages etc), pathways (e.g. surface water drainage) and receptors (e.g. controlled surface watercourse) at or adjacent to the site. A conceptual site model (CSM) and the level of risk associated with identified potential pollutant linkages (PPLs) is determined qualitatively from the model.

- There were no previous contamination or ground investigation reports provided for review.

## 1.5 Sources of Information

SLR has collected and reviewed various reports, published data and maps in an attempt to characterise the site and its surrounds. These sources comprise:

- MAGIC website ([www.magic.defra.gov.uk](http://www.magic.defra.gov.uk)).
- British Geological Survey (BGS) website ([www.bgs.ac.uk](http://www.bgs.ac.uk)).
- A Groundsure EnviroGeoInsight report on site conditions dated March 2022 (Appendix 02).
- Historical Ordnance Survey Mapping (Appendix 03).
- Google Earth/Streetview.
- Review of the Winchester City Council and Hampshire County Council planning portals.

The information from the above sources is included within the following sections of this report.

## 2.0 Site Description

### 2.1 Summary Site Details

A summary of site details based on Groundsure reports and a site walkover is provided in Table 2-1 below. The site is on the rural outskirts of Winchester.

**Table 2-1 – Site Details**

Site Details	Thurlow 2, Haverhill, South Cambridgeshire CB9 7SW	
National Grid Reference	446071 133961	
Site Area	4.52 hectares	
Surrounding Land Use	North	A small area of woodland is located directly north of the site as well as the A34 road and agricultural fields. Further north is Worthy Down and South Wonston.
	East	The A34 runs along the eastern boundary, with PCE Motopark, Winchester Golf and agricultural fields beyond.
	South	Three Maids Hill roundabout is directly to the south, with agricultural fields and Littleton beyond.
	West	The A272 runs along the western boundary, with agricultural fields beyond.

### 2.2 Site Walkover

The site was inspected by a representative of SLR’s Land Quality and Remediation team on 25<sup>th</sup> March 2022.

The Three Maids site comprises a single arable field located between the A34 and A272 roads. At the time of inspection, the site was covered with dead crop stubble. Shallow, dry ditches were observed proximal to both roads during the inspection. No structures were present in the field.

In an area of trees in the south-western corner of the site, some localised fly tipping was observed. Along the boundaries occasional wind-blown rubbish was present. There was some very localised evidence of crushed brick and concrete gravel on the ground surface in the vicinity of the gated access to the field, although no further evidence of made ground or potentially significant contamination sources were noted on site during the site visit.



**Figure 2-1 Site looking northwest**



**Figure 2-2 Site looking southeast**



**Figure 2-3 Crushed brick and concrete gravel**



**Figure 2-4 Evidence of fly tipped material**



## 3.0 Site History

### 3.1 Review of Historical Maps and Photographs

The site history is based on a review of historical maps (Appendix 03).

Earliest available mapping from 1870 shows the site to be agricultural land, with a track running south across the centre of the site, joining a road labelled Roman Road (the now A272). A Guidepost is also mapped in the south of the site. The site remains unchanged until 1956 where mixed woodland is mapped in the northern and western portions of the site. Mapping from 1963 shows the track running across the site is now labelled Gallop (thought to be used for horse riding/racing). The site remains unchanged until the mid-1980s when the mixed woodland is no longer mapped. By 2001 the track running through the site is no longer mapped and the site remains mapped as agricultural land to date.

Aerial photographs between 2005 and 2008 show the site to contain racetracks, thought to be part of the nearby motopark.

Mapping from the 1870s shows a Roman Road along the site's eastern boundary with woodland also alongside the road, Littleton is mapped approximately 1km to the southwest, a well is mapped approximately 500m to the west and Down Farm approximately 750m to the east. By 1895 chalk pits are mapped 300m to the west and 500m northwest. Little change occurs until 1932 when residential development was mapped approximately 750m to the north. By 1969 Littleton has been significantly developed, further development has occurred to the north and the Roman Road is now labelled A34. Mapping from 1976 shows a gas valve compound approximately 200m to the north. Along the eastern boundary a new road has been constructed (A272) and to the south is now Three Maids roundabout. By 2001 the gas valve compound is no longer mapped, Littleton Stud and Three Maids Bungalow are now shown approximately 100m south of the site. Mapping from 2010 shows a Motor Cross Circuit to the east of the site, although it is no longer shown in 2022 maps, and further development of Littleton has occurred.

### 3.2 Previous Planning Permissions

A review of Winchester City Council planning portal shows no planning applications for the site, however there is a planning application for land directly north of the site. A review of Hampshire County Council planning portal shows one previous planning application:

- 20/01765/HCS Land at Three Maids Hill, off A272, Winchester SO21 2QU: Development of an Inert Waste Recycling Facility. The application was refused in January 2021, the decision notice states, "the proposal would have an unacceptable adverse impact on the local amenity due to the nature of the proposed operations, in particular the potential to generate noise and dust, and the proximity to nearby sensitive receptors."

A limited ground investigation was carried out in association with the proposed development in June 2020 by Enviroconsult.pro. Six trial pits were advanced to a maximum depth of 1.2m below ground level (bgl). Soil samples were taken and sent for confirmatory laboratory testing. All concentrations of tested contaminants fell below the adopted Generic Assessment Criteria (GAC) for commercial end-use and the report concluded that the risk posed to receptors is low.

Directly north of the site there is a planning application (20/020311/FUL) for Land to the East of the A272 and West of the A34 Christmas Hill, Worthy Down, Hampshire. The proposal is for the construction of a solar farm and battery storage facility together with all associated works, equipment and necessary infrastructure. The application was permitted in May 2021.

### 3.3 Summary

Since the earliest available mapping the site has remained predominately undeveloped. Between 1870 and the mid-1980s the site comprised agricultural land with a track running through it, after which the site contained mixed woodland and was used as a racetrack. The site is currently agricultural land, bordered on the east and west by the A34 and A272, with the Three Maids Roundabout directly to the south.

## 4.0 Site Environmental Setting

### 4.1 Geography and Geology

The site environmental setting including geography, geology, hydrogeology and hydrology based on information from Groundsure, MAGIC and BGS is summarised in Table 4-1.

**Table 4-1 – Site Setting**

Site Details		Three Maids Hill, Winchester, SO21 2QG	
Geography and Hydrology	Topography, Elevation and Gradient	The site is at an elevation of approximately 93m above Ordnance Datum. The site is broadly rectangular and slopes down towards the A34; the lowest point is in the centre of the site with the topography rising towards the north and south.	
	Surface Water	There are no surface water features within 1km of the site.	
	Flooding	The site is not at risk of river or coastal flooding. The Environment Agency surface water flood map indicates that the highest risk on site is 1 in 30 years with depths between 0.3m and 1m.	
Geology and Hydrogeology	Geology	<p>There is a record of Made Ground on site, in the south-east corner, described as an artificial deposit.</p> <p>The north-eastern corner of the site is underlain by superficial deposits comprising Head deposits - Diamicton (clay, silt, sand and gravel). The rest of the site is not mapped to be underlain by superficial deposits.</p> <p>The majority of the site's bedrock geology comprises the Seaford Chalk Formation. A small band of the Stockbridge Rock Member – Limestone, runs through the centre of the site.</p>	
	Natural Ground Risks	<p>The site is at low to very low risk from ground dissolution of soluble rocks. The site is at very low or negligible risk from shrink swell clays, very low risks from collapsible deposits and landslides and negligible risk from running sands and compressible deposits.</p> <p>Site buildings are at low risk from radon and radon protection measures are not required within buildings.</p>	
	Aquifer status	Superficial deposits are defined as a secondary undifferentiated aquifer (variable in nature) and the bedrock aquifer is classified as a principal aquifer. The site does not lie within a groundwater source protection zone (SPZ).	
	Abstractions	<p>The nearest groundwater abstraction is located 750m to the east and relates to groundwater for General Farming and Domestic purposes by Trustees of the late Mrs E G Brown, which dates from 1965.</p> <p>There are no surface water abstractions within 2km of the site.</p>	
Sensitivity	Groundwater	Groundwater is considered to be of high vulnerability given the high leaching class, infiltration value and the productivity of the aquifers.	
	Surface Water	Surface water sensitivity is considered to low given the lack of nearby significant watercourses.	

## 4.2 Regulatory Searches

The Groundsure Enviroinsight report provided information on historical industrial activities in the vicinity of the site, pollution incidents and on activities that required environmental regulatory permitting in order to indicate the nature of surrounding site operations and identify those permitted activities that might be a source of soil or groundwater contaminant impact with respect to the site. The resulting detail on relevant permits, licenses and designations within 500m of the site is summarised below.

There is one historic record of a licensed discharge to controlled waters within 500m of the site. This is located 200m south-west and related to sewage discharges, the licence was revoked in 1997.

There is one record of a pollution incident within 500m of the site, located 370m north. In 2003 there was a diesel spill, the impacts to water, land and air were all classified as minor.

Records of historical industrial land uses within 500m of the site include cuttings 57m to the east between 1975 and 1987, a gas valve compound 200m northwest between 1975 and 1987, a chalk pit 330m southwest between 1895 and 1897 and numerous unspecified pits and ground workings.

There are no active, recent or historical landfills within 500m. Eight sites have an exemption from needing a waste permit, five of which are for use of waste in construction; the others are for screening and blending of waste, spreading waste on non-agricultural land to confer benefit and use of waste for a specified purpose. The closest of these being 180m north-east.

There are no records of any of the following within 500m of the site: current or recent tanks, energy features, garages, petrol stations, electricity cables, gas pipelines, sites determined as Contaminated Land, Control of Major Accident Hazards (COMAH) sites, regulated explosive sites, hazardous substance storage / usage, historical licensed industrial activities (IPC, Part A(1), Part A(2)/B), radioactive substance authorisations, pollutant release to surface waters (red List), pollutant release to public sewer, List 1 or 2 dangerous substances, pollution inventory substances, pollution inventory waste transfers and pollution inventory radioactive waste.

The site is designated as a nitrate vulnerable zone for surface water, eutrophic water and groundwater.

With the exception of designated Ancient Woodland (145m north-west at Worthy Copse) and priority habitat inventory (Deciduous woodland on-site and 4m south-west off-site) there are no sites with ecological or nature conservation designation located within 500m of the site. Refer to separate SLR Ecological report for further details.

## 5.0 Conceptual Site Model and Preliminary Qualitative Risk Assessment

### 5.1 Conceptual Site Model

This report section uses the information gathered in previous sections and aims to identify potential contaminant sources at the site and sensitive receptors which may be impacted by them. Consideration of viable pathways which may link a source and receptor can then enable an assessment of Potential Pollutant Linkages (PPLs).

When identifying the PPLs relevant to this site, SLR has considered the proposed redevelopment of site as an anaerobic digestion facility.

#### 5.1.1 Sources

UK contaminated land statutory guidance<sup>1</sup>, defines a Contaminant as:

*“a substance which is in, on or under the land and which has the potential to cause significant harm to a relevant receptor, or to cause significant pollution of Controlled Waters”.*

Given the history of the site as agricultural fields we have not identified any significant potential sources of contamination on site. The crushed brick and concrete made ground noted near the access area is not considered as a potential significant source due to being in a small, localised area. The use of the site as part of the nearby motopark racetrack is not considered as a significant source of contamination; no evidence of oils, fuels or chemicals were noted during the site walkover.

Additionally, the previous trial pit investigation carried out in 2020 did not identify any significant sources of contamination; all concentrations were found to be below the adopted generic assessment criteria for commercial end-use.

#### 5.1.2 Receptors

UK contaminated land statutory guidance defines a Receptor as:

*“something that could be adversely affected by a contaminant, for example a person, an organism, an ecosystem, property, or Controlled Waters.”* Under the proposed commercial/industrial end use the following potentially sensitive receptors have been identified:

- R1 – Human Health (future site users and construction workers).
- R2 – Controlled Waters (superficial deposits are classed as a secondary undifferentiated aquifer and bedrock is classified as a principal aquifer).

#### 5.1.3 Pathways

UK contaminated land statutory guidance defines a Pathway as:

*“a route by which a receptor is or might be affected by a contaminant”.*

Given the lack of potential sources of contamination there is no further assessment of potential pathways to sensitive receptors required.

<sup>1</sup> DEFRA; 2012; EPA 1990: Part2A, Contaminated Land Statutory Guidance, PB13735; April 2012

## 5.2 Qualitative Risk Assessment

UK contaminated land statutory guidance and associated supporting guidance documents including LCRM<sup>2</sup> and R&D66<sup>3</sup> recommend that a qualitative assessment of risk should be provided for each identified PPL to determine any risk management actions. Given the lack of potential contamination sources we have not identified any viable PPLs which require further consideration.

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<sup>2</sup> Land Contamination Risk Management (LCRM), EA 2020.

<sup>3</sup> Guidance for the Safe Development of Housing, R&D66, DEFRA, EA, CIEH 2008



## 6.0 Conclusions

### 6.1 Conclusions

The site consists of a broadly rectangular arable field. Historically the site has been used as agricultural land, and at some points mixed woodland was present in the north and west of the site. A track/gallop ran through the site from north to south and the site was used as a racetrack for the nearby motopark. There was no evidence of potentially significant sources of contamination identified on site during the walkover or from published information.

Groundwater is sensitive at the site given the presence of a secondary undifferentiated aquifer in the superficial deposits and a principal chalk aquifer in the bedrock, although the nearest groundwater abstraction is approximately 750m to the east.

Surface water sensitivity is considered low due to no surface water features having been identified within 1km of the site.

Qualitative risk assessment indicates that the site represents a low risk of contamination impacts to human health and controlled waters associated with the proposed development as no potentially significant sources have been identified.

Given the lack of potential contamination sources it is likely that on site soils can be excavated and reused as part of the proposed development.

### 6.2 Recommendations

#### 6.2.1 Land Quality

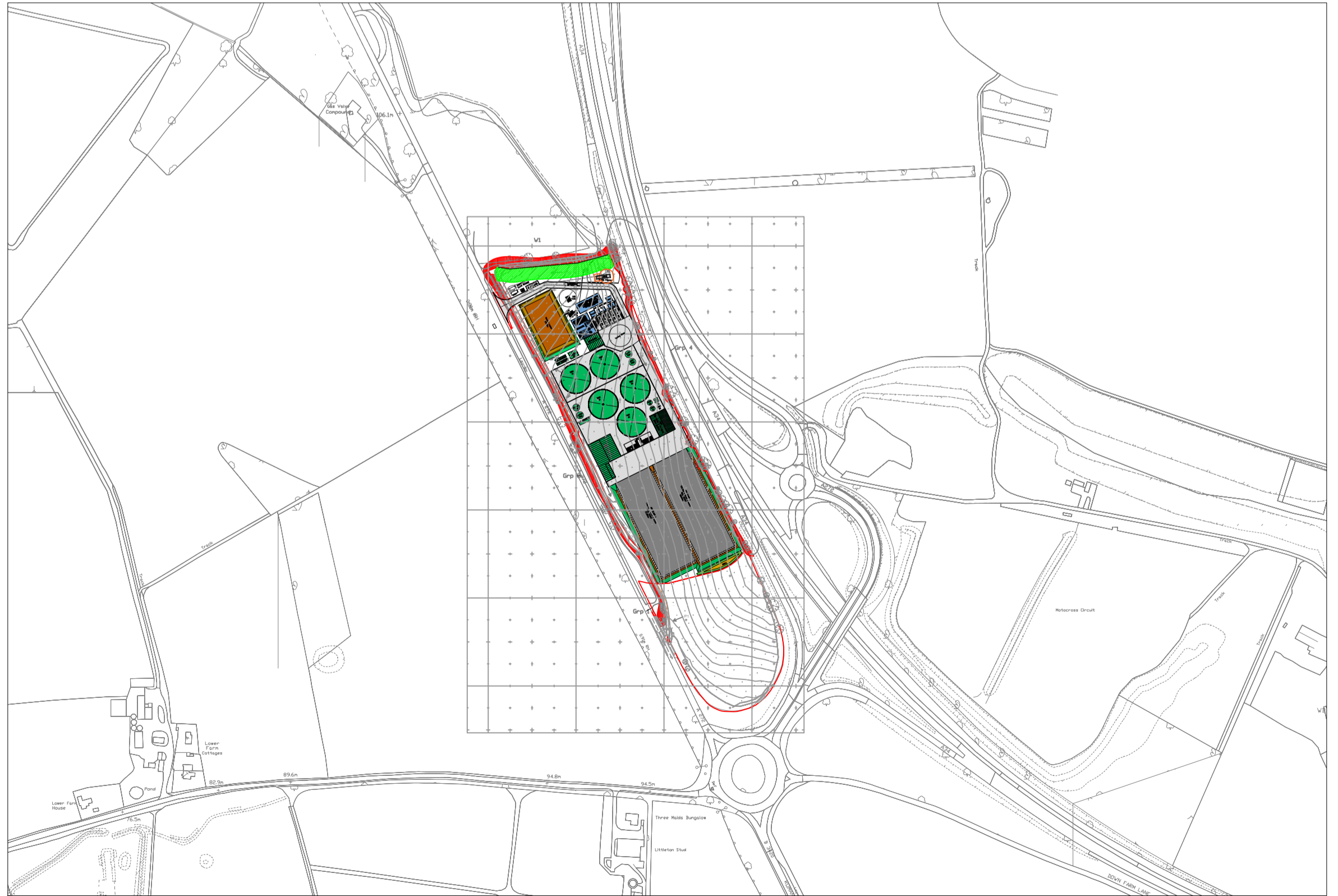
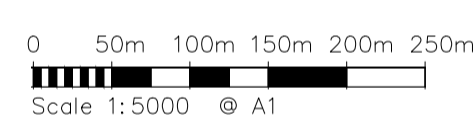
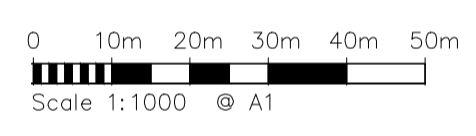
No further investigation or remediation is considered necessary for the proposed development. A watching brief should be maintained for potentially unexpected contamination during development. If any geotechnical investigations are proposed for foundation design, then consideration should be given to chemical analysis of made ground if it is encountered on site.

#### 6.2.2 Soil Materials Management

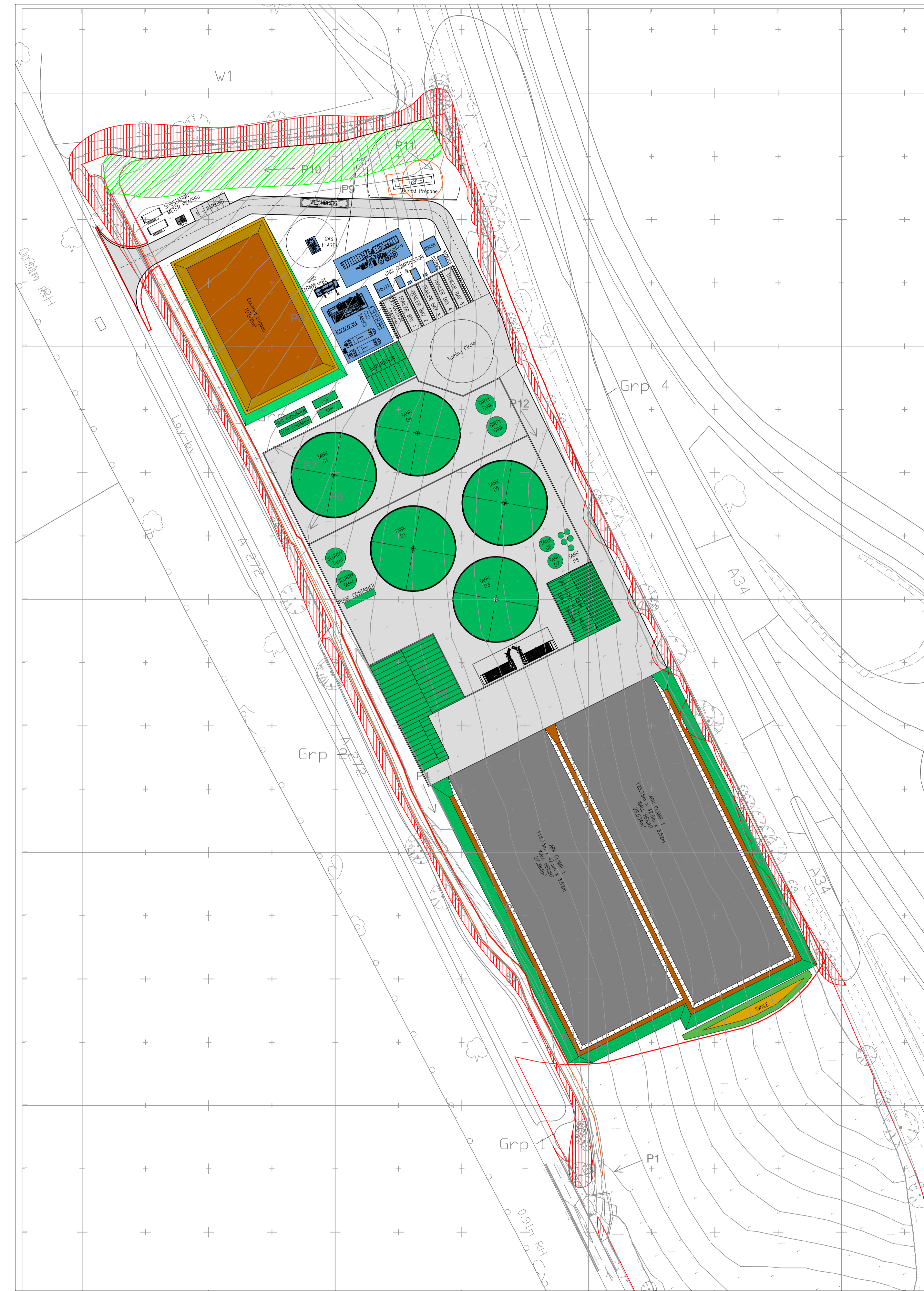
It is the responsibility of a holder of material to form their own view on whether that material is waste or not. Given the proposed reuse of natural occurring material within the same site boundary and lack of potential contamination sources it is possible that excavated soils reused as part of the proposed development would not be considered waste. However, we would recommend that any soil reuse is covered by a Materials Management Plan in accordance with the CLAIRE Definition of Waste Code of Practice (DoWCoP).

# APPENDIX 01

## Proposed Development



SITE LOCATION PLAN  
Scale: 1:5000 @ A1



SITE PLAN  
Scale: 1:1000 @ A1

- NOTES:
1. All dimensions must be checked on site and not scaled from this drawing.
  2. The Contractor shall make a survey of the site and shall be responsible for obtaining all dimensions and levels necessary for the proper fabrication of the structure as indicated.
  3. All levels shown on this drawing are relative to Agreed Topographic survey
  4. This drawing is to be read in conjunction with 29348/100 Series Drawings.
  5. All existing invert levels are to be confirmed by contractor prior to construction. Connection subject to approval.

- Site Red Line Boundary (4.52ha)
- ▨ 15m Woodland Easement
- ▨ Tree Easement

Rev	Date	Description	DR	CH
E	07/09/22	Notes Revised	JHC	JHC
D	25/08/22	Notes Revised	DJC	JHC
C	27/07/22	Layout Revised	DJC	JHC
B	13/06/22	Issued For Approval	DJC	JHC
A	24/03/22	Issued For Planning	DJC	JHC

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Client

Job Title  
AD Plant.  
Three Maids

Drawing Title  
Site Layout Plan

Status	Approval	
Scale	As Noted	Date Feb '22
Drawn By	Daniel Cook	Checked JHC Approved JHC

Dwg. No.	Rev
29348/101A	E

**NOT FOR CONSTRUCTION**

## APPENDIX 02

### EnviroGeoInsight Report

Three Maids, Winchester, SO21 2QG

## Order Details

**Date:** 16/03/2022  
**Your ref:** EMS\_767090\_954612  
**Our Ref:** EMS-767090\_992356  
**Client:** emapsite

## Site Details

**Location:** 446071 133961  
**Area:** 6.69 ha  
**Authority:** [Winchester City Council](#)



**Summary of findings**

p. 2

**Aerial image**

p. 8

**OS MasterMap site plan**

p.13

[groundsure.com/insightuserguide](https://groundsure.com/insightuserguide)

08444 159 000

## Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
<b>14</b>	<b>1.1</b>	<b><u>Historical industrial land uses</u></b>	0	0	4	14	-
15	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	-
16	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
<b>17</b>	<b>2.1</b>	<b><u>Historical industrial land uses</u></b>	0	0	4	17	-
18	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	-
<b>21</b>	<b>3.5</b>	<b><u>Historical waste sites</u></b>	1	0	0	1	-
22	3.6	Licensed waste sites	0	0	0	0	-
<b>22</b>	<b>3.7</b>	<b><u>Waste exemptions</u></b>	0	0	2	6	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
<b>23</b>	<b>4.1</b>	<b><u>Recent industrial land uses</u></b>	0	0	1	-	-
24	4.2	Current or recent petrol stations	0	0	0	0	-
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	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
26	4.12	Radioactive Substance Authorisations	0	0	0	0	-
<b>26</b>	<b>4.13</b>	<b><u>Licensed Discharges to controlled waters</u></b>	0	0	1	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	List 2 Dangerous Substances	0	0	0	0	-
<b>27</b>	<b>4.18</b>	<b><u>Pollution Incidents (EA/NRW)</u></b>	0	0	0	1	-
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	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
<b>29</b>	<b>5.1</b>	<b><u>Superficial aquifer</u></b>	Identified (within 500m)				
<b>30</b>	<b>5.2</b>	<b><u>Bedrock aquifer</u></b>	Identified (within 500m)				
<b>31</b>	<b>5.3</b>	<b><u>Groundwater vulnerability</u></b>	Identified (within 50m)				
<b>33</b>	<b>5.4</b>	<b><u>Groundwater vulnerability- soluble rock risk</u></b>	Identified (within 0m)				
34	5.5	Groundwater vulnerability- local information	None (within 0m)				
<b>35</b>	<b>5.6</b>	<b><u>Groundwater abstractions</u></b>	0	0	0	0	2
36	5.7	Surface water abstractions	0	0	0	0	0
36	5.8	Potable abstractions	0	0	0	0	0
37	5.9	Source Protection Zones	0	0	0	0	-
37	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
38	6.1	Water Network (OS MasterMap)	0	0	0	-	-



38	6.2	Surface water features	0	0	0	-	-
<b>39</b>	<b>6.3</b>	<b><u>WFD Surface water body catchments</u></b>	1	-	-	-	-
<b>39</b>	<b>6.4</b>	<b><u>WFD Surface water bodies</u></b>	0	0	0	-	-
<b>39</b>	<b>6.5</b>	<b><u>WFD Groundwater bodies</u></b>	2	-	-	-	-

Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
41	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
41	7.2	Historical Flood Events	0	0	0	-	-
41	7.3	Flood Defences	0	0	0	-	-
42	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
42	7.5	Flood Storage Areas	0	0	0	-	-
43	7.6	Flood Zone 2	None (within 50m)				
43	7.7	Flood Zone 3	None (within 50m)				

Page	Section	Surface water flooding					
<b>44</b>	<b>8.1</b>	<b><u>Surface water flooding</u></b>	1 in 30 year, 0.3m - 1.0m (within 50m)				

Page	Section	Groundwater flooding					
<b>46</b>	<b>9.1</b>	<b><u>Groundwater flooding</u></b>	Low (within 50m)				

Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
47	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
48	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
48	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
48	10.4	Special Protection Areas (SPA)	0	0	0	0	0
48	10.5	National Nature Reserves (NNR)	0	0	0	0	0
49	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
<b>49</b>	<b>10.7</b>	<b><u>Designated Ancient Woodland</u></b>	0	0	1	0	6
49	10.8	Biosphere Reserves	0	0	0	0	0
50	10.9	Forest Parks	0	0	0	0	0
50	10.10	Marine Conservation Zones	0	0	0	0	0
50	10.11	Green Belt	0	0	0	0	0
50	10.12	Proposed Ramsar sites	0	0	0	0	0

50	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
51	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
51	10.15	Nitrate Sensitive Areas	0	0	0	0	0
<b>51</b>	<b>10.16</b>	<b><u>Nitrate Vulnerable Zones</u></b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>
<b>53</b>	<b>10.17</b>	<b><u>SSSI Impact Risk Zones</u></b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
54	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
55	11.1	World Heritage Sites	0	0	0	-	-
55	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
55	11.3	National Parks	0	0	0	-	-
55	11.4	Listed Buildings	0	0	0	-	-
56	11.5	Conservation Areas	0	0	0	-	-
56	11.6	Scheduled Ancient Monuments	0	0	0	-	-
56	11.7	Registered Parks and Gardens	0	0	0	-	-

Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
<b>57</b>	<b>12.1</b>	<b><u>Agricultural Land Classification</u></b>	Grade 3a (within 250m)				
58	12.2	Open Access Land	0	0	0	-	-
<b>58</b>	<b>12.3</b>	<b><u>Tree Felling Licences</u></b>	<b>1</b>	<b>6</b>	<b>8</b>	<b>-</b>	<b>-</b>
59	12.4	Environmental Stewardship Schemes	0	0	0	-	-
<b>59</b>	<b>12.5</b>	<b><u>Countryside Stewardship Schemes</u></b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>-</b>	<b>-</b>

Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
<b>60</b>	<b>13.1</b>	<b><u>Priority Habitat Inventory</u></b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>-</b>	<b>-</b>
61	13.2	Habitat Networks	0	0	0	-	-
61	13.3	Open Mosaic Habitat	0	0	0	-	-
61	13.4	Limestone Pavement Orders	0	0	0	-	-

Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
<b>62</b>	<b>14.1</b>	<b><u>10k Availability</u></b>	Identified (within 500m)				
<b>63</b>	<b>14.2</b>	<b><u>Artificial and made ground (10k)</u></b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>-</b>
<b>65</b>	<b>14.3</b>	<b><u>Superficial geology (10k)</u></b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-</b>

66	14.4	Landslip (10k)	0	0	0	0	-
<b>67</b>	<b>14.5</b>	<b><u>Bedrock geology (10k)</u></b>	2	0	1	0	-
68	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
<b>69</b>	<b>15.1</b>	<b><u>50k Availability</u></b>	Identified (within 500m)				
<b>70</b>	<b>15.2</b>	<b><u>Artificial and made ground (50k)</u></b>	0	0	0	1	-
71	15.3	Artificial ground permeability (50k)	0	0	-	-	-
<b>72</b>	<b>15.4</b>	<b><u>Superficial geology (50k)</u></b>	1	0	0	0	-
<b>73</b>	<b>15.5</b>	<b><u>Superficial permeability (50k)</u></b>	Identified (within 50m)				
73	15.6	Landslip (50k)	0	0	0	0	-
73	15.7	Landslip permeability (50k)	None (within 50m)				
<b>74</b>	<b>15.8</b>	<b><u>Bedrock geology (50k)</u></b>	2	0	1	0	-
<b>75</b>	<b>15.9</b>	<b><u>Bedrock permeability (50k)</u></b>	Identified (within 50m)				
75	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
76	16.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence					
<b>77</b>	<b>17.1</b>	<b><u>Shrink swell clays</u></b>	Very low (within 50m)				
<b>78</b>	<b>17.2</b>	<b><u>Running sands</u></b>	Very low (within 50m)				
<b>80</b>	<b>17.3</b>	<b><u>Compressible deposits</u></b>	Negligible (within 50m)				
<b>81</b>	<b>17.4</b>	<b><u>Collapsible deposits</u></b>	Very low (within 50m)				
<b>82</b>	<b>17.5</b>	<b><u>Landslides</u></b>	Moderate (within 50m)				
<b>84</b>	<b>17.6</b>	<b><u>Ground dissolution of soluble rocks</u></b>	Low (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
86	18.1	Natural cavities	0	0	0	0	-
<b>87</b>	<b>18.2</b>	<b><u>BritPits</u></b>	0	0	0	1	-
<b>87</b>	<b>18.3</b>	<b><u>Surface ground workings</u></b>	0	0	2	-	-
87	18.4	Underground workings	0	0	0	0	0
88	18.5	Historical Mineral Planning Areas	0	0	0	0	-

<b>88</b>	<b>18.6</b>	<b><u>Non-coal mining</u></b>		<b>1</b>	0	0	0	<b>2</b>
88	18.7	Mining cavities		0	0	0	0	0
89	18.8	JPB mining areas		None (within 0m)				
89	18.9	Coal mining		None (within 0m)				
89	18.10	Brine areas		None (within 0m)				
89	18.11	Gypsum areas		None (within 0m)				
89	18.12	Tin mining		None (within 0m)				
90	18.13	Clay mining		None (within 0m)				
<b>Page</b>	<b>Section</b>	<b>Radon</b>						
<b>91</b>	<b>19.1</b>	<b><u>Radon</u></b>	<b>Less than 1% (within 0m)</b>					
<b>Page</b>	<b>Section</b>	<b>Soil chemistry</b>	<b>On site</b>	<b>0-50m</b>	<b>50-250m</b>	<b>250-500m</b>	<b>500-2000m</b>	
<b>92</b>	<b>20.1</b>	<b><u>BGS Estimated Background Soil Chemistry</u></b>	<b>13</b>	<b>4</b>	-	-	-	
93	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-	
93	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-	
<b>Page</b>	<b>Section</b>	<b>Railway infrastructure and projects</b>	<b>On site</b>	<b>0-50m</b>	<b>50-250m</b>	<b>250-500m</b>	<b>500-2000m</b>	
94	21.1	Underground railways (London)	0	0	0	-	-	
94	21.2	Underground railways (Non-London)	0	0	0	-	-	
94	21.3	Railway tunnels	0	0	0	-	-	
94	21.4	Historical railway and tunnel features	0	0	0	-	-	
94	21.5	Royal Mail tunnels	0	0	0	-	-	
95	21.6	Historical railways	0	0	0	-	-	
95	21.7	Railways	0	0	0	-	-	
95	21.8	Crossrail 1	0	0	0	0	-	
95	21.9	Crossrail 2	0	0	0	0	-	
95	21.10	HS2	0	0	0	0	-	

## Recent aerial photograph



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Capture Date: 05/04/2020

Site Area: 6.69ha

## Recent site history - 2017 aerial photograph



Capture Date: 20/06/2017

Site Area: 6.69ha

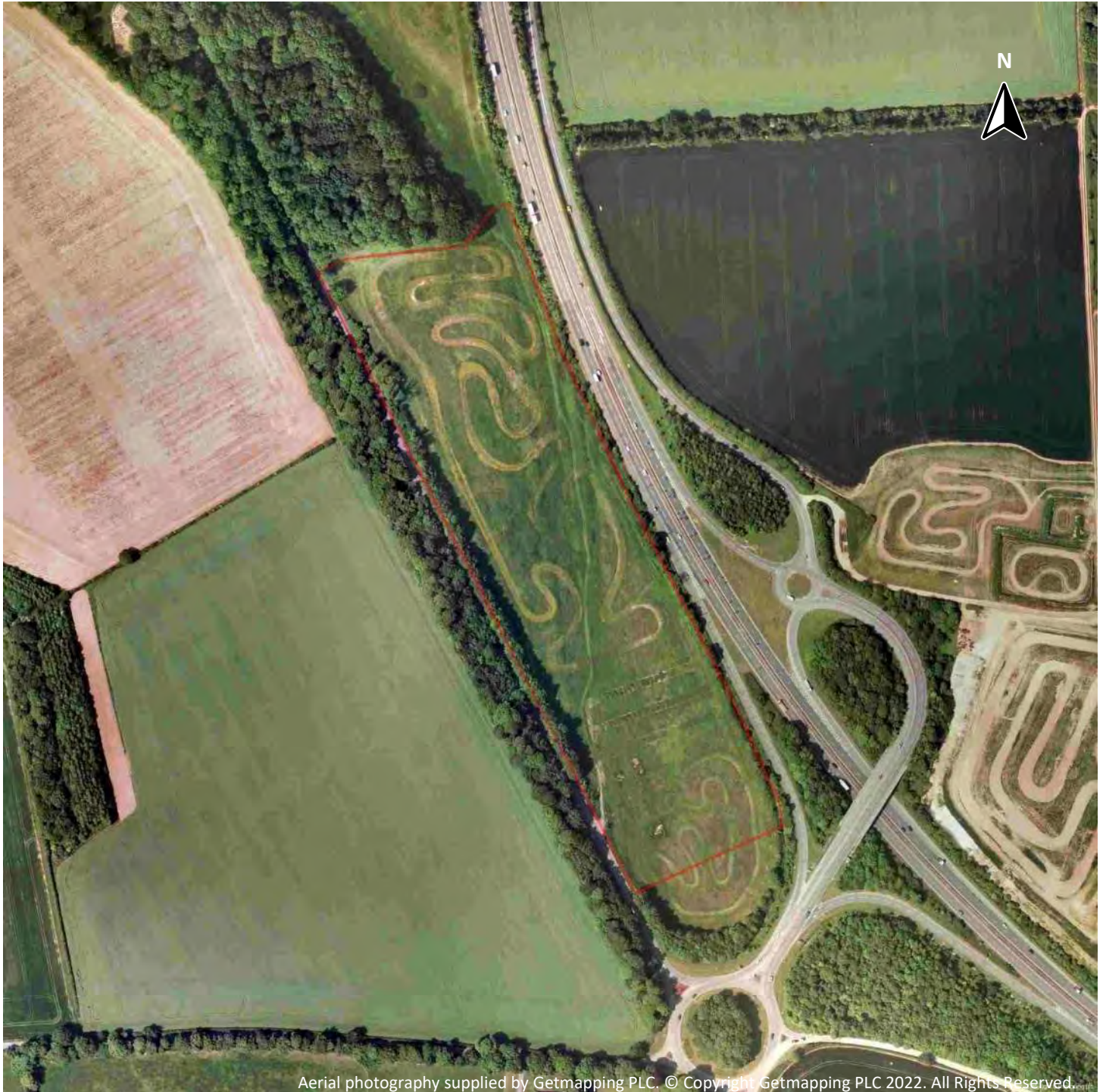
## Recent site history - 2013 aerial photograph



Capture Date: 04/06/2013

Site Area: 6.69ha

## Recent site history - 2005 aerial photograph



Capture Date: 07/06/2005

Site Area: 6.69ha



## Recent site history - 1999 aerial photograph



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Capture Date: 30/04/1999

Site Area: 6.69ha

## OS MasterMap site plan



Site Area: 6.69ha

## 1 Past land use



**Site Outline**

Search buffers in metres (m)

- Historical industrial land uses

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### 1.1 Historical industrial land uses

**Records within 500m**

**18**

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 14**

ID	Location	Land use	Dates present	Group ID
A	57m E	Cuttings	1987	1939714

ID	Location	Land use	Dates present	Group ID
A	57m E	Cuttings	1975	1941591
B	209m NW	Gas Valve Compound	1975	1904155
B	209m NW	Gas Valve Compound	1987	1936851
C	327m SW	Chalk Pit	1895 - 1897	1966983
C	333m SW	Unspecified Pit	1932	1956945
C	335m SW	Unspecified Pit	1966	1940527
C	335m SW	Unspecified Pit	1969 - 1975	1895644
C	335m SW	Unspecified Pit	1987	1946480
C	335m SW	Unspecified Pit	1961	1952729
C	336m SW	Old Chalk Pit	1908	1856396
C	341m SW	Unspecified Pit	1871	1968302
D	396m NW	Unspecified Pit	1975	1877126
D	411m NW	Unspecified Ground Workings	1961	1852354
1	423m N	Unspecified Ground Workings	1961	1852355
2	447m NW	Unspecified Ground Workings	1961	1852356
E	473m SW	Unspecified Pit	1969 - 1975	1915621
E	473m SW	Unspecified Pit	1987	1959650

*This data is sourced from Ordnance Survey / Groundsure.*

## 1.2 Historical tanks

<b>Records within 500m</b>	<b>0</b>
----------------------------	----------

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** **21**

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 17**

ID	Location	Land Use	Date	Group ID
A	57m E	Cuttings	1987	1939714
A	57m E	Cuttings	1975	1941591
B	209m NW	Gas Valve Compound	1987	1936851

ID	Location	Land Use	Date	Group ID
B	209m NW	Gas Valve Compound	1975	1904155
C	327m SW	Chalk Pit	1897	1966983
C	328m SW	Chalk Pit	1895	1966983
C	333m SW	Unspecified Pit	1932	1956945
C	335m SW	Unspecified Pit	1966	1940527
C	335m SW	Unspecified Pit	1987	1946480
C	335m SW	Unspecified Pit	1961	1952729
C	335m SW	Unspecified Pit	1969	1895644
C	335m SW	Unspecified Pit	1975	1895644
C	336m SW	Old Chalk Pit	1908	1856396
C	341m SW	Unspecified Pit	1871	1968302
D	396m NW	Unspecified Pit	1975	1877126
D	411m NW	Unspecified Ground Workings	1961	1852354
1	423m N	Unspecified Ground Workings	1961	1852355
2	447m NW	Unspecified Ground Workings	1961	1852356
E	473m SW	Unspecified Pit	1987	1959650
E	473m SW	Unspecified Pit	1969	1915621
E	473m SW	Unspecified Pit	1975	1915621

*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

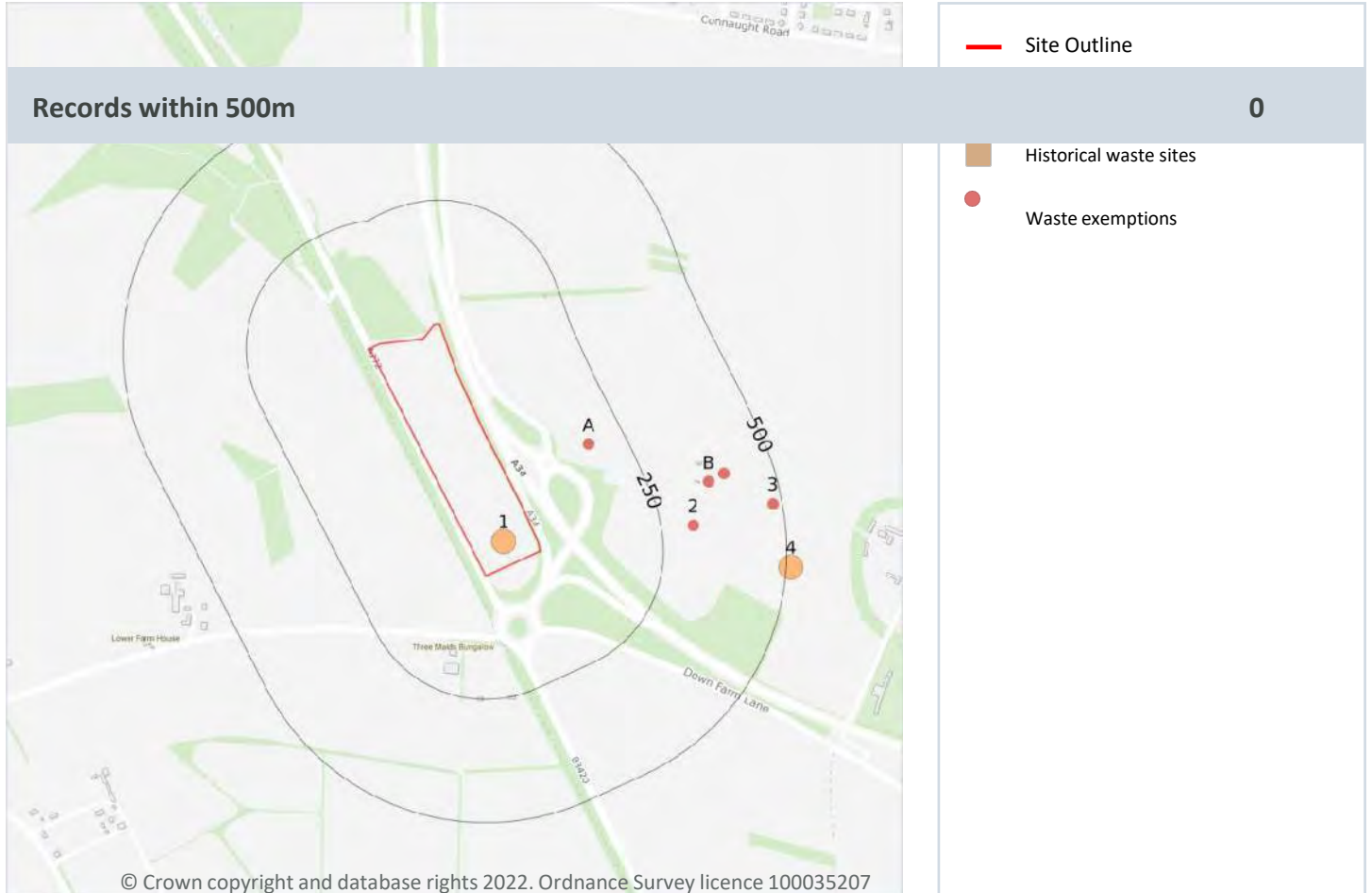
0

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



### 3.1 Active or recent landfill

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

2

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

Features are displayed on the Waste and landfill map on **page 20**

ID	Location	Address	Further Details	Date
1	On site	Site Address: Land at Three Maids Hill, Off A272, Winchester, Hampshire, SO21 2QU	<p><b>Type of Site: Waste Recycling Facility</b></p> <p><b>Planning application reference: HCC/2020/0428</b></p> <p><b>Description: Scheme comprises development of an inert waste recycling facility . This project also includes associated infrastructure works and access roads.</b></p> <p><b>Data source: Historic Planning Application</b></p> <p><b>Data Type: Point</b></p>	14/08/2020
4	484m E	Site Address: Land at Down Farm, Down Farm Lane, Headbourne Worthy, Winchester, Hampshire, SO23 7LA	<p><b>Type of Site: Waste Transfer Station</b></p> <p><b>Planning application reference: HCC/2020/0310</b></p> <p><b>Description: Scheme comprises importation and storage of road plannings for crushing and screening to create recycled aggregate, including associated buildings, structures and vehicle parking</b></p> <p><b>Data source: Historic Planning Application</b></p> <p><b>Data Type: Point</b></p>	05/06/2020

*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**
**8**

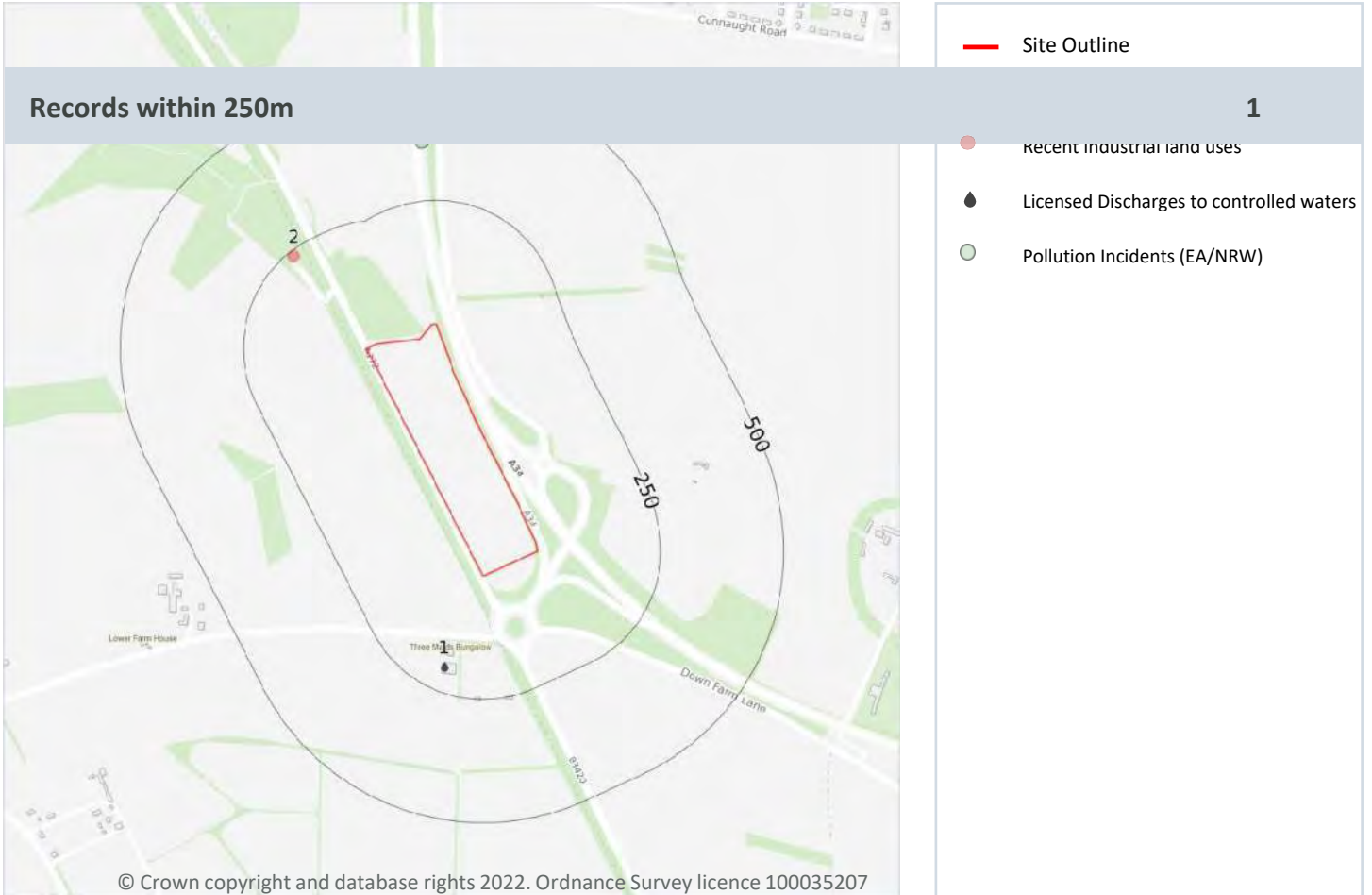
Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 20**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	177m NE	-	WEX276390	Using waste exemption	Not on a farm	Use of waste in construction
A	177m NE	-	WEX276390	Treating waste exemption	Not on a farm	Screening and blending of waste
2	314m E	-	WEX252634	Using waste exemption	On a farm	Use of waste in construction
B	365m E	Down Farm WINCHESTER Hampshire SO22 6RG	EPR/JF0603W G/A001	Using waste exemption	Agricultural Waste Only	Use of waste in construction
B	365m E	Down Farm WINCHESTER Hampshire SO22 6RG	EPR/JF0603W G/A001	Using waste exemption	Agricultural Waste Only	Spreading waste on non-agricultural land to confer benefit
B	365m E	Down Farm WINCHESTER Hampshire SO22 6RG	EPR/JF0603W G/A001	Using waste exemption	Agricultural Waste Only	Use of waste for a specified purpose
B	400m E	-	WEX252486	Using waste exemption	On a farm	Use of waste in construction
3	481m E	-	WEX252317	Using waste exemption	On a farm	Use of waste in construction

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

## 4 Current industrial land use



### 4.1 Recent industrial land uses

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 23**

ID	Location	Company	Address	Activity	Category
2	238m NW	Gas Valve Compound	Hampshire, SO21	Gas Features	Infrastructure and Facilities

*This data is sourced from Ordnance Survey.*

## 4.2 Current or recent petrol stations

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

Open, closed, under development and obsolete petrol stations.

*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

0

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.

*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****1**

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

Features are displayed on the Current industrial land use map on **page 23**

ID	Location	Address	Details	
1	200m SW	J.SMITH ESQ., STAFF COTTAGE, LITTLETON STUD LITTLETON, WINCHESTER HAMPSHIRE	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: P01377 Permit Version: 1 Receiving Water: INTO LAND	Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995 Issue date: 01/03/1989 Effective Date: 01/03/1989 Revocation Date: 31/03/1997

*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	<b>0</b>
---------------------	----------

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	<b>0</b>
---------------------	----------

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.

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

#### 4.18 Pollution Incidents (EA/NRW)

Records within 500m	<b>1</b>
---------------------	----------

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

Features are displayed on the Current industrial land use map on **page 23**

ID	Location	Details	
3	370m N	Incident Date: 11/11/2003 Incident Identification: 200890 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)

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

#### 4.19 Pollution inventory substances

Records within 500m	<b>0</b>
---------------------	----------

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

1

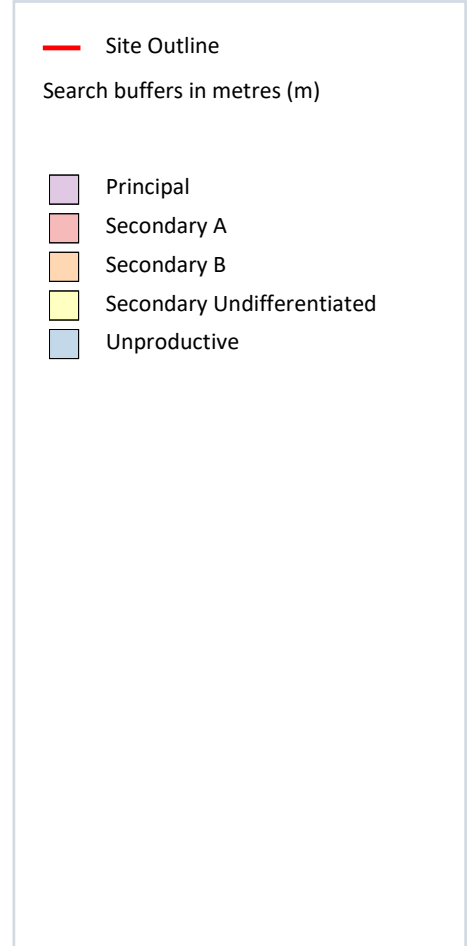
Aquifer status of groundwater held within superficial geology.

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

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

## Bedrock aquifer



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### 5.2 Bedrock aquifer

Records within 500m

1

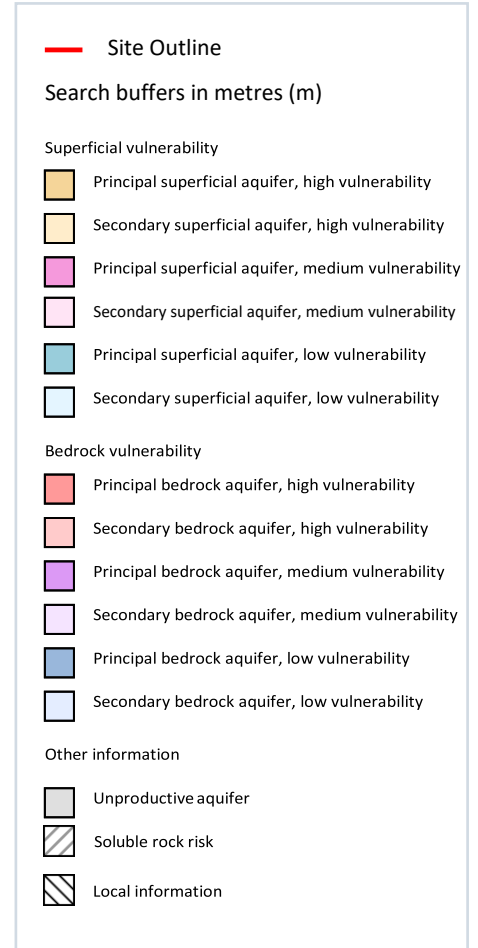
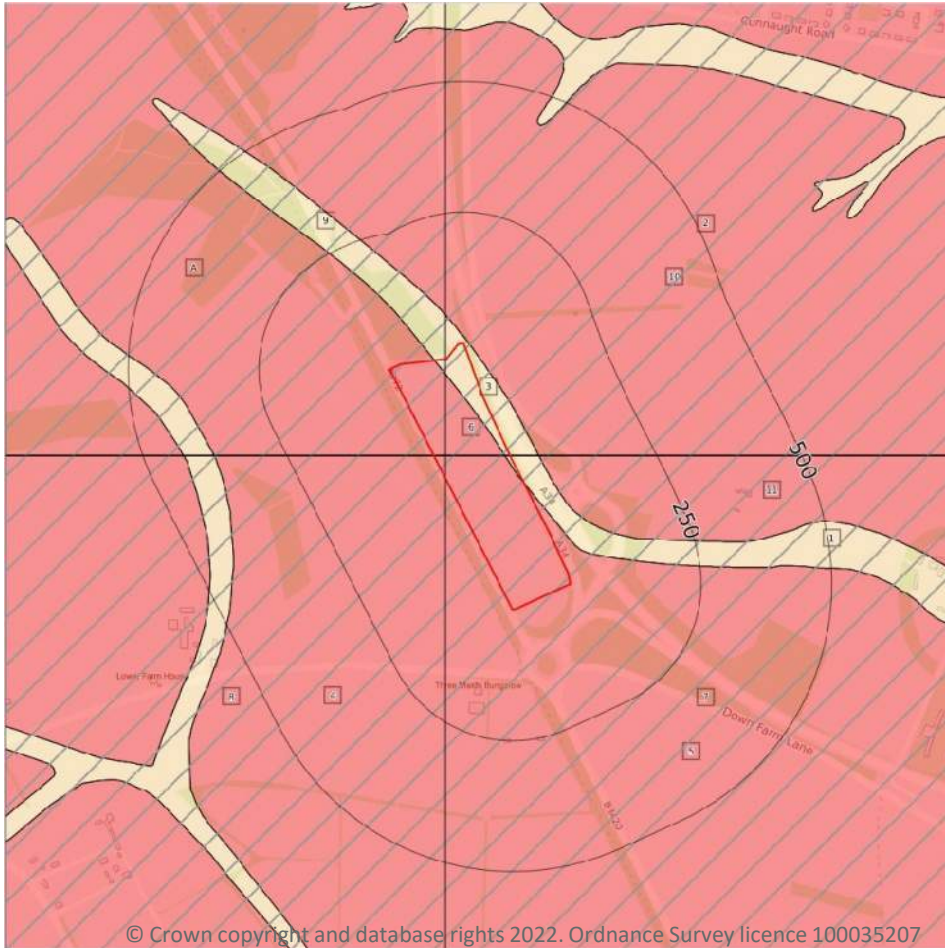
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 30**

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

9

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 31**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	<b>Summary Classification:</b> Secondary superficial aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, Productive Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> High <b>Aquifer type:</b> Secondary <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures
3	On site	<b>Summary Classification:</b> Secondary superficial aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, Productive Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> High <b>Aquifer type:</b> Secondary <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures
4	On site	<b>Summary Classification:</b> Principal bedrock aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, No Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> - <b>Aquifer type:</b> - <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures
5	On site	<b>Summary Classification:</b> Principal bedrock aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, No Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> - <b>Aquifer type:</b> - <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures
6	On site	<b>Summary Classification:</b> Principal bedrock aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, No Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> - <b>Aquifer type:</b> - <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures
9	On site	<b>Summary Classification:</b> Secondary superficial aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, Productive Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> High <b>Aquifer type:</b> Secondary <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures
A	On site	<b>Summary Classification:</b> Principal bedrock aquifer - High Vulnerability <b>Combined classification:</b> Productive Bedrock Aquifer, No Superficial Aquifer	<b>Leaching class:</b> High <b>Infiltration value:</b> >70% <b>Dilution value:</b> 300- 550mm/year	<b>Vulnerability:</b> - <b>Aquifer type:</b> - <b>Thickness:</b> <3m <b>Patchiness value:</b> <90% <b>Recharge potential:</b> No Data	<b>Vulnerability:</b> High <b>Aquifer type:</b> Principal <b>Flow mechanism:</b> Well connected fractures

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
10	7m NE	Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures
11	48m NE	Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High 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

**4**

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
2	<b>Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.</b>	<b>11.0%</b>
7	<b>Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.</b>	<b>6.0%</b>
8	<b>Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.</b>	<b>8.0%</b>
A	<b>Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.</b>	<b>9.0%</b>

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



## 5.5 Groundwater vulnerability- local information

Records on site

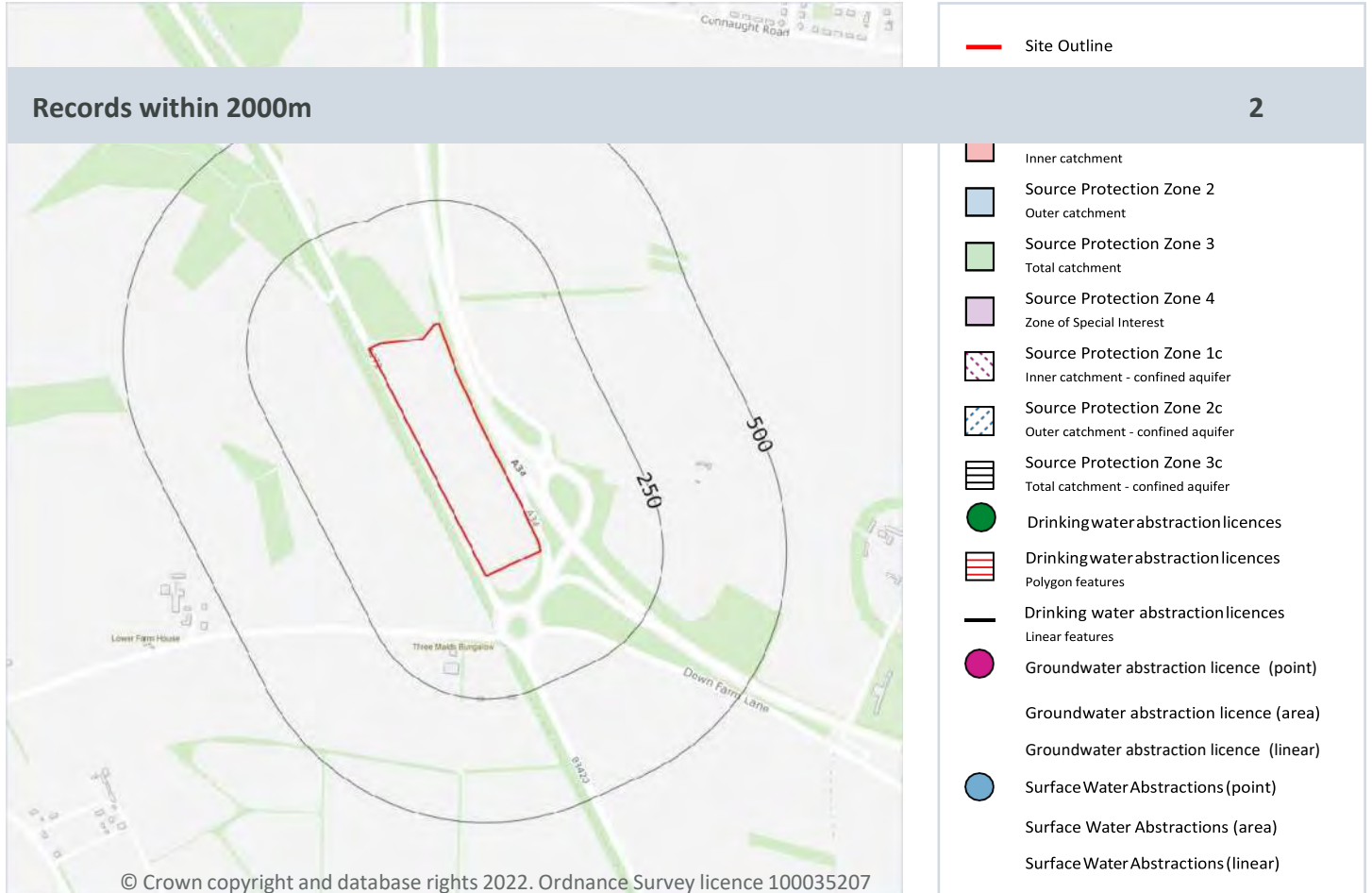
0

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](mailto:enquiries@environment-agency.gov.uk).

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



## Abstractions and Source Protection Zones



### 5.6 Groundwater abstractions

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	
-	743m E	Status: Active Licence No: 11/42/22.5/73 Details: General Farming & Domestic Direct Source: Southern Region Groundwater Point: UPPER & DOWN FARMS POINT A, HEADBOURNE WORTHY Data Type: Point Name: Trustees Of The Late Mrs E G Brown Easting: 446980 Northing: 133690	Annual Volume (m <sup>3</sup> ): 2,682 Max Daily Volume (m <sup>3</sup> ): 36.40 Original Application No: WR.4058 Original Start Date: 23/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2008 Version End Date: -
-	1589m NW	Status: Historical Licence No: 33/240 Details: General Washing/Process Washing Direct Source: Southern Region Groundwater Point: POINT B AT LARKWHISTLE FARM Data Type: Point Name: Pentex Oil UK Ltd Easting: 445150 Northing: 135570	Annual Volume (m <sup>3</sup> ): - Max Daily Volume (m <sup>3</sup> ): - Original Application No: - Original Start Date: 11/04/2001 Expiry Date: 31/03/2013 Issue No: 2 Version Start Date: 24/06/2003 Version End Date: -

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

## 5.7 Surface water abstractions

**Records within 2000m**

**0**

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.

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

## 5.8 Potable abstractions

**Records within 2000m**

**0**

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

0

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

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

## 5.10 Source Protection Zones (confined aquifer)

Records within 500m

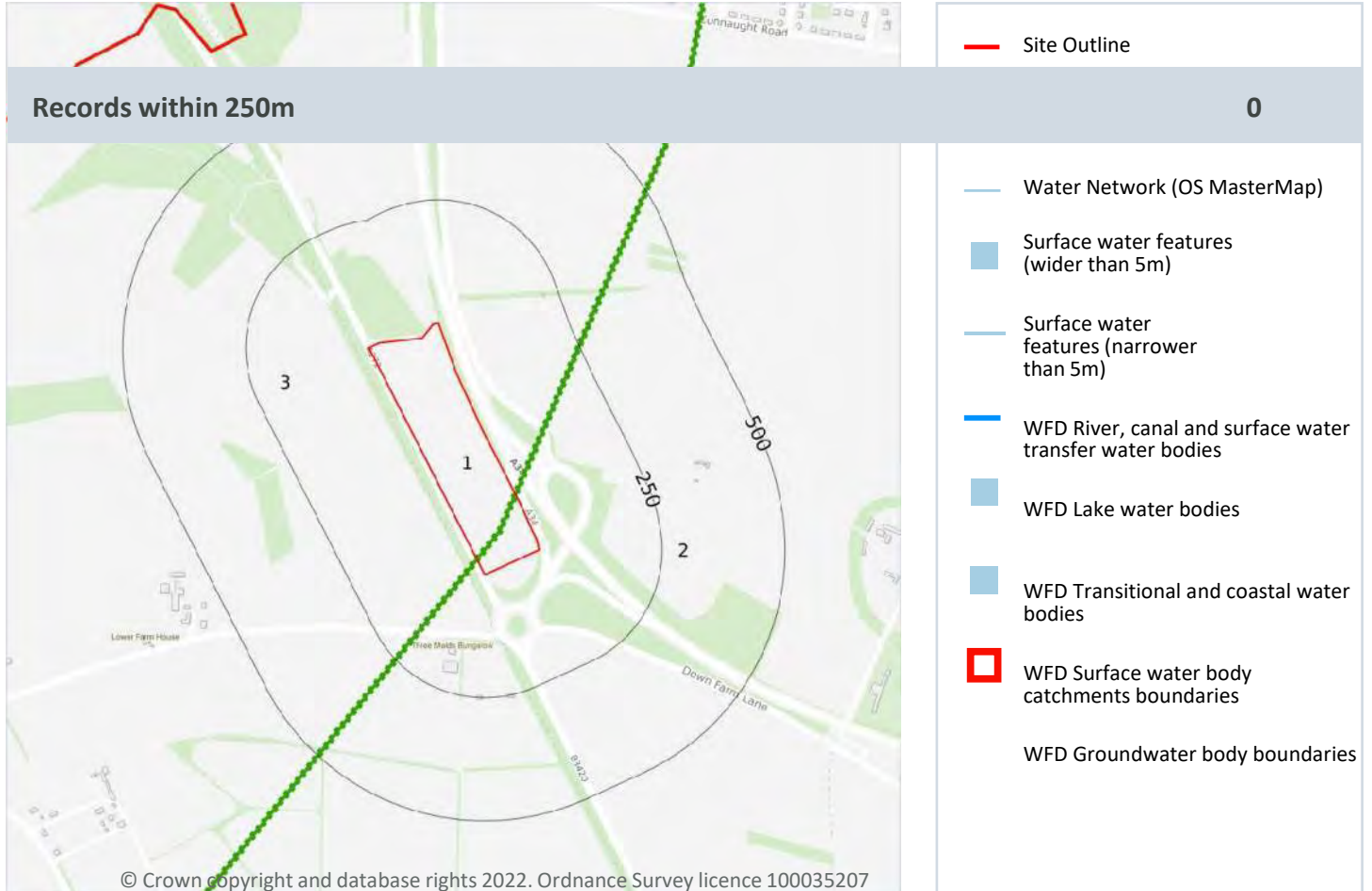
0

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



### 6.1 Water Network (OS MasterMap)

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

<b>Records on site</b>	<b>1</b>
------------------------	----------

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 38**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	On site	River	Nun's Walk Stream	GB107042022730	Itchen	Test and Itchen

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

### 6.4 WFD Surface water bodies

<b>Records identified</b>	<b>1</b>
---------------------------	----------

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 38**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	2751m SE	River	Nun's Walk Stream	<a href="#">GB107042022730</a>	Moderate	Fail	Good	2019

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

### 6.5 WFD Groundwater bodies

<b>Records on site</b>	<b>2</b>
------------------------	----------

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 38**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
2	On site	River Itchen Chalk	<u>GB40701G505000</u>	Poor	Poor	Poor	2019
3	On site	River Test Chalk	<u>GB40701G501200</u>	Poor	Poor	Good	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

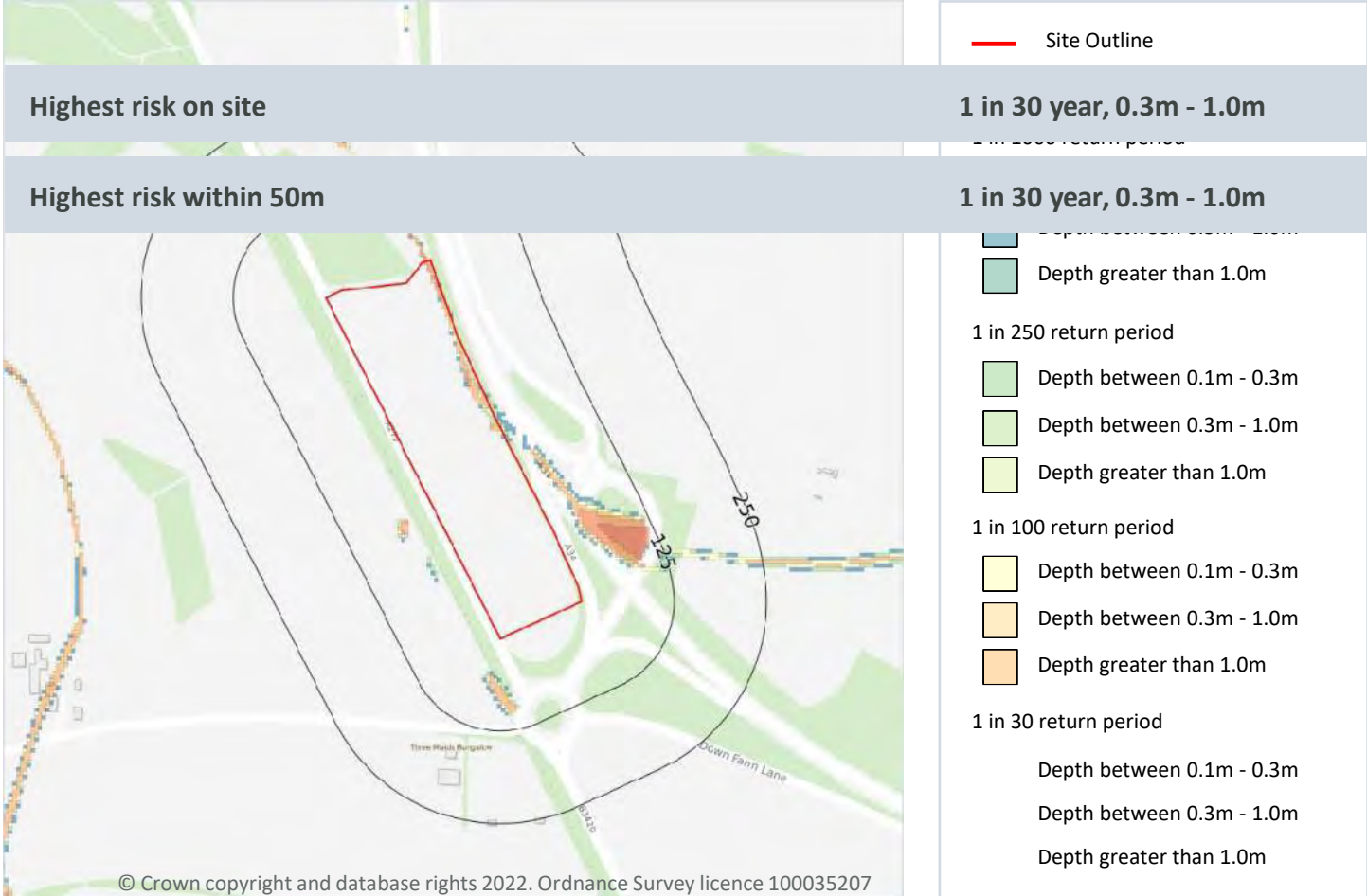
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

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





## 8 Surface water flooding



### 8.1 Surface water flooding

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 44**

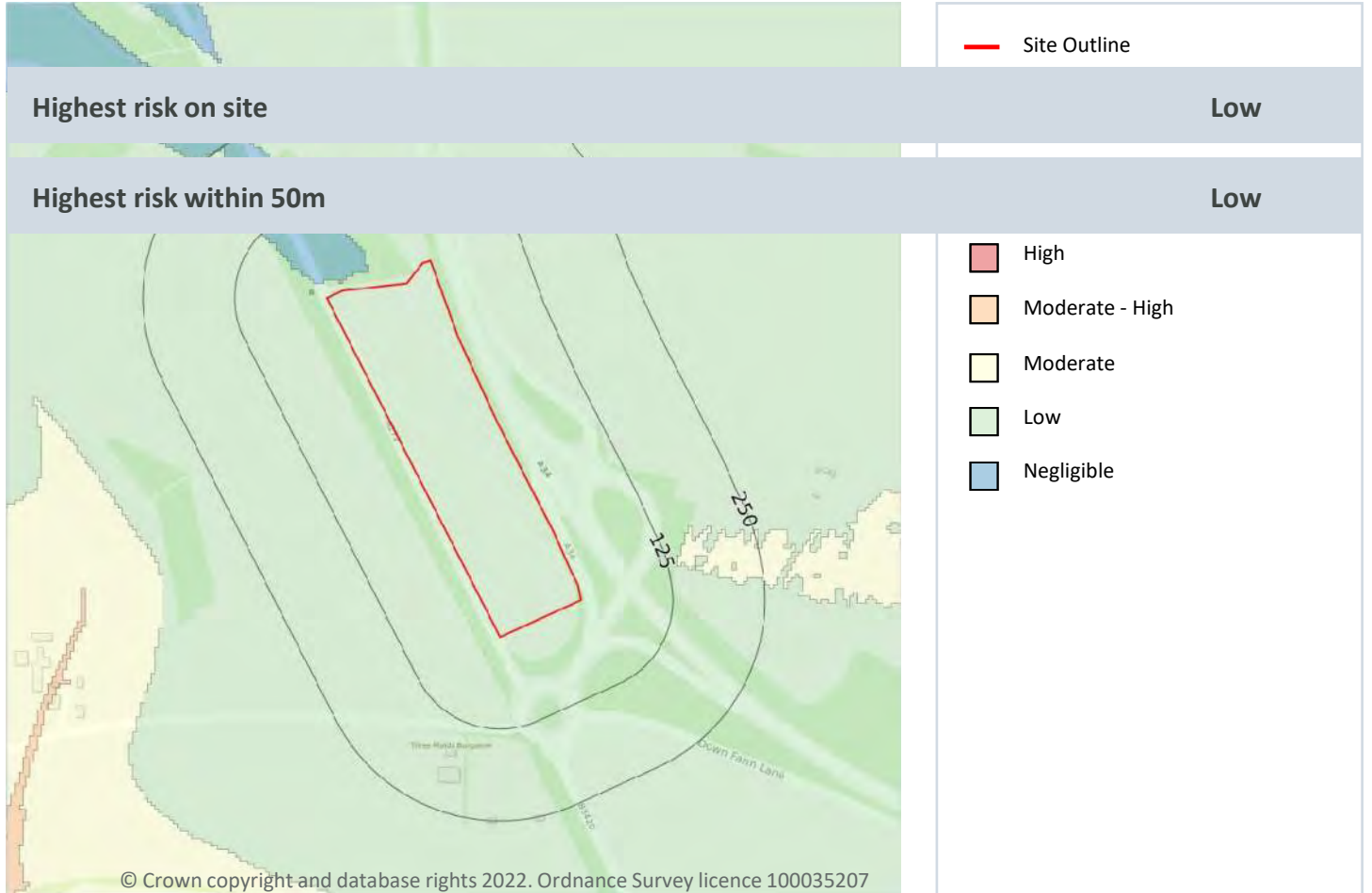
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

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 0.3m and 1.0m
1 in 100 year	Between 0.3m and 1.0m
1 in 30 year	Between 0.3m and 1.0m

*This data is sourced from Ambiantal Risk Analytics.*

## 9 Groundwater flooding



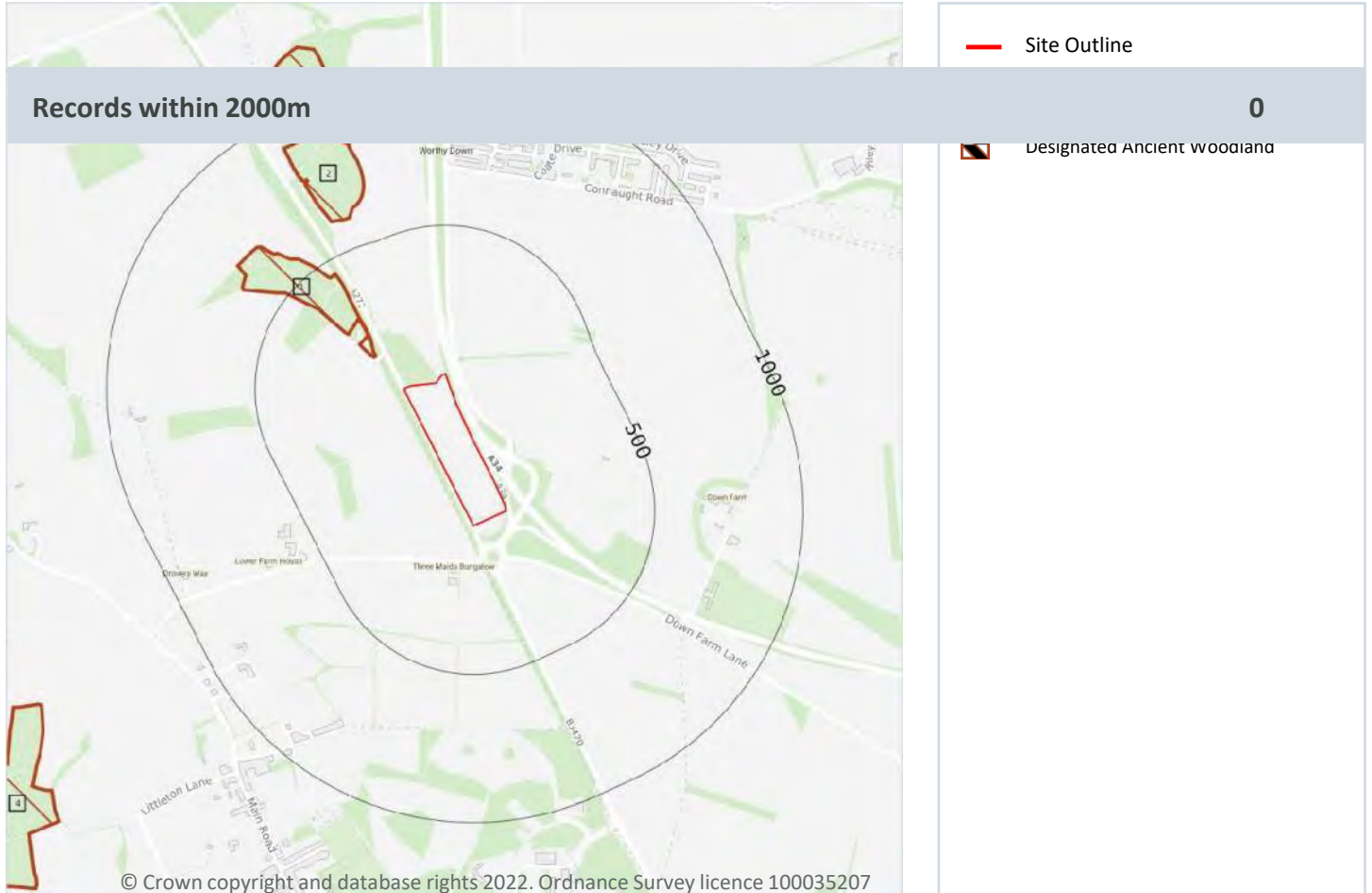
### 9.1 Groundwater flooding

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 46**

*This data is sourced from Ambiental Risk Analytics.*

## 10 Environmental designations



### 10.1 Sites of Special Scientific Interest (SSSI)

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

0

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.

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

## 10.7 Designated Ancient Woodland

Records within 2000m

7

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.

Features are displayed on the Environmental designations map on **page 47**

ID	Location	Name	Woodland Type
1	145m NW	Worthy Copse	Ancient & Semi-Natural Woodland
2	602m N	South Worthy Grove	Ancient & Semi-Natural Woodland
3	988m N	Unknown	Ancient & Semi-Natural Woodland
4	1570m SW	Long Wood	Ancient & Semi-Natural Woodland
-	1898m SW	Unknown	Ancient Replanted Woodland
-	1975m SW	Unknown	Ancient Replanted Woodland
-	1997m SW	Unknown	Ancient & Semi-Natural Woodland

*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

0

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

*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

8

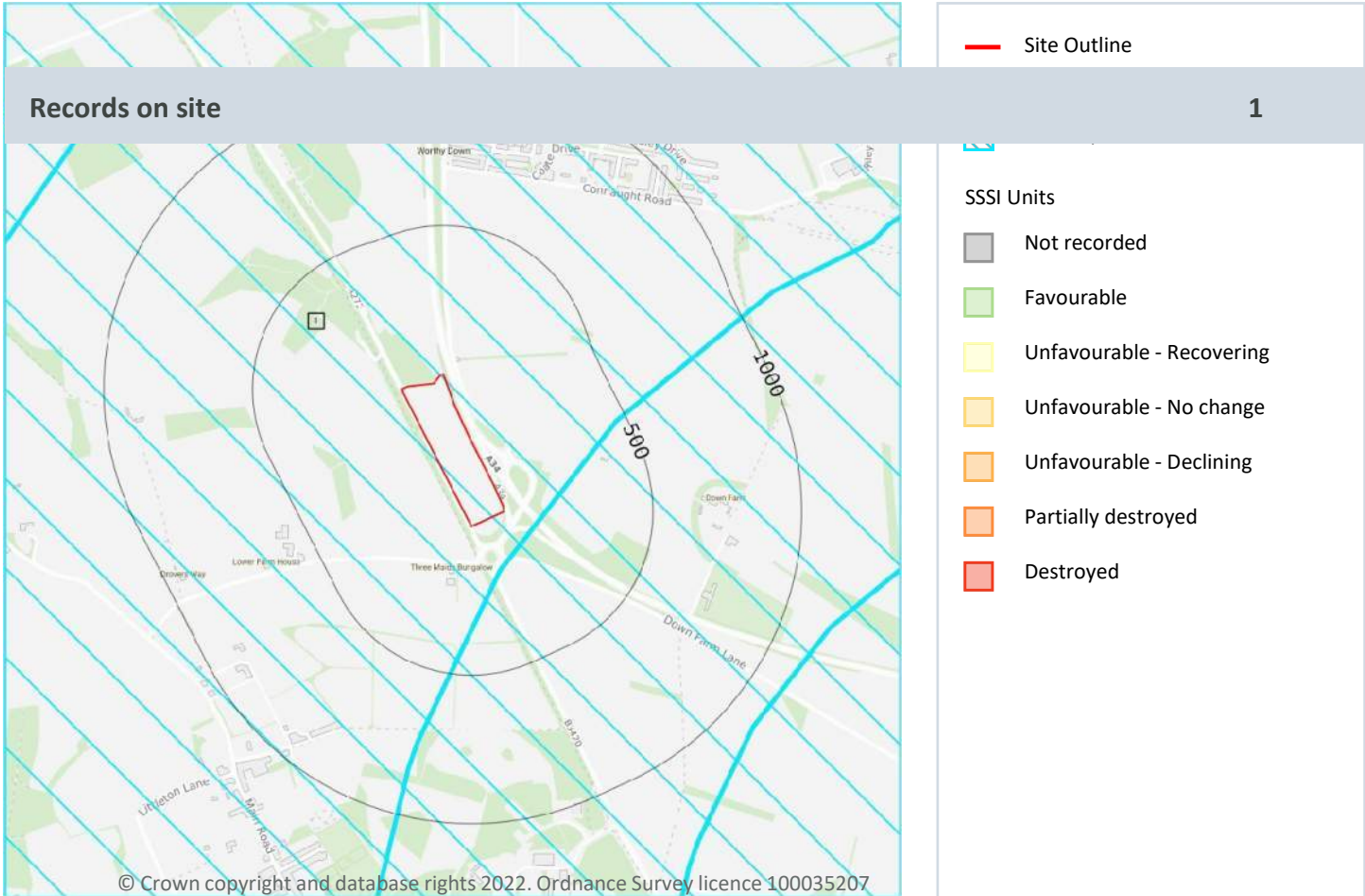
Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	Nun's Walk Stream NVZ	Surface Water	812	Existing
On site	Hamble Estuary Eutrophic NVZ (TraC)	Eutrophic Water	3	Existing
On site	Hampshire Chalk	Groundwater	143	Existing
1766m NE	Hamble Estuary Eutrophic NVZ (TraC)	Eutrophic Water	3	Existing
1766m NE	Hampshire Chalk	Groundwater	143	Existing
1802m SW	Hampshire Chalk	Groundwater	143	Existing
1802m SW	Hamble Estuary Eutrophic NVZ (TraC)	Eutrophic Water	3	Existing
1971m NE	Nun's Walk Stream NVZ	Surface Water	812	Existing



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

## SSSI Impact Zones and Units



### 10.17 SSSI Impact Risk Zones

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.

Features are displayed on the SSSI Impact Zones and Units map on **page 53**

ID	Location	Type of developments requiring consultation
1	On site	<p><b>Infrastructure - Airports, helipads and other aviation proposals.</b></p> <p><b>Air pollution - Any industrial/agricultural development that could cause air pollution (incl: industrial processes, livestock &amp; poultry units with floorspace &gt; 500m<sup>2</sup>, slurry lagoons &amp; digestate stores &gt; 750m<sup>2</sup>, manure stores &gt; 3500t).</b></p> <p><b>Combustion - General combustion processes &gt;50mw energy input. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.</b></p> <p><b>Discharges - Any discharge of water or liquid waste that is discharged to ground (ie to seep away) or to surface water, such as a beck or stream.</b></p> <p><b>Notes: Solent nutrient impact area. for new development with overnight accommodation reg 63 of the conservation of habitats and species regulations 2017 must be applied. lpa to refer to natural england's solent nutrient neutrality advice note june 2019.</b></p>

*This data is sourced from Natural England.*

## 10.18 SSSI Units

<b>Records within 2000m</b>	<b>0</b>
-----------------------------	----------

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

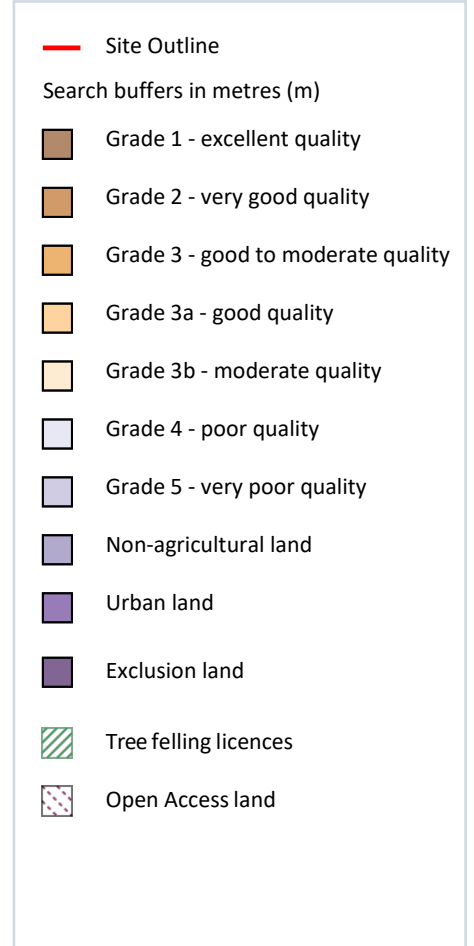
**Records within 250m**

**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



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### 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 57**

ID	Location	Classification	Description
1	On site	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.

ID	Location	Classification	Description
11	161m SE	Grade 3a	Good quality agricultural land. Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

*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**

**15**

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.

Features are displayed on the Agricultural designations map on **page 57**

ID	Location	Description	Reference	Application date
<b>2</b>	<b>On site</b>	<b>Selective Fell/Thin (Unconditional)</b>	<b>018/366/15-16</b>	-
A	12m NE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
A	14m NE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
3	33m NE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
4	33m E	Selective Fell/Thin (Unconditional)	018/366/15-16	-
5	35m NE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
6	38m NE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
7	53m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
B	57m NE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
B	61m NE	Selective Fell/Thin (Unconditional)	018/366/15-16	-

ID	Location	Description	Reference	Application date
8	84m E	Selective Fell/Thin (Unconditional)	018/366/15-16	-
9	110m SE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
C	145m NW	Selective Fell/Thin (Unconditional)	019/295/07-08	15/01/2008
C	145m NW	Selective Fell/Thin (Unconditional)	019/582/11-12	10/05/2012
10	145m N	Selective Fell/Thin (Unconditional)	018/366/15-16	-

*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**

**1**

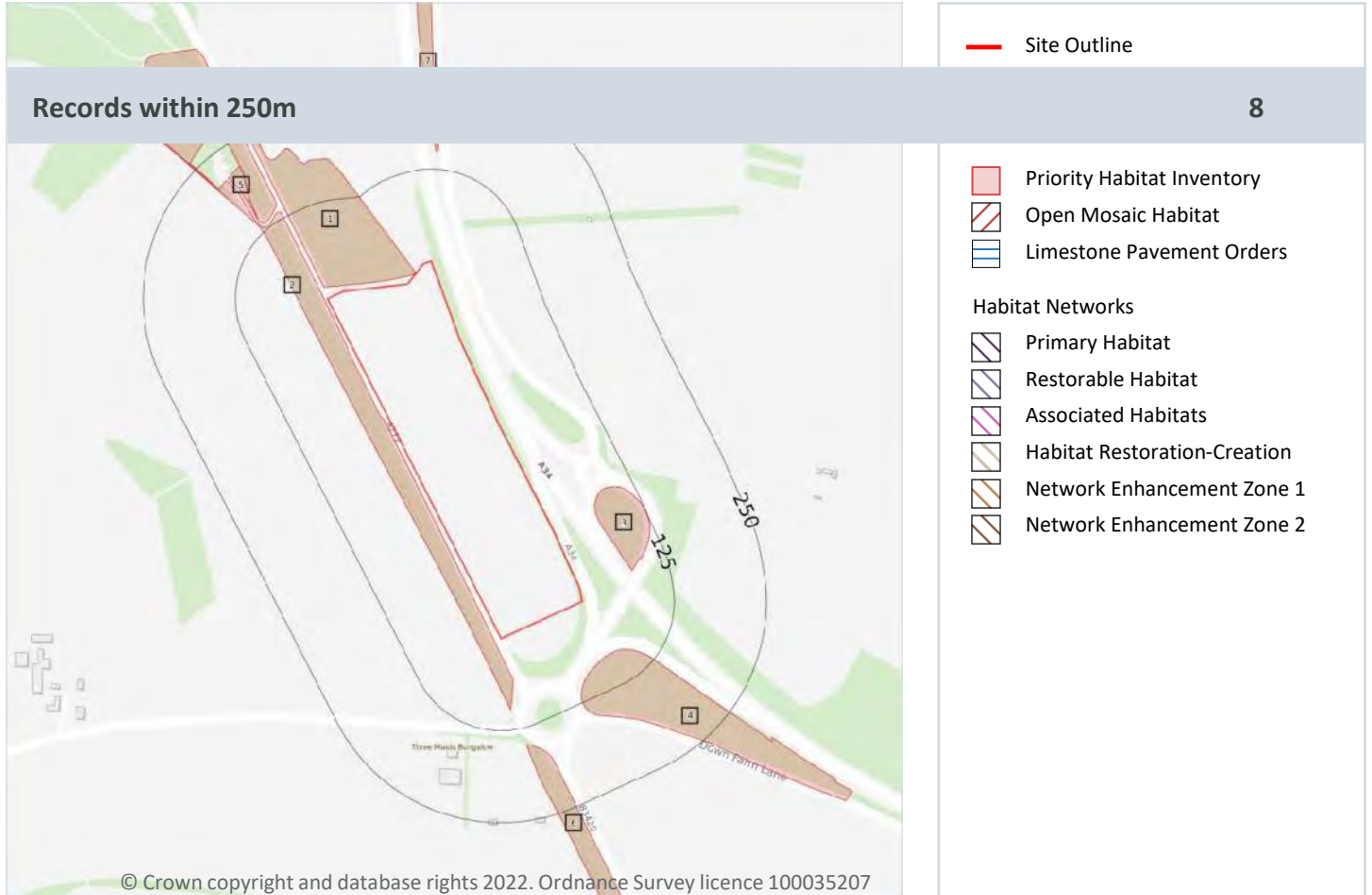
Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

Location	Reference	Scheme	Start Date	End Date
31m W	1050938	Countryside Stewardship (Middle Tier)	01/01/2021	31/12/2025

*This data is sourced from Natural England.*



## 13 Habitat designations



### 13.1 Priority Habitat Inventory

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

Features are displayed on the Habitat designations map on **page 60**

ID	Location	Main Habitat	Other habitats
1	On site	Deciduous woodland	<b>Main habitat: DWOOD (INV &gt; 50%)</b>
2	4m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	61m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	81m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

ID	Location	Main Habitat	Other habitats
5	145m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
6	148m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
7	149m N	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
8	193m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

*This data is sourced from Natural England.*

## 13.2 Habitat Networks

<b>Records within 250m</b>	<b>0</b>
----------------------------	----------

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

<b>Records within 250m</b>	<b>0</b>
----------------------------	----------

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.*

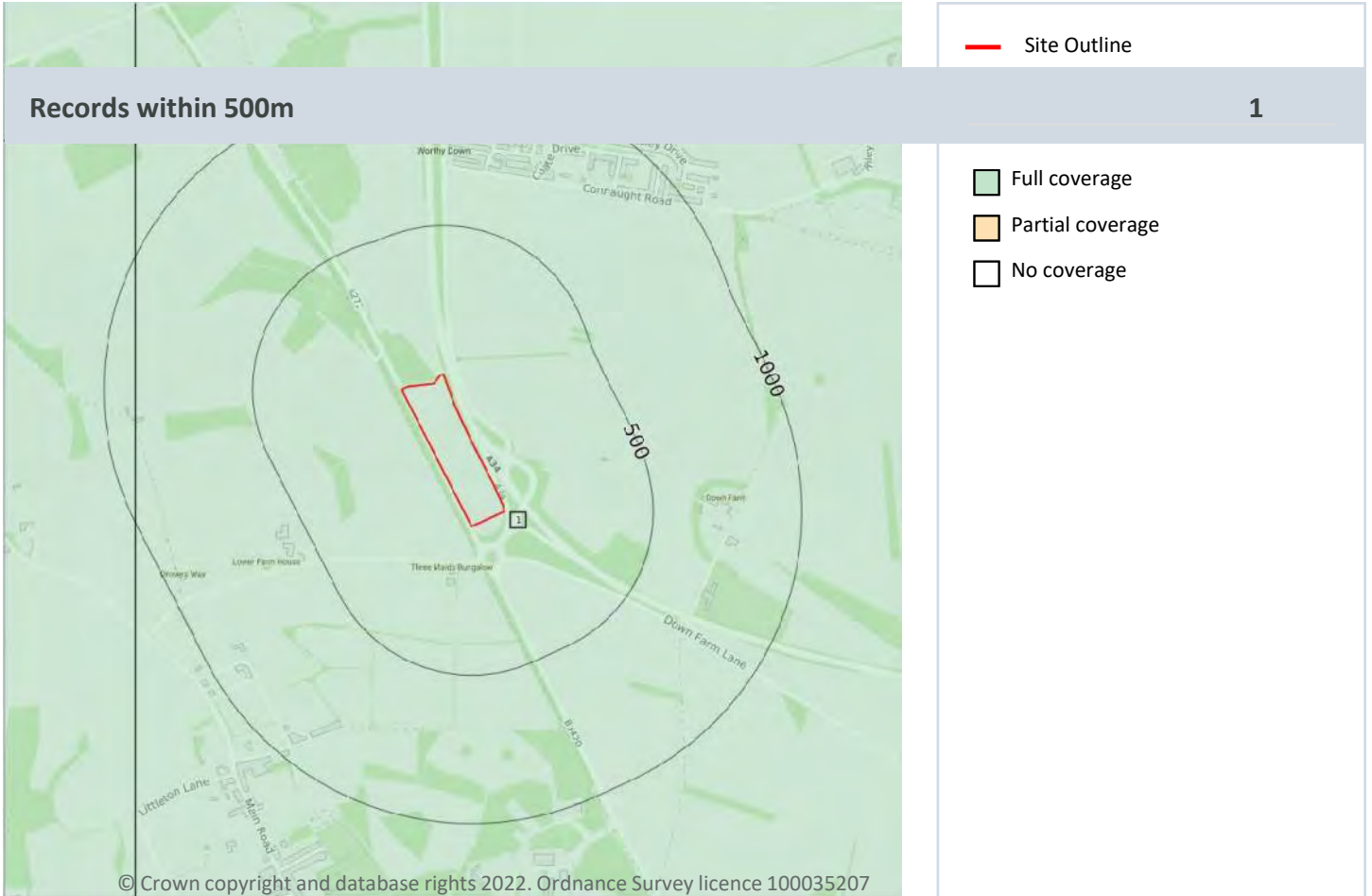
## 13.4 Limestone Pavement Orders

<b>Records within 250m</b>	<b>0</b>
----------------------------	----------

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



### 14.1 10k Availability

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 62**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	No coverage	SU43SE

*This data is sourced from the British Geological Survey.*

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



**Site Outline**

Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

### 14.2 Artificial and made ground (10k)

Records within 500m

6

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.

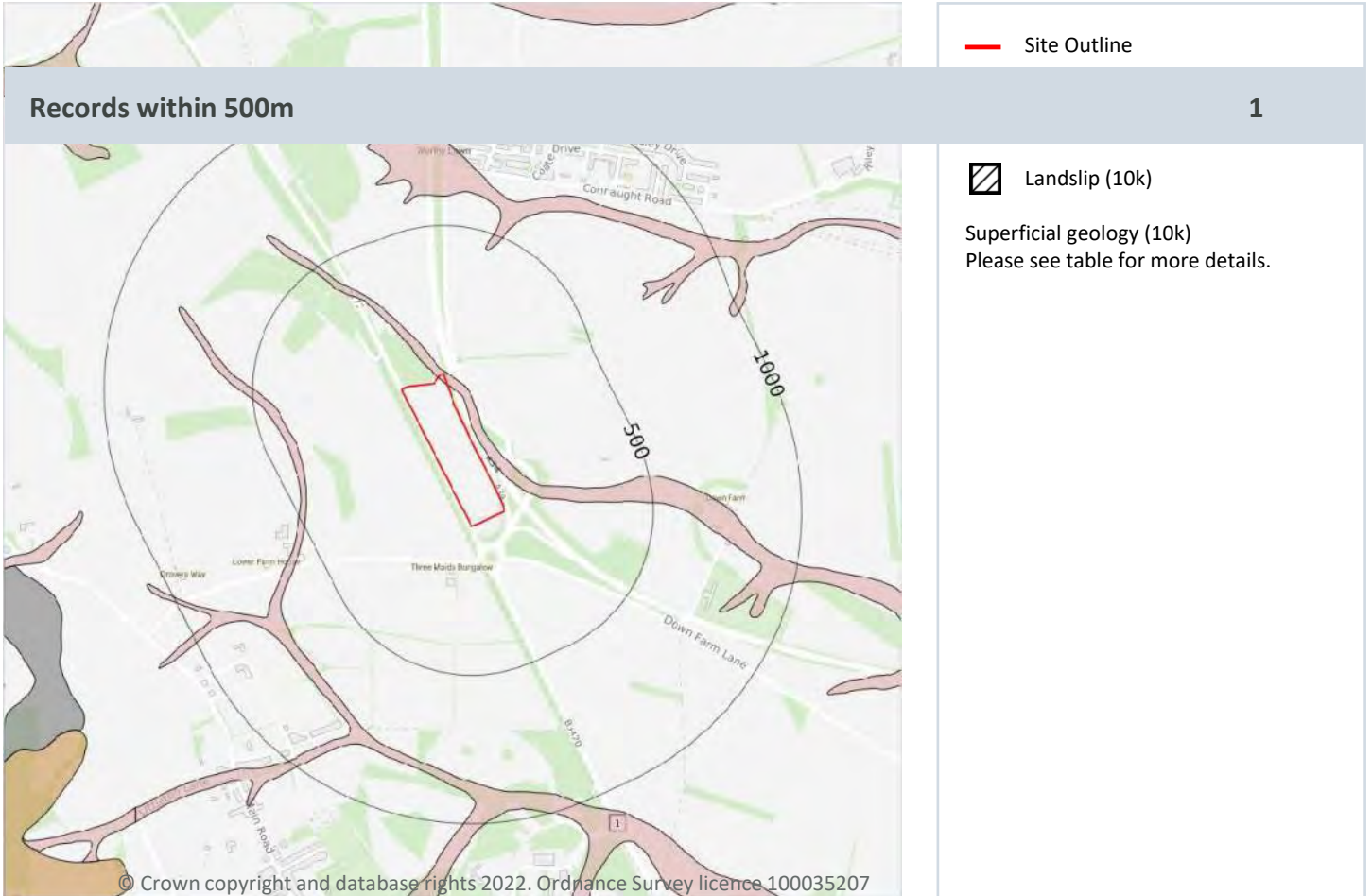
Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 63**

ID	Location	LEX Code	Description	Rock description
1	On site	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2	29m N	WGR-VOID	Worked Ground (Undivided)	Void
3	47m E	WGR-VOID	Worked Ground (Undivided)	Void
4	75m NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

ID	Location	LEX Code	Description	Rock description
5	334m SW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
6	466m SW	LSGR-UNKNOWN	Landscaped Ground (Undivided)	Unknown/unclassified Entry

*This data is sourced from the British Geological Survey.*

## Geology 1:10,000 scale - Superficial



### 14.3 Superficial geology (10k)

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.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 65**

ID	Location	LEX Code	Description	Rock description
1	On site	HEAD-DMTN	Head - Diamicton	Diamicton

*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



— Site Outline

Search buffers in metres (m)

— Bedrock faults and other linear features (10k)

Bedrock geology (10k)  
Please see table for more details.

### 14.5 Bedrock geology (10k)

Records within 500m

3

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.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 67**

ID	Location	LEX Code	Description	Rock age
1	On site	SECK-CHLK	Seaford Chalk Formation - Chalk	Santonian Age - Coniacian Age
2	On site	STRK-LMST	Stockbridge Rock Member - Limestone	Santonian Age
3	56m NW	NCK-CHLK	Newhaven Chalk Formation - Chalk	Campanian Age - Santonian Age

*This data is sourced from the British Geological Survey.*



## 14.6 Bedrock faults and other linear features (10k)

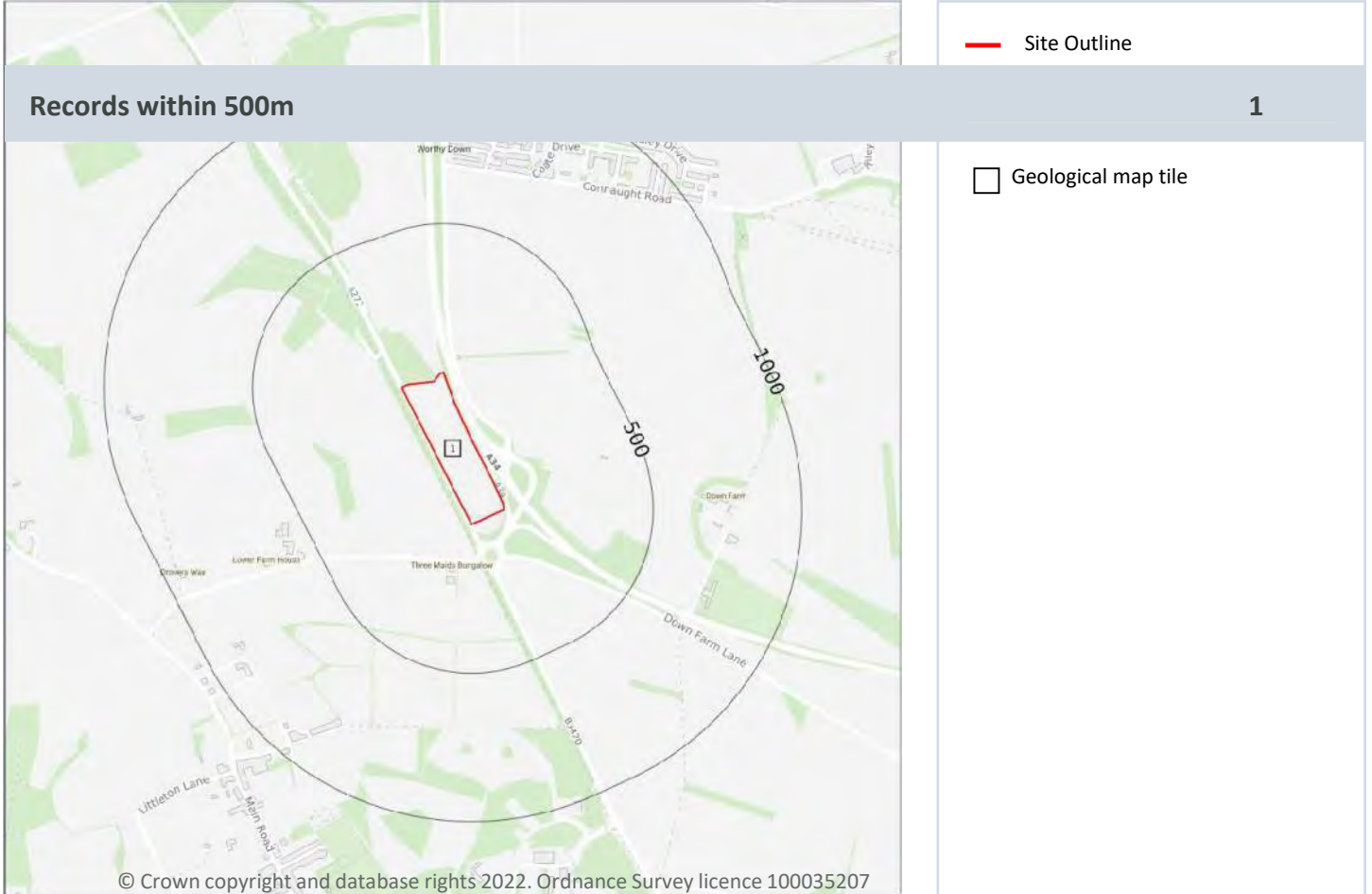
Records within 500m

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



### 15.1 50k Availability

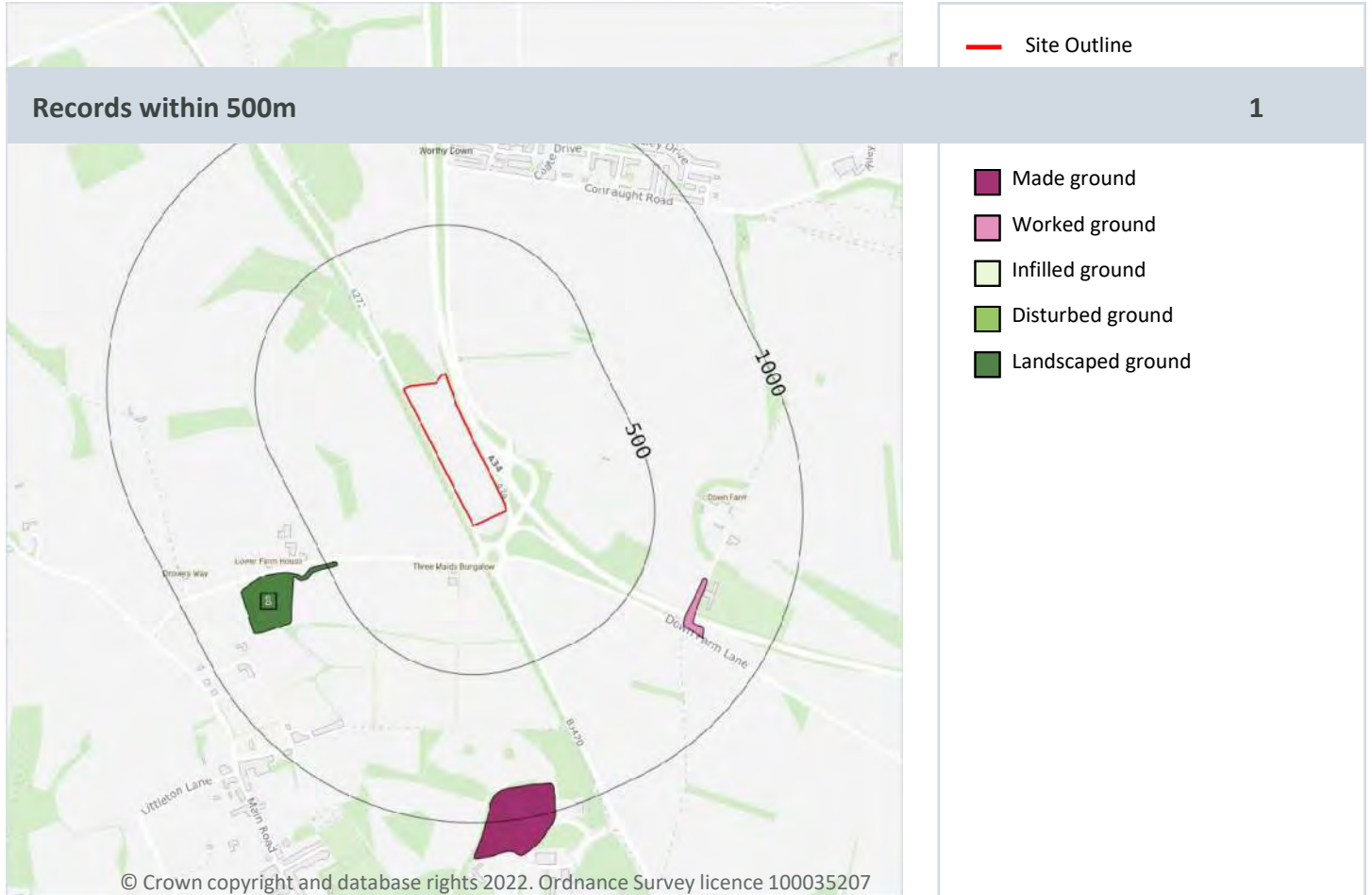
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 69**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	No coverage	EW299_winchester_v4

*This data is sourced from the British Geological Survey.*

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



### 15.2 Artificial and made ground (50k)

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 70**

ID	Location	LEX Code	Description	Rock description
1	466m SW	LSGR-ARTGR	LANDSCAPED GROUND (UNDIVIDED)	ARTIFICIALLY MODIFIED GROUND

*This data is sourced from the British Geological Survey.*

### 15.3 Artificial ground permeability (50k)

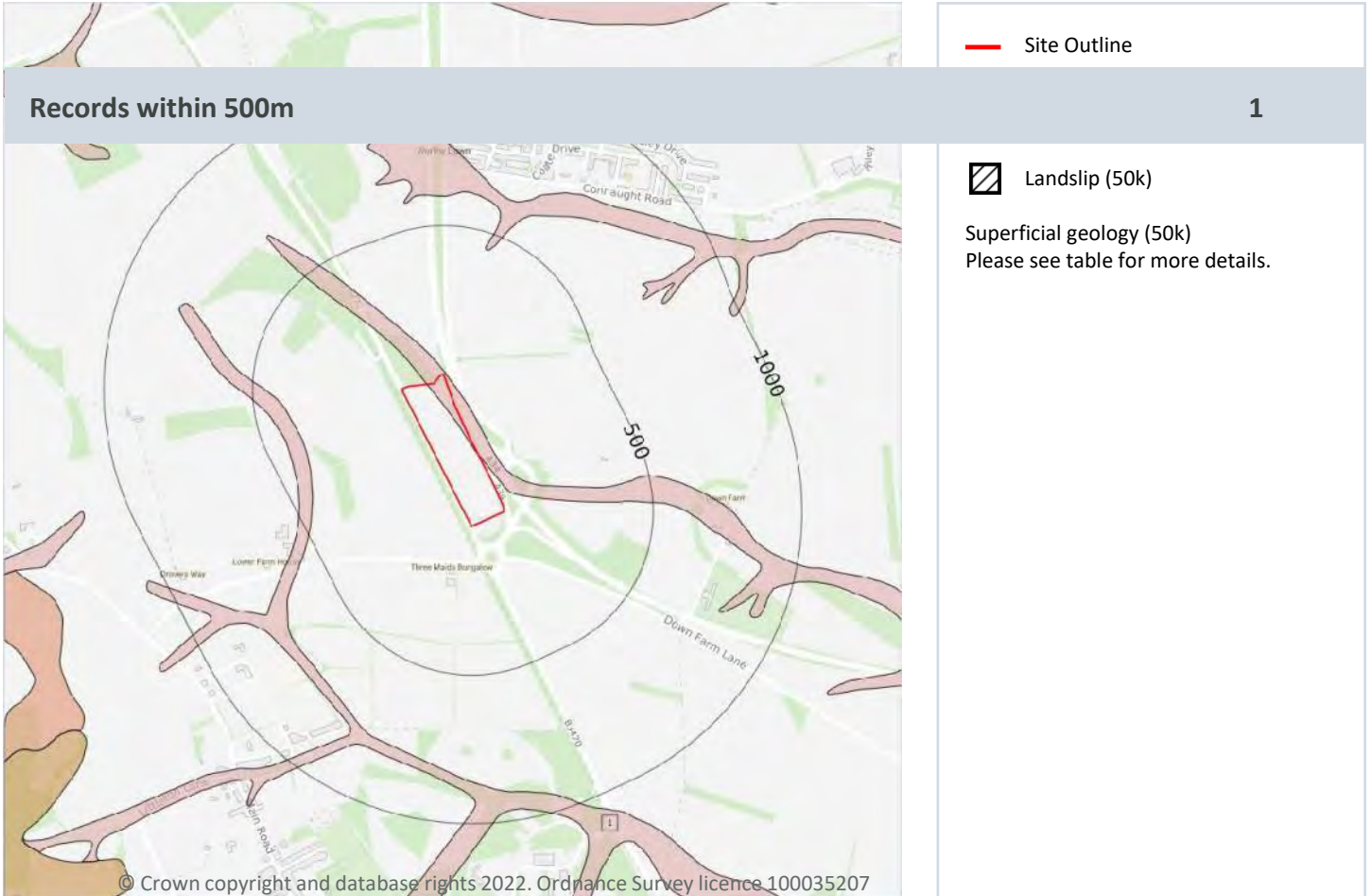
Records within 50m

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



### 15.4 Superficial geology (50k)

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 72**

ID	Location	LEX Code	Description	Rock description
1	On site	HEAD- XCZSV	HEAD	CLAY, SILT, SAND AND GRAVEL

*This data is sourced from the British Geological Survey.*

## 15.5 Superficial permeability (50k)

<b>Records within 50m</b>	<b>1</b>
---------------------------	----------

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)

<b>Records within 500m</b>	<b>0</b>
----------------------------	----------

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)

<b>Records within 50m</b>	<b>0</b>
---------------------------	----------

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

3

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 74**

ID	Location	LEX Code	Description	Rock age
1	On site	STRK-LMST	STOCKBRIDGE ROCK MEMBER - LIMESTONE	SANTONIAN
2	On site	SECK-CHLK	SEAFORD CHALK FORMATION - CHALK	CONIACIAN
3	56m NW	NCK-CHLK	NEWHAVEN CHALK FORMATION - CHALK	SANTONIAN

*This data is sourced from the British Geological Survey.*

## 15.9 Bedrock permeability (50k)

<b>Records within 50m</b>	<b>2</b>
---------------------------	----------

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

*This data is sourced from the British Geological Survey.*

## 15.10 Bedrock faults and other linear features (50k)

<b>Records within 500m</b>	<b>0</b>
----------------------------	----------

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



### 17.1 Shrink swell clays

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 77**

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



### 17.2 Running sands

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 78**

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



### 17.3 Compressible deposits

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 80**

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



### 17.4 Collapsible deposits

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 81**

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



### 17.5 Landslides

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 82**

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	<b>Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.</b>
On site	Low	<b>Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.</b>
7m NE	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.
23m NW	Moderate	Slope instability problems are probably present or have occurred in the past. Land use should consider specifically the stability of the site.

*This data is sourced from the British Geological Survey.*



## Natural ground subsidence - Ground dissolution of soluble rocks



### 17.6 Ground dissolution of soluble rocks

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.

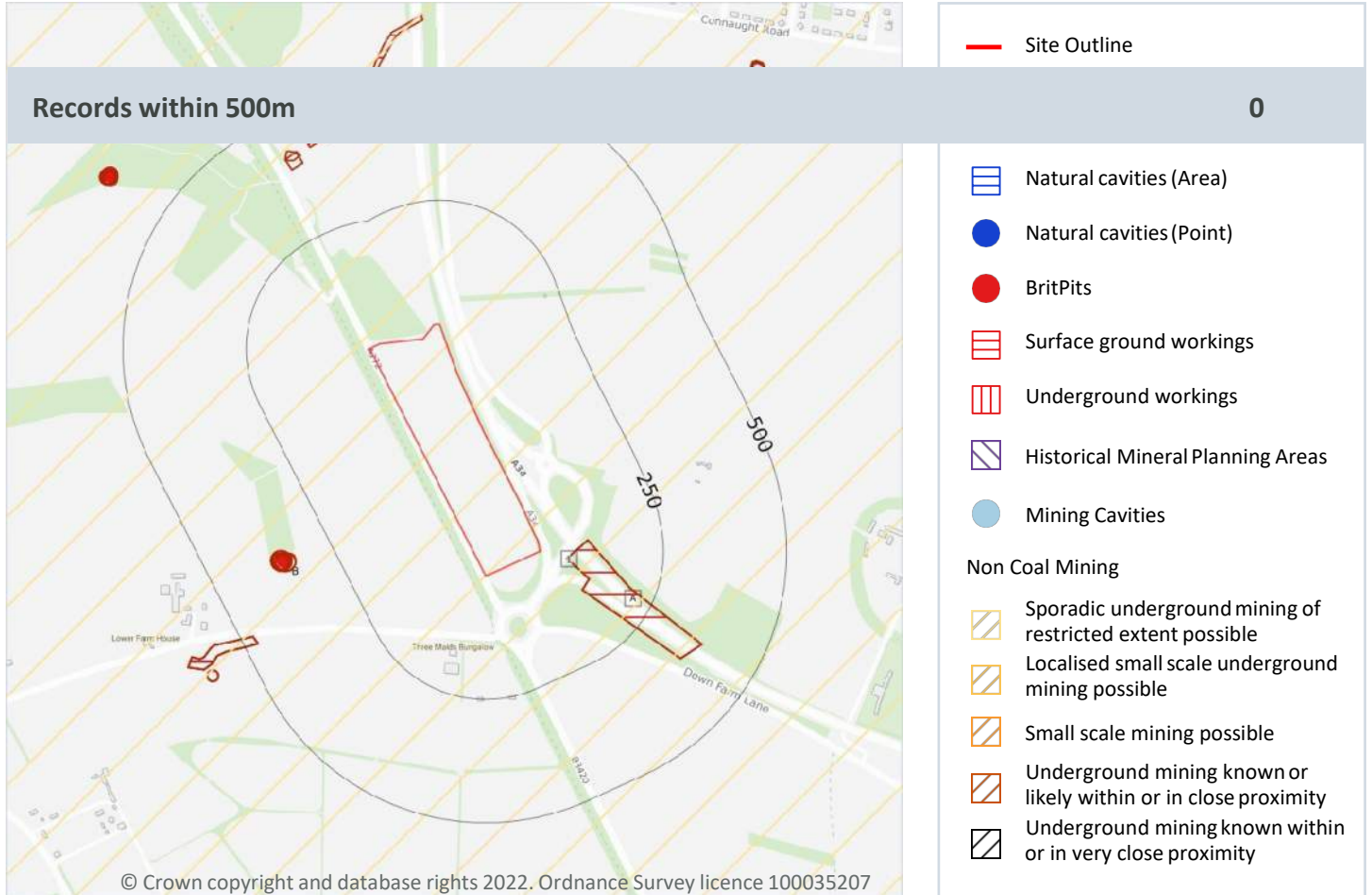
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 84**

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.

Location	Hazard rating	Details
On site	Low	<b>Soluble rocks are present within the ground. Some dissolution features may be present. Potential for difficult ground conditions are at a level where they may be considered, localised subsidence need not be considered except in exceptional circumstances.</b>
37m N	Low	Soluble rocks are present within the ground. Some dissolution features may be present. Potential for difficult ground conditions are at a level where they may be considered, localised subsidence need not be considered except in exceptional circumstances.

*This data is sourced from the British Geological Survey.*

## 18 Mining, ground workings and natural cavities



### 18.1 Natural cavities

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.*

## 18.2 BritPits

### Records within 500m

**1**

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.

Features are displayed on the Mining, ground workings and natural cavities map on **page 86**

ID	Location	Details	Description
B	348m SW	Name: Littleton Chalk Pit Address: Littleton, WINCHESTER, Hampshire Commodity: Limestone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

*This data is sourced from the British Geological Survey.*

## 18.3 Surface ground workings

### Records within 250m

**2**

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.

Features are displayed on the Mining, ground workings and natural cavities map on **page 86**

ID	Location	Land Use	Year of mapping	Mapping scale
A	57m E	Cuttings	1987	1:10000
A	57m E	Cuttings	1975	1:10000

*This data is sourced from Ordnance Survey/Groundsure.*

## 18.4 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.*

## 18.5 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, ground workings and natural cavities map on **page 86**

ID	Location	Name	Commodity	Class	Likelihood
1	On site	Not available	Chalk	A	<b>Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered</b>
-	784m N	Not available	Chalk	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
-	894m W	Not available	Chalk	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered

*This data is sourced from the British Geological Survey.*

## 18.7 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.*

## 18.8 JPB mining areas

Records on site	0
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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.*

## 18.9 Coal mining

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

Areas which could be affected by past, current or future coal mining.

*This data is sourced from the Coal Authority.*

## 18.10 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.*

## 18.11 Gypsum areas

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

Generalised areas that may be affected by gypsum extraction.

*This data is sourced from British Gypsum.*

## 18.12 Tin mining

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

Generalised areas that may be affected by historical tin mining.

*This data is sourced from Groundsure.*

## 18.13 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 Radon



### 19.1 Radon

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 91**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None**

*This data is sourced from the British Geological Survey and Public Health England.*



## 20 Soil chemistry

### 20.1 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 km<sup>2</sup>. 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 km<sup>2</sup>; 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	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
7m NE	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
9m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
37m NW	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
49m E	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg

*This data is sourced from the British Geological Survey.*



## 20.2 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 km<sup>2</sup>).

*This data is sourced from the British Geological Survey.*

## 20.3 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 km<sup>2</sup>.

*This data is sourced from the British Geological Survey.*

## 21 Railway infrastructure and projects

### 21.1 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.*

### 21.2 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.*

### 21.3 Railway tunnels

Records within 250m 0

Railway tunnels taken from contemporary Ordnance Survey mapping.

*This data is sourced from the Ordnance Survey.*

### 21.4 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.*

### 21.5 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.*

## 21.6 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.*

## 21.7 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.*

## 21.8 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.*

## 21.9 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.*

## 21.10 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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## APPENDIX 03

### Historical Ordnance Survey Maps

**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355  
**Grid Ref:** 446066, 133960

**Map Name:** County Series

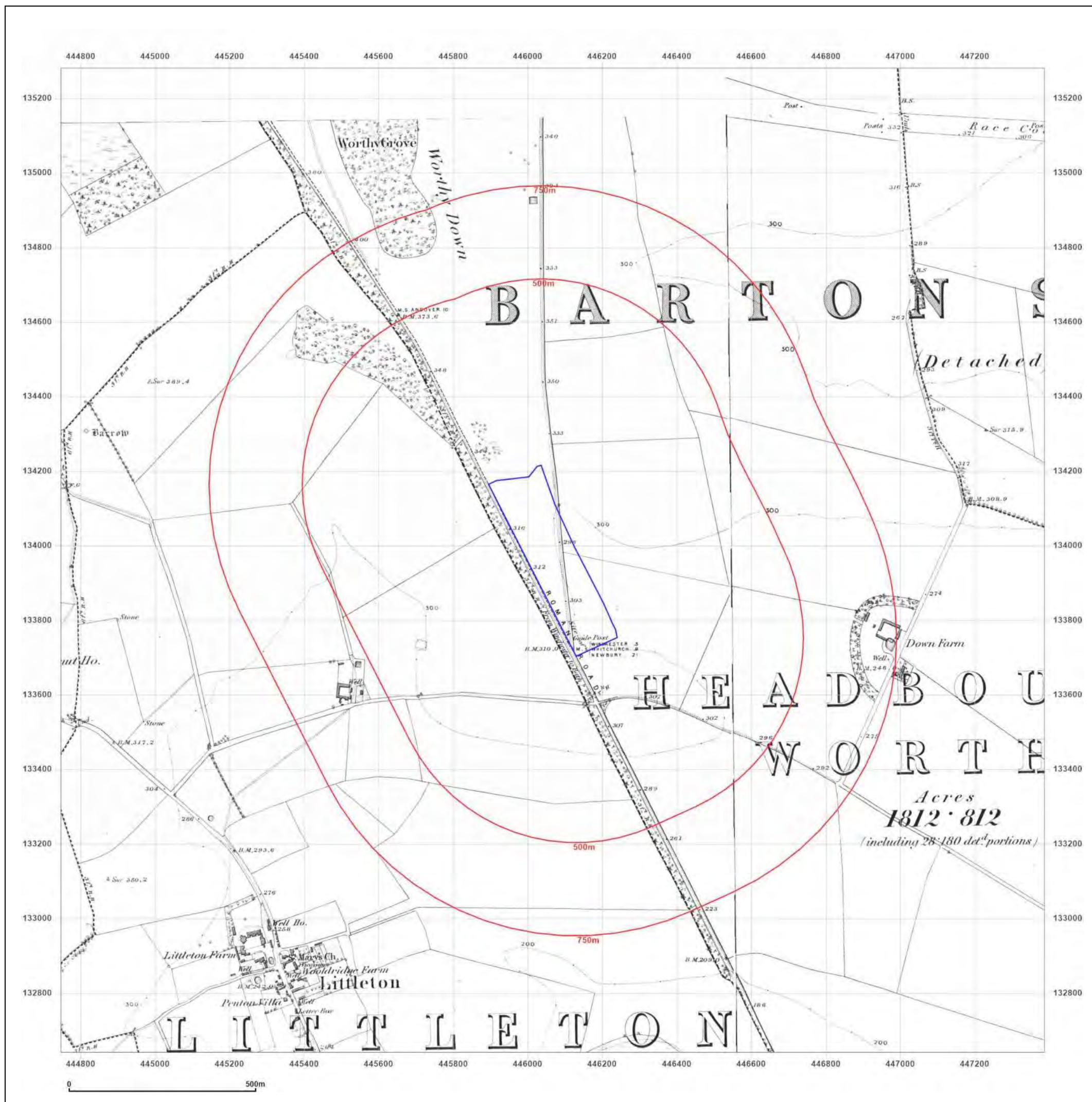
**Map date:** 1874-1875

**Scale:** 1:10,560

**Printed at:** 1:10,560



<p>Surveyed 1871 Revised N/A Edition 1875 Copyright N/A Levelled 1874</p>		<p>Surveyed 1869 Revised N/A Edition 1874 Copyright N/A Levelled 1873</p>
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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355  
**Grid Ref:** 446066, 133960

**Map Name:** County Series

**Map date:** 1895-1897

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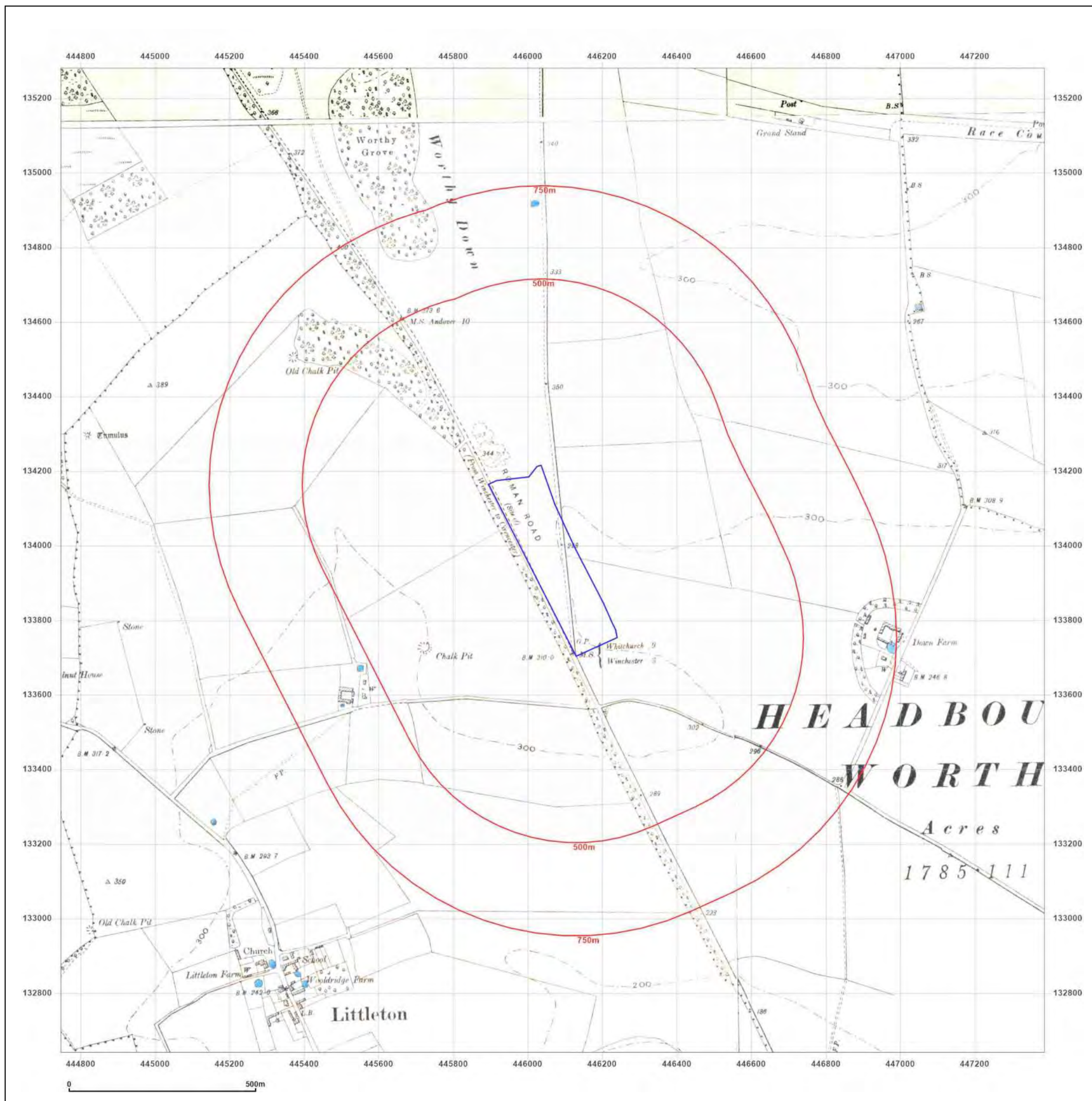
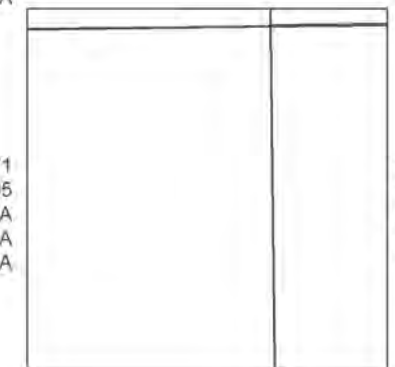


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2QG

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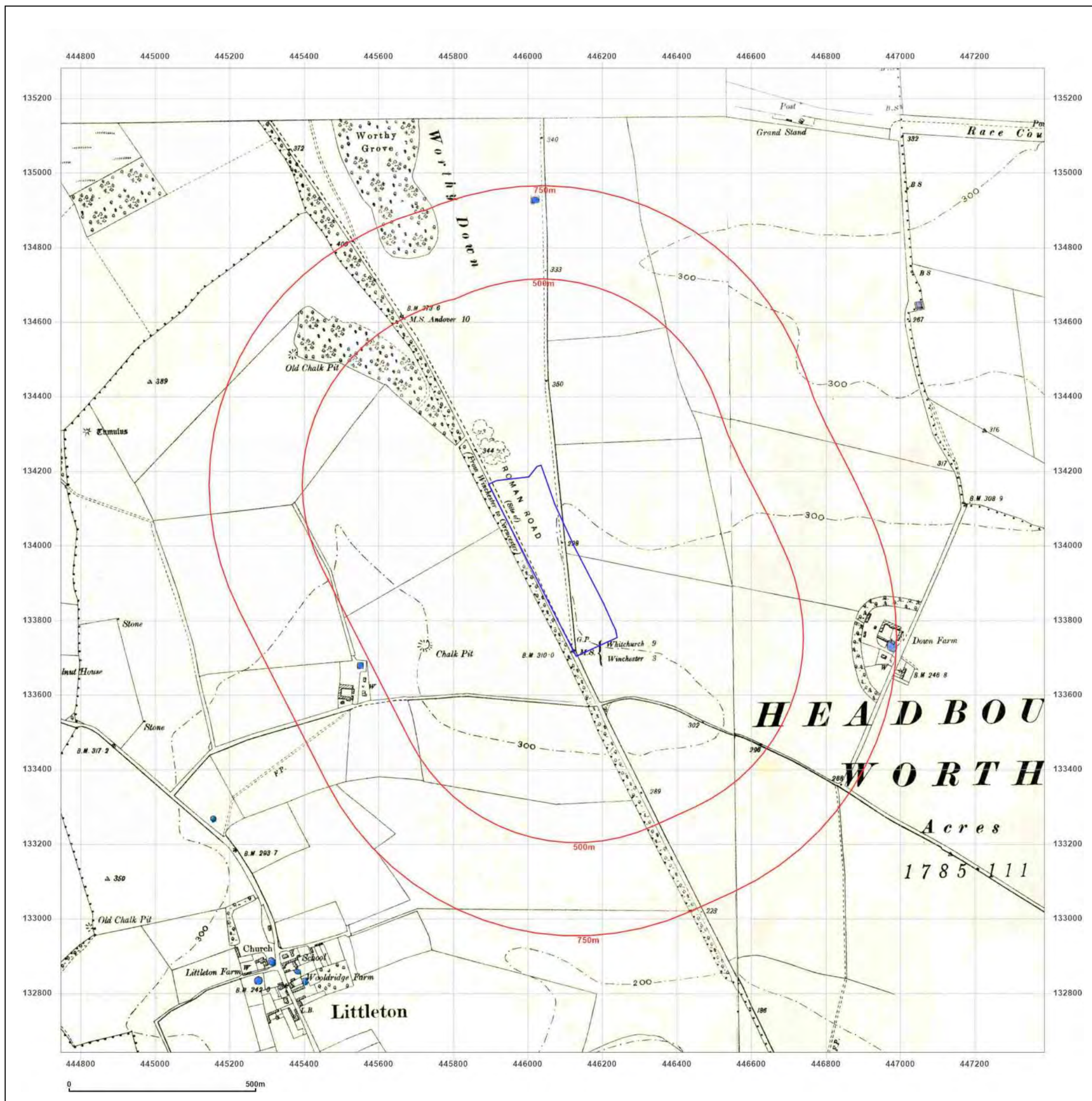
**Printed at:** 1:10,560



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**Map date:** 1908-1911

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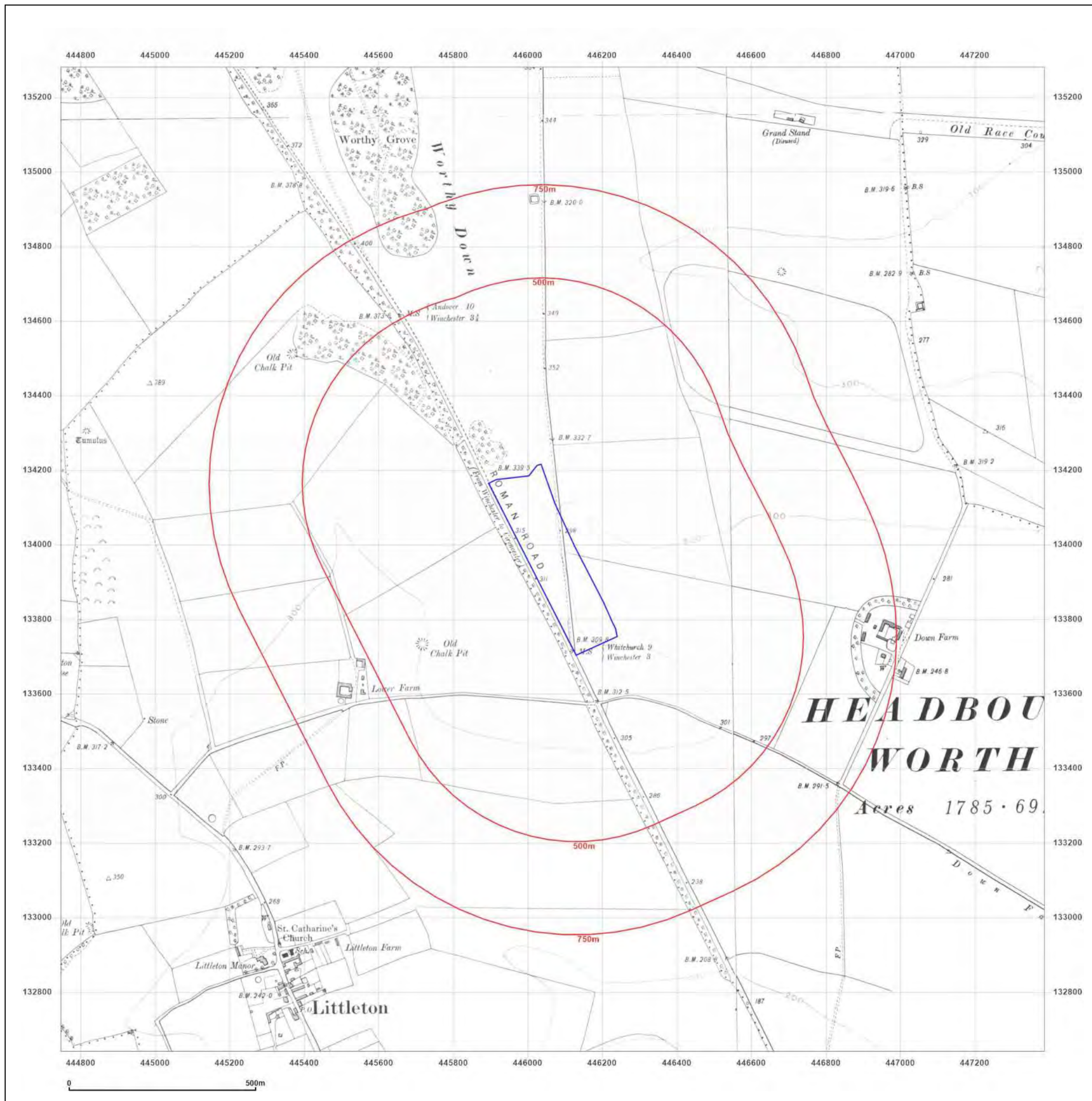
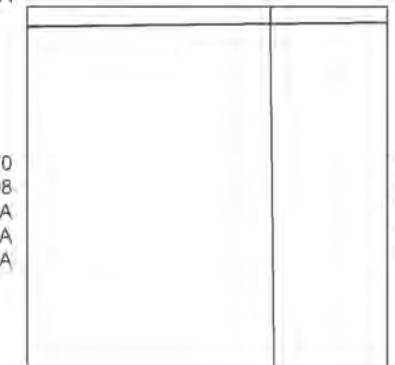


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**Map Name:** County Series

**Map date:** 1932

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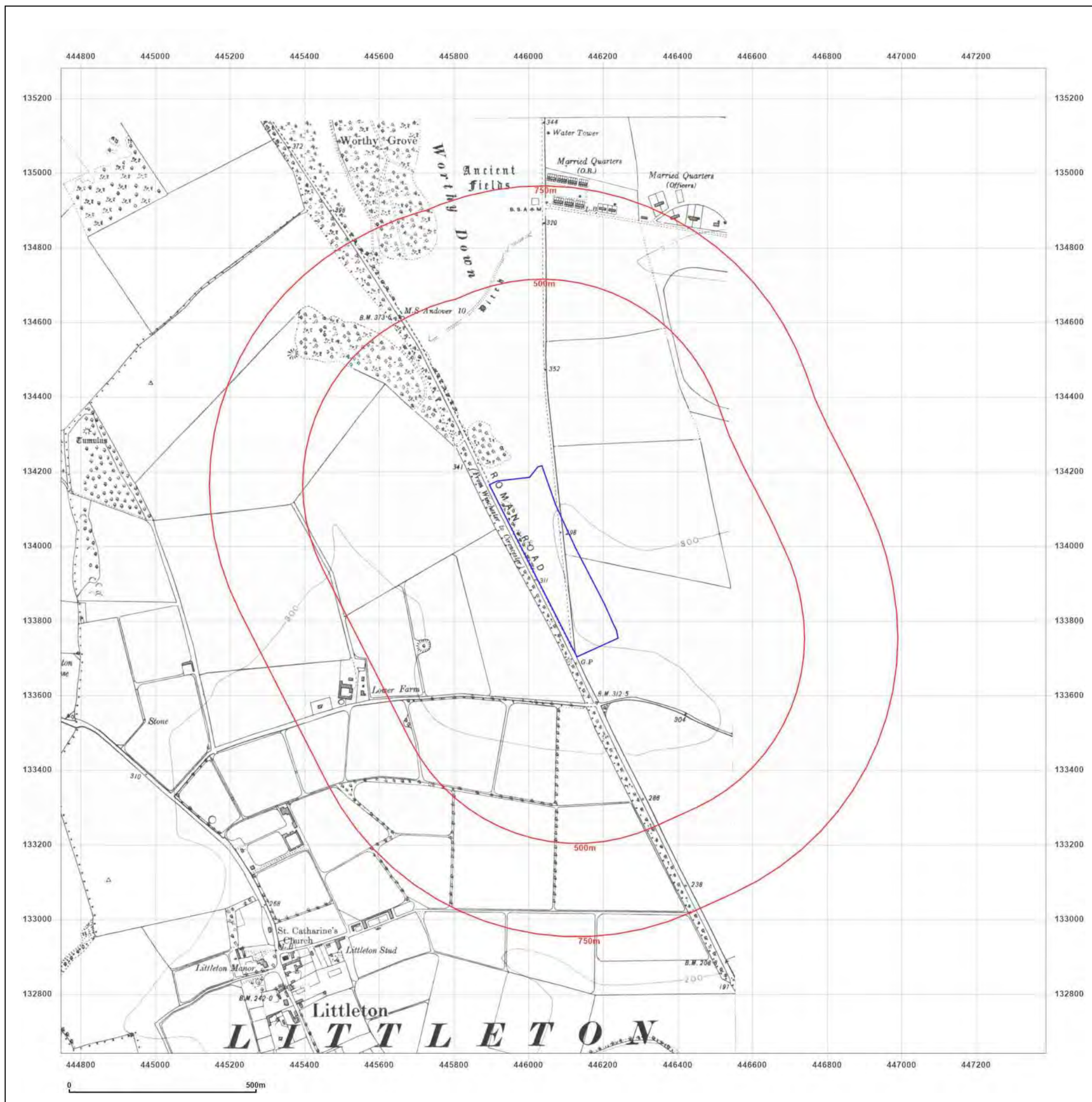


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**Map Name:** Provisional

**Map date:** 1956-1961

**Scale:** 1:10,560

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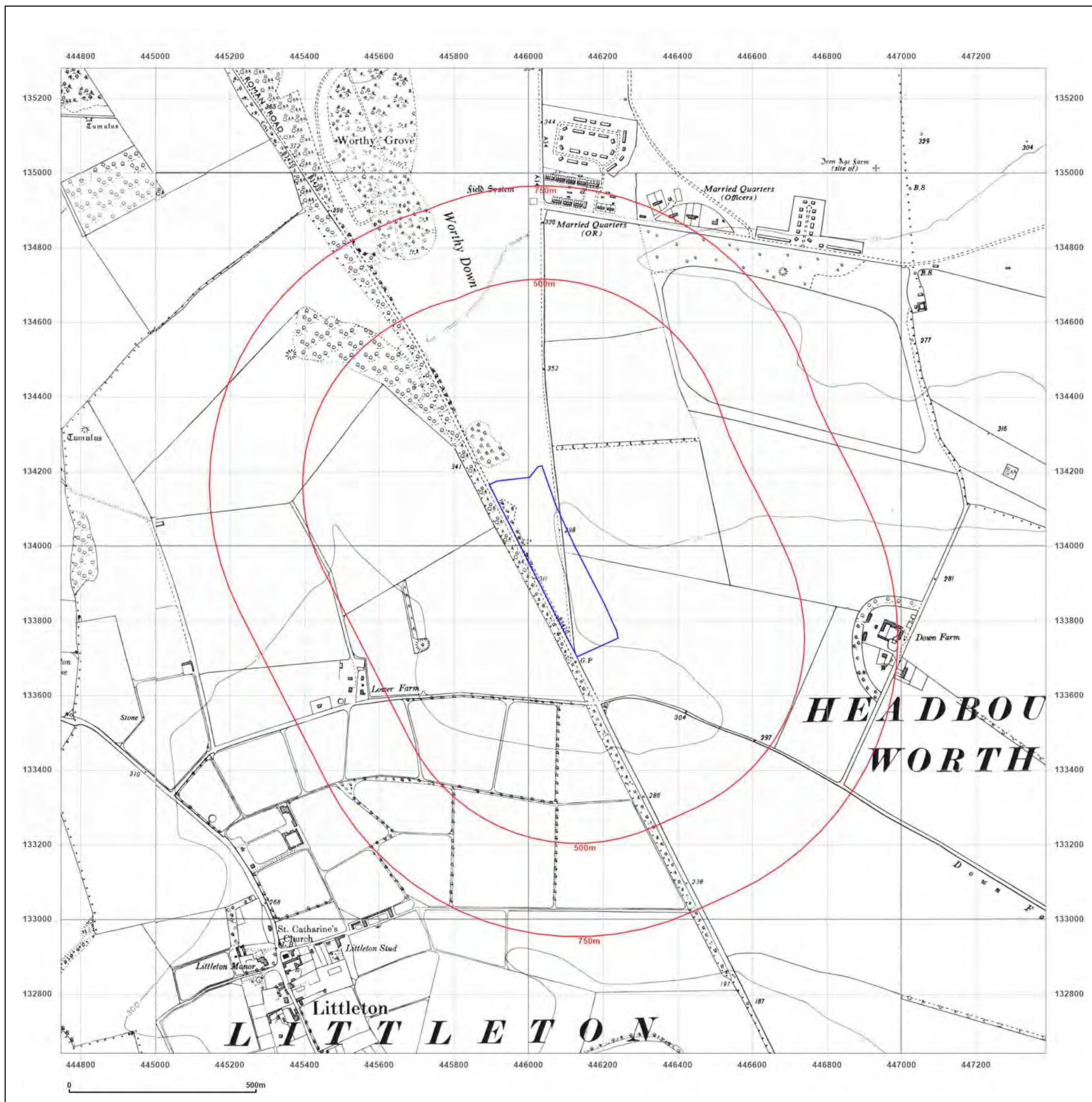


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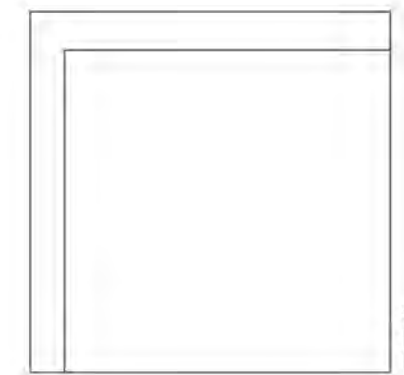
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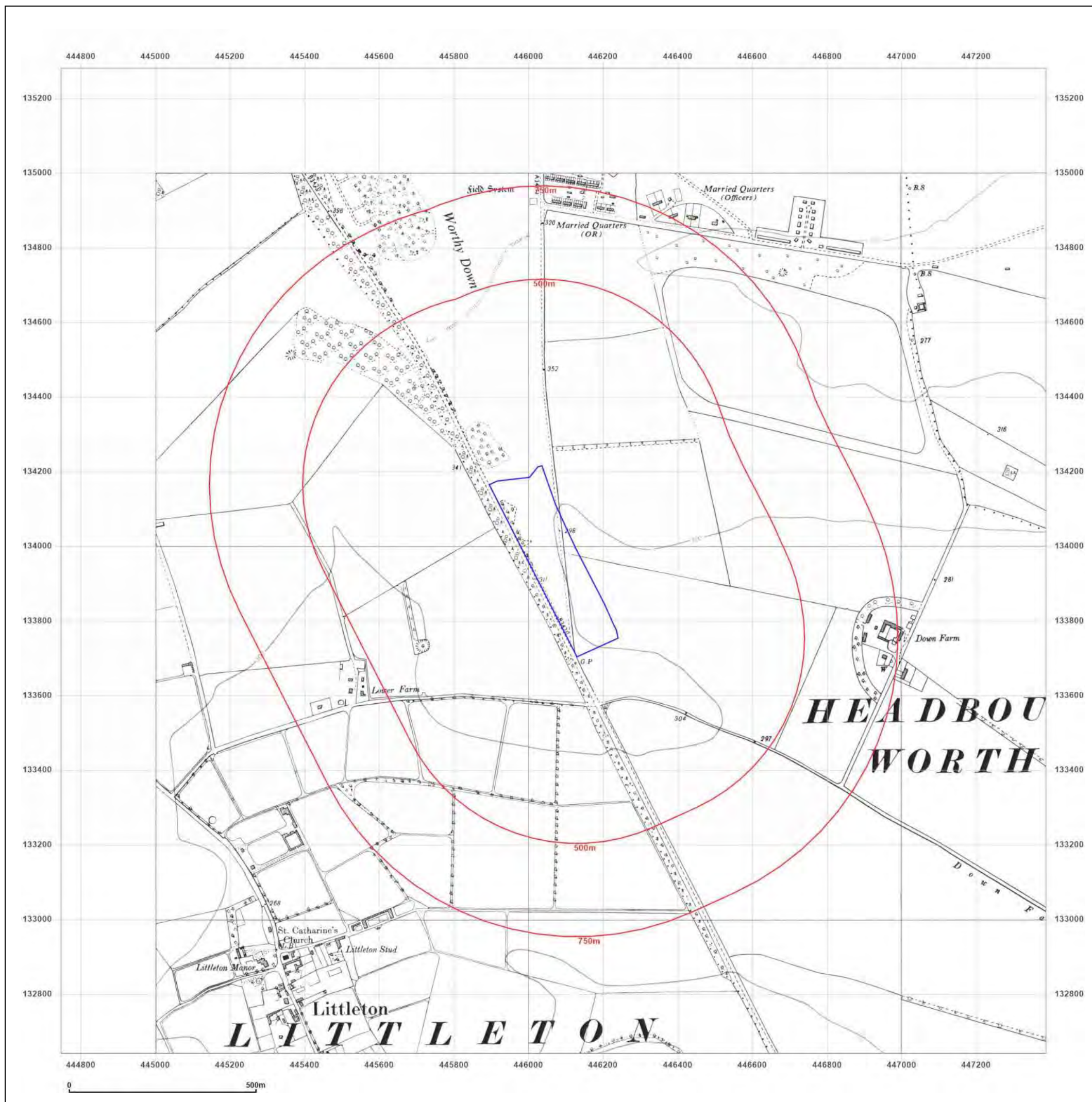


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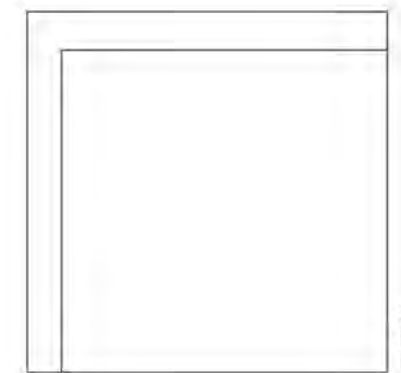
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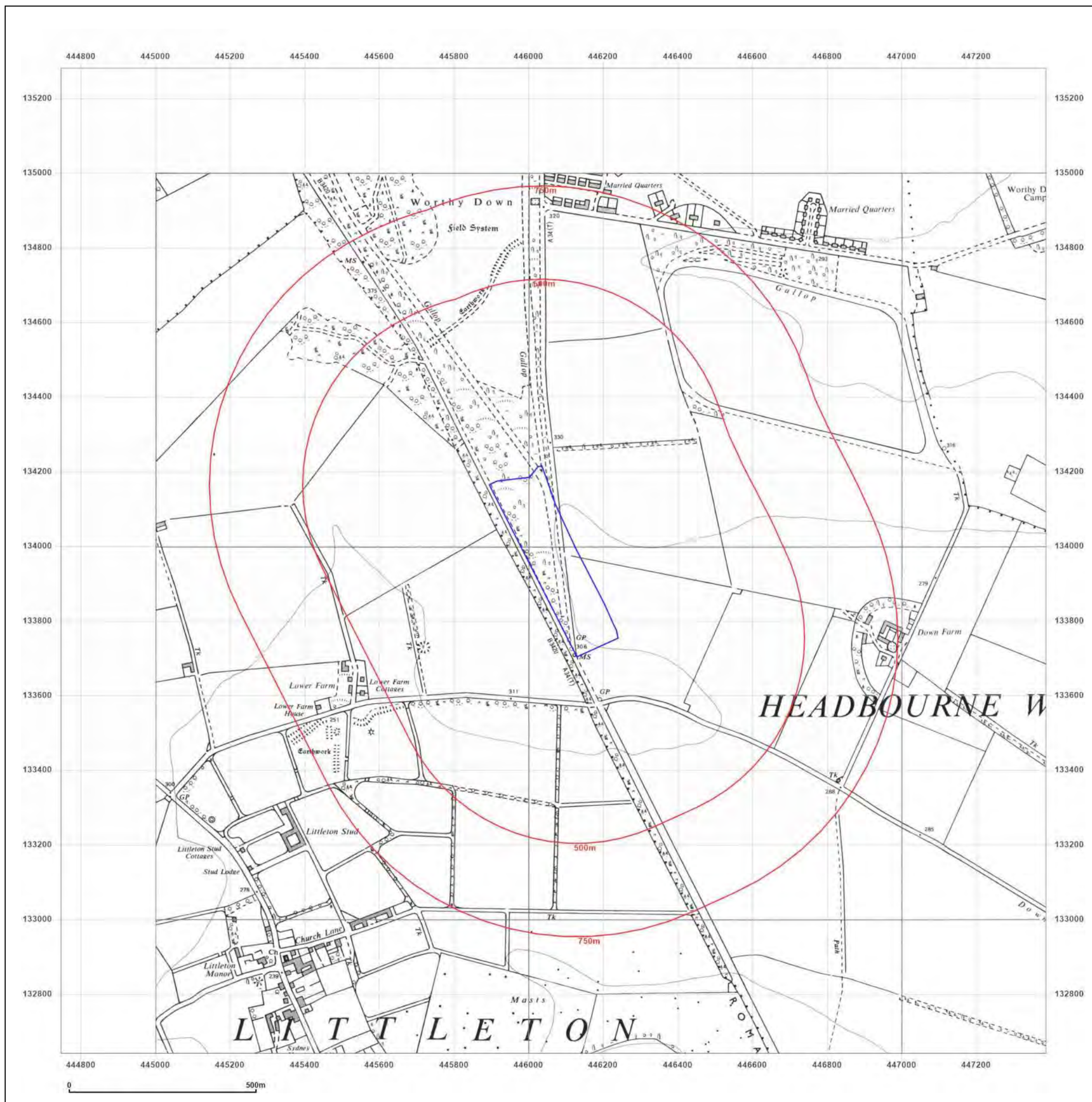


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**Map Name:** National Grid

**Map date:** 1976-1977

**Scale:** 1:10,000

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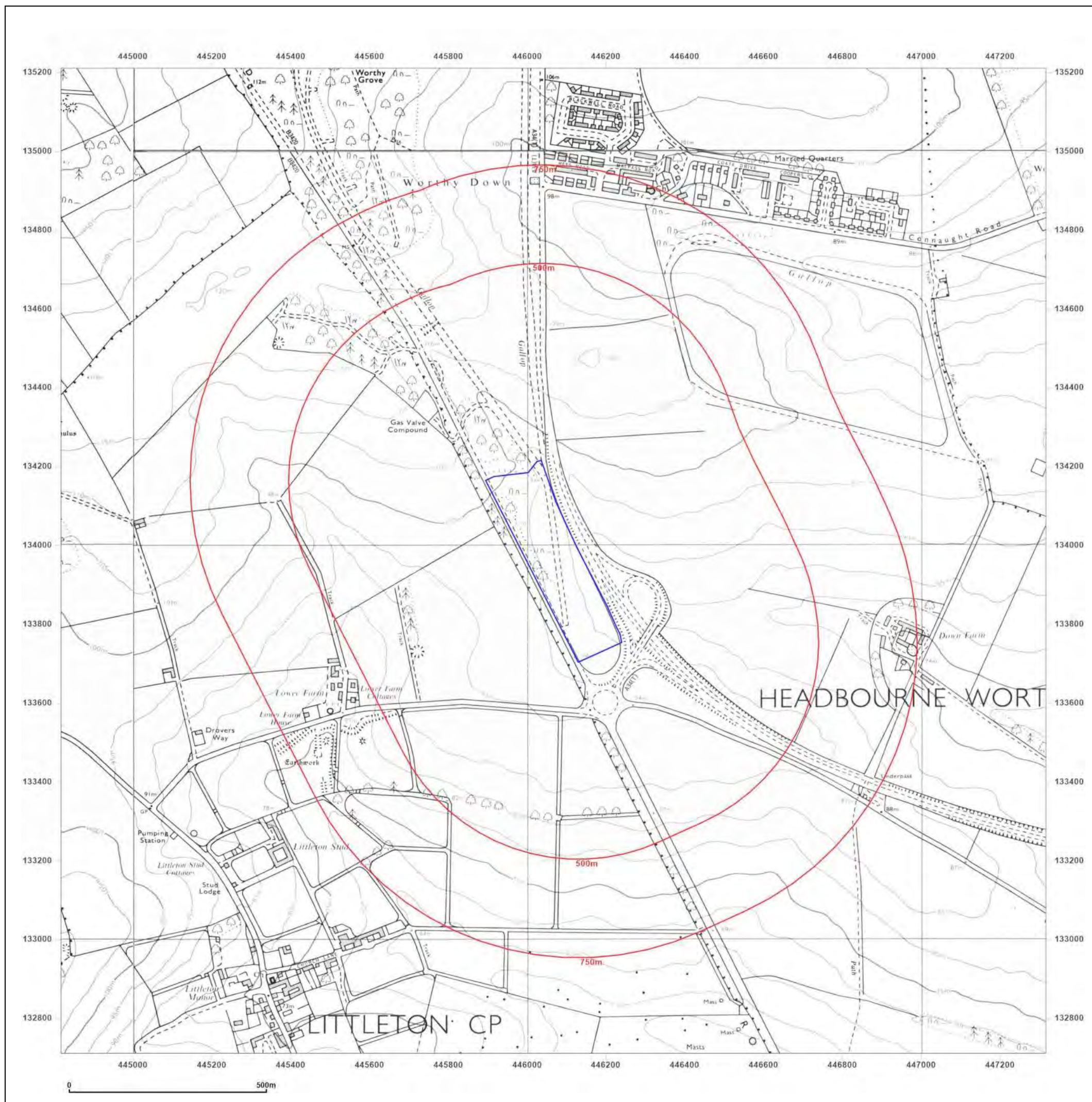


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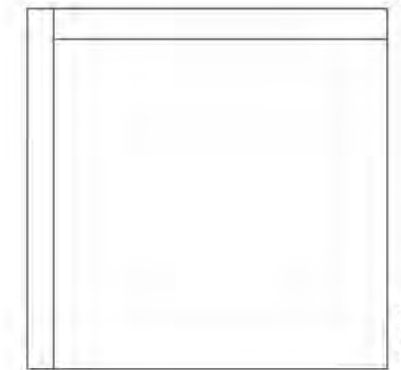
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**Scale:** 1:10,000

**Printed at:** 1:10,000



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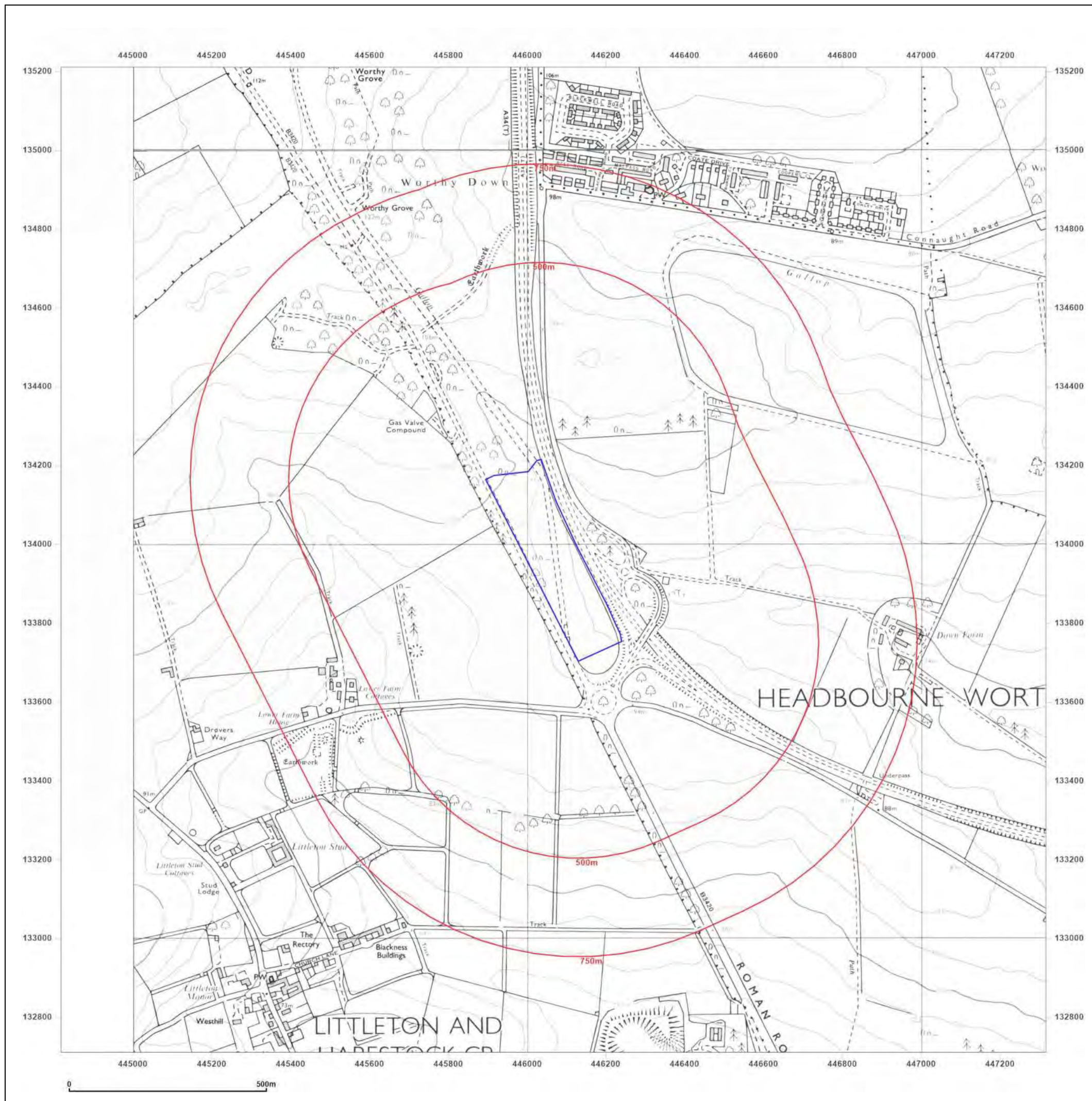


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**Map Name:** National Grid

**Map date:** 2001

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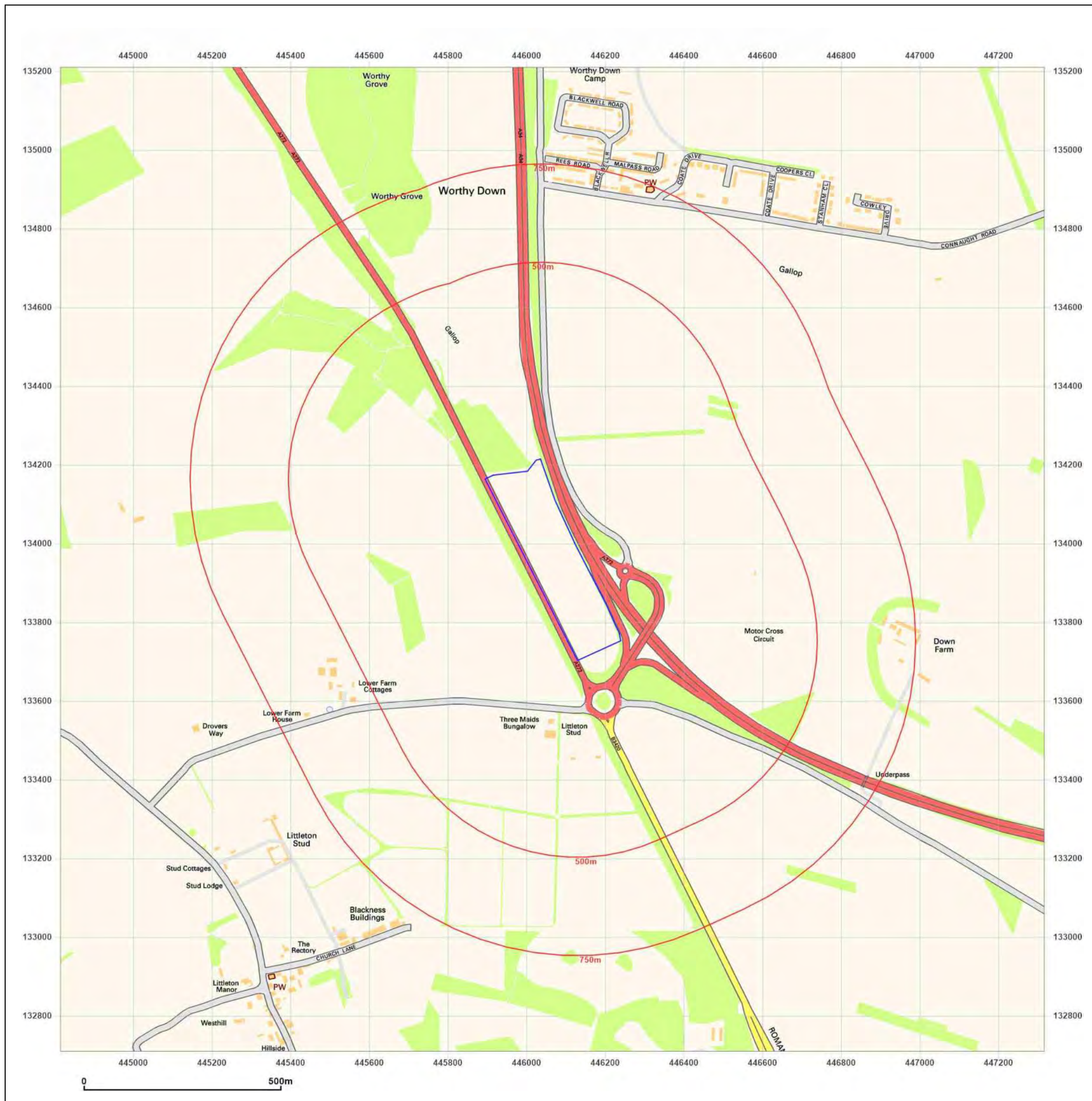
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**Map Name:** National Grid

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**Map Name:** National Grid

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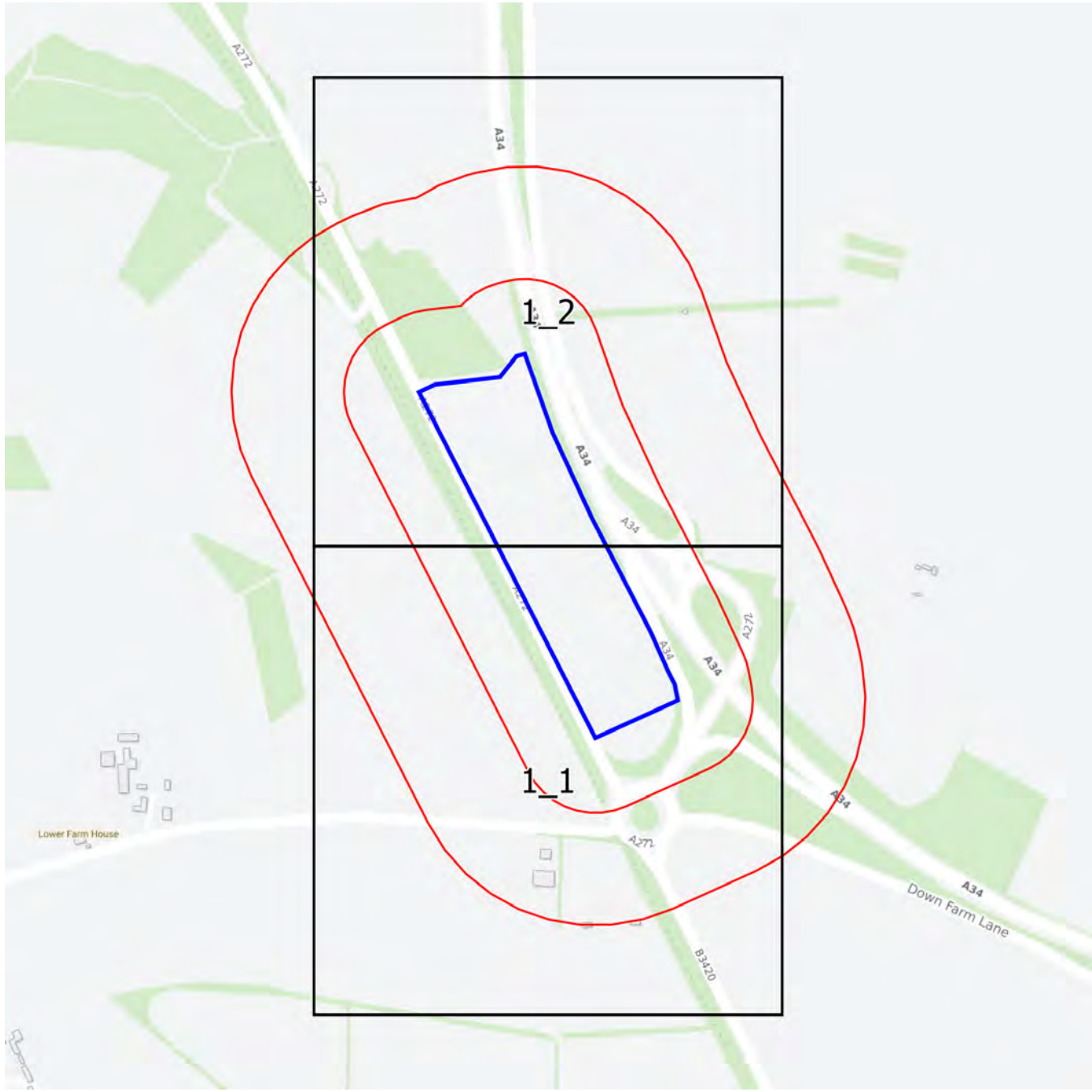


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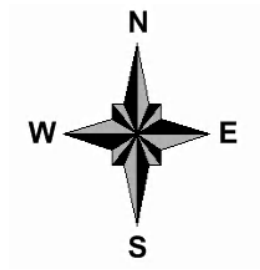
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INSIGHTS

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2QG

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**Report Ref:** EMS-767090\_992355\_LS\_1\_2  
**Grid Ref:** 446066, 134271

**Map Name:** County Series

**Map date:** 1870

**Scale:** 1:2,500

**Printed at:** 1:2,500



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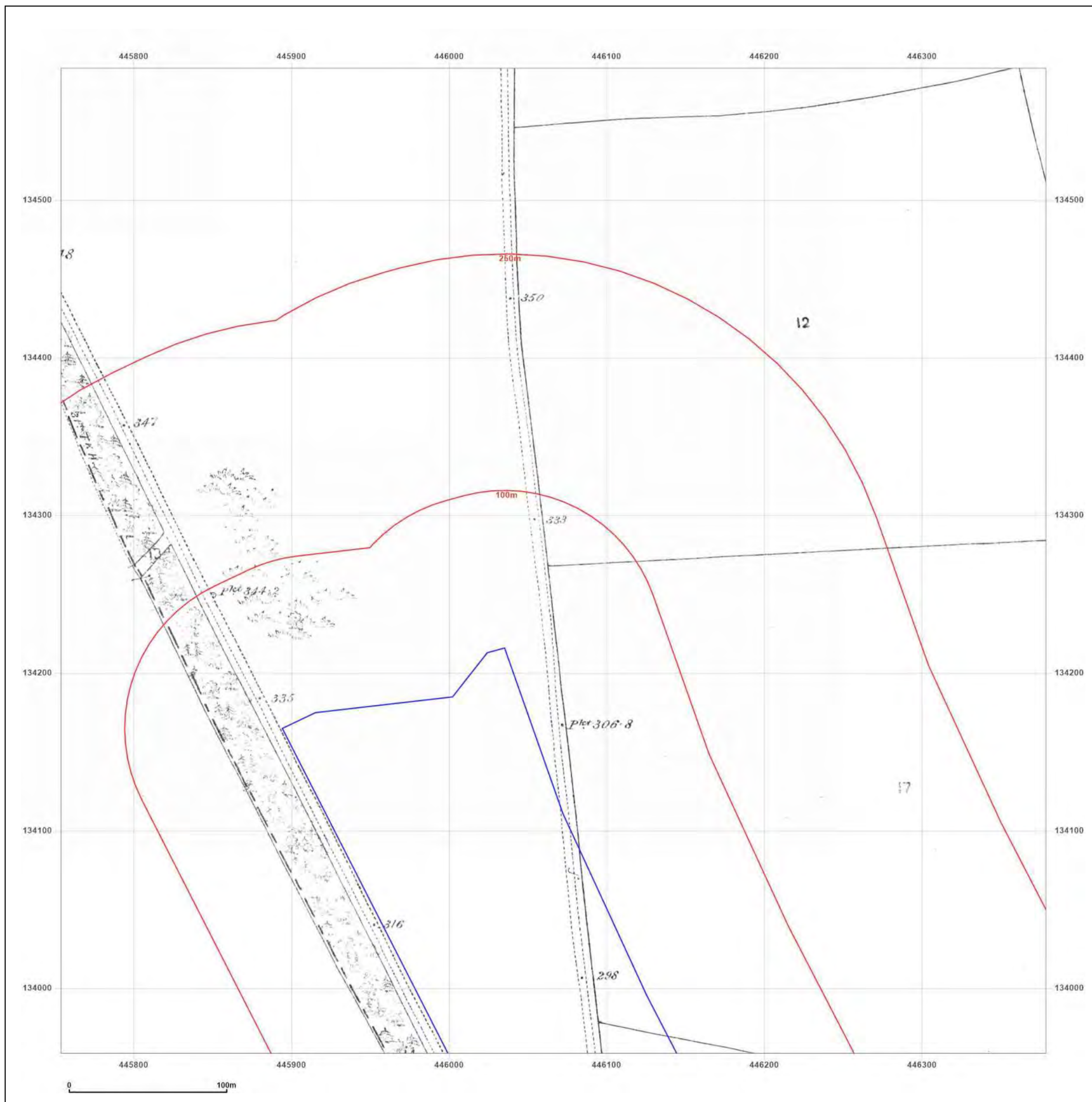


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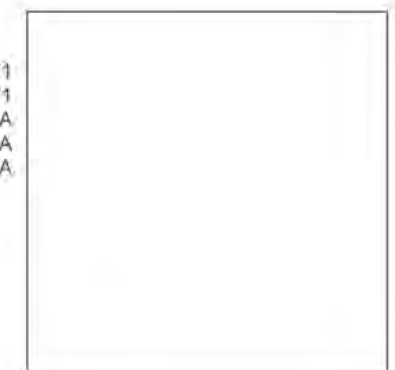
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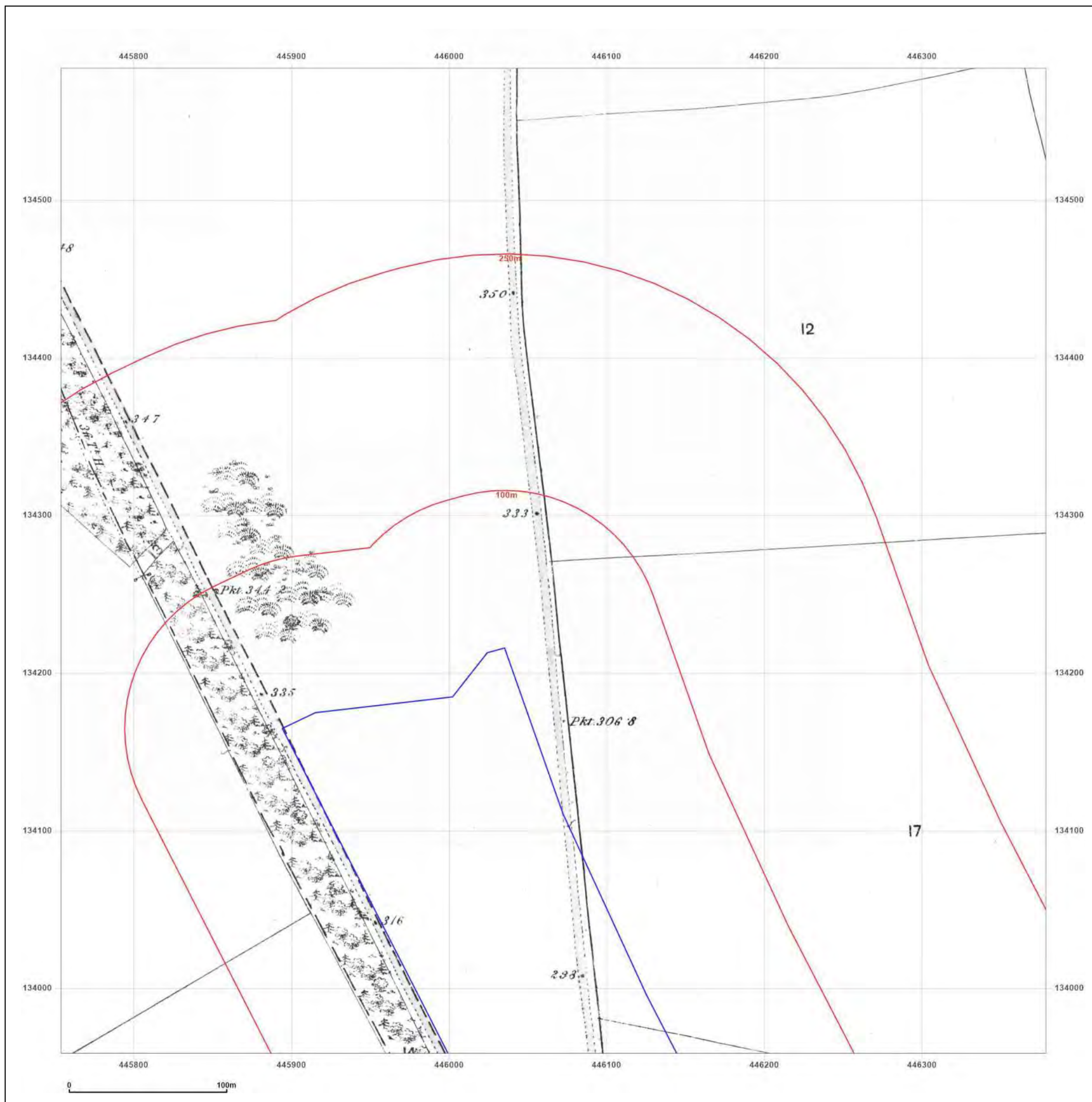


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_2  
**Grid Ref:** 446066, 134271

**Map Name:** County Series

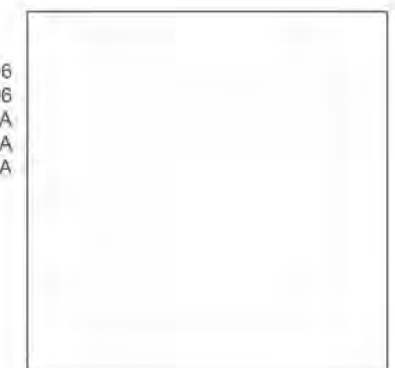
**Map date:** 1896

**Scale:** 1:2,500

**Printed at:** 1:2,500



Surveyed 1896  
Revised 1896  
Edition N/A  
Copyright N/A  
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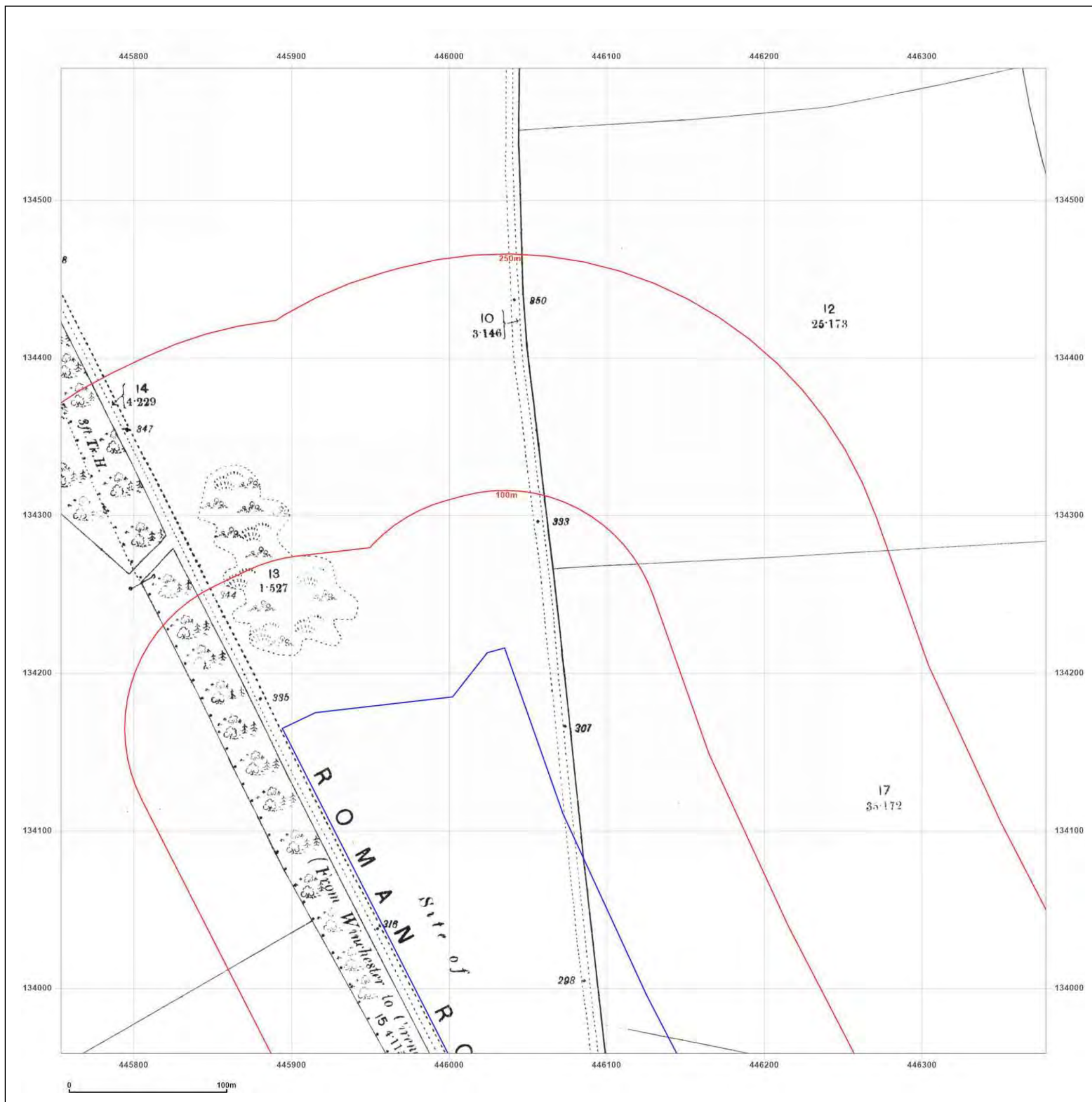


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_2  
**Grid Ref:** 446066, 134271

**Map Name:** County Series

**Map date:** 1910

**Scale:** 1:2,500

**Printed at:** 1:2,500



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Revised 1910  
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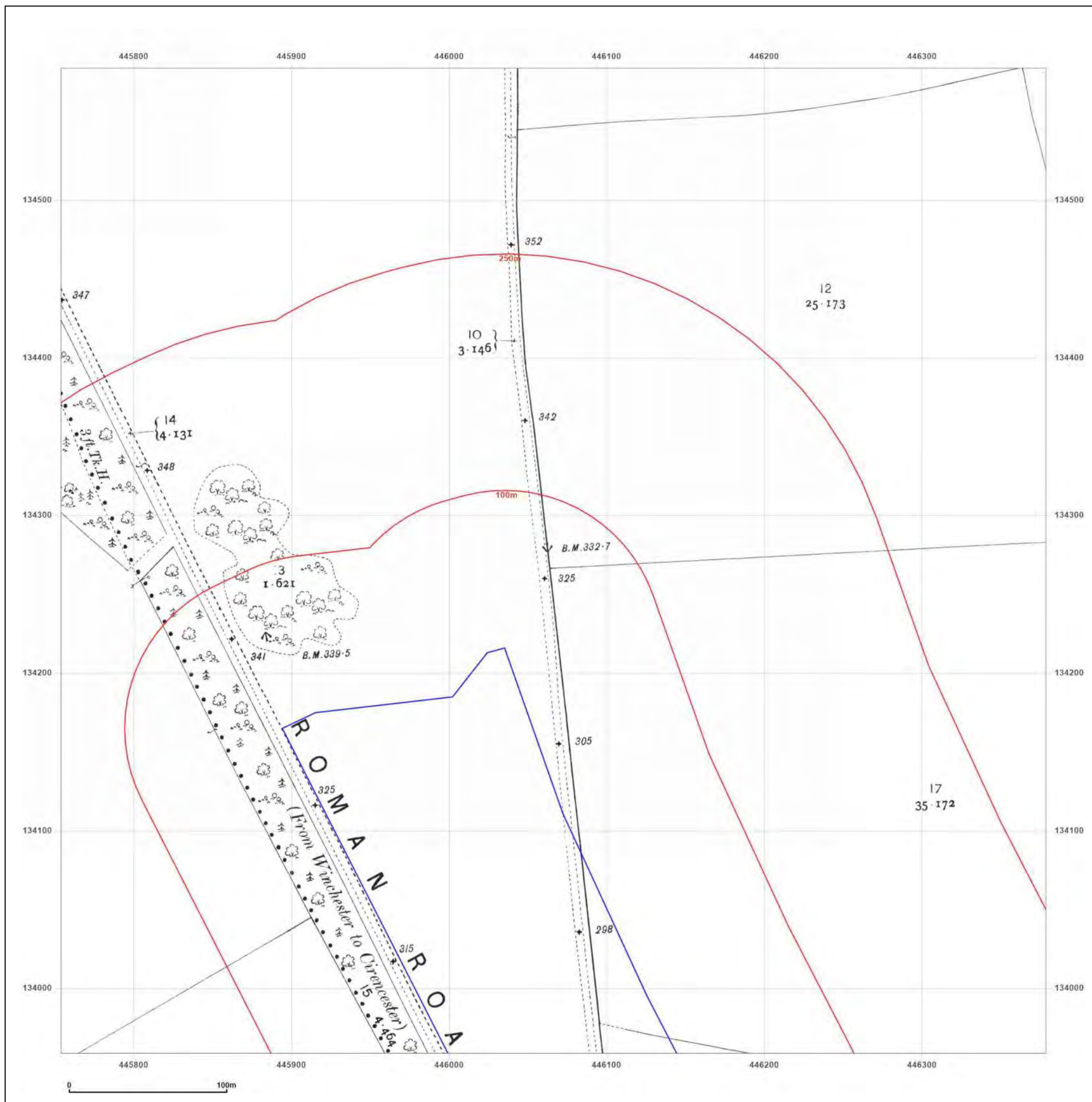


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_2  
**Grid Ref:** 446066, 134271

**Map Name:** County Series

**Map date:** 1932

**Scale:** 1:2,500

**Printed at:** 1:2,500



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Revised 1932  
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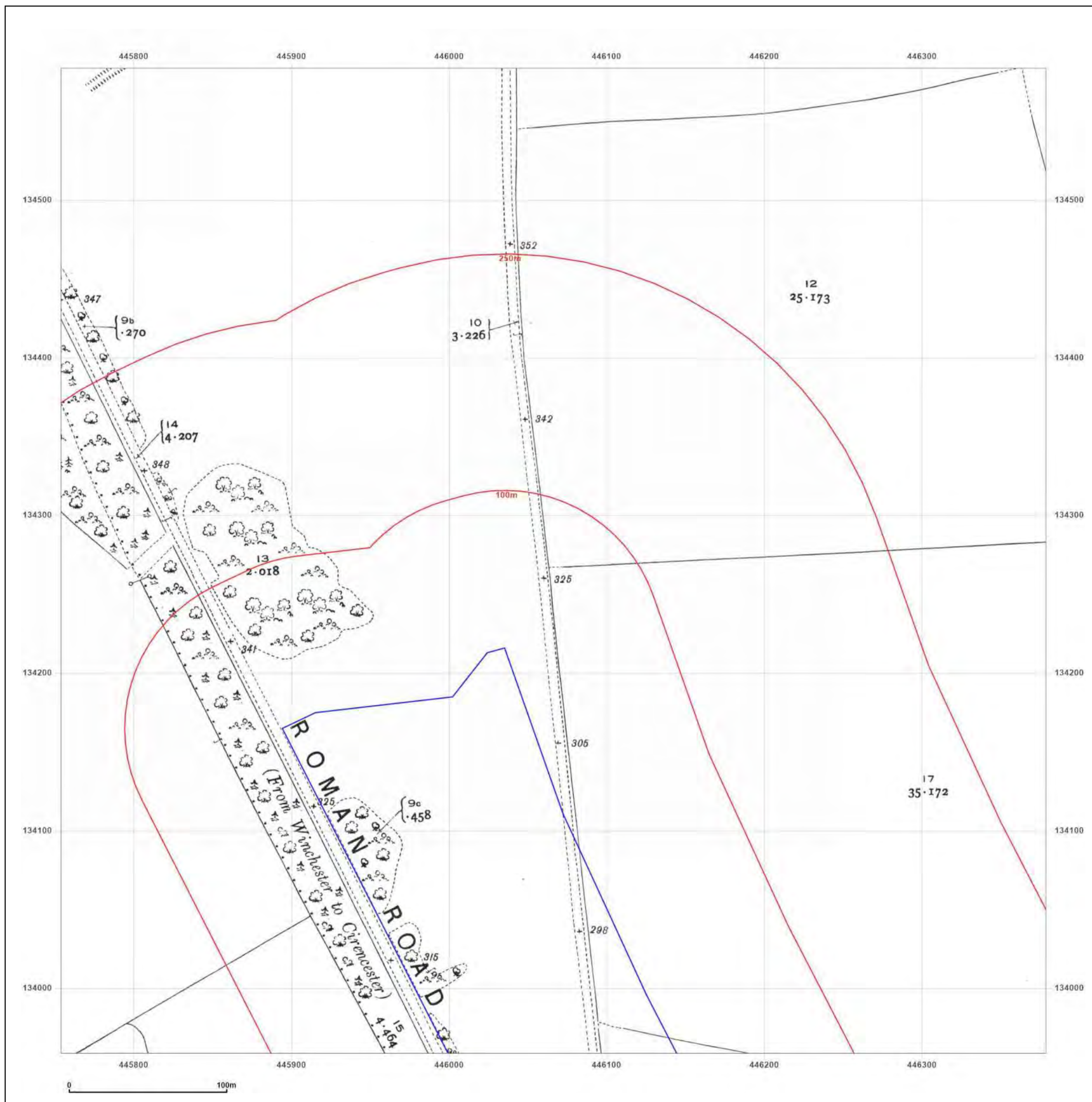


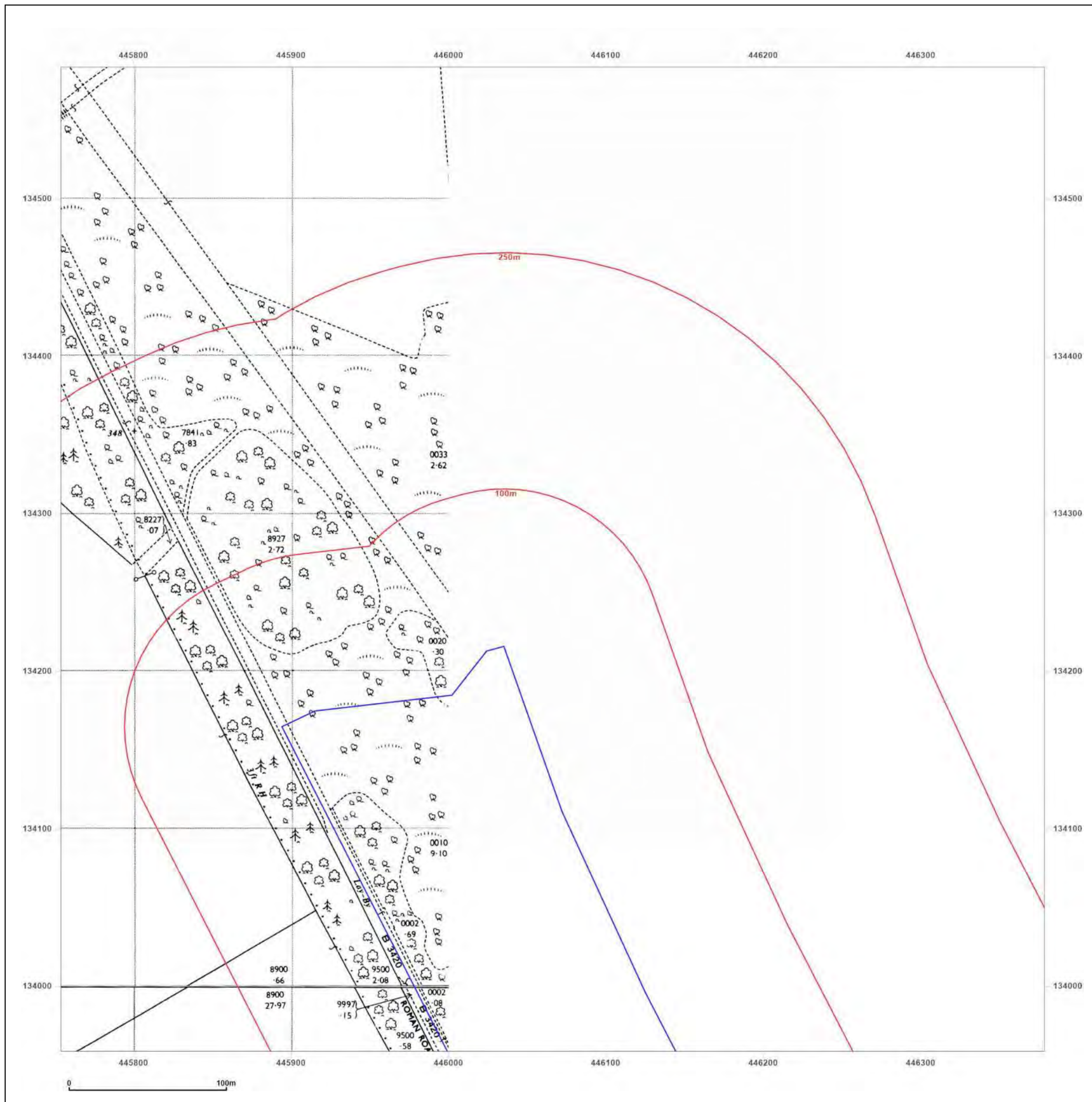
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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
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**Grid Ref:** 446066, 134271

**Map Name:** National Grid

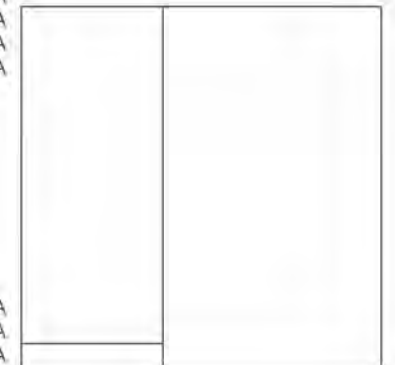
**Map date:** 1963

**Scale:** 1:2,500

**Printed at:** 1:2,500



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 Revised N/A  
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**Site Details:**

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2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_2  
**Grid Ref:** 446066, 134271

**Map Name:** National Grid

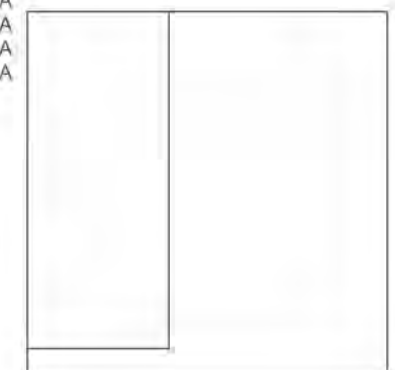
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**Scale:** 1:2,500

**Printed at:** 1:2,500



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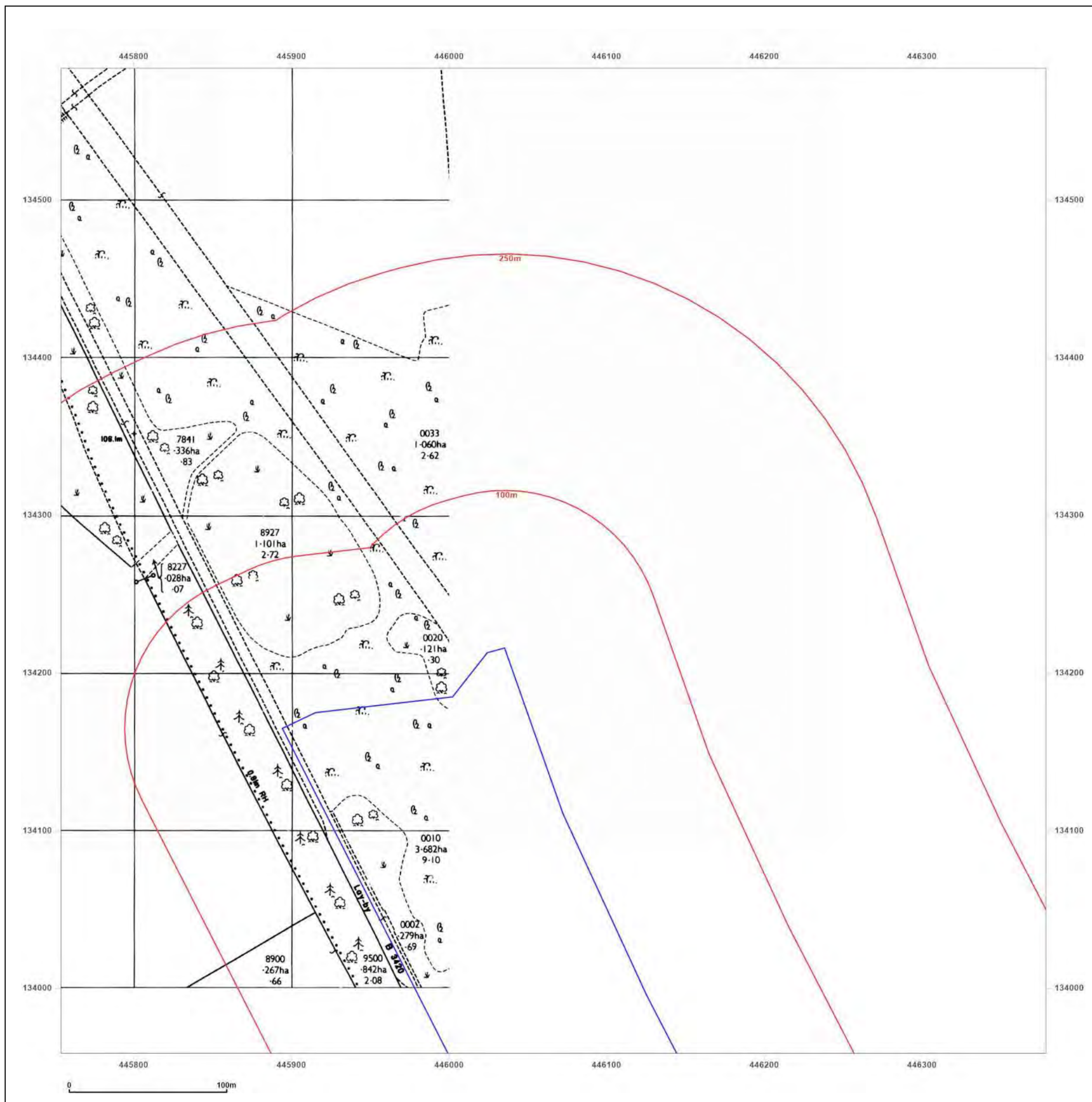


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_2  
**Grid Ref:** 446066, 134271

**Map Name:** National Grid

**Map date:** 1963-1965

**Scale:** 1:2,500

**Printed at:** 1:2,500



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Surveyed 1964  
Revised 1964  
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Revised 1962  
Edition N/A  
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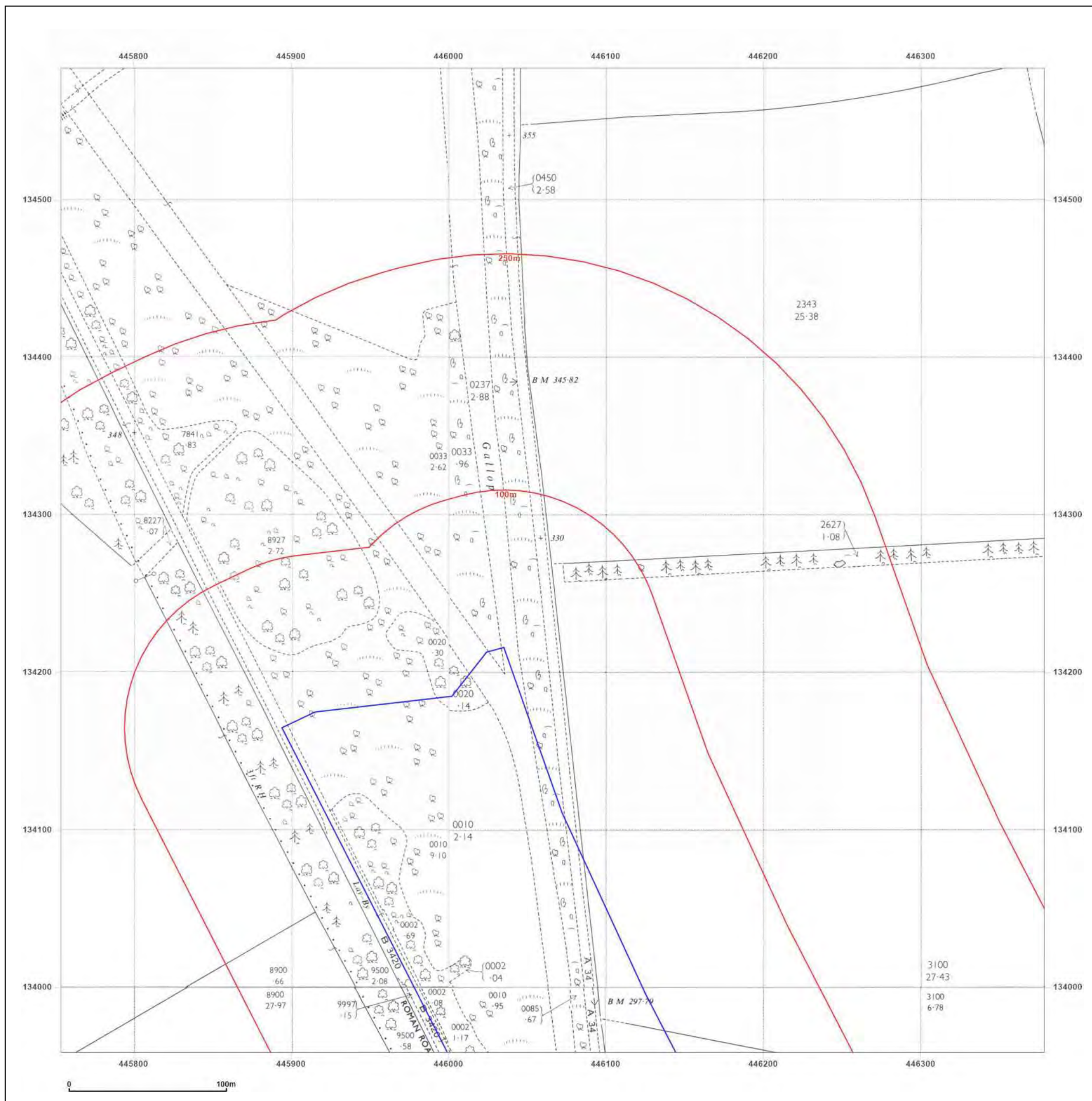


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

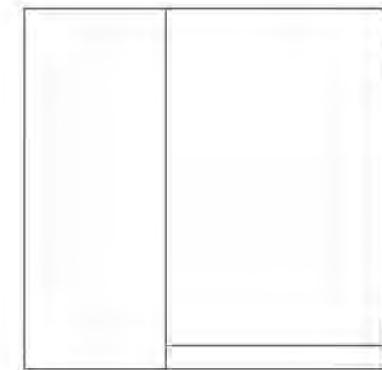
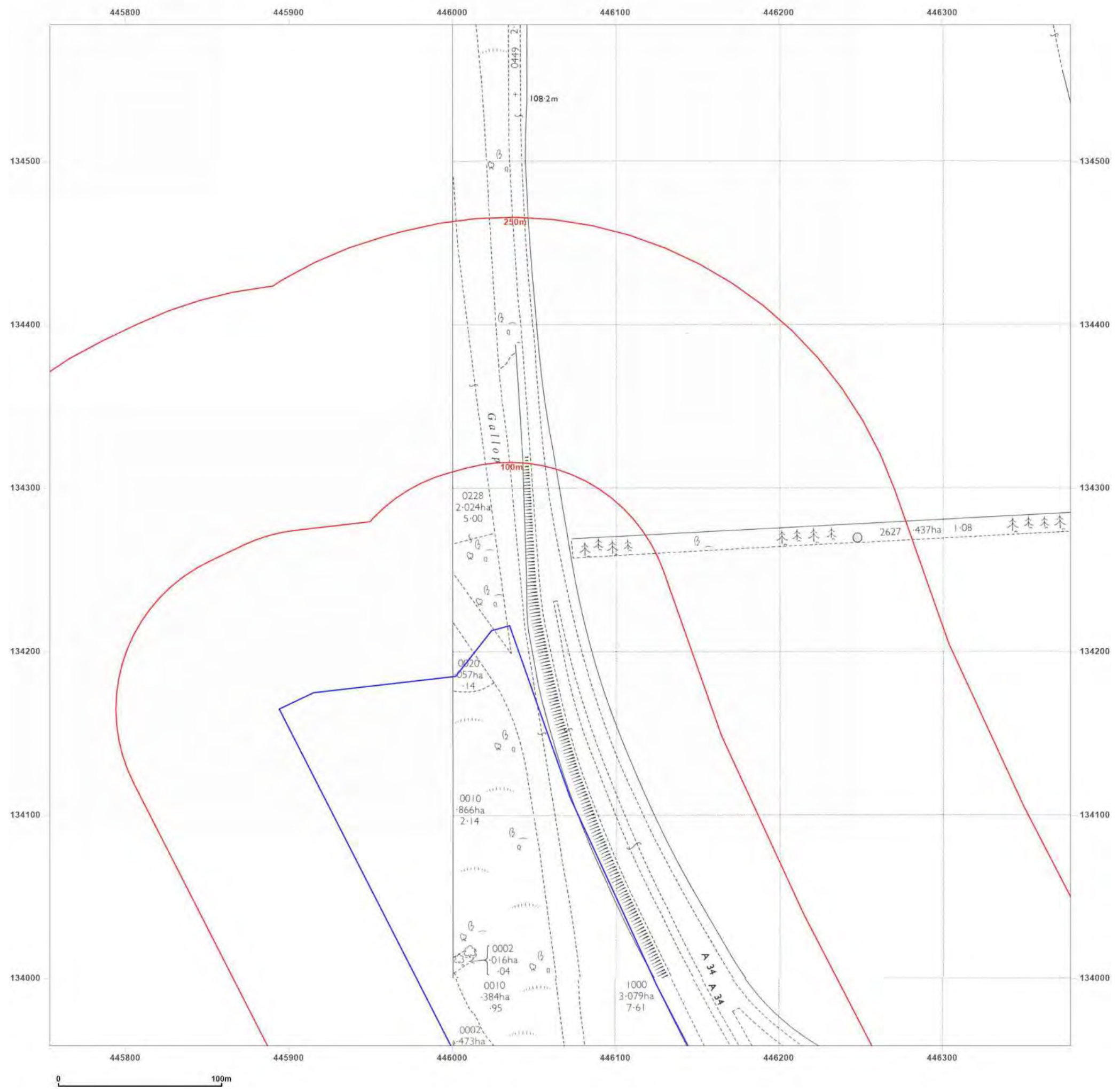
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**Grid Ref:** 446066, 134271

**Map Name:** National Grid

**Map date:** 1970

**Scale:** 1:2,500

**Printed at:** 1:2,500



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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_2  
**Grid Ref:** 446066, 134271

**Map Name:** National Grid

**Map date:** 1980-1984

**Scale:** 1:2,500

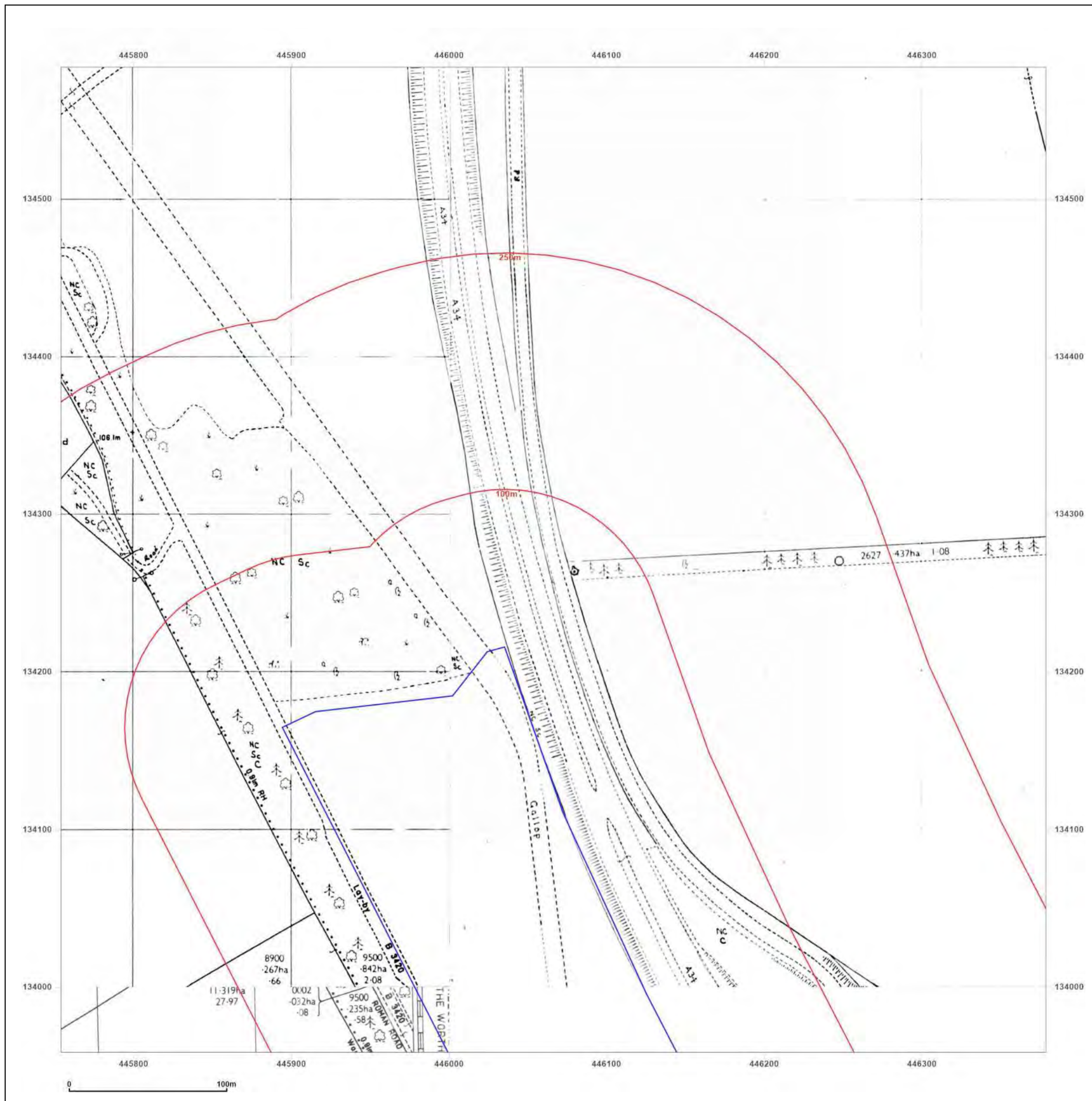
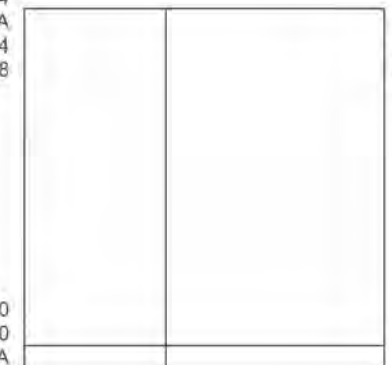
**Printed at:** 1:2,500



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Revised 1984  
Edition N/A  
Copyright 1984  
Levelled 1958

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Revised N/A  
Edition N/A  
Copyright 1984  
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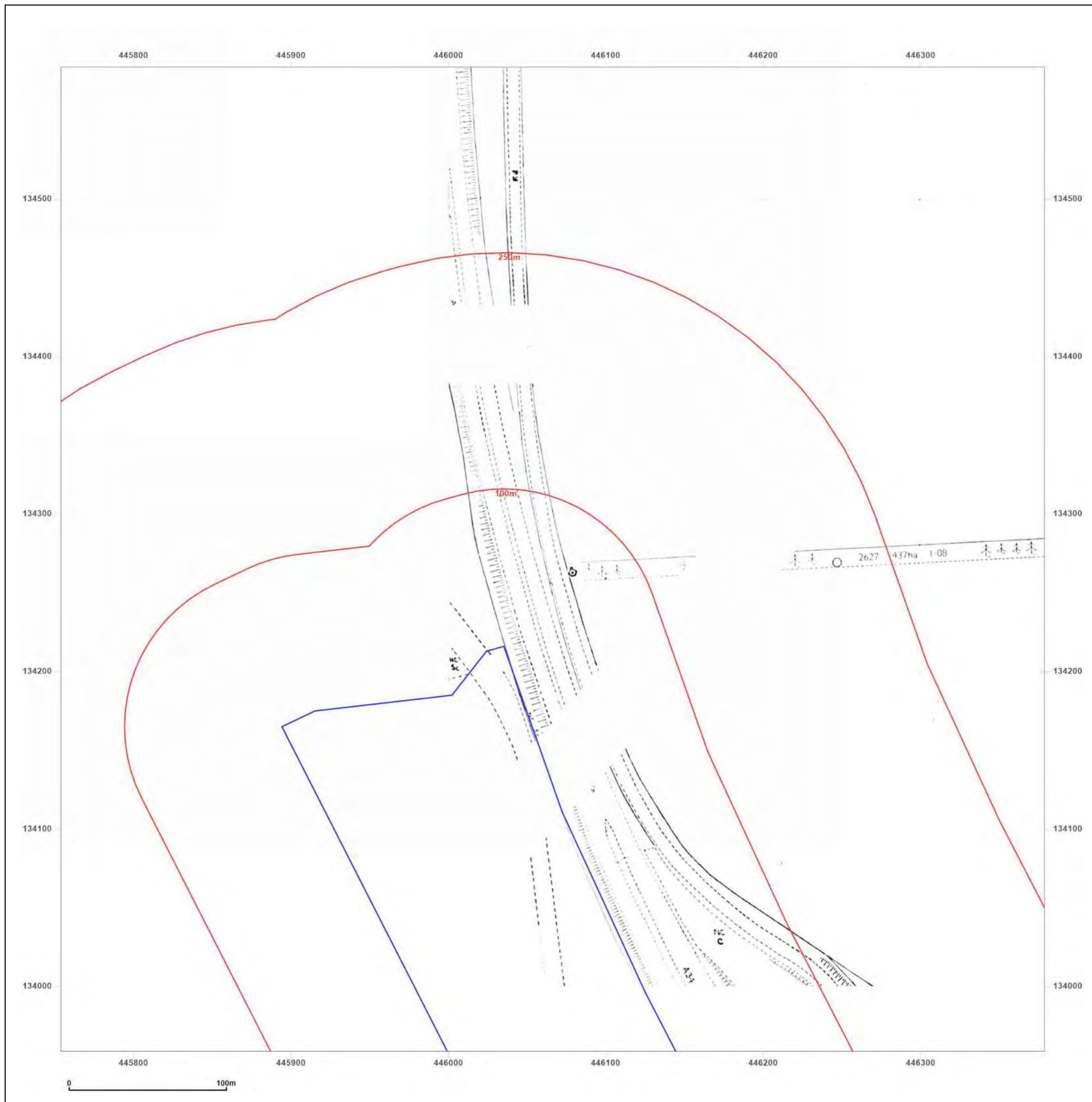


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

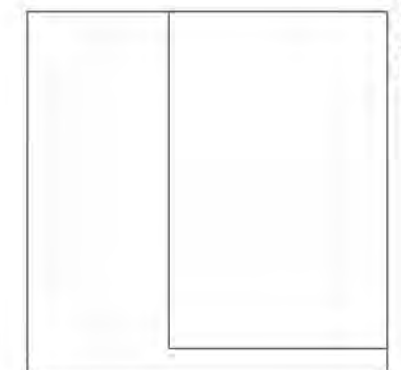
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**Grid Ref:** 446066, 134271

**Map Name:** National Grid

**Map date:** 1984

**Scale:** 1:2,500

**Printed at:** 1:2,500



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Edition N/A  
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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_2  
**Grid Ref:** 446066, 134271

**Map Name:** National Grid

**Map date:** 1990-1993

**Scale:** 1:2,500

**Printed at:** 1:2,500



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Edition N/A  
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Revised 1993  
Edition N/A  
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Surveyed 1990  
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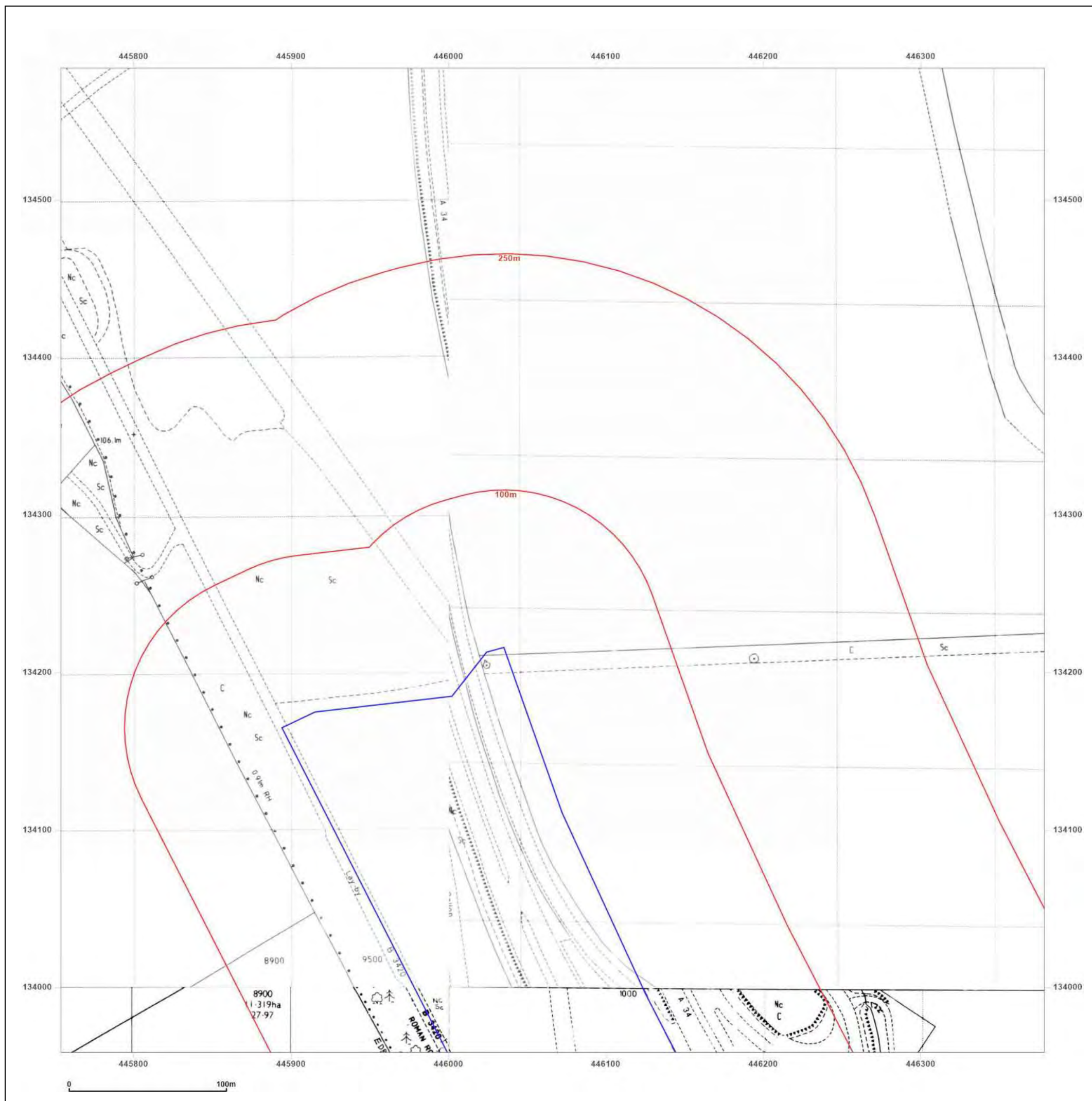


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_1  
**Grid Ref:** 446066, 133646

**Map Name:** County Series

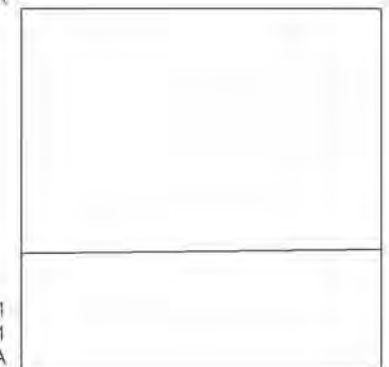
**Map date:** 1870-1871

**Scale:** 1:2,500

**Printed at:** 1:2,500



Surveyed 1870  
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Revised 1871  
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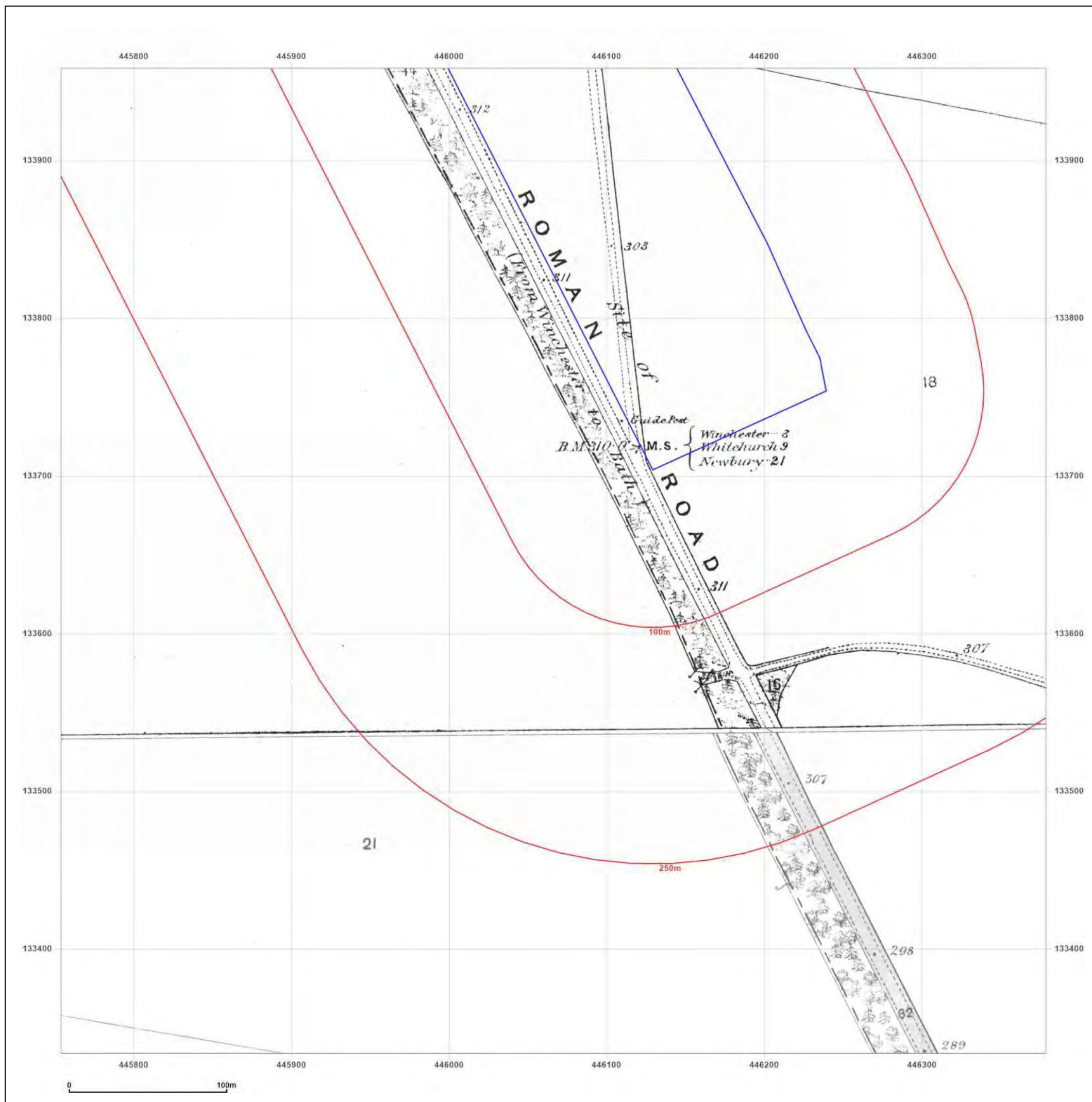


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

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**Report Ref:** EMS-767090\_992355\_LS\_1\_1  
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**Map Name:** County Series

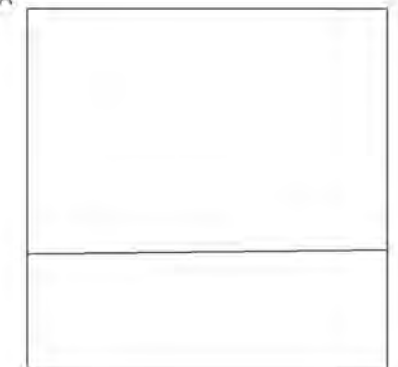
**Map date:** 1871

**Scale:** 1:2,500

**Printed at:** 1:2,500



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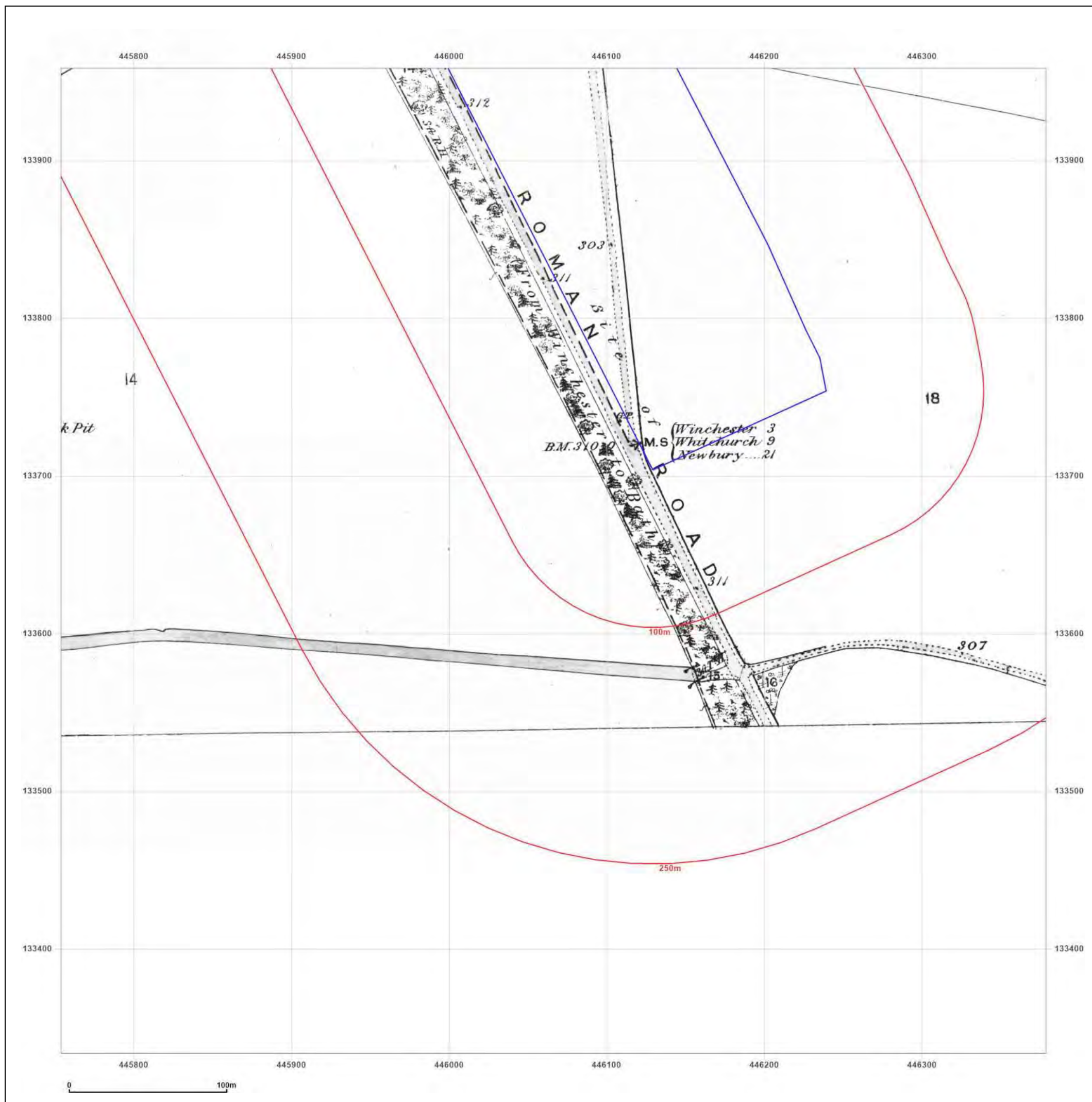


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

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**Grid Ref:** 446066, 133646

**Map Name:** County Series

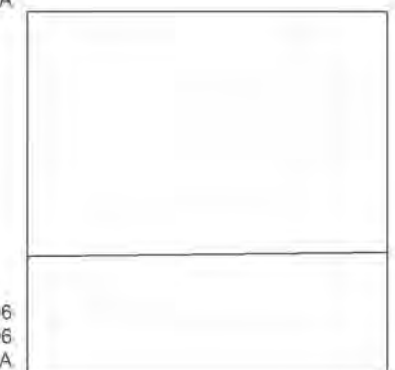
**Map date:** 1896

**Scale:** 1:2,500

**Printed at:** 1:2,500



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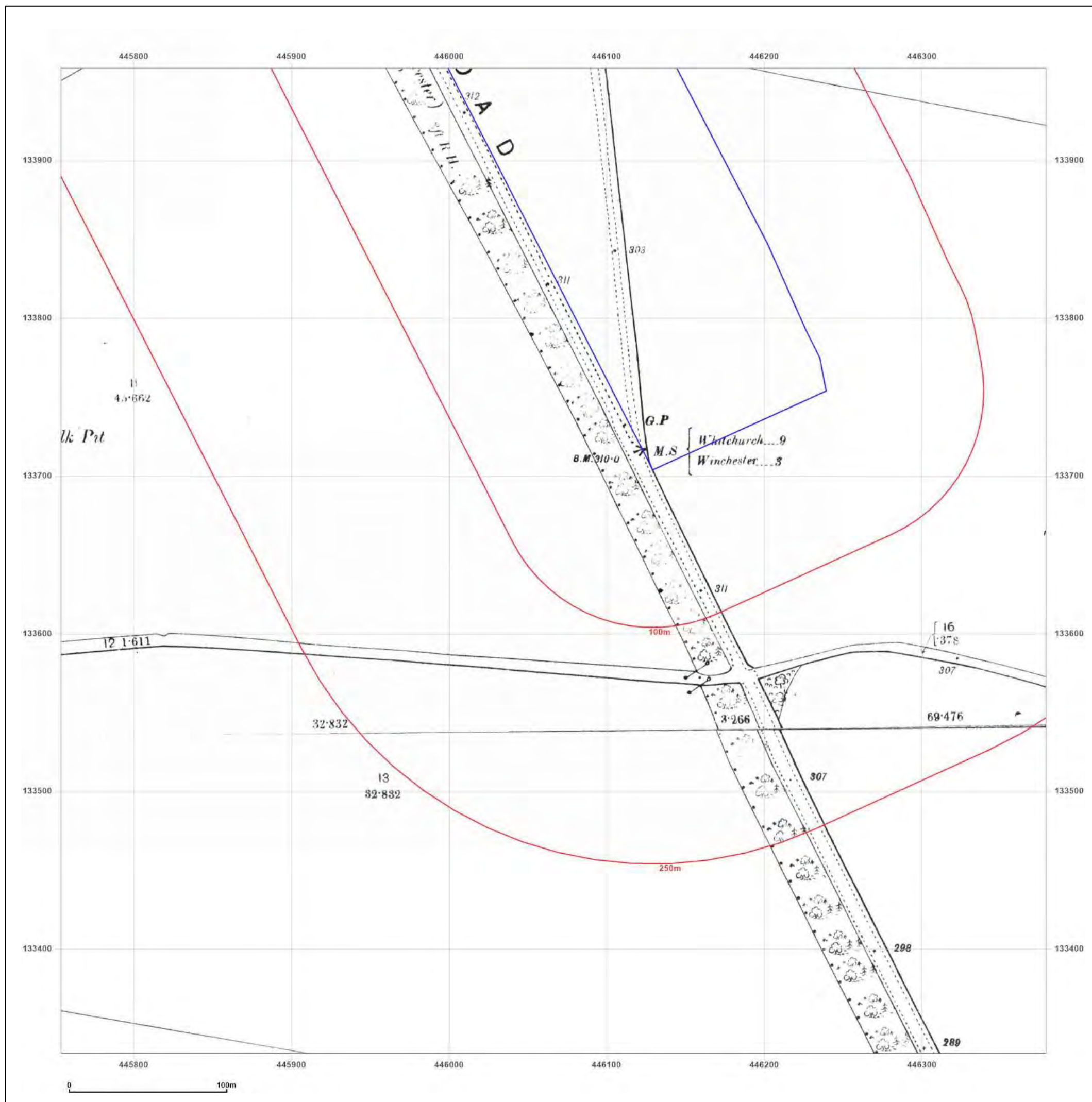


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
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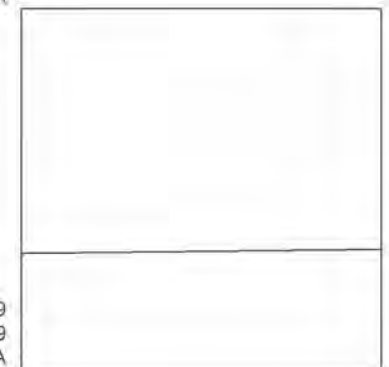
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**Scale:** 1:2,500

**Printed at:** 1:2,500



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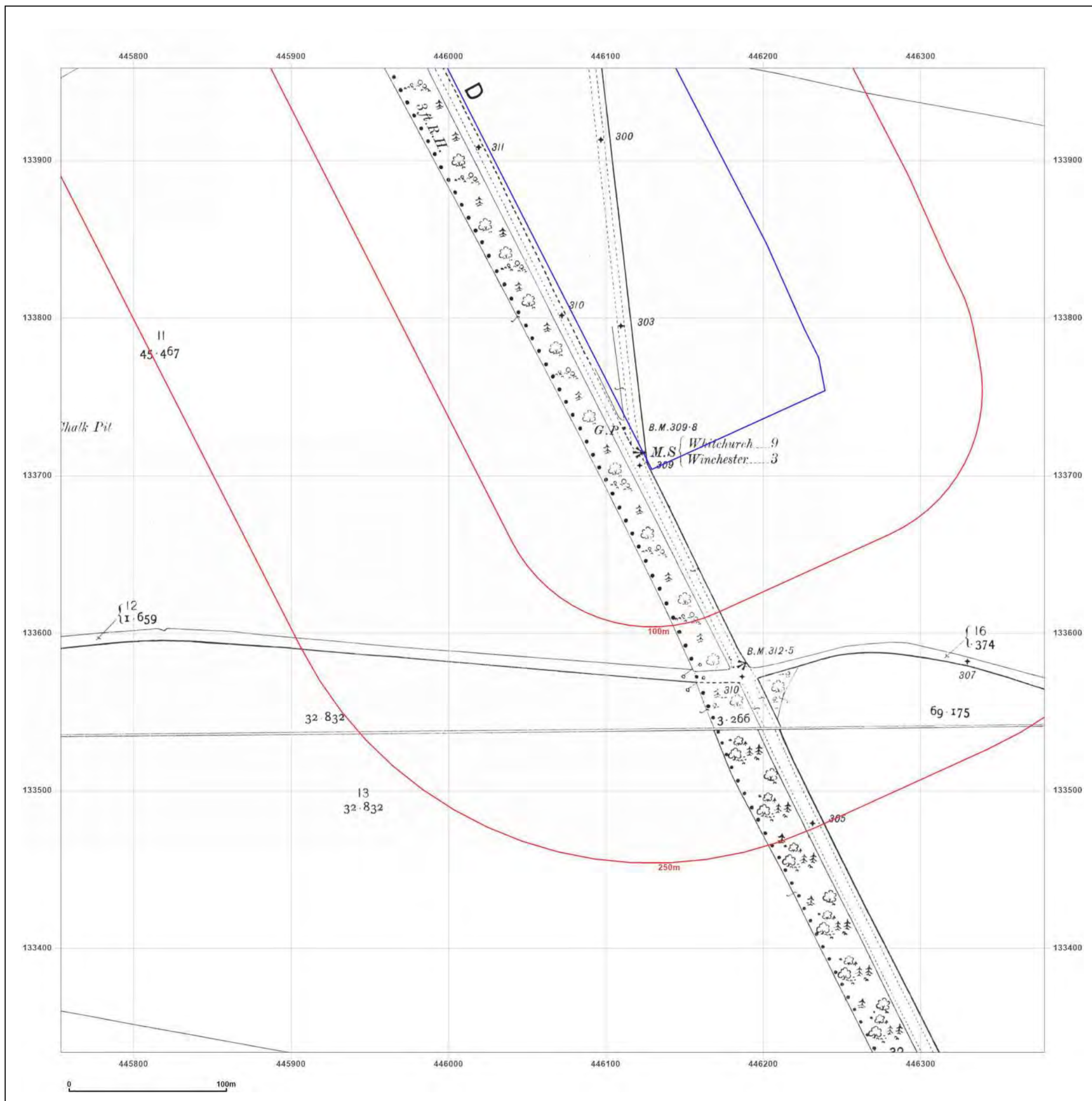


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_1  
**Grid Ref:** 446066, 133646

**Map Name:** County Series

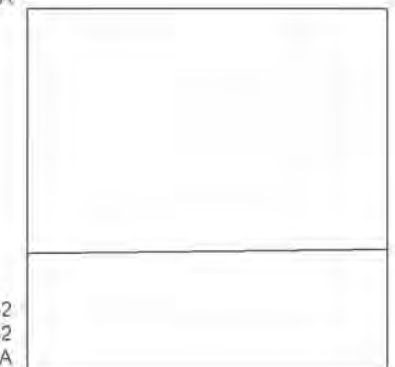
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**Scale:** 1:2,500

**Printed at:** 1:2,500



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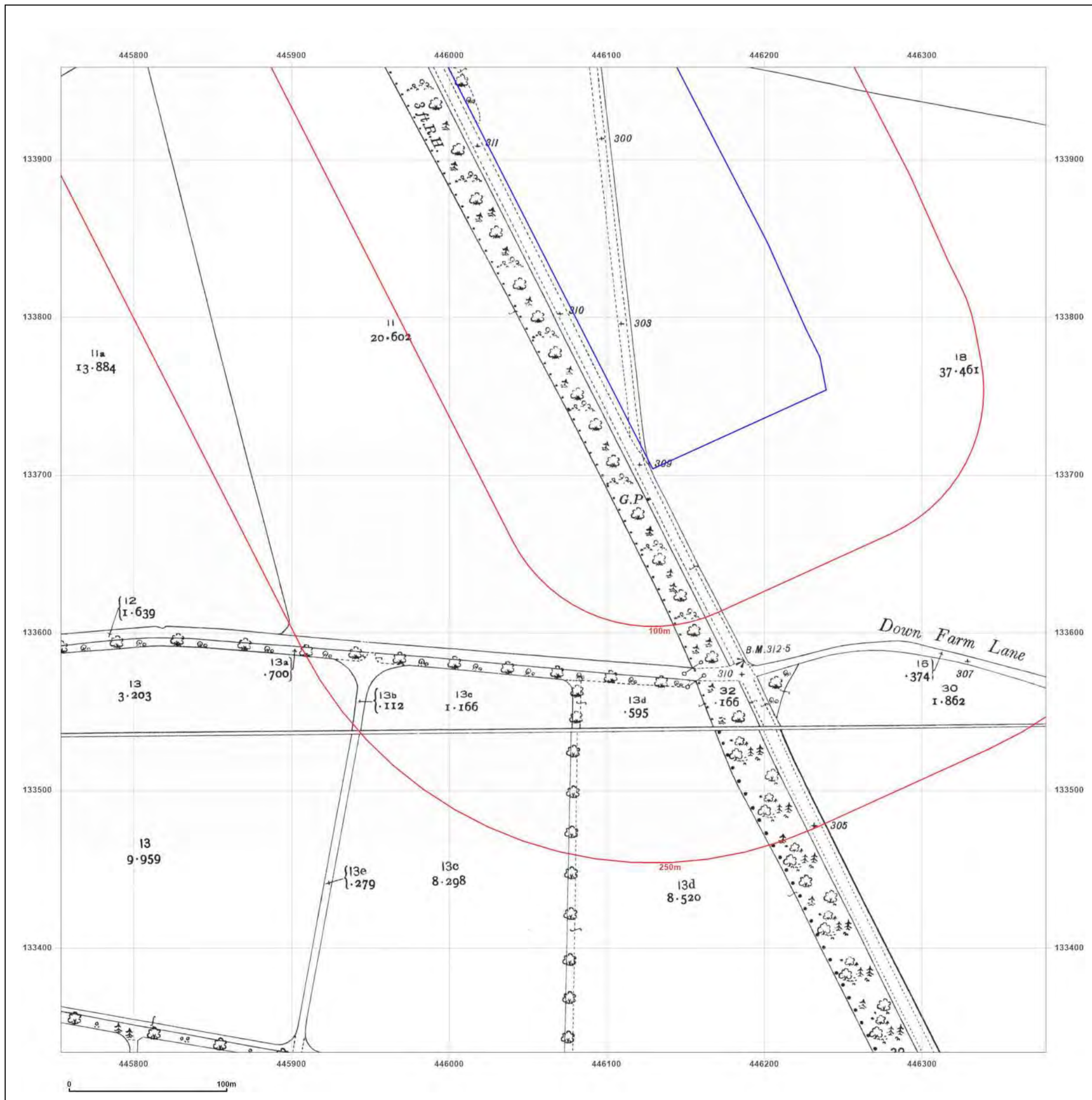


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_1  
**Grid Ref:** 446066, 133646

**Map Name:** National Grid

**Map date:** 1963

**Scale:** 1:2,500

**Printed at:** 1:2,500



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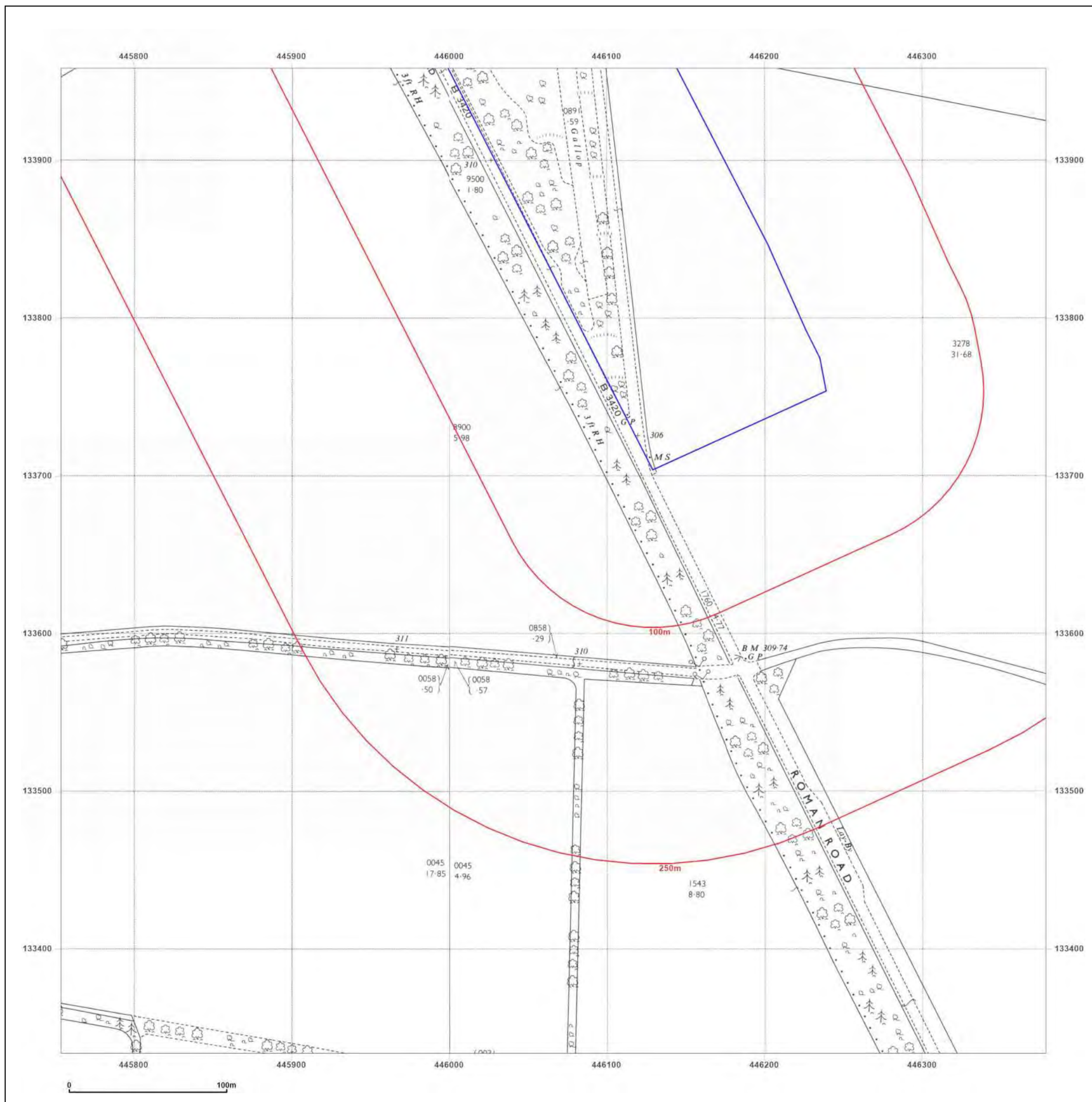


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

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**Report Ref:** EMS-767090\_992355\_LS\_1\_1  
**Grid Ref:** 446066, 133646

**Map Name:** National Grid

**Map date:** 1963

**Scale:** 1:2,500

**Printed at:** 1:2,500



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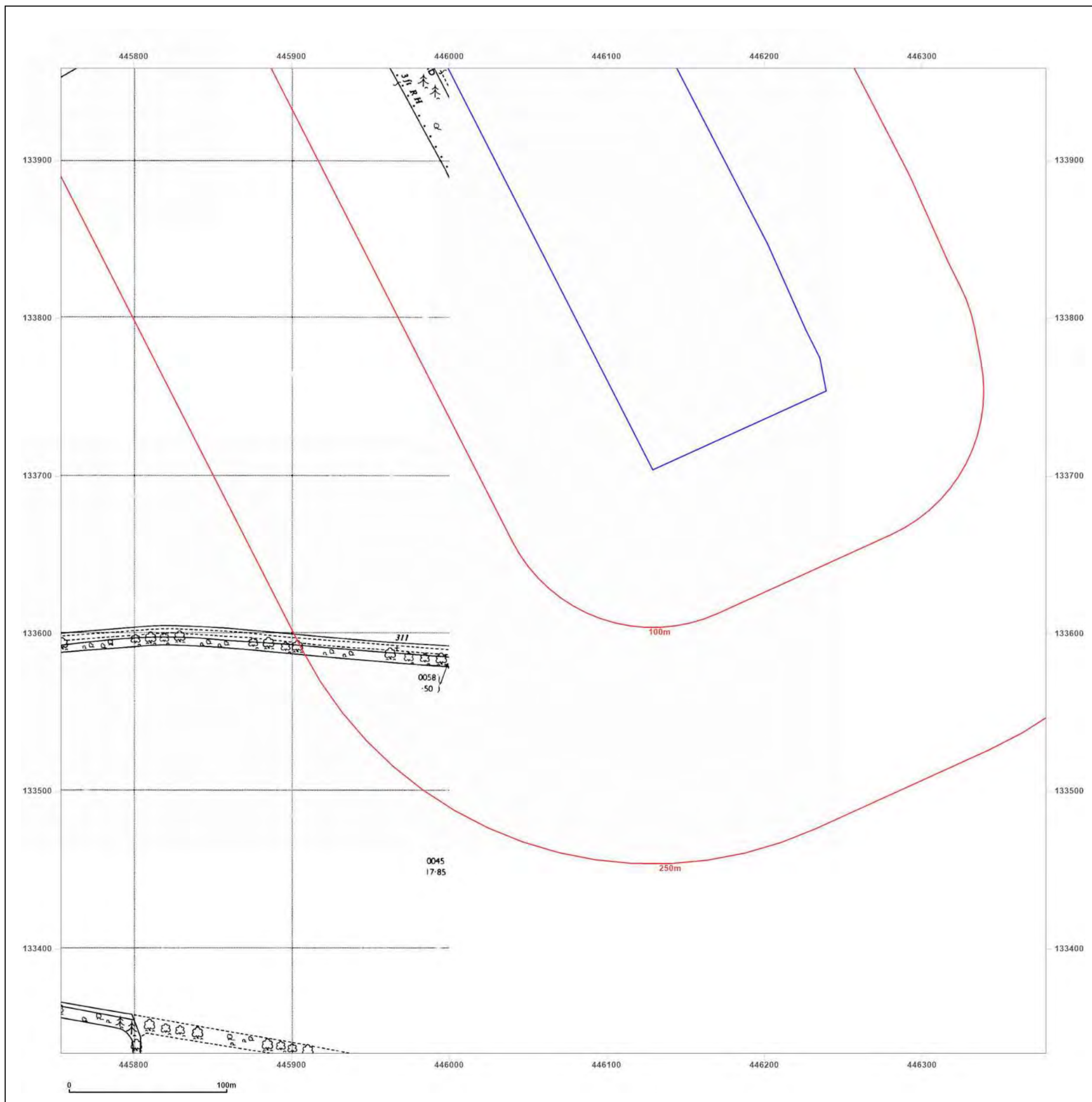


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**Site Details:**

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2QG

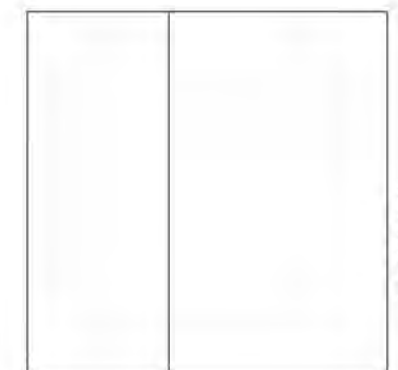
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**Map Name:** National Grid

**Map date:** 1970

**Scale:** 1:2,500

**Printed at:** 1:2,500



Surveyed 1969  
Revised 1969  
Edition N/A  
Copyright 1970  
Levelled 1958



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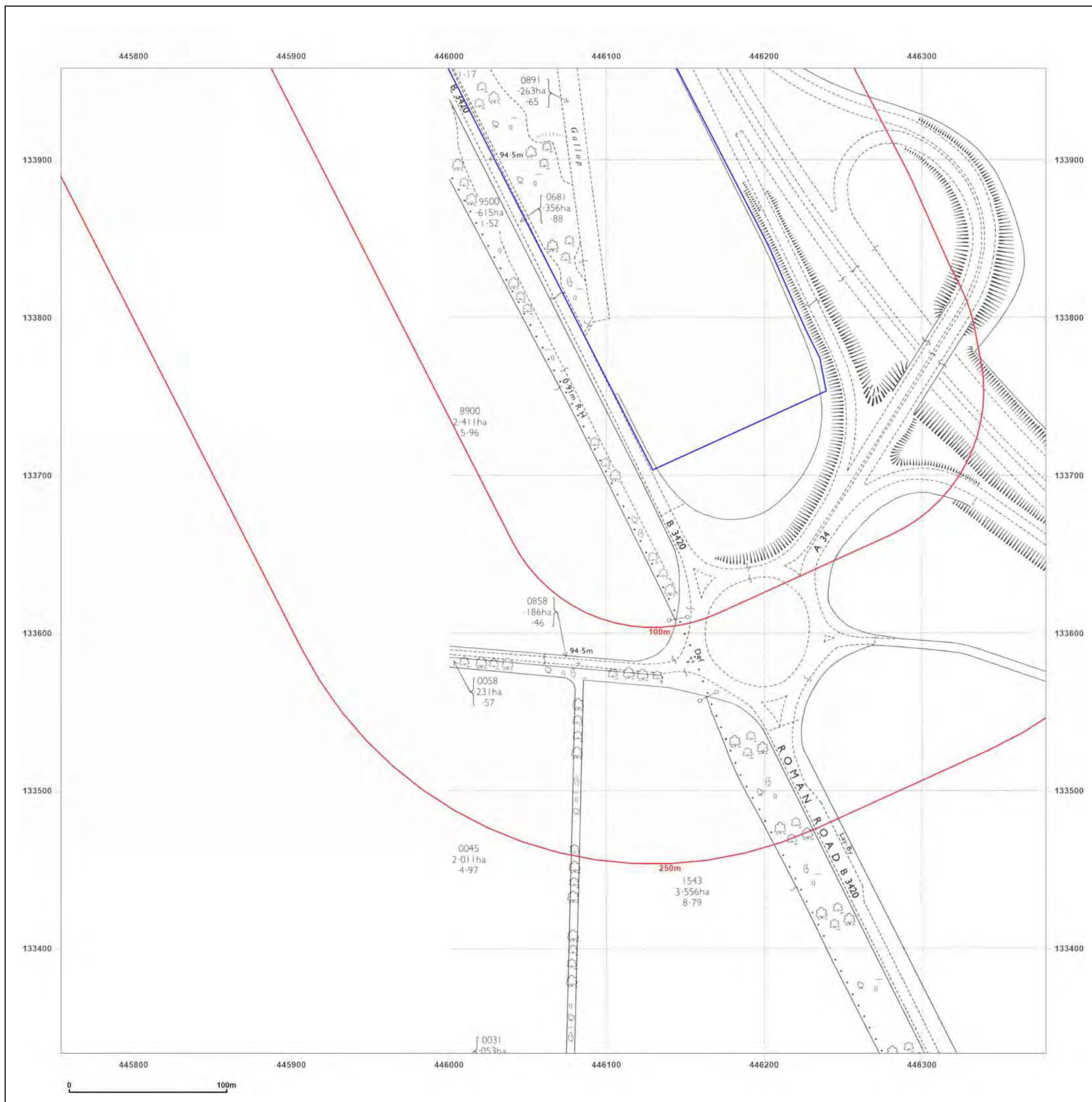


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Production date: 16 March 2022

Map legend available at:  
[www.groundsure.com/sites/default/files/groundsure\\_legend.pdf](http://www.groundsure.com/sites/default/files/groundsure_legend.pdf)



**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_1  
**Grid Ref:** 446066, 133646

**Map Name:** National Grid

**Map date:** 1980

**Scale:** 1:2,500

**Printed at:** 1:2,500



Surveyed 1980  
Revised 1980  
Edition N/A  
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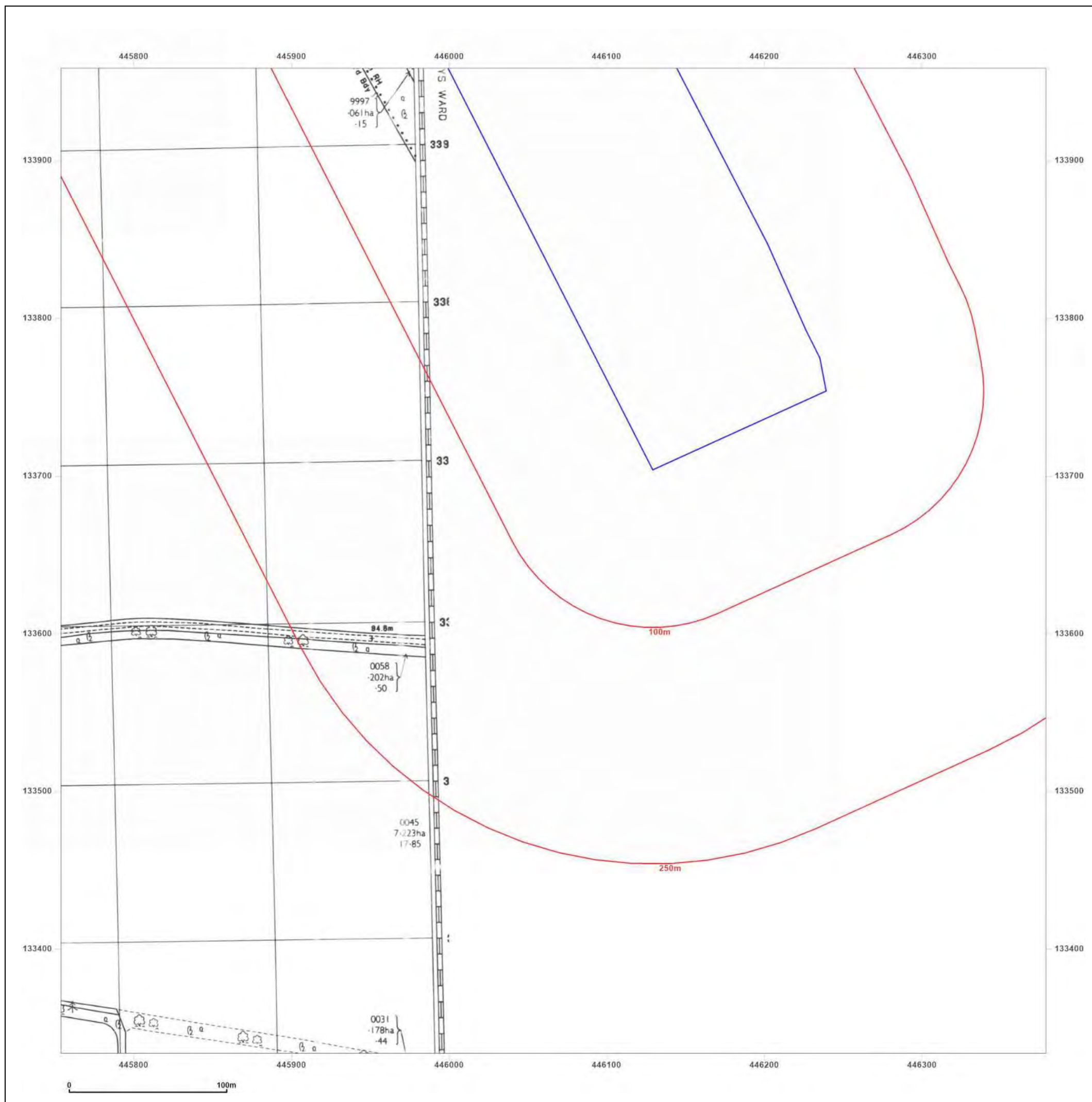


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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_1  
**Grid Ref:** 446066, 133646

**Map Name:** National Grid

**Map date:** 1990-1993

**Scale:** 1:2,500

**Printed at:** 1:2,500



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Revised 1990  
Edition N/A  
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Surveyed 1993  
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**Site Details:**

Three Maids, Winchester, SO21  
2QG

**Client Ref:** EMS\_767090\_954612  
**Report Ref:** EMS-767090\_992355\_LS\_1\_1  
**Grid Ref:** 446066, 133646

**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



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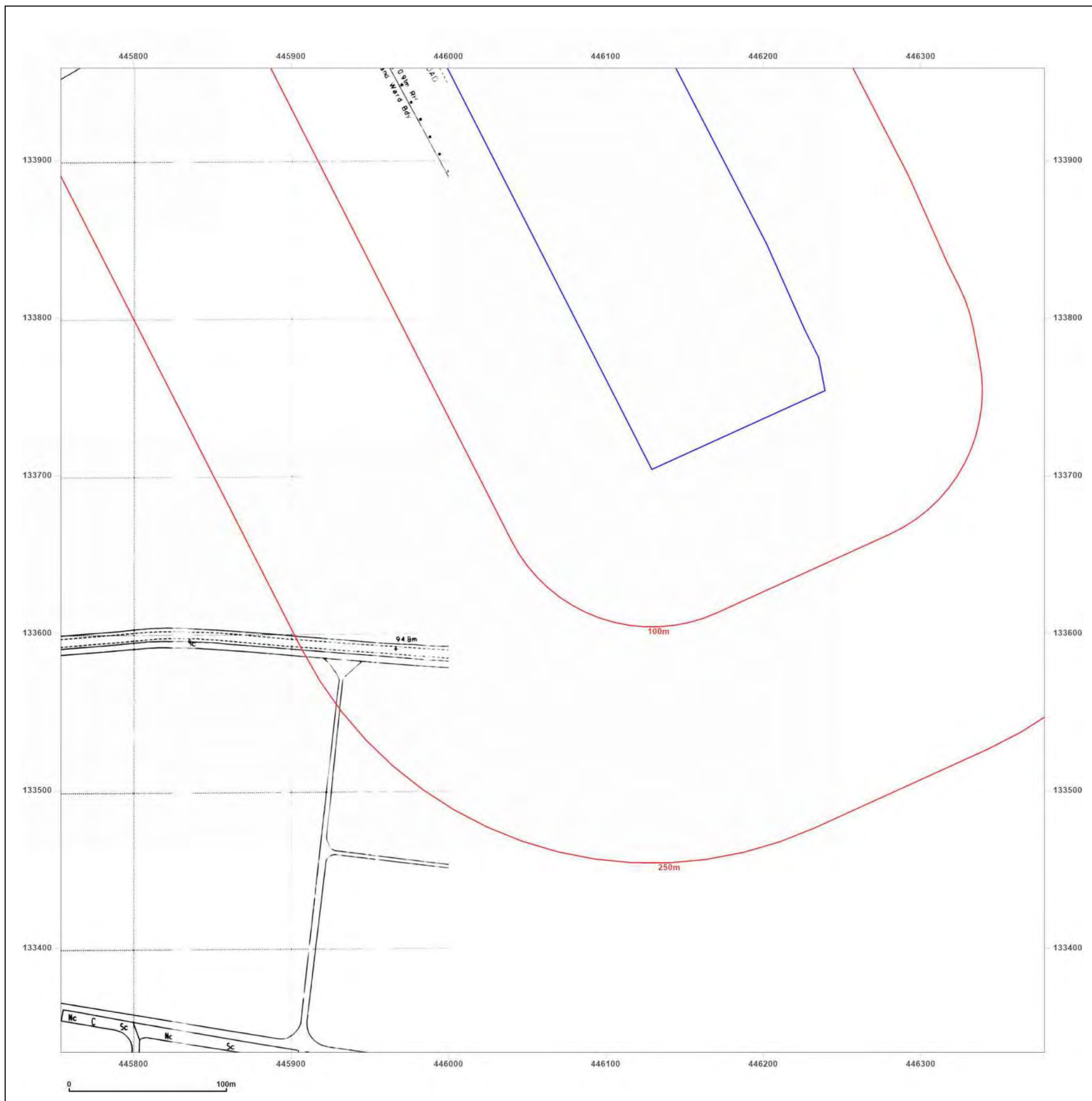


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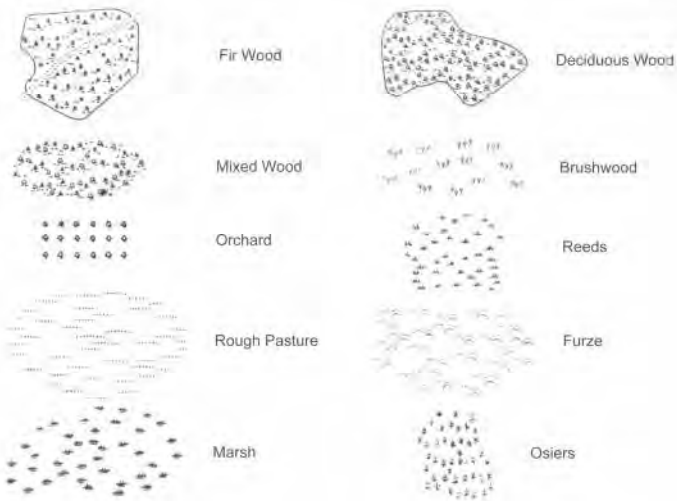
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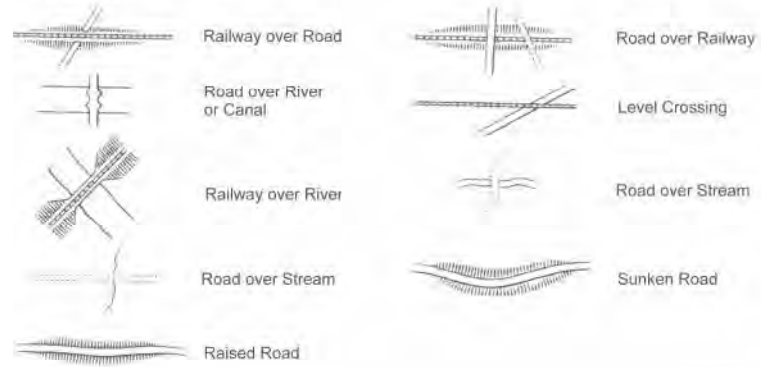


# County Series 1:10,560 scale

## VEGETATION



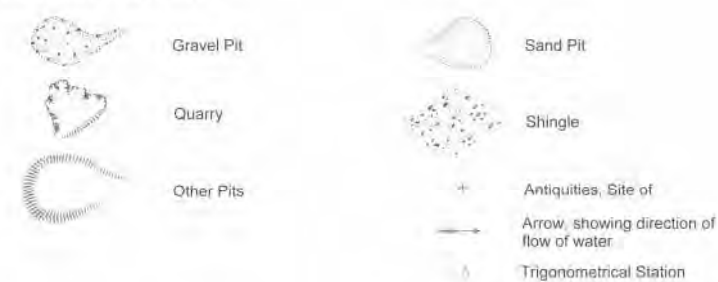
## ROADS



## RAILWAYS



## GENERAL FEATURES



## BOUNDARIES



# National Grid 1:10,000 scale

## HEIGHTS (METRES)

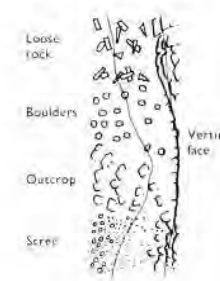
Values are given in metres above mean sea level at Newlyn.

Surface heights determined by ground survey or by 1st m.

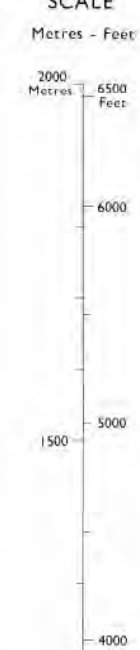
Bench marks and their values are shown on large scale maps, and bench mark lists containing fuller and possibly later levelling information are obtainable from the Director General, Ordnance Survey.

Contours are at 5 metres vertical interval.

## ROCK FEATURES



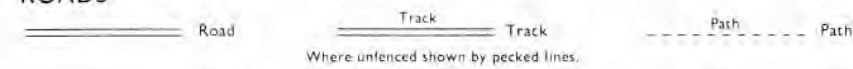
## CONVERSION SCALE



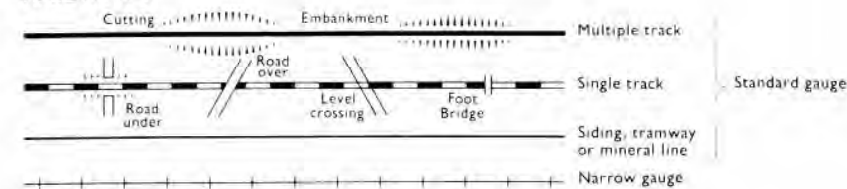
## ABBREVIATIONS

BP,BS	Boundary Post or Stone	PO	Post Office
Ch	Church	PC	Public Convenience
CH	Club House	PH	Public House
F Sta	Fire Station	S	Stone
FB	Foot Bridge	Spr	Spring
Ft	Fountain	TCB	Telephone Call Box
GP	Guide Post	TCP	Telephone Call Post
MP,MS	Mile Post or Stone	TH	Town Hall
P	Pole or Post	W	Well
Pol Sta	Police Station	Y	Youth Hostel

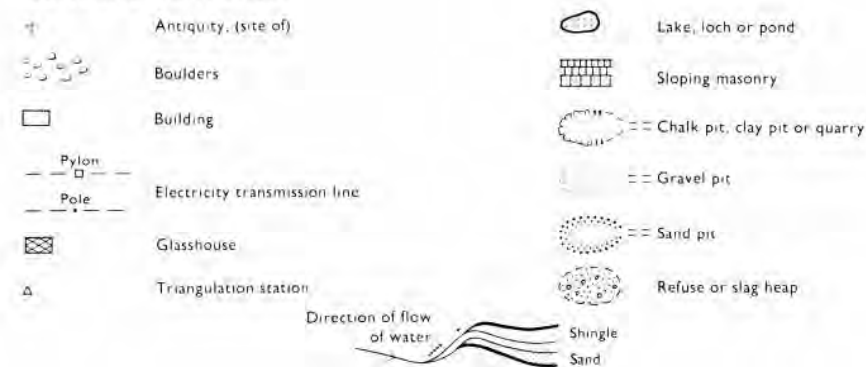
## ROADS



## RAILWAYS



## GENERAL FEATURES



## VEGETATION



In some areas bracken ( ) and rough grassland ( ) are shown separately.



# Historical Map Pack Legend

# County Series & National Grid 1:10,560 scale

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# County Series 1:2,500 scale

# National Grid 1:2,500 / 1:1,250 scale



# Historical Map Pack Legend

**GENERAL FEATURES**

Wood	Marsh	Reeds
Fir	Mixed Wood	Brush Wood
Orchard	Bush	Rough Pasture
Ford	Stepping Stones	Ferry
Lock	Waterfall	Quarry
Shingle	Gravel Pit	Sand Pit
Trigonometrical Station	Sluice	Trough
507 $\Delta$ Altitude at Trigonometrical Station	Sp. Spring	Well
B.M. 325-9 $\nabla$ Bench Mark	M.R. Mooring Ring	M.P. Mooring Post
342 $\nabla$ Surface Level	B.S. Boundary Stone	B.P. Boundary Post
$\Delta$ Permanent Traverse Station		
$\oplus$ Antiquities (site of)		
$\leftarrow$ Arrow denotes flow of water		

**GENERAL FEATURES**

Non-coniferous Trees	Slopes	Antiquity (site of)
Coniferous Trees	Cave	Culvert
Sweeped Trees	Cave Entrance	Direction of water flow
Orchard Trees	Rock	Electricity Pylon
Cespices, Clear	Boulders	Electricity Transmission Line
Scrub	Sloping Masonry	Trigonulation Station
Bracken	Roofted Building	Traverse Station (permanent)
Heath	Glasshouse	Bench Mark
Rough Grounded	Change of boundary marking	Archway
Marsh, sittings	Reeds	Revision Point (instrumentally fixed)
		Revision Point & Bench Mark coincident

Top	Slopes	Quarry	Refuse Heap	Sloping Masonry
Flat Rock	Sand	Sand Pit	Culvert	Archway
Shingle	Boulders	Gravel Pit	Cliff Face	Glazed Roof Building

**ROADS**

Road over single structure

Road over River or Canal

**RAILWAYS**

Railway crossing River or Canal

Railway crossing Road

Level Crossing

Embankment

Cutting

**BOUNDARIES**

**England & Wales**

- County Boundary (geographical)
- County & Civil Parish Boundary coterminous
- Admin County or County Borough Boundary
- London Borough Boundary
- M.B. Bdy, U.D. Bdy, R.D. Bdy: County District Boundaries based on civil parish

**England, Wales & Scotland**

- Civil Parish Boundary
- Boro (or Burgh) Const & Ward Bdy: Parly & Ward Boundaries based on civil parish
- Co Const Bdy
- Boro (or Burgh) Const & Ward Bdy: Parly & Ward Boundaries not based on civil parish

**Scotland**

- County Boundary (geographical)
- Co. Cnl Bdy: County Council Boundary
- Co. Cnl Bdy: County of the City Boundary
- Co. of City Bdy
- Burgh Bdy: Burgh Boundary
- Burgh Bdy
- Dist. Bdy: District Council Boundary
- Dist. Bdy

\* Not with parish    † Coincident with parish

**ABBREVIATIONS**

$\Delta$ Trigonometrical Station	Sluice
507 $\Delta$ Altitude at Trigonometrical Station	Trough
B.M. 325-9 $\nabla$ Bench Mark	Spring
342 $\nabla$ Surface Level	Well
$\Delta$ Permanent Traverse Station	Mooring Ring
$\oplus$ Antiquities (site of)	Mooring Post
$\leftarrow$ Arrow denotes flow of water	Boundary Stone
	Boundary Post

**ABBREVIATIONS**

B.H. Beer House	F.Sta. Fire Station	M.P.U. Mail Pickup	S.L. Signal Light
B.M. Bench Mark	G.P. Guide Post	M.S. Mile Stone	Sl. Sluice
B.P. Boundary Post	G.V.C. Gas Valve Compound	N.T. National Trust	S.P. Signal Post
B.S. Boundary Stone	H. Hydrant or Hydraulic	N.T.L. Normal Tidal Limit	Spr. Spring
C. Crone	ha. Heccares	N.T.S. National Trust for Scotland	S.Sta. Signal Station
C.H. Club House	lb. Letter Box	P. Pillar, Pole or Post	T.C.B. Telephone Call Box
Chy. Chimney	L.B.Sta. Lighthouse	P.C. Public Convenience	T.C.P. Telephone Call Post
Cn. Caean	L.C. Level Crossing	P.C.B. Police Call Box	Tr. Tank or Track
D.F. Drinking Fountain	L.G. Leading Gauge	P.H. Public House	Tr. Trough
Dk. Dock	L.Ha. Lighthouse	P.O. Post Office	ts. Traverse Station
E.P. Electricity Pillar or Post	L.Twr. Lighting Tower	P. Pump	W. Well
E.T.L. Electricity Transmission Line	m. Metro	F.T.P. Police Telephone Pillar	W.B. Weighbridge
F.A. Fire Alarm	M.H.W. Mean High Water	Rsr. Reservoir	Wd. Pd. Wind Pump
F.A.P. Fire Alarm Pillar	M.H.W.S. Mean High Water Springs	R.H. Road House	Wks. Works
F.B. Filter Bed, Foot Bridge	M.L.W. Mean Low Water	rp. Revision Point	Wr. Pl. Water Point
F.B.M. Fundamental Bench Mark	M.L.W.S. Mean Low Water Springs	S. Stone	W.T. Water Tap
F.S. Flagstaff	M.P. Mile or Mooring Post	S.B. Signal Box	

# County Series 1:1,250 scale ~ County Series & National Grid 1:2,500 scale

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## Appendix D: Site Walkover Photographs 22 September 2022 (Earthcare Technical limited)

Photo 1 View from current site entrance north. Field area in maize crop





**Photo 2 Brick and rubble in site gateway**



**Photo 3 PHI deciduous woodland to northern boundary of the site shown.**



**Photo 4 Gulley - ditch to eastern site boundary bordered by A34**



**Photo 5 Site view north from southern corner showing site topography falling to the south east**



## Appendix D: Google Earth Images of the site

### Google Earth Image 1 January 2022



**Google Earth Image 2 March 2021**



**Google Earth Image 3 July 2020**



**Google Earth Image 4 September 2019**



**Google Earth Image 5 April 2017**



**Google Earth Image 6 September 2008**



**Google Earth Image 7 December 2005**



**Google Earth Image 8 December 2000**



**Google Earth Image 9 December 1999**

