

The Southern Co-operative

RIDGE

DESK TOP STUDY REPORT

DUNSBURY WAY, HAVANT, HANTS



PART 1 OF 6



RIDGE

DESK TOP STUDY- DUNSBURY WAY, HAVANT
THE SOUTHERN CO-OPERATIVE
October 2018

DESK TOP STUDY – DUNSBURY WAY, HAVANT

October 2018

Prepared for

The Southern Co-operative
1000 Lakeside
Western Road
Portsmouth
PO6 3FE

Prepared by

Ridge and Partners LLP
Partnership House
Moorside Road
Winchester
Hampshire
SO23 7RX

Tel: 01962 834400

Contact

Richard Holloway
Associate- Geo-Environmental Engineering
rholloway@ridge.co.uk
07748 790224

Version Control

Project	5003415
Issue Date	October 2018
Originator	MS
Checked	RJH
Version	2.0
Notes	

CONTENTS

1. INTRODUCTION	1
1.1. Instructions	1
1.2. Legal Context	1
1.3. Methodology	2
1.4. Proposed End Use	3
1.5. Report Scope and Limitation	3
2. SITE CONDITIONS	4
2.1. Site Location and Description	4
2.2. Surroundings	5
2.3. Potential Sources of Contamination – Walkover Survey	5
3. SITE HISTORY AND HISTORICAL CONTAMINATIVE SOURCES	6
3.1. Review of Historical Maps	6
3.2. Potential Sources of Contamination – Historical Map Review	7
4. PHYSICAL SETTING	8
4.1. Geology and Hydrogeology	8
4.2. Hydrology	10
4.3. Controlled Waters	10
5. ENVIRONMENTAL RECORDS REVIEW	11
5.1. Groundsure Record Search	11
5.2. Permits, Incidents and Registers	11
5.3. Information from Local Authority	12
5.4. Potential Sources of Contamination – Records Review	12
6. CONCEPTUAL SITE MODEL	13
6.1. Sources	13
6.2. Pathways	13
6.3. Receptors	14
7. RISK ASSESSMENT	15
7.1. Risk Assessment Procedure	15
7.2. Pollutant Linkage Assessment	17
7.3. Pollutant Linkage Assessment	18
8. CONCLUSIONS AND RECOMMENDATIONS	19
8.1. Potential Sources of Contamination	19
FIGURE 1 – SITE LOCATION PLAN	20
FIGURE 2 – PROPOSED DEVELOPMENT PLANS	21

APPENDIX 1 – REPORT CONDITIONS	22
APPENDIX 2 – HISTORICAL MAPS	23
APPENDIX 3 – GROUNDSURE REPORT	24
APPENDIX 4 – WALKOVER PHOTOGRAPHS	25

1. INTRODUCTION

1.1. Instructions

Ridge and Partners LLP (Ridge) was commissioned by The Southern Co-operative in April 2017 to undertake a Desk Top Study of a plot of land off Dunsbury Way, Havant, PO9 5BQ (hereafter referred to as “the site”). Due to a delay in issuing the original report to the Local Authority (Ref: 5003415-815-01, Date: May 2017), this Desk Top Study has been updated (in October 2018) and includes up to date Groundsure Enviro Insight information.

Ridge were briefed to use the development information provided to obtain an environmental database search relating to the site, and carry out a walkover survey to assess and report on the findings with respect to potential ground contamination and potential associated future liabilities in accordance with the Preliminary Risk Assessment procedure outlined in the Model Procedures for the Management of Land Contamination (CLR 11), published by the Environment Agency.

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

1.1.1. Proposals

It is understood that the site is proposed for development as residential apartments. A change in the site use from that currently proposed may result in the need for re-assessment of risk criteria and the conclusions and recommendations resulting from the risk assessment could therefore significantly change.

1.2. Legal Context

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

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

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

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

While Part IIA of the Environmental Protection Act provides a risk-based approach to the identification and remediation of land where contamination poses an unacceptable risk to human health or the environment, the regime does not take into account future uses. New developments are therefore controlled by the planning regime, with reference to the National Planning Policy Framework, 2018 (NPPF), rather than directly by Part IIA of the Environmental Protection Act.

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

1.3. Methodology

This report has been prepared in accordance with published Environment Agency guidance (‘Model Procedures for the Management of Land Contamination – Contaminated Land Report (CLR) 11’). CLR 11 provides the technical framework for structured decision making about land contamination and builds on previous work carried out under the Contaminated Land Research Programme (of the former Department of the Environment). CLR 11 has adopted and refined the well-recognised methodology and terminology that has been used in contaminated land risk assessment for a number of years.

1.3.1. Pollutant Linkage Concept

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

- A **contaminant source** – a substance that is in, on or under the land and has the potential to cause harm or to cause pollution of controlled waters.
- A **receptor** – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body.
- A **pathway** – a route or means by which a receptor can be exposed to, or affected by, a contaminant.

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

1.3.2. Conceptual Model

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

1.3.3. Risk Assessment

CLR 11 advocates a phased approach to risk assessment comprising the following in order, as necessary:

Preliminary Risk Assessment – a desk study consisting of a review of documentary, anecdotal and site walk over evidence.

Generic Quantitative Risk Assessment (GQRA) - comparison of contaminant concentrations obtained from site investigation with generic assessment criteria.

Detailed Quantitative Risk Assessment (DQRA) - comparison of contaminant concentrations obtained from site investigation with site-specific assessment criteria.

This document constitutes a Preliminary Risk Assessment.

1.4. Proposed End Use

It is understood that the site is proposed for development as residential apartments. A change in the site use from that currently proposed may result in the need for re-assessment of risk criteria and the conclusions and recommendations resulting from the risk assessment could therefore significantly change.

1.5. Report Scope and Limitation

This report is based upon a review of readily available historical and current information, a site walkover survey, geological and hydrogeological maps and information from an environmental database search. The assessment is based on the proposed use outlined in Section 1.4. The outcomes of this assessment could change if the end uses change.

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

2. SITE CONDITIONS

A Geo-Environmental Engineer from Ridge completed a Walkover Survey of the site on 5th May 2017, details of which are provided in subsequent report sections below. A second site visit (from adjacent public areas) was conducted on 23rd October to verify site conditions were the same, with the site being secure and vacant.

2.1. Site Location and Description

SITE ADDRESS	Land off Dunsbury Way, Havant, PO9 5BQ
EASTING, NORTHING	471311, 108235
SITE AREA	0.52ha
SITE OCCUPIER	Dairy Crest and Co-operative
SITE ACCESS	Direct from Dunsbury Way to the west
SITE BOUNDARIES	Dunsbury Way to the west. Car rental business to the east. Public green space to the south. Fulflood Road to the north.
GROUND COVER	Approximately 70% hardstanding or build footprint, and 30% soft landscaping.
SITE TOPOGRAPHY AND ELEVATION	The site lies at approximately 15mAOD. There is a very slight downslope toward an unnamed stream adjacent south of the site.

Table 2.1: Site Details

The site is roughly square in plan shape with an area of approximately 0.5ha. The northern area of the site comprises a single storey masonry former milk packaging and distribution depot building along the north-west boundary with covered bays and a yard in the north-east and east, a toilet block in the north-east corner and parking bays in the west of the site. The building contains predominantly office accommodation at the western end with warehouse, storage, refrigeration and loading areas in the centre and west. The covered bays in the north-east and east of the site, where milk distribution vehicles are believed to have been parked, were noted to be of steel frame construction with brick rear walls and suspected asbestos cement sheeting forming the roofs. The yard was predominantly covered by asphalt surfacing with a concrete slab along the western edge of the yard. No evidence of fuel or chemical storage was observed during the walkover survey and it is understood from planning records that repair, servicing or refuelling of vehicles was not permitted on site under the planning permission for the development of the depot.

The southern area of the site comprises a single storey brick funeral care facility with soft landscaping and parking fronting Dunsbury Way to the west of the building with a yard and garage to the rear (east) of the building. Adjacent to the south of the funeral care building is a residential bungalow, understood to have originally been constructed as the dwelling for the manager of the funeral care facility, with soft landscaping fronting Dunsbury Way and a rear garden to the east. No evidence of fuel or chemical storage was noted in relation to the funeral care facility or the bungalow. The southern boundary of the site is formed by a steep embankment down to the adjacent Riders Stream, approximately 2-3m below the site surface level.

2.2. Surroundings

The site is situated within a residential and commercial part of the sprawling town of Havant. Residential properties are located to the south and west, with a number of associated public green spaces noted. Light commercial properties are located to the east.

Riders Infant School is situated 125m west, and The Catholic Church of Saint Michael and All Angels is located 50m north-west.

Photographs relating to the observations made during the walkover are included within Appendix 4.

2.3. Potential Sources of Contamination – Walkover Survey

Following the site walkover, no potential contaminant sources were identified. Justification is provided in the table below.

POTENTIAL SOURCES OF CONTAMINATION CONSIDERED A RISK TO THE SITE		
FEATURE	DISTANCE, DIRECTION	APPROX. DATES PRESENT
Possible asbestos containing materials (ACMs) in existing and former buildings and potentially buried on site.	On site	Current

Table 2.2: Potential Sources following site walkover

3. SITE HISTORY AND HISTORICAL CONTAMINATIVE SOURCES

3.1. Review of Historical Maps

Ordnance Survey Maps provided within a Groundsure Report package have been obtained to provide details of the history of the site and surrounding areas. A chronological description of the maps is shown in the table below. The descriptions focus on features which are considered to be relevant to the proposed development within 100m of the development site boundary. Note, potential contaminative sources and features more than 100m from the site have been discussed only where they are considered to be relevant. Copies of the maps are included as Appendix 2.

3.1.1. Relevant History of Site and Surroundings

The Ordnance Survey maps provided and reviewed from 1866 to 2014 (scales 1:2,500, 1:10,000, 1:1,250, 1:10,560) indicate that the site formed part of an open field from the earliest available map until the site was initially developed as part of a sewage disposal works sometime shortly after 1932, which included the construction of Dunsbury Way along the western boundary of the site. The site comprised Congestion Tanks in the southeast and Sludge Beds in the southwest with Settling Tanks and Filter beds shown adjacent to the east of the site and Humus Beds shown beyond Dunsbury Way to the west of the site.

The sewage works appears to have been removed in the mid to late 1950s and a housing estate was developed to the south of the site. The site is shown to be vacant until the 1962 map, which shows the north of the site to have been developed as a Depot, believed to be the existing former Dairy Crest Depot. The Depot on site appears to have formed part of an industrial estate with another Depot adjacent to the east, the Leigh Park Estate Office and Fulflood Road adjacent to the north with large Works buildings beyond these. A garage is also shown beyond Dunsbury Way to the west.

The ground level of the site and the associated new industrial estate appears to have been raised as part of the development with an embankment shown along the stream to the south of the site.

During the late 1960s/early 1970s the south of the site was developed with two linked buildings identified as 222 and 224, believed to be the existing Co-operative Funeral care premises and adjacent residential bungalow. The 1971 map also shows the Depot to the east to be an Omnibus Depot, the Works beyond that to the east to have been extended and referred to as a Factory and the Works building to the north to have also been extended. It is understood that these units formed the former Procter and Gamble factory. The western section of the Factory building was subsequently demolished during the early 1990s and the works buildings and former Estate Office to the north of the site were demolished between 2002 and 2010 and the majority of the area replaced with housing.

3.2. Potential Sources of Contamination – Historical Map Review

Contaminant sources considered to present a potential risk to the site are detailed in the table below.

POTENTIAL SOURCES OF CONTAMINATION CONSIDERED A RISK TO THE SITE		
FEATURE	DISTANCE, DIRECTION	APPROX. DATES
Possible Made Ground and fill materials associated with historical development of site.	On site	From 1930s
Potential fuel oil and other contaminants associated with the refuelling depot on the adjacent former bus depot.	Adjacent east	From 1960s
Surrounding land uses – depots, factory, works within 100m.	Within 100m north and east	From 1960s

Table 3.1: Potential Sources following Historical Map Review

4. PHYSICAL SETTING

4.1. Geology and Hydrogeology

The following observations are taken from the British Geological Survey (BGS) Geology of Britain Viewer (2018) and the Geo Insight Groundsure Report (Appendix 3).

The British Geological Survey (BGS) Geology of Britain Viewer (2018) indicates that the majority of the site is underlain by superficial deposits of Head, with no deposits recorded in the north-east corner of the site.

Bedrock geology is recorded as the London Clay Formation.

The table below identifies the expected composition of the published strata and associated aquifer classification.

SUPERFICIAL DEPOSITS	
Unit Name	Head – Clay, Silt, Sand and Gravel
Geology Description	Comprises Gravel, Sand and Clay depending on upslope source and distance from source. Poorly sorted and poorly stratified deposits. Essentially comprises Sand and Gravel, locally with lenses of Silt, Clay or peat and organic material.
Aquifer Classification	Secondary Undifferentiated
Aquifer Description	Assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
BEDROCK GEOLOGY – EASTERN PART OF SITE	
Unit Name	London Clay Formation
Geology Description	Bioturbated or poorly laminated, blueish grey or greyish brown, slightly calcareous, silty to very silty Clay, clayey Silt and sometimes Silt, with some layers of sandy Clay.
Aquifer Classification	Unproductive
Aquifer Description	Rock layers of drift deposits with low permeability that have negligible significance for water supply or river base flow.

Table 4.1: Geology and Hydrogeology

4.1.1. Historical Borehole Records

The closest geologically relevant borehole is situated approximately 750m west of the site (Ref: SU70NW65). Firm brown/ grey silty sandy Clay with stones was identified from 0.3m to 2.4m below a veneer of topsoil. Stiff mottled grey brown Clay with 'crystals' was identified from 2.4m to the maximum drill depth of 4.6m.

4.1.2. Artificial Ground

There are no records of artificial ground within 500m of the site boundary at 1:10,000 scale.

4.1.3. Landslips

There are no records within the 500m search buffer.

4.1.4. Radon

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

4.1.5. Ground Workings

There are no records of historical or current ground workings within 250m of the site.

4.1.6. Mining, Extraction and Natural Cavities

There are no records of historical mining, coal mining, or Johnson Poole and Bloomer data within 1km of the site boundary. Furthermore, there are no records of clay, tin, gypsum, or brine extraction.

4.1.7. Natural Ground Subsidence

The BGS has provided the following on site information as summarised in the table below.

PROCESS	RISK LEVEL
Running Sands	Low
Shrink Swell Clay	Low
Landslides	Very Low
Collapsible Deposits	Very Low
Ground Dissolution of Soluble Rocks	Negligible
Compressible Deposits	Negligible

Table 4.2: Natural Ground Subsidence

4.1.8. Estimated Background Soil Chemistry

Estimated background concentrations on site are as follows: arsenic <15mg/kg; cadmium <1.8mg/kg; chromium 90 - 120mg/kg; nickel 15 - 30mg/kg, lead <100mg/kg.

4.2. Hydrology

4.2.1. Surface Water Features

An unnamed stream is situated adjacent south of the site.

4.2.2. Flooding

The site is classified as an Environment Agency Zone 3 Flood Area – annual probability of flooding between 1% or greater from rivers, and 0.5% or greater from the sea.

The Risk of Flooding from Rivers and Sea (RoFRaS) Flood Rating is classified as High (1 in 30 or greater).

There are no flood defences or areas benefiting from flood defences within 250m of the site.

4.3. Controlled Waters

4.3.1. Abstraction Licenses

There are no groundwater abstraction licenses within 1km of the site. There are no records of surface water abstraction licenses within 2km of the site boundary.

4.3.2. Source Protection Zones

The site is situated within a Zone 1c SPZ. This is defined as an inner zone SPZ for subsurface activity only. This is where the aquifer is confined and may be impacted by deep drilling activities.

4.3.3. Groundwater Vulnerability and Soil Leaching Potential

On site soils are not classified.

4.3.4. Designated Environmentally Sensitive Sites

There is one record of ancient woodland 265m north-east. The site is classified as a Nitrate Vulnerable Zone. There are no further records of environmental designations in the vicinity.

5. ENVIRONMENTAL RECORDS REVIEW

The following information has been obtained from public archive via the data supplier Groundsure or by direct application. The full (2018) Enviro Insight Groundsure Report is included as Appendix 3. The subsequent review focusses on records within 100m of the outlined development site, or those which are considered relevant to the proposed development. Ridge have not included data from Groundsure's own review of historical maps.

5.1. Groundsure Record Search

The following observations are taken from the British Geological Survey (BGS) Geology of Britain Viewer (2018) and the Enviro Insight Report (Appendix 3).

5.1.1. Historical Tank Database

There is record of an on site Congestion Tank based on the 1952 mapping. 1970 and 1995 mapping identified a tank approximately 20m north-east. All other tanks within 100m are associated with settling/ humus.

5.1.2. Historical Energy Features

There is one record within 100m; an electricity substation approximately 70m north-east (1970 mapping).

5.1.3. Potentially Infilled Land

There are no records within 400m.

5.2. Permits, Incidents and Registers

5.2.1. Discharge Consents

Stage Coach South Ltd. (15m north-east) have a license of discharge of site drainage to a freshwater river, assumed to be the unnamed stream identified adjacent south.

5.2.2. Dangerous or Hazardous Sites

There are no records of Dangerous or Hazardous Sites within 500m of the site.

5.2.3. Pollution Incidents

There are three records within 200m, the closest of which relates to a sewage incident 45m south-west – the incident caused minor impact to water. All other incidents within 200m caused minor impact only.

5.2.4. Landfill and other Waste Sites

There are no records of current or historical landfill or waste facilities within 1km of the site.

5.2.5. Current Industrial Data

Kwik Clutch (vehicle repair, testing and servicing) are situated adjacent east. A tank is noted approximately 20m north-east.

Andair (industrial aero products) is located 40m north. Larchwood vehicle service centre is 75m north.

5.3. Information from Local Authority

A request for environmental information was submitted to the Contaminated Land Officer at Havant Borough Council in relation to this site. A response was received on 2nd May 2017 and contained a summary of the development history of the site, the planning history of the site and a list of investigation reports for sites in the vicinity of the study site.

The most pertinent information is summarised below:

- The site does not appear to have been previously investigated or been associated with fuel storage or refuelling operations;
- The bus depot adjacent to the east of the site contained refuelling facilities;
- The raising of the south-east of the site is likely to be associated with cut and fill from the local area rather than imported material;
- Buried asbestos cement had previously been discovered on the adjacent site; and,
- The former factory site to the east was extensively investigated and remediated between 2003 and 2008.

5.4. Potential Sources of Contamination – Records Review

Potential sources of contamination identified following the environmental records review are detailed in the table below.

POTENTIAL SOURCES OF CONTAMINATION CONSIDERED A RISK TO THE SITE		
FEATURE	DISTANCE, DIRECTION	APPROX. DATES
Ground gas associated with organic materials (congestion tank) and Made Ground (cut and fill)	On site	1950 - 1960
Hydrocarbon fuels associated with tank.	20m north-east	From 1960s
Vehicle repair	Adjacent east	Post 1990s
Industrial aero products	40m north	Post 1960s
Larchwood vehicle service centre	75m north	Post 1960s
POTENTIAL SOURCES NOT CONSIDERED FURTHER		
FEATURE	JUSTIFICATION	
Electrical substation 70m east	Low contamination potential and distance from site	
Discharge consent 15m north-east	Surface water discharge only	
Pollution Incident, closest 45m south-west	Classified as minor incident and distance from site	

Table 5.1: Potential Sources

6. CONCEPTUAL SITE MODEL

6.1. Sources

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

The conceptual model, based on information obtained as part of the preliminary risk assessment, identified the following potential contaminant sources:

6.1.1. On-Site – Historical and Current

1. Potential ground gas associated with organic materials (congestion tank) and Made Ground (cut and fill).
2. Possible asbestos containing materials (ACMs) in soils and Made Ground associated with historical development of site. Contaminants of Concern (CoC) include asbestos, heavy metals, petroleum hydrocarbons and PAHs.
3. Potential fuel oil and other contaminants associated with the refuelling depot on the adjacent (east) former bus depot. CoC primarily include petroleum hydrocarbons and PAHs.

6.1.2. Off-Site – Historical and Current

4. Surrounding land uses within 100m inclusive of depots, vehicle repair, service centre, factory and works. CoC include commonly identified contaminants such as asbestos, heavy metals, petroleum hydrocarbons and PAHs.

6.2. Pathways

The key environmental pathways and exposure routes by which potentially toxic substances can reach the identified potential receptors are considered to be:

6.2.1. Indirect

- Vertical and lateral migration of ground gas and soil vapour leading to accumulation in enclosed spaces
- Vertical migration of contaminants through the underlying geology and/ or via overland flow
- Vertical and lateral migration of organic and inorganic compounds through underlying geology associated with off site land uses

6.2.2. Direct

- Inhalation of ground gases
- Inhalation of contaminated dust
- Ingestion
- Dermal Contact

6.3. Receptors

Receptors that may be affected by the potential contamination are considered to be:

6.3.1. Human

- End Users (residents and maintenance workers)
- Construction Workers (during development)

6.3.2. Environmental

- Underlying Secondary (Undifferentiated) Superficial Aquifer
- Adjacent south unnamed stream

7. RISK ASSESSMENT

7.1. Risk Assessment Procedure

By considering the sources, pathways and receptors (pollutant linkages), an assessment of the human health/ environmental risks is made with reference to the significance and degree of the risk. This assessment is based on consideration of whether the contamination source can reach a receptor and hence whether it is of major or minor significance.

The risk assessment has been undertaken with reference to BS 10175:2011+A1:2013 and CIRIA Document C552: Contaminated Land Risk assessment 'A Guide to Good Practice'. The risk assessment has been carried out by assessing the severity of the potential consequence, considering both the potential magnitude of the hazard and the sensitivity of the target, based on the categories given below.

CATEGORY	EXAMPLES
High	Residential with gardens/Groundwater Source Protection Zone
Medium	Residential without gardens/Principal (Major) Aquifer/sensitive watercourse
Low	Commercial and industrial use/Secondary (Minor) Aquifer
Very Low	Construction and maintenance workers/non-sensitive watercourse

Table 7.1: Sensitivity of Receptor

CATEGORY	EXAMPLES
Gross Impact	Heavily contaminated gasworks or industrial site, hazardous waste landfill
Moderate Impact	Major leaks and spills from fuel infrastructure (e.g. petrol stations), domestic waste landfills
Slight Impact	Minor leaks and spills from fuel infrastructure, 'inert' waste landfills

Table 7.2: Magnitude of Impact

MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR			
	High	Medium	Low	Very Low
Gross Impact	Severe	Medium	Mild	Minor
Moderate Impact	Medium	Mild	Minor	Minor
Slight Impact	Mild	Minor	Minor	Minor

Table 7.3: Level of severity of potential hazard

The likelihood of an event (probability) takes into account both the presence of the hazard and target and the integrity of the pathway and has been assessed based on the categories given below.

CATEGORY	EXAMPLES
High likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor.
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term.
Low likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so.
Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable.

Table 7.4: Probability of risk definition

The potential severity of the risk and the probability of the risk occurring have been combined in accordance with the following matrix in order to give a level of risk for each potential hazard.

PROBABILITY OF RISK	SENSITIVITY OF RECEPTOR			
	Severe	Medium	Mild	Minor
High likelihood	Very High	High	Moderate	Low/Moderate
Likely	High	Moderate	Low/Moderate	Low
Low likelihood	Moderate	Low/Moderate	Low	Very Low
Unlikely	Low/Moderate	Low	Very Low	Very Low

Table 7.5: Level of risk for potential hazard definition

The assessment is discussed below in terms of plausible pollutant linkages. A complete assessment of the pollutant linkages is presented in Table 7.6.

A description of these risk classifications and likely action required are given in CIRIA 552 as:

Very high risk – High probability that severe harm could arise to a designated receptor from an identified hazard OR there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in substantial liability. Urgent investigation and remediation are likely to be required.

High risk – Harm is likely to arise to a designated receptor from an identified hazard. This risk, if realised, is likely to result in substantial liability. Urgent investigation is required, and remedial works may be necessary in the short term and are likely over the long term.

Moderate risk – It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation is normally required to clarify risks and to determine potential liability. Some remedial works may be required in the long term.

Low risk – It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.

Very low risk – It is a low possibility that harm could arise to a designated receptor. In the event of such harm being realised it is not likely to be severe.

7.2. Pollutant Linkage Assessment

A discussion of the key factors influencing the preliminary risk ratings is presented below, with a summary provided in table 7.6.

The primary risk driver for the proposed residential development is the potential presence of asbestos containing materials and fibres in the soil as a result of the potential for buried asbestos containing materials. Due to the discrete nature of asbestos contamination, these impacts, if present, may not be identified by intrusive investigation works. This potential risk should therefore be considered throughout the development works. It is, however, recommended to investigate the potential for large quantities of asbestos containing material to have been buried on site following the reported discovery of buried asbestos on an adjacent site.

As the southern area of the site appears to have been raised and given the former use of the site as a sewage treatment works, a significant potential exists for ground gas to be generated beneath the site, which could impact the proposed development.

There is also a potential for residual contaminants in the soil associated with the former adjacent bus depot refuelling operations. Due to the anticipated geology on the site, any contamination associated with this former use is likely to have migrated to groundwater and may be laterally migrating with groundwater flow towards the adjacent stream, potentially parallel to the site boundary.

An intrusive investigation is therefore recommended to further assess these risks.

7.3. Pollutant Linkage Assessment

SOURCE	PATHWAY	RECEPTOR	SEVERITY	LIKELIHOOD	RISK LEVEL
1. (ground gas)	Vertical and lateral migration of ground gas leading to accumulation in confined spaces and inhalation	Future Site users inclusive of residents and maintenance workers	Medium	Low Likelihood	Low/ Moderate
		Construction Workers (during development)	Minor	Likely	Low
2. (Made Ground and ACMs)	Direct contact, ingestion and inhalation of impacted soils/ groundwater inhalation	Future Site users inclusive of residents and maintenance workers	Medium	Likely	Moderate
		Construction Workers (during development)	Minor	Likely	Low
	Vertical migration of contaminants through the underlying geology and/ or via overland flow	Superficial Secondary Undifferentiated Aquifer	Minor	Low Likelihood	Very Low
		Surface water (unnamed stream adjacent south)	Minor	Low Likelihood	Very Low
3. (refuelling infrastructure at adjacent east former bus depot)	Direct contact, ingestion and inhalation of impacted soils/ groundwater	Future Site users inclusive of residents and maintenance workers	Medium	Low Likelihood	Low/ Moderate
		Construction Workers (during development)	Minor	Low Likelihood	Very Low
	Vertical and lateral migration of hydrocarbon soil vapours leading to accumulation in confined spaces and inhalation	Future Site users inclusive of residents and maintenance workers	Medium	Low Likelihood	Low/ Moderate
		Construction Workers (during development)	Minor	Low Likelihood	Very Low
4. (surrounding uses within 100m)	Direct contact, ingestion and inhalation of impacted soils/ groundwater	Future Site users inclusive of residents and maintenance workers	Mild	Unlikely	Very Low
		Construction Workers (during development)	Minor	Unlikely	Very Low
	Vertical and lateral migration of hydrocarbon soil vapours leading to accumulation in confined spaces and inhalation	Future Site users inclusive of residents and maintenance workers	Mild	Unlikely	Very Low
		Construction Workers (during development)	Minor	Unlikely	Very Low

Table 7.6: Pollutant Linkage Assessment

8. CONCLUSIONS AND RECOMMENDATIONS

8.1. Potential Sources of Contamination

The following potential sources of contamination were identified:

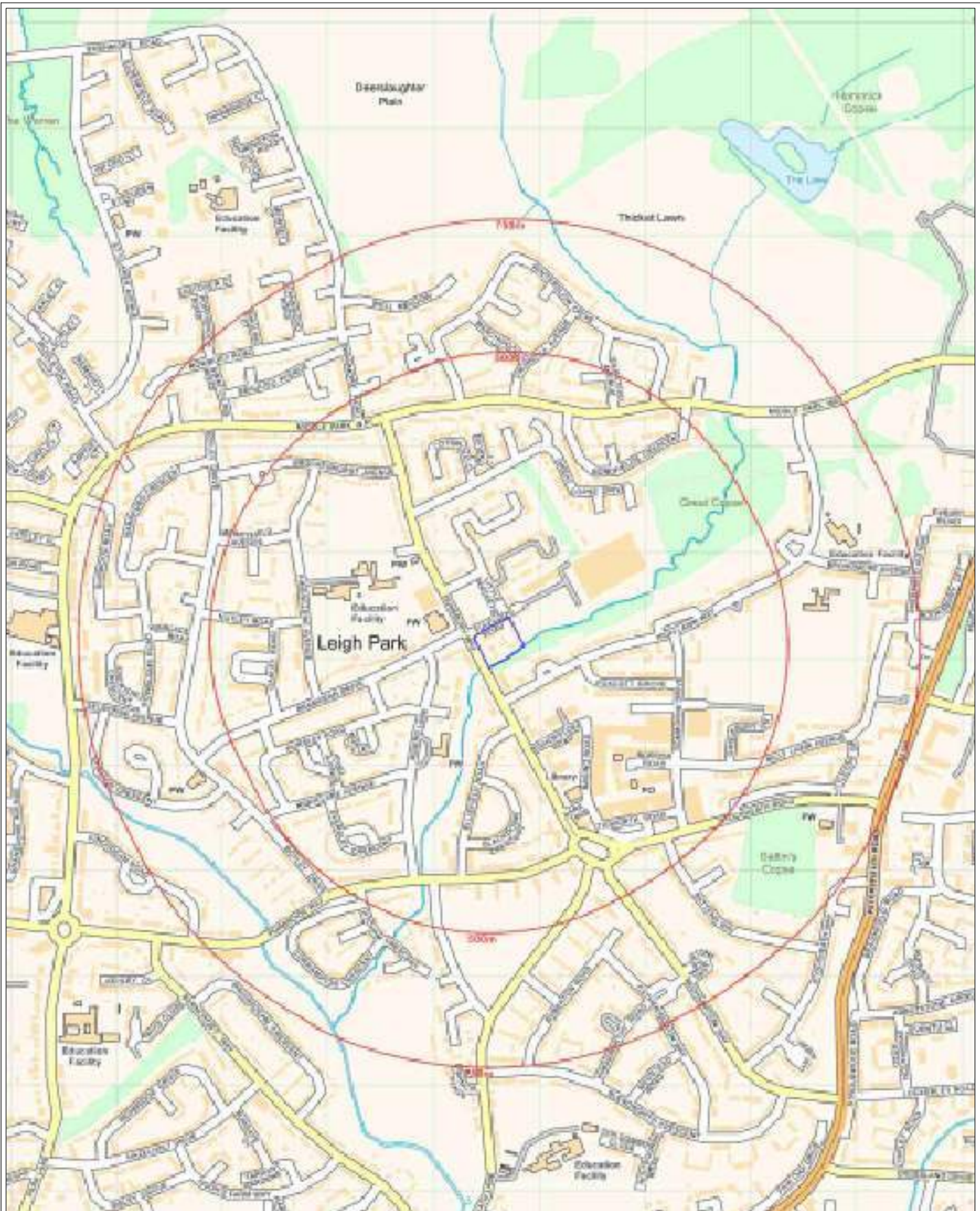
1. Potential ground gas associated with on site organic materials (congestion tank) and Made Ground (cut and fill).
2. Possible asbestos containing materials (ACMs) in soils and Made Ground associated with historical development of site.
3. Potential fuel oil and other contaminants associated with the refuelling depot on the adjacent (east) former bus depot.
4. Surrounding land uses within 100m inclusive of depots, vehicle repair, service centre, factory and works.

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

8.1.1. Preliminary Risk Rating

The risk of impact to identified receptors from the identified potential sources is considered to be **very low** to **moderate**. An intrusive investigation is therefore recommended to further investigate the potential contamination risks to human health and controlled waters.

FIGURE 1 – SITE LOCATION PLAN



-	02.05	FINAL	AP	RP
REF	DATE	REVISION	DRAWN	CHECKED

SURVEY PRODUCED UNDER ORDNANCE SURVEY CROWN COPYRIGHT 2011 ALL RIGHTS RESERVED LICENCE NUMBER 100023183

PROJECT
DUNSURY WAY
HAVANT

RIDGE

PARTNERSHIP HOUSE
MOORSIDE ROAD
WINCHESTER
HAMPSHIRE, SO23 7RX
Also at Reading, Bristol, London and Leicester

TEL: 01962 834400
FAX: 01993 815001
www.ridge.co.uk

CLIENT
SOUTHERN COOPERATIVE

DRAWING

5003415-LOC

SCALE
NTS @ A4

DATE
02.05.17

DRAWN BY
AP

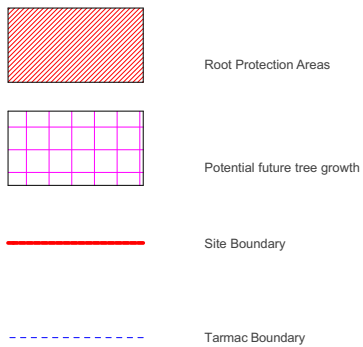
CHECKED BY
RP

FIGURE 1 - SITE LOCATION PLAN

REV

-

FIGURE 2 – PROPOSED DEVELOPMENT PLANS



1:200

Project No. **5264** drawing No. **1200** rev **B**

APPENDIX 1 – REPORT CONDITIONS

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

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

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

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

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

APPENDIX 2 – HISTORICAL MAPS

Site Details:

SOUTHERN CO-OPERATIVE
DAIRIES LTD, DUNSBURY WAY,
HAVANT, PO9 5BQ

Client Ref: 5003415-602235
Report Ref: GS-3817577
Grid Ref: 471322, 108231

Map Name: County Series

Map date: 1867-1869

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1867
Revised 1867
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1869
Revised 1869
Edition N/A
Copyright N/A
Levelled N/A

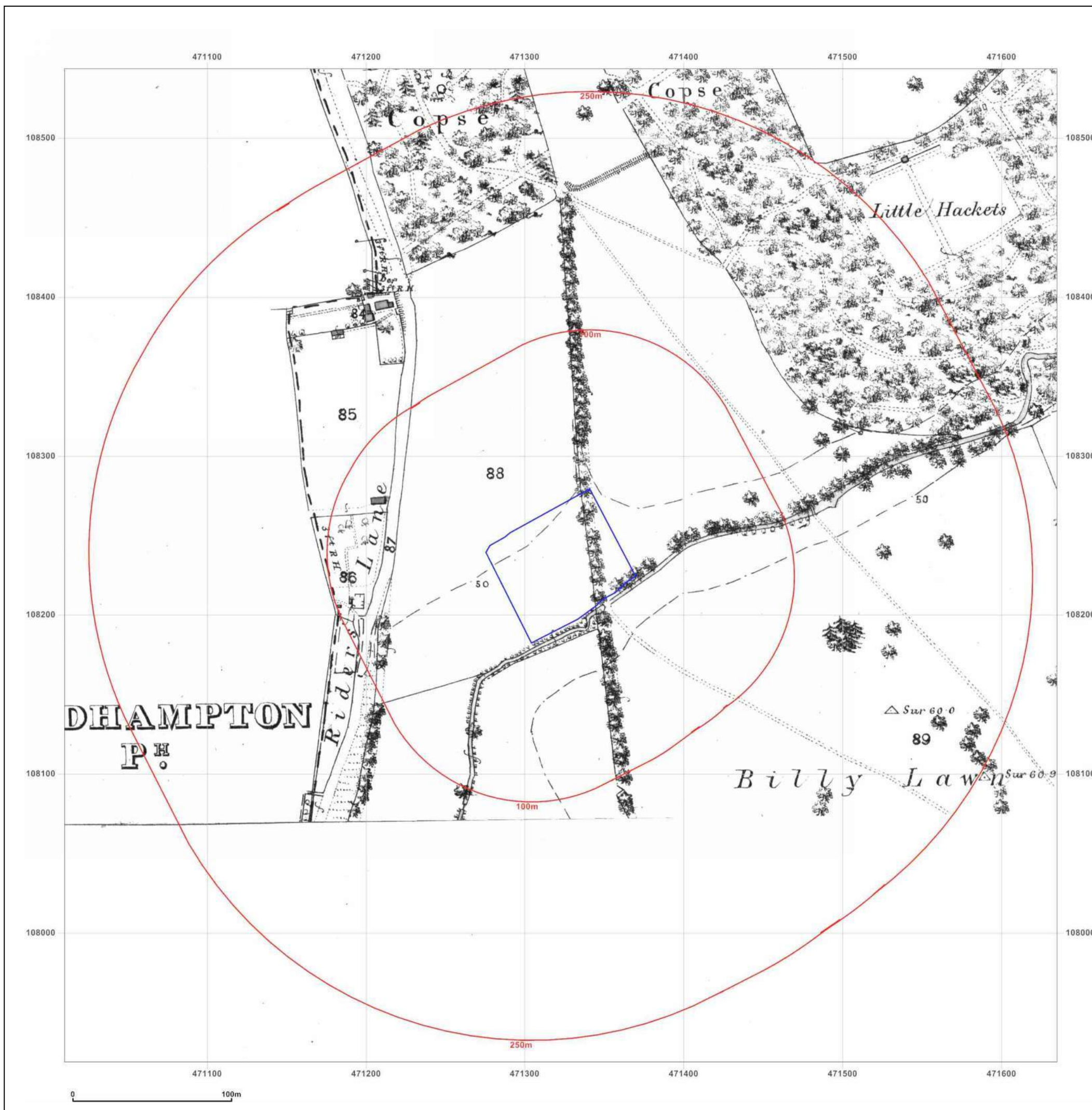


Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 20 April 2017

To view map legend click here [Legend](#)



Site Details:

SOUTHERN CO-OPERATIVE
DAIRIES LTD, DUNSBURY WAY,
HAVANT, PO9 5BQ

Client Ref: 5003415-602235
Report Ref: GS-3817577
Grid Ref: 471322, 108231

Map Name: County Series

Map date: 1897

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1897
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1897
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

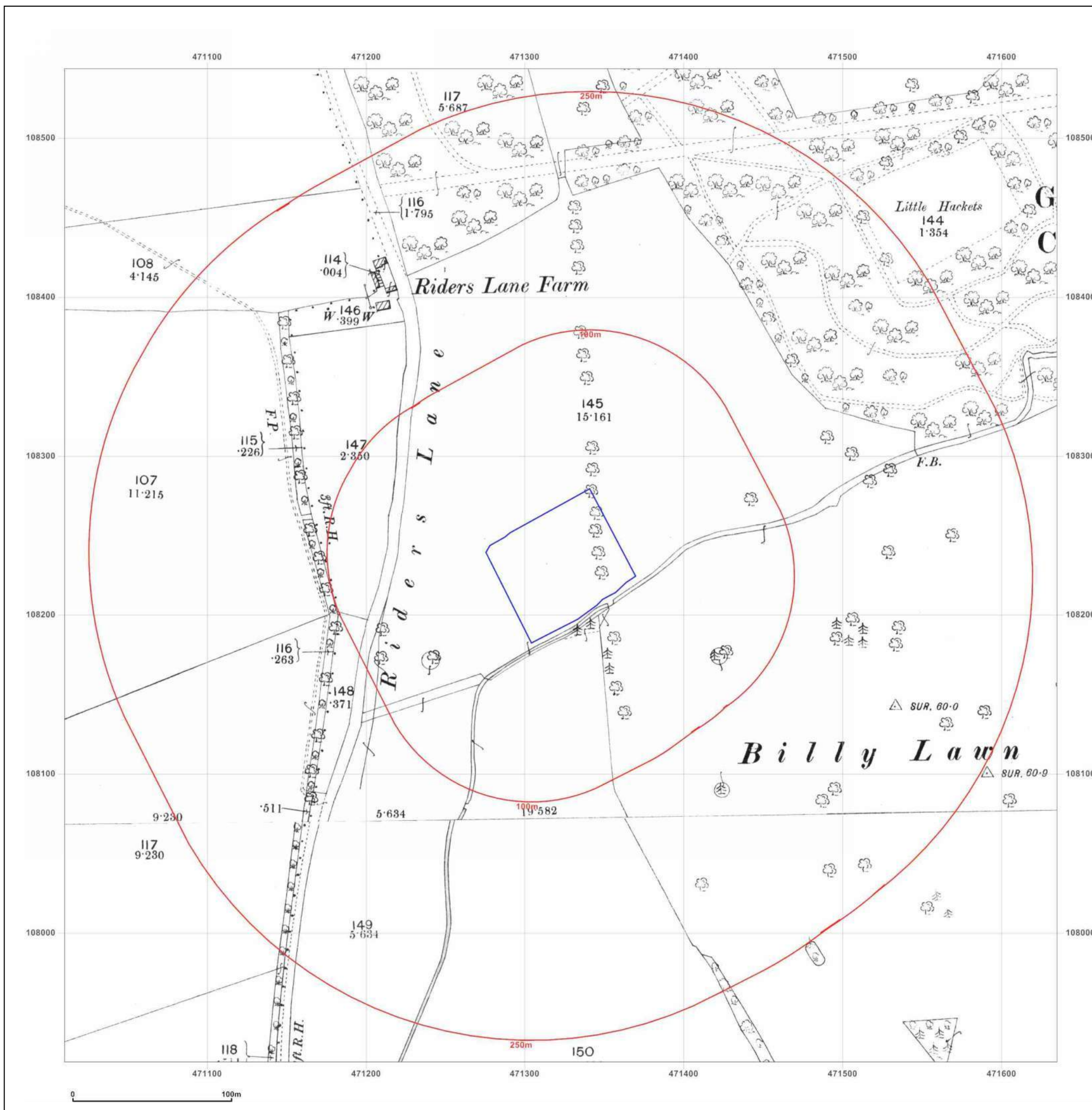


Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 20 April 2017

To view map legend click here [Legend](#)



Site Details:

SOUTHERN CO-OPERATIVE
DAIRIES LTD, DUNSBURY WAY,
HAVANT, PO9 5BQ

Client Ref: 5003415-602235
Report Ref: GS-3817577
Grid Ref: 471322, 108231

Map Name: County Series

Map date: 1909

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1909
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1909
Revised 1909
Edition N/A
Copyright N/A
Levelled N/A

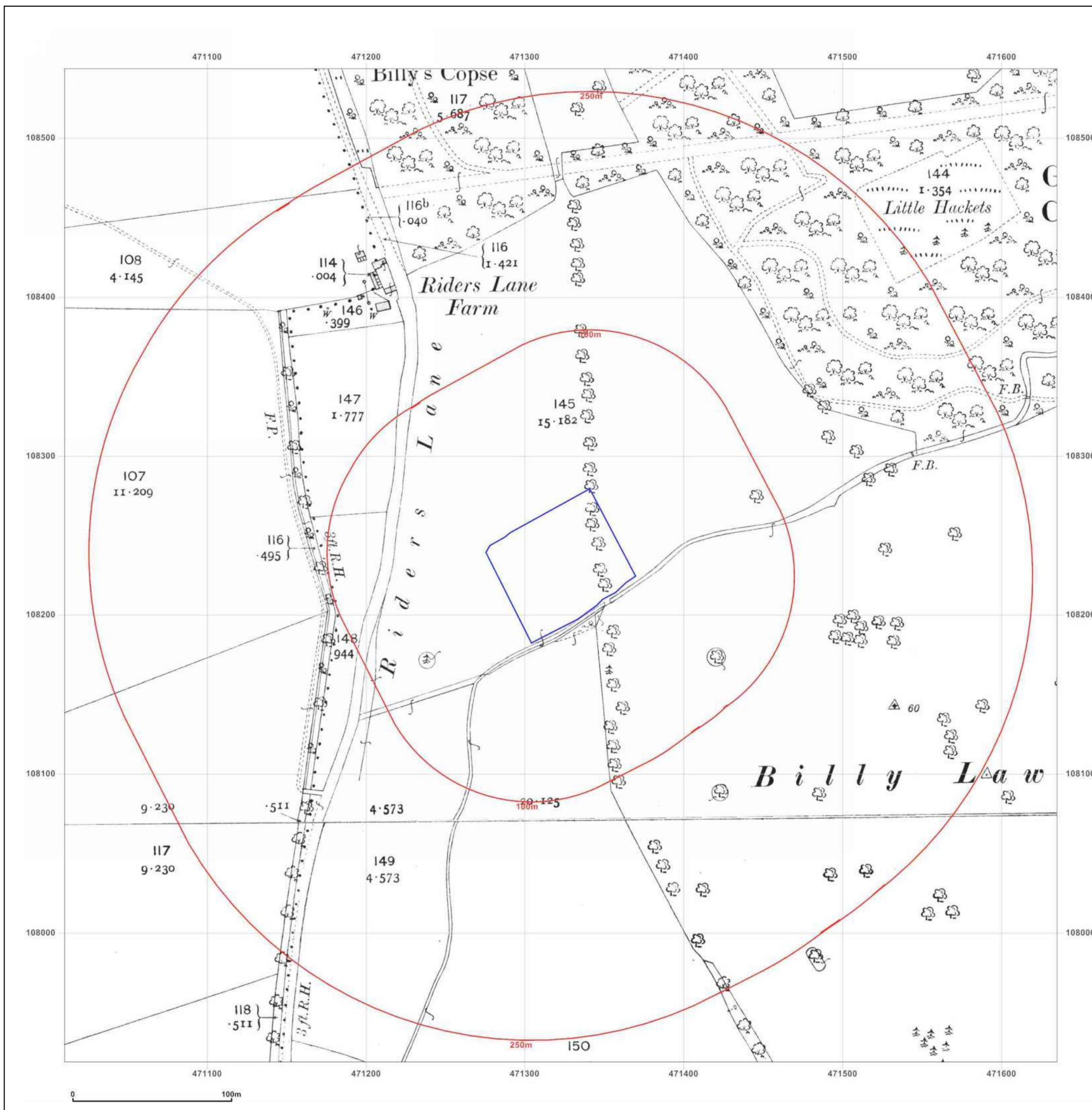


Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 20 April 2017

To view map legend click here [Legend](#)



Site Details:

SOUTHERN CO-OPERATIVE
DAIRIES LTD, DUNSBURY WAY,
HAVANT, PO9 5BQ

Client Ref: 5003415-602235
Report Ref: GS-3817577
Grid Ref: 471322, 108231

Map Name: County Series

Map date: 1932

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A

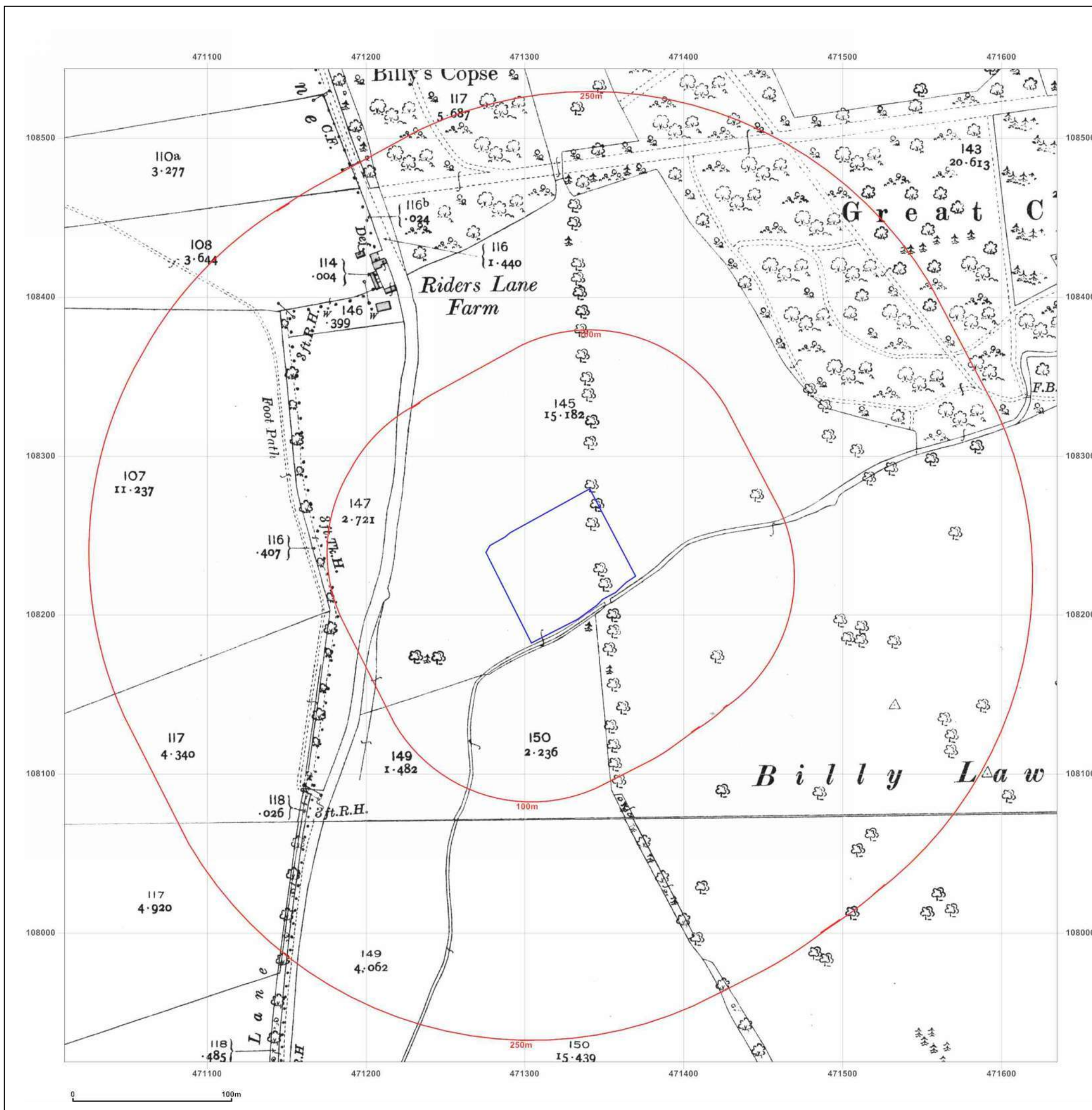


Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 20 April 2017

To view map legend click here [Legend](#)



Site Details:

SOUTHERN CO-OPERATIVE
DAIRIES LTD, DUNSBURY WAY,
HAVANT, PO9 5BQ

Client Ref: 5003415-602235
Report Ref: GS-3817577
Grid Ref: 471322, 108231

Map Name: National Grid

Map date: 1952-1955

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1952
Revised 1952
Edition N/A
Copyright N/A
Levelled 1942

Surveyed 1955
Revised 1955
Edition 1942
Copyright N/A
Levelled 1942

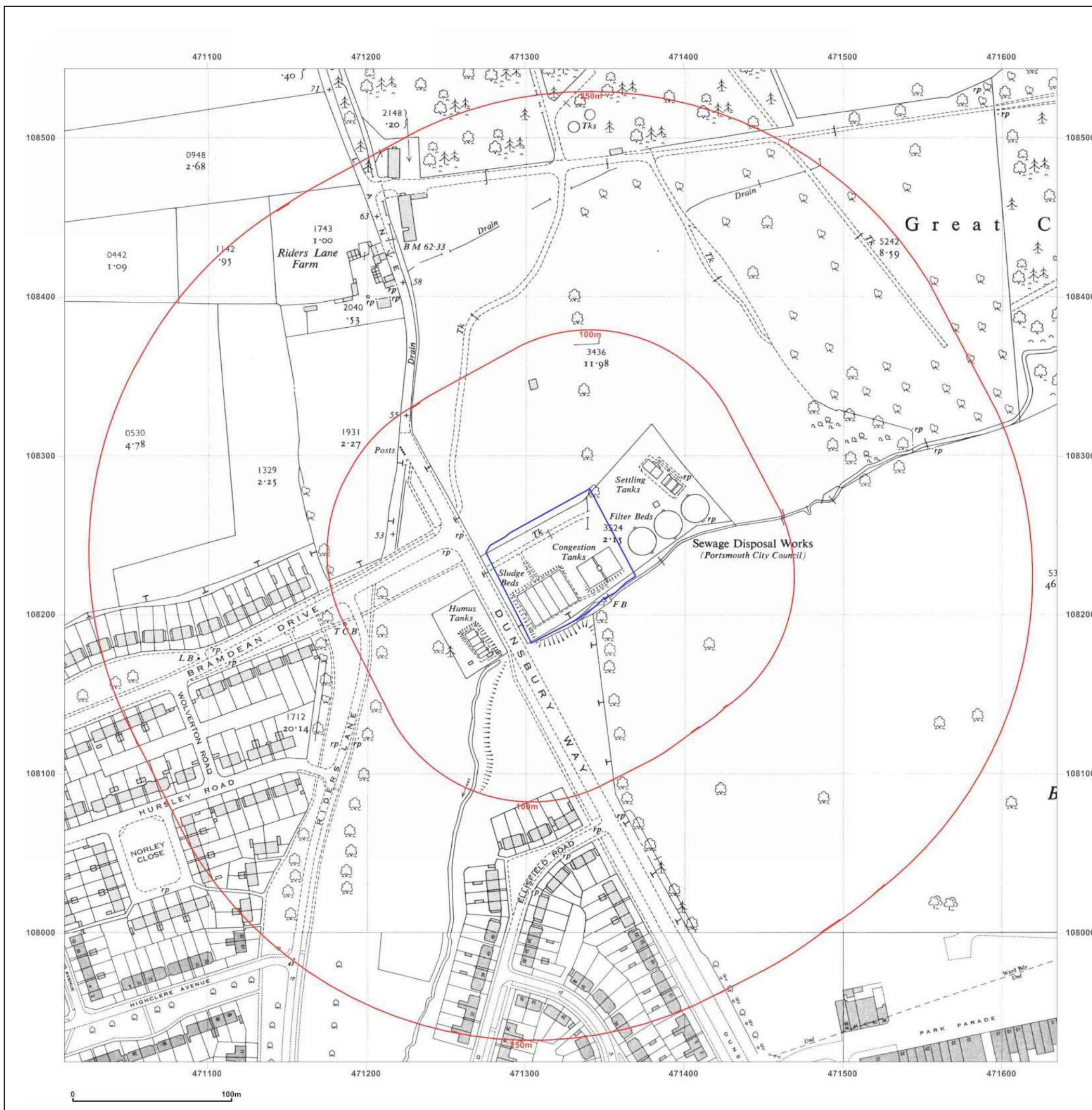


Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 20 April 2017

To view map legend click here [Legend](#)



Site Details:

SOUTHERN CO-OPERATIVE
DAIRIES LTD, DUNSBURY WAY,
HAVANT, PO9 5BQ

Client Ref: 5003415-602235
Report Ref: GS-3817577
Grid Ref: 471322, 108231

Map Name: National Grid

Map date: 1951-1956

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1956
Revised 1956
Edition 1958
Copyright N/A
Levelled 1942

Surveyed 1951
Revised 1951
Edition N/A
Copyright N/A
Levelled 1942

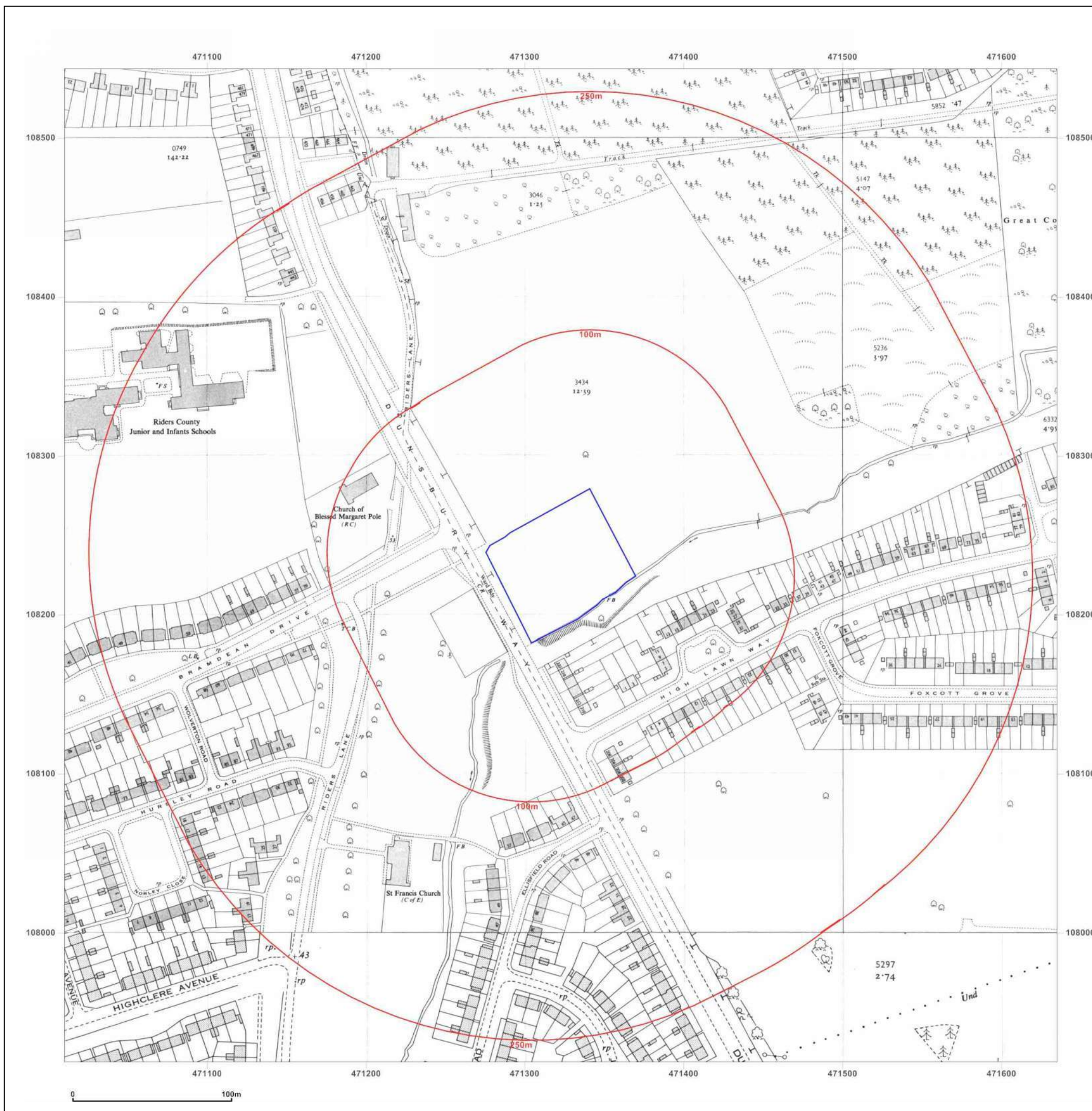


Produced by
Groundsure Insights
T: 08444 159000
E: info@groundsure.com
W: www.groundsure.com

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 20 April 2017

To view map legend click here [Legend](#)



Site Details:

SOUTHERN CO-OPERATIVE
DAIRIES LTD, DUNSBURY WAY,
HAVANT, PO9 5BQ

Client Ref: 5003415-602235
Report Ref: GS-3817577
Grid Ref: 471322, 108231

Map Name: National Grid

Map date: 1955-1957

Scale: 1:1,250

Printed at: 1:2,000



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

Surveyed 1956
Revised 1956
Edition N/A
Copyright N/A
Levelled 1942

Surveyed 1955
Revised 1955
Edition N/A
Copyright N/A
Levelled 1942

Surveyed 1955
Revised 1955
Edition N/A
Copyright N/A
Levelled 1942



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

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 20 April 2017

To view map legend click here [Legend](#)



Site Details:

SOUTHERN CO-OPERATIVE
DAIRIES LTD, DUNSBURY WAY,
HAVANT, PO9 5BQ

Client Ref: 5003415-602235
Report Ref: GS-3817577
Grid Ref: 471322, 108231

Map Name: National Grid

Map date: 1956-1959

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1959
Revised 1959
Edition N/A
Copyright N/A
Levelled 1942

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

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

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



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

© Crown copyright and database rights 2015 Ordnance Survey 100035207

Production date: 20 April 2017

To view map legend click here [Legend](#)



