



Geo-Environmental Report

Land East of Castle Avenue, Havant, PO9 2RY
for:

Persimmon Homes South Coast

Contact Details:

Enzygo Ltd.
The Byre
Woodend Lane
Cromhall
Gloucestershire
GL12 8AA

tel: 01454 269237
fax: 01454 269760
email: steve.rhodes@enzygo.com
www: enzygo.com

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Project:	Land East of Castle Avenue, Havant, PO9 2RY
For:	Persimmon Homes South Coast.
Ref:	CRM.1033.025.GE.R.001.B
Status:	Final
Date:	January 2017
Author:	Steve Rhodes Technical Director
Reviewer:	Richard Hamilton Associate Director

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Enzygo Limited Registered in England No. 6525159

Registered Office Stag House The Chipping Wotton-Under-Edge Gloucestershire GL12 7AD

Executive Summary

Proposed Development

The site is to be re-developed for residential use.

Investigation

Site investigation, desk study and a monitoring visit were undertaken by Enzygo Ltd. in December 2016.

Ground Conditions

Ground Conditions comprise topsoil over gravelly clay over medium dense gravel and loose sand. Shallow groundwater was encountered.

Contamination

No contamination was identified.

Foundations

Spread foundations may be feasible for wall loading of up to 50kN/m with settlements predicted to be between 15mm and 25mm.

It is recommended that settlements are re-assessed once structural loadings are known. It is possible that settlements they may exceed the tolerable value of 25mm and that vibro granular columns will therefore be required.

Pavement Design

An equilibrium CBR of 2.5% is recommended. Soils are not considered to be frost susceptible.

Buried Concrete

It is recommended that Class AC-1s conditions of Special Digest 1 are used for shallow soils.

Drainage

Preliminary soakaway tests recorded soil infiltration rates of between 5E^{-5} m/s and 1E^{-4} m/s and represents the sand present at depth. Given the presence of more clayey gravel near surface, together with shallow groundwater it is likely that soakaway drainage may not be feasible.

Ground Gas and Radon

No radon or ground gas risk risks have been identified at the site.

TABLE OF CONTENTS

Executive Summary	i
1.0 INTRODUCTION	1
<i>Background</i>	1
<i>Proposed Development</i>	1
<i>Objectives</i>	1
<i>Risk Classification</i>	2
2.0 SITE SETTING	3
<i>Site Description</i>	3
<i>Current Site Description</i>	3
<i>Surrounding Area</i>	3
3.0 SITE HISTORY	4
4.0 ENVIRONMENTAL SETTING	5
<i>Ground Conditions</i>	5
<i>Groundwater</i>	5
<i>Coal Mining</i>	6
<i>Non Coal Mining</i>	6
<i>Natural Cavities</i>	6
<i>Ground Workings</i>	6
<i>Hydrology</i>	6
<i>Radon Risk Potential</i>	6
<i>Natural Hazards Finding</i>	6
<i>Sensitive Land Uses</i>	7
<i>Environmental Sensitivity</i>	7
<i>Industrial Land Uses</i>	7
5.0 CONSULTATIONS.....	9

<i>Regulatory Database</i>	<i>9</i>
<i>Landfill Sites and Waste Treatment Sites</i>	<i>9</i>
<i>Planning Records</i>	<i>9</i>
6.0 PRELIMINARY CONCEPTUAL MODEL	10
7.0 SITE INVESTIGATION	11
<i>General</i>	<i>11</i>
<i>Site Works</i>	<i>11</i>
<i>Monitoring</i>	<i>12</i>
<i>Laboratory Testing</i>	<i>12</i>
8.0 GROUND AND GROUNDWATER CONDITIONS.....	13
<i>Summary of Ground and Groundwater Conditions.....</i>	<i>13</i>
<i>Topsoil like Made Ground.....</i>	<i>13</i>
<i>Alluvium.....</i>	<i>13</i>
<i>Visual and Olfactory Evidence of Contamination</i>	<i>14</i>
<i>Soil Strength</i>	<i>14</i>
<i>Groundwater</i>	<i>14</i>
<i>Ground Gas</i>	<i>14</i>
9.0 CONTAMINATION ASSESSMENT	16
<i>General</i>	<i>16</i>
<i>Human Health.....</i>	<i>16</i>
<i>Controlled Waters</i>	<i>16</i>
<i>Ground Gas</i>	<i>17</i>
<i>Revised Conceptual Model.....</i>	<i>18</i>
<i>Remediation</i>	<i>20</i>
<i>Waste Classification.....</i>	<i>20</i>
10.0 GEOTECHNICAL ASSESSMENT.....	21

<i>Proposed Development</i>	21
<i>Ground Conditions</i>	21
<i>Site Preparation</i>	21
<i>Foundations</i>	21
<i>Ground Floor Slab</i>	22
<i>Pavement Construction</i>	22
<i>Drainage</i>	22
<i>Buried Concrete</i>	23
<i>Excavation</i>	23
Drawings	24
Appendix A – Desk Study Information	25
Appendix B – Exploratory Hole Records	26
Appendix C – Chemical Testing	27
Appendix D – Geotechnical Testing	32

1.0 INTRODUCTION

Background

- 1.1 Enzygo Limited has been commissioned by Persimmon Homes South Coast to prepare a Geo-Environmental Report for a site at Land at Land East of Castle Avenue, Havant, PO9 2RY.

Proposed Development

- 1.2 Persimmon Homes are seeking to re-develop the site for residential use comprising domestic houses and gardens with associated infrastructure. The proposed development is shown on the Constraints and Sketch Layout Plan, which is incorporated into Drawing CRM.1033.025.GE.D.001.

Objectives

- 1.3 The objectives of the study are to:
- Review historical plans, geology, hydrogeology, site sensitivity, mining records and contaminated land information in order to complete a Desk Study. A Groundsure Report has been obtained which includes a larger area than the application site. A copy of the Groundsure Report is included in Appendix A;
 - Undertake a targeted ground investigation;
 - Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the future use of the site and in relation to off-site receptors; and
 - Provide a factual and interpretative report relating to the desk study and site investigations.
 - Provide a revised conceptual model and recommendations on any potential development issues and mitigation measures, where appropriate.
 - Provide geotechnical recommendations in relation to foundations and infrastructure.

Risk Classification

- 1.4 Enzygo has utilised the available information, together with our experience to assess the likely risks to development from land quality issues. Definitions of the risk terms used are provided on the following table.

Risk	Description
Negligible	No contamination risk has been identified which is likely to affect development.
Low	No significant contaminated land risks have been encountered affecting development and a low risk that remediation will be required.
Low-Moderate	There are unlikely to be significant contaminated land issue associated with the site which will adversely affect its re-development. However, minor or localised contamination may be present requiring remediation. Remediation should be possible under a discovery strategy and with a call out service.
Moderate	Some potential contaminated land risks have been encountered or identified which may affect re- development. The risks identified are unlikely to affect the entire site or preclude development. Remediation is considered feasible as part of the development process and no further investigation is considered necessary.
Moderate-High	Some potentially significant contaminated land risks have been identified at the property that requires remediation. It is recommended that a separate remedial methodology is prepared supported by a site-specific risk assessment
High	Significant potential contaminated land risks have been identified and remediation is required supported by further intrusive ground investigation, risk assessment and remedial design.

- 1.5 Where adverse risks from ground instability are identified these are discussed within the report.

2.0 SITE SETTING

Site Description

Item	Description
Site Address	Land East of Castle Avenue, Havant, PO9 2RY
National Grid Reference	473061,106294
Site Area	2.1 Hectares

Current Site Description

- 2.1 The following site description has been compiled from the site inspection undertaken by Enzygo staff, together with current maps, aerial photographs and a topographical survey.
- 2.2 At the time of the ground investigation the site comprises fields vegetated with grass and with occasional mature trees.
- 2.3 A pond is present adjacent to the western boundary of the site.
- 2.4 Trees are present along the field boundaries.

Surrounding Area

- 2.5 The surrounding land uses are summarised as follows:

Direction	Land Use
South	A27 road with fields beyond.
East	Fields.
West	Residential development.
North	Railway line constructed in a cutting with fields beyond.

- 2.6 No significant sources of potential contamination were noted on or near to the site.
- 2.7 The railway line is in cutting and separated from the site by a 10m wide vegetated strip. As such the risk of migration of potential contaminants is not considered significant.

3.0 SITE HISTORY

- 3.1 A review of historical Ordnance Survey maps and information pertinent to the site and within a 250m radius is summarised below:

Potentially Contaminative Historical Land Use		
Historical Land Use		
Map Edition	On Site	Off Site
1869	Field. Pond along western boundary.	Railway line 0m N. Fields 0m S, E, W & 10m N. Farm 120m SW. Emsworth Road 60m S.
1897	No change.	Residential development 120m NW. Orchard 70m W..
1909	No change.	Clay pit 110m NW.
1932	No change.	Residential development 0m S & SW. Residential development 70m W on former orchard. Residential development 90m NW including over former clay pit.
1951	No change.	No change.
1963	No change.	Residential development 0m W & 10m NW
1972	No change.	No change.
1978	No change.	No change.
1984	No change.	A27 road on embankment 50m S with slip road 20m S.
1993	No change.	No change.
2002	No change.	No change.
2010	No change.	No change.
2014	No change.	No change.

- 3.2 The former clay pit is too far from the site to pose a significant risk and has been redeveloped for residential use and so is unlikely to include significant putrescible material.
- 3.3 No risks to the site are identified to the site from the historical maps.

4.0 ENVIRONMENTAL SETTING

Ground Conditions

- 4.1 The British Geological Survey (BGS) indicates that the site is underlain by the following geological sequence:

Geological Unit	Type	Description	Aquifer Classification
Drift	River Terrace Deposits	Sand, Silt and Clay	Secondary A
	Alluvium.	Clay and Silt.	
Solid	London Clay	Limestone	Unproductive

- 4.2 Alluvium is identified within the south west corner of the site only and is likely to overly the River Terrace Deposits.
- 4.3 There are no records of Made Ground below or near to the site and no records of landslips near to the site.
- 4.4 BGS borehole records show the River Terrace Deposit to comprise soft clay over medium dense clayey flint gravel. Alluvium is noted to comprise firm clay with chalk gravel underlain by clayey sand consistent with the River Terrace Deposits.
- 4.5 Records of background soil chemistry show no exceedances of residential values.

Groundwater

- 4.6 The recorded permeability of the drift geology is very low to high reflecting the mixed lithology. The recorded permeability of the solid geology is very low to moderate. As the London Clay is designated as an Unproductive Aquifer it is considered that the soils will be low permeability clay.
- 4.7 The GroundSure Report shows the site not to be within a Source Protection Zone associated with shallow aquifer.
- 4.8 There are no groundwater abstraction licenses within 1000m of the site.
- 4.9 BGS records show that the site is at risk of groundwater flooding but this is not considered a risk unless basements are proposed.

Coal Mining

- 4.10 No historical or current coal mining extraction has been identified within 1000m of the site.

Non Coal Mining

- 4.11 No other mining activity has been identified within 1000m of the site.

Natural Cavities

- 4.12 No natural cavities or solution features are identified within 1000m of the site.

Ground Workings

- 4.13 No ground workings are identified within 250m of the site other than those already assessed within the site history section.

Hydrology

- 4.14 There are no water courses on the site. The nearest surface water course is a drain located 112m south of the site which is designated as a Tertiary River. Given the distance from the site this is not considered a viable source.
- 4.15 There are no surface water abstractions within 1000m of the site.
- 4.16 Environment Agency records show that the site is not within a Flood Zone.

Radon Risk Potential

- 4.17 The Groundsure GeoInsight Report indicates that the site is not within a Radon Affected Area. No radon protective measures are necessary in the construction of new dwellings.

Natural Hazards Finding

- 4.18 BGS information presented within the Groundsure Geoinsight report identifies the following:

Hazard	Risk Designation (Groundsure)
Coal Mining.	None Identified.
Collapsible Ground.	Low/Negligible.
Compressible Ground.	Negligible/Moderate.
Ground Dissolution.	Negligible.
Landslide.	Very Low.
Running Sand.	Negligible/Low.
Swelling / Shrinking Clay.	Very Low/Low.

- 4.19 There is a moderate risk of compressible ground associated with Alluvium. This is restricted to the south west corner of the site and appears to be outside of any proposed buildings. No other significant geotechnical risks are identified.

Sensitive Land Uses

- 4.20 There are no sites of special interest on or adjacent to the site.
- 4.21 English Heritage has not identified any listed buildings or scheduled ancient monuments on or close to the site. No sensitive geology has been identified at the site.

Environmental Sensitivity

- 4.22 Overall the site is currently considered to be of **low/moderate** sensitivity due to the following:
- The underlying stratum is classified as a Secondary A Aquifer;
 - Not located within a Source Protection Zone;
 - No surface water-course near to the site;
 - field; and
 - No sensitive ecology designation is noted adjacent to or on the site.
- 4.23 The proposed end use of the site is residential and as such future sensitivity will be high for end users.

Industrial Land Uses

- 4.24 There are no significant industrial uses within 250m of the site other than electrical substations, which are not considered a significant risk. A vehicle repair company is

identified 38m south west of the site, however, a view of the address confirms that this is a residential house. As such it is considered likely to be a registered address rather than a works and as such the risk is dismissed.

- 4.25 The Groundsure EnviroInsight Report indicates that there no fuel stations within 500m of the site.
- 4.26 There are no high-pressure oil/gas pipelines within 500m of the site.
- 4.27 No new potential contamination risks are identified on or adjacent to the site from the register of industrial activities.

5.0 CONSULTATIONS

Regulatory Database

- 5.1 The following information has been obtained from a commercially available environmental database. The summary table only includes records not otherwise detailed in the report.

Environmental Permits, Incidents and Registers	0 -250m	250-500m	Details
Site determined as contaminated land.	0	0	Not Applicable.
Authorised industrial processes.	0	0	Not Applicable.
Registered radioactive substances.	0	0	Not Applicable.
Enforcements, prohibitions or prosecutions.	0	0	Not Applicable.
Pollution Incidents.	1	0	Category 3 (Minor) impact to land 233m S from waste. Given the distance this risk is dismissed.
Consents issued under the Planning (Hazardous Substances) Act 1990.	0	0	Not Applicable.
Control of Major Accident Hazard (COMAH)/ Notification of Installations Handling Hazardous Substances (NIHHS) sites.	0	0	Not Applicable.
Records of Licensed Discharge Consents.	0	0	Not Applicable.

- 5.2 No risks are identified from the regulatory database.

Landfill Sites and Waste Treatment Sites

- 5.3 There are no active or historic landfills within 500m of the site.
- 5.4 There are no waste treatment licenses within 500m of the site.
- 5.5 There are no new significant risks are identified from waste activities.

Planning Records

- 5.6 A review of Havant Borough Council's planning portal does not show any potential risks at or adjacent to the site.

6.0 PRELIMINARY CONCEPTUAL MODEL

Source	Location	Exposure Pathway	Potential Receptor	Probability of Exposure	Details
Human Health					
Asbestos, Hydrocarbon and metals.	Unforeseen Contamination.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	Normal PPE will address risk.
			Site users.	Negligible.	No source identified.
Asbestos, Hydrocarbon and metals.	Current and historic uses.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	No source identified.
			Site users.		
Hydrocarbon and metals.	Potential migration from off-site source.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	No significant off site sources identified.
			Site users.		
Ground Gas.	Historic Landfill.	Inhalation & Explosive.	Construction Workers.	Dismissed.	No source identified.
			Site users.		
	Potential Made Ground.	Inhalation & Explosive.	Construction Workers.	Dismissed.	No significant source identified.
			Site users.		
Groundwater					
Hydrocarbon and metals.	Potential spillage on site	Vertical Migration.	Groundwater	Negligible.	No source identified.
Surface Water					
Hydrocarbon and metals.	Potential spillage on site	Horizontal Migration.	River Network	Negligible.	No source identified.
Environmental Receptors					
On site contaminants		Ingestion dermal and inhalation.	Ecology.	Dismissed.	No sensitive ecology designation.
		Direct.	Archaeology.	Dismissed.	None present.
		Direct.	Geology.	Dismissed.	No sensitive receptor present.
		Phytotoxic.	Woodland.	Dismissed.	None present.
		Phytotoxic.	Crops.	Dismissed.	No source identified.
		Ingestion dermal and inhalation.	Livestock.	Dismissed.	No source identified.
Building Services					
On site contaminants		Direct.	Historic Buildings.	Dismissed.	None present.
		Direct.	Proposed Buildings.	Dismissed.	No source identified.
		Permeate into pipework.	Water Pipes.	Dismissed.	No source identified.

6.1 There is a negligible risk associated with potential unforeseen contamination such as inclusions within soils from agricultural practices.

7.0 SITE INVESTIGATION

General

- 7.1 A ground investigation was undertaken based on the findings of the desk study. The locations of the exploratory holes are shown on Drawing CRM.1033.025.GE.D.001.

Site Works

- 7.2 The site investigation works were undertaken between 3rd and 10th October 2016 and comprised window sampler holes and trial pits. Exploratory holes were located to avoid know services and hand pits were excavated to verify the locations of the water main and gas main.
- 7.3 The investigation works are summarised in the table below:

Rational	Exploratory Holes	Notes
Pavement design.	TP1 to TP4.	Along road alignment & CBR Tests.
Foundation design.	WS1 to WS5 & TP5 to TP16.	Adjacent to or below proposed houses.
Potential desiccation.	TP8.	Near to exiting trees.
General coverage.	WS1 to WS5 & TP1 to TP16	Across the site.
Garden Areas.	TP5, TP6, TP7, TP9, TP10, TP14, TP15, TP16.	Identified from proposed development plan.
Waste Classification.	TP2 & WS3.	WAC tests.
Monitoring.	WS1, WS3 & WS5.	Installations.
Soakage.	WS1 & WS3.	Preliminary soil infiltration test.

- 7.4 Representative soil samples were collected for chemical and geotechnical testing. Soil samples destined for chemical analysis were collected in appropriate containers provided by the analytical laboratory. Samples were stored in cool boxes prior to dispatch to the laboratory for analysis. All samples were collected using appropriate sampling equipment that was cleaned at each sampling location.
- 7.5 Generally samples were collected from Made Ground, which may contain potential inclusions of contaminating materials and materials displaying evidence of potential contamination.
- 7.6 In the absence of any evidence of contamination samples were collected near surface as this material is more likely to be contaminated by surface spillages and also will potentially be in contact with future residents.

Monitoring

- 7.7 Return visits to monitor groundwater levels from installations were undertaken and during these visits ground gas was also measured.

Laboratory Testing

- 7.8 Samples for geotechnical testing were sent to the laboratories of I2, which is NAMAS accredited, for the following analysis:
- California Bearing Ratio(CBR) tests undertaken on re-compacted samples
 - Atterberg Limits Determinations; and
 - Soluble sulphate and pH.
- 7.9 Samples for chemical analysis were sent to the laboratories of laboratories of I2 who are NAMAS and MCERTS accredited. Samples were tested for the CLEA metal suite, pH, sulphate, cyanide, phenols, speciated Polycyclic Aromatic Hydrocarbons (PAH), organic carbon, banded Total Petroleum Hydrocarbon (TPH), asbestos screen and two stage WAC tests.
- 7.10 As no specific contamination sources were identified on or near to the site, which is a greenfield site, a general suite of testing was undertaken.

8.0 GROUND AND GROUNDWATER CONDITIONS

Summary of Ground and Groundwater Conditions

8.1 The investigations undertaken identify the following strata:

Strata	Summary Description	Thickness (m)
Topsoil like Made Ground.	Grass over grey brown gravelly sandy silt with fine roots. Gravel comprises flint and occasional brick.	0.2 to 0.5
Alluvium	Soft red brown sandy gravelly clay.	0 to 1.3
River Terrace Deposits	Medium dense sandy and clayey flint gravel.	0.7 to >1.6
	Loose red brown silty fine sand.	>1.9
Groundwater	Seepages	1.25m to 3.0m bgl

8.2 Details of the ground and groundwater conditions encountered are given on the exploratory hole records included in Appendix B and are summarised in the sections below:

Topsoil like Made Ground

8.3 Topsoil was encountered across the site comprising grass over grey brown gravelly sandy silt with fine roots. Gravel was noted to comprises flint and occasional brick.

8.4 This material appears to be topsoil; which has been disturbed by normal agricultural practices.

Alluvium

8.5 A layer of soft red brown sandy gravelly clay was noted across the site which is likely to be the Alluvium.

River Terrace Deposits

8.6 A layer of medium dense sandy and clayey flint gravel was noted below the Alluvium. It is considered that this represent the River Terrace Deposits and was encountered at depths of between 0.5m and 1.5m bgl.

8.7 The River Terrace Deposits were noted to become a loose red brown silty fine sand with depth.

Visual and Olfactory Evidence of Contamination

- 8.8 No visual or olfactory evidence of contamination was encountered during the site works.

Soil Strength

- 8.9 SPT results undertaken within the window sampler boreholes confirm that the River Terrace Deposits are medium dense at 1m bgl with SPT values of 25 to 40. These materials become loose with depth with SPT values of between 3 and 8 at 2m bgl.

Groundwater

- 8.10 Groundwater was encountered at depths of between 1.25m and 3.0m bgl during the site investigation. The depth to groundwater measured from installations during monitoring visits are summarised on the table below:

Exploratory Hole	Depth m(bgl)			
	21-12-16	6-1-17	13-1-17	20-1-17
WS1	0.96	0.76	0.56	0.55
WS3	1.56	1.48	1.40	1.25
WS5	1.66	1.57	1.44	1.26

Preliminary Soil Infiltration

- 8.11 Preliminary soakaway tests were undertaken in Boreholes WS3 and WS5 installations during a monitoring visit. This gave a preliminary soil infiltration rates of between 5E^{-5} m/s and 1E^{-4} m/s.

Ground Gas

- 8.12 Ground gas was monitored during the return visits to monitor groundwater levels.
- 8.13 Results of the gas monitoring is summarised on the table below:

Exploratory Hole	Atmos pressure (Mb)	Flow (l/hr)	CH4		CO2		O2
			Concentration (%)	GSV (l/hr)	Concentration (%)	GSV (l/hr)	Concentration (%)
21-12-16							
WS1	1018	<0.1	<0.1	<0.0001	3.2	<0.0032	13.2
WS3	1018	<0.1	<0.1	<0.0001	1.7	<0.0017	19.4
WS5	1018	<0.1	<0.1	<0.0001	2.8	<0.0028	18.4
6-12-17							
WS1	1035	<0.1	<0.1	<0.0001	2.7	<0.0027	15.3
WS3	1035	<0.1	<0.1	<0.0001	2.4	<0.0024	16.9
WS5	1035	<0.1	<0.1	<0.0001	2.2	<0.0022	18.1
13-1-17							
WS1	1007	<0.1	<0.1	<0.0001	2.1	<0.0021	20.1
WS3	1007	<0.1	<0.1	<0.0001	2.3	<0.0023	17.9
WS5	1007	<0.1	<0.1	<0.0001	2.2	<0.0022	17.8
20-1-17							
WS1	1029	<0.1	<0.1	<0.0001	1.4	<0.0014	18.4
WS3	1029	<0.1	<0.1	<0.0001	2.1	<0.0021	17.9
WS5	1029	<0.1	<0.1	<0.0001	1.6	<0.0016	19.3

9.0 CONTAMINATION ASSESSMENT

General

- 9.1 A Tier I risk assessment has been undertaken using available and current screening values for human health and where appropriate controlled waters. The risk assessment is undertaken based on the findings of the preliminary conceptual model presented in Section 6. Based on the contamination testing and Tier I assessment a revised Conceptual Model has been prepared, which is presented later in this section.
- 9.2 Where significant risks are identified remedial measures are recommended.

Human Health

- 9.3 Assessment of the risks to human health has been undertaken by comparing the soil quality data with reference values obtained from the Contaminated Land Exposure Assessment (CLEA), Soil Guideline Values (SGV) and General Acceptance Criteria (GAC) published by LQM/CIEH. The LQM/CIEH S4UL4 values are used and summary tables of the reference values are included in Appendix C.
- 9.4 Where an exceedance is identified the risk is assessed by considering the sensitivity of the proposed development and the potential pathway.
- 9.5 The soil quality shows no exceedances of the reference values for residential use with plant uptake.
- 9.6 No asbestos fibres were detected.

Controlled Waters

- 9.7 Where groundwater samples have been analysed the results are compared against reference values. These reference values are summarised in Appendix C and are taken from Fresh Water Environmental Quality Standards (EQS), UK Drinking Water Standards and World Health Organisation (WHO) values for Drinking Water.
- 9.8 Where the controlled waters receptor is a surface water course then the EQS are used as the primary reference value. Drinking Water Standards and WHO values are used where EQS values are not available. An assessment of likely risk is then made based on a source-pathway-receptor model. Where the receptor is potable groundwater resources the Drinking Water Standards and WHO values are used.

- 9.9 Risk to surface waters has been dismissed based on the absence of contaminant source on site.
- 9.10 The risk to groundwater is dismissed due to the absence of contaminant source on site

Ground Gas

- 9.11 Following the guidance provided in Section 3 of CIRIA C665 an initial assessment is undertaken to determine if there are any significant sources of potential ground gas. Such sources include landfills, organic clays and made ground incorporating putrescible materials such as rags, paper and wood. Where no significant source is identified no further assessment is necessary.
- 9.12 This approach is further supported by supplementary guidance given in RB17, published by CL:AIRE which confirms that gas monitoring is not generally required on sites where Made Ground is less than 5m thick and with low organic matter content or on natural soils such as alluvial clays and Chalk as the ground gas sources are not considered significant. The supplementary guidance given in RB17 also takes account of the current requirements for sealing of floor slabs and substructures to meet air tightness requirements under Part L of the Building Regulations which were not considered in CIRIA C665. The advice given in RB17 is consistent with CIRIA C665 and the Local Authority Guide to Ground Gas published by CIEH.
- 9.13 Where significant potential risk from ground gas has been identified from the Initial Conceptual Model and the intrusive ground investigation works ground gas monitoring is undertaken and the results of the monitoring are compared against the Gas Screening Values given in CIRIA Report 665. From this the Characteristic Situation is identified and remedial measures proposed.
- 9.14 When assessing the risk and type of remedial measures appropriate consideration is given to the likely construction of the development, the nature of the gas posing a risk and the nature of the likely source. The use of engineering judgement when determining risk from ground gas is consistent with the recommendations given in CIRIA C665.
- 9.15 No significant sources of ground gas were noted from the desk study. Soils encountered on site did not include significant discrete putrescible materials and as such there is not considered to be a viable significant risk from ground gas.

- 9.16 Gas monitoring was undertaken during return visits to monitor groundwater levels. Ground gas has not recorded significant elevated concentrations of Methane or Carbon Dioxide and no detectable gas flow rates have been measured.
- 9.17 As no significant ground gas source has been identified it is considered that there is no significant gas risk requiring remediation.
- 9.18 No gas protection measures are proposed.

Revised Conceptual Model

- 9.19 The Initial Conceptual Model presented in Section 6 has been revised based on the findings of the ground investigation and the revised Conceptual Model is presented below:

Source	Location	Exposure Pathway	Potential Receptor	Probability of Exposure	Details
Human Health					
Asbestos, Hydrocarbon and metals.	Unforeseen Contamination.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	Normal PPE will address risk.
			Site users.	Negligible.	No source identified.
Asbestos, Hydrocarbon and metals.	On site materials.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	Below GAC.
			Site users.		
Asbestos, Hydrocarbon and metals.	Current and historic uses.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	No source identified.
			Site users.		
Hydrocarbon and metals.	Potential migration from off-site source.	Ingestion dermal and inhalation.	Construction Workers.	Dismissed.	No significant off site sources identified.
			Site users.		
Ground Gas.	Historic Landfill.	Inhalation & Explosive.	Construction Workers.	Dismissed.	No source identified.
			Site users.		
	Potential Made Ground.	Inhalation & Explosive.	Construction Workers.	Dismissed.	No significant source identified and no elevated gas flux measured.
			Site users.		
Groundwater					
Hydrocarbon and metals.	Potential spillage on site	Vertical Migration.	Groundwater	Dismissed.	No source.
Surface Water					
Hydrocarbon and metals.	Potential spillage on site	Horizontal Migration.	River Network	Dismissed.	No source.
Environmental Receptors					
On site contaminants		Ingestion dermal and inhalation.	Ecology.	Dismissed.	No sensitive ecology designation.
		Direct.	Archaeology.	Dismissed.	None present.
		Direct.	Geology.	Dismissed.	No sensitive receptor present.
		Phytotoxic.	Woodland.	Dismissed.	None present.
		Phytotoxic.	Crops.	Dismissed.	No source identified.
		Ingestion dermal and inhalation.	Livestock.	Dismissed.	No source identified.
Building Services					
On site contaminants		Direct.	Historic Buildings.	Dismissed.	None present.
		Direct.	Proposed Buildings.	Dismissed.	No source identified.
		Permeate into pipework.	Water Pipes.	Dismissed.	No source identified.

Remediation

- 9.20 No remediation is proposed.
- 9.21 If unforeseen contamination is encountered during construction works an Environmental Consultant will be available on a 'call out' basis to undertake an assessment of risk. If 'unforeseen contamination' is encountered this will be discussed with the Local Planning Authority and remedial measures agreed prior to implementation. A validation report will be prepared should any remediation of unforeseen contamination be required in accordance with the NPPF.

Waste Classification

- 9.22 Two part WAC test has been undertaken across the site, the results of which are included in Appendix C. These show no exceedances above the inert threshold values for leachable extracts. TPH, PAH and TOC are all below the threshold for inert waste.
- 9.24 The Waste Management paper 2 has recently been updated to version 3 which states that that sites which previously could be considered 'uncontaminated land' surplus soils if they did not exceed the GAC values now requires the landfill to make an appropriate assessment of the waste classification. As such final assessment, will be undertaken by the receiving landfill based on the requirements of their permit.

10.0 GEOTECHNICAL ASSESSMENT

Proposed Development

- 10.1 The proposed development comprises two storey residential houses. Structural loadings are not known but assumed to be 50 kN/m wall run.
- 10.2 It is considered that the scheme meets the criteria of Geotechnical Category 1 of Eurocode 7.

Ground Conditions

- 10.3 Ground Conditions comprise topsoil over gravelly clay over medium dense gravel and loose sand.
- 10.4 Shallow groundwater was encountered.

Site Preparation

- 10.5 The site should be cleared and any vegetation below areas of proposed development stripped in accordance with Series 200 of the Specification for Highway Works. This should include:
 - Any redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill;
 - Tree root balls and soils with significant organic material should be grubbed out and replaced with appropriate compacted materials.

Foundations

- 10.6 Consideration has been given to the use of conventional strip foundations founding at a minimum depth of 1m bgl and at least 150mm in to the medium dense gravels or firm clay. Assuming a wall loading of 50kN/m run, which is typical for 2 storey structures an assessment of settlement has been undertaken using the Burland and Burbridge approach and also applying an elastic displacement assessment.
- 10.7 Based on this assessment settlement predictions of between 15mm and 25mm have been estimated.
- 10.8 It is considered that ground improvement may be prudent using vibro-granular columns to improve the deeper soils and reduce settlement. If conventional foundations are to be used

it is recommended that the settlements are re-assessed once final structural loadings are known and that foundations are reinforced to minimise risk of differential settlement.

- 10.9 Where strip foundations are used these may also need to be deepened in accordance with NHBC requirements for building near trees and also below any soft soils encountered. Foundations should be designed assuming soils of low shrinkage potential. No evidence of desiccation was noted from the laboratory test results.

Ground Floor Slab

- 10.10 Given the soft nature of the shallow soils it is recommended that suspended floor slabs are used.

Pavement Construction

- 10.11 An assessment of the likely California Bearing Ratio (CBR) has been assessed from the following sources:

- Laboratory CBR tests undertaken on re-compacted soil samples;
- Description of the materials encountered in the exploratory holes; and
- Guidance given in HD25/94.

- 10.12 Based on the above it is considered that an equilibrium CBR of 2.5% is recommended.

- 10.13 It is recommended that the sub-formation is proof rolled with any soft materials being excavated and replaced with suitable compacted capping.

- 10.14 Soils are not considered to be frost susceptible.

Drainage

- 10.15 Preliminary soakaway tests recorded soil infiltration rates of between $5E^{-5}$ m/s and $1E^{-4}$ m/s and represents the sand present at depth. Given the presence of more clayey gravel near surface, together with shallow groundwater it is likely that soakaway drainage may not be feasible.

- 10.16 Chemical results should be provided to the water authority to confirm the design of potable water supply pipes. No special requirements are anticipated.

Buried Concrete

- 10.17 Results of the sulphate testing indicate that shallow soils have soluble sulphate concentrations of less than 0.5 g/l consistent with DS1 Conditions and as such buried concrete can be designed to Class AC1-s.

Excavation

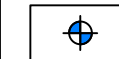
- 10.18 Site observations show that excavations should be suitable with normal construction plant. Where access is required the excavations should be designed in accordance with CIRIA RR97.



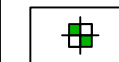
Key



Site Boundary



Window Sampler Boreholes (WS)
(WS1-WS5)



Trail Pit (TP)
(TP1-TP16)



Samuel House, 5 Fox Valley Way, Stocksbridge, Sheffield, S36 2AA

CLIENT:
Client Persimmon Homes

SCALE: 1:1,250@A3 PROJECT REF: CRM.1033.025

DRAWN: NP CHECKED: SR DATE: Dec 2016

PROJECT:
Havant

TITLE:
Site Plan

FIGURE NO:
CRM.1033.025.GE.D.001

Site Details:

Client Ref: EMS_395709_529349
Report Ref: EMS-395709_529349
Grid Ref: 473060, 106297

Map Name: County Series

Map date: 1897

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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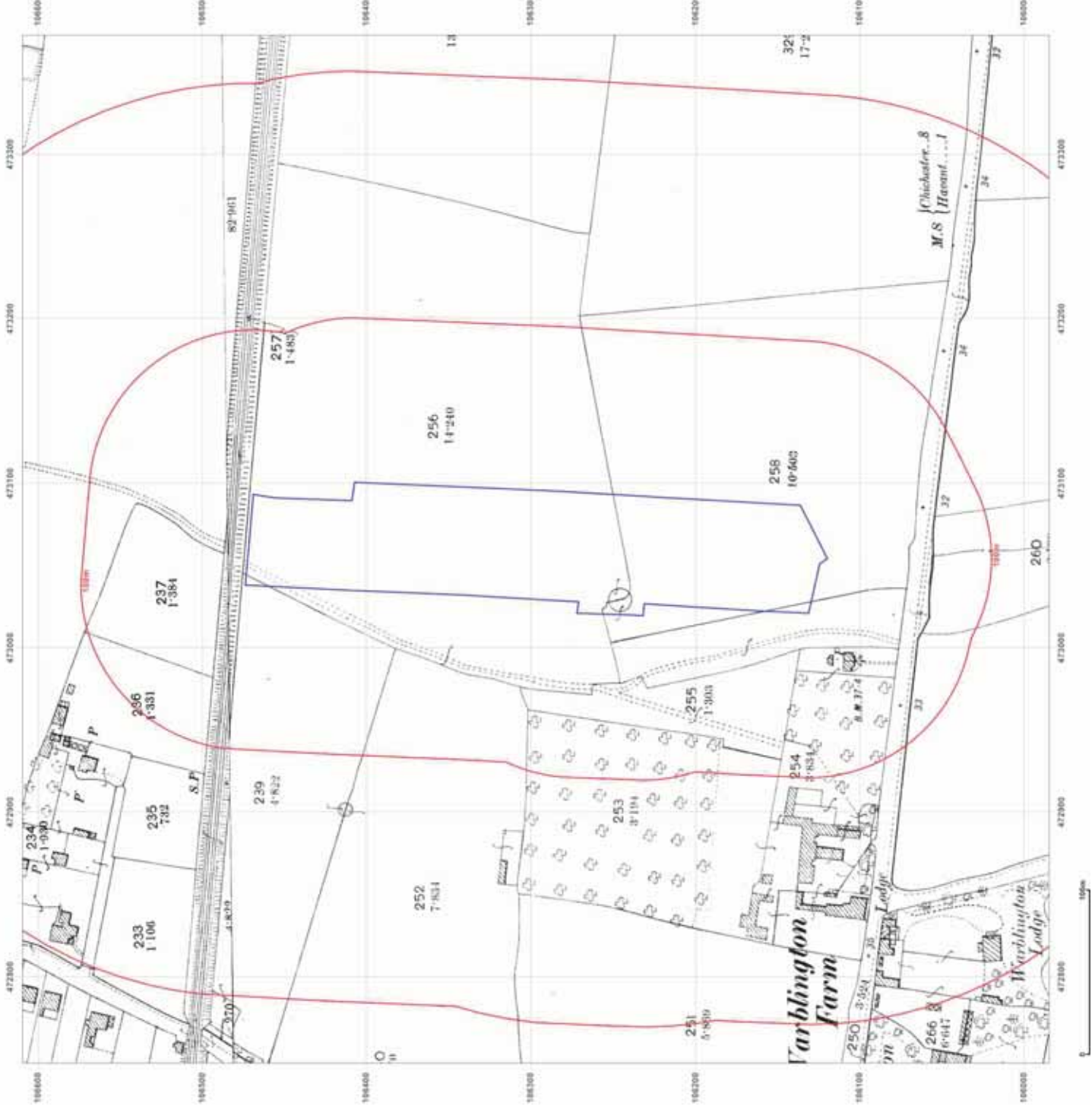
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Map Name: County Series

Map date: 1909

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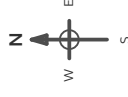
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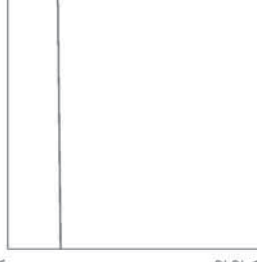
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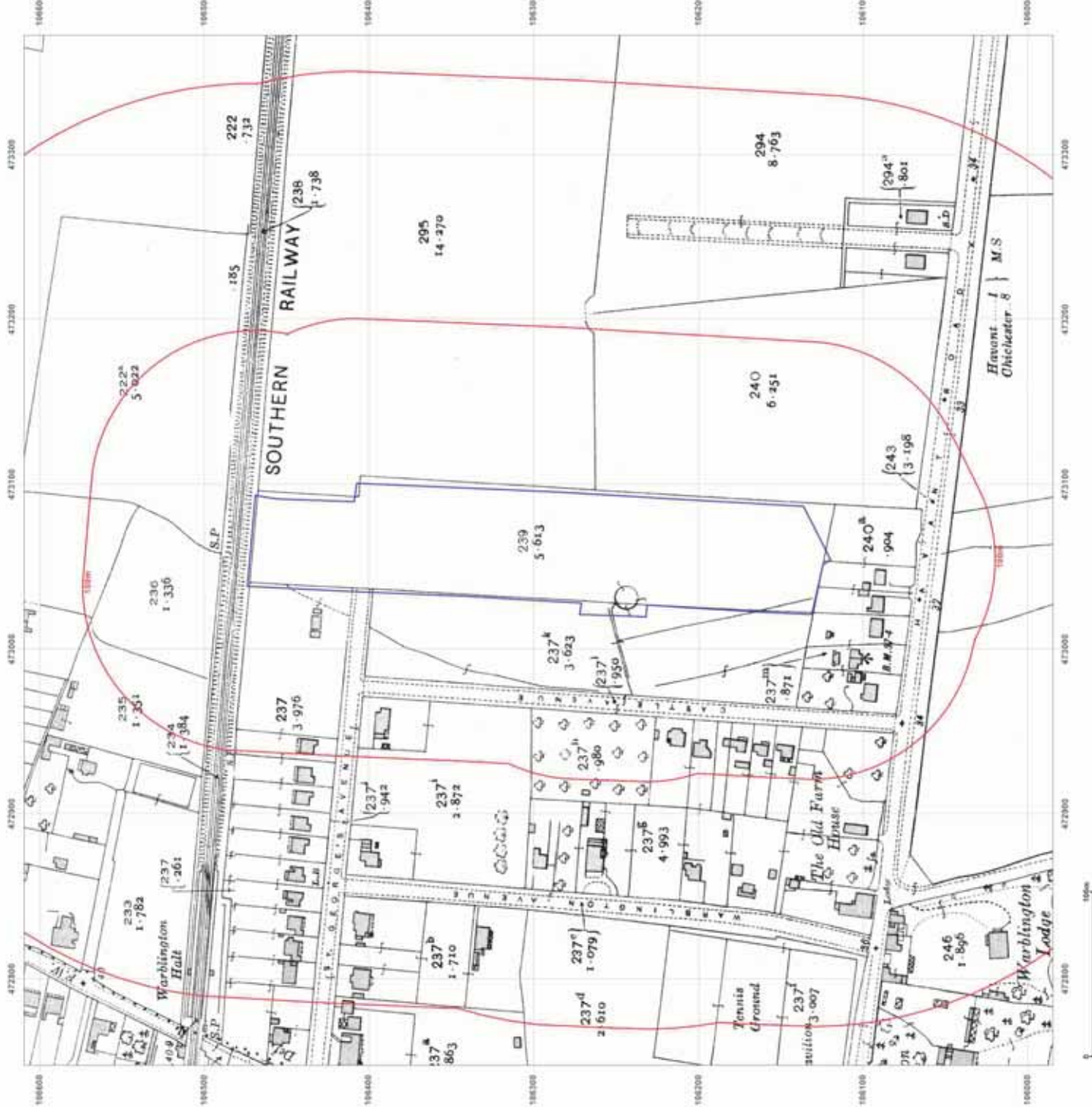
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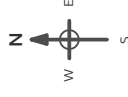
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Grid Ref: 473060, 106297

Map Name: National Grid

Map date: 1951-1952

Scale: 1:2,500

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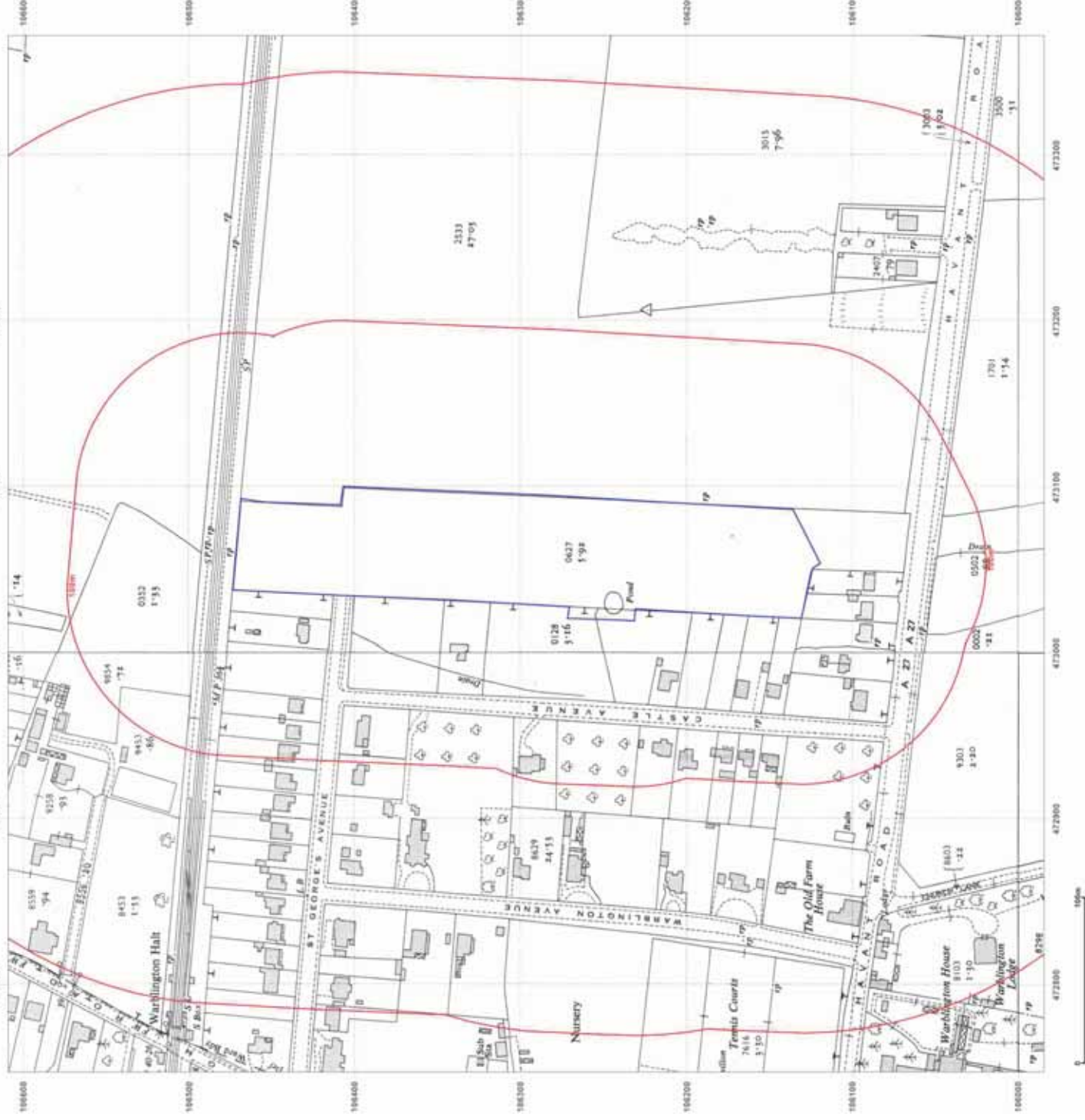
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Map Name: National Grid

Map date: 1962

Scale: 1:1,250

Printed at: 1:2,000



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Map Name: National Grid

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Printed at: 1:2,500



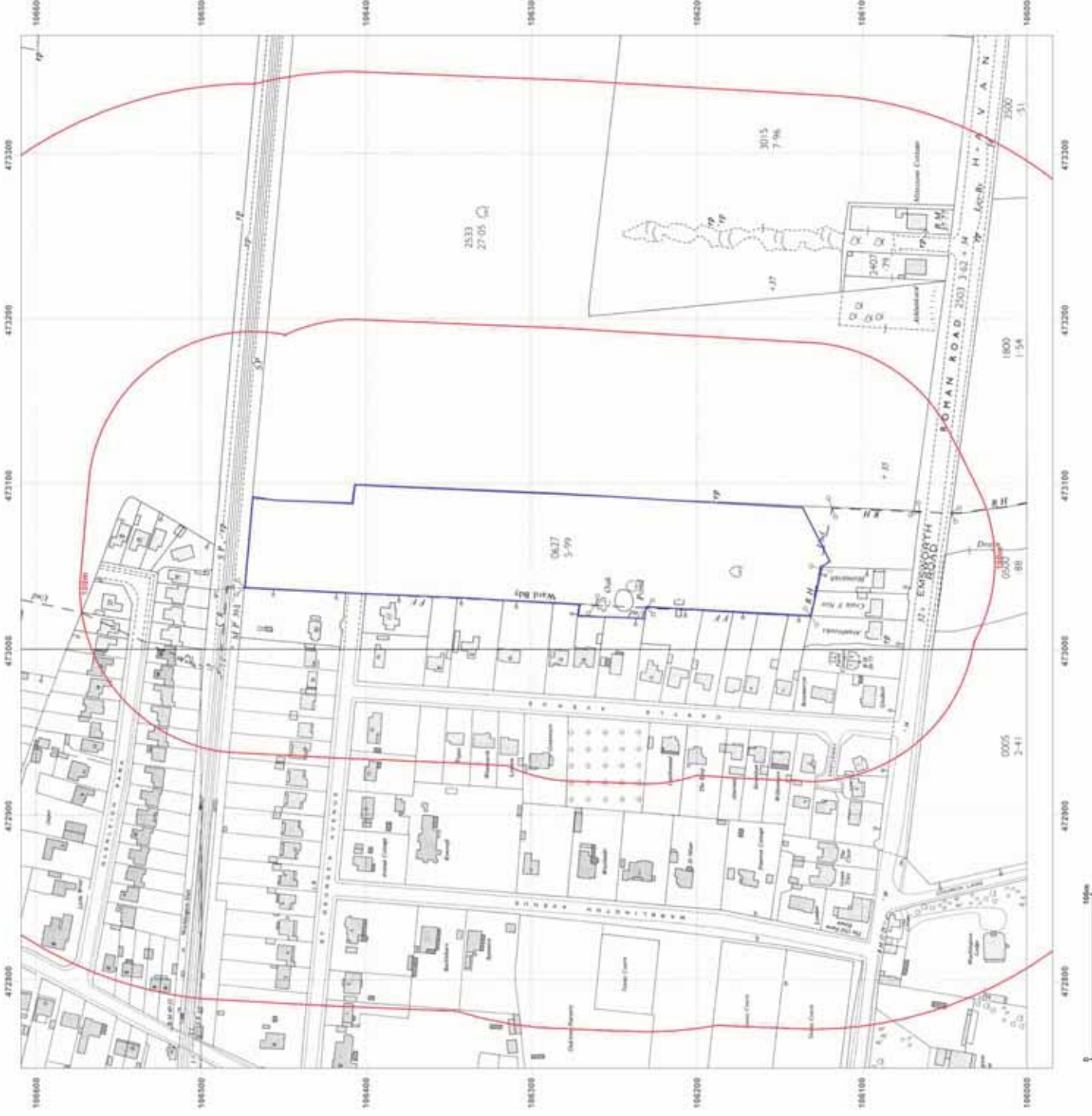
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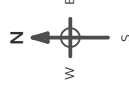
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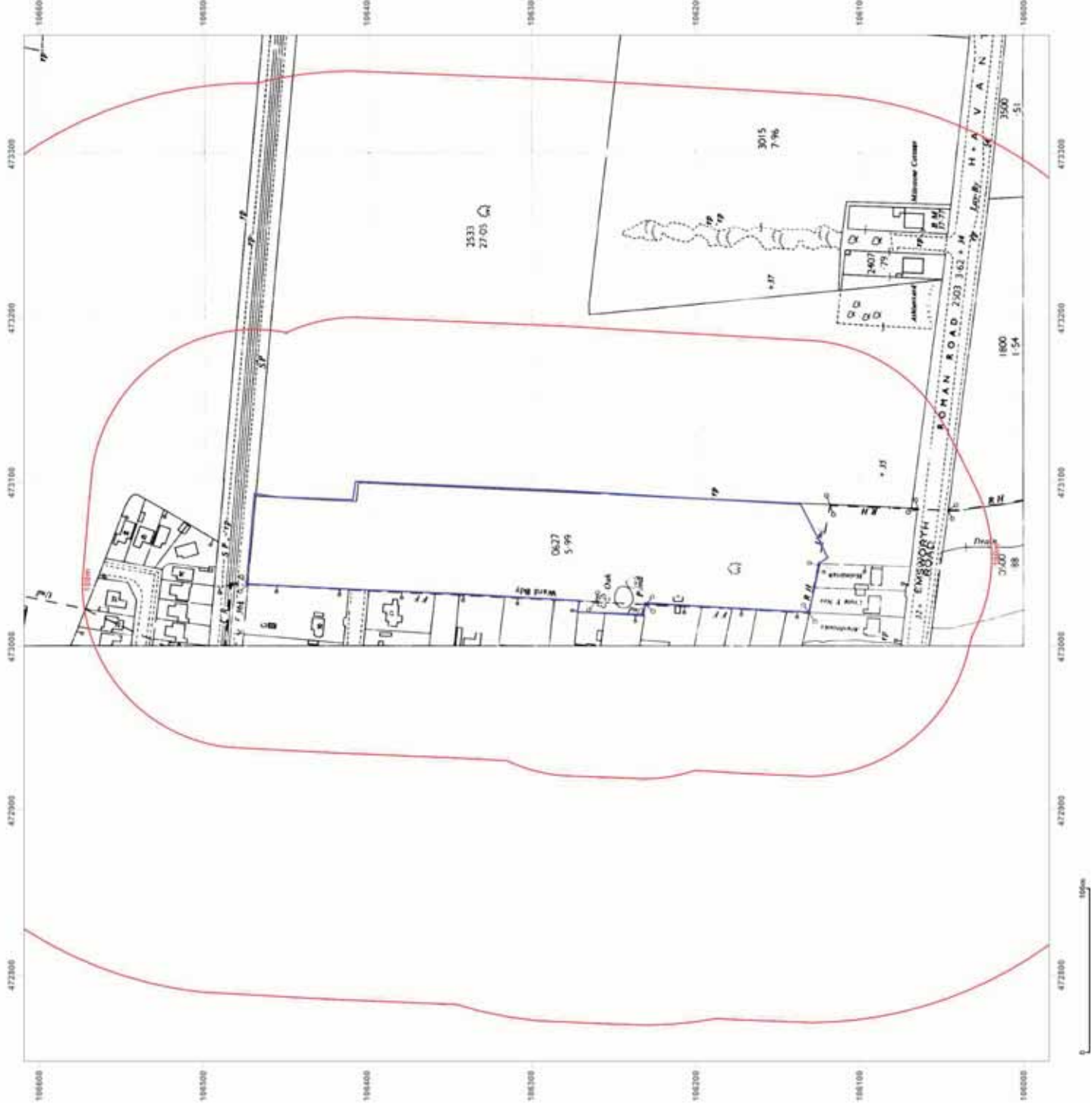
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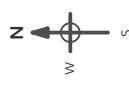
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Map Name: National Grid

Map date: 1971

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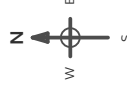
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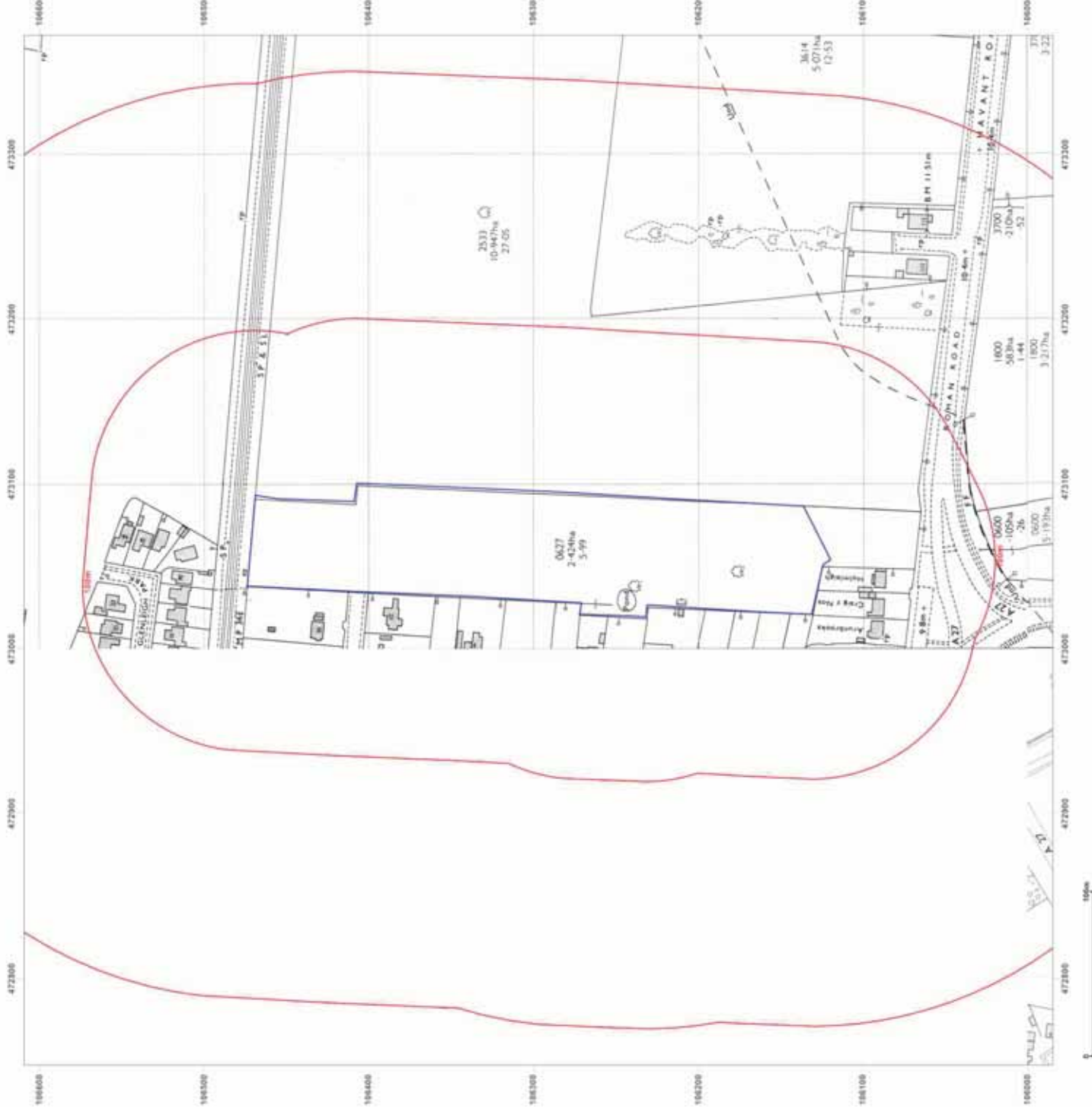
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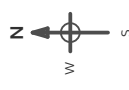
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Map date: 1973-1978

Scale: 1:1,250

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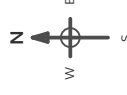
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Map Name: National Grid

Map date: 1993

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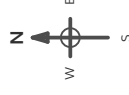
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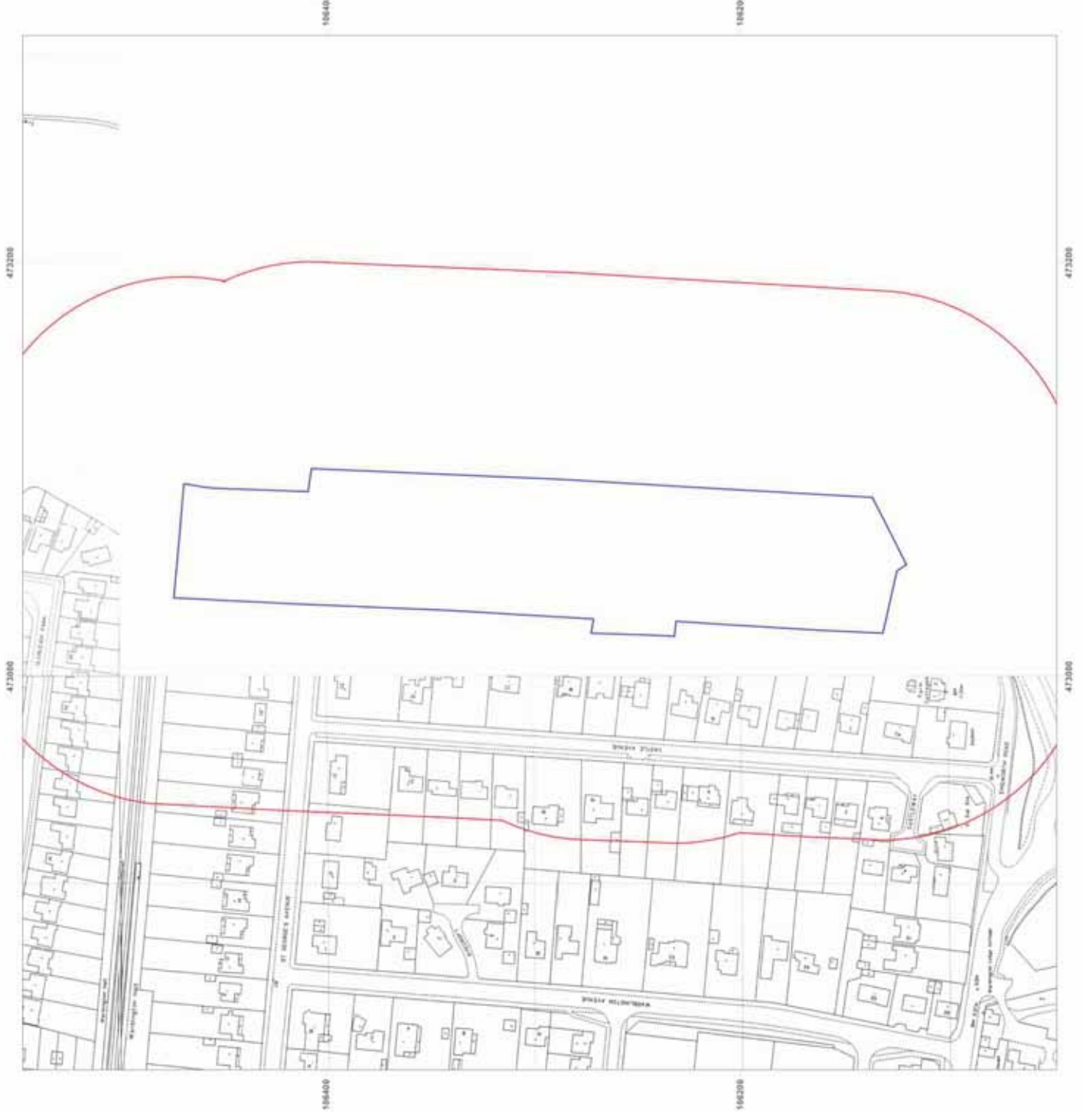
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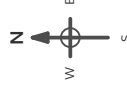
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Report Ref: EMS-395709_529349
Grid Ref: 473060, 106297

Map Name: County Series
Map date: 1866
Scale: 1:10,560
Printed at: 1:10,560



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Edition N/A
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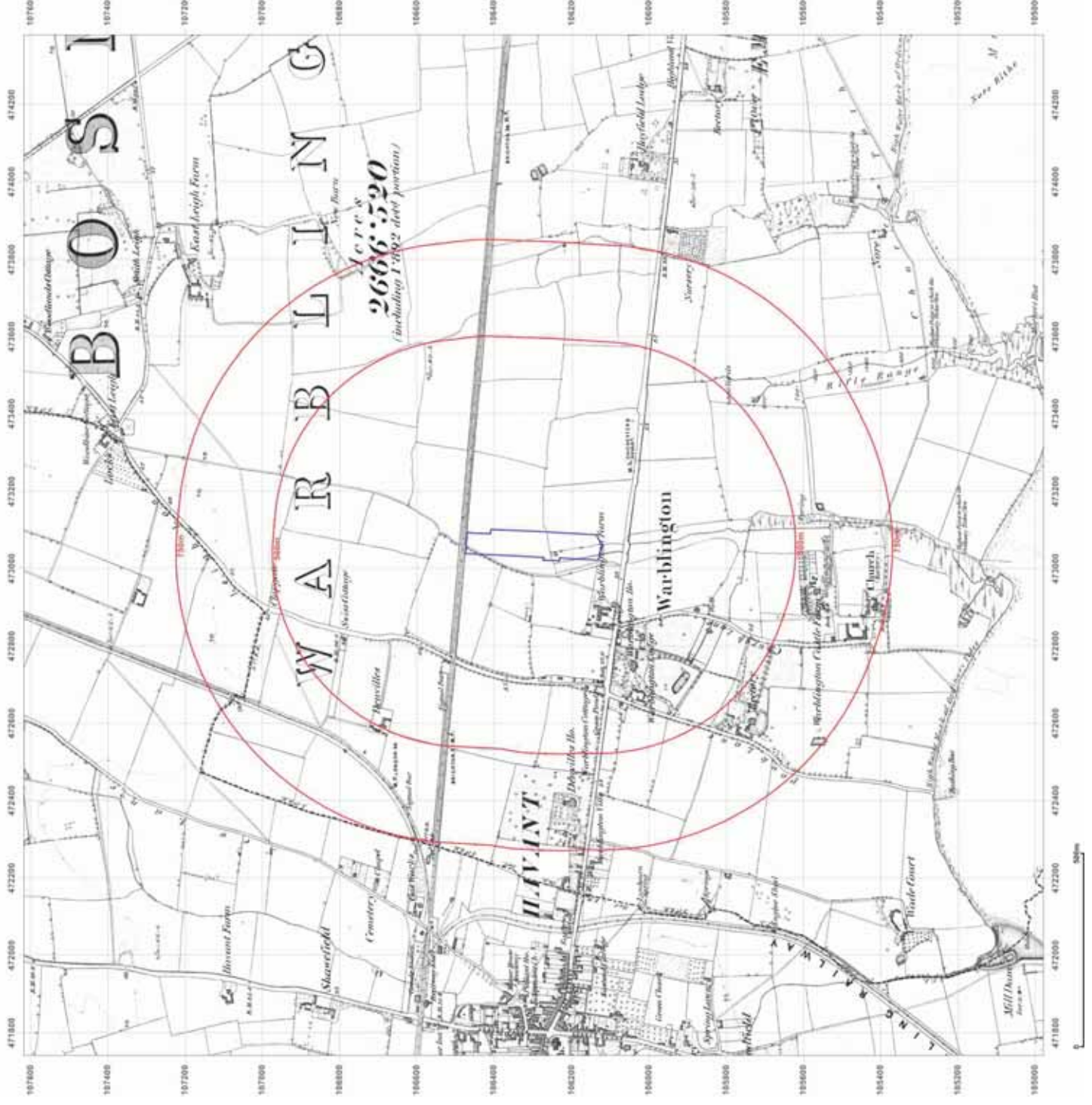
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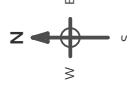
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Grid Ref: 473060, 106297

Map Name: County Series

Map date: 1895-1896

Scale: 1:10,560

Printed at: 1:10,560



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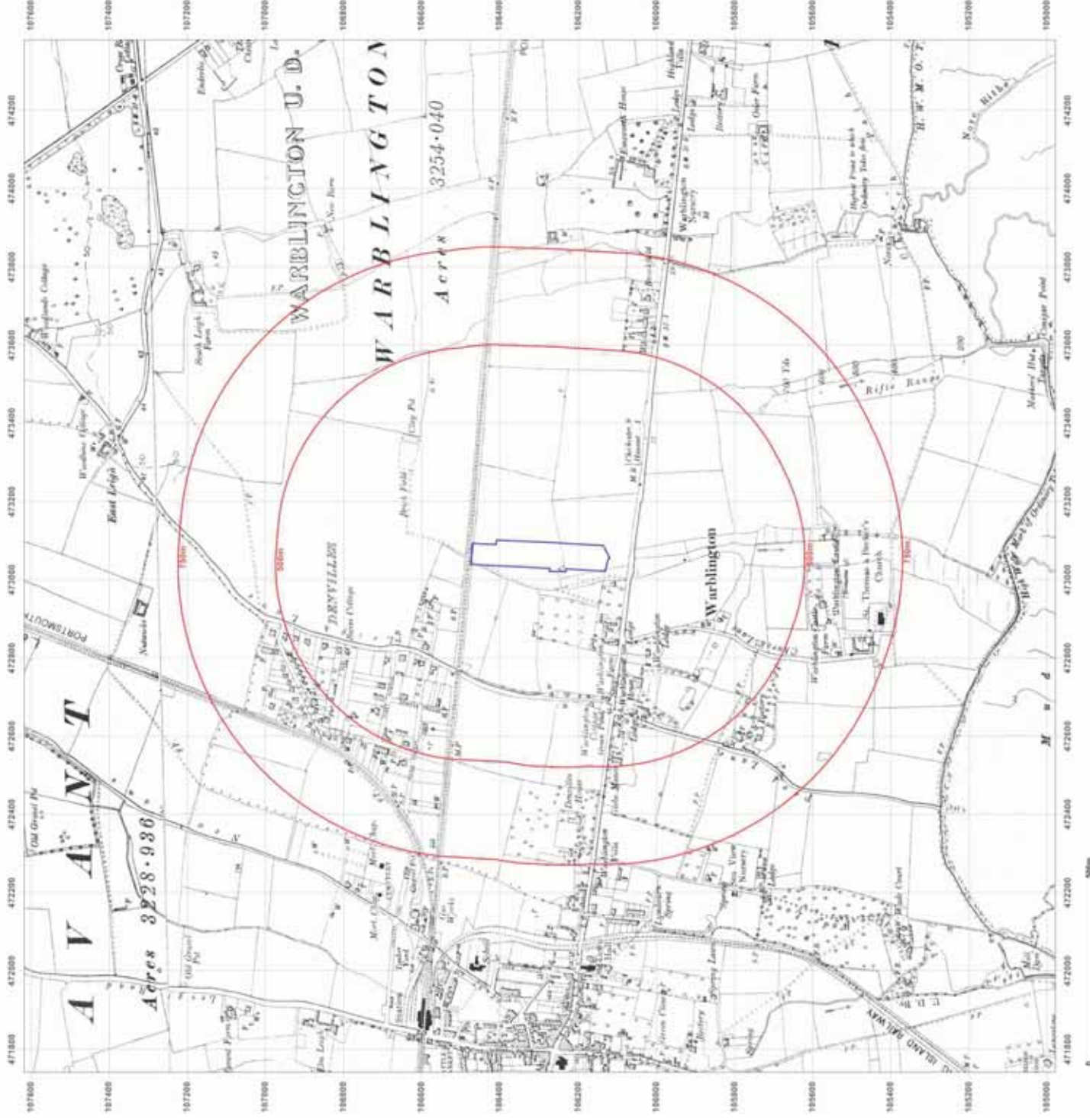
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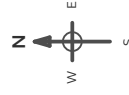
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Grid Ref: 473060, 106297

Map Name: County Series

Map date: 1896-1898

Scale: 1:10,560

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Revised 1896	Levelled N/A
Edition N/A	



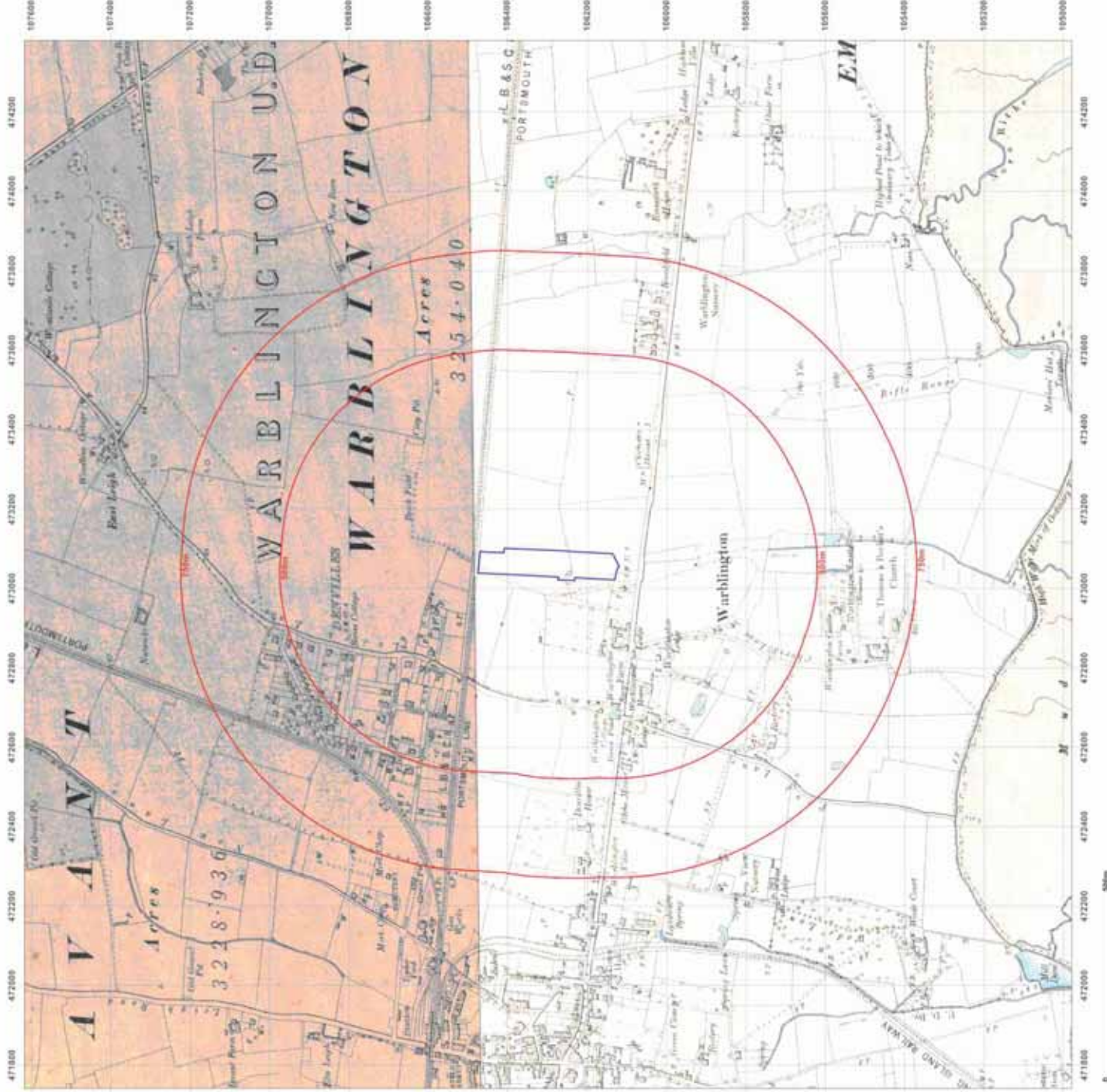
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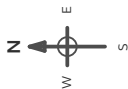
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Grid Ref: 473060, 106297

Map Name: County Series
Map date: 1907
Scale: 1:10,560
Printed at: 1:10,560



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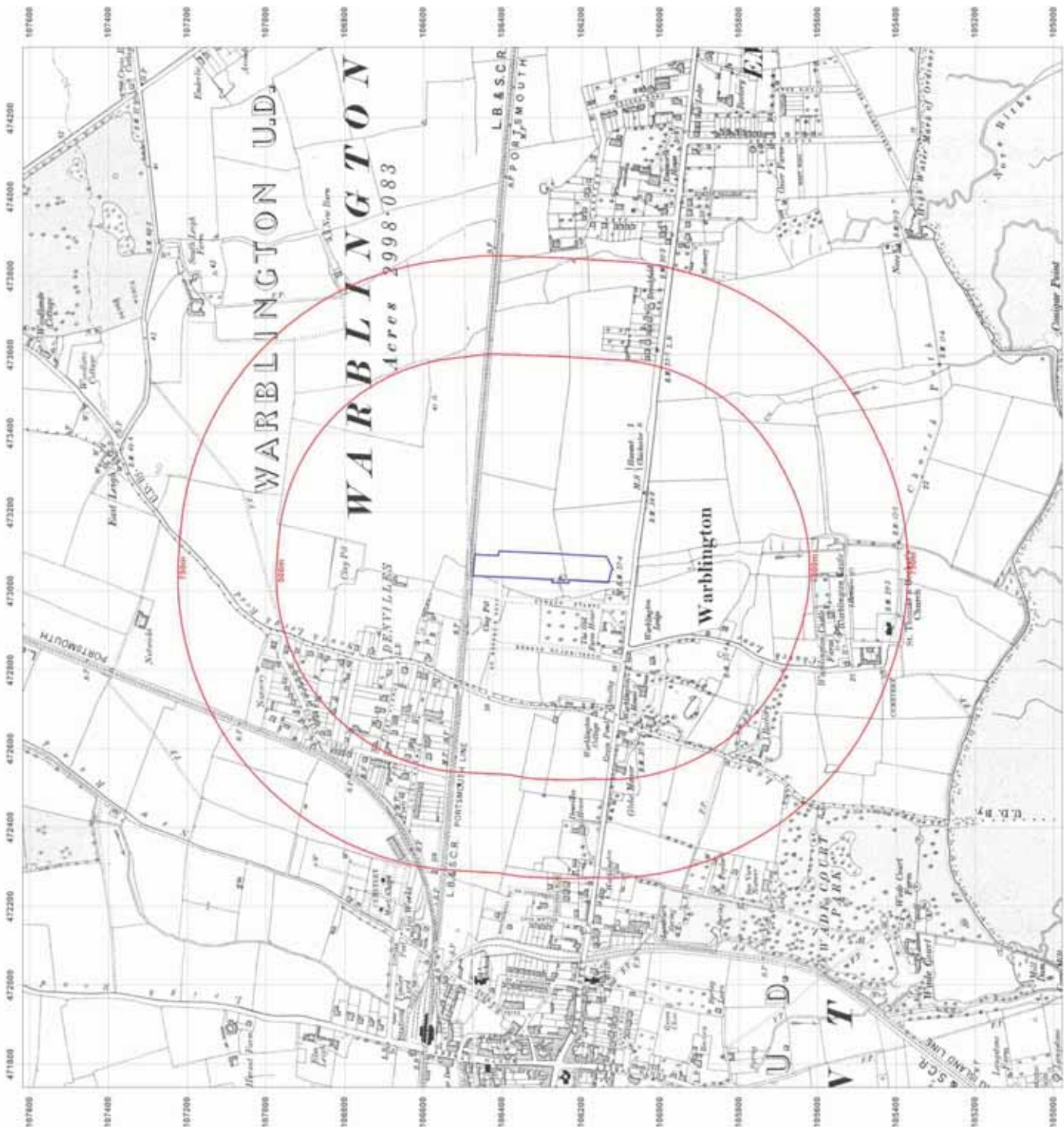
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Map Name: County Series

Map date: 1910-1914

Scale: 1:10,560

Printed at: 1:10,560



Map date: 1910-1914

Scale: 1:10,560

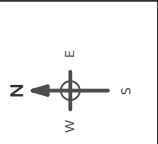
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A compass rose with a central circle and four arrows pointing towards the cardinal directions. The arrows are labeled 'N' for North, 'S' for South, 'E' for East, and 'W' for West. The 'N' arrow is slightly longer than the others.

Scale: 1:10,560

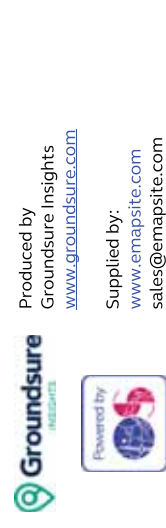
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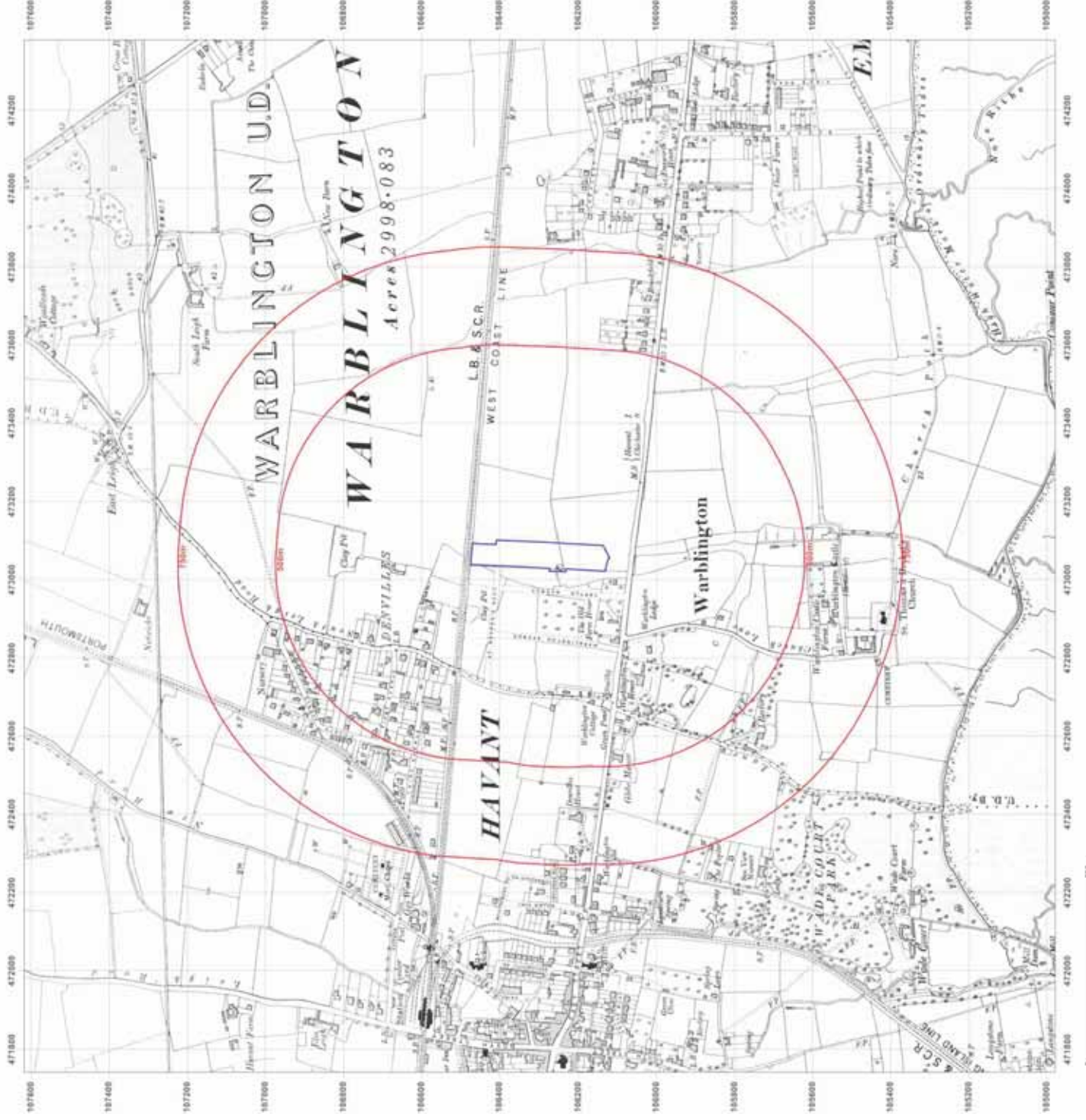
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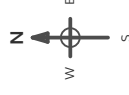
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Map Name: County Series

Map date: 1931

Scale: 1:10,560

Printed at: 1:10,560



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Edition N/A
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Surveyed 1865
Revised 1931
Edition N/A
Copyright N/A
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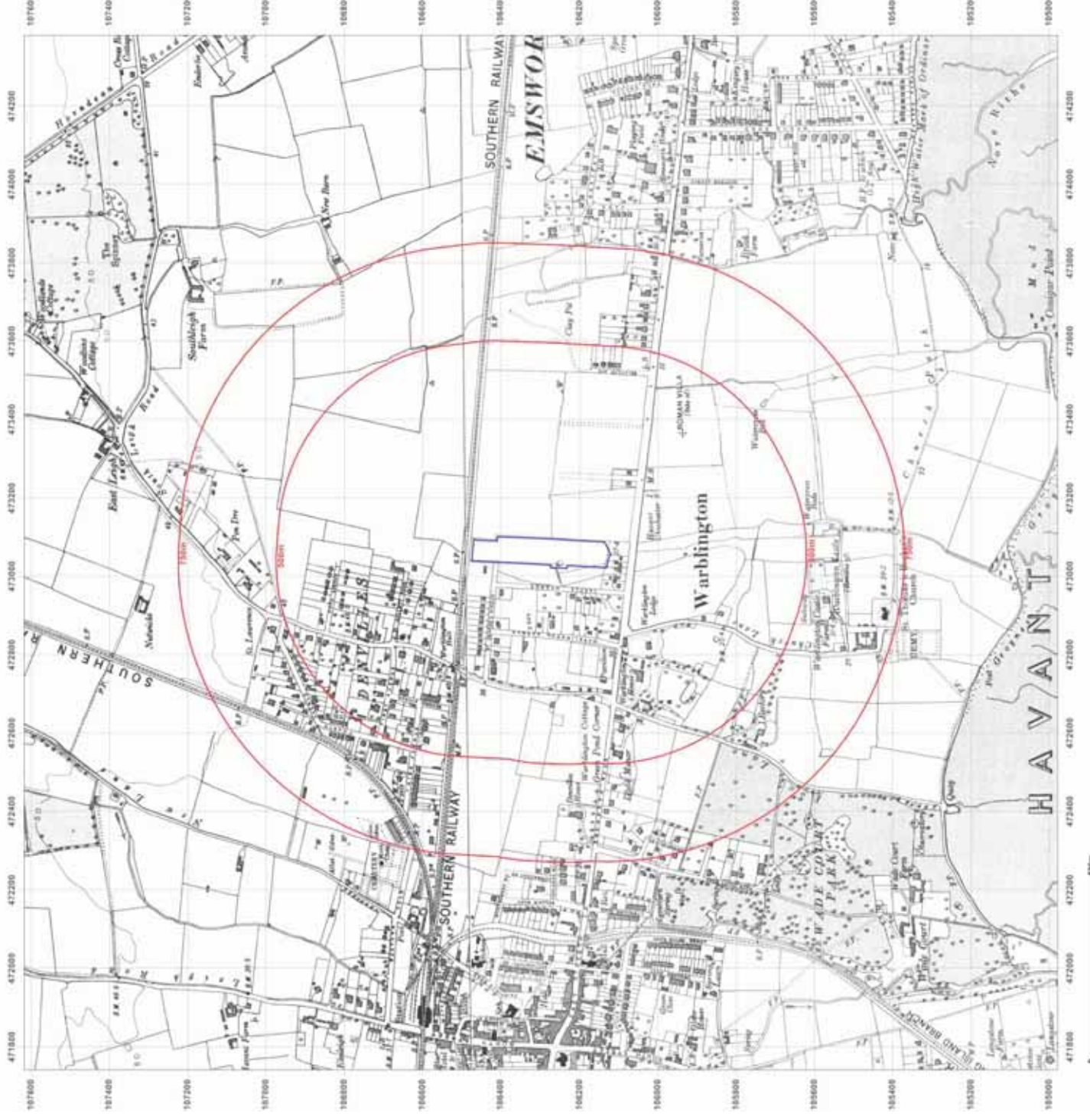
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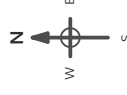
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Report Ref: EMS-395709_529349
Grid Ref: 473060, 106297

Map Name: County Series

Map date: 1931

Scale: 1:10,560

Printed at: 1:10,560



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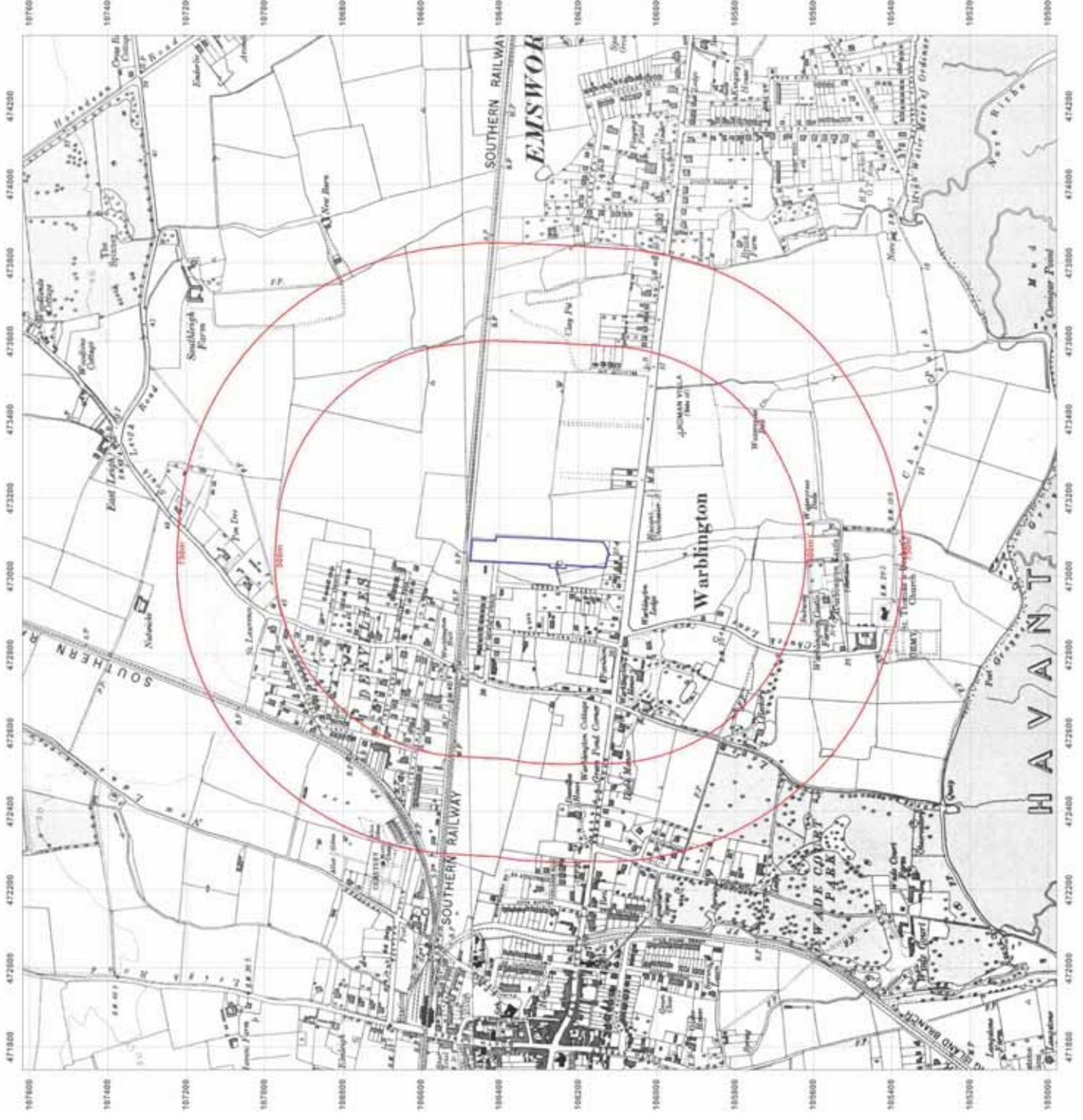
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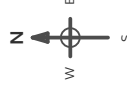
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Report Ref: EMS-395709_529349
Grid Ref: 473060, 106297

Map Name: County Series
Map date: 1932
Scale: 1:10,560
Printed at: 1:10,560



Surveyed 1873
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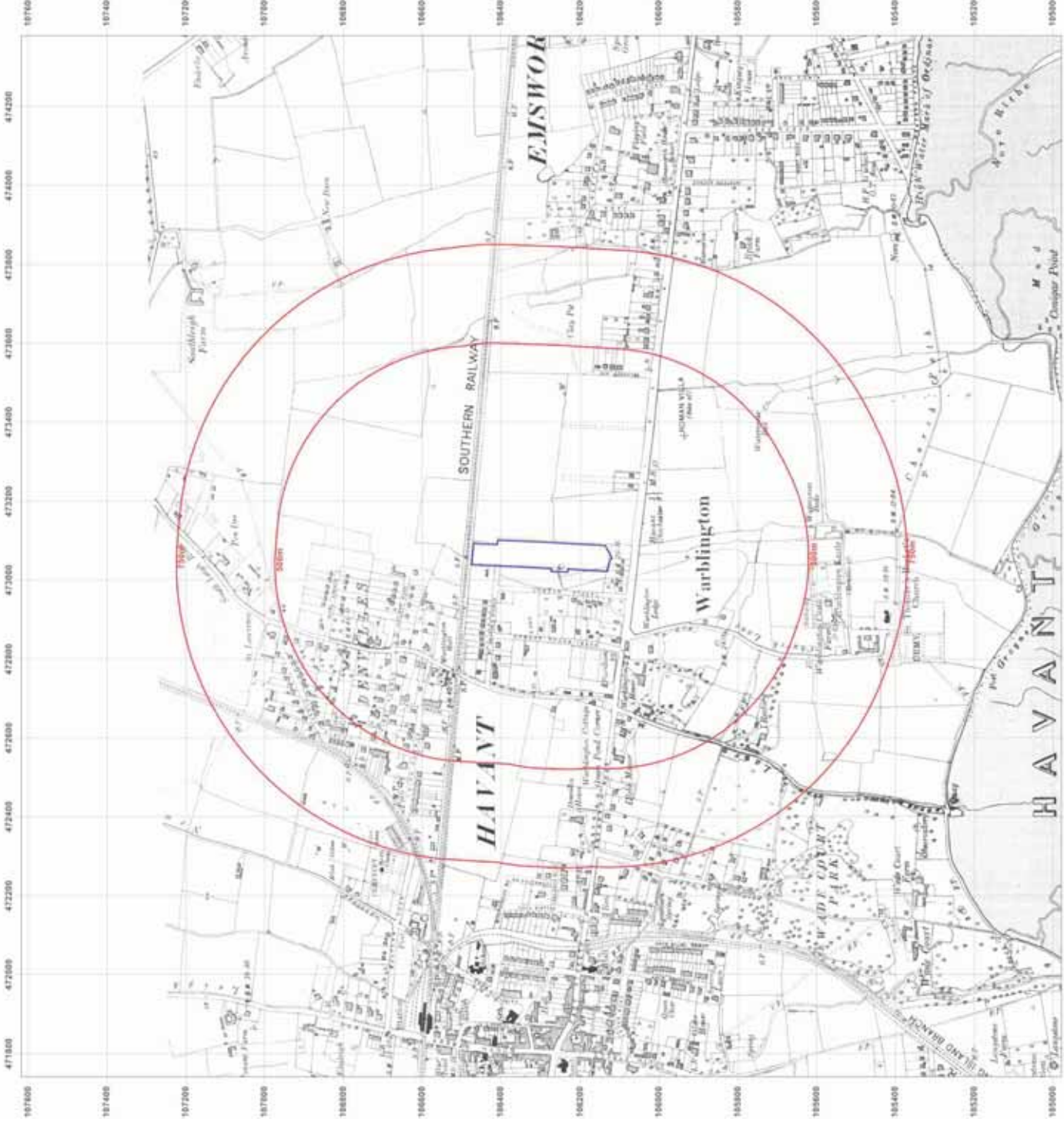
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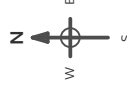
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Grid Ref: 473060, 106297

Map Name: County Series

Map date: 1938-1942

Scale: 1:10,560

Printed at: 1:10,560



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Surveyed 1865
Revised 1942
Edition N/A
Copyright N/A
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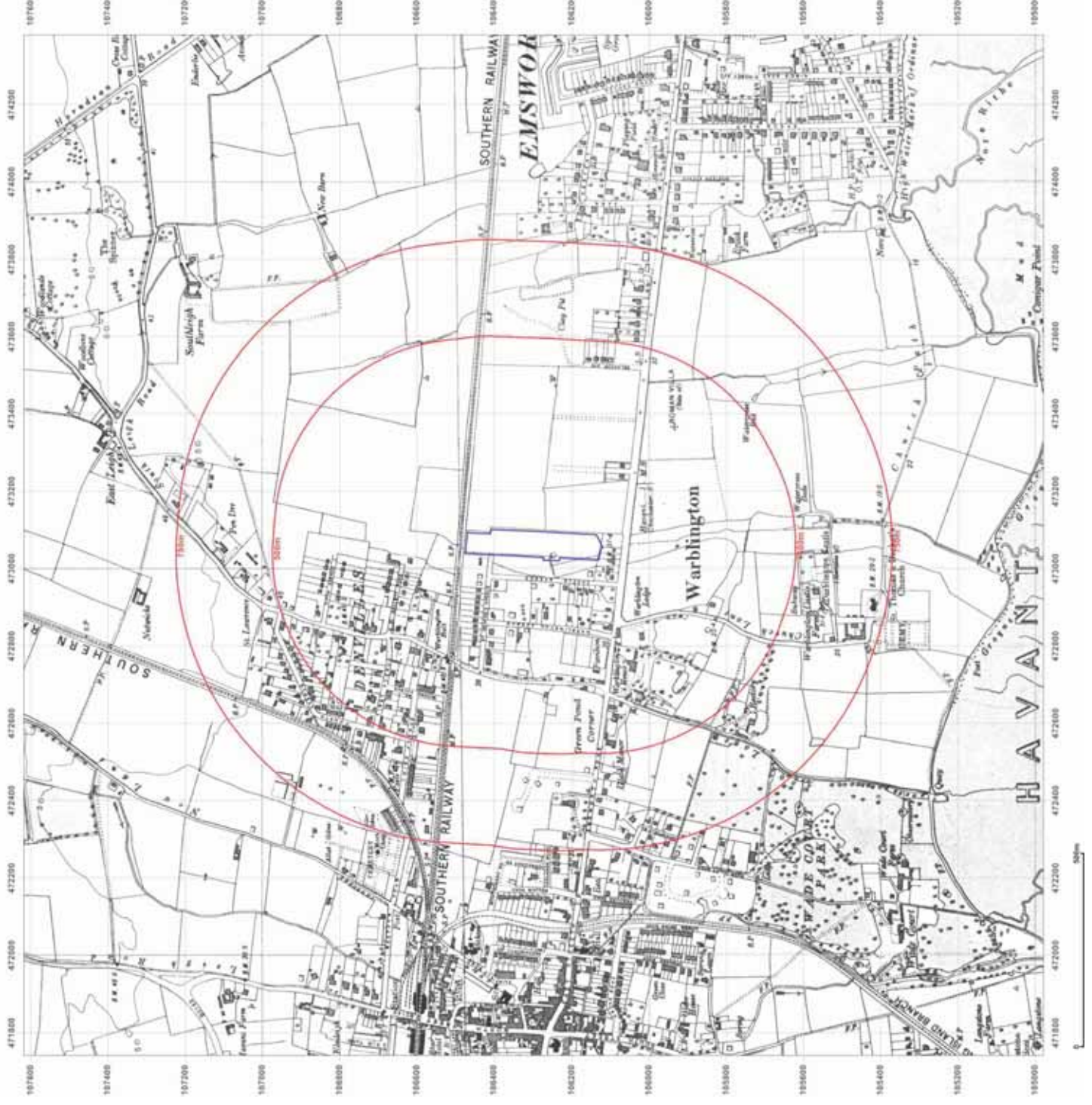
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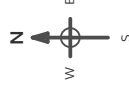
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Report Ref: EMS-395709_529349
Grid Ref: 473060, 106297

Map Name: Provisional

Map date: 1963

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1957
Edition N/A
Copyright 1963
Levelled N/A



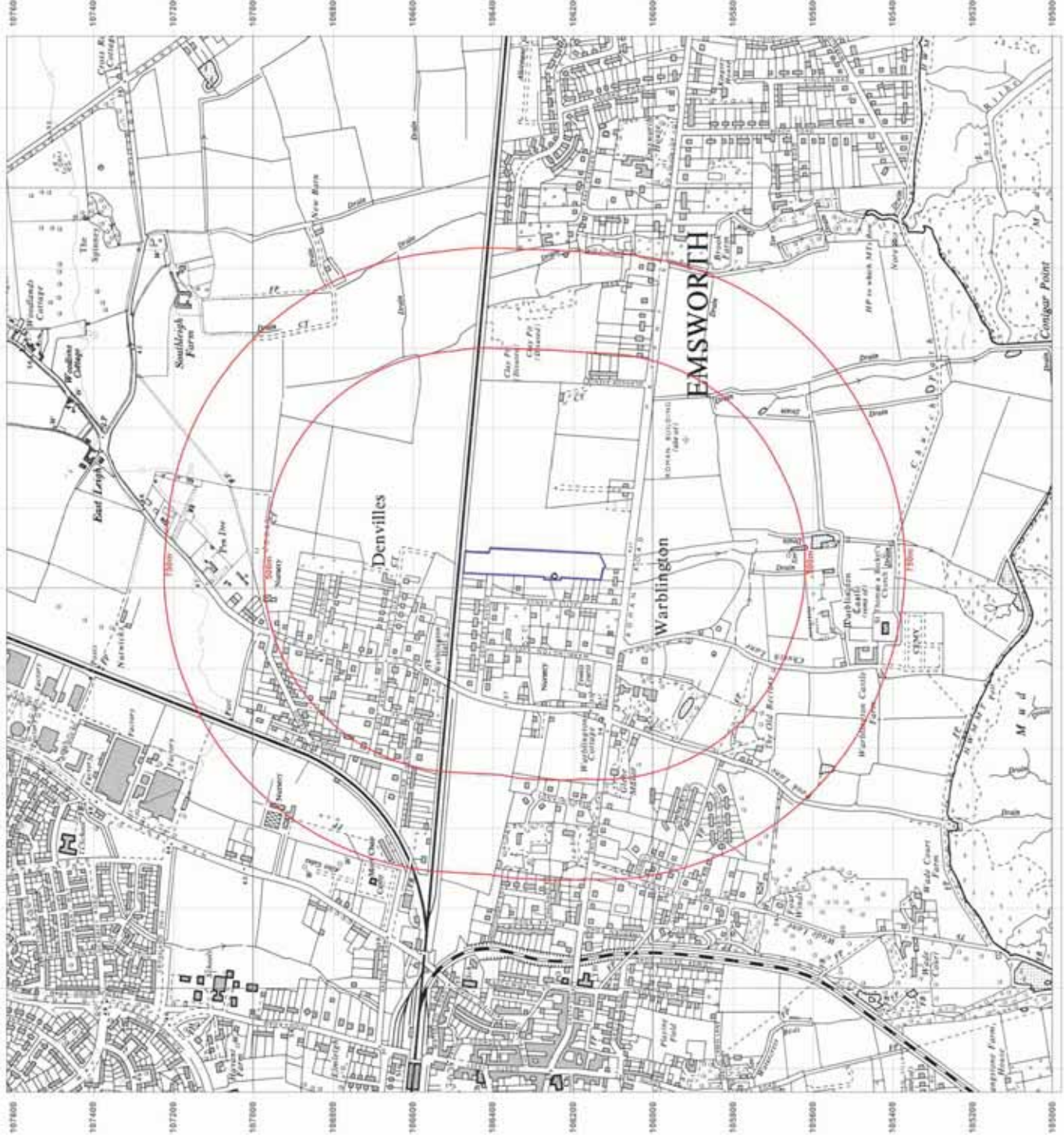
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Site Details:

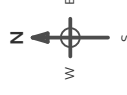
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Report Ref: EMS-395709_529349
Grid Ref: 473060, 106297

Map Name: Provisional

Map date: 1966

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1873
Revised 1966
Edition N/A
Copyright 1963
Levelled N/A



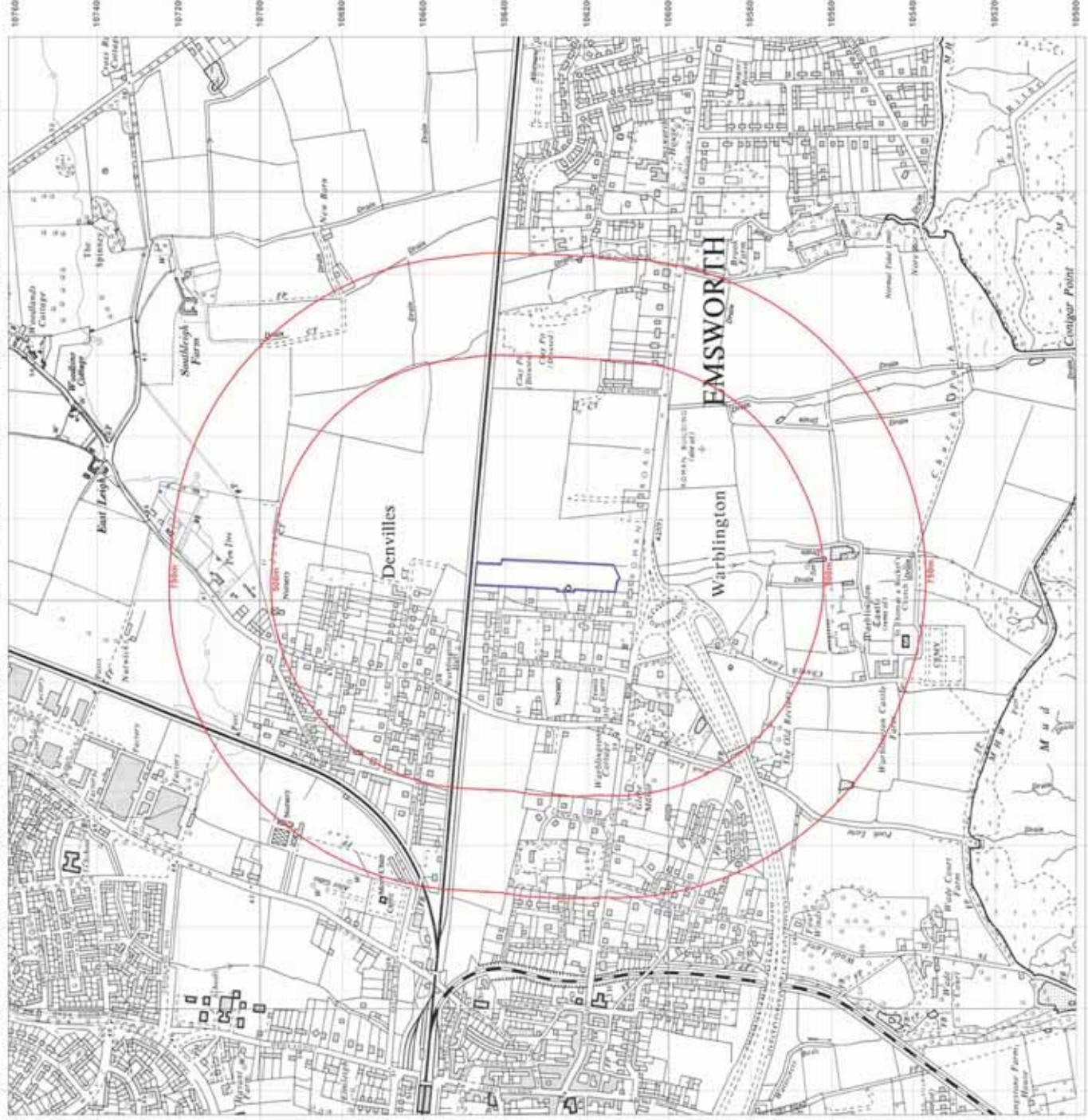
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Report Ref: EMS-395709_529349
Grid Ref: 473060, 106297

Map Name: National Grid

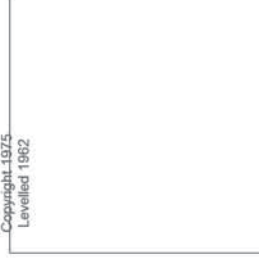
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Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1973
Revised 1975
Edition N/A
Copyright 1975
Levelled 1962



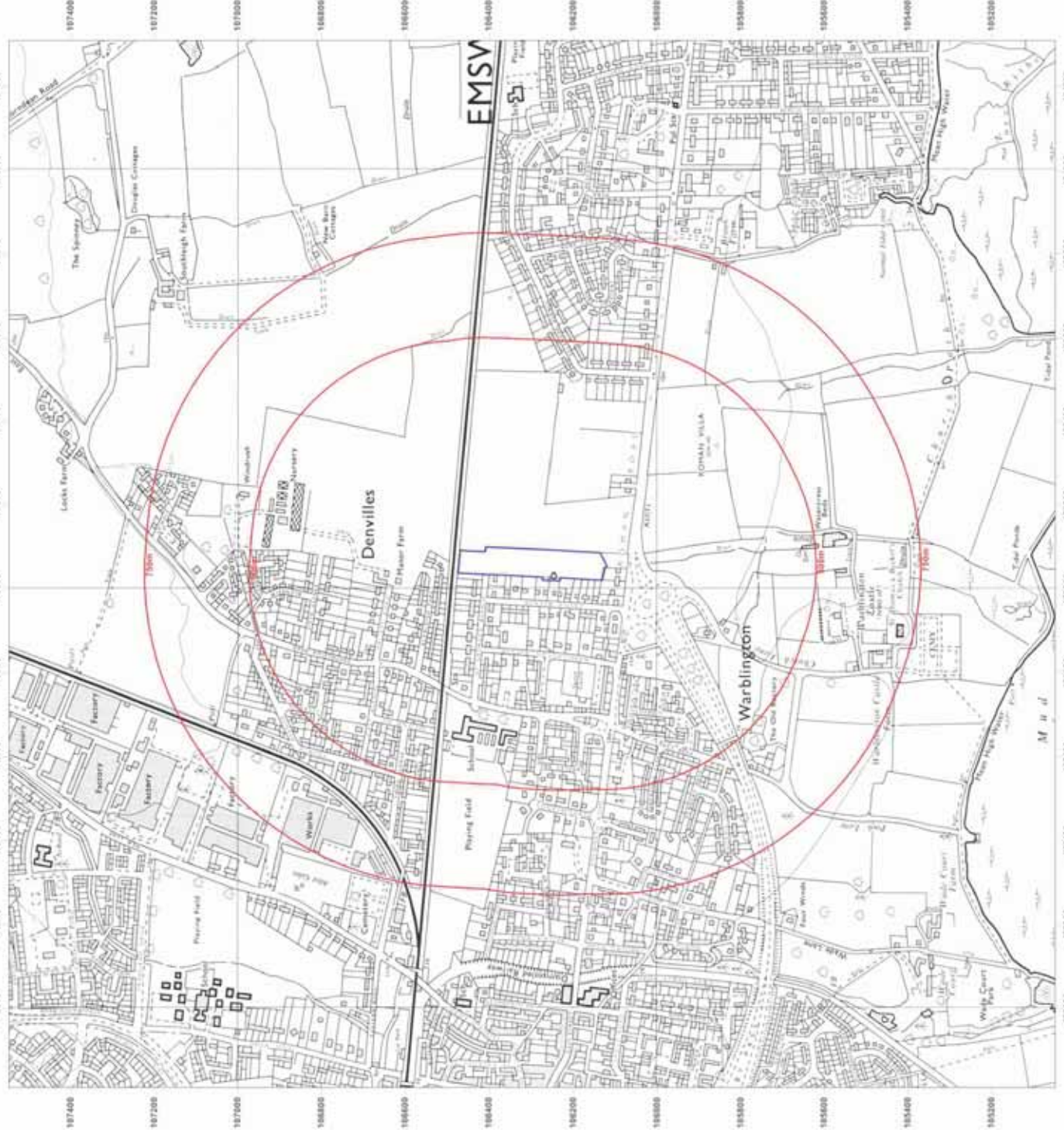
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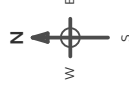
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Report Ref: EMS-395709_529349
Grid Ref: 473060, 106297

Map Name: National Grid

Map date: 1991

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1989
Revised 1991
Edition N/A
Copyright N/A
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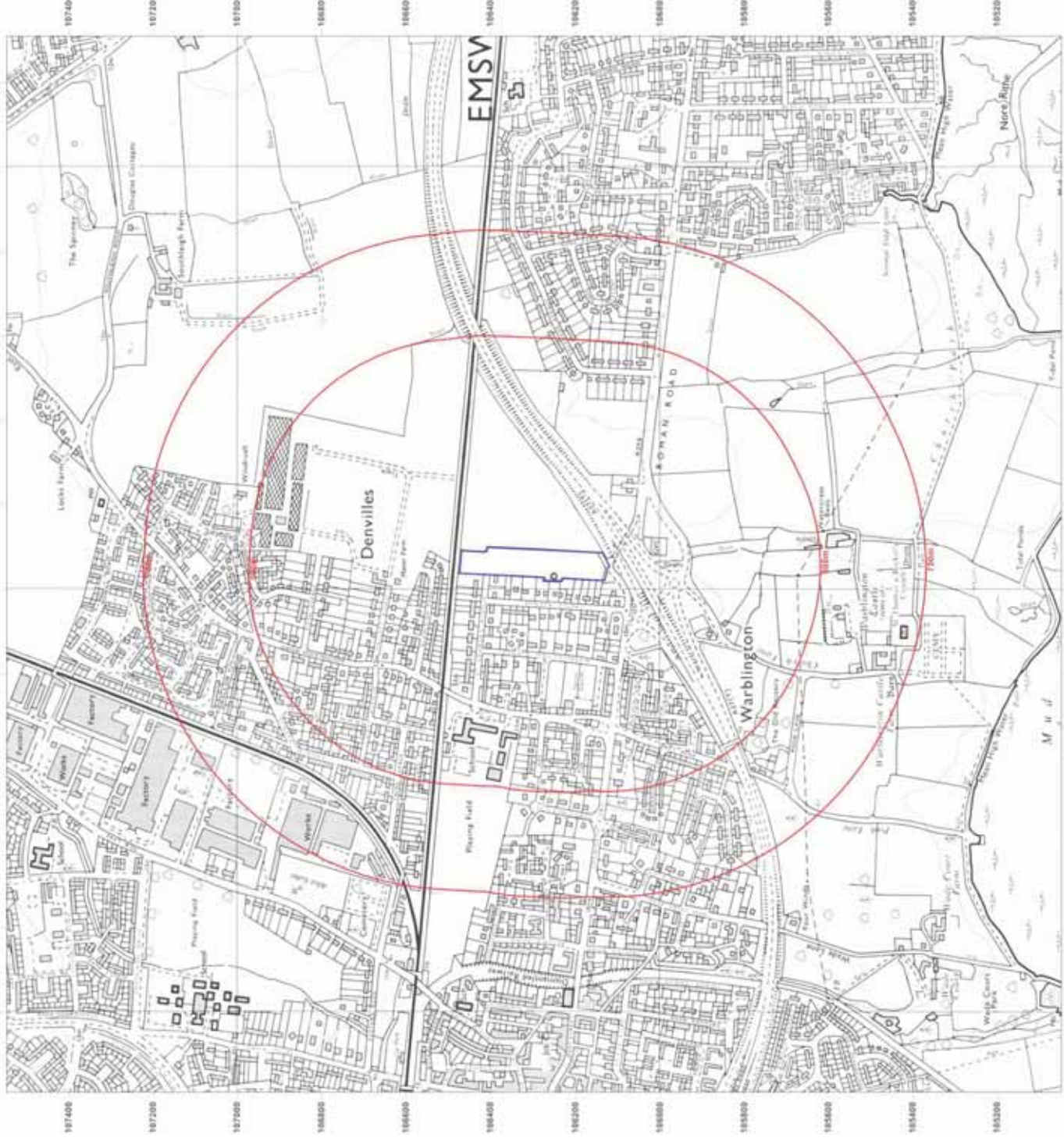
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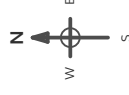
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Report Ref: EMS-395709_529349
Grid Ref: 473060, 106297

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



2002



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Site Details:

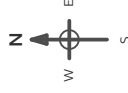
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Report Ref: EMS-395709_529349
Grid Ref: 473060, 106297

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



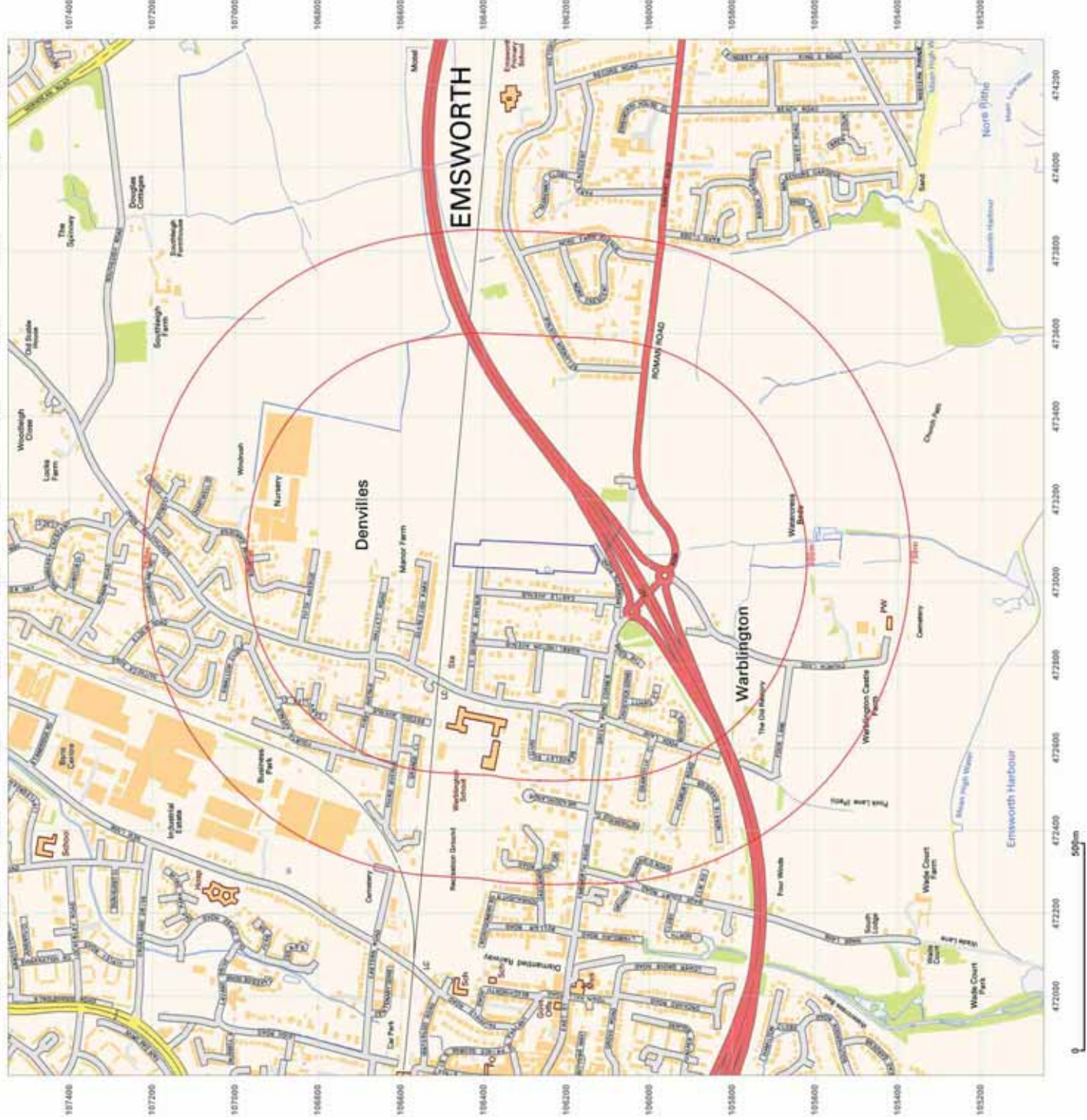
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Report Ref: EMS-395709_529349
Grid Ref: 473060, 106297

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



2014



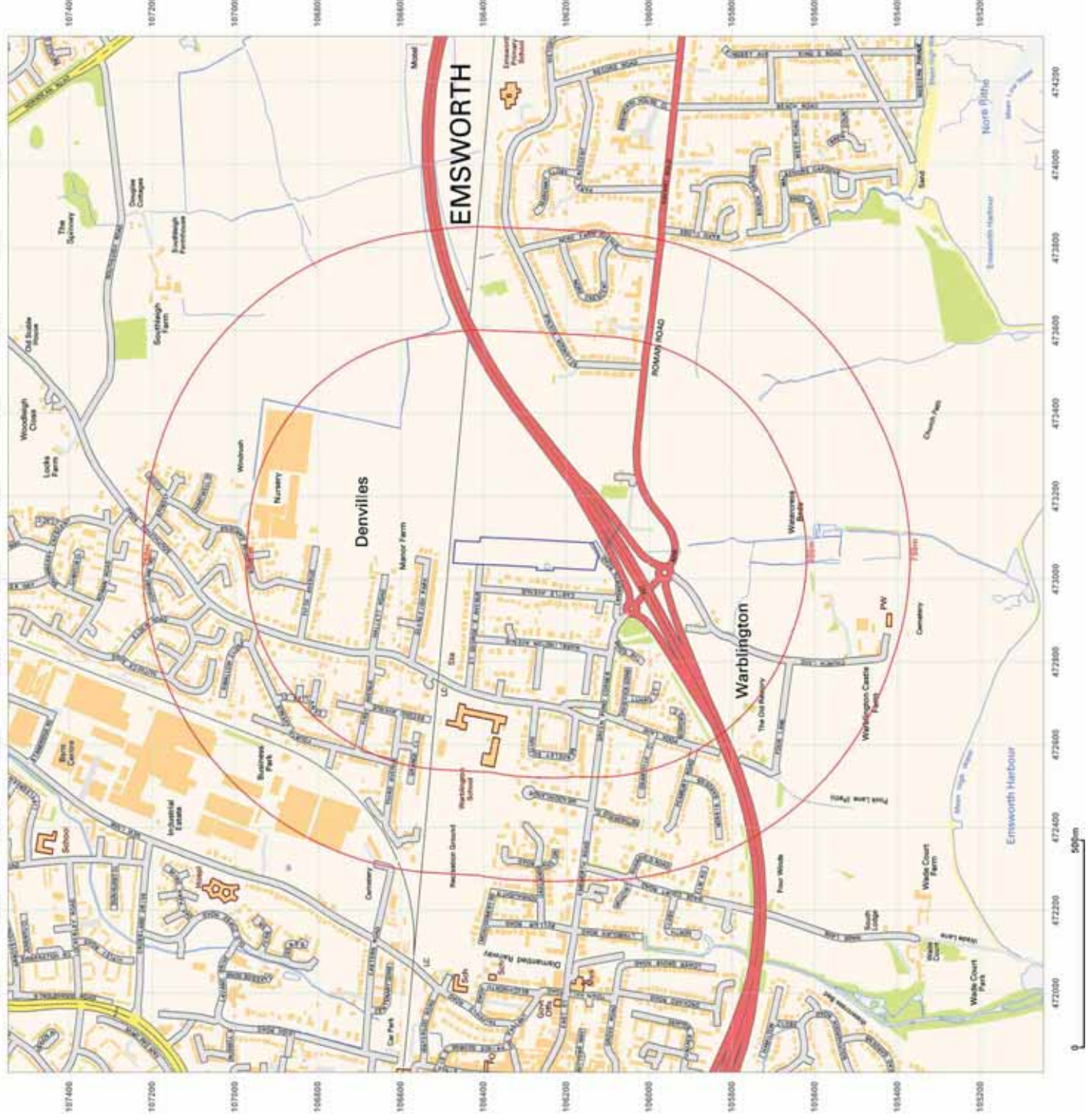
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EmapSite

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Eversley, RG27 0RP

Report Reference: EMS-395709_529350

Your Reference: EMS_395709_529350

Report Date 1 Dec 2016

Report Delivery Method: Email - pdf

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If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.
Groundsure Geoinsight



Groundsure Geo Insight

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Date: 1 Dec 2016
Reference: EMS-395709_529350
Client: EmapSite



Aerial Photograph Capture date: 20-Aug-2013
Grid Reference: 473061,106294
Site Size: 2.22ha

Contents Page

Overview of Findings.....	5
1 Geology.....	8
1.1 Artificial Ground Map.....	8
1 Geology.....	9
1.1 Artificial Ground.....	9
1.1.1 Artificial/ Made Ground.....	9
1.1.2 Permeability of Artificial Ground.....	9
1.2 Superficial Deposits and Landslips Map.....	10
1.2 Superficial Deposits and Landslips.....	11
1.2.1 Superficial Deposits/ Drift Geology.....	11
1.2.2 Permeability of Superficial Ground.....	11
1.2.3 Landslip.....	11
1.2.4 Landslip Permeability.....	12
1.3 Bedrock and Faults Map.....	13
1.3 Bedrock, Solid Geology & Faults.....	14
1.3.1 Bedrock/ Solid Geology.....	14
1.3.2 Permeability of Bedrock Ground.....	14
1.3.3 Faults.....	14
1.4 Radon Data.....	15
1.4.1 Radon Affected Areas.....	15
1.4.2 Radon Protection.....	15
2 Ground Workings Map.....	16
2 Ground Workings.....	17
2.1 Historical Surface Ground Working Features derived from Historical Mapping.....	17
2.2 Historical Underground Working Features derived from Historical Mapping.....	17
2.3 Current Ground Workings.....	18
3 Mining, Extraction & Natural Cavities Map.....	19
3 Mining, Extraction & Natural Cavities.....	20
3.1 Historical Mining.....	20
3.2 Coal Mining.....	20
3.3 Johnson Poole and Bloomer.....	20
3.4 Non-Coal Mining.....	20
3.5 Non-Coal Mining Cavities.....	21
3.6 Natural Cavities.....	21
3.7 Brine Extraction.....	21
3.8 Gypsum Extraction.....	21
3.9 Tin Mining.....	21
3.10 Clay Mining.....	22
4 Natural Ground Subsidence.....	23
4.1 Shrink-Swell Clay Map.....	23
4.2 Landslides Map.....	24
4.3 Ground Dissolution Soluble Rocks Map.....	25
4.4 Compressible Deposits Map.....	26
4.5 Collapsible Deposits Map.....	27
4.6 Running Sand Map.....	28
4 Natural Ground Subsidence.....	29
4.1 Shrink-Swell Clays.....	29
4.2 Landslides.....	29
4.3 Ground Dissolution of Soluble Rocks.....	30

4.4 Compressible Deposits.....	30
4.5 Collapsible Deposits.....	30
4.6 Running Sands.....	31
5 Borehole Records Map.....	32
5 Borehole Records.....	33
6 Estimated Background Soil Chemistry.....	35
7 Railways and Tunnels Map.....	37
7 Railways and Tunnels.....	38
7.1 Tunnels	38
7.2 Historical Railway and Tunnel Features	38
7.3 Historical Railways.....	39
7.4 Active Railways.....	39
7.5 Railway Projects.....	39

Overview of Findings

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

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

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

Section 1:Geology

1.1 Artificial Ground	1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?	Yes
	1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?	Yes
	1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	1.2.4 Are there any records relating to permeability of landslips within the study site boundary?	No
1.3 Bedrock, Solid Geology & Faults	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records relating to permeability of bedrock within the study site boundary?	Yes
	1.3.3 Are there any records of faults within 500m of the study site boundary?	Yes
1.4 Radon data	1.4.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level
	1.4.2 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

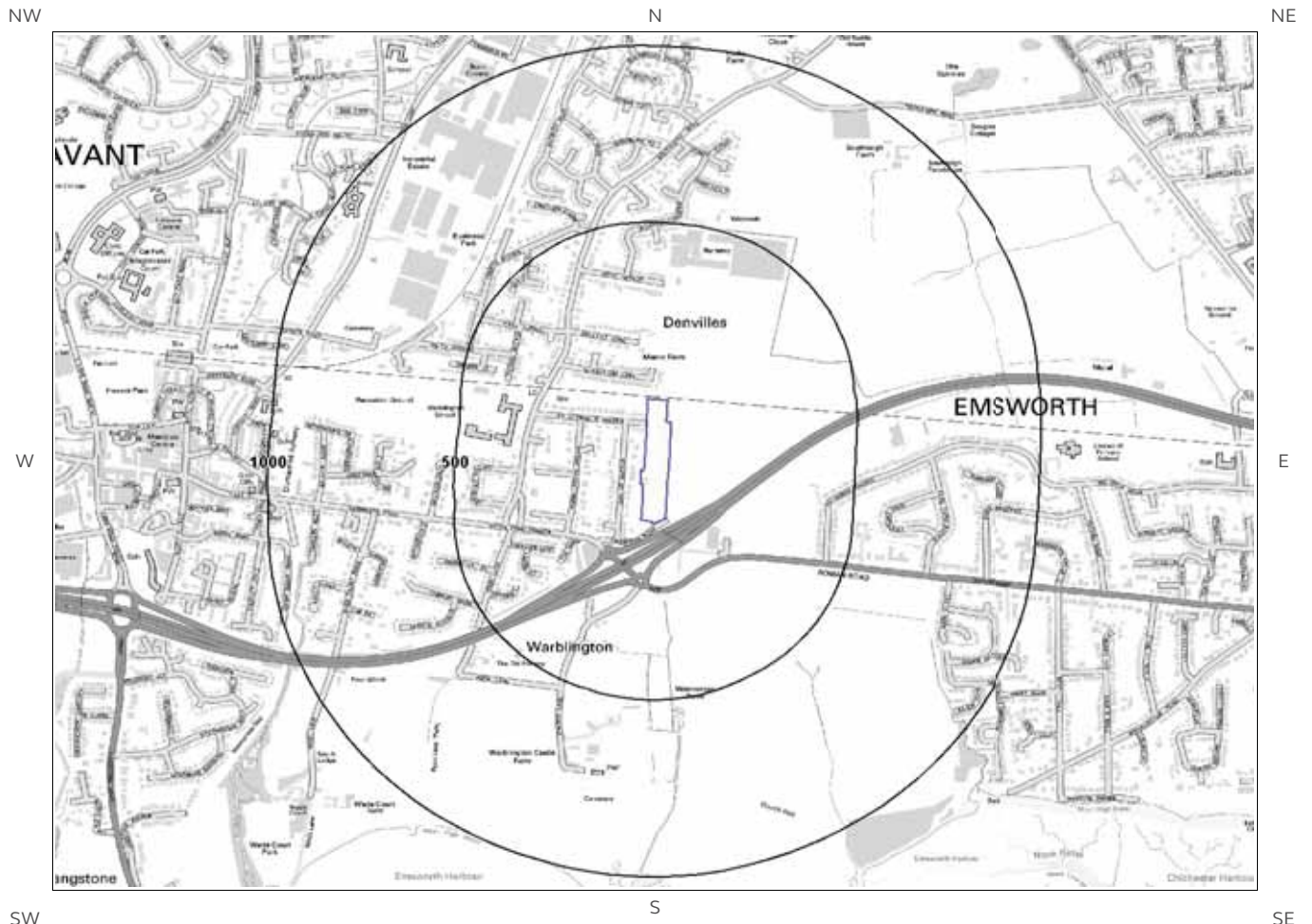
Section 2:Ground Workings	On-site	0-50m	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	4	0	3	Not Searched	Not Searched
2.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
2.3 Current Ground Workings	0	0	0	2	2

Section 3: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0
3.2 Coal Mining	0	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
3.4 Non-Coal Mining	0	0	0	0	0
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0
Section 4: Natural Ground Subsidence	On-site				
4.1 Shrink Swell Clay	Low				
4.2 Landslides	Very Low				
4.3 Ground Dissolution of Soluble Rocks	Negligible				
4.4 Compressible Deposits	Moderate				
4.5 Collapsible Deposits	Low				
4.6 Running Sand	Low				
Section 5: Borehole Records	On-site	0-50m	51-250		
5 BGS Recorded Boreholes	0	4	21		
Section 6: Estimated Background Soil Chemistry	On-site	0-50m	51-250		
6 Records of Background Soil Chemistry	3	7	21		
Section 7: Railways and Tunnels	On-site	0-50m	51-250	251-500	
7.1 Tunnels	0	0	0	Not Searched	
7.2 Historical Railway and Tunnel Features	0	0	0	Not Searched	
7.3 Historical Railways	0	0	0	Not Searched	
7.4 Active Railways	0	3	0	Not Searched	

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

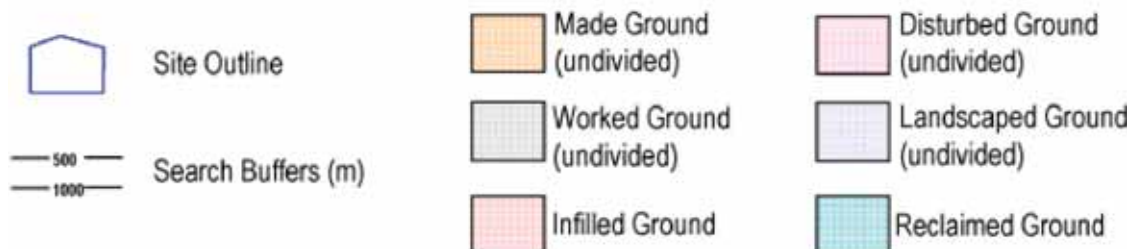
1 Geology

1.1 Artificial Ground Map



Artificial Ground Legend

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1 Geology

1.1 Artificial Ground

1.1.1 Artificial/ Made Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:316

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

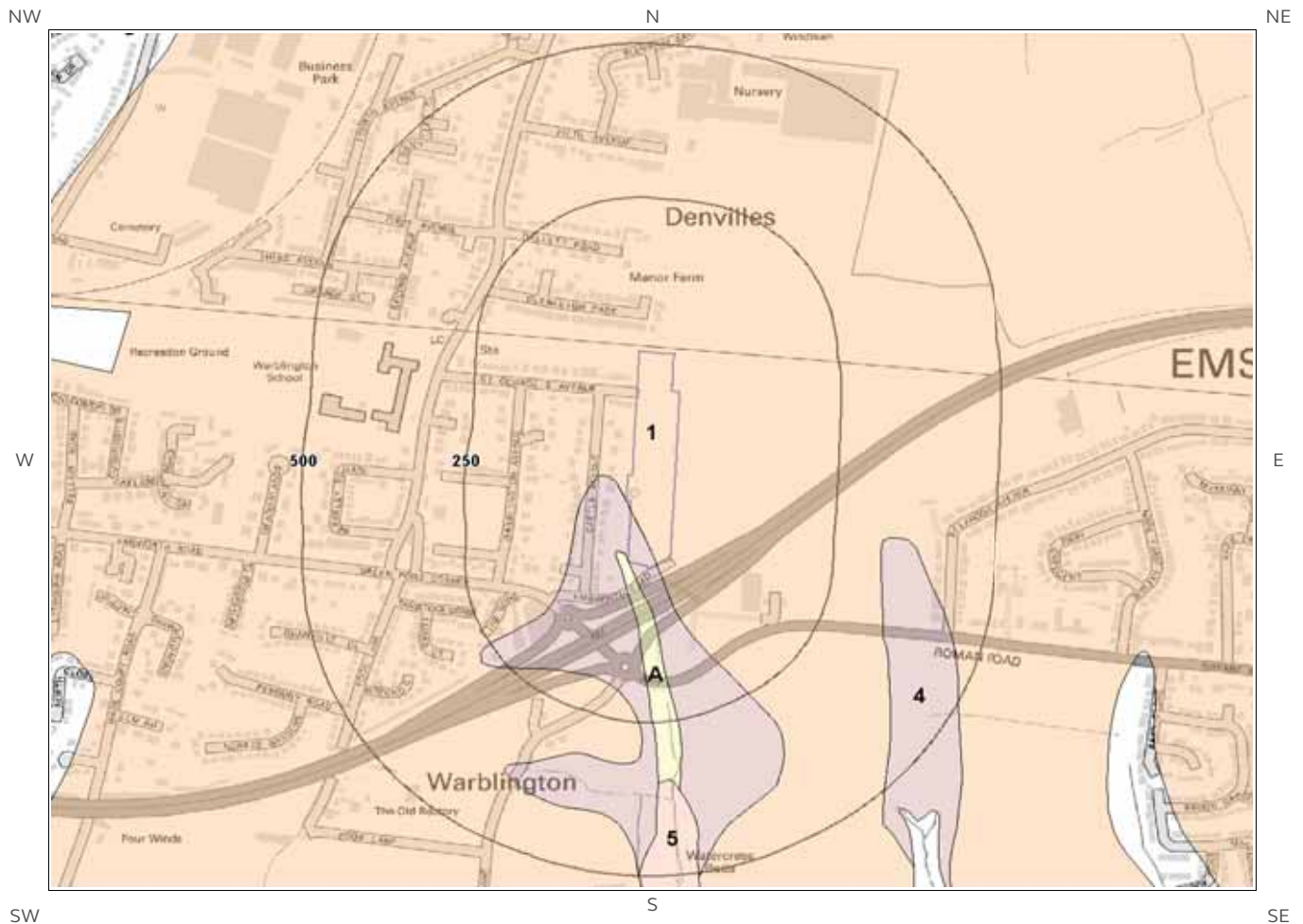
Database searched and no data found.

1.1.2 Permeability of Artificial Ground

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

Database searched and no data found.

1.2 Superficial Deposits and Landslips Map



**Superficial Deposits and Landslips
Legend**

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1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/ Drift Geology

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

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	RTDU	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY [UNLITHIFIED DEPOSITS CODING SCHEME]
2A	0.0	On Site	ALV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
3A	0.0	On Site	HEAD	HEAD	GRAVEL, CLAYEY [UNLITHIFIED DEPOSITS CODING SCHEME]
4	323.0	E	HEAD	HEAD	GRAVEL, CLAYEY [UNLITHIFIED DEPOSITS CODING SCHEME]
5	344.0	S	RMD	RAISED MARINE DEPOSITS	SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]

1.2.2 Permeability of Superficial Ground

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

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

1.2.3 Landslip

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

Database searched and no data found.

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

1.2.4 Landslip Permeability

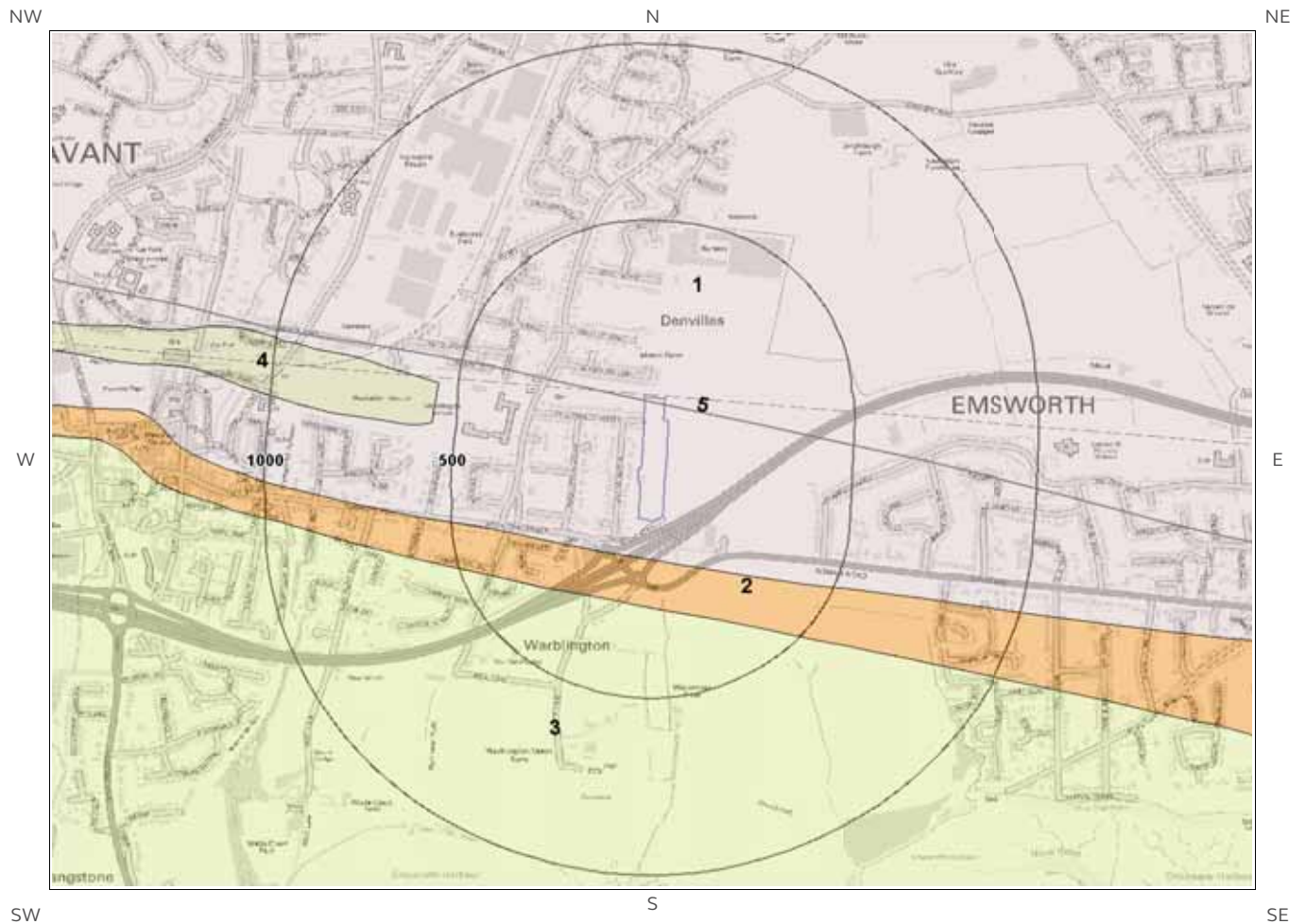
Are there any records relating to permeability of landslips within the study site** boundary?

No

Database searched and no data found.

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

1.3 Bedrock and Faults Map



Bedrock and Faults Legend

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1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:316

1.3.1 Bedrock/ Solid Geology

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

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	LC-CLSISA	London Clay Formation - Clay, Silt And Sand	No Details
2	104.0	S	LMBE-CLSISA	Lambeth Group - Clay, Silt And Sand	No Details
3	237.0	S	LPCK-CHLK	Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation And Portsdown C	Campanian / Turonian

1.3.2 Permeability of Bedrock Ground

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

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

1.3.3 Faults

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

ID	Distance (m)	Direction	Category Description	Feature Description
5	0.0	On Site	FOLD_AXIS	Axial plane trace of major syncline

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

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

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

1.4 Radon Data

1.4.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level

1.4.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary

2 Ground Workings Map



Ground Workings Legend

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2 Ground Workings

2.1 Historical Surface Ground Working Features derived from Historical Mapping

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

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

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

ID	Distance (m)	Direction	NGR	Use	Date
1	0.0	On Site	473255 106463	Cuttings	1866
2	0.0	On Site	473033 106246	Pond	1942
3	0.0	On Site	473073 106479	Cuttings	1914
4	0.0	On Site	473105 106476	Cuttings	1907
5A	102.0	W	472911 106465	Clay Pit	1907
6A	104.0	W	472910 106464	Clay Pit	1914
7	240.0	NE	473326 106630	Brick Field	1896

2.2 Historical Underground Working Features derived from Historical Mapping

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

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

2.3 Current Ground Workings

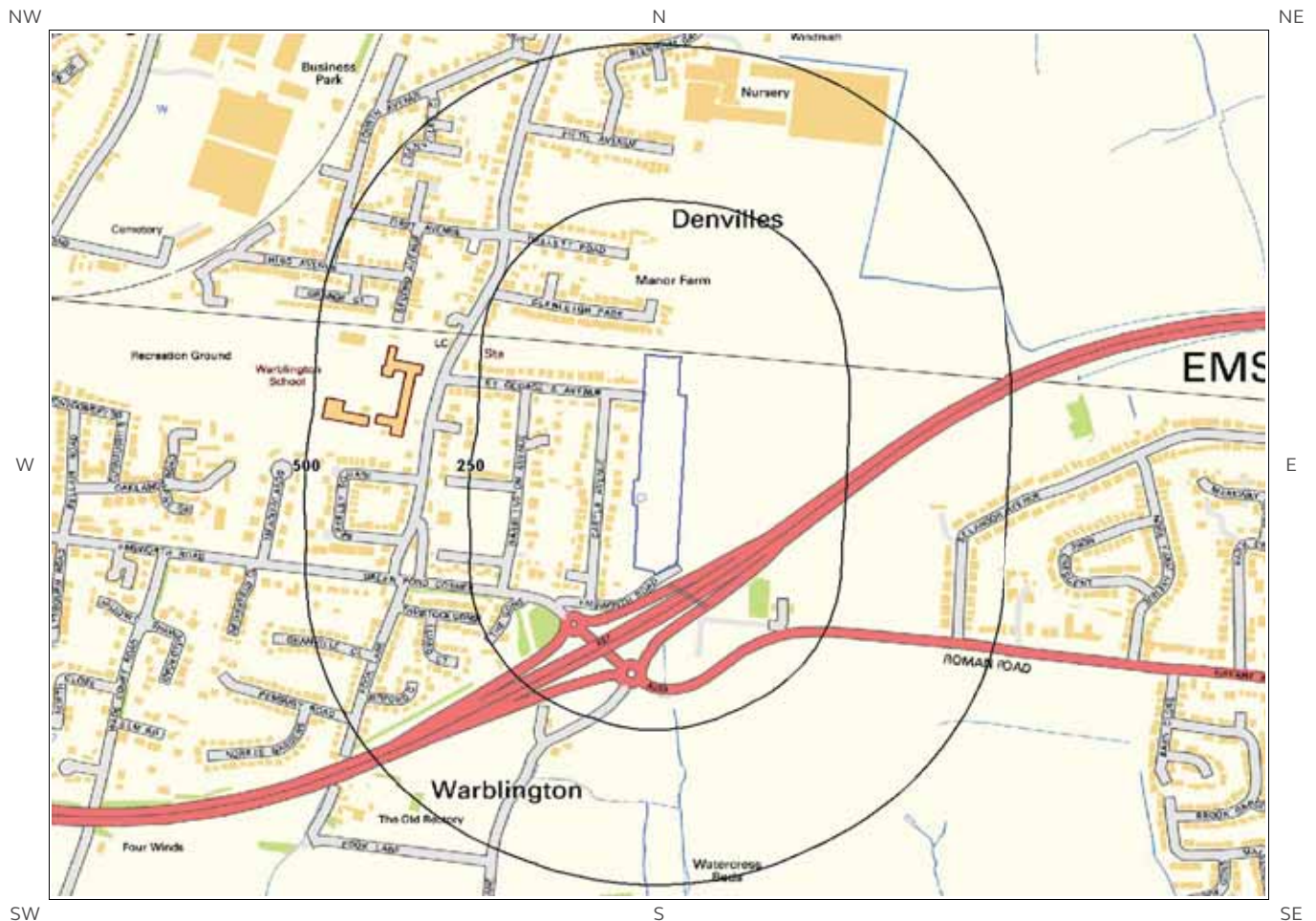
This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

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

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

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
8	319.0	NE	473364 106637	Clay & Shale	Denvilles Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	322.0	N	473079 106793	Clay & Shale	Denvilles Clay Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	625.0	E	473719 106259	Clay & Shale	Emsworth Clay Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	851.0	W	472198 106610	Sand & Gravel	Havant Park Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

3 Mining, Extraction & Natural Cavities Map



Mining, Extraction and Natural Cavities Legend

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3 Mining, Extraction & Natural Cavities

3.1 Historical Mining

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

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

Database searched and no data found.

3.2 Coal Mining

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

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

Database searched and no data found.

3.3 Johnson Poole and Bloomer

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

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

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

3.4 Non-Coal Mining

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

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

Database searched and no data found.

3.5 Non-Coal Mining Cavities

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

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

Database searched and no data found.

3.6 Natural Cavities

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

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

Database searched and no data found.

3.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

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

Database searched and no data found.

3.8 Gypsum Extraction

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

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

Database searched and no data found.

3.9 Tin Mining

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

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

Database searched and no data found.

3.10 Clay Mining

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

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

No

Database searched and no data found.

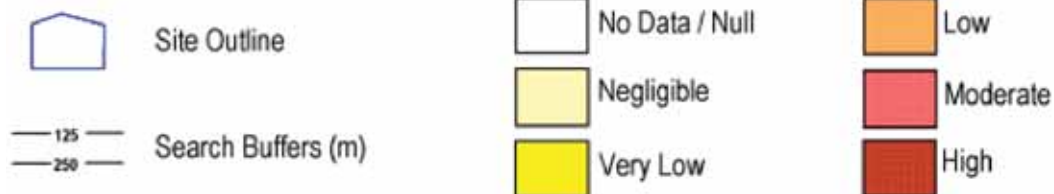
4 Natural Ground Subsidence

4.1 Shrink-Swell Clay Map

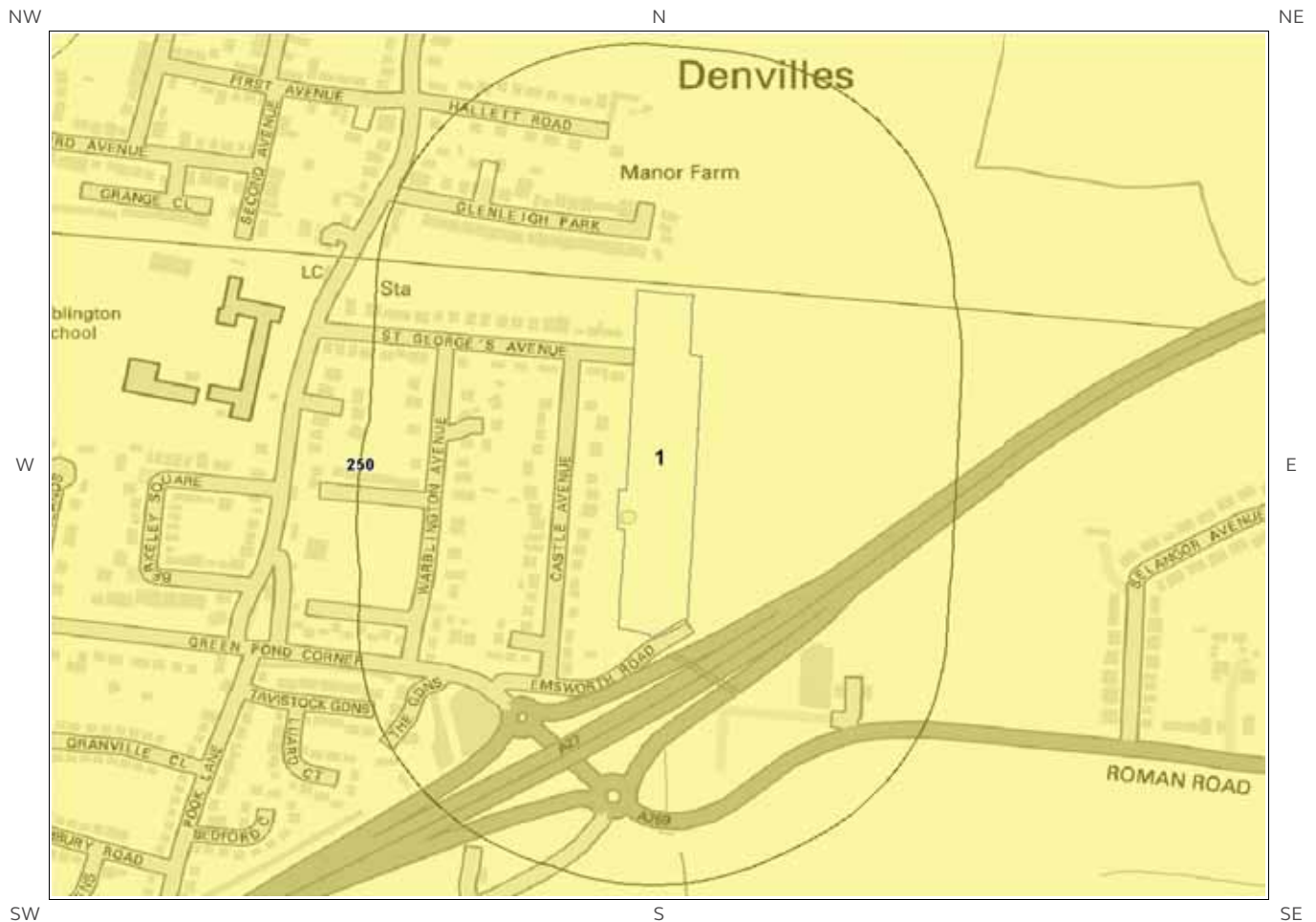


Shrink Swell Clay Legend

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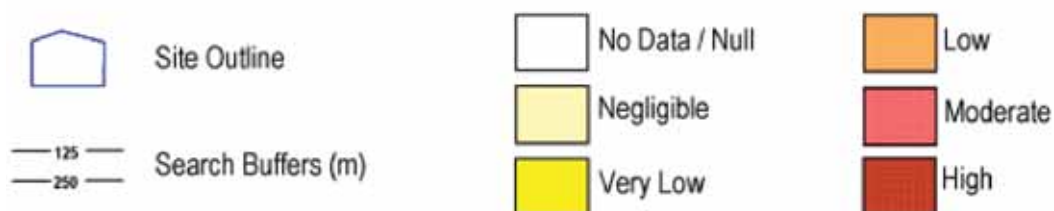


4.2 Landslides Map

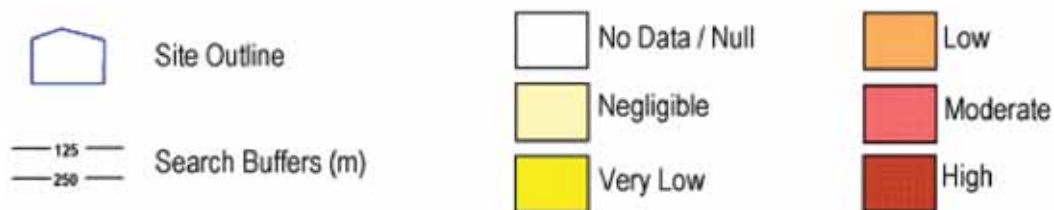
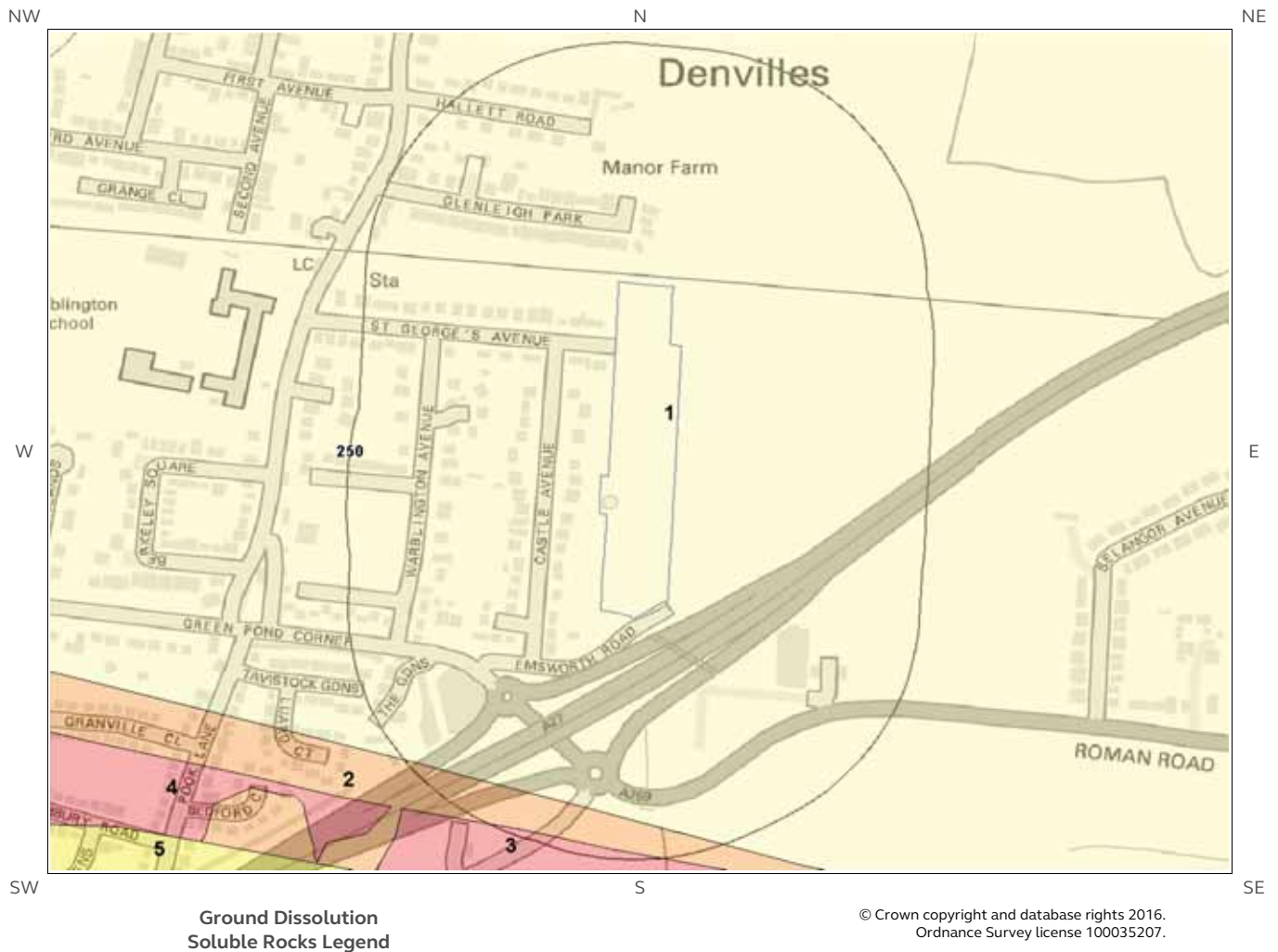


Landslides Legend

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4.3 Ground Dissolution Soluble Rocks Map

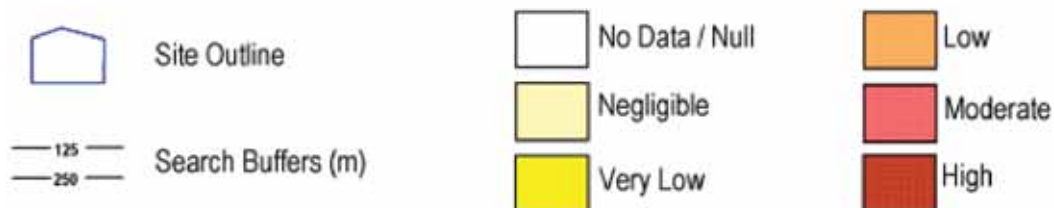


4.4 Compressible Deposits Map



Compressible Deposits Legend

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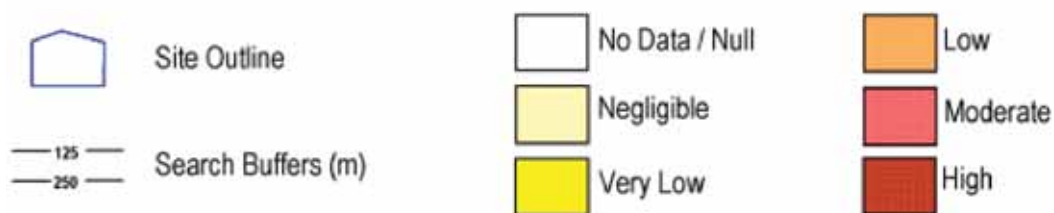


4.5 Collapsible Deposits Map



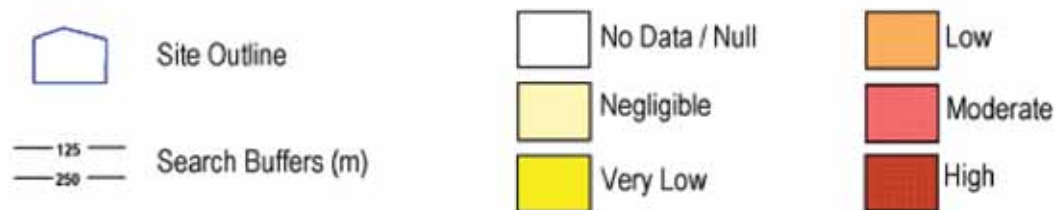
Collapsible Deposits Legend

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A map of the Denvilles area, showing a network of roads and landmarks. The map is oriented with North (N) at the top, South (S) at the bottom, East (E) to the right, and West (W) to the left. The area is bounded by coordinates NW, NE, SE, and SW. Key roads include First Avenue, Second Avenue, Hallett Road, Glenleigh Park, St George's Avenue, Marlborough Avenue, Castle Avenue, Green Pond Corner, Tavistock Gdns, Granville Ct, Brook Lane, Burford Ct, and Roman Road. Landmarks include Manor Farm, Glenleigh Park, and a school (labeled 'blington chool'). Four numbered locations are marked: 1 is at the intersection of Castle Avenue and Marlborough Avenue; 2 is at the intersection of Castle Avenue and Roman Road; 3 is on Castle Avenue; and 4 is on Roman Road. The map also shows a large green area (possibly a park or field) and a large orange area (possibly a residential or commercial zone).

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4 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site** boundary? Moderate

4.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
2	0.0	On Site	Low	Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present.

4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

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

4.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

4.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible ground identified. No special actions required to avoid problems due to compressible ground. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible ground.
2	0.0	On Site	Moderate	Significant potential for compressibility problems. Do not drain, load or de-water ground near the property without technical advice. For new build, consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property, possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

4.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
3	0.0	On Site	Low	Slight possibility for collapsible deposit problems after major changes in loading or groundwater conditions. Normal maintenance to avoid large amounts of water entering the ground through pipe leakage or soak-aways should reduce the likelihood of problems due to collapsible deposits. For new build, assess the possibility of collapsible (loessic) deposits in ground investigation. For existing property, no significant increase in insurance risk from collapsible deposits is likely.

4.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build, consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property, no significant increase in insurance risk due to running sand problems is likely.
3	0.0	On Site	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build, consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property, no significant increase in insurance risk due to running sand problems is likely.

5 Borehole Records Map



Borehole Records Legend

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5 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

25

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	9.0	E	473100 106460	SU70NW198	5.5	DENVILLES SEWERAGE BH3
2	14.0	E	473100 106140	SU70NW209	6.0	DENVILLES SEWERAGE BH6
3	29.0	N	473070 106500	SU70NW199	5.5	DENVILLES SEWERAGE BH4
4	31.0	S	473060 106090	SU70NW277	2.5	A27 HAVANT - CHICHESTER TP401
5	52.0	SE	473110 106090	SU70NW43	1.0	TRIAL PIT 201
6	87.0	SE	473110 106050	SU70NW278	3.0	A27 HAVANT - CHICHESTER TP402
7A	103.0	S	473000 106030	SU70NW296	20.0	A27 HAVANT BY-PASS 187
8	110.0	SE	473120 106030	SU70NW197	5.5	DENVILLES SEWERAGE BH2
9	115.0	S	473020 106010	SU70NW297	15.0	A27 HAVANT BY-PASS 188
10A	115.0	S	472990 106020	SU70NW294	15.0	A27 HAVANT BY-PASS 185
11	134.0	E	473220 106140	SU70NW44	2.0	TRIAL PIT 202
12B	135.0	S	472990 106000	SU70NW298	3.0	A27 HAVANT BY-PASS TP287
13B	140.0	S	473000 105990	SU70NW295	20.0	A27 HAVANT BY-PASS 186
14	141.0	S	472970 106000	SU70NW312	8.0	SOUTH COAST ROAD A27 HAVANT-CHICHESTER 553
15	144.0	SW	472902 106050	SU70NW366	-1.0	SURFACE WATER DRAINAGE SCHEME 4
16C	158.0	SW	472950 105990	SU70NW292	20.0	A27 HAVANT BY-PASS 183
17C	158.0	SW	472950 105990	SU70NW299	2.0	A27 HAVANT BY-PASS TP288
18	172.0	S	472960 105970	SU70NW293	15.0	A27 HAVANT BY-PASS 184
19	176.0	SW	472930 105980	SU70NW290	15.0	A27 HAVANT BY-PASS 181
20	189.0	SW	472940 105960	SU70NW291	20.0	A27 HAVANT BY-PASS 182
21	209.0	SW	472900 105960	SU70NW313	8.0	SOUTH COAST ROAD A27 HAVANT-CHICHESTER 554

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
22	211.0	S	473120 105920	SU70NW208	6.5	DENVILLES SEWERAGE BH5
23	218.0	E	473310 106240	SU70NW305	4.0	SOUTH COAST ROAD A27 HAVANT-CHICHESTER 501
24	225.0	NE	473250 106630	SU70NW327	28.9	HAMPSHIRE RESERVOIRS SITE 20 20/2
25	239.0	E	473330 106500	SU70NW311	6.0	SOUTH COAST ROAD A27 HAVANT-CHICHESTER 507

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

#1: scans.bgs.ac.uk/sobi_scans/boreholes/425580
 #2: scans.bgs.ac.uk/sobi_scans/boreholes/425591
 #3: scans.bgs.ac.uk/sobi_scans/boreholes/425581
 #4: scans.bgs.ac.uk/sobi_scans/boreholes/15624042
 #5: scans.bgs.ac.uk/sobi_scans/boreholes/425425
 #6: scans.bgs.ac.uk/sobi_scans/boreholes/15624043
 #7A: scans.bgs.ac.uk/sobi_scans/boreholes/15624328
 #8: scans.bgs.ac.uk/sobi_scans/boreholes/425579
 #9: scans.bgs.ac.uk/sobi_scans/boreholes/15624329
 #10A: scans.bgs.ac.uk/sobi_scans/boreholes/15624326
 #11: scans.bgs.ac.uk/sobi_scans/boreholes/425426
 #12B: scans.bgs.ac.uk/sobi_scans/boreholes/15624330
 #13B: scans.bgs.ac.uk/sobi_scans/boreholes/15624327
 #14: scans.bgs.ac.uk/sobi_scans/boreholes/15624413
 #16C: scans.bgs.ac.uk/sobi_scans/boreholes/15624324
 #17C: scans.bgs.ac.uk/sobi_scans/boreholes/15624331
 #18: scans.bgs.ac.uk/sobi_scans/boreholes/15624325
 #19: scans.bgs.ac.uk/sobi_scans/boreholes/15624322
 #20: scans.bgs.ac.uk/sobi_scans/boreholes/15624323
 #21: scans.bgs.ac.uk/sobi_scans/boreholes/15624415
 #22: scans.bgs.ac.uk/sobi_scans/boreholes/425590
 #23: scans.bgs.ac.uk/sobi_scans/boreholes/15624403
 #24: scans.bgs.ac.uk/sobi_scans/boreholes/15988292
 #25: scans.bgs.ac.uk/sobi_scans/boreholes/15624411

6 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

31

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
0.0	On Site	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
0.0	On Site	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
19.0	W	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
19.0	W	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	200 - 300 mg/kg
21.0	W	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
21.0	W	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	200 - 300 mg/kg
26.0	N	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
46.0	NW	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
46.0	NW	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
104.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
104.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
109.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
109.0	S	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	200 - 300 mg/kg
110.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
120.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
121.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
121.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
131.0	SW	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
131.0	SW	Sediment	<15 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
141.0	SE	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
141.0	SE	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
160.0	SW	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	200 - 300 mg/kg
192.0	S	Sediment	<15 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
200.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
200.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
237.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
237.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg
237.0	S	Sediment	<15 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	300 - 600 mg/kg
240.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
244.0	S	Sediment	<15 mg/kg	2.2 - 3.0 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	600 - 1200 mg/kg

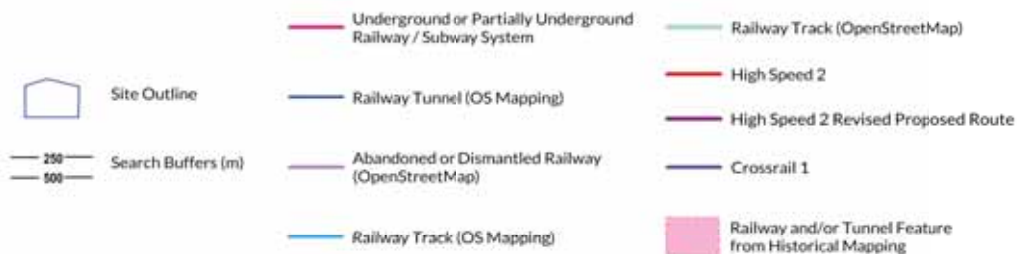
*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

7 Railways and Tunnels Map



Railways and Tunnels Legend

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7 Railways and Tunnels

7.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

7.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

7.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Note: multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels Map.

7.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? Yes

Distance (m)	Direction	Name	Type
9	N	Not given	Multi Track
17	N	West Coastway Line	Rail
20	N	West Coastway Line	Rail

Note: multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels Map.

7.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.

Crossrail route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

Contact Details

emapsite™

EmapSite
Telephone: 0118 9736883
sales@emapsite.com

emapsite™

British Geological Survey Enquiries

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



BGS Geological Hazards Reports and general geological enquiries

British Gypsum

British Gypsum Ltd
East Leake
Loughborough
Leicestershire
LE12 6HX



The Coal Authority

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



Public Health England

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



Johnson Poole & Bloomer Limited

Harris and Pearson Building, Brettell Lane
Brierley Hill, West Midlands
DY5 3LH
Tel: +44 (0) 1384 262 000
Email: enquiries.gs@jpb.co.uk
Website: www.jpb.co.uk



Ordnance Survey

Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505
Website: <http://www.ordnancesurvey.co.uk/>



Getmapping PLC

Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444
Website: <http://www1.getmapping.com/>



Contact Details

emapsite™

Peter Brett Associates

Caversham Bridge House

Waterman Place

Reading

Berkshire RG1 8DN

Tel: +44 (0)118 950 0761 E-mail: reading@pba.co.uk

Website: <http://www.peterbrett.com/home>



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<https://www.groundsure.com/terms-and-conditions-sept-2016/>



EmapSite

Masdar House, 1 Reading Road,
Eversley, RG27 0RP

Groundsure
Reference:

EMS-395709_529351

Your Reference:

EMS_395709_529351

Report Date

1 Dec 2016

Report Delivery
Method:

Email - pdf

Groundsure Enviro Insight

Address: ,

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.

Groundsure Enviroinsight



Groundsure Enviro Insight

Address: ,
Date: 1 Dec 2016
Reference: EMS-395709_529351
Client: EmapSite

NW

N

NE

W

E



SW

S

SE

Aerial Photograph Capture date: 20-Aug-2013
Grid Reference: 473061,106294
Site Size: 2.22ha

Report Reference: EMS-395709_529351
Client Reference: EMS_395709_529351

Contents Page

Contents Page	3
Overview of Findings	6
Using this report	10
1. Historical Land Use	11
1. Historical Industrial Sites	12
1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping	12
1.2 Additional Information – Historical Tank Database	13
1.3 Additional Information – Historical Energy Features Database	13
1.4 Additional Information – Historical Petrol and Fuel Site Database	14
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	14
1.6 Potentially Infilled Land	15
2. Environmental Permits, Incidents and Registers Map	16
2. Environmental Permits, Incidents and Registers	17
2.1 Industrial Sites Holding Licences and/or Authorisations	17
2.1.1 Records of historic IPC Authorisations within 500m of the study site	17
2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site	17
2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site	17
2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site	17
2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site	17
2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site	18
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	18
2.1.8 Records of Licensed Discharge Consents within 500m of the study site	18
2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site	18
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	18
2.2 Dangerous or Hazardous Sites	18
2.3 Environment Agency Recorded Pollution Incidents	19
2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site	19
2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site	19
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	19
3. Landfill and Other Waste Sites Map	20
3. Landfill and Other Waste Sites	21
3.1 Landfill Sites	21
3.1.1 Records from Environment Agency landfill data within 1000m of the study site	21
3.1.2 Records of Environment Agency historic landfill sites within 1500m of the study site	21
3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site	21
3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site	21
3.2 Other Waste Sites	21
3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site	21
3.2.2 Records of Environment Agency licensed waste sites within 1500m of the study site	22
4. Current Land Use Map	23
4. Current Land Uses	24
4.1 Current Industrial Data	24
4.2 Petrol and Fuel Sites	24
4.3 National Grid High Voltage Underground Electricity Transmission Cables	25
4.4 National Grid High Pressure Gas Transmission Pipelines	25
5. Geology	26
5.1 Artificial Ground and Made Ground	26

5.2 Superficial Ground and Drift Geology	26
5.3 Bedrock and Solid Geology	26
6 Hydrogeology and Hydrology	27
6a. Aquifer Within Superficial Geology	27
6b. Aquifer Within Bedrock Geology and Abstraction Licenses	28
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses	29
6d. Hydrogeology – Source Protection Zones within confined aquifer	30
6e. Hydrology – Detailed River Network and River Quality	31
6. Hydrogeology and Hydrology	32
6.1 Aquifer within Superficial Deposits.....	32
6.2 Aquifer within Bedrock Deposits.....	32
6.3 Groundwater Abstraction Licences.....	32
6.4 Surface Water Abstraction Licences.....	33
6.5 Potable Water Abstraction Licences.....	33
6.6 Source Protection Zones.....	33
6.7 Source Protection Zones within Confined Aquifer.....	33
6.8 Groundwater Vulnerability and Soil Leaching Potential.....	34
6.9 River Quality.....	34
6.9.1 Biological Quality:.....	34
6.9.2 Chemical Quality:.....	35
6.10 Detailed River Network.....	35
6.11 Surface Water Features.....	36
7a. Environment Agency Flood Map for Planning (from rivers and the sea)	37
7b. Environment Agency Risk of Flooding from Rivers and the Sea (RoFRaS) Map	38
7 Flooding	39
7.1 River and Coastal Zone 2 Flooding.....	39
7.2 River and Coastal Zone 3 Flooding.....	39
7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating.....	39
7.4 Flood Defences.....	39
7.5 Areas benefiting from Flood Defences.....	39
7.6 Areas benefiting from Flood Storage.....	40
7.7 Groundwater Flooding Susceptibility Areas.....	40
7.7.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site? Yes.....	40
7.7.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?.....	40
7.8 Groundwater Flooding Confidence Areas.....	40
8. Designated Environmentally Sensitive Sites Map	41
8. Designated Environmentally Sensitive Sites	42
8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:.....	42
8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:.....	42
8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:.....	42
8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:.....	43
8.5 Records of Ramsar sites within 2000m of the study site:.....	43
8.6 Records of Ancient Woodland within 2000m of the study site:	43
8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:.....	43
8.8 Records of World Heritage Sites within 2000m of the study site:.....	44
8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:	44
8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:	44
8.11 Records of National Parks (NP) within 2000m of the study site:	44
8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:.....	44
8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:.....	45

8.14 Records of Green Belt land within 2000m of the study site:.....	45
9. Natural Hazards Findings.....	46
9.1 Detailed BGS GeoSure Data.....	46
9.1.1 Shrink Swell.....	46
9.1.2 Landslides.....	46
9.1.3 Soluble Rocks.....	46
9.1.4 Compressible Ground.....	47
9.1.5 Collapsible Rocks.....	47
9.1.6 Running Sand.....	47
9.2 Radon.....	47
9.2.1 Radon Affected Areas.....	47
9.2.2 Radon Protection.....	48
10. Mining.....	49
10.1 Coal Mining.....	49
10.2 Non-Coal Mining.....	49
10.3 Brine Affected Areas	49
Contact Details.....	50
Standard Terms and Conditions.....	52

Overview of Findings

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

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	3	0	9	34
1.2 Additional Information – Historical Tank Database	0	0	1	9
1.3 Additional Information – Historical Energy Features Database	0	0	6	17
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	0	0
1.6 Potentially Infilled Land	4	0	3	29

Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	0	0	0
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHS sites	0	0	0	0
2.3 Environment Agency Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	1	0
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency Historic Landfill Sites	0	0	0	0	0	0
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency Licensed Waste Sites	0	0	0	0	2	0

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	1	7	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	0	0
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?	No
5.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	Yes
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology	0-500m					
6.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?	Yes					
6.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?	Yes					
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.6 Source Protection Zones (within 500m of the study site)	0	0	1	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	1	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	1	1	2	Not searched	Not searched
	On-site	0-50m	51-250	251-500	501-1000	1000-1500

Section 6: Hydrogeology and Hydrology

0-500m

6.9 Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	Yes	Yes
6.10 Detailed River Network entries within 500m of the site	0	0	2	7	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	No	Yes	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Are there any Environment Agency Zone 2 floodplains within 250m of the study site?	No
7.2 Are there any Environment Agency Zone 3 floodplains within 250m of the study site	No
7.3 What is the Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site?	Very Low
7.4 Are there any Flood Defences within 250m of the study site?	No
7.5 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
7.6 Are there any areas used for Flood Storage within 250m of the study site?	No
7.7 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Potential at Surface
7.8 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Moderate

Section 8: Designated Environmentally Sensitive Sites

On-site 0-50m 51-250 251-500 501-1000 1000-2000

8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	2	3
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	1	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	1	1
8.5 Records of Ramsar sites	0	0	0	0	1	1
8.6 Records of Ancient Woodlands	0	0	0	0	0	1
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	3
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	1	0	0	0

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	2	0	0	0	0	0
8.14 Records of Green Belt land	0	0	0	0	0	0

Section 9: Natural Hazards	
9.1 What is the maximum risk of natural ground subsidence?	Moderate
9.1.1 What is the maximum Shrink-Swell hazard rating identified on the study site?	Low
9.1.2 What is the maximum Landslides hazard rating identified on the study site?	Very Low
9.1.3 What is the maximum Soluble Rocks hazard rating identified on the study site?	Negligible
9.1.4 What is the maximum Compressible Ground hazard rating identified on the study site?	Moderate
9.1.5 What is the maximum Collapsible Rocks hazard rating identified on the study site?	Low
9.1.6 What is the maximum Running Sand hazard rating identified on the study site?	Low
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining	
10.1 Are there any coal mining areas within 75m of the study site?	No
10.2 Are there any Non-Coal Mining areas within 50m of the study site boundary?	No
10.3 Are there any brine affected areas within 75m of the study site?	No

Using this report

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

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

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

3. Landfills and Other Waste Sites

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

4. Current Land Uses

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

5. Geology

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

6. Hydrogeology and Hydrology

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

7. Flooding

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

8. Designated Environmentally Sensitive Sites

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

9. Natural Hazards

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

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

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

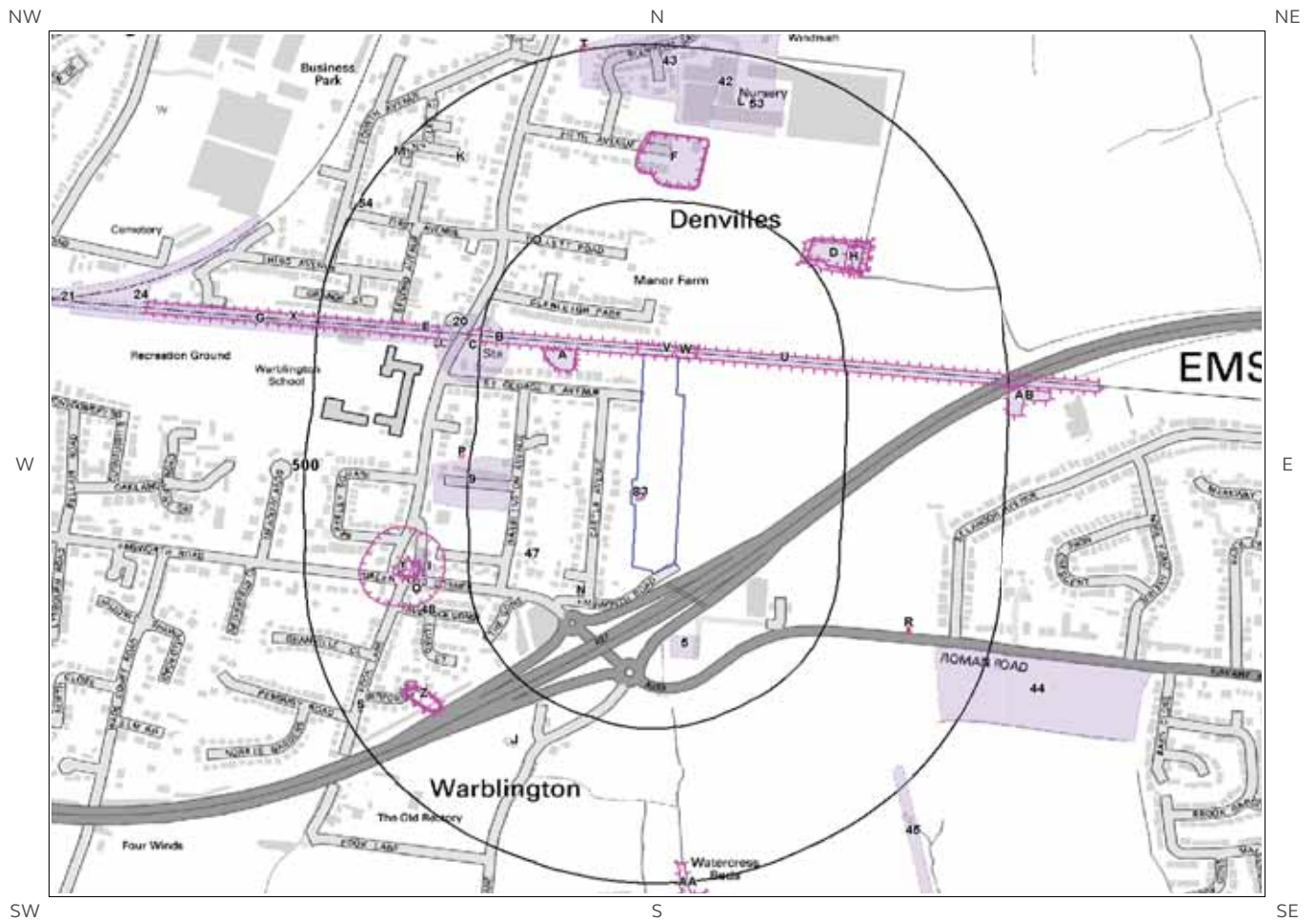
Note: Maps

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

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

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

1. Historical Land Use



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Historical 1:10,000 and 1:10,560 scale mapping



Site Outline



Industrial Land Use



Potentially Infilled Land

Historical 1:2,500, 1:1,250 and 1:500 scale mapping



Search Buffers (m)



Energy Features



Petrol Stations



Tanks



Garages

1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 46

ID	Distance [m]	Direction	Use	Date
1U	0	On Site	Cuttings	1866
2V	0	On Site	Cuttings	1914
3W	0	On Site	Cuttings	1907
4A	102	W	Clay Pit	1907
5	103	S	Gas Valve Compound	1991
6A	104	W	Clay Pit	1914
7B	176	W	Railway Station	1931
8B	176	W	Railway Station	1931
9	187	W	Nursery	1963
10C	206	W	Railway Station	1991
11C	206	W	Railway Station	1973
12D	240	NE	Brick Field	1896
13D	251	NE	Brick Field	1898
14D	251	NE	Brick Field	1898
15D	252	NE	Brick Field	1895
16F	272	N	Clay Pit	1914
17E	274	W	Railway Sidings	1907
18E	274	W	Railway Sidings	1938
19F	275	N	Clay Pit	1907
20	278	W	Railway Building	1931
21	285	W	Railway Sidings	1932
22H	288	NE	Clay Pit	1896
23G	289	W	Railway Sidings	1963
24	292	W	Railway Sidings	1931
25G	296	W	Railway Sidings	1914
26H	299	NE	Clay Pit	1898
27H	299	NE	Clay Pit	1898
28G	299	W	Railway Sidings	1931
29G	299	W	Railway Sidings	1931
30I	300	W	Smithy	1896
31H	301	NE	Clay Pit	1895
32I	310	W	Smithy	1907
33I	312	W	Smithy	1914
34X	313	W	Cuttings	1866

35I	313	W	Smithy	1898
36I	320	W	Smithy	1896
37J	330	SW	Unspecified Tank	1907
38J	330	SW	Unspecified Tank	1931
39J	330	SW	Unspecified Tank	1942
40J	333	SW	Unspecified Tank	1914
41J	333	SW	Unspecified Tank	1932
42	374	N	Nursery	1973
43	376	N	Nursery	1963
44	416	E	Nursery	1896
45	470	SE	Rifle Range	1866
46AB	498	E	Disused Clay Pit	1963

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary:

10

ID	Distance (m)	Direction	Use	Date
47	149	W	Unspecified Tank	1869
48	316	W	Unspecified Tank	1952
49L	416	N	Unspecified Tank	1993
50K	416	NW	Unspecified Tank	1940
51K	416	NW	Unspecified Tank	1932
52L	418	N	Unspecified Tank	1993
53	418	N	Unspecified Tank	1978
54	485	NW	Unspecified Tank	1909
55M	489	NW	Unspecified Tank	1963
56M	489	NW	Unspecified Tank	1962

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary:

23

ID	Distance (m)	Direction	Use	Date
57N	83	SW	Electricity Substation	1971
58N	83	SW	Electricity Substation	1993

59N	84	SW	Electricity Substation	1989
60O	239	NW	Electricity Substation	1993
61O	239	NW	Electricity Substation	1971
62O	240	NW	Electricity Substation	1984
63P	258	W	Electricity Substation	1952
64P	260	W	Electricity Substation	1993
65P	260	W	Electricity Substation	1989
66Q	328	W	Electricity Substation	1971
67Q	329	W	Electricity Substation	1993
68Q	330	W	Electricity Substation	1989
69R	366	E	Electricity Substation	1989
70R	367	E	Electricity Substation	1993
71R	367	E	Electricity Substation	1978
72R	368	E	Electricity Substation	1973
73S	471	SW	Electricity Substation	1972
74S	471	SW	Electricity Substation	1971
75S	472	SW	Electricity Substation	1993
76S	472	SW	Electricity Substation	1989
77T	498	N	Electricity Substation	1993
78T	499	N	Electricity Substation	1971
79T	499	N	Electricity Substation	1984

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 0

Database searched and no data found.

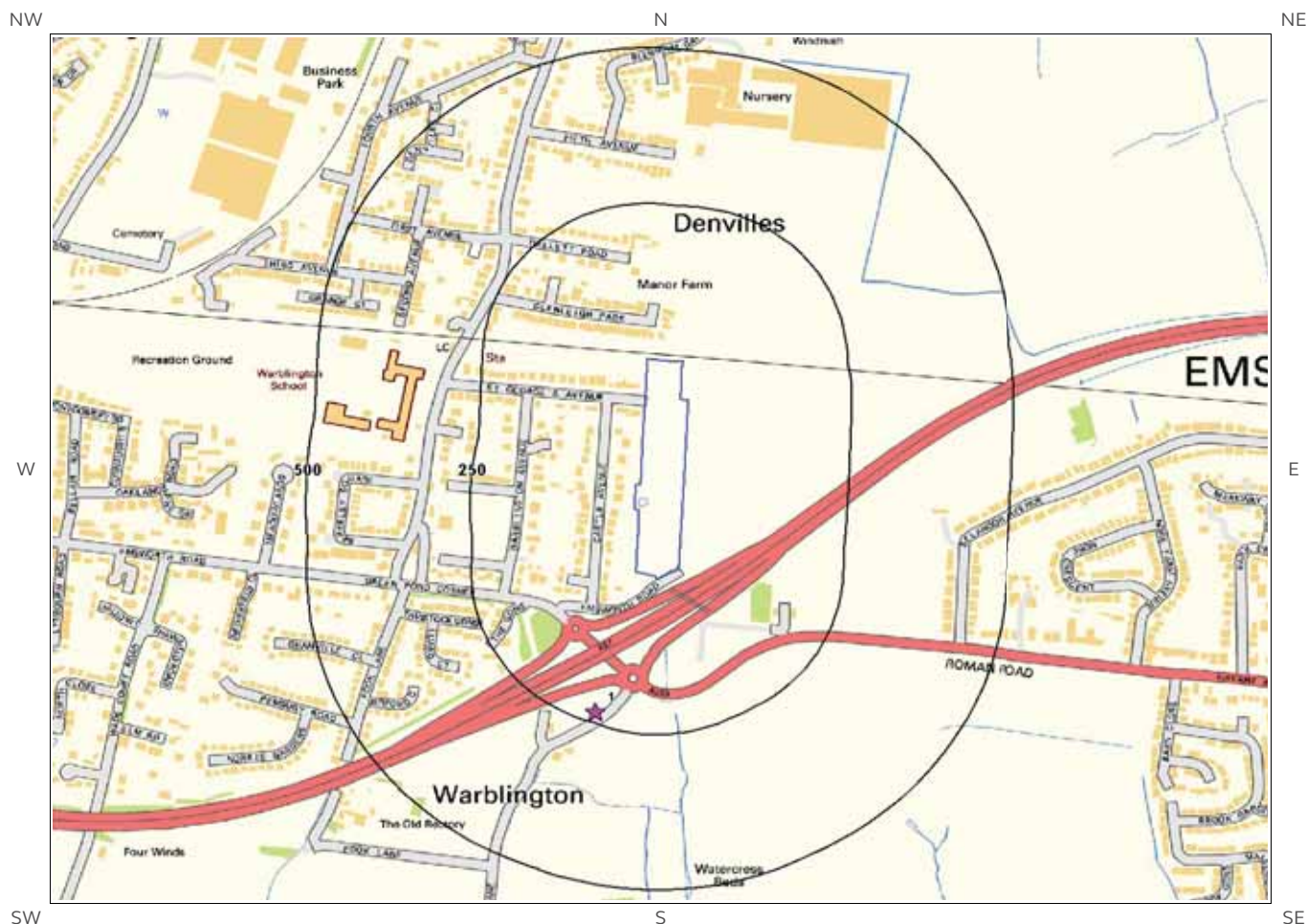
1.6 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 36

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
80U	0	On Site	Cuttings	1866
81V	0	On Site	Cuttings	1914
82W	0	On Site	Cuttings	1907
83	0	On Site	Pond	1942
84A	102	W	Clay Pit	1907
85A	104	W	Clay Pit	1914
86D	240	NE	Brick Field	1896
87D	251	NE	Brick Field	1898
88D	251	NE	Brick Field	1898
89D	252	NE	Brick Field	1895
90F	272	N	Clay Pit	1914
91F	275	N	Clay Pit	1907
92Y	286	W	Pond	1896
93H	288	NE	Clay Pit	1896
94H	299	NE	Clay Pit	1898
95H	299	NE	Clay Pit	1898
96H	301	NE	Clay Pit	1895
97X	313	W	Cuttings	1866
98Y	323	W	Pond	1866
99Y	324	W	Pond	1896
100Y	327	W	Pond	1907
101Y	336	W	Pond	1914
102Z	365	SW	Pond	1931
103Z	365	SW	Pond	1898
104Z	365	SW	Pond	1896
105Z	365	SW	Pond	1907
106Z	365	SW	Pond	1942
107Z	365	SW	Pond	1866
108Z	365	SW	Pond	1931
109Z	368	SW	Pond	1932
110Z	368	SW	Pond	1914
111Z	368	SW	Pond	1963
112AA	469	S	Ponds	1963
113AA	469	S	Ponds	1973
114AA	469	S	Ponds	1991
115AB	498	E	Disused Clay Pit	1963

2. Environmental Permits, Incidents and Registers Map



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- | | | |
|-----------------------------|---------------------------------------|--|
| Site Outline | Recorded Pollution Incident | RAS 3 & 4 Authorisations |
| Search Buffers (m) | Dangerous Substances (List 1) | Part A(1) Authorised Processes and Historic IPC Authorisations |
| 250 | Dangerous Substances (List 2) | Part A(2) and Part B Authorised Processes |
| 500 | Water Industry Referrals | COMAH / NIHHS Sites |
| Licenced Discharge Consents | Sites Determined as Contaminated Land | Hazardous Substance Consents and Enforcements |
| Red List Discharge Consents | | |

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

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

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

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

0

Database searched and no data found.

2.3 Environment Agency Recorded Pollution Incidents

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

1

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

ID	Distance (m)	Direction	NGR	Details
1	233	S	472958 105907	Incident Date: 13-Feb-2003 Incident Identification: 136757 Pollutant: Specific Waste Materials Pollutant Description: Containers Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

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

0

Database searched and no data found.

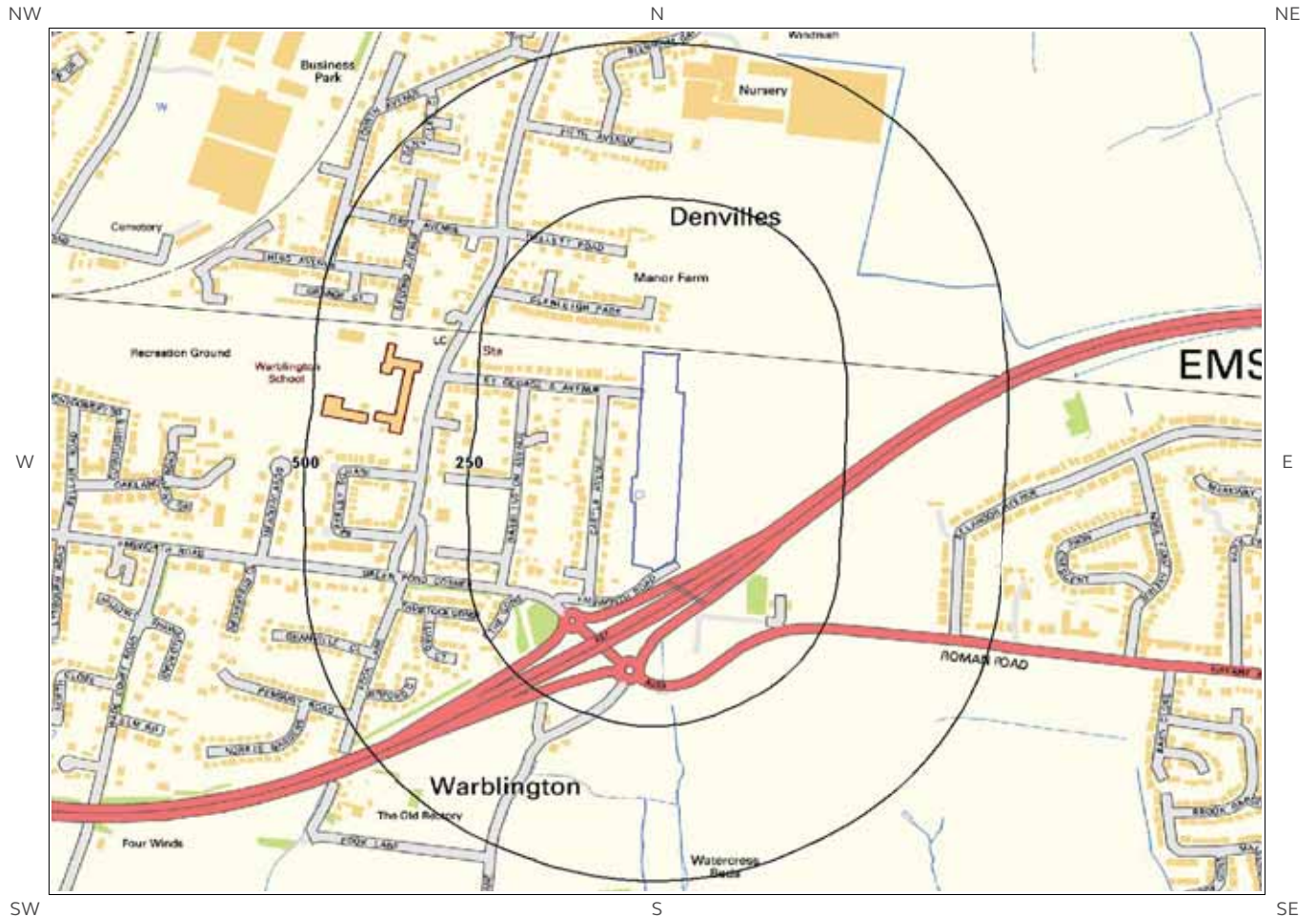
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

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

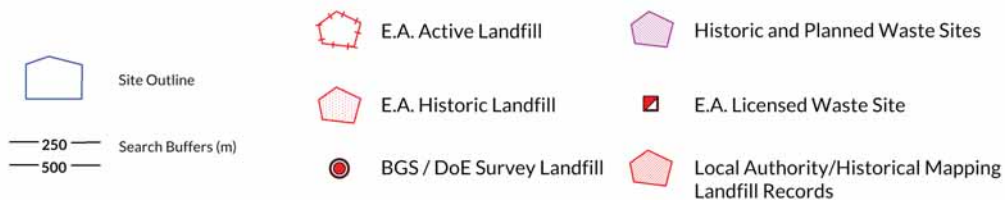
0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



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3. Landfill and Other Waste Sites

3.1 Landfill Sites

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

3.2 Other Waste Sites

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

0

Database searched and no data found.

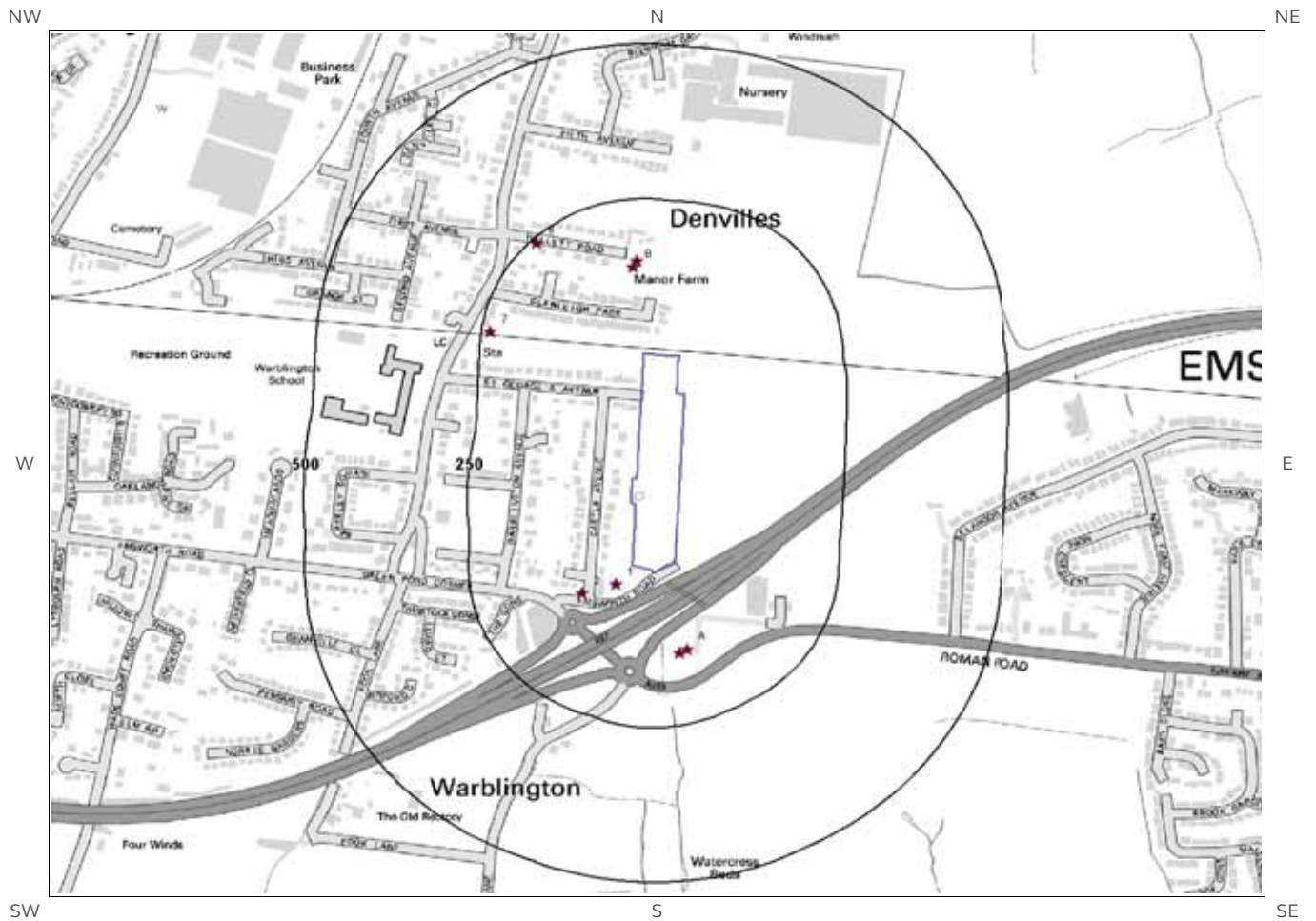
3.2.2 Records of Environment Agency licensed waste sites within 1500m of the study site:

2

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

ID	Distance (m)	Direction	NGR	Details
Not shown	883	NW	472550 107210	Site Address: 32, New Lane, Havant, Hampshire, PO9 2NG Type: In-House Storage Facility Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: WYE001 EPR reference: EA/EPR/WP3692HF/V002 Operator: John Wyeth And Brother Ltd Waste Management licence No: 19987 Annual Tonnage: 2499.0 Issue Date: 13/09/1991 Effective Date: - Modified: 11/06/2001 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Storage At Wyeth Labs Correspondence Address: -
Not shown	918	W	472130 106610	Site Address: 8, New Lane, Havant, Hampshire, PO9 2JH Type: Household, Commercial & Industrial Waste T Stn Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: WES001 EPR reference: EA/EPR/WP3292HL/A001 Operator: Wessex Construction And Plant Ltd Waste Management licence No: 19986 Annual Tonnage: 75000.0 Issue Date: 05/12/1991 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: Transfer Station At New Lane Correspondence Address: -

4. Current Land Use Map



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4. Current Land Uses

4.1 Current Industrial Data

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

8

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

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	38	SW	Scuffmaster	472996 106102	2 Farm Cottages, Emsworth Road, Havant, PO9 2SA	Vehicle Repair, Testing and Servicing	Repair and Servicing
2	88	SW	Electricity Sub Station	472944 106088	PO9	Electrical Features	Infrastructure and Facilities
3A	133	S	Gas Valve Compound	473104 105997	PO9	Gas Features	Infrastructure and Facilities
4A	135	S	Gas Valve Compound	473093 105991	PO9	Gas Features	Infrastructure and Facilities
5B	142	N	Stride Bros	473022 106614	19, Hallett Road, Havant, PO9 2PJ	Fruit, Flower and Vegetable Growers	Farming
6B	150	N	Electricity Sub Station	473027 106624	PO9	Electrical Features	Infrastructure and Facilities
7	238	W	Warblington Rail Station	472803 106510	PO9	Railway Stations, Junctions and Halts	Public Transport, Stations and Infrastructure
8	243	NW	Electricity Sub Station	472875 106654	PO9	Electrical Features	Infrastructure and Facilities

4.2 Petrol and Fuel Sites

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

0

Database searched and no data found.

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site:

0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site:

0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

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

5.2 Superficial Ground and Drift Geology

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

Lex Code	Description	Rock Type
RTDU	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED)	SAND, SILT AND CLAY [UNLITHIFIED DEPOSITS CODING SCHEME]
ALV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL [UNLITHIFIED DEPOSITS CODING SCHEME]
HEAD	HEAD	GRAVEL, CLAYEY [UNLITHIFIED DEPOSITS CODING SCHEME]

5.3 Bedrock and Solid Geology

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

Lex Code	Description	Rock Type
LC-CLSISA	LONDON CLAY FORMATION	CLAY, SILT AND SAND

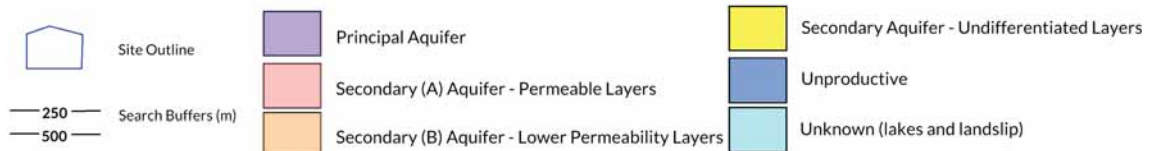
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

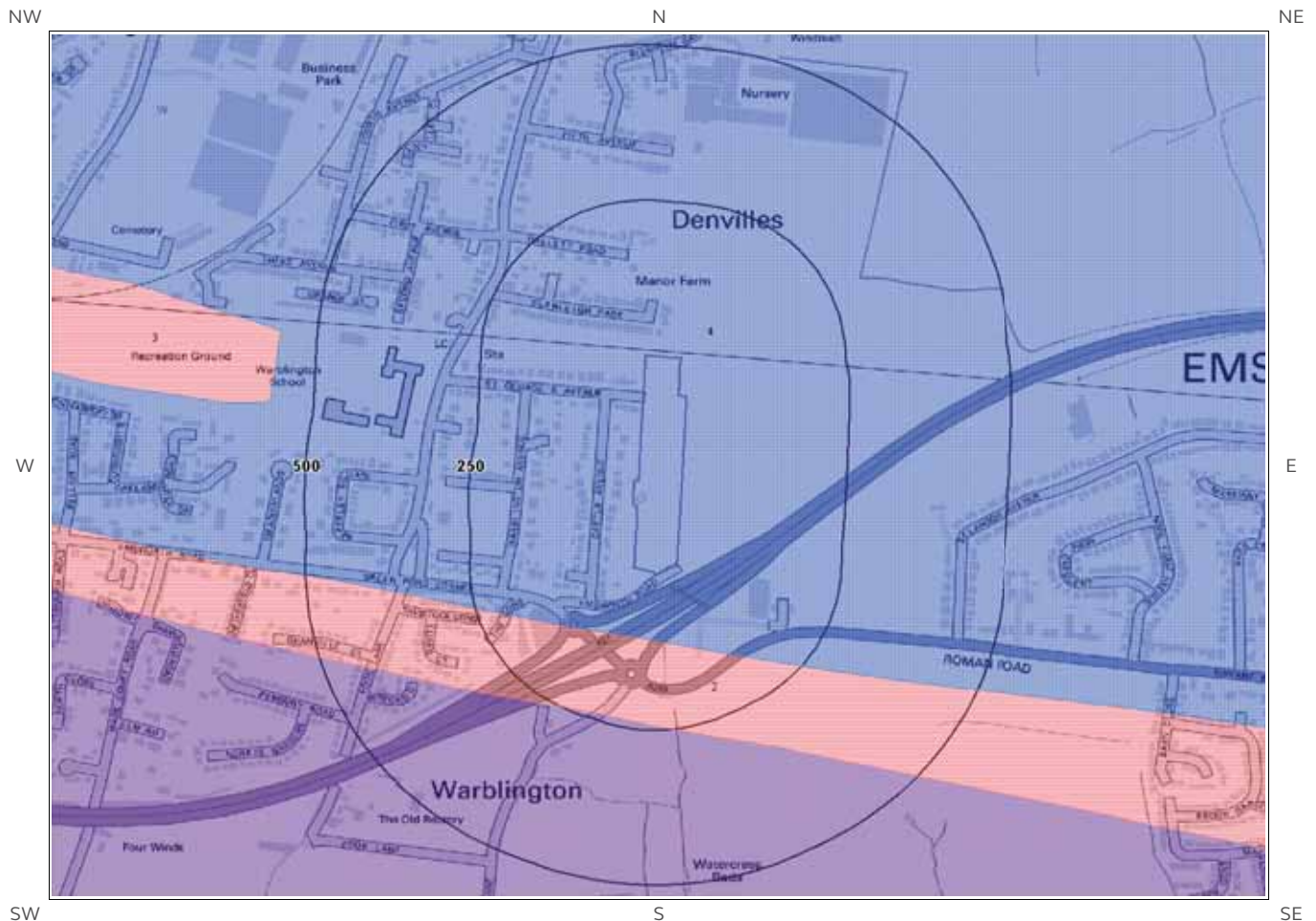
6a. Aquifer Within Superficial Geology



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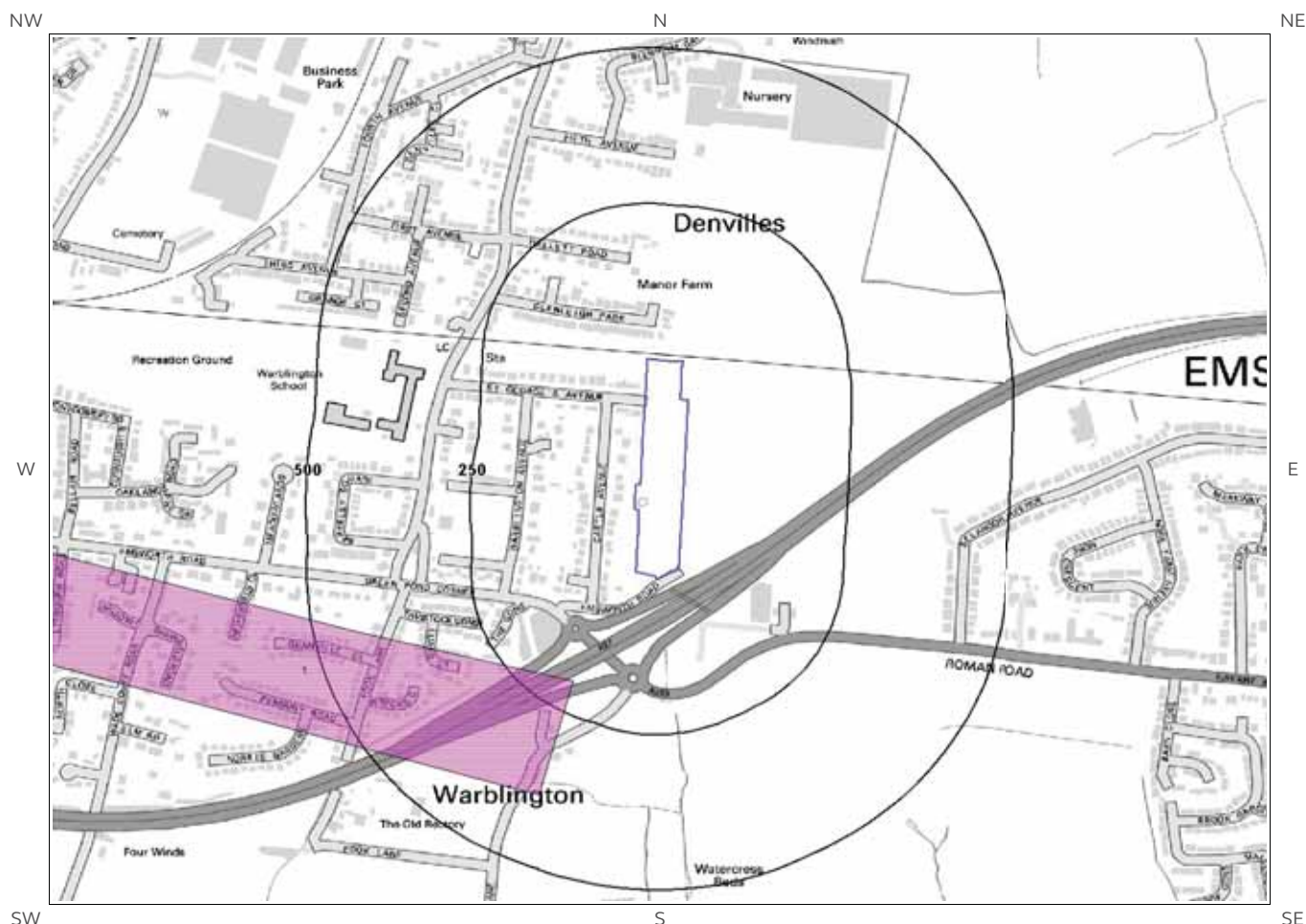
6b. Aquifer Within Bedrock Geology and Abstraction Licenses



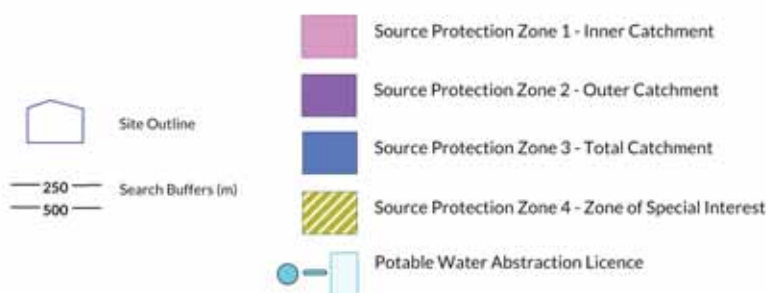
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6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



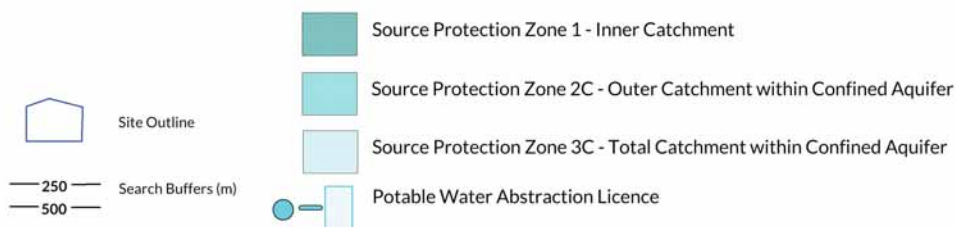
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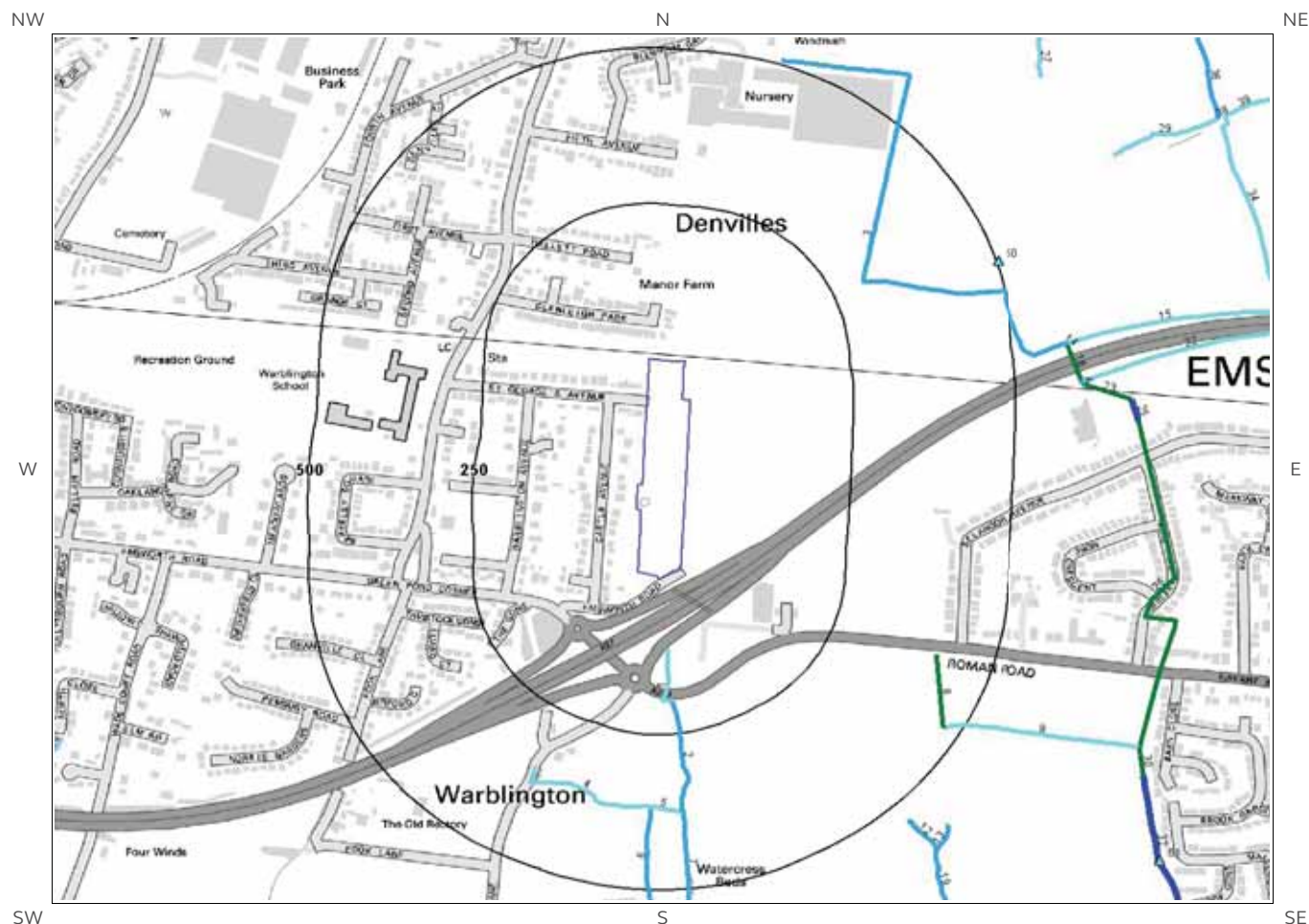
6d. Hydrogeology – Source Protection Zones within confined aquifer



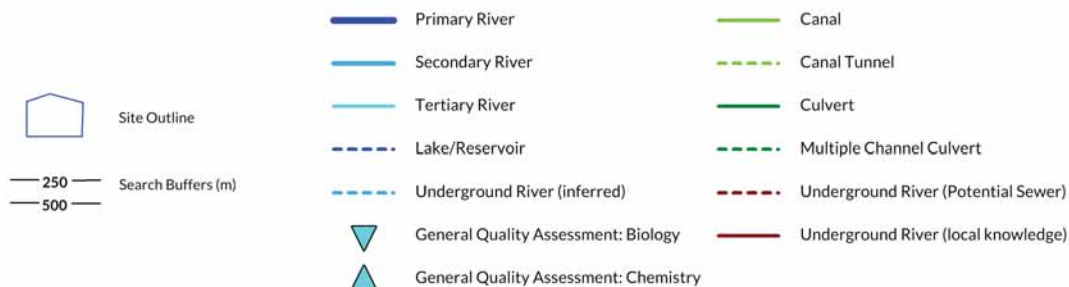
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6e. Hydrology – Detailed River Network and River Quality



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6. Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

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

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

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	344	S	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

6.2 Aquifer within Bedrock Deposits

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

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

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
4	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
2	104	S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
1	237	S	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

6.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site? No

Database searched and no data found.

6.4 Surface Water Abstraction Licences

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

No

Database searched and no data found.

6.5 Potable Water Abstraction Licences

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

No

Database searched and no data found.

6.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site?

Yes

The following Source Protection Zones records are represented on the SPZ and Potable Water Abstraction Map (6c):

ID	Distance (m)	Direction	Zone	Description
1	199	SW	1	Inner catchment

6.7 Source Protection Zones within Confined Aquifer

Are there any Source Protection Zones within the Confined Aquifer within 500m of the study site?

Yes

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

The following Source Protection Zones records are represented on the SPZ within Confined Aquifer and Potable Water Abstraction Map(6d):

ID	Distance	Direction	Type	Description
1	0	On Site	1c	Inner catchment within confined aquifer

6.8 Groundwater Vulnerability and Soil Leaching Potential

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

Yes

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Minor Aquifer/Intermediate Leaching Potential	I1	Soils which can possibly transmit a wide range of pollutants.
19	W	Minor Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.
70	S	Minor Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.
328	E	Minor Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.
455	S	Minor Aquifer/Intermediate Leaching Potential	I1	Soils which can possibly transmit a wide range of pollutants.

6.9 River Quality

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

Yes

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

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

The following Chemical Quality records are shown on the Hydrology Map (6e):

ID	Distance (m)	Direction	NGR	River Quality Grade	Chemical Quality Grade				
					2005	2006	2007	2008	2009
50	503	E	473570 106630	River Name: Warblington Stream - No.1 Reach: Tidal Limit - Source End/Start of Stretch: Start of Stretch NGR	D	C	C	C	C
51	870	SE	473817 105665	River Name: Warblington Stream - No.1 Reach: Tidal Limit - Source End/Start of Stretch: Sample Point NGR	D	C	C	C	C
Not shown	1132	SE	473920 105370	River Name: Warblington Stream - No.1 Reach: Tidal Limit - Source End/Start of Stretch: End of Stretch NGR	D	C	C	C	C

6.10 Detailed River Network

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

The following Detailed River Network records are represented on the Hydrology Map (6e):

ID	Distance (m)	Direction	Details	
1	112	S	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
2	198	S	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
3	300	NE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
4	348	SW	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
5	365	S	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
6	366	S	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
7	377	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
8	412	E	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details
9	474	SE	River Name: Drain Welsh River Name: - Alternative Name: - River Type: Tertiary River Main River Status: Currently Undefined

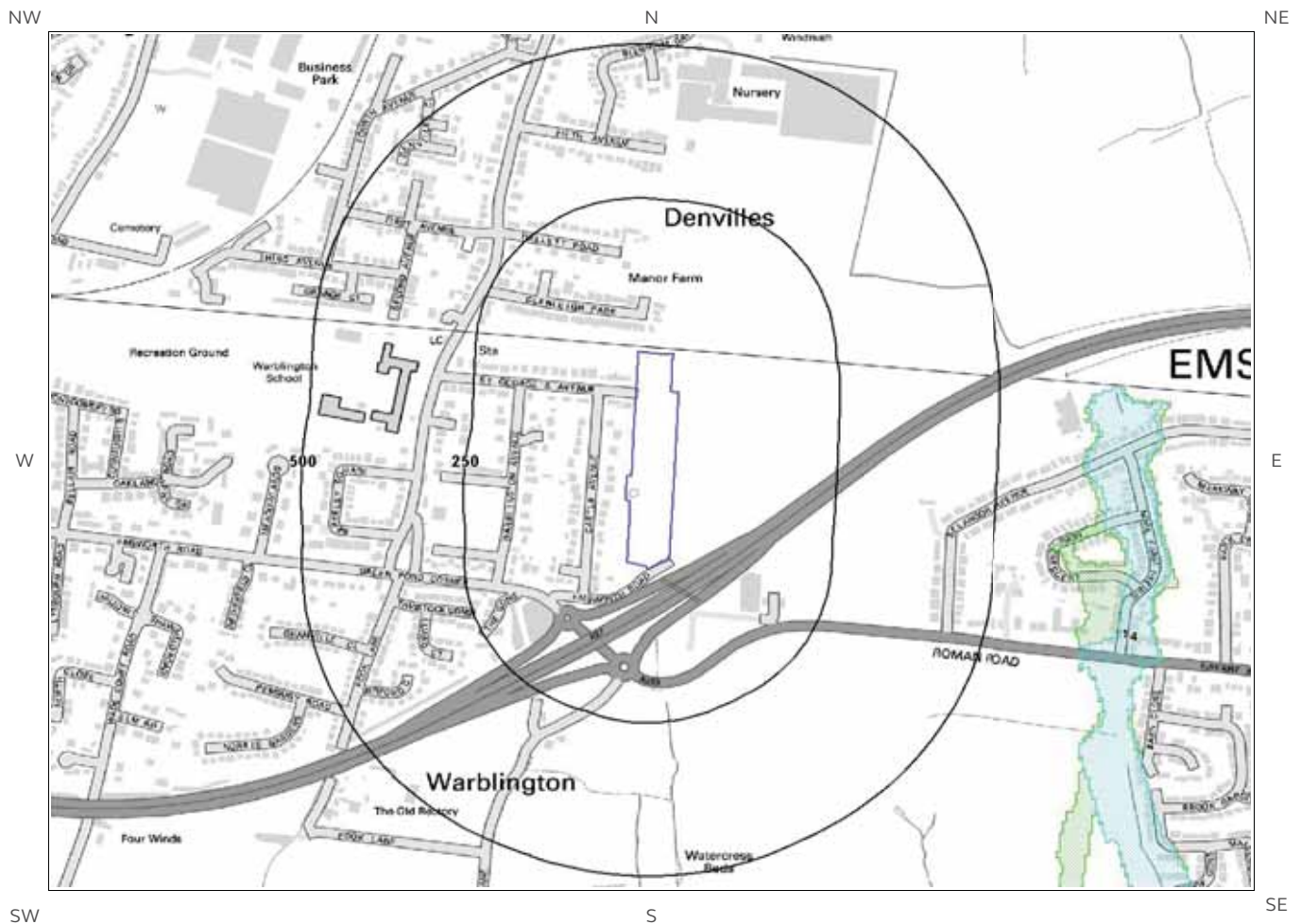
6.11 Surface Water Features

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

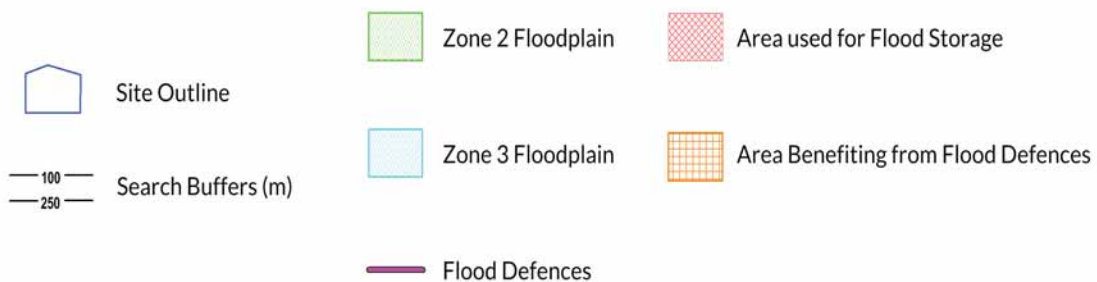
The following surface water records are not represented on mapping:

Distance (m)	Direction
112	S
193	S
217	S

7a. Environment Agency Flood Map for Planning (from rivers and the sea)



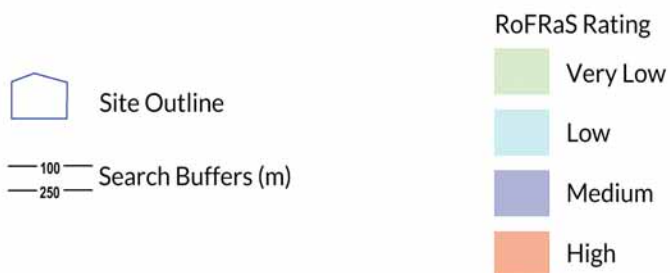
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7b. Environment Agency Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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7 Flooding

7.1 River and Coastal Zone 2 Flooding

Is the site within 250m of an Environment Agency Zone 2 floodplain? No

Environment Agency Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

Database searched and no data found.

7.2 River and Coastal Zone 3 Flooding

Is the site within 250m of an Environment Agency Zone 3 floodplain? No

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

Database searched and no data found.

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

What is the highest risk of flooding onsite? Very Low

The Environment Agency RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

Are there any Flood Defences within 250m of the study site? No
Database searched and no data found.

7.5 Areas benefiting from Flood Defences

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

7.6 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site?

No

7.7 Groundwater Flooding Susceptibility Areas

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

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

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

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

Potential at Surface

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

7.8 Groundwater Flooding Confidence Areas

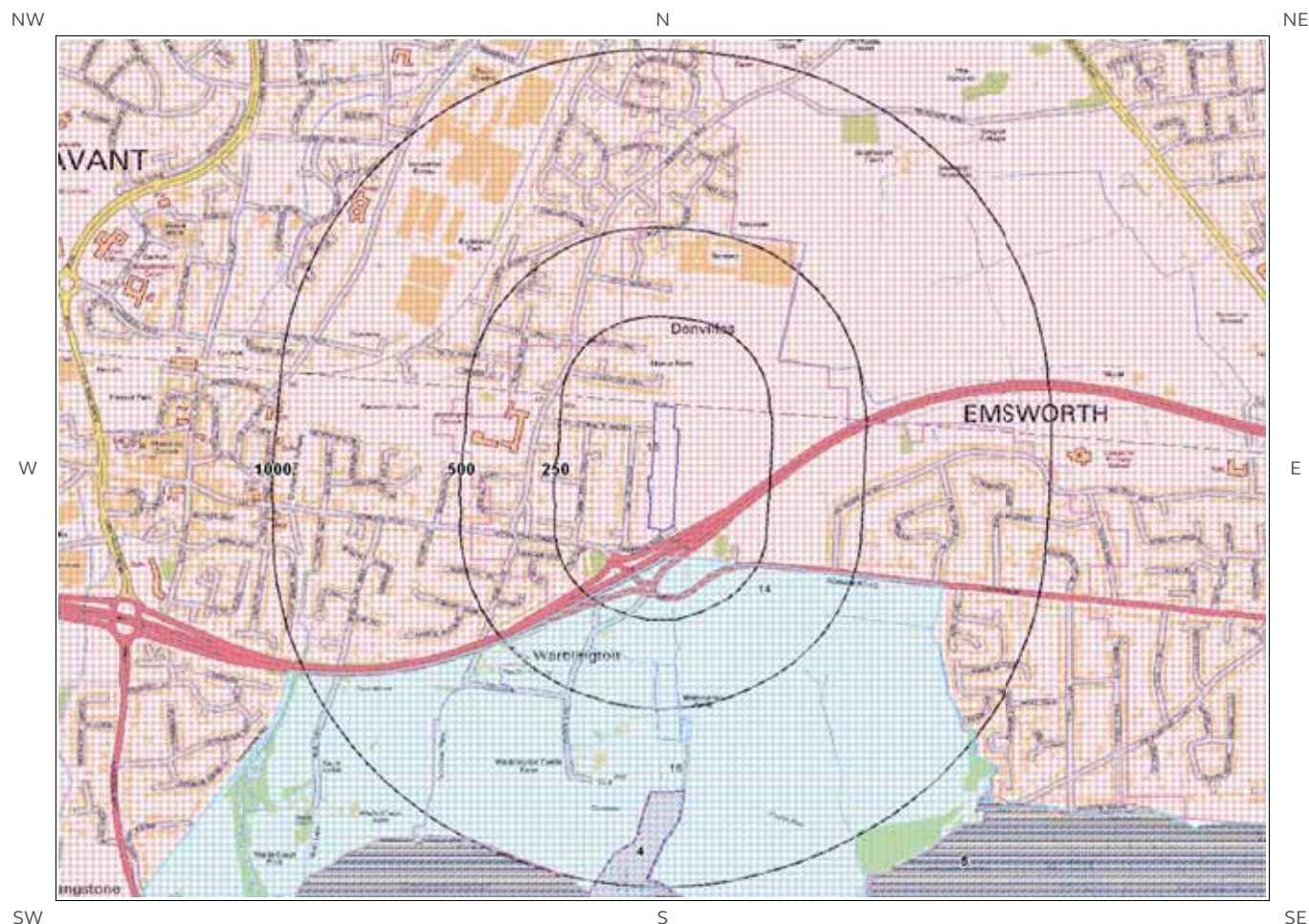
What is the British Geological Survey confidence rating in this result?

Moderate

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

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

8. Designated Environmentally Sensitive Sites Map



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8. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site?

Yes

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

5

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

ID	Distance (m)	Direction	SSSI Name	Data Source
4	732	S	Warblington Meadow	Natural England
5	995	SW	Chichester Harbour	Natural England
Not shown	1393	S	Chichester Harbour	Natural England
Not shown	1880	SW	Langstone Harbour	Natural England
Not shown	1966	SW	Langstone Harbour	Natural England

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

0

Database searched and no data found.

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

1

The following Special Area of Conservation (SAC) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	SAC Name	Data Source
1	995	SW	Solent Maritime	Natural England

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

2

The following Special Protection Area (SPA) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	SPA Name	Data Source
2A	995	SW	Chichester and Langstone Harbours	Natural England
Not shown	1880	SW	Chichester and Langstone Harbours	Natural England

8.5 Records of Ramsar sites within 2000m of the study site:

2

The following Ramsar records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ramsar Site Name	Ramsar Site Status	Data Source
9A	995	SW	Chichester and Langstone Harbours	Listed	Natural England
Not shown	1880	SW	Chichester and Langstone Harbours	Listed	Natural England

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

1

The following records of Designated Ancient Woodland provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
Not shown	1647	N	UNKNOWN	Ancient and Semi-Natural Woodland

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

3

The following Local Nature Reserve (LNR) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	LNR Name	Data Source
Not shown	1888	E	Brook Meadow (Emsworth)	Natural England

ID	Distance (m)	Direction	LNR Name	Data Source
Not shown	1928	E	Brook Meadow (Emsworth)	Natural England
Not shown	1939	E	Brook Meadow (Emsworth)	Natural England

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

1

The following Area of Outstanding Natural Beauty (AONB) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	AONB/NSA Name	Data Source
16	72	S	Chichester Harbour	Natural England

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

2

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
14	0	On Site	Existing	DEFRA
15	0	On Site	Existing	DEFRA

8.14 Records of Green Belt land within 2000m of the study site:

0

Database searched and no data found.

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a **Groundsure Geo Insight**, available from our **website**. The following information has been found:

9.1.1 Shrink Swell

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

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

Hazard
Ground conditions predominantly medium plasticity. Do not plant trees with high soil moisture demands near to buildings. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a possible increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a possible increase in insurance risk, especially during droughts or where vegetation with high moisture demands is present.

9.1.2 Landslides

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

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

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

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

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

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

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

9.1.4 Compressible Ground

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

Moderate

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

Hazard
Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

9.1.5 Collapsible Rocks

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

Low

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

Hazard
Slight possibility for collapsible deposit problems after major changes in loading or groundwater conditions. Normal maintenance to avoid large amounts of water entering the ground through pipe leakage or soak-aways should reduce the likelihood of problems due to collapsible deposits. For new build, assess the possibility of collapsible (loessic) deposits in ground investigation. For existing property, no significant increase in insurance risk from collapsible deposits is likely.

9.1.6 Running Sand

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

Low

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

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

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.

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

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing

ones as described in publication BR211 by the Building Research Establishment?

No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

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

No

Database searched and no data found.

10.2 Non-Coal Mining

Are there any Non-Coal Mining areas within 50m of the study site boundary?

No

Database searched and no data found.

10.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site?

No

Guidance: No Guidance Required.

Contact Details

EmapSite
Telephone: 0118 9736883
sales@emapsite.com

emapsite™

British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:

Web: www.bgs.ac.uk

BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk



**British
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

Environment Agency

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

Web: www.environment-agency.gov.uk

Email: enquiries@environment-agency.gov.uk



Public Health England

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



The Coal Authority

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



Ordnance Survey

Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505



Local Authority

Authority: Havant Borough Council
Phone: 023 9247 4174
Web: <http://www.havant.gov.uk/>
Address: Civic Centre, Civic Centre Road, Havant, Hampshire, PO9

Gemapping PLC

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



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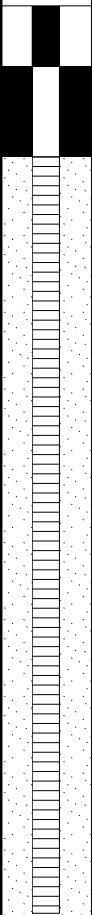
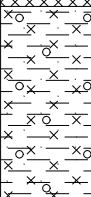
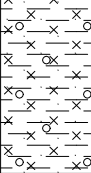
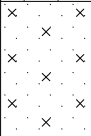
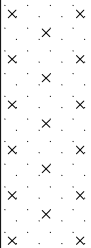
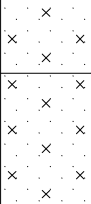
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<https://www.groundsure.com/terms-and-conditions-sept-2016>



Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site Land East of Castle Street, Havant PO9 2RY				WS1
Job No CRM.1033.025	Dates Start 15-12-16 Finish 15-12-16	Ground Level (m)	Co-Ordinates	
Client Persimmon Homes				Sheet 1 of 1

Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
					0.30			(MADE GROUND) Topsoil: Grass over dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
		0.50	ES					(Soft to firm) Reddish brown sandy gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	
		1.00 1.00 - 1.45	D SPT	C 9				1.00 - 1.45 Firm, low to medium strength.	1
					1.50			Reddish grey brown slightly silty fine SAND.	
		2.00 2.00 - 2.45	D SPT	C 4				2.00 - 2.45 Loose. 2.00 - 3.00 Becoming dark grey.	2
		3.00 3.00 - 3.45	D SPT	C 18	3.00			2.90 Sub-horizontal reddish brown closely spaced bands. Medium dense dark grey slightly silty fine SAND.	3
					3.45			Borehole completed at 3.45m.	
					{4.00}				4

General Remarks

EQUIPMENT: Premier 110 Compact Window Sampling Tracked Rig.
METHOD: Hand dug inspection pit 0.00m-1.00m. Dynamic sampled 1.00m-3.00mbgl.
CASING: Not used.
GROUNDWATER: Groundwater not encountered.
BACKFILL: On completion, a slotted pipe (50mm) was installed to 3.00m, granular response zone (3.00m-0.50m), bentonite seal 0.50m-0.20m, concrete and stopcock cover 0.20m-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
All dimensions in metres Scale 1:25				
				Logged By MV

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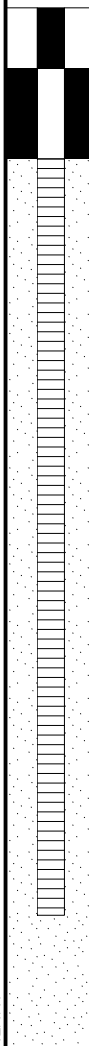
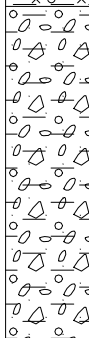
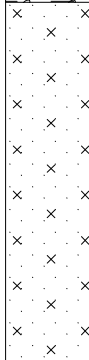
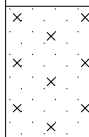


Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site Land East of Castle Street, Havant PO9 2RY							WS2		
Job No CRM.1033.025		Dates Start 15-12-16 Finish 15-12-16		Ground Level (m)		Co-Ordinates			
Client Persimmon Homes							Sheet 1 of 1		
Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
		0.25						(MADE GROUND) Topsoil: Grass over dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
		0.50	ES		0.55			(Firm) Reddish brown gravelly sandy silty CLAY with fine rootlets. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	
		1.00 1.00 - 1.45	D SPT	C 50	1.50			Reddish brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine. 1.00 - 1.45 Very dense. Refused at 1.40mbgl.	1
		2.00 2.00 - 2.45	D SPT	C 3	3.00			Reddish brown slightly silty fine SAND. 2.00 - 2.45 Very loose.	2
		3.00 3.00 - 3.45	D SPT	C 11	3.45			Medium dense reddish brown slightly silty fine SAND.	3
					{4.00}			Borehole completed at 3.45m.	4
General Remarks EQUIPMENT: Premier 110 Compact Window Sampling Tracked Rig. METHOD: Hand dug inspection pit 0.00m-1.00m. Dynamic sampled 1.00m-3.00mbgl. CASING: Not used. GROUNDWATER: Groundwater not encountered. BACKFILL: On completion, the borehole was backfilled with arisings.									
Groundwater									
Date		Strike Depth (m)		Casing Depth (m)		Depth After Observation (m)			
All dimensions in metres Scale 1:25								Logged By MV	

1.0 ENZYGO BH LOG CRM.1033.025 HAVANT GPJ GINT STD AGS 3 1 ENZYGO GPJ 12/1/17

Site Land East of Castle Street, Havant PO9 2RY				WS3
Job No CRM.1033.025	Dates Start 15-12-16 Finish 15-12-16	Ground Level (m)	Co-Ordinates	
Client Persimmon Homes				Sheet 1 of 1

Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
		0.50	ES		0.30			(MADE GROUND) Topsoil: Grass over dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
					0.70			(Firm) Reddish brown orange slightly gravelly sandy silty CLAY with fine rootlets. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	
		1.00 1.00 - 1.45	D SPT	C 49				Reddish brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	1
		1.50	D					1.00 - 1.45 Dense.	
		2.00 2.00 - 2.45	D SPT	C 6	1.80			Reddish brown slightly silty fine SAND.	2
		3.00 3.00 - 3.45	D SPT	C 5	3.00			2.00 - 2.45 Loose.	
					3.45			Loose reddish brown slightly silty fine SAND.	3
					{4.00}			3.00 - 3.45 Loose.	4
								Borehole completed at 3.45m.	

General Remarks

EQUIPMENT: Premier 110 Compact Window Sampling Tracked Rig.
METHOD: Hand dug inspection pit 0.00m-1.00m. Dynamic sampled 1.00m-3.00mbgl.
CASING: Not used.
GROUNDWATER: Groundwater not encountered.
BACKFILL: On completion, a slotted pipe (50mm) was installed to 3.00m, granular response zone (3.00m-0.50m), bentonite seal 0.50m-0.20m, concrete and stopcock cover 0.20m-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
All dimensions in metres Scale 1:25				
				Logged By MV



Enzygo Ltd
Tel: 01454 269237
Fax: 01454 269760
Web: www.enzygo.com

Site Land East of Castle Street, Havant PO9 2RY				WS4
Job No CRM.1033.025	Dates Start 15-12-16 Finish 15-12-16	Ground Level (m)	Co-Ordinates	

Client Persimmon Homes	Sheet 1 of 1
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Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
		0.50	ES		0.25			(MADE GROUND) Topsoil: Grass over dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
					0.70			(Firm) Dark reddish orange brown slightly gravelly sandy silty CLAY with fine rootlets. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	
		1.00 1.00 - 1.45	D SPT	C 43				Reddish brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	1
								1.00 - 1.45 Dense.	
		2.00 2.00 - 2.45	D SPT	C 8				2.00 - 2.45 Loose.	2
					2.50				
		3.00 3.00 - 3.45	D SPT	C 9	3.00			Reddish brown slightly silty fine SAND.	3
					3.45			Loose reddish brown slightly silty fine SAND.	
					{4.00}			Borehole completed at 3.45m.	4

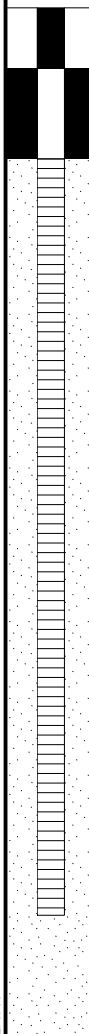
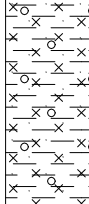
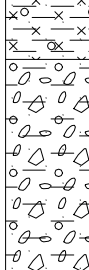
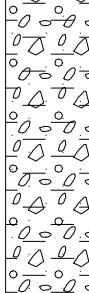
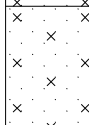
General Remarks

EQUIPMENT: Premier 110 Compact Window Sampling Tracked Rig.
METHOD: Hand dug inspection pit 0.00m-1.00m. Dynamic sampled 1.00m-3.00mbgl.
CASING: Not used.
GROUNDWATER: Groundwater not encountered.
BACKFILL: On completion, the borehole was backfilled with arisings.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
All dimensions in metres Scale 1:25				
				Logged By MV

1.0 ENZYGO BH LOG CRM.1033.025 HAVANT GPJ GINT STD AGS 3.1 ENZYGO GPJ 12/1/17

Site Land East of Castle Street, Havant PO9 2RY				WS5
Job No CRM.1033.025	Dates Start 15-12-16 Finish 15-12-16	Ground Level (m)	Co-Ordinates	
Client Persimmon Homes				Sheet 1 of 1

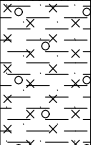
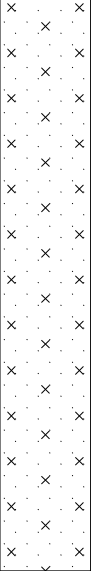
Well	Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
		Depth (m)	No/Type	Results					
					0.23			(MADE GROUND) Topsoil: Grass over dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
		0.50	ES					(Firm) Reddish brown slightly sandy slightly gravelly silty CLAY with fine rootlets. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	
		1.00 1.00 - 1.45	D SPT	C 40	1.10			Reddish brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	1
		1.90 2.00 - 2.45	D SPT	C 27				1.90 - 2.80 Damp. 2.00 - 2.45 Medium dense.	2
		3.00 3.00 - 3.45	D SPT	C 3	3.00			Reddish brown slightly silty fine SAND.	
					3.45			Very loose reddish brown slightly silty fine SAND.	3
					{4.00}			Borehole completed at 3.45m.	4

General Remarks

EQUIPMENT: Premier 110 Compact Window Sampling Tracked Rig.
METHOD: Hand dug inspection pit 0.00m-1.00m. Dynamic sampled 1.00m-3.00mbgl.
CASING: Not used.
GROUNDWATER: Groundwater not encountered.
BACKFILL: On completion, a slotted pipe (50mm) was installed to 3.00m, granular response zone (3.00m-0.50m), bentonite seal 0.50m-0.20m, concrete and stopcock cover 0.20m-0.00m.

Groundwater	Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
All dimensions in metres Scale 1:25				
				Logged By MV

Site Land East of Castle Street, Havant PO9 2RY						TP1		
Job No CRM.1033.025		Dates Start 13-12-16 Finish 13-12-16		Ground Level (m) 				Co-Ordinates
Client Persimmon Homes							Sheet 1 of 1	

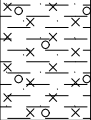
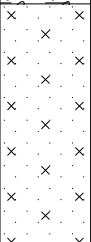
Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.50	ES		0.30			(MADE GROUND) Topsoil: Grass over (soft) light greyish brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
			0.80			(Soft) Reddish brown sandy gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine to coarse.		
	1.40	D		1.40			Reddish brown clay-bound sandy cobbly GRAVEL. Gravel is subangular and subrounded, fine to coarse flint, and cobbles of flint. Sand is fine.	1
						Reddish grey brown mottled green slightly silty fine glauconitic SAND.	2	
	3.30	D		3.30				3
				{4.00}			Trial Pit completed at 3.30m.	

General Remarks

Dimensions: 2.80x0.70x3.30
 Trial pit excavated by JCB 3CX.
 Trial pit sides collapsing from 1.40-3.30mbgl.
 Groundwater not encountered.
 On completion, the trial pit was backfilled with materials arisings.

All dimensions in metres Scale 1:25		Logged By MV
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Site Land East of Castle Street, Havant PO9 2RY				TP2
Job No CRM.1033.025	Dates Start 14-12-16 Finish 14-12-16	Ground Level (m)	Co-Ordinates	
Client Persimmon Homes				Sheet 1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
				0.20			(MADE GROUND) Topsoil: Grass over dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
	0.50	ES		0.60			(Soft) Reddish brown sandy gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	
	1.00	D		1.70			Dark reddish brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	1
	2.50	D		2.50			Light greyish green and light brown slightly silty fine glauconitic SAND.	2
				{4.00}			Trial Pit completed at 2.50m.	3
								4

General Remarks

Dimensions: 2.90x0.70x2.50
Trial pit excavated by JCB 3CX.
Trial pit sides collapsing from 1.70-2.50mbgl.
Groundwater not encountered.
On completion, the trial pit was backfilled with materials arisings.

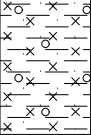
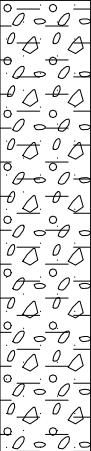


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Site Land East of Castle Street, Havant PO9 2RY						TP3		
Job No CRM.1033.025		Dates Start 14-12-16 Finish 14-12-16		Ground Level (m)				Co-Ordinates
Client Persimmon Homes						Sheet 1 of 1		
Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
▽				0.20			(MADE GROUND) Topsoil: Grass over dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
	0.50	ES		0.50			(MADE GROUND) (Soft to firm) Dark reddish brown sandy gravelly silty clay. Gravel is subangular and subrounded, fine to coarse flint, and occasional brick fragments. Sand is fine.	
	1.00	D					Reddish brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	1
				1.70				
	2.40	D		2.40			Dark reddish brown slightly silty fine glauconitic SAND.	2
							Trial Pit completed at 2.40m.	3
				{4.00}				4
General Remarks Dimensions: 2.90x0.70x2.40 Trial pit excavated by JCB 3CX. Trial pit sides collapsing from 1.70-2.40mbgl. Groundwater seepage encountered at 1.70mbgl. On completion, the trial pit was backfilled with materials arisings.								
All dimensions in metres Scale 1:25						Logged By MV		

1.1 ENZYGO TP LOG CRM.1033.025 HAVANT.GPJ GINT STD AGS 3_1 ENZYGO.GPJ 12/1/17

Site Land East of Castle Street, Havant PO9 2RY				TP4
Job No CRM.1033.025	Dates Start 13-12-16 Finish 13-12-16	Ground Level (m)	Co-Ordinates	
Client Persimmon Homes				Sheet 1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
				0.25			(MADE GROUND) Topsoil: Grass over (soft) dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
	0.50	ES		0.70			(Soft) Reddish brown mottled grey sandy gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine to coarse.	
	1.00	D					Reddish brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine. 1.00 - 2.20 Hard to excavate.	1
	2.20	D		2.20				2
							Trial Pit completed at 2.20m.	3
				{4.00}				4

General Remarks

Dimensions: 2.60x0.70x2.20
Trial pit excavated by JCB 3CX.
Trial pit sides remained vertical and stable.
Groundwater seepage encountered at 2.20mbgl.
On completion, the trial pit was backfilled with materials arisings.

Site Land East of Castle Street, Havant PO9 2RY						TP5	
Job No CRM.1033.025	Dates Start 14-12-16 Finish 14-12-16	Ground Level (m)	Co-Ordinates				
Client Persimmon Homes						Sheet 1 of 1	

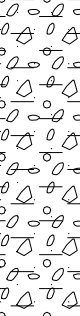
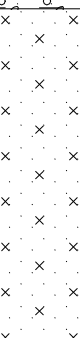
Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.50	ES		0.30			(MADE GROUND) Topsoil: Grass over dark greyish brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
				0.60			(Soft to firm) Light greyish brown sandy gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	
	1.00	D		1.40			Greyish brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine. 0.75 - 1.40 Becoming reddish brown with pockets of light greyish green slightly glauconitic fine SAND.	1
				2.50			Light and dark yellow brown fine SAND.	2
	2.50	D		2.50			Trial Pit completed at 2.50m.	3
			{4.00}					4

General Remarks

Dimensions: 2.60x0.70x2.50
 Trial pit excavated by JCB 3CX.
 Trial pit sides collapsing from 1.40-2.00mbgl.
 Groundwater slight seepage encountered at 1.40mbgl.
 On completion, the trial pit was backfilled with materials arisings.

All dimensions in metres Scale 1:25		Logged By MV
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Site Land East of Castle Street, Havant PO9 2RY						TP6	
Job No CRM.1033.025		Dates Start 14-12-16 Finish 14-12-16		Ground Level (m)			
Client Persimmon Homes							Sheet 1 of 1

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.50	ES		0.30			(MADE GROUND) Topsoil: Grass over dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
				0.50			(Soft to firm) Dark brown sandy gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	
	1.50	D		1.60			Reddish brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	1
				2.70			Dark reddish brown mottled green slightly silty fine glauconitic SAND.	2
	2.70	D		2.70			Trial Pit completed at 2.70m.	3
				{4.00}				4

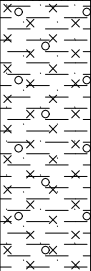
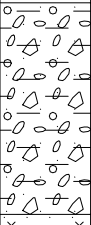
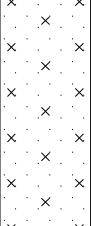
General Remarks

Dimensions: 2.80x0.70x2.70
 Trial pit excavated by JCB 3CX.
 Trial pit sides collapsing from 1.60-2.70mbgl.
 Groundwater seepage encountered at 1.60mbgl, accumulating rapidly.
 On completion, the trial pit was backfilled with materials arisings.

All dimensions in metres Scale 1:25		Logged By MV
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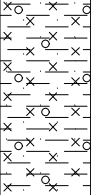
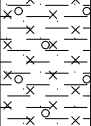


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Site Land East of Castle Street, Havant PO9 2RY						TP7		
Job No CRM.1033.025		Dates Start 14-12-16 Finish 14-12-16		Ground Level (m)				Co-Ordinates
Client Persimmon Homes						Sheet 1 of 1		
Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.50	ES		0.30			(MADE GROUND) Topsoil: Grass over dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
				1.20			(Soft) Light greyish brown sandy gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	1
	1.50	D		1.90			Reddish brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	
				2.70			Reddish brown mottled green slightly silty fine glauconitic SAND.	2
	2.40	D					Trial Pit completed at 2.70m.	3
				{4.00}				
General Remarks Dimensions: 2.60x0.70x2.70 Trial pit excavated by JCB 3CX. Trial pit sides collapsing from 1.90-2.70mbgl. Groundwater not encountered. On completion, the trial pit was backfilled with materials arisings.								
All dimensions in metres Scale 1:25						Logged By MV		

1.1 ENZYGO TP LOG CRM.1033.025 HAVANT.GPJ GINT STD AGS 3_1 ENZYGO.GPJ 12/1/17

Site Land East of Castle Street, Havant PO9 2RY				TP8
Job No CRM.1033.025	Dates Start 13-12-16 Finish 13-12-16	Ground Level (m)	Co-Ordinates	
Client Persimmon Homes				Sheet 1 of 1

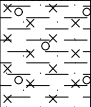
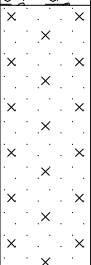
Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
				0.25			(MADE GROUND) Topsoil: Grass over (soft) dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
	0.50	ES					(Soft) Grey mottled reddish brown sandy gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	
	1.00	D						1
				1.35				
	2.00	D					Reddish brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	2
	3.00	D		3.00				3
				{4.00}			Trial Pit completed at 3.00m.	4

General Remarks

Dimensions: 2.70x0.70x3.00
Trial pit excavated by JCB 3CX.
Trial pit sides collapsing at 3.00mbgl.
Groundwater seepage encountered at 3.00mbgl, moderate ingress.
On completion, the trial pit was backfilled with materials arisings.

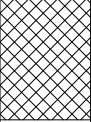
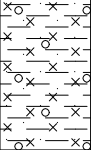
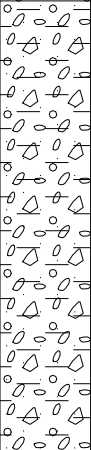
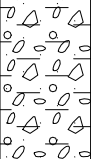
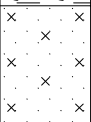


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Site Land East of Castle Street, Havant PO9 2RY						TP9		
Job No CRM.1033.025		Dates Start 13-12-16 Finish 13-12-16		Ground Level (m)				Co-Ordinates
Client Persimmon Homes						Sheet 1 of 1		
Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.50	ES		0.30			(MADE GROUND) Topsoil: Grass over (soft) dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
					0.70			(Soft) Yellow brown sandy gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.
	1.00	D					Reddish brown clay-bound sandy cobbly GRAVEL. Gravel is subangular and subrounded, fine to coarse flint, and cobbles of flint. Sand is fine.	1
								1.40 - 1.80 Hard to excavate.
	1.80	D		1.80			Yellow brown slightly silty fine SAND.	2
					2.70			Trial Pit completed at 2.70m.
				{4.00}				4
General Remarks Dimensions: 2.70x0.70x2.70 Trial pit excavated by JCB 3CX. Trial pit sides remained vertical and stable. Groundwater not encountered. On completion, the trial pit was backfilled with materials arisings.								
All dimensions in metres Scale 1:25						Logged By MV		

1.1 ENZYGO TP LOG CRM.1033.025 HAVANT.GPJ GINT STD AGS 3_1 ENZYGO.GPJ 12/1/17

Site Land East of Castle Street, Havant PO9 2RY				TP10
Job No CRM.1033.025	Dates Start 13-12-16 Finish 13-12-16	Ground Level (m)	Co-Ordinates	
Client Persimmon Homes				Sheet 1 of 1

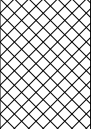
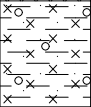
Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
▽	0.50	ES		0.40			(MADE GROUND) Topsoil: Grass over (soft) greyish brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
							(Soft) Light greyish brown slightly gravelly sandy silty CLAY. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	
	1.00	D		0.90			Yellow brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	1
	2.00	D						2
				2.40			Reddish brown slightly silty fine SAND.	
	2.80	D		2.80			Trial Pit completed at 2.80m.	3
				{4.00}				4

General Remarks

Dimensions: 2.90x0.70x2.80
Trial pit excavated by JCB 3CX.
Trial pit sides collapsing from 1.80-2.80mbgl.
Groundwater seepage encountered at 2.40mbgl, moderate ingress.
On completion, the trial pit was backfilled with materials arisings.

All dimensions in metres Scale 1:25	Logged By MV
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Site Land East of Castle Street, Havant PO9 2RY						TP11	
Job No CRM.1033.025	Dates Start 13-12-16 Finish 13-12-16	Ground Level (m)	Co-Ordinates				
Client Persimmon Homes						Sheet 1 of 1	

Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.50	ES		0.45		 (MADE GROUND) Topsoil: Grass over (soft) greyish brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0	
				0.80		 (Soft to firm) Reddish yellow brown slightly gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.		
	1.00	D				 Yellow brown clay-bound sandy cobbly GRAVEL. Gravel is subangular and subrounded, fine to coarse flint, and cobbles of flint. Sand is fine.	1	
	2.00	D					2	
	2.60	D		2.60		Becoming brown slightly silty SAND at 2.60mbgl. Trial Pit completed at 2.60m.	3	
				{4.00}			4	

General Remarks

Dimensions: 2.90x0.70x2.60
 Trial pit excavated by JCB 3CX.
 Trial pit sides collapsing from 2.70-2.60mbgl.
 Groundwater not encountered.
 On completion, the trial pit was backfilled with materials arisings.

All dimensions in metres Scale 1:25		Logged By MV
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Land East of Castle Street, Havant PO9 2RY

TP12

CRM.1033.025

Start 13-12-16
Finish 13-12-16

Ground Level (m)

Co-Ordinates

Persimmon Homes

Sheet

1 of 1

1 ENZYGO TP LOG CRM.1033.025 HAVANT.GPJ GINT STD AGS 3_1 ENZYGO.GPJ 12/1/17

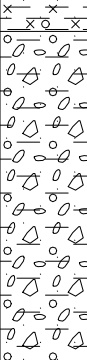
Dimensions: 2.60x0.70x3.00
Trial pit excavated by JCB 3CX.
Trial pit sides remained vertical and stable.
Groundwater not encountered.
On completion, the trial pit was backfilled with materials arisings.

All dimensions in metres
Scale 1:25

Logged By MV



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Site Land East of Castle Street, Havant PO9 2RY						TP13			
Job No CRM.1033.025		Dates Start 13-12-16 Finish 13-12-16		Ground Level (m)				Co-Ordinates	
Client Persimmon Homes						Sheet 1 of 1			
Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description		
	Depth (m)	No/Type	Results						
	0.50	ES		0.30			(MADE GROUND) Topsoil: Grass over (soft) dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0	
					0.70			(Soft) Reddish brown mottled orange sandy gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	
			1.00	D				Reddish brown clay-bound sandy cobbly GRAVEL. Gravel is subangular and subrounded, fine to coarse flint, and cobbles of flint. Sand is fine.	1
	1.80	D		1.80			Trial Pit completed at 1.80m.	2	
				{4.00}				4	
General Remarks Dimensions: 2.70x0.70x1.80 Trial pit excavated by JCB 3CX. Trial pit sides remained vertical and stable. Groundwater not encountered. On completion, the trial pit was backfilled with materials arisings.									
All dimensions in metres Scale 1:25						Logged By MV			

1.1 ENZYGO TP LOG CRM.1033.025 HAVANT.GPJ GINT STD AGS 3_1 ENZYGO.GPJ 12/1/17

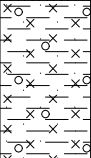
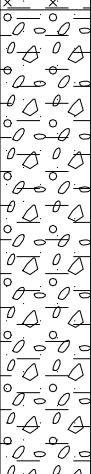


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Site Land East of Castle Street, Havant PO9 2RY						TP14		
Job No CRM.1033.025		Dates Start 14-12-16 Finish 14-12-16		Ground Level (m)				Co-Ordinates
Client Persimmon Homes						Sheet 1 of 1		
Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.50	ES		0.35			(MADE GROUND) Topsoil: Grass over dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
					0.60			(Soft) Dark brown sandy gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.
	1.00	D					Reddish brown clay-bound sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	1
					1.60			
	2.40	D					Light greenish grey and light brown slightly silty fine SAND.	2
					2.40			
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								



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Site Land East of Castle Street, Havant PO9 2RY						TP15		
Job No CRM.1033.025		Dates Start 14-12-16 Finish 14-12-16		Ground Level (m)				Co-Ordinates
Client Persimmon Homes						Sheet 1 of 1		
Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.50	ES		0.30			(MADE GROUND) Topsoil: Grass over dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
					0.85			(Soft) Light greyish brown sandy gravelly silty CLAY. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.
	1.50	D					Reddish brown clay-bound sandy slightly cobbly GRAVEL. Gravel is subangular and subrounded, fine to coarse flint, and occasional cobbles of flint. Sand is fine.	1
								1.70 - 2.40 Becoming reddish brown mottled green.
	2.40	D		2.40			Trial Pit completed at 2.40m.	
				{4.00}				3
								4
General Remarks Dimensions: 2.80x0.70x2.40 Trial pit excavated by JCB 3CX. Trial pit sides remained vertical and stable. Groundwater seepage encountered at 0.00mbgl, moderate ingress. On completion, the trial pit was backfilled with materials arisings.								
All dimensions in metres Scale 1:25						Logged By MV		

1.1 ENZYGO TP LOG CRM.1033.025 HAVANT.GPJ GINT STD AGS 3_1 ENZYGO.GPJ 12/1/17



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Site Land East of Castle Street, Havant PO9 2RY						TP16		
Job No CRM.1033.025		Dates Start 14-12-16 Finish 14-12-16		Ground Level (m)				Co-Ordinates
Client Persimmon Homes						Sheet 1 of 1		
Water Levels	Samples & In Situ Testing			Depth (m)	Level (mAD)	Legend	Stratum Description	
	Depth (m)	No/Type	Results					
	0.50	ES		0.25			(MADE GROUND) Topsoil: Grass over dark brown slightly gravelly sandy silt with rootlets. Gravel is subangular to subrounded, fine to coarse flint. Sand is fine.	0
				0.70			(Soft) Dark greyish brown gravelly sandy silty CLAY with fine rootlets. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	
	1.00	D		0.95			(Firm) Dark reddish brown mottled bluish grey gravelly sandy silty CLAY with fine rootlets. Gravel is subangular and subrounded, fine to coarse flint. Sand is fine.	1
							Reddish brown clay-bound sandy cobbly GRAVEL. Gravel is subangular and subrounded, fine to coarse flint, and cobbles of flint. Sand is fine.	
	2.00	D		2.00			1.25 - 2.00 With detached pockets and bands of light greyish green glauconitic SAND.	2
							Trial Pit completed at 2.00m.	3
								4
				{4.00}				
General Remarks Dimensions: 2.60x0.70x2.00 Trial pit excavated by JCB 3CX. Trial pit sides collapsing from 1.25-2.00mbgl. Groundwater seepage encountered at 1.25mbgl, accumulating rapidly. On completion, the trial pit was backfilled with materials arisings.								
All dimensions in metres Scale 1:25						Logged By MV		

1.1 ENZYGO TP LOG CRM.1033.025 HAVANT.GPJ GINT STD AGS 3_1 ENZYGO.GPJ 12/1/17

APPENDIX C – CHEMICAL TESTING

Analytical Report Number: 16-36094

Project / Site name: Havant

Lab Sample Number				677816	677817	677818	677819	677820
Sample Reference				TP16	TP14	TP6	TP15	TP7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.50	0.50	0.50
Date Sampled				12/12/2016	12/12/2016	12/12/2016	12/12/2016	12/12/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	21	15	12	14	15
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.2	1.1	1.1

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.4	7.2	7.4	7.5	7.7
Total Organic Carbon (TOC)	%	0.1	MCERTS	2.1	0.5	0.5	0.6	1.3

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.4	10	8.7	9.0	5.9
Boron (water soluble)	mg/kg	0.2	MCERTS	3.0	0.4	0.7	0.6	1.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	21	23	26	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	18	13	16	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	26	16	14	15	20
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	12	12	13	9.9
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	42	34	48	41



4041



Environmental Science

Analytical Report Number: 16-36094

Project / Site name: Havant

Lab Sample Number				677816	677817	677818	677819	677820
Sample Reference				TP16	TP14	TP6	TP15	TP7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.50	0.50	0.50
Date Sampled				12/12/2016	12/12/2016	12/12/2016	12/12/2016	12/12/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH (C>5 - C7)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C>7 - C8)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10)	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	ISO 17025	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16)	mg/kg	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	2.2	< 1.0
TPH (C35 - C44)	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C44	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

Analytical Report Number: 16-36094

Project / Site name: Havant

Lab Sample Number				677821	677822	677823	677824
Sample Reference				TP9	TP5	TP12	TP10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.50	2.00
Date Sampled				12/12/2016	12/12/2016	12/12/2016	12/12/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	14	11	11
Total mass of sample received	kg	0.001	NONE	1.0	1.2	1.0	0.81

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.6	6.6	7.4	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.8	1.4	0.3	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.8	4.5	12	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.6	0.9	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	16	32	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	11	19	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	49	18	22	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	9.2	16	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	48	34	44	-



4041



Environmental Science

Analytical Report Number: 16-36094

Project / Site name: Havant

Lab Sample Number				677821	677822	677823	677824
Sample Reference				TP9	TP5	TP12	TP10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.50	2.00
Date Sampled				12/12/2016	12/12/2016	12/12/2016	12/12/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10	< 10	< 10

TPH (C>5 - C7)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C>7 - C8)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10)	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	ISO 17025	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16)	mg/kg	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35)	mg/kg	1	ISO 17025	< 1.0	5.8	< 1.0	6.5
TPH (C35 - C44)	mg/kg	10	NONE	< 10	< 10	< 10	< 10
TPH Total C5 - C44	mg/kg	10	NONE	< 10	< 10	< 10	< 10



7 Woodshots Meadow
Croxtley Green Business Park
Watford, WD18 8YS

Fax: 01923 237404

email:reception@i2analytical.com

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and IZ cannot be held responsible for any discrepancies with current legislation

* = UKAS accredited (liquid eluate analysis only) # = For mineral oil carbon banding please see method summary.

** = MCERTS accredited

Iss No 16-36096-1 Havant CRM.1033.025

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The results included within the report are representative of the samples submitted for analysis.

i2 Analytical

7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404

Fax: 01923 237404

email:reception@i2analytical.com

Waste Acceptance Criteria Analytical Results

Report No:	16-36096						
					Client: ENZYGOGEO		
Location	Havant						
Lab Reference (Sample Number)	677837				Landfill Waste Acceptance Criteria		
					Limits		
Sampling Date	12/12/2016				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	TP2						
Depth (m)	0.50						
Solid Waste Analysis							
TOC (%)**	0.5				3%	5%	6%
Loss on Ignition (%) **	3.2				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.30				1	--	--
Mineral Oil (mg/kg) #	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 1.6				100	--	--
pH (units)**	6.7				--	>6	--
Acid Neutralisation Capacity (mol / kg)	-0.75				--	To be evaluated	To be evaluated
Eluate Analysis		2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test	
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)		mg/l	mg/l		mg/kg	using BS EN 12457-3 at L/S 10 l/kg (mg/kg)	
Arsenic *	< 0.010	< 0.010		< 0.050	0.5	2	25
Barium *	< 0.0050	< 0.0050		< 0.020	20	100	300
Cadmium *	< 0.0005	< 0.0005		< 0.0020	0.04	1	5
Chromium *	< 0.0010	< 0.0010		< 0.0050	0.5	10	70
Copper *	0.015	0.0072		0.081	2	50	100
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum *	< 0.0030	< 0.0030		< 0.020	0.5	10	30
Nickel *	0.0012	< 0.0010		< 0.0050	0.4	10	40
Lead *	< 0.0050	< 0.0050		< 0.020	0.5	10	50
Antimony *	< 0.0050	< 0.0050		< 0.020	0.06	0.7	5
Selenium *	< 0.010	< 0.010		< 0.040	0.1	0.5	7
Zinc *	0.0019	0.0031		0.029	4	50	200
Chloride *	< 4.0	< 4.0		21	800	4000	25000
Fluoride	0.19	0.19		1.9	10	150	500
Sulphate *	3.0	0.71		10	1000	20000	50000
TDS	16	5.4		68	4000	60000	100000
Phenol Index (Monhydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-	-
DOC	8.8	6.1		65	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.2						
Dry Matter (%)	87						
Moisture (%)	13						
Stage 1							
Volume Eluate L2 (litres)	0.32						
Filtered Eluate VE1 (litres)	0.22						
Results are expressed on a dry weight basis, after correction for moisture content where applicable							

Human Health Assessment Reference Values

Determinant	Units	GAC Value Residential					
		With Plant Uptake			Without Plant Uptake		
Arsenic	mg/kg	37			40		
Cadmium	mg/kg	11			85		
Chromium	mg/kg	910			910		
Chromium VI	mg/kg	6			6		
Lead	mg/kg	200			310		
Mercury	mg/kg	40			56		
Nickel	mg/kg	130			180		
Selenium	mg/kg	250			430		
Copper	mg/kg	2400			7100		
Zinc	mg/kg	3700			40000		
Cyanide	mg/kg	791			800		
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	120	200	380	440	690	1200
Napthalene	mg/kg	2.3	5.6	13	2.3	5.6	13
Acenaphtylene	mg/kg	170	420	920	2900	4600	6000
Acenaphthene	mg/kg	210	510	1100	3000	4700	6000
Flourene	mg/kg	170	400	860	2800	3800	4500
Phenanthrene	mg/kg	95	220	440	1300	1500	1500
Anthracene	mg/kg	2400	5400	11000	31000	35000	37000
Fluoranthene	mg/kg	280	560	890	1500	1600	1600
Pyrene	mg/kg	620	1200	2000	3700	3800	3800
Benzo(a)Anthracene	mg/kg	7.2	11	13	11	14	15
Chrysene	mg/kg	15	22	27	30	31	32
Benzo(b)Flouranthene	mg/kg	2.6	3.3	3.7	3.9	4.0	4.0
Benzo(k)Flouranthene	mg/kg	77	93	100	110	110	110
Benzo(a)Pyrene	mg/kg	2.2	2.7	3.0	3.2	3.2	3.2
Indeno(123-cd)Pyrene	mg/kg	27	36	41	45	46	46
Dibenzo(a,h)Anthracene	mg/kg	0.24	0.28	0.3	0.31	0.32	0.32
Benzo(ghi)Perylene	mg/kg	320	340	350	360	360	360
TPH C ₅ -C ₆ Aliphatic	mg/kg	42	78	160	42	78	160
TPH C ₆ -C ₈ Aliphatic	mg/kg	100	230	530	100	230	530
TPH C ₈ -C ₁₀ Aliphatic	mg/kg	27	65	150	27	65	150
TPH C ₁₀ -C ₁₂ Aliphatic	mg/kg	130	330	760	130	330	770
TPH C ₁₂ -C ₁₆ Aliphatic	mg/kg	1100	2400	4300	1100	2400	4400
TPH C ₁₆ -C ₃₅ Aliphatic	mg/kg	65000	92000	110000	65000	92000	110000
TPH C ₃₅ -C ₄₄ Aliphatic	mg/kg	65000	92000	110000	65000	92000	110000
TPH C ₅ -C ₇ Aromatic	mg/kg	70	140	300	370	690	1400
TPH C ₇ -C ₈ Aromatic	mg/kg	130	290	660	860	1800	3900
TPH C ₈ -C ₁₀ Aromatic	mg/kg	34	83	190	47	110	270
TPH C ₁₀ -C ₁₂ Aromatic	mg/kg	74	180	380	250	590	1200
TPH C ₁₂ -C ₁₆ Aromatic	mg/kg	140	330	660	1800	2300	2500
TPH C ₁₆ -C ₂₁ Aromatic	mg/kg	260	540	930	1900	1900	1900
TPH C ₂₁ -C ₃₅ Aromatic	mg/kg	1100	1500	1700	1900	1900	1900
TPH C ₃₅ -C ₄₄ Aromatic	mg/kg	1100	1500	1700	1900	1900	1900
Benzene	mg/kg	0.087	0.17	0.37	0.38	0.70	1.4
Toluene	mg/kg	130	290	660	880	1900	3900
Ethylbenzene	mg/kg	47	110	260	83	190	440
Xylene	mg/kg	56	130	310	79	180	430

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Determinant	Units	GAC Value					
		Residential POS			Commercial		
Arsenic	mg/kg	79			640		
Cadmium	mg/kg	120			190		
Chromium	mg/kg	1500			8600		
Chromium VI	mg/kg	7.7			33		
Lead	mg/kg	630			2330		
Mercury	mg/kg	120			1100		
Nickel	mg/kg	230			980		
Selenium	mg/kg	1100			12000		
Copper	mg/kg	12000			68000		
Zinc	mg/kg	81000			730000		
Cyanide	mg/kg	N/A			16200		
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	760	1500	3200	760	1500	3200
Napthalene	mg/kg	4900	4900	4900	190	460	1100
Acenaphtylene	mg/kg	15000	15000	15000	83000	97000	100000
Acenaphthene	mg/kg	15000	15000	15000	84000	97000	100000
Flourene	mg/kg	9900	9900	9900	63000	68000	71000
Phenanthrene	mg/kg	3100	3100	3100	22000	22000	23000
Anthracene	mg/kg	74000	74000	74000	520000	540000	540000
Fluoranthene	mg/kg	3100	3100	3100	23000	23000	23000
Pyrene	mg/kg	7400	7400	7400	54000	54000	54000
Benzo(a)Anthracene	mg/kg	29	29	29	170	170	180
Chrysene	mg/kg	57	57	57	350	350	350
Benzo(b)Flouranthene	mg/kg	7.1	7.2	7.2	44	44	45
Benzo(k)Flouranthene	mg/kg	190	190	190	1200	1200	1200
Benzo(a)Pyrene	mg/kg	5.7	5.7	5.7	35	35	36
Indeno(123-cd)Pyrene	mg/kg	82	82	82	500	510	510
Dibenzo(a,h)Anthracene	mg/kg	0.57	0.57	0.58	3.5	3.6	3.6
Benzo(ghi)Perylene	mg/kg	640	640	640	3900	4000	4000
TPH C ₅ -C ₆ Aliphatic	mg/kg	570000	590000	600000	3200	5900	12000
TPH C ₆ -C ₈ Aliphatic	mg/kg	600000	610000	620000	7800	17000	40000
TPH C ₈ -C ₁₀ Aliphatic	mg/kg	13000	13000	13000	2000	4800	11000
TPH C ₁₀ -C ₁₂ Aliphatic	mg/kg	13000	13000	13000	9700	23000	47000
TPH C ₁₂ -C ₁₆ Aliphatic	mg/kg	13000	13000	13000	59000	82000	90000
TPH C ₁₆ -C ₃₅ Aliphatic	mg/kg	250000	250000	250000	1600000	1700000	1800000
TPH C ₃₅ -C ₄₄ Aliphatic	mg/kg	250000	250000	250000	1600000	1700000	1800000
TPH C ₅ -C ₇ Aromatic	mg/kg	56000	56000	56000	26000	46000	86000
TPH C ₇ -C ₈ Aromatic	mg/kg	56000	56000	56000	56000	110000	180000
TPH C ₈ -C ₁₀ Aromatic	mg/kg	5000	5000	5000	3500	8100	17000
TPH C ₁₀ -C ₁₂ Aromatic	mg/kg	5000	5000	5000	16000	28000	34000
TPH C ₁₂ -C ₁₆ Aromatic	mg/kg	5100	5100	5000	36000	37000	38000
TPH C ₁₆ -C ₂₁ Aromatic	mg/kg	3800	3800	3800	28000	28000	28000
TPH C ₂₁ -C ₃₅ Aromatic	mg/kg	3800	3800	3800	28000	28000	28000
TPH C ₃₅ -C ₄₄ Aromatic	mg/kg	3800	3800	3800	28000	28000	28000
Benzene	mg/kg	72	72	73	27	47	90
Toluene	mg/kg	56000	56000	56000	56000	110000	180000
Ethylebenzene	mg/kg	24000	24000	25000	5700	13000	27000
Xylene	mg/kg	41000	42000	43000	5900	14000	30000

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Determinant	Units	GAC Value					
		Park POS			Allotments		
Arsenic	mg/kg	170			43		
Cadmium	mg/kg	532			1.9		
Chromium	mg/kg	33000			18000		
Chromium VI	mg/kg	220			1.8		
Lead	mg/kg	1300			80		
Mercury	mg/kg	240			19		
Nickel	mg/kg	800			53		
Selenium	mg/kg	1800			88		
Copper	mg/kg	44000			520		
Zinc	mg/kg	170000			620		
Cyanide	mg/kg						
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	760	1500	3200	66	140	280
Napthalene	mg/kg	1200	1900	3000	4.1	10	24
Acenaphtylene	mg/kg	29000	30000	30000	28	69	160
Acenaphthene	mg/kg	29000	30000	30000	34	85	200
Flourene	mg/kg	20000	20000	20000	27	67	160
Phenanthrene	mg/kg	6200	6200	6300	15	38	90
Anthracene	mg/kg	150000	150000	150000	380	950	2200
Fluoranthene	mg/kg	6300	6300	6400	52	130	290
Pyrene	mg/kg	15000	15000	15000	110	270	620
Benzo(a)Anthracene	mg/kg	49	56	62	2.9	6.5	13
Chrysene	mg/kg	93	110	120	4.1	9.4	19
Benzo(b)Flouranthene	mg/kg	13	15	16	0.99	2.1	3.9
Benzo(k)Flouranthene	mg/kg	370	410	440	37	75	130
Benzo(a)Pyrene	mg/kg	11	12	13	0.97	2.0	3.5
Indeno(123-cd)Pyrene	mg/kg	150	170	180	9.5	21	39
Dibenzo(a,h)Anthracene	mg/kg	1.1	1.3	1.4	0.14	0.27	0.43
Benzo(ghi)Perylene	mg/kg	1400	1500	1600	290	470	640
TPH C ₅ -C ₆ Aliphatic	mg/kg	95000	130000	180000	730	1700	3900
TPH C ₆ -C ₈ Aliphatic	mg/kg	150000	220000	320000	2300	5600	13000
TPH C ₈ -C ₁₀ Aliphatic	mg/kg	14000	18000	21000	320	770	1700
TPH C ₁₀ -C ₁₂ Aliphatic	mg/kg	21000	23000	24000	2200	4400	7300
TPH C ₁₂ -C ₁₆ Aliphatic	mg/kg	25000	25000	26000	11000	13000	13000
TPH C ₁₆ -C ₃₅ Aliphatic	mg/kg	450000	480000	490000	260000	270000	270000
TPH C ₃₅ -C ₄₄ Aliphatic	mg/kg	450000	480000	490000	260000	270000	270000
TPH C ₅ -C ₇ Aromatic	mg/kg	76000	84000	92000	13	27	57
TPH C ₇ -C ₈ Aromatic	mg/kg	87000	95000	100000	22	51	120
TPH C ₈ -C ₁₀ Aromatic	mg/kg	7200	8500	9300	8.6	21	51
TPH C ₁₀ -C ₁₂ Aromatic	mg/kg	9200	9700	10000	13	31	74
TPH C ₁₂ -C ₁₆ Aromatic	mg/kg	10000	10000	10000	23	57	130
TPH C ₁₆ -C ₂₁ Aromatic	mg/kg	7600	7700	7800	46	110	260
TPH C ₂₁ -C ₃₅ Aromatic	mg/kg	7800	7800	7900	370	820	1600
TPH C ₃₅ -C ₄₄ Aromatic	mg/kg	7800	7800	7900	370	820	1600
Benzene	mg/kg	90	100	110	0.017	0.034	0.075
Toluene	mg/kg	87000	95000	100000	22	51	120
Ethylbenzene	mg/kg	17000	22000	27000	16	39	91
Xylene	mg/kg	17000	23000	31000	28	67	160

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Controlled Waters Assessment Reference Values

Determinant	Unit	EQS Freshwater						Uk DWS	WHO
Hardness	mg/l	0-50	50-100	100-150	150-200	200-250	>250		
Arsenic	ug/l	50						10	10
Boron	ug/l	2000						1000	0.3
Cadmium	ug/l	5						5	3
Chromium	ug/l	2	10	10	20	20	20	50	50
Lead	ug/l	4	10	10	20	20	20	10	10
Mercury	ug/l	1						1	1
Selenium	ug/l							10	10
Copper	ug/l	0.5	3	3	3	8	12	20000	2000
Nickel	ug/l	8	20	20	40	40	40	20	70
Zinc	ug/l	8	15	15	50	50	50	5000	3000
Sulphate	mg/l	400						250	250
PAH	ug/l							0.1	
Anthracene	ug/l	0.02							
Napthalene	ug/l	10							
Benzo(a)Pyrene	ug/l	0.03							0.01
Fluoranthene	ug/l	0.02							
Benzene	ug/l	30						1	10
Toluene	ug/l	50							
Ethylebenzene	ug/l	20							
Xylene	ug/l	30							
C ₅ – C ₆ Aliphatic	ug/l								15000
C ₆ – C ₈ Aliphatic	ug/l								15000
C ₈ – C ₁₀ Aliphatic	ug/l								300
C ₁₀ – C ₁₂ Aliphatic	ug/l								300
C ₁₂ – C ₁₆ Aliphatic	ug/l								300
C ₁₆ – C ₃₆ Aliphatic	ug/l								N/A
C ₆ – C ₇ Aromatic	ug/l								10
C ₇ – C ₈ Aromatic	ug/l	50							10
C ₈ – C ₁₀ Aromatic	ug/l	20							300
C ₁₀ – C ₁₂ Aromatic	ug/l								1000
C ₁₂ – C ₁₆ Aromatic	ug/l								1000
C ₁₆ – C ₂₁ Aromatic	ug/l								90
C ₂₁ – C ₃₅ Aromatic	ug/l								90

Analytical Report Number: 16-36087

Project / Site name: Havant

Lab Sample Number				677741	677742	677743		
Sample Reference				WS5	WS5	WS5		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				1.00	1.90	3.00		
Date Sampled				12/12/2016	12/12/2016	12/12/2016		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	14	7.6	21		
Total mass of sample received	kg	0.001	NONE	0.27	0.27	0.29		

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	8.4	8.6		
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.052	0.22	0.12		



TEST CERTIFICATE

Determination of Moisture Content

Tested in Accordance with BS 1377-2:1990: Clause 3.2

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Enzygo Geoenvironmental Ltd
Client Address: The Byre
Woodend lane
Cromhall
Gloucestershire, GL12 8AA
Contact: Steve Rhodes
Site Name: Havant
Site Address: Not Given

Client Reference: CRM.1033.025
Job Number: 16-36086
Date Sampled: 12/12/2016
Date Received: 16/12/2016
Date Tested: 04/01/2017
Sampled By: Not Given

Test results

Laboratory Reference	Sample Reference	Location	Depth Top [m]	Depth Base [m]	Sample Type	Description	Moisture Content [%]
677724	Not Given	TP1	0.5	Not Given	B	Brown gravelly CLAY	23
677738	Not Given	TP8	1	Not Given	D	Brown CLAY	20
677739	Not Given	TP8	2	Not Given	D	Brown gravelly CLAY	17
677740	Not Given	TP8	3	Not Given	D	Brown clayey GRAVEL	15
677728	Not Given	WS1	1	Not Given	D	Brown gravelly CLAY	14
677729	Not Given	WS1	2	Not Given	D	Yellowish brown clayey SAND	27
677730	Not Given	WS2	1	Not Given	D	Brown clayey GRAVEL	7.3
677731	Not Given	WS2	2	Not Given	D	Brown clayey GRAVEL	10
677732	Not Given	WS3	1	Not Given	D	Brown clayey GRAVEL	5.6
677733	Not Given	WS3	2	Not Given	D	Yellowish brown sandy CLAY	25

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Date Reported: 06/01/2017

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

for and on behalf of i2 Analytical Ltd

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The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Śląska, Poland."



TEST CERTIFICATE

Determination of Moisture Content

Tested in Accordance with BS 1377-2:1990: Clause 3.2

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Enzygo Geoenvironmental Ltd
Client Address: The Byre
Woodend lane
Cromhall
Gloucestershire, GL12 8AA
Contact: Steve Rhodes
Site Name: Havant
Site Address: Not Given

Client Reference: CRM.1033.025
Job Number: 16-36086
Date Sampled: 12/12/2016
Date Received: 16/12/2016
Date Tested: 04/01/2017
Sampled By: Not Given

Test results

Laboratory Reference	Sample Reference	Location	Depth Top [m]	Depth Base [m]	Sample Type	Description	Moisture Content [%]
677734	Not Given	WS4	0.5	Not Given	D	Brown clayey GRAVEL	7.2
677735	Not Given	WS5	0.5	Not Given	D	Brown slightly gravelly CLAY	18
677736	Not Given	WS5	1.9	Not Given	D	Brown clayey GRAVEL	7.3
677737	Not Given	WS5	3	Not Given	D	Brown sandy CLAY	25

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Date Reported: 06/01/2017

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: Enzygo Geoenvironmental Ltd
Client Address: The Byre
Woodend lane
Cromhall
Gloucestershire. GL12 8AA
Contact: Steve Rhodes
Site Name: Havant
Site Address: Not Given

Client Reference: CRM.1033.025
Job Number: 16-36086
Date Sampled: 12/12/2016
Date Received: 16/12/2016
Date Tested: 04/01/2017
Sampled By: Not Given

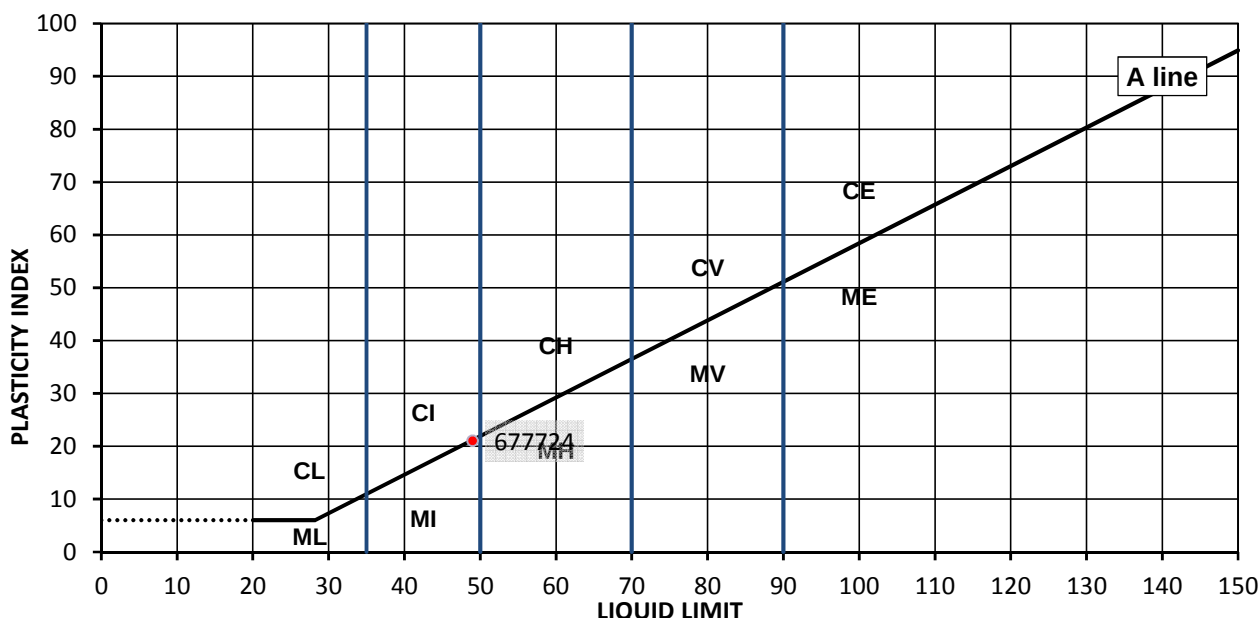
TEST RESULTS

Laboratory Reference: 677724
Sample Reference: Not Given

Description: Brown gravelly CLAY
Location: TP1
Sample Preparation: Tested after >425um removed by hand

Sample Type: B
Depth Top [m]: 0.5
Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
23	49	28	21	77



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L Low	50 to 70
	I Medium	70 to 90
	H High	exceeding 90
	V Very high	
	E Extremely high	
	Organic	O append to classification for organic material (eg CHO)

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 06/01/2017

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: Enzygo Geoenvironmental Ltd
Client Address: The Byre
Woodend lane
Cromhall
Gloucestershire. GL12 8AA
Contact: Steve Rhodes
Site Name: Havant
Site Address: Not Given

Client Reference: CRM.1033.025
Job Number: 16-36086
Date Sampled: 12/12/2016
Date Received: 16/12/2016
Date Tested: 04/01/2017
Sampled By: Not Given

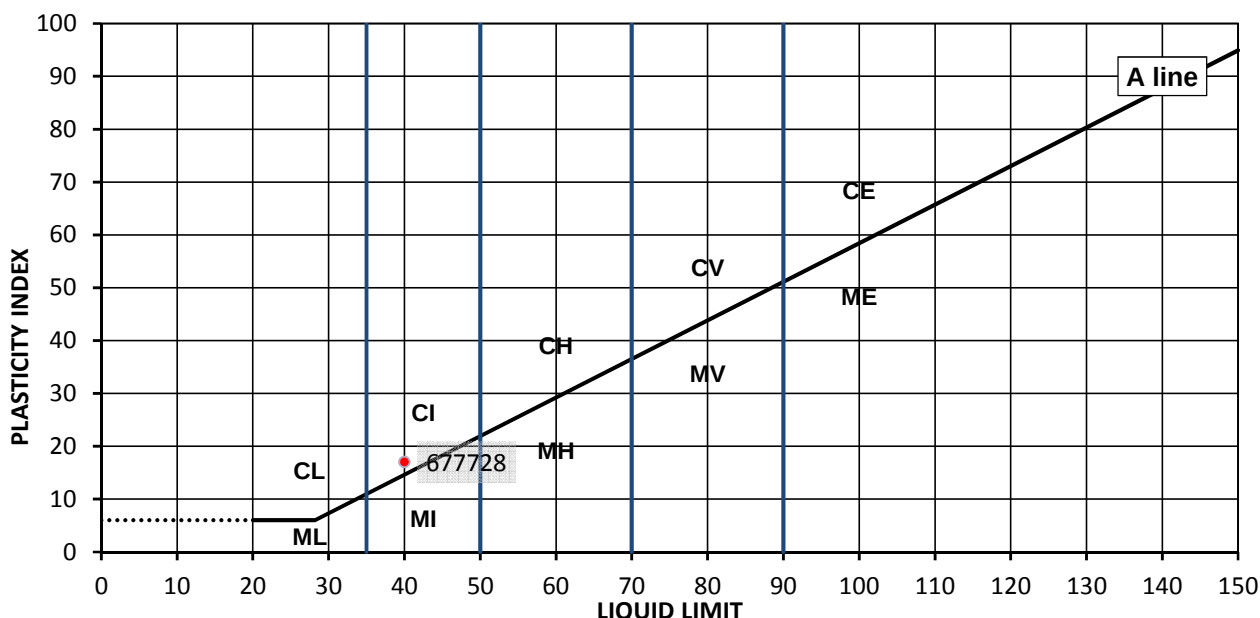
TEST RESULTS

Laboratory Reference: 677728
Sample Reference: Not Given

Description: Brown gravelly CLAY
Location: WS1
Sample Preparation: Tested after washing to remove >425um

Sample Type: D
Depth Top [m]: 1
Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
14	40	23	17	53



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L Low	50 to 70
	I Medium	70 to 90
	H High	exceeding 90
	V Very high	
	E Extremely high	
	Organic	O append to classification for organic material (eg CHO)

Remarks

Approved:

Mirosława Pytlík
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 06/01/2017

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TEST CERTIFICATE

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Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: Enzygo Geoenvironmental Ltd
Client Address: The Byre
Woodend lane
Cromhall
Gloucestershire. GL12 8AA
Contact: Steve Rhodes
Site Name: Havant
Site Address: Not Given

Client Reference: CRM.1033.025
Job Number: 16-36086
Date Sampled: 12/12/2016
Date Received: 16/12/2016
Date Tested: 04/01/2017
Sampled By: Not Given

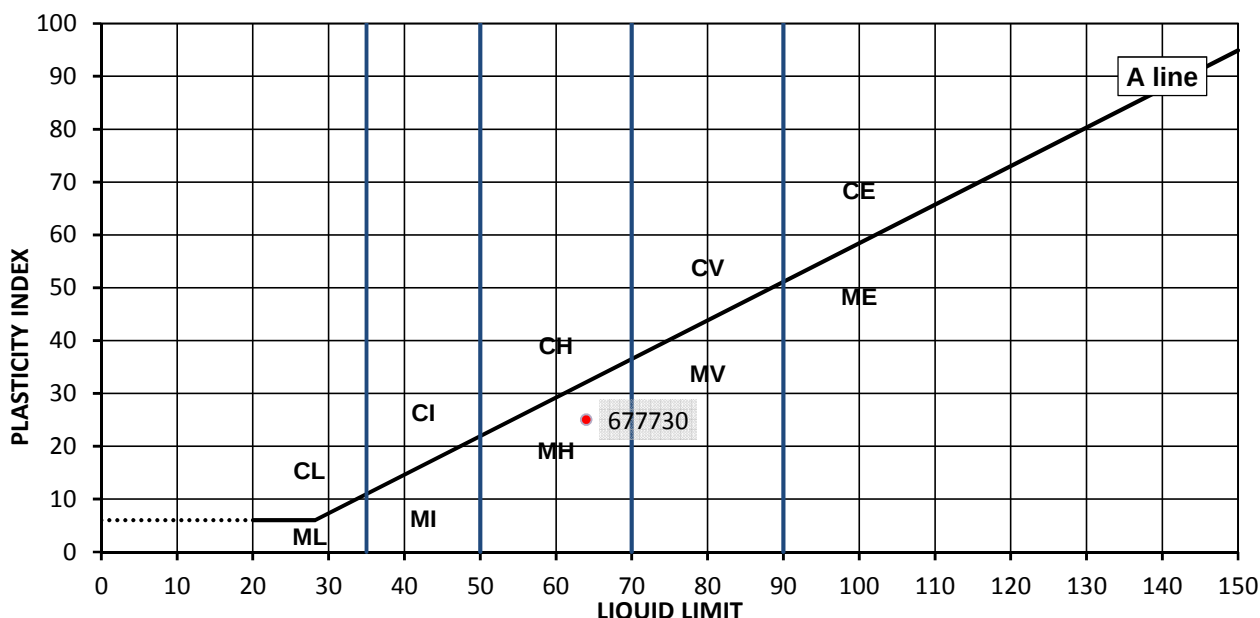
TEST RESULTS

Laboratory Reference: 677730
Sample Reference: Not Given

Description: Brown clayey GRAVEL
Location: WS2
Sample Preparation: Tested after washing to remove >425um

Sample Type: D
Depth Top [m]: 1
Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
7.3	64	39	25	25



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L Low	50 to 70
	I Medium	70 to 90
	H High	exceeding 90
	V Very high	
	E Extremely high	
	Organic	O append to classification for organic material (eg CHO)

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 06/01/2017

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: Enzygo Geoenvironmental Ltd
Client Address: The Byre
Woodend lane
Cromhall
Gloucestershire. GL12 8AA
Contact: Steve Rhodes
Site Name: Havant
Site Address: Not Given

Client Reference: CRM.1033.025
Job Number: 16-36086
Date Sampled: 12/12/2016
Date Received: 16/12/2016
Date Tested: 04/01/2017
Sampled By: Not Given

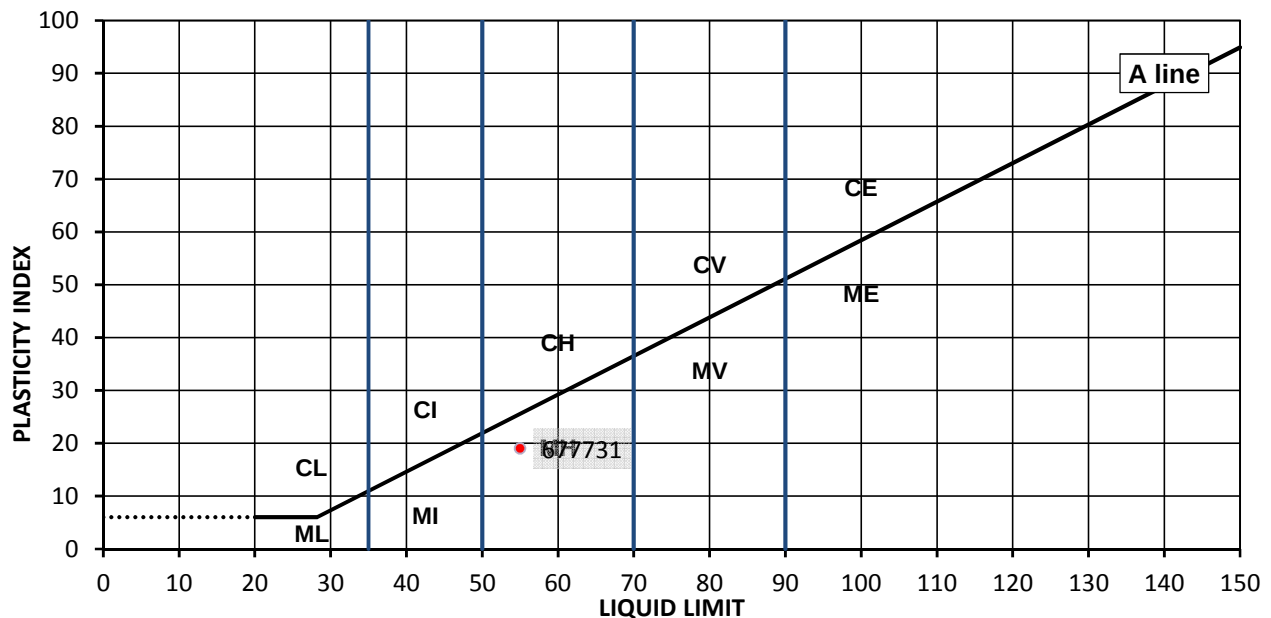
TEST RESULTS

Laboratory Reference: 677731
Sample Reference: Not Given

Description: Brown clayey GRAVEL
Location: WS2
Sample Preparation: Tested after washing to remove >425um

Sample Type: D
Depth Top [m]: 2
Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
10	55	36	19	30



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L Low	50 to 70
	I Medium	70 to 90
	H High	exceeding 90
	V Very high	
	E Extremely high	
	Organic	O append to classification for organic material (eg CHO)

Remarks

Approved:

Mirosława Pytlík
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 06/01/2017

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: Enzygo Geoenvironmental Ltd
Client Address: The Byre
Woodend lane
Cromhall
Gloucestershire. GL12 8AA
Contact: Steve Rhodes
Site Name: Havant
Site Address: Not Given

Client Reference: CRM.1033.025
Job Number: 16-36086
Date Sampled: 12/12/2016
Date Received: 16/12/2016
Date Tested: 04/01/2017
Sampled By: Not Given

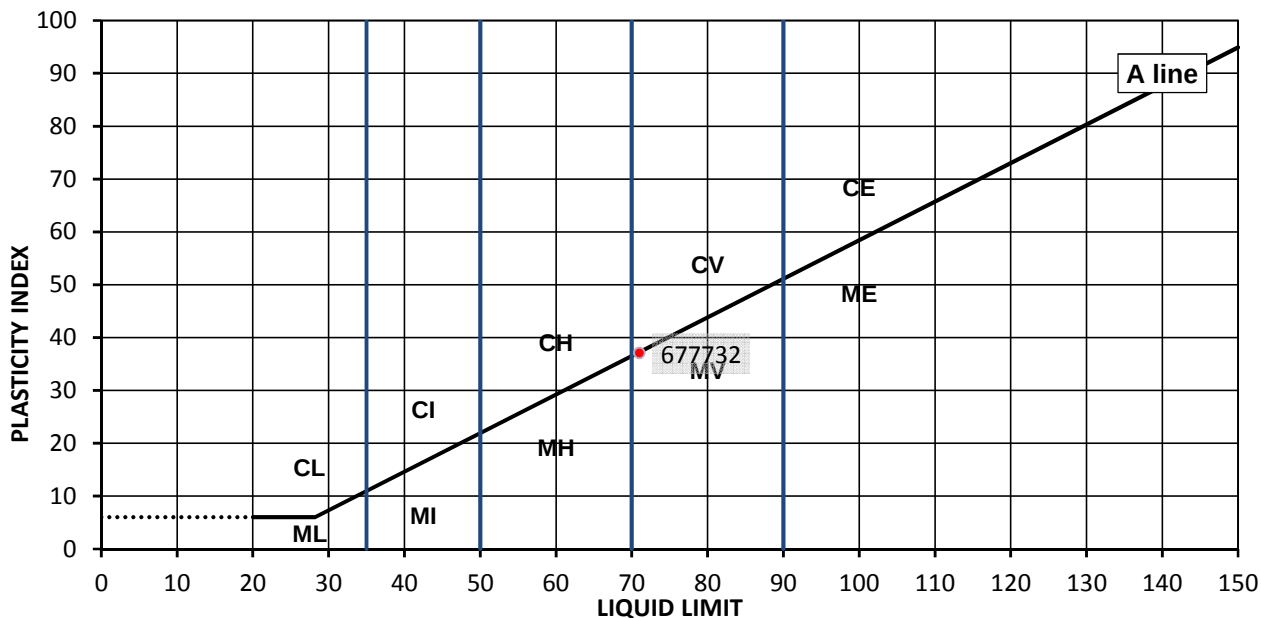
TEST RESULTS

Laboratory Reference: 677732
Sample Reference: Not Given

Description: Brown clayey GRAVEL
Location: WS3
Sample Preparation: Tested after washing to remove >425um

Sample Type: D
Depth Top [m]: 1
Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
5.6	71	34	37	27



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L Low	50 to 70
	I Medium	70 to 90
	H High	exceeding 90
	V Very high	
	E Extremely high	
	O	append to classification for organic material (eg CHO)

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 06/01/2017

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Sampled By: Not Given

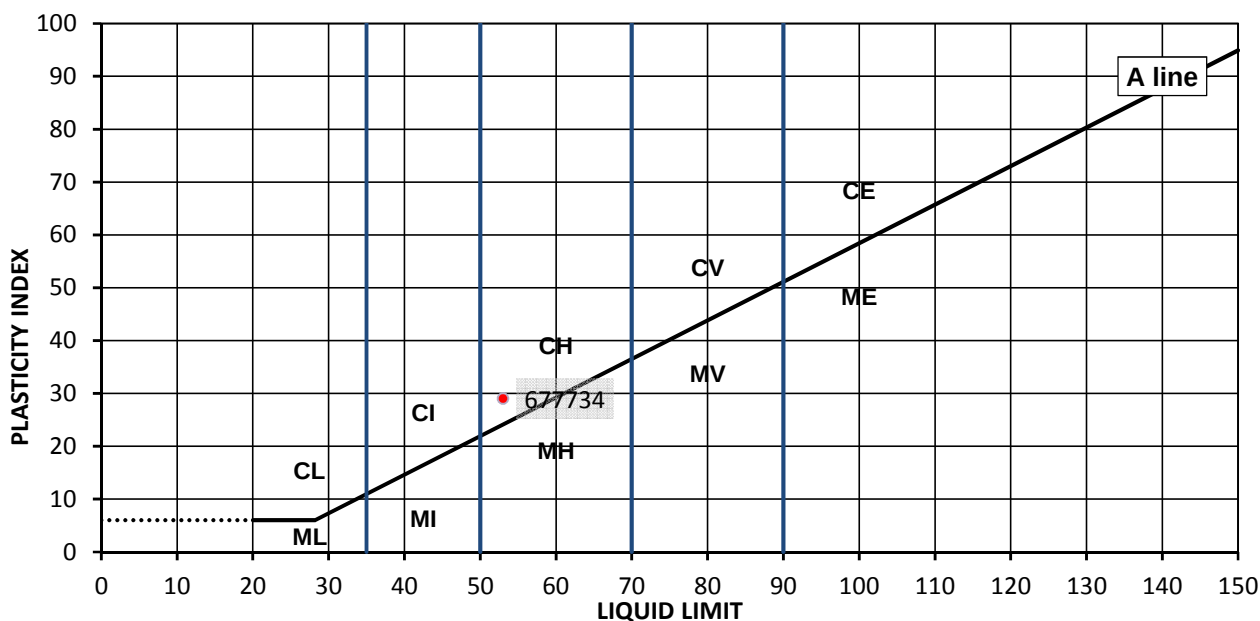
TEST RESULTS

Laboratory Reference: 677734
Sample Reference: Not Given

Description: Brown clayey GRAVEL
Location: WS4
Sample Preparation: Tested after washing to remove >425um

Sample Type: D
Depth Top [m]: 0.5
Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
7.2	53	24	29	43



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	I	Medium
	H	High
	V	Very high
	E	Extremely high
		exceeding 90
	Organic	
	O	append to classification for organic material (eg CHO)

Remarks

Approved:

Mirosława Pytlík
PL Head of
Geotechnical Section

Signed:

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Technical Manager
(Geotechnical Division)

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Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

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Client: Enzygo Geoenvironmental Ltd
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Woodend lane
Cromhall
Gloucestershire. GL12 8AA
Contact: Steve Rhodes
Site Name: Havant
Site Address: Not Given

Client Reference: CRM.1033.025
Job Number: 16-36086
Date Sampled: 12/12/2016
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Date Tested: 04/01/2017
Sampled By: Not Given

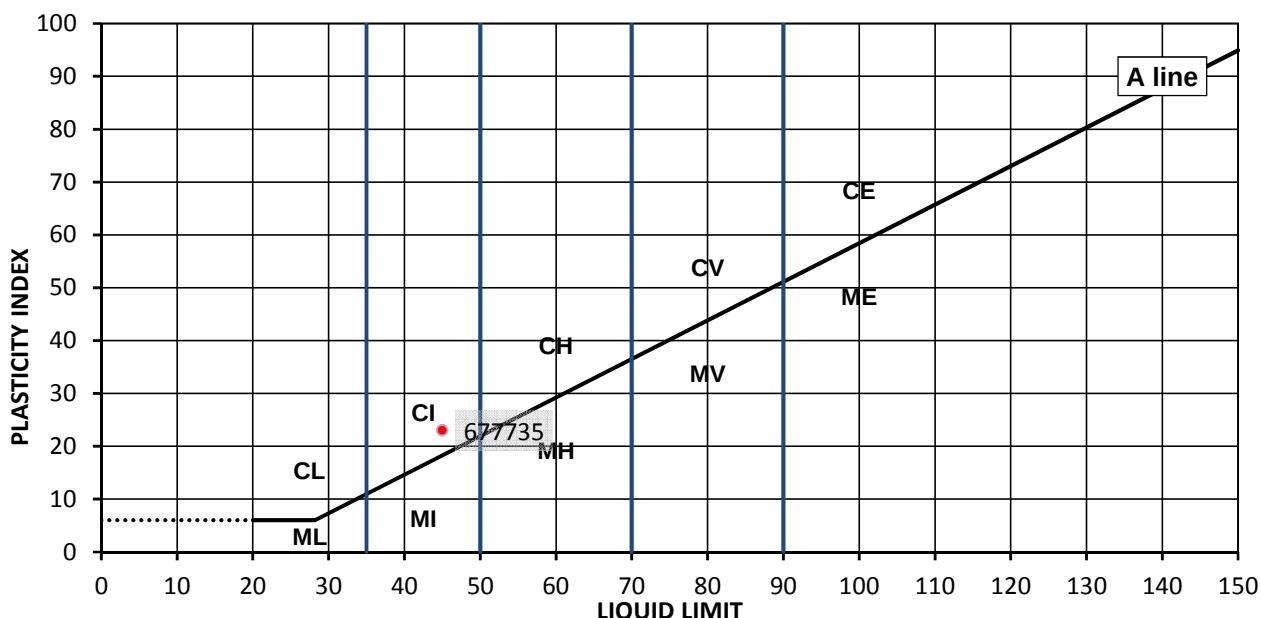
TEST RESULTS

Laboratory Reference: 677735
Sample Reference: Not Given

Description: Brown slightly gravelly CLAY
Location: WS5
Sample Preparation: Tested after >425um removed by hand

Sample Type: D
Depth Top [m]: 0.5
Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
18	45	22	23	99



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L Low	50 to 70
	I Medium	70 to 90
	H High	exceeding 90
	V Very high	
	E Extremely high	
	Organic	O append to classification for organic material (eg CHO)

Remarks

Approved:

Mirosława Pytlík
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
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Determination of Liquid and Plastic Limits

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Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: Enzygo Geoenvironmental Ltd
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Gloucestershire. GL12 8AA
Contact: Steve Rhodes
Site Name: Havant
Site Address: Not Given

Client Reference: CRM.1033.025
Job Number: 16-36086
Date Sampled: 12/12/2016
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Date Tested: 04/01/2017
Sampled By: Not Given

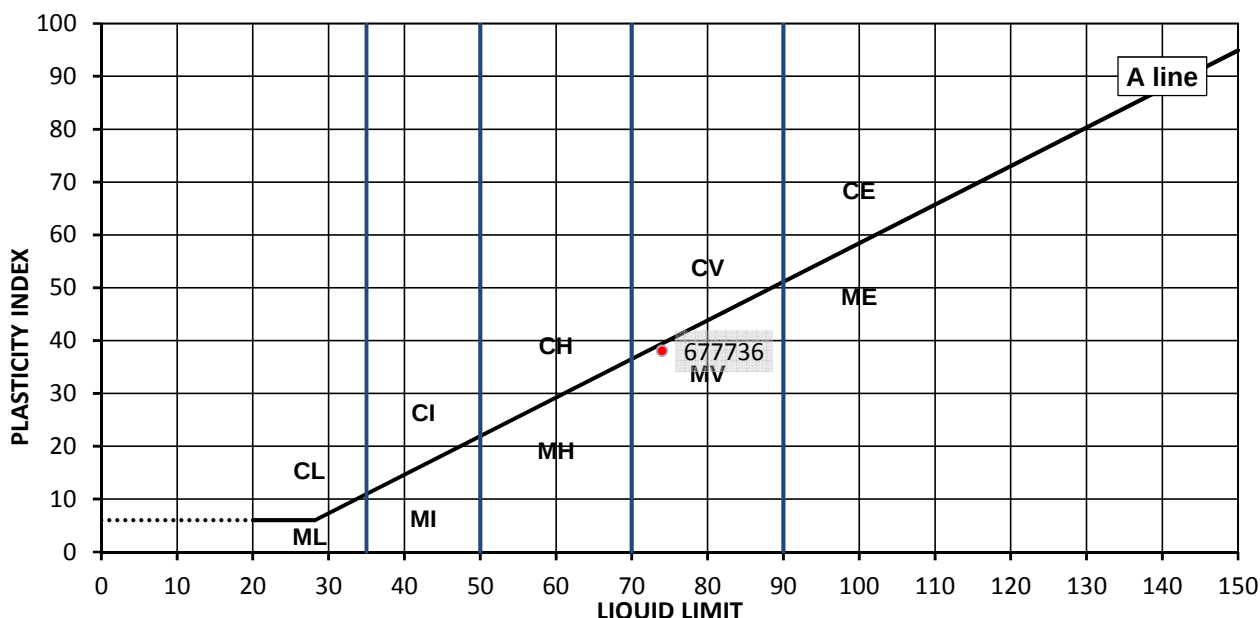
TEST RESULTS

Laboratory Reference: 677736
Sample Reference: Not Given

Description: Brown clayey GRAVEL
Location: WS5
Sample Preparation: Tested after washing to remove >425um

Sample Type: D
Depth Top [m]: 1.9
Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
7.3	74	36	38	35



Legend, based on BS 5930:2015 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L Low	50 to 70
	I Medium	70 to 90
	H High	exceeding 90
	V Very high	
	E Extremely high	
	Organic	O append to classification for organic material (eg CHO)

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 06/01/2017

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TEST CERTIFICATE

Summary of Classification Test Results

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Enzygo Geoenvironmental Ltd
Client Address: The Byre
Woodend lane
Cromhall
Gloucestershire, GL12 8AA
Contact: Steve Rhodes
Site Name: Havant
Site Address: Not Given

Client Reference: CRM.1033.025
Job Number: 16-36086
Date Sampled: 12/12/2016
Date Received: 16/12/2016
Date Tested: 04/01/2017
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Soil Description	Density		M/C	Atterberg				PD
		Reference	Top depth [m]	Base depth [m]	Type		bulk	dry		% Passing 425um	LL	PL	PI	
							Mg/m3	Mg/m3		%	%	%	%	
677724	TP1	Not Given	0.50	Not Given	B	Brown gravelly CLAY			23	77	49	28	21	
677728	WS1	Not Given	1.00	Not Given	D	Brown gravelly CLAY			14	53	40	23	17	
677730	WS2	Not Given	1.00	Not Given	D	Brown clayey GRAVEL			7.3	25	64	39	25	
677731	WS2	Not Given	2.00	Not Given	D	Brown clayey GRAVEL			10	30	55	36	19	
677732	WS3	Not Given	1.00	Not Given	D	Brown clayey GRAVEL			5.6	27	71	34	37	
677734	WS4	Not Given	0.50	Not Given	D	Brown clayey GRAVEL			7.2	43	53	24	29	
677735	WS5	Not Given	0.50	Not Given	D	Brown slightly gravelly CLAY			18	99	45	22	23	
677736	WS5	Not Given	1.90	Not Given	D	Brown clayey GRAVEL			7.3	35	74	36	38	

Comments:

Approved:

Mirosława Pytlík
PL Head of Geotechnical Section

Date Reported: 06/01/2017

Signed:

Sushil Sharda
Technical Manager (Geotechnical Division)

for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE**Determination of California Bearing Ratio**

Tested in Accordance with BS 1377-4: 1990: Clause 7

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Enzygo Geoenvironmental Ltd
Client Address: The Byre
Woodend lane
Cromhall
Gloucestershire, GL12 8AA
Contact: Steve Rhodes
Site Name: Havant
Site Address: Not Given

Client Reference: CRM.1033.025
Job Number: 16-36086
Date Sampled: 12/12/2016
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Date Tested: 04/01/2017
Sampled By: Not Given

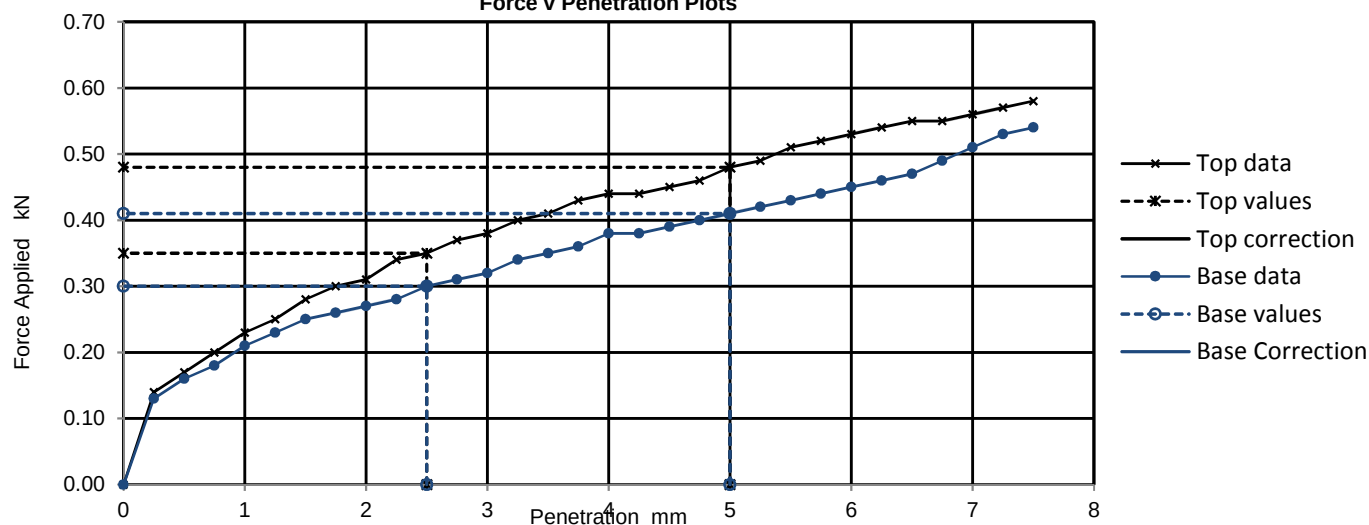
Test Results:

Laboratory Reference: 677724
Hole No.: TP1
Sample Reference: Not Given

Depth Top [m]: 0.5
Depth Base [m]: Not Given
Sample Type: B

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
Sample Description:	Brown gravelly CLAY	Time to surface	days
Material retained on 20mm sieve removed	11 %	Amount of swell recorded	mm
Initial Specimen details	Bulk density 2.00 Mg/m ³	Dry density after soaking	Mg/m ³
	Dry density 1.62 Mg/m ³	Surcharge applied	8 kg
	Moisture content 23 %		4.8 kPa

Force v Penetration Plots

Results

TOP
BASE

Curve correction applied	CBR Values, %			
	2.5mm	5mm	Highest	Average
No	2.7	2.4	2.7	2.5
No	2.3	2.1	2.3	

Moisture Content %
23
21

Remarks:

Test/ Specimen
specific remarks:

Approved:

Signed:

Mirosława Pytlík
PL Head of
Geotechnical Section

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 06/01/2017

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Tested in Accordance with BS 1377-4: 1990: Clause 7

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Enzygo Geoenvironmental Ltd
Client Address: The Byre
Woodend lane
Cromhall
Gloucestershire, GL12 8AA
Contact: Steve Rhodes
Site Name: Havant
Site Address: Not Given

Client Reference: CRM.1033.025
Job Number: 16-36086
Date Sampled: 12/12/2016
Date Received: 16/12/2016
Date Tested: 04/01/2017
Sampled By: Not Given

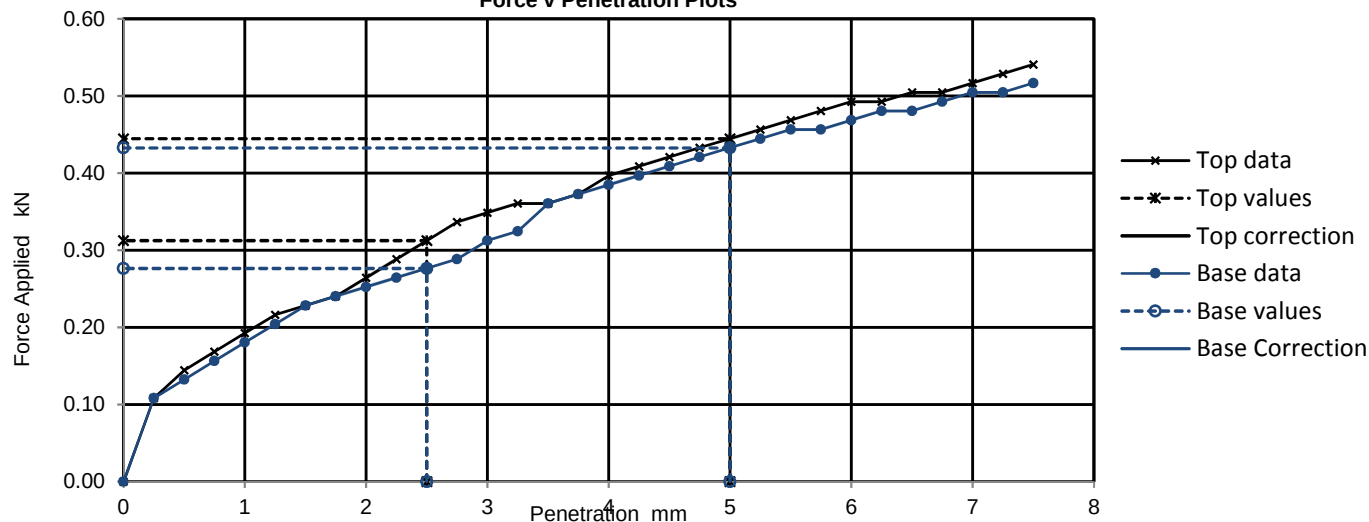
Test Results:

Laboratory Reference: 677725
Hole No.: TP2
Sample Reference: Not Given

Depth Top [m]: 0.5
Depth Base [m]: Not Given
Sample Type: B

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
Sample Description:	Brown gravelly CLAY	Time to surface	days
Material retained on 20mm sieve removed	28 %	Amount of swell recorded	mm
Initial Specimen details	Bulk density 2.08 Mg/m3	Dry density after soaking	Mg/m3
	Dry density 1.74 Mg/m3	Surcharge applied	8 kg
	Moisture content 20 %		4.9 kPa

Force v Penetration Plots

Results

TOP
BASE

Curve correction applied	CBR Values, %			
	2.5mm	5mm	Highest	Average
No	2.4	2.2	2.4	2.3
No	2.1	2.2	2.2	

Moisture Content %
16
17

Remarks:

Test/ Specimen
specific remarks:

Approved:

Signed:

Mirosława Pytlík
PL Head of
Geotechnical Section

Sushil Sharda
Technical Manager
(Geotechnical Division)

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Job Number: 16-36086
Date Sampled: 12/12/2016
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Date Tested: 04/01/2016
Sampled By: Not Given

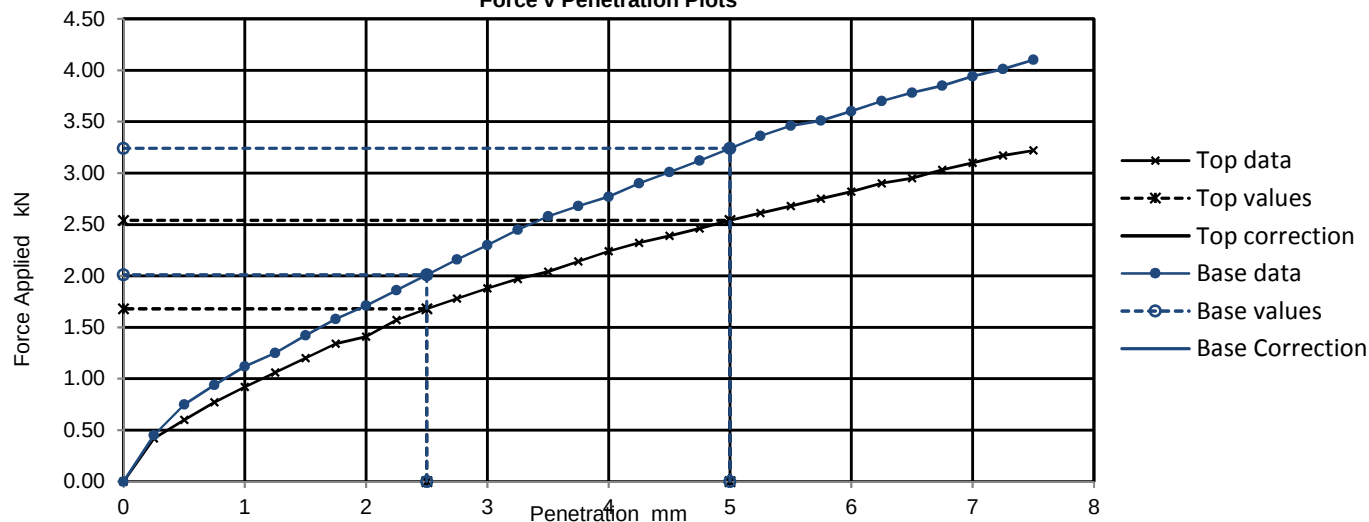
Test Results:

Laboratory Reference: 677726
Hole No.: TP3
Sample Reference: Not Given

Depth Top [m]: 0.5
Depth Base [m]: Not Given
Sample Type: B

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
Sample Description:	Brown gravelly slightly clayey SAND	Amount of swell recorded	mm
Material retained on 20mm sieve removed	33 %	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density 1.93 Mg/m3	Surcharge applied	8 kg
	Dry density 1.70 Mg/m3		4.9 kPa
	Moisture content 13 %		

Force v Penetration Plots

Results

TOP
BASE

Curve correction applied	CBR Values, %			
	2.5mm	5mm	Highest	Average
No	13.0	13.0	13.0	
No	15.0	16.0	16.0	

Moisture Content %
17
15

Remarks:

Test/ Specimen
specific remarks:

Approved:

Signed:

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Sushil Sharda
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Site Name: Havant
Site Address: Not Given

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Job Number: 16-36086
Date Sampled: 12/12/2016
Date Received: 16/12/2016
Date Tested: 05/01/2017
Sampled By: Not Given

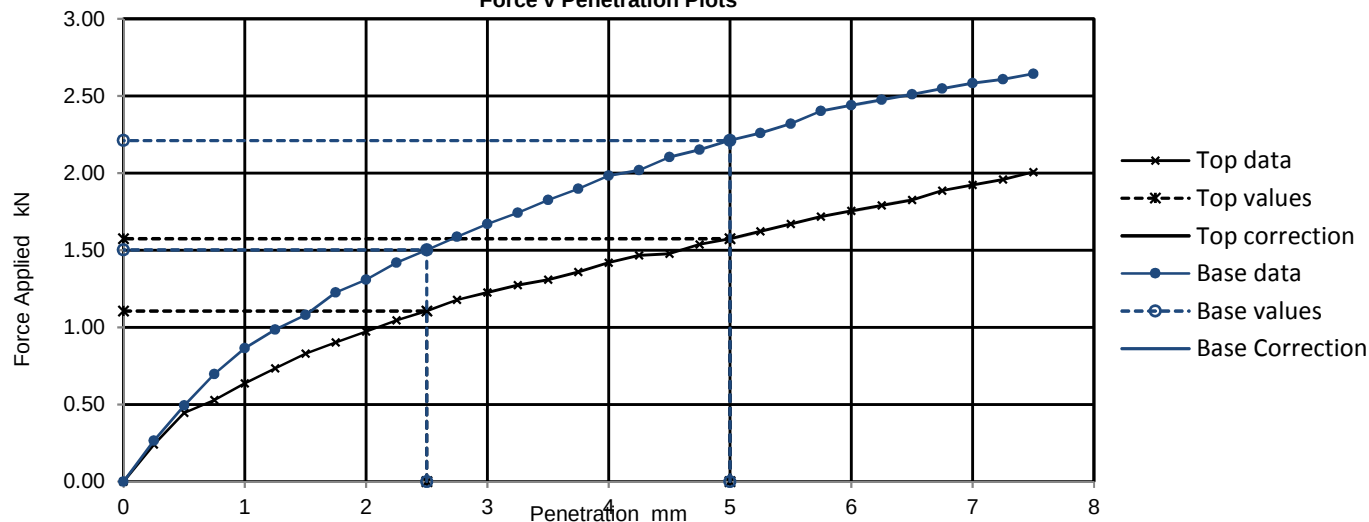
Test Results:

Laboratory Reference: 677727
Hole No.: TP4
Sample Reference: Not Given

Depth Top [m]: 0.5
Depth Base [m]: Not Given
Sample Type: B

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
Sample Description:	Brown gravelly slightly clayey SAND	Amount of swell recorded	mm
Material retained on 20mm sieve removed	22 %	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density 2.01 Mg/m3	Surcharge applied	8 kg
	Dry density 1.73 Mg/m3		4.9 kPa
	Moisture content 16 %		

Force v Penetration Plots

Results

TOP
BASE

Curve correction applied	CBR Values, %			
	2.5mm	5mm	Highest	Average
No	8.4	7.9	8.4	
No	11.0	11.0	11.0	

Moisture Content %
17
17

Remarks:

Test/ Specimen
specific remarks:

Approved:

Signed:

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Enzygo specialise in a wide range of technical services:

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Waste Technologies and Renewables

Landscape and Visual Impact

Environmental Assessment Co-ordination

Hydrology and Flood Risk

Waste Contract Procurement

Noise and Vibration

Environmental Permitting and Regulation

Development Planning & Policy

Ecology Services

Contaminated Land and Geotechnical

Traffic and Transportation

Planning Services

BRISTOL OFFICE

The Byre,
Woodend Lane,
Cromhall,
Gloucestershire GL12 8AA
Tel: 01454 269 237

SHEFFIELD OFFICE

Samuel House,
5 Fox Valley Way,
Stocksbridge,
Sheffield S36 2AA
Tel: 0114 321 5151

MANCHESTER OFFICE

76 King Street,
Manchester,
M2 4NH

Tel: 0161 413 6444

Please visit our website for more information.

enzygo.com