TWEEDIE EVANS CONSULTING

Seaward Properties Ltd

Bonhams Field, Yapton

Preliminary Geoenvironmental and Geotechnical Assessment

ARUN DISTRICT COUNCIL Y/1/17/OUT

TWEEDIE EVANS CONSULTING

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Bonhams Field, Yapton

Preliminary Geoenvironmental and Geotechnical Assessment

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1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Tweedie Evans Consulting Ltd (TEC) has been appointed by Seaward Properties Ltd to undertake a preliminary geoenvironmental and geotechnical assessment of Bonhams Field, Yapton. All works were undertaken in accordance with our proposal letter dated 22 August 2016 and referenced RE.1608012.001.

1.2 Background

1.2.1 The site is located off the B2233 Road, in the north-west of Yapton (Figure 1). The site covers an area of approximately 3.23ha with the centre situated at approximate National Grid Reference 497540, 103450. The nearest postcode is BN18 0DX.

1.2.2 The site currently comprises a rectangular parcel of land separated into 2No. fields by a series of hedgerows lain predominantly to grass.

1.2.3 It is understood that it is proposed to develop the site to provide 40 to 50 two storey residential units with associated parking and private gardens. However, full details relating to the proposed are currently unknown.

1.2.4 The aim of these works is to provide information on geoenvironmental and engineering conditions and constraints associated with the site with regard to the proposed development.

1.3 Scope of Works

1.3.1 The scope of work undertaken as part of this report is presented below:

- Preliminary Risk Assessment. This phase of assessment involves development of an initial site conceptual model, based on desk study research and a site reconnaissance survey, in order to establish whether or not there are potentially unacceptable risks.

- Generic Quantitative Risk Assessment. This phase of assessment involves refinement of the site conceptual model developed as part of the Preliminary Risk Assessment based on the findings of an intrusive investigation. Generic assessment criteria and assumptions, if appropriate, are used to evaluate potentially unacceptable risks. Should unacceptable risks be identified, a feasible remediation options appraisal is provided and/or a Detailed Quantitative Risk Assessment is recommended. The purpose of the Detailed Quantitative Risk Assessment is to further refine the conceptual model and use more detailed site specific information and criteria to determine whether there are unacceptable risks.

- Preliminary Geotechnical Assessment. General recommendations regarding likely engineering abnormals are provided on the basis of the findings of an intrusive investigation, together with preliminary foundation design recommendations for the proposed development.

1.3.2 The above scope of work has been undertaken in accordance with current guidance such as CLR 11 *'Model Procedures for the Management of Land Contamination'* (Environment Agency, 2004), BS10175+A1 (2013) and, where appropriate NHBC and Eurocode 7.

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1.3.3 The report is presented in the following format.

- Preliminary Risk Assessment:
  Section 2 - Site Description
  Section 3 - Site History
  Section 4 - Environmental Setting
  Section 5 - Outline Conceptual Model

- Generic Quantitative Risk Assessment:
  Section 6 - Intrusive Investigation
  Section 7 - Encountered Ground Conditions
  Section 8 - Contamination Characterisation
  Section 9 - Refined Conceptual Model

- Preliminary Geotechnical Assessment:
  Section 10 - Ground Engineering

- Section 11 - Conclusions and Recommendations

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2 SITE DESCRIPTION

2.1 Site Location

2.1.1 The site is located within a predominantly residential/rural area and is bounded by the following features (Table 2.1):

Table 2.1: Site Boundary Features

Direction from Site	Description
North	Bounded by agricultural land
East	Residential housing and associated gardens; with the B2132 road and residential housing beyond.
South	Bonhams House and Elm Barn; with the B2233 road and agricultural fields beyond.
West	Agricultural fields and residential housing with associated gardens.

2.2 Land Use and Site Condition

2.2.1 A site reconnaissance survey was undertaken on 5 September 2016. A summary of the observations is presented below Photographs taken during groundwater and gas monitoring in November 2016 are presented in Appendix K.

Current Site Use

2.2.2 The site currently comprises a rectangular parcel of land lain predominantly to grass, separated into 2No. fields by a series of hedgerows. The site is accessed via a gate along the southern boundary of the site.

2.2.3 The site boundaries are demarcated by a series of hedgerows and semi-mature to mature deciduous trees along the north, east and west boundaries and a metal fence along the southern boundary.

Site Topography

2.2.4 The site as a whole was noted to be undulating. Available Ordnance Survey mapping indicates the site to be located at elevations of approximately 6.2m Above Ordnance Datum (AOD) in the north-west corner of the site, rising to approximately 7.3mAOD along the northern boundary. The site falls to an approximate elevation of 6.8mAOD in the south-east corner of the site.

Hard and Soft Landscaping

2.2.5 The site was observed to be entirely laid to open grassland and no areas of hardstanding were observed.

Fuel Storage

2.2.6 No above ground storage tanks (ASTs) or evidence of underground storage tanks (USTs) were observed during the site reconnaissance.

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Hazardous Chemicals and Waste Materials Storage

2.2.7 No evidence of hazardous chemical storage or waste materials storage was observed during the site reconnaissance.

Asbestos Containing Materials

2.2.8 No evidence of potential Asbestos Containing Material (ACM) was observed on the ground surface of the site.

Site Drainage

2.2.9 No drainage features were observed during the site reconnaissance.

Evidence of Potential Contamination

2.2.10 No visual or olfactory evidence of contamination was observed at the ground surface of the site during the site reconnaissance.

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3 SITE HISTORY

3.1 Introduction

3.1.1 Details of the site history have been obtained through the review of historical Ordnance Survey (OS) mapping. The mapping reviewed is contained within Appendix A.

3.1.2 It is not the purpose of this section to provide a comprehensive account of development history, but only to detail those factors that are or could be relevant to the potentially contaminative history of the site and surrounds and the development of an outline site conceptual model.

3.2 Site History

3.2.1 The following represents a summary of potentially significant features recorded within the site area (Table 3.1).

Table 3.1: Site Features

Site Features	OS Dates
Undeveloped, agricultural fields.	1877 - 1880
Single rectangular building in the south-west corner of the site.	1897 - 1967
Building has been demolished. Agricultural fields as per the current site layout.	1975 - 2016

3.3 Neighbouring History

3.3.1 The land uses within the immediate vicinity of the site have been considered. Based upon the reviewed map information the following potentially significant features have been identified (Table 3.2).

Table 3.2: Surrounding Features

Surrounding Features	OS Dates	Distance	Direction
Well	1877 – 1897 1877 – 1897 1897	~5m ~50m ~150m	South West South-east
Canal; *Later disused / abandoned*	1877 1899 – 2016	~70m	South
Smithy	1897 - 1912	~150m	East
Tank	1975 – 1989	~10m	South
Pump House	1975 – 1995	~120m	North-west
Pond	1975 - 1989	~10m	North-east
Electrical Sub-Station	1975 – 1995 1975 – 1999	~10m ~200m	South-east North-east
Garage	1975 – 1995	~50m	South
Abattoir	1975 – 1982	~125m	North-east

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4 ENVIRONMENTAL SETTING

4.1 Information Sources

4.1.1 Environmental information for the site has been obtained through review of an Envirocheck® report for the site. This report provides extensive information, obtained from regulatory and commercial sources, regarding the environmental setting of the site. The Envirocheck® report has been included within Appendix B.

4.2 Geology and Hydrogeology

4.2.1 Published geological and hydrogeological information indicate the following geological sequence at the site:

Table 4.1: Geological and Hydrogeological Setting

Geological Unit	Thickness	Aquifer Status
River Terrace Deposits (Undifferentiated)	Unknown	Secondary A Aquifer
Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated)	Unknown	Principal Aquifer

Geology

4.2.2 The published geology for the site is shown on British Geological Survey (BGS) Sheet 317/332 (Chichester and Bognor) Solid and Drift Edition as River Terrace Deposits (Undifferentiated) overlying the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated).

4.2.3 The River Terrace Deposits are described by the BGS as consisting of Aeolian Deposits ('Brickearth'); mainly silts, in part contaminated with gravel, while the underlying Chalk is generally described as white chalk with flints; potentially nodular and containing thin marl beds.

4.2.4 Historic BGS borehole records indicate the following ground conditions in proximity to the site:

- ***SU90SE29*** (~95m south-west of the site): Ground materials are recorded as soil to 0.5m, overlying Brickearth described as "clay, brown, silty" to a depth of 1.9m. This is underlain by Raised Beach Deposits which includes material described as "silt, chalky, with chalk pebbles" to 2.9m and a "very clayey sandy gravel" to 3.9m. This is reported to overlie the Upper Chalk which is described as "chalk, rubbly, soft, silty and sandy" to a maximum observed depth of 6.2m. The water level was recorded at 4.7mbgl.

4.2.5 The Envirocheck® estimated soil chemistry on site is reported as follows:

- Arsenic – <15mg/kg
- Cadmium - <1.8mg/kg
- Chromium – 60-90mg/kg
- Lead – <100mg/kg
- Nickel – 15-30mg/kg

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4.2.6 It is noted that the estimated soil chemistry values are below the human health screening values for a residential end use with homegrown produce.

Ground Gas Generation

4.2.7 In accordance with current guidance (BS8576: 2013 and Wilson, Card and Haines (2009)) the ground gas generation potential of the geology (River Terrace Deposits Undifferentiated and Lewes Nodular Chalk Formation Undifferentiated) reported to underlie the site may be classified as being very low with a very low risk for on-site development and a negligible risk of lateral migration.

4.2.8 Notwithstanding this, made ground, if present, may provide a potential source of ground gas, subject to thickness and chemical composition.

4.2.9 In addition, an infilled canal is recorded approximately 70m to the south of the site. Information obtained from the Envirocheck® report indicates the canal was used for the deposition of inert waste in the past. The potential for such a feature to provide a potential source of ground gas generation cannot be discounted.

4.2.10 The site is not recorded to be within a radon affected area as less than 1% of homes are above the Action Level. Therefore, no radon protection measures are reported as necessary in the construction of new dwellings or extensions.

Hydrogeology

4.2.11 The Envirocheck® report for the site records that the Environment Agency has classified the underlying geology (Lewes Nodular Chalk Formation Undifferentiated) as Principal Aquifer. The underlying superficial deposits (River Terrace Deposits Undifferentiated) are classified as Secondary A Aquifer. The Environment Agency classifies these aquifer as follows:

> ***Principal Aquifer**: These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer; and*
>
> ***Secondary A Aquifer:** permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.*

4.2.12 The soil is reported as having an Intermediate Leaching Potential; these are soils which can possibly transmit a wide range of pollutants.

4.2.13 There is one reported groundwater abstraction license within 500m of the site; located ~395m to the north-east and relates to horticultural watering.

4.2.14 The site is not reported to be within an Environment Agency Source Protection Zone.

4.2.15 There is potential for groundwater flooding of property situated below ground level to occur on-site.

4.2.16 Based upon the above information the geological and hydrogeological setting of the site is considered to be of **Moderate Sensitivity**.

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4.3 Hydrology

4.3.1 The nearest surface water course to the site is a drain, located approximately 150m to the east.

4.3.2 The site is situated ~50m to the east of an area at risk from extreme flooding from rivers or sea without defences.

4.3.3 Given the above information, the hydrology of the site is considered to be of **Low Sensitivity**.

4.4 Environmental Data

4.4.1 Additional environmental data from the Envirocheck® report for the site is summarised in Table 4.2.

Table 4.2: Additional Environmental Data Summary

Category	0-250m	250-500m	Details
Waste Management			
Landfills and/or other waste management sites	1	0	*Historic Landfill* ~70m west: Disused canal, deposited waste included inert waste.
Potentially infilled land (non-water)	0	1	~325m south-east: Unknown filled ground (pit, quarry etc).
Potentially infilled land (water)	1	1	~50m south-east: Unknown filled ground (pond, stream etc). ~460m south: Unknown filled ground (pond, stream etc).
Current Land Uses			
Potentially contaminative land uses	3	19	*Including:* <u>0-250m:</u> Mechanical engineers/ garage services – ~20m S; and Pet foods & animal feeds - ~245m NE. <u>250-500m:</u> Commercial cleaning services - ~370m SE, 390m NE, ~450m S; Car dealers/ car body repairs - ~375m NE, ~395m NE, ~420m NE; Waste disposal services - ~420m NE; and Printers - ~425m NE.
Petrol and fuel sites	1	0	~20m south: Central garage, obsolete.

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Category	0-250m	250-500m	Details
Ecological Designated Areas			
Site of ecological value	1	0	The site is reported to be located within a Nitrate Vulnerable Zone.

4.5 Engineering Considerations

4.5.1 Engineering considerations identified from the Envirocheck® report for the site are summarised below:

Table 4.3: Engineering Considerations

Hazard	Hazard Potential					
	No Hazard	Negligible	Very Low	Low	Moderate	High
Collapsible ground				X		
Compressible ground	X					
Ground dissolution			X			
Landslide			X			
Running sand				X		
Shrink/swell clays				X		
Coal mining	X					
Non-coal mining	X					

4.5.2 It is reported that there is one mineral site located ~370m to the south-east. The site, known as Burndell Brick Yard, was an opencast pit and was used for the extraction of common clay and shale. The site is reported as having ceased operation.

4.6 Regulatory Consultations

4.6.1 The following regulatory consultation has been undertaken with respect to possible environmental issues and ground conditions on-site and in the surrounding area.

Pollution Team – Arun District Council

4.6.2 The Pollution Team at Arun District Council (ADC) was contacted with regards to any potential contaminated land issues on site and within the surrounding area. The information provided is presented in Appendix C. A summary of the response is provided below.

- The Council report the presence of an infilled canal approximately 75m to the southwest of the site. It is reported that this feature was infilled with inert waste prior to 1970. However, no leachate or gas data is held by the Council with regards to this feature.

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- The Council report the presence of an underground storage tank approximately 10m to the south of the site, associated with the former Reptune Motors. Information provided by the Council indicates this tank was made safe by derv filling in April 2000.

- It has been reported that there is no land determined as contaminated within 500m of the site, furthermore, no pollution incidents have been reported in proximity to the site.

- It is reported that there are no Part B APC authorisations or private water supplies in proximity to the site.

- Furthermore, is has been reported that there are no records relating to previous site investigation, known ground gas issues, naturally elevated contaminant concentrations or unexploded ordnance held for on site or in proximity.

- In addition, the site is not listen as potentially contaminated under Part IIA of the Environmental Protection Act 1990.

Building Control – Arun District Council

4.6.3 Building Control was contacted with regards to any potential foundation and ground condition issues on site and within the surrounding area. At the time of writing, no information had been received. Any pertinent information received in due course will be issued in an addendum letter.

4.7 General Summary

4.7.1 Given the above Environmental Setting and the general land use for the area, discussed in Section 2, this site is considered to be of **Low to Moderate Overall Environment Sensitivity.**

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5 OUTLINE CONCEPTUAL MODEL

5.1 Introduction

5.1.1 The assessment of potential risk associated with any identified contamination is based upon the identification and evaluation of Significant Pollutant Linkages.

5.1.2 A Significant Pollutant Linkage exists on a site only if three conditions are satisfied. These conditions are:

- *The presence of substances (potential contaminants / pollutants) that may cause harm (a **Source**)*
- *The presence of a target which may be harmed e.g. site residents, groundwater (a **Receptor**)*
- *A linkage between the Source and the Receptor e.g. ingestion of soil, inhalation of vapour (a **Pathway**)*

5.1.3 In each case, the existence of a pollutant linkage requires that not only does both a Source and a Receptor have to exist but that a demonstrable Pathway also exists. Therefore, the presence of measurable concentrations of contaminants within the ground or groundwater environment does not automatically imply that a contamination problem exists on site.

5.1.4 The nature and importance of both pathways and receptors, which are relevant to a particular site, will vary according to the actual or intended use of the site, its characteristics and its surroundings.

5.1.5 This process of the identification of Pollutant Linkages has been applied below to assess the potential risks associated with the site.

5.2 Hazard Identification

5.2.1 Potentially contaminative current and historic processes have been identified on and within the vicinity of the site and are presented in Table 5.1.

Table 5.1: Identified Potential Hazards

Potential Hazard/ Source	Location	Details
Made Ground	On site	No evidence of potentially significant made ground was observed during the site reconnaissance survey and no historical industrial use or potential significant on-site development has been recorded. Notwithstanding this, the potential for made ground of unknown chemical composition to be present in localised areas of the site cannot be fully discounted. In addition, any made ground present on site may provide a potential source of ground gas, subject to composition and thickness.

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Potential Hazard/ Source	Location	Details
Potentially contaminative current and historic processes	On site	The site is understood to have been used for agricultural purposes in the past. Therefore, the potential for localised contamination associated with this practice cannot be discounted.
Potentially contaminative current and historic processes	Off site	A number of potentially contaminative historic land uses have been identified in proximity to the site including the nearby garage, infilled canal, tanks, electrical sub-station and abattoir, which may provide a potential source of onsite contamination.

5.3 Potential Receptors and Pathways

5.3.1 Potential receptors identified as part of this preliminary risk assessment are:

- Current/future site users;
- Construction workers; and
- Controlled waters (Principal and Secondary A Aquifer)

5.3.2 Potential contaminant pathways relating to the identified receptors and contaminants of concern include:

- Dermal contact – contact with soil, dust or water;
- Ingestion - ingestion of soil, dust or water;
- Inhalation – inhalation of soil, dust or vapours;
- Vertical migration – seepage of contaminants at the ground surface through cracks in hardstanding and/or leaching of contaminants within the unsaturated zone resulting in vertical contaminant migration; and
- Horizontal migration – lateral migration of contaminants within the saturated zone and along preferential pathways such as drainage pipe bedding.

5.4 Hazard Assessment and Risk Estimation

5.4.1 Potential significant pollutant linkages identified as part of this preliminary risk assessment are summarised in the Outline Site Conceptual Model presented in Table 5.2. References to risk estimations are made in accordance with the methodology presented in CIRIA publication C552 (2001) titled *'Contaminated Land Risk Assessment: A Guide to Good Practice'* and summarised in Appendix D.

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Table 5.2: Outline Conceptual Model (Hazard Assessment and Risk Estimation)

Potential Hazard/ Source	Potential Receptor	Potential Pathway to Receptors	Associated Hazard	Scale of Impact	Potential Consequence of Source-Receptor Linkage	Potential Likelihood for Significant Source-Receptor Linkage	Risk Classification
Made Ground– on site	Current and future site users and construction workers	Exposure to potential contaminants through ingestion, inhalation and dermal contact	Risk of harm to human health	Local	Medium	**Unlikely to low likelihood:** No evidence of potentially significant made ground was observed during the site reconnaissance survey and no historical industrial use or potential on-site development has been recorded. Notwithstanding this, the potential for made ground of unknown chemical composition to be present in localised areas of the site cannot be fully discounted at this stage.	**Low Risk**
	Controlled waters	Infiltration of water through the unsaturated zone resulting in leaching of potential contaminants and subsequent potential vertical and horizontal migration along preferential pathways	Risk to Controlled Waters (Primary Aquifer and Secondary A Aquifer)	Local to Regional	Medium	**Unlikely:** Given that the potential presence of made ground on site cannot be fully discounted and that the site is underlain by strata classified as a Secondary A and Principal Aquifer, the potential for a residual risk to controlled waters cannot be fully discounted. Notwithstanding this, it is reported that the site is underlain by soils of intermediate leaching potential. Therefore, the risk to controlled water receptors from potential made ground is considered low.	**Low Risk**
	Future site end users and proposed development	Migration, ingress and inhalation of ground gasses.	Risk of harm to human health	Local	Medium to Severe	**Low Likelihood**: Made ground, if present, may provide a potential source of ground gas subject to thickness and composition.	**Low to Moderate Risk**
Potentially contaminative current and historic processes – on site	Future site end users, construction and proposed development	Exposure to potential contaminants through ingestion, inhalation and dermal contact.	Risk of harm to human health	Local	Medium	**(Locally) Low Likelihood:** Given the historically agricultural use of the site, the potential for localised contamination associated with this practice cannot be discounted at this stage.	**Low to Moderate Risk**

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Potential Hazard/ Source	Potential Receptor	Potential Pathway to Receptors	Associated Hazard	Scale of Impact	Potential Consequence of Source-Receptor Linkage	Potential Likelihood for Significant Source-Receptor Linkage	Risk Classification
Potentially contaminative current and historic processes – off site	Current and future site users	Exposure to potential contaminants through ingestion, inhalation and dermal contact.	Risk of harm to human health	Local	Medium	**Low Likelihood:** Potentially contaminative current and historic processes have been recorded in proximity to the site. Therefore, potential on site migration of contaminants from these potential off site sources cannot be fully discounted at this stage.	**Low to Moderate Risk**
	Future site end users and proposed development structures	Migration, ingress and inhalation of ground gasses.	Risk of harm to human health	Local	Medium to Severe	**Low Likelihood:** A historic canal, reportedly infilled with inert waste prior to 1970, is reported to be within ~70m of the site. Given the reported age and nature of the deposited waste materials, the potential risk of lateral migration of ground gas from such features cannot be discounted. Notwithstanding this, such features are located down gradient of the site and Arun District Council report no known ground gas issues in the area.	**Low to Moderate Risk**

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6 INTRUSIVE INVESTIGATION

6.1 Background

6.1.1 The ground investigation undertaken was designed to provide specific information regarding site conditions in support of the proposed site development.

6.1.2 In particular, the investigation was designed to provide further information on:

- Ground conditions to aid with the design of the development; and
- The potential significant pollutant linkages identified as part of the Preliminary Risk Assessment.

6.1.3 All site works were undertaken in accordance with BS5930:2015, BS10175+A1 (2013) and, where appropriate, Eurocode 7. Works were supervised by a suitably experienced geoenvironmental consultant from TEC.

6.2 Methodology

6.2.1 Intrusive works were undertaken on 5th September and 6th September 2016 and comprised the advancement of 6No. dynamic sample boreholes using an Archway Dart Terrier rig. In situ Standard Penetration Tests (SPTs) were undertaken within the dynamic sample boreholes at regular intervals in order to gain an indicative strength profile of the underlying materials. In addition, combined ground gas and groundwater monitoring wells were installed within 3No. boreholes to allow for a preliminary assessment of potential ground gas and groundwater issues at the site.

6.2.2 In addition, 8No. trial pits were advanced to a maximum depth of 4.00mbgl (TP4) using a JCB 3CX. Soakage testing, in general accordance with BRE 365 was undertaken within two trial pits (TP1/SA1 and TP2/SA2).

6.2.3 Exploratory hole locations are presented in Figure 2 and the reasoning behind each investigation location is given in Table 6.1, as follows:

Table 6.1: Exploratory Hole Rationale

Location	Location Rationale
WS1 to WS6	• Advanced to provide general site coverage; • Allow for the characterisation of underlying ground conditions; • Allow for the installation of combined groundwater and ground gas monitoring wells (WS1, WS4 and WS6); and • Collection of near surface and deeper ground materials for geochemical and geotechnical analysis.
TP1/SA1 and TP2/SA2	• Classification and description of underlying deposits; • Collection of near surface and deeper ground materials for geochemical and geotechnical analysis.; and • Soakage testing in general accordance with BRE 365.

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Location	Location Rationale
TP3 to TP8	• Advanced to provide general site coverage; • Allow for the characterisation of underlying ground conditions; and • Collection of near surface and deeper ground materials for geochemical and geotechnical analysis.
DCP1 to DCP6	• In-situ DCP testing to gain indicative CBR values for the underlying shallow ground materials across the site.

6.2.4 Detailed descriptions of encountered ground conditions are shown on exploratory hole logs presented in Appendix E.

6.3 Field Testing

6.3.1 Where appropriate, hand shear vane (HSV) and pocket penetrometer testing was undertaken on the cohesive natural ground material recovered from boreholes and trial pits in order to determine correlations of in situ shear strength of the encountered materials. The results are presented within Appendix E.

6.3.2 Two soakage tests were undertaken in general accordance BRE 365 (TP1/SA1 and TP2/SA2) at the site to determine the soakage potential of the underlying ground material. The results are presented within Appendix I.

6.3.3 In situ testing using a Dynamic Cone Penetrometer (DCP-TRL) was undertaken at 6No. locations across the site to gain an indicative CBR value for the underlying shallow ground conditions. The results are presented in Appendix J.

6.3.4 Combined groundwater and gas monitoring wells were installed within boreholes: WS1, WS4 and WS6. Gas monitoring was undertaken at these locations using a calibrated GFM 430 gas analyser, whilst the groundwater level was recorded using a dual phase interface probe. The results of the ground gas / groundwater level monitoring are presented in Appendix H.

6.4 Chemical Testing

6.4.1 Laboratory testing was scheduled on the basis of field observations.

6.4.2 Representative soil samples were collected and chemically tested at i2 Analytical Ltd, a UKAS/MCERTS accredited laboratory, for a selection of the following parameters:

Soils (Totals)

- *Heavy metals (arsenic, chromium, cadmium, copper, lead, selenium, zinc, barium, mercury, nickel, beryllium, vanadium and water soluble boron);*
- *Phenol (monohydric), cyanide (total), water soluble sulphate, sulphide, total organic carbon, pH;*
- *Speciated Polycyclic Aromatic Hydrocarbons (PAHs);*
- *Total Petroleum Hydrocarbons (TPH CWG including BTEX and MTBE); and*
- *Asbestos Screen.*

6.4.3 Geochemical certificates of analysis are presented Appendix F.

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6.5 Geotechnical Testing

6.5.1 Selected soil samples were submitted for geotechnical analysis at K4 Soils. Laboratory testing was scheduled upon the basis of field observations for a selection of the following:

- *Moisture Content;*
- *Plasticity Indices;*
- *Saturation Moisture Content of Chalk; and*
- *pH, Sulphur and Sulphates.*

6.5.2 Soil geotechnical certificates of analysis are presented in Appendix G.

6.6 General Sampling

6.6.1 Soil samples were collected directly into pre-labelled sample containers. During the course of the sampling care was taken to minimise head space of the sample containers. Once filled sample containers were placed within cool boxes containing ice packs to maintain as cool a temperature as possible, nominally 4°C.

6.6.2 Samples were collected by courier for delivery to the selected laboratories. All samples were accompanied by detailed chain of custody sheets.

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7 ENCOUNTERED GROUND CONDITIONS

7.1 Introduction

7.1.1 A summary of encountered ground conditions for the site is provided below.

7.1.2 Detailed descriptions of encountered ground conditions are shown on exploratory hole logs presented in Appendix E.

Made Ground / Near Surface Materials

7.1.3 Made ground / near surface materials were observed across the site to a maximum observed depth of 0.6mbgl (WS4) and was generally observed to comprise brown, locally clay, locally gravelly, sandy silt with frequent rootlets. Gravel, where encountered was observed to comprise red brick, chert, chalk and black carbonaceous material.

Natural Ground

River Terrace Deposits

7.1.4 The natural ground was encountered across the site from a depth of 0.1mbgl and the upper reported superficial deposits were generally observed to comprise firm / stiff light brown slightly sandy clayey silt with a friable texture underlain by firm to stiff orangish brown slightly sandy silty clay / firm to stiff gravelly sandy clay. Gravel, where encountered, was generally observed to comprise flint and occasional chalk.

7.1.5 In the majority of exploratory holes advanced across the site, the upper firm to stiff material was noted to be underlain by very soft / soft / soft to firm sandy to very sandy clay. This material was noted to vary in depth (encountered from depths of between 1.0mbgl and 2.45mbgl) and thickness (0.45m to 2.8m). However, within 3No. locations, the full extent of this softer material was not confirmed.

7.1.6 With the exception of TP7 and TP8 (located in the north-east corner of the site), this material was generally noted to be underlain by firm, locally stiff, gravelly sandy clay. The gravel within this material was noted to comprise flint and chalk.

Chalk

7.1.7 The chalk was encountered in a number of locations on site from depths of between 2.4mbgl (TP6) and 4.9mbgl (WS1) and was generally observed to comprise structureless chalk composed of gravelly sandy silt. The chalk gravel was generally noted to be weak, medium density and white, with occasional staining. In addition, flint gravel was observed in numerous locations.

7.2 Generalised Ground Profile

7.2.1 The general ground profile encountered at the site is summarised in Table 7.1 below.

Table 7.1: Generalised Ground Profile

Depth (mbgl)	Encountered Material
0 – 0.1 / 0.6	**Made Ground / Near Surface Materials:** locally clayey, locally gravelly sandy silt with frequent rootlets. Gravel of red brick, chert, chalk and black carbonaceous material.

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Depth (mbgl)	Encountered Material
0.1/0.6 – 2.4 / >5.0	**River Terrace Deposits:** generally firm to stiff brown slightly sandy clayey silt with occasional gravel of flint or chalk. Underlain by very soft / soft / soft to firm sandy to very sandy clay. In majority of locations, this material was observed to be underlain by firm locally stiff gravelly sandy clay with gravel of flint and chalk.
2.4/4.0 - >5.0	**Upper Chalk (undifferentiated):** Structureless chalk (CIRIA Grade Dm) composed of gravelly sandy silt. The chalk was generally noted to be weak, medium density and white with occasional staining. Flint gravel was observed in a number of locations.

7.3 Groundwater and Perched Water

7.3.1 Water strikes encountered during the site works are shown on the exploratory hole logs in Appendix E and summarised in Table 7.2 below.

Table 7.2: Groundwater Strikes

Location	Date	Groundwater Strike (mbgl)	Strata
WS5	05/09/2016	5.0mbgl	Chalk

7.3.2 Groundwater was encountered within a single location during the exploratory works (WS5) at a depth of 5.0mbgl.

7.3.3 Following completion of the site works, groundwater monitoring was undertaken as part of the ground gas monitoring. The results of the monitoring are presented in Appendix H and summarised in Table 7.3.

Table 7.3: Groundwater Levels

Location	Date	Groundwater Levels (mbgl)	Strata
WS1	06/09/2016	4.0	River Terrace Deposits
	20/09/2016	3.99	
	24/11/2016	4.11	
WS4	06/09/2016	Dry	River Terrace Deposits / Chalk
	20/09/2016	Dry	
	24/11/2016	Dry	
WS6	06/09/2016	4.45	River Terrace Deposits / Chalk
	20/09/2016	4.57	
	24/11/2016	4.39	

7.4 Contamination Summary

7.4.1 No visual or olfactory evidence of gross contamination was observed on site during the intrusive works.

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8 CONTAMINATION CHARACTERISATION

8.1 Legislation

8.1.1 Contaminated Land is defined in Part 2A of the Environmental Protection Act (1990) as:

"Any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reasons of substances in, on or under the land that:

- Significant harm is being caused or there is a significant possibility of such harm being caused;

or

- *significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused."

**Section 86 of the Water Act 2003 amends section 78A of Environmental Protection Act 1990 for Controlled Waters.*

8.2 Generic Quantitative Risk Assessment

Human Health Screening

8.2.1 Current legislation and guidance on the assessment of contaminated land promotes a tiered risk approach (CLR 11). The generic quantitative risk assessment comprises a screening of identified contaminants against generic guideline values that are appropriate to the site setting and the receptors concerned. For risks to human health the basis for these generic guideline values are the methodologies set out by the Environment Agency's Contaminated Land Exposure Assessment (CLEA) guidelines.

8.2.2 The following regulatory and industry guidance has been utilised for the selection of Generic Assessment Criteria utilised as part of the GQRA. The order of the guidance listed is in terms of hierarchy for selection of GACs (where the land uses and parameters are considered most applicable).

1. *Category 4 Screen Levels (C4SLs) – DEFRA (2014)*
2. *Soil Guidance Values (SGVs) – Environment Agency (2009)*
3. *Suitable For Use Levels (S4ULs) – LQM/CIEH (2015)*
4. *EIC/AGS/CL:AIRE GAC (2009)*

8.2.3 The C4SLs for arsenic, cadmium, chromium (VI) and lead have been utilised as part of the GQRA. Benzene and benzo(a)pyrene C4SLs have not been utilised as part of the Tier 1 screening as they are based upon 6% soil organic matter (SOM) as opposed to 1% SOM utilised by LQM/CIEH (2015).

8.2.4 SGVs have been utilised, where appropriate, for dioxins, furans and dioxin-like PCBs; nickel; inorganic mercury and selenium (residential SGV used for proposed residential end use). SGVs for organic compounds are not utilised as they are derived using a 6% soil organic matter as opposed to 1% SOM utilised by LQM/CIEH (2015).

8.2.5 In the absence of a published UK derived GAC for cyanide, the GQRA for total cyanide is based upon comparison of recorded values against the Dutch Intervention Value for free cyanide (VROM 2000).

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8.2.6 S4ULs and EIC/AGS/CL:AIRE GACs are adopted for the remaining potential contaminants using the hierarchy noted above.

8.2.7 The purpose of the site investigation was to provide information to establish the suitability of the site for a residential development. Therefore, the standard land use for the site, for use in the generic assessment, has been defined as "*Residential with homegrown produce*" in accordance with current guidance.

Ground Gas Screening

8.2.8 An initial qualitative risk screening assessment based upon the methodology for characterising gassing sites detailed within the following documents has been undertaken:

- CIRIA Report C665 (2007) '*Assessing risks posed by hazardous ground gases to buildings (revised)*';
- NHBC (March 2007) '*Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present*';
- BS8485:2015 *'Code of Practice for the characterisation and remediation from ground gas in affected developments*';
- BS8576:2013 '*Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)';* and
- Wilson S., Card C. and Haines S. (2009) '*Ground Gas Handbook'*.

8.2.9 The objectives of the screening assessment are to provide a general characterisation of the ground materials within the site based on the investigation works undertaken to-date. This information is used to provide a preliminary assessment of gassing potential for the materials encountered at the site. This, together with ground gas data collected as part of the monitoring undertaken to date, is used to provide a qualitative conceptual model of identified risk in relation to the proposed development.

8.3 Soil Analysis - Human Health

8.3.1 Soil samples were collected and analysed from made ground materials. Certificates of analysis for samples are contained within Appendix F.

8.3.2 Current regulatory guidance for the statistical assessment of environmental data within a contaminated land context is detailed within the CIEH and CL:AIRE joint publication titled '*Guidance on Comparing Soil Concentration Data with a Critical Concentration'* (2008). However, as judgemental sampling has been undertaken, statistical assessment as detailed in CL:AIRE (2008) has not been carried out as part of this assessment. Therefore, to identify Contaminants of Potential Concern (COPC) as part of this preliminary assessment, the analytical results for the ground materials sampled have been assessed by the screening of individual analyses against the relevant Tier 1 Site Screening Values (SSVs) adopted.

8.3.3 For generic assessment purposes, SSVs have been conservatively selected, where appropriate, based upon a sandy soil and Soil Organic Matter (SOM) of 1%.

Made Ground

8.3.4 8No. samples of made ground were scheduled for analysis from the site. The results obtained from made ground are summarised in Table 8.1 below:

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Table 8.1: Soil Analysis Summary

Contaminant	Max (mg/kg)	Min (mg/kg)	SSV[1] (mg/kg)	No. of Tests	No. of Exceedances
Arsenic	11	5.4	37[(1)]	8	0
Boron	2.2	<0.2	290[(3)]	8	0
Cadmium	0.4	<0.2	22[(1)]	8	0
Chromium (total)	32	21	910[(3)]	8	0
Chromium (VI)	<1.2	<1.2	21[(1)]	8	0
Copper	21	12	2400[(3)]	8	0
Lead	83	38	200[(1)]	8	0
Mercury	0.9	<0.3	170[(2)]	8	0
Nickel	23	14	130[(2)]	8	0
Selenium	2.2	<1	350[(2)]	8	0
Zinc	110	49	3700[(3)]	8	0
Beryllium	0.87	0.59	1.7[(3)]	8	0
Vanadium	49	34	410[(3)]	8	0
Barium	80	52	1300[(4)]	8	0
Cyanide (Total)	<1	<1	20[(5)]	8	0
Total Phenol (Monohydric)	2.1	<1	120[(3)]	8	0
Water Soluble Sulphate (SO_4) – g/l	0.11	0.013	-	8	0
Sulphide	28	<1	-	8	0
pH	7.3	5.6	-	8	0
Naphthalene	<0.05	<0.05	2.3[(3)]	8	0
Acenaphthylene	<0.1	<0.1	170[(3)]	8	0
Acenaphthene	<0.1	<0.1	210[(3)]	8	0
Fluorene	<0.1	<0.1	170[(3)]	8	0
Phenanthrene	0.41	<0.1	95[(3)]	8	0
Anthracene	<0.1	<0.1	2400[(3)]	8	0
Fluoranthene	1.7	<0.1	280[(3)]	8	0
Pyrene	1.5	<0.1	620[(3)]	8	0
Benzo(a)anthracene	0.92	<0.1	7.2[(3)]	8	0
Chrysene	1.1	<0.05	15[(3)]	8	0
Benzo(b)fluoranthene	1.3	<0.1	2.6[(3)]	8	0
Benzo(k)fluoranthene	0.53	<0.1	77[(3)]	8	0
Benzo(a)pyrene	0.92	<0.1	2.2[(3)]	8	0
Indeno(1,2,3-cd)pyrene	0.48	<0.1	27[(3)]	8	0
Dibenz(a,h)anthracene	<0.1	<0.1	0.24[(3)]	8	0
Benzo(g,h,i)perylene	0.57	<0.05	320[(3)]	8	0
Total PAH	9.25	<1.60	-	8	0
Benzene	<1.0	<1.0	0.087[(3)]	2	0
Toluene	<1.0	<1.0	130[(3)]	2	0
Ethylbenzene	<1.0	<1.0	47[(3)]	2	0
p & m-xylene	<1.0	<1.0	56[(3)]	2	0
o-xylene	<1.0	<1.0	60[(3)]	2	0
MTBE	<1.0	<1.0	49[(4)]	2	0
TPH Aliphatic C5-C6	<0.1	<0.1	42[(3)]	2	0
TPH Aliphatic C6-C8	<0.1	<0.1	100[(3)]	2	0
TPH Aliphatic C8-C10	<0.1	<0.1	27[(3)]	2	0
TPH Aliphatic C10-C12	<1.0	<1.0	130[(3)]	2	0
TPH Aliphatic C12-C16	<2.0	<2.0	1100[(3)]	2	0

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Contaminant	Max (mg/kg)	Min (mg/kg)	SSV[1] (mg/kg)	No. of Tests	No. of Exceedances
TPH Aliphatic C16-C21	<8	<8	65000[(3)]	2	0
TPH Aliphatic C21-C35	<8	<8		2	0
TPH Aromatic C5-C7	<0.1	<0.1	70[(3)]	2	0
TPH Aromatic C7-C8	<0.1	<0.1	130[(3)]	2	0
TPH Aromatic C8-C10	<0.1	<0.1	34[(3)]	2	0
TPH Aromatic C10-C12	<1	<1	74[(3)]	2	0
TPH Aromatic C12-C16	<2	<2	140[(3)]	2	0
TPH Aromatic C16-C21	<10	<10	260[(3)]	2	0
TPH Aromatic C21-C35	28	<10	1100[(3)]	2	0
TPH (C10-C40)	46	<10	-	2	0

Notes:
1 DEFRA C4SLs (2014) based on "*Residential with homegrown produce*" end use
2 Environment Agency SGVs (2009) based on "*Residential*" end use
3 LQM/CIEH S4ULs (2015) based on "*Residential with homegrown produce*" end use
4 CL:AIRE, AGS & EIS (2009) based on "*Residential*" end use
5 Dutch Intervention Value for free cyanide (VROM 2000)
6 Reported as Laboratory Limit of Detection (LOD)

8.3.5 No elevated organic or inorganic contaminant concentrations were recorded within the sampled near surface and made ground materials, in relation to Tier 1 SSVs for a residential site end use.

8.3.6 In addition, an asbestos screen was conducted on the materials sampled. No asbestos was detected within the sampled near surface materials.

8.4 Ground Gas

8.4.1 Two rounds of ground gas monitoring have been undertaken to-date.

8.4.2 All gas monitoring was undertaken using a calibrated GFM 430 infra-red gas analyser fitted with an internal flow pod. The monitoring results are presented in Appendix H and summarised in Table 8.2 below.

Table 8.2: Summary of Ground Gas Monitoring Data

Borehole	Response Zone/Strata	Evidence of potential source of ground gas	No. of monitoring occasions	Methane (%)	Carbon dioxide (%)	Min. Oxygen (%)	Flow (l/hr)	Water levels (mbgl)	Range of atmospheric pressure (mb)
WS1	Natural	None	2	0.0	4.1[(1)] (3.5)[(2)]	17.7	28[(1)] (0.0)[(2)]	3.99 – 4.11	1013 – 1026
WS4	Natural	None	2	0.0	3.8[(1,2)]	17.6	1.0[(1)] (0.3)[(2)]	Dry	1016 – 1027
WS6	Natural	None	2	0.0	3.5[(1,2)]	18.4	0.4[(1)] (0.2)[(2)]	4.39 – 4.57	1016 – 1027

Notes:
1 Maximum recorded
2 Stable recorded

8.4.3 Atmospheric pressure was recorded between 1013mb and 1027mb during the monitoring undertaken to-date and was noted to be generally rising.

8.4.4 Fluctuation of borehole flow rate of between 0.0l/hr and 28l/hr was recorded within

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WS1 within the initial 30 seconds of monitoring. This was recorded to reduce and stabilise to a rate of 0.0l/hr. A maximum flow rate of 1.0l/hr and 0.4l/hr was recorded within WS4 and WS6, respectively, reducing to stable flow rates of 0.3l/hr and 0.2l/hr following a period of 180 seconds and 120 seconds respectively.

8.4.5 No measurable concentrations of methane were recorded within the boreholes during the monitoring undertaken to-date.

8.4.6 A maximum concentration of carbon dioxide of 4.1%v/v has been recorded from WS1 on the second monitoring visit undertaken on site, reducing to a concentration of 3.5%v/v following a period of 480 seconds. Maximum and stable concentrations of 3.8%v/v and 3.5%v/v were recorded within WS4 and WS6, respectively. It is noted that the concentrations recorded to date are only just below the current screening level presented in current guidance for a high sensitivity end use (i.e. 5% carbon dioxide for housing).

8.4.7 On the basis of the ground gas monitoring recorded to-date, the natural ground encountered on site would be characterised, in accordance with current guidance (CIRIA C665), as having a Gas Screening Value of 0.0l/hr for methane (based on a maximum flow rate of 28l/hr and maximum concentration of 0.0%v/v) and 0.0147l/hr for carbon dioxide (based on a maximum stable flow rate of 0.3l/hr and maximum carbon dioxide concentration of 4.1%v/v), irrespective of location.

8.4.8 Made ground was encountered on site to a maximum depth of 0.6mbgl. Based upon the gas monitoring data, the absence of degradable organic material and the recorded total organic carbon (TOC%) content within the made ground (between 1.8% and 3.7%), the made ground encountered on site is not considered to be a potential source source of ground gas generation.

8.4.9 On the basis of site observations and the limited monitoring undertaken to date, the site may be classified as CS1 in accordance with current guidance (CIRIA C665 and BS8485:2015). Notwithstanding this, given the potential source of ground gas generation (infilled canal) in close proximity to the site and the atmospheric conditions at the time of monitoring, additional monitoring is recommended in accordance with current guidance to fully characterise the ground gas regime of the site.

8.4.10 The site is reported to be located within a lower probability radon area as less than 1% of homes are above the Action Level. Therefore, it is reported that no radon protection measures are necessary in the construction of new dwellings.

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9 REFINED CONCEPTUAL MODEL

9.1 Introduction

9.1.1 The Preliminary Risk Assessment undertaken as part of this report identified the presence of potential significant pollutant linkages associated with the site and surrounds. Therefore, in accordance with the approach recommended in CLR11, additional information was collected about the site and its surroundings as part of a Generic Quantitative Risk Assessment. Based upon this additional information, the site conceptual model has been refined and pollutant linkages confirmed for evaluation where considered necessary.

9.2 Hazard Identification

9.2.1 Potential sources of contamination have been identified on and within the vicinity of the site and are presented in Table 9.1.

Table 9.1: Identified Hazards

Identified Hazard/ Source	Location	Details
Made Ground / Potentially Contaminative Land Uses	On site	Limited made ground was observed on site. No elevated total contaminant concentrations were recorded within the near surface materials sampled, in relation to Tier 1 SSVs for a residentiall end use. Further, based upon the observed thickness and composition of the made ground and near surface materials encountered on site, this is not considered a potential source of significant ground gas.
Potentially contaminative current and historic processes	Off site	Potentially contaminative current or historic processes have been identified in close proximity to site. Notwithstanding this, laboratory test results, field test data and visual/ olfactory observations made during the intrusive investigation suggest no potential on-site contaminant migration. Ground gas monitoring undertaken to date would suggest the site may be classified as Characteristic Situation 1. Notwithstanding this, in accordance with current guidance additional monitoring is recommended to fully define the potential risk of ground gas posed by the nearby infilled canal.

9.3 Identified Potential Receptors and Pathways

9.3.1 Potential receptors identified as part of the generic risk assessment are:

- Current/future site users;
- Construction workers; and
- Controlled waters (Principal and Secondary Aquifer).

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9.3.2 Potential contaminant pathways identified as part of the generic risk assessment include:

- Dermal contact – contact with soil, dust or water;
- Ingestion - ingestion of soil, dust or water;
- Inhalation – inhalation of soil, dust or vapours;
- Vertical migration – seepage of contaminants at the ground surface through cracks in hardstanding and/or leaching of contaminants within the unsaturated zone resulting in vertical contaminant migration; and
- Horizontal migration – lateral migration of contaminants within the saturated zone and along preferential pathways such as drainage pipe bedding.

9.4 Hazard Assessment and Risk Estimation

9.4.1 Potential significant pollutant linkages identified following completion of the intrusive works are summarised in the Refined Site Conceptual Model presented in Table 9.2.

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Table 9.2: Refined Conceptual Model (Hazard Assessment and Risk Estimation)

Identified Hazard/ Source	Identified Receptor	Potential Pathway to Receptors	Associated Hazard	Scale of Impact	Potential Consequence of Source-Receptor Linkage	Potential Likelihood for Significant Source-Receptor Linkage	Risk Classification
Made ground – on site	Current and future site users and construction workers and Controlled Waters	Exposure to potential contamination through ingestion, inhalation and dermal contact. Infiltration of water through the unsaturated zone resulting in leaching of potential contaminants and subsequent potential vertical and horizontal migration along preferential pathways	Risk of harm to human health and Secondary and Principal Aquifers	Local to regional	Medium	**Unlikely:** Limited made ground / near surface materials were observed on site. In addition, no elevated total contaminant concentrations were recorded in samples tested.	**Low Risk**
	Future site end users and proposed development structures	Migration, ingress and inhalation of ground gasses	Risk of harm to human health and buildings	Local	Medium to Severe	**Unlikely:** Based upon the observed thickness and composition of the near surface materials encountered on site, this is not considered to be a potential source of significant ground gas.	**Low Risk**
Potentially Contaminative Current and Historic Processes – on and off site	Current and future site users	Exposure to potential contamination through ingestion, inhalation and dermal contact.	Risk to human health and controlled waters on site	Local	Medium	**Unlikely**: While a number of potentially contaminative current and historic process have been recorded in close proximity to the site, no visual or olfactory evidence of potentially significant contamination was observed within the ground materials encountered at the site. In addition, no elevated total contaminant concentrations were recorded in samples tested.	**Low Risk**
	Future site end users and proposed development structures	Migration, ingress and inhalation of ground gasses	Risk of harm to human health and buildings	Local	Medium to Severe	**Low Likelihood:** While monitoring undertaken to date would suggest the site may be classified in as Characteristic Situation 1 given the presence of the nearby infilled canal, the potential risk from ground gas as a result of this feature cannot be fully discounted.	**Low to Moderate Risk**

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10 GROUND ENGINEERING

10.1 Proposed Development

10.1.1 It is understood that it is proposed to develop the site to provide 40 to 50 two storey residential units with associated parking and private gardens.

10.1.2 Full details regarding the proposed development have not been provided to TEC and therefore, general recommendations with regards to the ground engineering have been made below.

10.2 Ground Conditions

10.2.1 The general ground profile encountered at the site is summarised in Table 10.1 below.

Table 10.1: Generalised Ground Profile

Depth (mbgl)	Encountered Material
0 – 0.1 / 0.6	**Made Ground / Near Surface Materials:** locally clayey, locally gravelly sandy silt with frequent rootlets. Gravel of red brick, chert, chalk and black carbonaceous material.
0.1/0.6 – 2.4 / >5.0	**River Terrace Deposits:** generally firm to stiff brown slightly sandy clayey silt with occasional gravel of flint or chalk. Underlain by very soft / soft / soft to firm sandy to very sandy clay. In majority of locations, this material was observed to be underlain by firm locally stiff gravelly sandy clay with gravel of flint and chalk.
2.4/4.0 - >5.0	**Seaford Chalk (undifferentiated):** Structureless chalk (CIRIA Grade Dm) composed of gravelly sandy silt. The chalk was generally noted to be weak, medium density and white with occasional staining. Flint gravel was observed in a number of locations.

Made Ground

10.2.2 No geotechnical testing was undertaken on samples of the made ground. However, as a part of the geochemical testing undertaken for the site, pH and sulphate testing was undertaken on samples of encountered made ground. The test data indicated sulphate concentrations in the range of 0.013g/l to 0.11g/l and pH values of 5.6 to 7.3.

Natural Strata

10.2.3 Geotechnical test results are discussed below. Geotechnical laboratory test certificates are provided in Appendix G with in-situ tests being presented on the exploratory hole logs in Appendix E of this report.

10.2.4 Laboratory analysis was conducted on 12No samples of the encountered natural ground material. The results of these analyses are presented in Table 10.2 below.

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Table 10.2: Summary of Laboratory Test Results - Natural Strata

Test	Number of Tests	Range of Results
Plasticity Index (%)	7	12 – 32
Moisture Content (%)	9	12 – 34
% passing 425µm sieve	7	50 – 100
Saturation Moisture Content – Chalk %	2	24 – 26
Dry Density (Mg/m^3)	2	1.60 – 1.65
pH Value	7	6.90 – 7.80
SO_4 (g/l in soil)	7	0.15 – 0.30

10.2.5 The Plasticity Indices of the encountered superficial deposits ranged between 12% (WS5 at 3.5mbgl) and 32% (WS1 at 2.9%), corresponding to Modified Plasticity Indices of between 9.6% (WS5 at 3.5mbgl) and 26.7% (WS2 at 1.0mbgl), suggesting the materials to be of non-plastic to medium volume change potential, as defined by the NHBC (2016).

10.2.6 2No. intact samples of the encountered chalk material were submitted for laboratory analysis for Saturation Moisture Content (SMC). The results of these tests recorded SMC values of between 24% and 26% and dry density values of between $1.60Mg/m^3$ and $1.65Mg/m^3$, indicating the materials to be classified as medium density.

10.2.7 Standard Penetration Testing (SPTs) undertaken within the dynamic sample boreholes recorded 'N' values between 3 and 23, within the underlying superficial deposits, suggesting the materials to be very soft to stiff. The SPT 'N' values within the underlying Chalk ranged between 10 and >50.

10.2.8 Hand shear vane and pocket penetrometer testing was undertaken on the cohesive superficial materials encountered. The results indicate undrained shear strengths of between 65kPa and 160kPa within the upper materials; and unconfined compressive strengths between $2.0kg/cm^2$ and $>5.0kg/cm^2$ suggesting undrained shear strength is the region of $98kN/m^2$ to $317kN/m^2$, suggesting the materials to be generally firm to very stiff, medium to very high strength. The lower superficial deposits, generally recorded as very soft / soft and soft to firm recorded undrained shear strengths of between 25kPa and 60kPa; and unconfined compressive strengths between $<0.5kg/cm^2$ and $0.75kg/cm^2$, suggesting undrained shear strength is the region of $<22.5kN/m^2$ and $33.75kN/m^2$, suggesting the lower materials to be generally very soft to firm, very low to medium strength.

10.2.9 In addition, correlations with the Standard Penetration (SPT) data suggests undrained shear strengths between 45kPa and 65kPa. Therefore, based on the results obtained, a tentative characteristic undrained strength parameter of $50kN/m^2$ is considered appropriate for these upper materials.

10.2.10 Using standard correlations with SPT data, e.g. Stroud (1988), the encountered cohesive deposits may be considered as being of very low to high compressibility, with a coefficient of compressibility (m_v) of between $0.07m^2/MN$ and $0.7m^2/MN$ recorded for the superficial River Terrace Deposits.

10.2.11 Geochemical testing of representative samples of the natural ground materials included the analysis for water soluble sulphate and pH testing within the natural ground. The results indicate sulphate concentrations of between 0.15g/l and 0.30g/l and pH values of between 6.9 and 7.8.

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10.3 Foundations

Ground Conditions

10.3.1 Made ground materials were encountered across the site to a maximum observed depth of 0.6mbgl. The natural ground, encountered from a depth of 0.1mbgl was observed to comprise River Terrace Deposits underlain by Chalk.

River Terrace Deposits

10.3.2 The natural ground was encountered across the site from a depth of 0.1mbgl and was generally observed to comprise firm / stiff light brown slightly sandy clayey silt with a friable texture underlain by firm to stiff orangish brown slightly sandy silty clay / firm to stiff gravelly sandy clay. Gravel, where encountered was generally observed to comprise flint and occasional chalk.

10.3.3 With the exception of WS6, TP4 and TP6, the upper firm to stiff material was noted to be underlain by very soft / soft / soft to firm sandy to very sandy clay. This material was noted to vary in depth (encountered from depths of between 1.0mbgl and 2.45mbgl) and thickness (0.45m to 2.8m). However, within 3No. locations, the full extent of this softer material was not confirmed.

10.3.4 With the exception of TP7 and TP8 (located in the north-east corner of the site), this material was generally noted to be underlain by firm, locally stiff, gravelly sandy clay. The gravel within this material was noted to comprise flint and chalk.

Chalk

10.3.5 The chalk was encountered in a number of locations on site from depths of between 2.4mbgl (TP6) and 4.9mbgl (WS1) and was generally observed to comprise structureless chalk composed of gravelly sandy silt. The chalk gravel was generally noted to be weak, medium density and white, with occasional staining. In addition, flint gravel was observed in numerous locations.

Preliminary Foundation Design Recommendations

10.3.6 On the basis of field observations, variability of the underlying superficial deposits and the potential loads associated with the proposed development, it is considered unlikely that conventional foundations would be suitable for the proposed development across the majority of the development area. Consequently, it is suggested that a piled foundation solution may be most suitable for the proposed structures.

10.3.7 Should a piling foundation be utilised across the site, it is considered likely that piles will need to be taken to competent ground (i.e. the firm to stiff superficial deposits or underlying chalk encountered on site from a depth of 2.4mbgl).

10.3.8 However, additional intrusive works will be required in order to allow detailed design to be undertaken of the most appropriate founding option.

10.3.9 Furthermore, as the cohesive superficial deposits have been shown to exhibit a non-plastic to medium volume change potential, an appropriate void should be allowed for within the design, i.e. a minimum of 100mm below ground beams in accordance with NHBC (2016) guidance.

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North/North-west Section of the Site (WS6 and TP4)

10.3.10 Notwithstanding this, within the northern/north-western section of the site (WS4 and TP6), encountered ground conditions were noted to vary to that of the rest of the site. Further intrusive works may provide a refinement of an allowable bearing resistance within this area to determine the feasibility of conventional foundations within this area.

10.3.11 Should conventional foundations be considered appropriate within this area, it is noted that a non-plastic to medium volume change potential is reported for the encountered underlying cohesive superficial deposits, which, in accordance with NHBC (2016) guidance, would require a minimum founding depth of 0.9mbgl. However, it should be noted that where within the influence of historic, existing or proposed planting, this depth may be required to be deepened in accordance with the NHBC guidance and a minimum founding depth of 1.25mbgl would be required.

10.3.12 Should additional investigation show that conventional footings would be possible within this localised area founding within the competent superficial deposits (i.e. firm to stiff sandy very gravelly clay), encountered from depths of 0.1mbgl, an allowable bearing resistance is the region of 100kN/m2 would be suggested by current information.

10.4 Ground Floor Slabs

10.4.1 Should piled foundation be utilised across the site, the use of suspended floors are considered appropriate. As a result of the recorded non-plastic to medium plastic nature of the upper superficial deposits it is suggested that a minimum void of 100mm should be utilised where suspended in situ concrete flooring is incorporated into the design and where pre-cast concrete suspended floors are used a minimum void space of 250mm should be utilised to allow for 150mm of ventilation.

10.4.2 Alternatively, should conventional foundations be utilised and the proposed structure is wholly within competent natural ground or following the removal of made ground, a ground bearing slab may be utilised where the foundation depth is less than 1.0mbgl. However, a suitable thick granular blanket/stabilised fill material will be required and it is suggested that a minimum 450mm blanket may be appropriate, although the thickness of the granular blanket may need to be increased depending on the final proposed foundation depth of each structure.

10.5 Preliminary Pavement Design

10.5.1 Six Dynamic Cone Penetrometer (DCP-TRL) tests were undertaken across the site. The results are presented in Appendix J.

10.5.2 Using the calculations outlined in Jones CR and J Rolt (1991), the results for DCP2 and DCP3 indicated Californian Bearing Ratio (CBR) values of between 5.9% and 32.0% below assumed formation level (500mmbgl).

10.5.3 In addition, based on correlations with plasticity indices using the Design Manual for Roads and Bridges IAN 73/06 Revision 1 (2009) and observations made on site during the intrusive works, a CBR value of 3% to 6% may be appropriate for preliminary pavement design where road construction is within the natural deposits.

10.5.4 Therefore, based upon the data obtained to-date, a CBR value in excess of 5% may be appropriate for preliminary design purposes where road formation is proven to be within natural ground deposits. Owing to inherent variability of made ground

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materials, CBR values of <2.5% would be recommended for preliminary design purposes where road formation is proven to be within made ground.

10.5.5 It should be noted that all road formations should be proof rolled and soft spots removed and replaced with selected granular fill and, where adoptable, a pavement of sufficient thickness to prevent the penetration of frost should be employed.

10.6 Excavations

10.6.1 Excavation of the materials immediately beneath the site should be achievable using conventional excavation plant.

10.6.2 Based on observations made during intrusive site investigations, groundwater ingress unlikely to pose an issue within excavations on site. Therefore, dewatering works are considered unlikely during the excavation works.

10.6.3 Where excavations extend beyond 1.2m depth and are within soils, it is recommended that appropriate shoring/temporary works is used i.e. in accordance with current Health and Safety requirements where access for personnel is required.

10.7 Protection of Buried Concrete

10.7.1 The results of the water soluble sulphate and pH testing carried out for the made ground and natural ground materials indicate that in accordance with BRE Special Digest 1 (2005), the natural ground materials encountered on site generally yield an Aggressive Chemical Environment for Concrete (ACEC) of AC-1 requiring a Design Sulphate Class of DS-1.

10.8 Drainage

10.8.1 Soakage testing was undertaken in two locations on site (TP1/SA1 and TP2/SA2), in general accordance with BRE 365, within the natural ground materials comprising gravelly sandy clay and sandy gravelly clay respectively. The full data sheet is provided in Appendix I.

10.8.2 TP1 (SA1) failed to drain during the test period (i.e. to 75% effective water depth). Notwithstanding this, extrapolation of the data suggests indicative infiltration rate of 3.65×10^{-6} within this location.

10.8.3 TP2 (SA2) drained fully (i.e. to >75% effective water depth) during the 3No. tests undertaken within this location. As a result, an infiltration rate has been calculated based on the methodology described in BRE365, with indicative infiltration rates of between 3.02×10^{-5} and 6.75×10^{-5} m/s calculated for this location.

10.8.4 A summary of the calculated infiltration rates for all soakage tests carried out at the site is presented in Table 10.3.

Table 10.3: Summary of Soakage Test Data

Location	Test 1	Test 2	Test 3
TP01/SA1	9.16×10^{-6}	-	-
TP02/SA2	3.08×10^{-5}	2.92×10^{-5}	2.97×10^{-5}

10.8.5 Based on the soakage test data collated to date, it is considered that the more granular underlying ground materials encountered may provide a suitable drainage medium, should suitable and sufficient attenuation be available. It is recommended that an

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appropriate drainage engineer be consulted as to whether such systems will be viable and additional testing may be required to confirm this, given the variation in ground conditions encountered within the 2No. soakage test locations.

10.8.6 It should also be noted that CIRIA Report 156 – Infiltration Drainage – Manual of Good Practice, recommends that any infiltration systems constructed should normally be built at least 5m away from the nearest foundation.

10.8.7 In addition, the requirements of the Environment Agency would need to be incorporated into any design which drains into an aquifer.

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11 CONCLUSIONS & RECOMMENDATIONS

11.1 Conclusions

11.1.1 Tweedie Evans Consulting Ltd (TEC) has been appointed by Seaward Properties Ltd to undertake a preliminary geoenvironmental and geotechnical assessment of Bonhams Field, Yapton. All works were undertaken in accordance with our proposal letter dated 22 August 2016 and referenced RE.1608012.001.

11.1.2 The site is located off the B2233 Road, in the north-west of Yapton. The site covers an area of approximately 3.23ha with the centre situated at approximate National Grid Reference 497540, 103450. The nearest postcode is BN18 0DX.

11.1.3 The site currently comprises a rectangular parcel of land separated into 2No. fields by a series of hedgerows lain predominantly to grass.

11.1.4 It is understood that it is proposed to develop the site to provide 40 to 50 two storey residential units with associated parking and private gardens. However, full details relating to the proposed are currently unknown.

11.1.5 The site is considered to be of low to moderate environmentally sensitivity due primarily to the underlying Principal and Secondary Aquifer.

11.1.6 Made ground was encountered across the site to a maximum observed depth of 0.6mbgl. Notwithstanding this, no elevated contaminant concentrations were reported within laboratory testing when considering a residential site end use.

11.1.7 An infilled canal has been identified in proximity to the site, which is considered to provide a potential source of ground gas generation for the site. While the ground gas monitoring undertaken to date would suggest the site may be classified as Characteristic Situation 1, in accordance with current guidance. Notwithstanding this, monitoring was undertaken at high and rising atmospheric pressures which would not be considered "worst case" conditions for gas migration therefore additional testing is recommended to fully define the ground gas regime of the site.

11.2 Geoenvironmental Risk Evaluation

11.2.1 Based upon the information contained within this report, it is the opinion of TEC that the site represents a low risk of geoenvironmental liability. This reflects the absence of potential Significant Pollutant Linkages.

11.3 Geoenvironmental Risk Management Recommendations

11.3.1 Based upon the information obtained to-date, it is considered that no remedial measures are required at the site in relation to identifed human health or controlled water receptors.

11.3.2 Furthermore, it is reported that the site is located within a lower radon protection area, as less than 1% of homes are affected. Therefore, in accordance with BRE211, no radon protective measures are considered necessary for new properties or extensions.

11.3.3 Notwithstanding this, in accordance with current guidance further ground gas monitoring is recommended to fully define the ground gas regime present on site from the identified source (infilled canal).

11.3.4 Should water pipes be placed within the made ground on site, due consideration should be given to the UK Water Industry Research Ltd (UKWIR) guidance.

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11.3.5 Based on our conceptual understanding of the site to-date, it would be anticipated that a similar ground profile to those encountered within this assessment are present across the site area. However, should a greater thickness of made ground or visual or olfactory evidence of potentially significant contamination be identified during the development works, further investigation and assessment may be required.

11.4 Ground Engineering

Preliminary Foundation Design Recommendations

11.4.1 On the basis of field observations, variability of the underlying superficial deposits and the potential loads associated with the proposed development, it is considered unlikely that conventional foundations would be suitable for the proposed development across the majority of the development area. Consequently, it is suggested that a piled foundation solution may be most suitable for the proposed structures.

11.4.2 Should a piling foundation be utilised across the site, it is considered likely that piles will need to be taken to competent ground (i.e. the firm to stiff superficial deposits or underlying chalk encountered on site from a depth of 2.4mbgl).

11.4.3 However, it is considered likely that additional intrusive works will be required in order to allow detailed design to be undertaken of the most appropriate founding option.

11.4.4 Furthermore, as the cohesive superficial deposits have been shown to exhibit a non-plastic to medium volume change potential, an appropriate void should be allowed for within the design, i.e. a minimum of 100mm below ground beams in accordance with NHBC (2016) guidance.

North/North-west Section of the Site (WS6 and TP4)

11.4.5 Notwithstanding this, within the northern/north-western section of the site (WS4 and TP6), encountered ground conditions were noted to vary to that of the rest of the site. Further intrusive works may provide a refinement of an allowable bearing resistance within this area to determine the feasibility of conventional foundations within this area.

11.4.6 Should conventional foundations be considered appropriate within this area, it is noted that a non-plastic to medium volume change potential is reported for the encountered underlying cohesive superficial deposits, which, in accordance with NHBC (2016) guidance, would require a minimum founding depth of 0.9mbgl. However, it should be noted that where within the influence of historic, existing or proposed planting, this depth may be required to be deepened in accordance with the NHBC guidance and a minimum founding depth of 1.25mbgl would be required.

11.4.7 Where founding within the competent superficial deposits (i.e. firm to stiff sandy very gravelly clay), encountered from depths of 0.1mbgl, an allowable bearing resistance is the region of 100kN/m^2 may be appropriate. However, further works are recommended within this area to confirm the engineering properties and recommendations within this area.

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Ground Floor Slabs

11.4.8 Should piled foundation be utilised across the site, the use of suspended floors are considered appropriate. As a result of the recorded non-plastic to medium plastic nature of the upper superficial deposits it is suggested that a minimum void of 100mm should be utilised where suspended in situ concrete flooring is incorporated into the design and where pre-cast concrete suspended floors are used a minimum void space of 250mm should be utilised to allow for 150mm of ventilation.

11.4.9 Alternatively, should conventional foundations be utilised and the proposed structure is wholly within competent natural ground or following the removal of made ground, a ground bearing slab may be utilised where the foundation depth is less than 1.0mbgl. However, a suitable thick granular blanket/stabilised fill material will be required and it is suggested that a minimum 450mm blanket may be appropriate, although the thickness of the granular blanket may need to be increased depending on the final proposed foundation depth of each structure.

Preliminary Pavement Design

11.4.10 California Bearing Ration (CBR) values have been obtained through in situ Dynamic Cone Penetrometer testing which gave results suggesting a CBR in excess of 5% may be appropriate for preliminary design purposes where road formation is proven to be within natural ground deposits. Owing to inherent variability of made ground materials, CBR values of <2.5% would be recommended for preliminary design purposes where road formation is proven to be within made ground.

11.4.11 It should be noted that all road formations should be proof rolled and soft spots removed and replaced with selected granular fill and, where adoptable, a pavement of sufficient thickness to prevent the penetration of frost should be employed.

Excavations

11.4.12 Excavation of the materials immediately beneath the site should be achievable using conventional excavation plant.

11.4.13 Based on observations made during intrusive site investigations, groundwater ingress unlikely to pose an issue within excavations on site. Therefore, dewatering works are considered unlikely during the excavation works.

11.4.14 Where excavations extend beyond 1.2m depth and are within soils, it is recommended that appropriate shoring/temporary works is used i.e. in accordance with current Health and Safety requirements where access for personnel is required.

Protection of Buried Concrete

11.4.15 The results of the water soluble sulphate and pH testing carried out for the made ground and natural ground materials indicate that in accordance with BRE Special Digest 1 (2005), the natural ground materials encountered on site generally yield an Aggressive Chemical Environment for Concrete (ACEC) of AC-1 requiring a Design Sulphate Class of DS-1.

Drainage

11.4.16 Based on the soakage test data collated to date, it is considered that the more granular underlying ground materials encountered may provide a suitable drainage medium, should suitable and sufficient attenuation be available. It is recommended that an appropriate drainage engineer be consulted as to whether such systems will be viable

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and additional testing may be required to confirm this, given the variation in ground conditions encountered within the 2No. soakage test locations.

11.4.17 It should also be noted that CIRIA Report 156 – Infiltration Drainage – Manual of Good Practice, recommends that any infiltration systems constructed should normally be built at least 5m away from the nearest foundation.

11.4.18 In addition, the requirements of the Environment Agency would need to be incorporated into any design which drains into an aquifer.

TWEEDIE EVANS CONSULTING LIMITED

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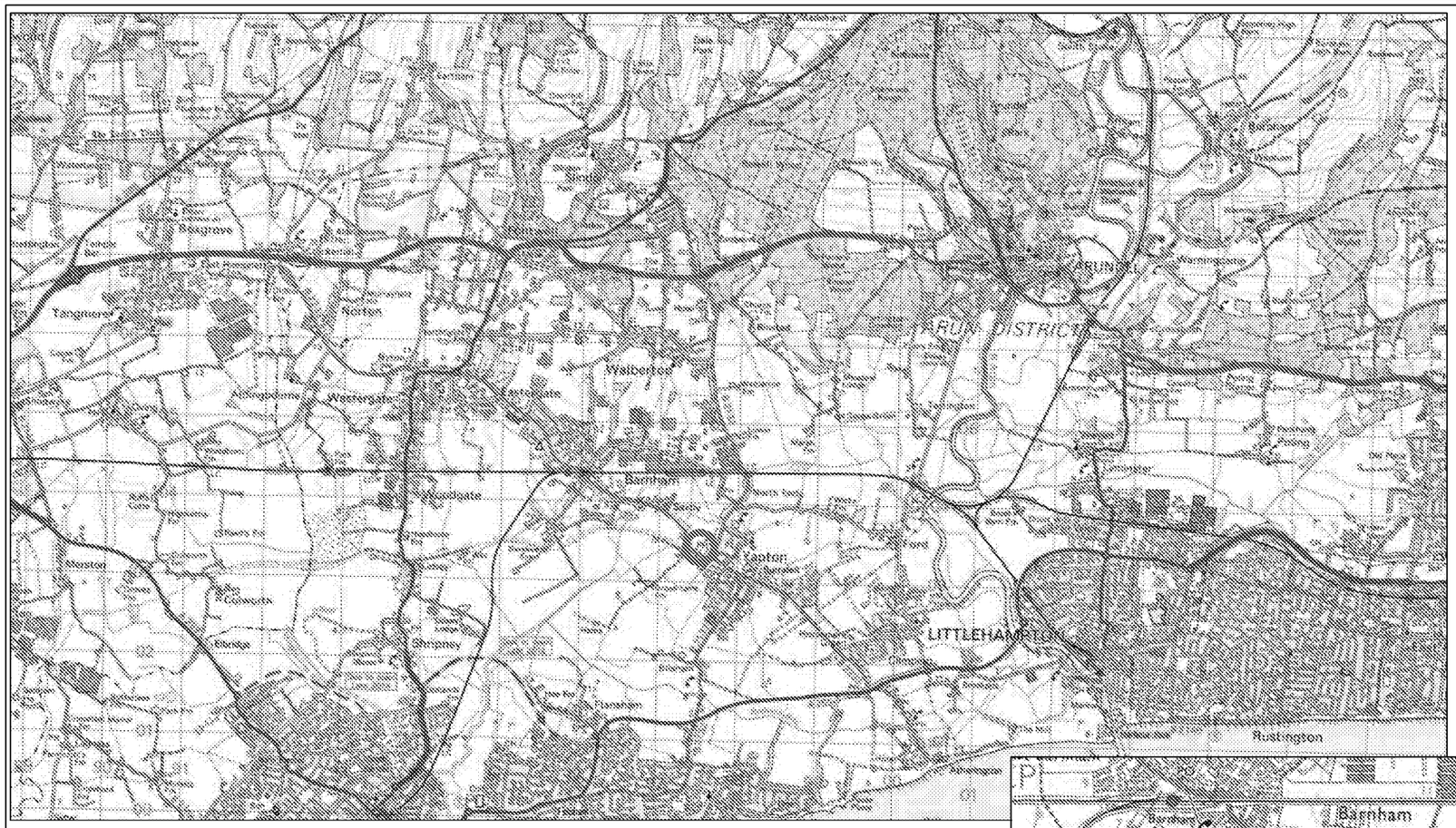
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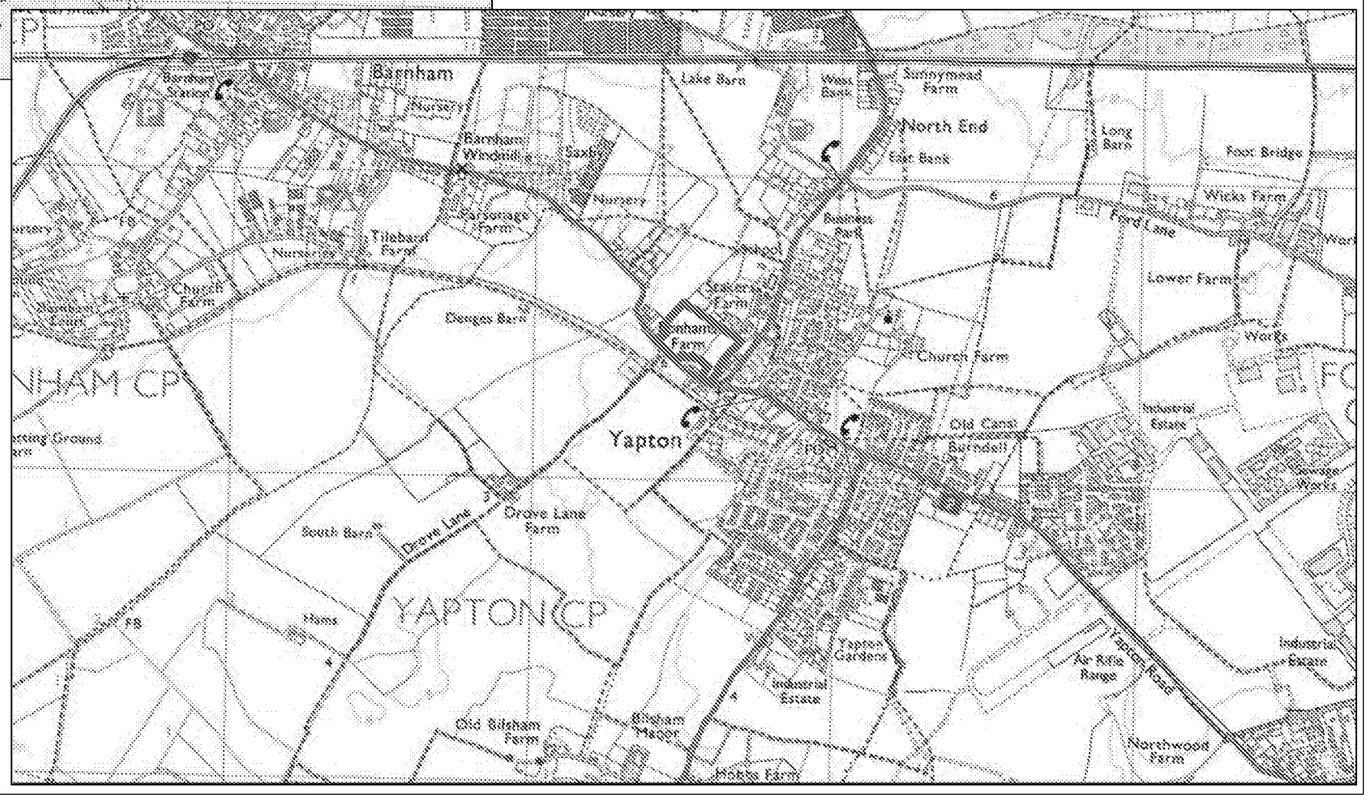
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FIGURES





Approximate Site Location:

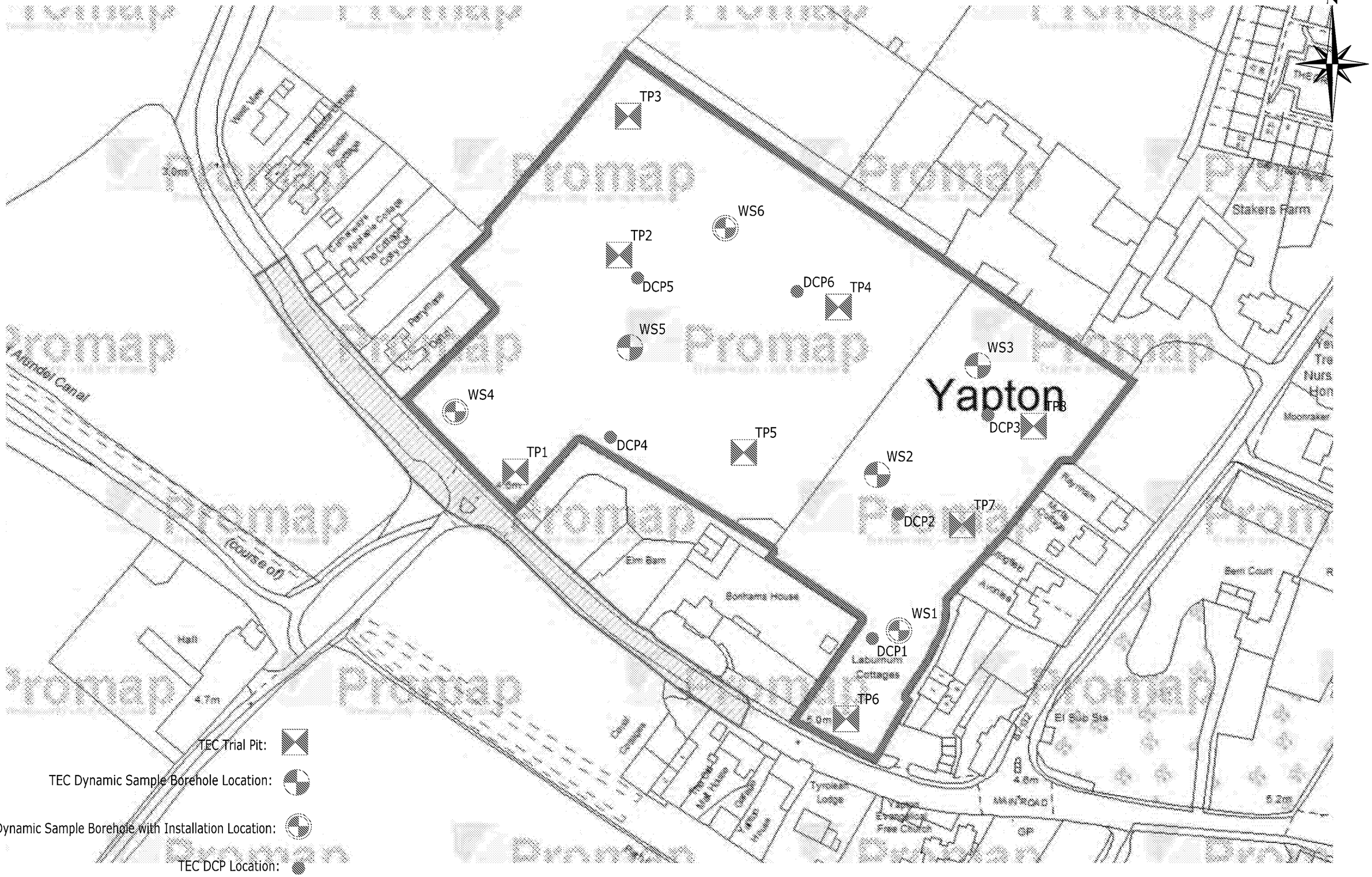
Approximate Site Boundary:

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www.tecon.co.uk

Site Name:	Drawing Name:	Client Name:	Project No:	Figure No:	Date:	Scale:
Bonhams Field, Yapton	Site Location Plan	Seaward Properties Ltd	1608013.001	1	October 2016	NTS

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TEC TWEEDIE EVANS CONSULTING	Tweedie Evans Consulting The Old Chapel 35a Southover Wells, Somerset BA5 1UH	Tel: 01749 677760 Fax: 01749 679345 Email:info@tecon.co.uk www.tecon.co.uk	Site Name: Bonhams Field, Yapton	Drawing Name: Exploratory Hole Location Plan	Client Name: Seaward Properties Ltd	Project No: 1608013.001	Figure No: 2	Date: October 2016	Scale: NTS

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APPENDIX A

Historical Maps

Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500

Quarry
Gravel Pit
Sand Pit
Clay Pit
Shingle
Refuse Heap
Sloping Masonry
Flat Rock
Marsh
Reeds
Osiers
Rough Pasture
Furze
Wood
Mixed Wood
Brushwood
Orchard
Fir
Ford
Stepping Stones
Ferry
Waterfall
Lock
Trig. Station
507 Altitude at Trig. Station
B.M.325·9 Bench Mark
342 Surface Level
Arrow denotes flow of water
Antiquities (site of)
Cutting
Embankment
Railway crossing Road
Level Crossing
Road crossing Railway
Railway crossing River or Canal
Road over single stream
Road over River or Canal
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. County Borough Boundary (England)
Co. Burgh Bdy. County Burgh Boundary (Scotland)

B.P. B.S.	Boundary Post or Stone	P.C.B.	Police Call Box
B.R.	Bridle Road	P.	Pump
E.P.	Electricity Pylon	S.P.	Signal Post
F.B.	Foot Bridge	Sl.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P.	Guide Post or Board	T.C.B.	Telephone Call Box
M.S.	Mile Stone	Tr.	Trough
M.P. M.R.	Mooring Post or Ring	W.	Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250

Inactive Quarry, Chalk Pit or Clay Pit
Active Quarry, Chalk Pit or Clay Pit
Rock
Boulders
Cliff
Slopes
Top
Roofed Building
Glazed Roof Building
Top
Sloping Masonry
Archway
Non-Coniferous Tree (surveyed)
Coniferous Tree (surveyed)
Non-Coniferous Trees (not surveyed)
Coniferous Trees (not surveyed)
Orchard Tree
Scrub
Bracken
Coppice, Osier
Reeds
Marsh, Saltings
Rough Grassland
Heath
Culvert
Direction of water flow
Bench Mark
Antiquity (site of)
Cave Entrance
Triangulation Station
Electricity Pylon
Electricity Transmission Line
County Boundary (Geographical)
County & Civil Parish Boundary
Civil Parish Boundary
Admin. County or County Bor. Boundary
L B Bdy London Borough Boundary
Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250

Cliff
Slopes
Top
Top
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Positioned Boulder
Scree
Non-Coniferous Tree (surveyed)
Coniferous Tree (surveyed)
Non-Coniferous Trees (not surveyed)
Coniferous Trees (not surveyed)
Orchard Tree
Scrub
Bracken
Coppice, Osier
Reeds
Marsh, Saltings
Rough Grassland
Heath
Culvert
Direction of water flow
Triangulation Station
Antiquity (site of)
Electricity Transmission Line
Electricity Pylon
BM 291.60m Bench Mark
Buildings with Building Seed
Roofed Building
Glazed Roof Building
Civil parish/community boundary
District boundary
County boundary
Boundary post/stone
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

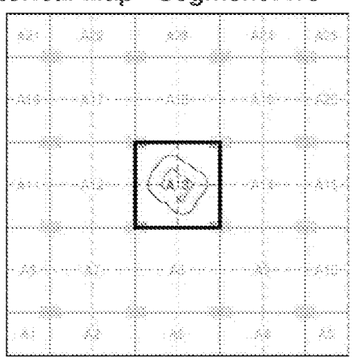
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Sussex	1:2,500	1876 - 1877	2
Sussex	1:2,500	1897	3
Sussex	1:2,500	1912	4
Sussex	1:2,500	1938 - 1939	5
Ordnance Survey Plan	1:2,500	1975	6
Additional SIMs	1:2,500	1982	7
Additional SIMs	1:2,500	1988	8
Additional SIMs	1:2,500	1989	9
Additional SIMs	1:2,500	1992	10
Large-Scale National Grid Data	1:2,500	1994	11
Large-Scale National Grid Data	1:2,500	1995	12

Historical Map - Segment A13



Order Details

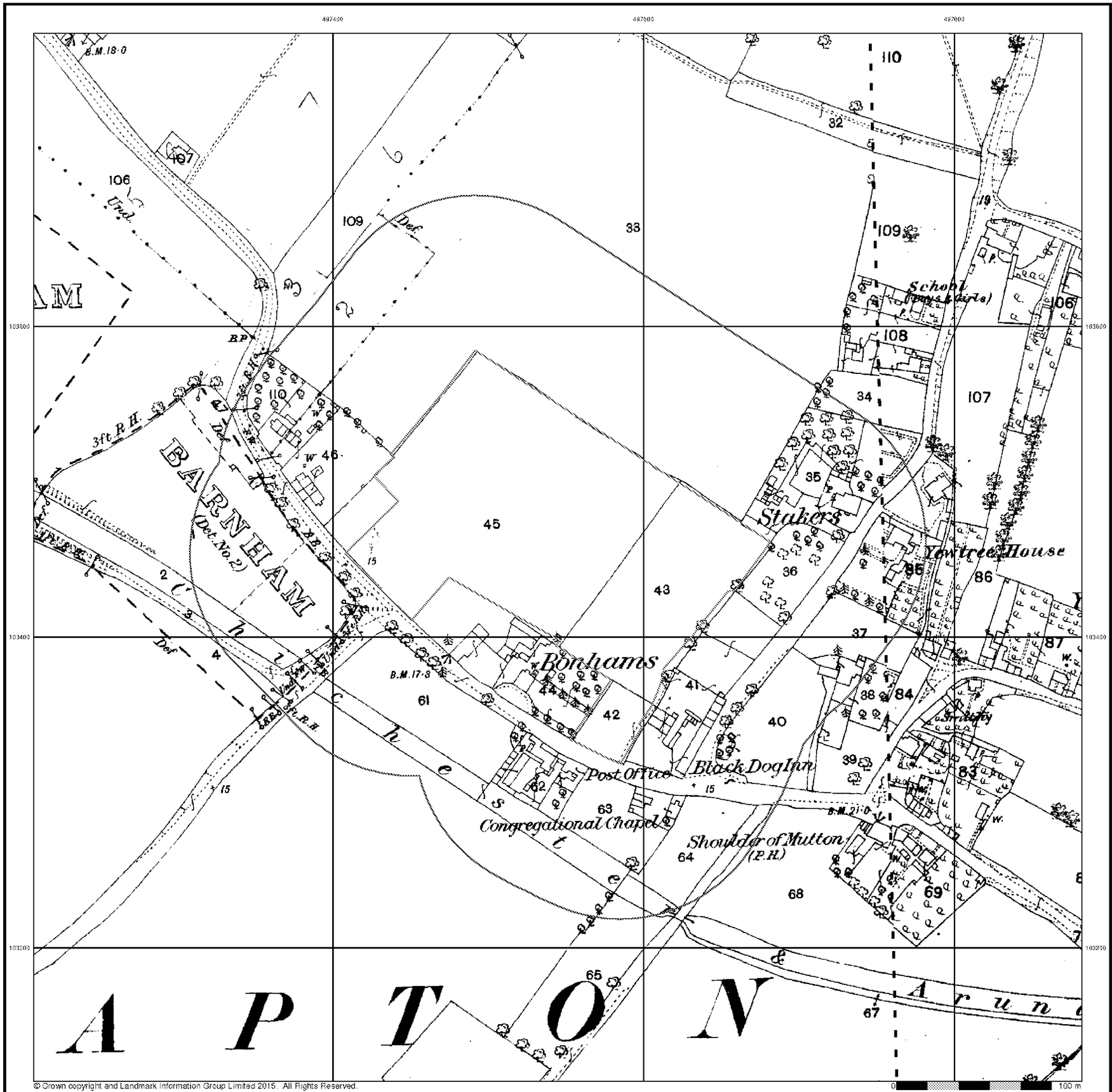
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Customer Ref: 1608012
National Grid Reference: 497540, 103450
Slice: A
Site Area (Ha): 3.23
Search Buffer (m): 100

Site Details

Bonhams Field, Yapton, Arundel, BN18 0DX

Landmark Information Group
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

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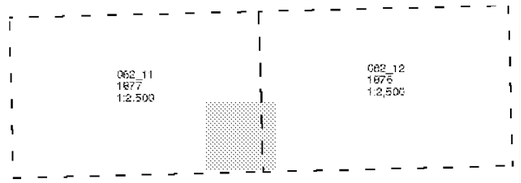
Sussex

Published 1876 - 1877

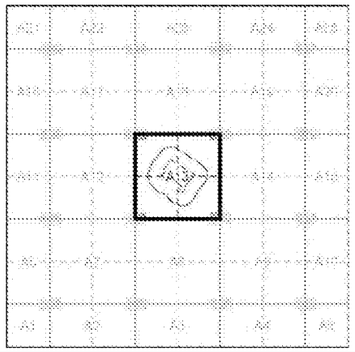
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



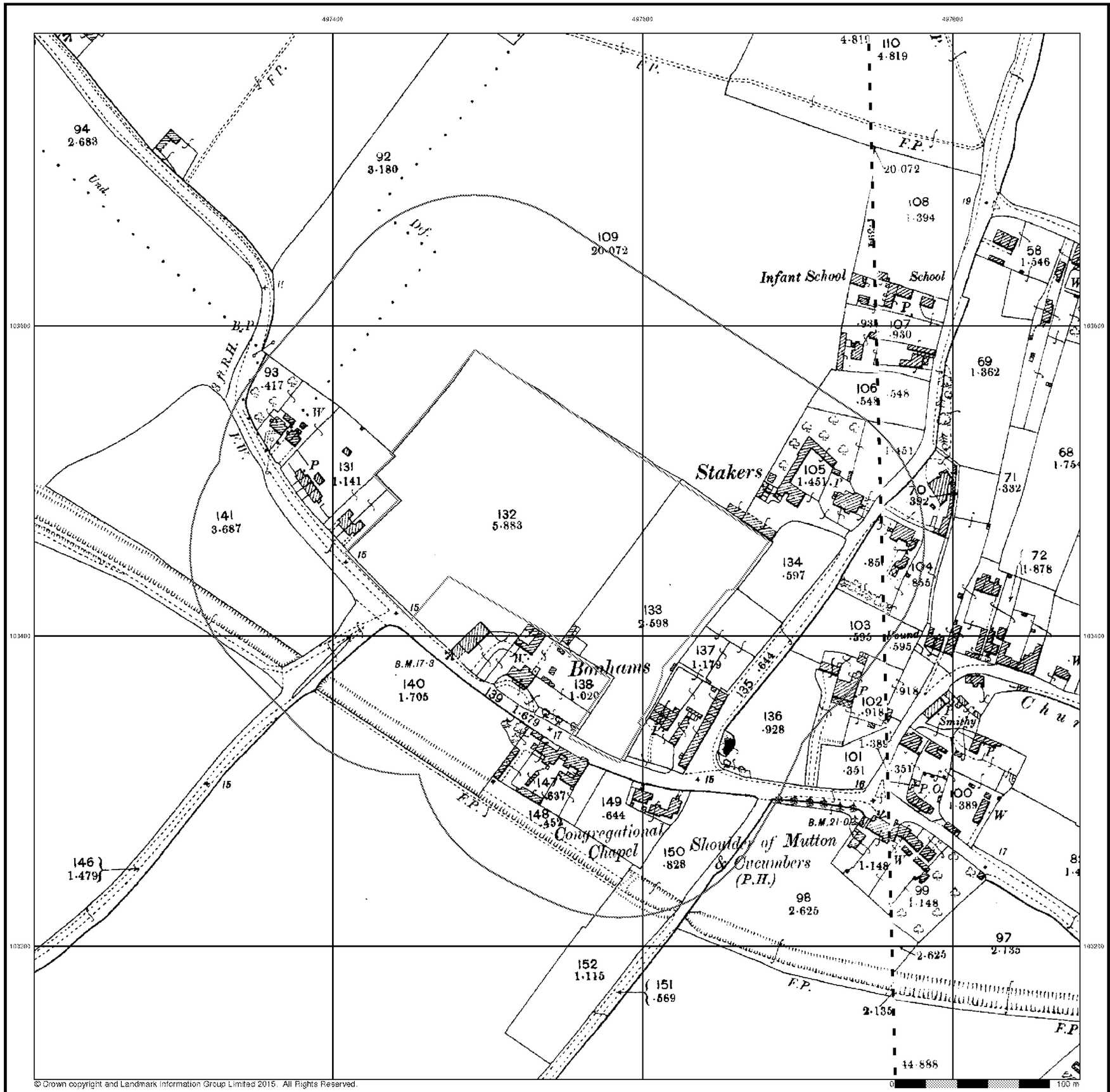
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Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	100

Site Details

Bonhams Field, Yapton, Arundel, BN18 0DX

Landmark
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Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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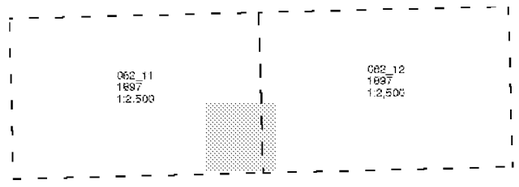
Sussex

Published 1897

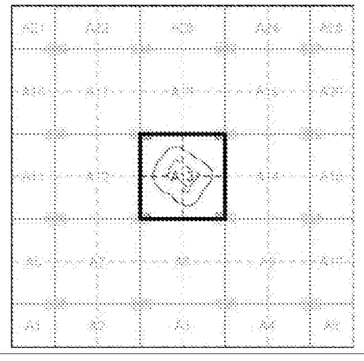
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Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

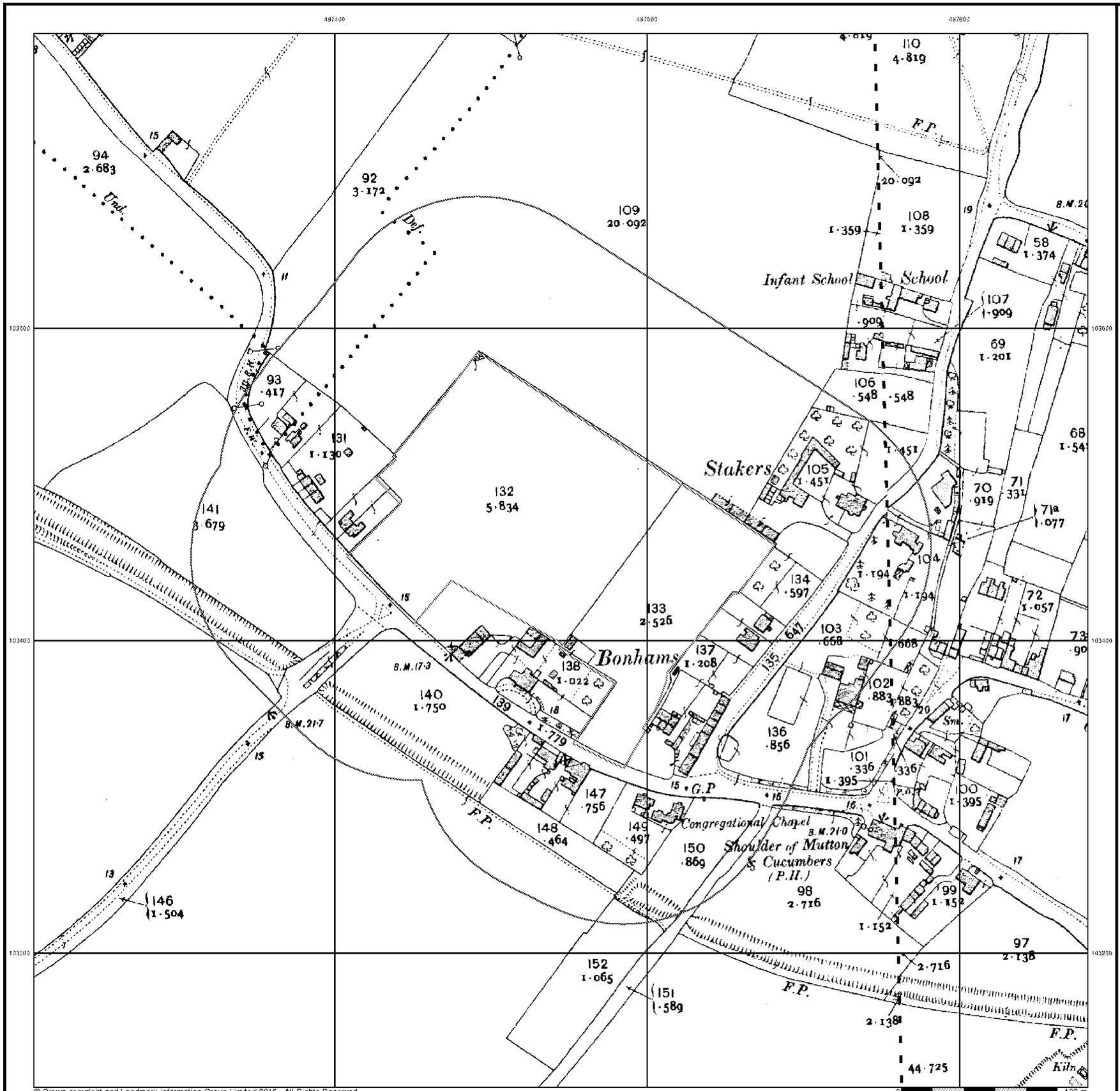
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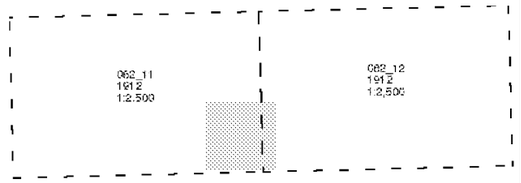
Sussex

Published 1912

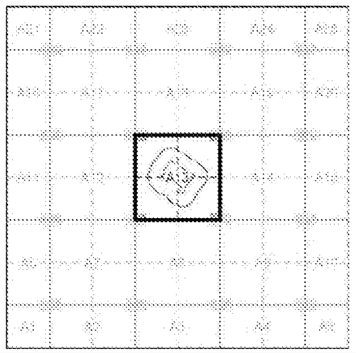
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



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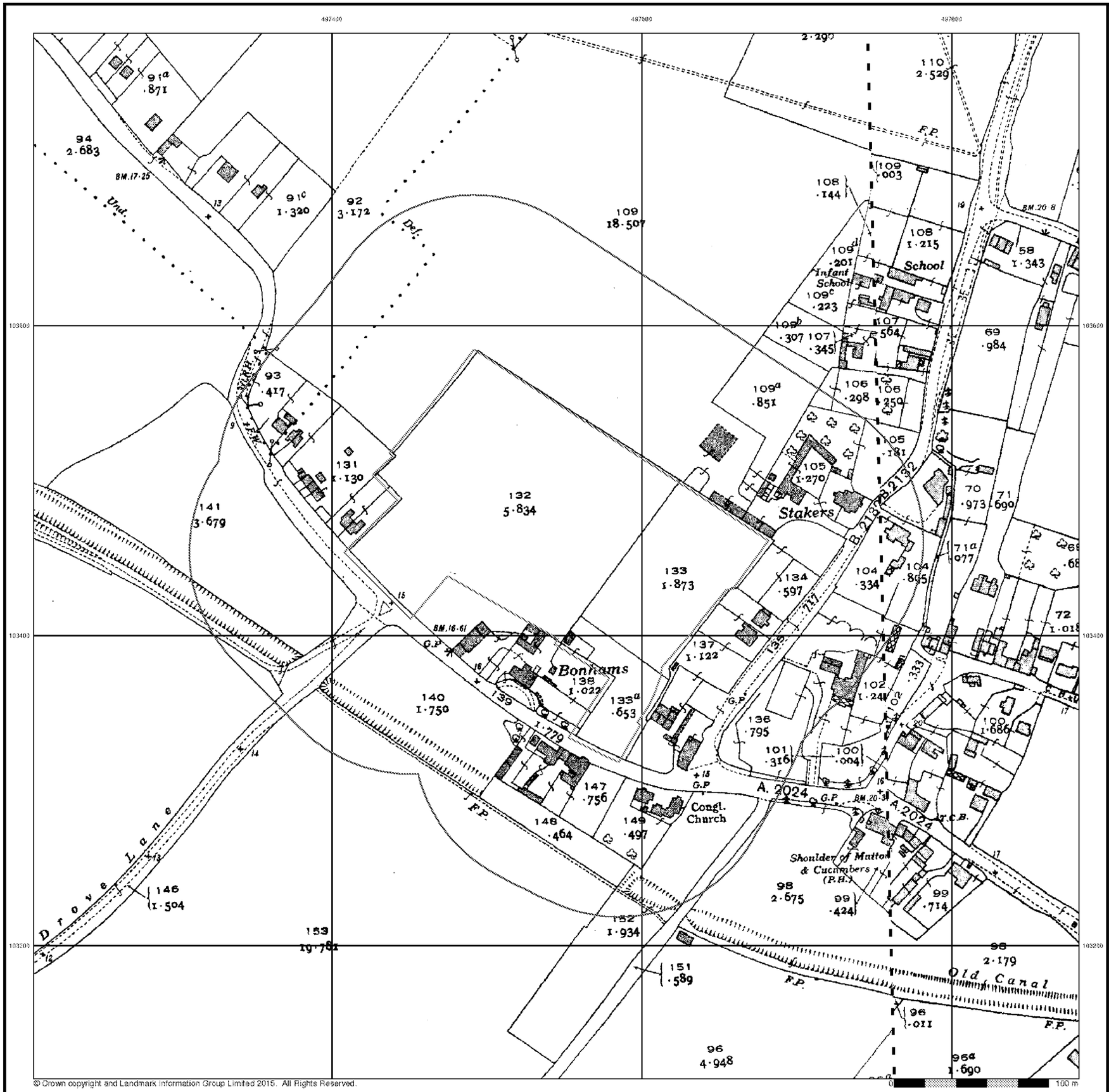
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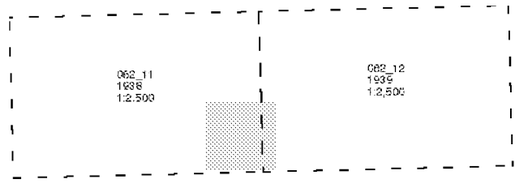
Sussex

Published 1938 - 1939

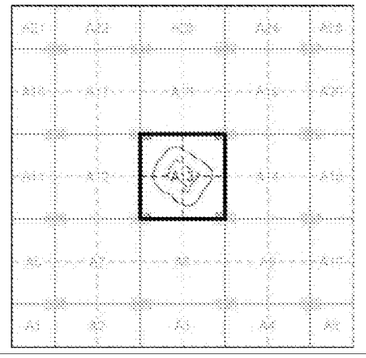
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Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

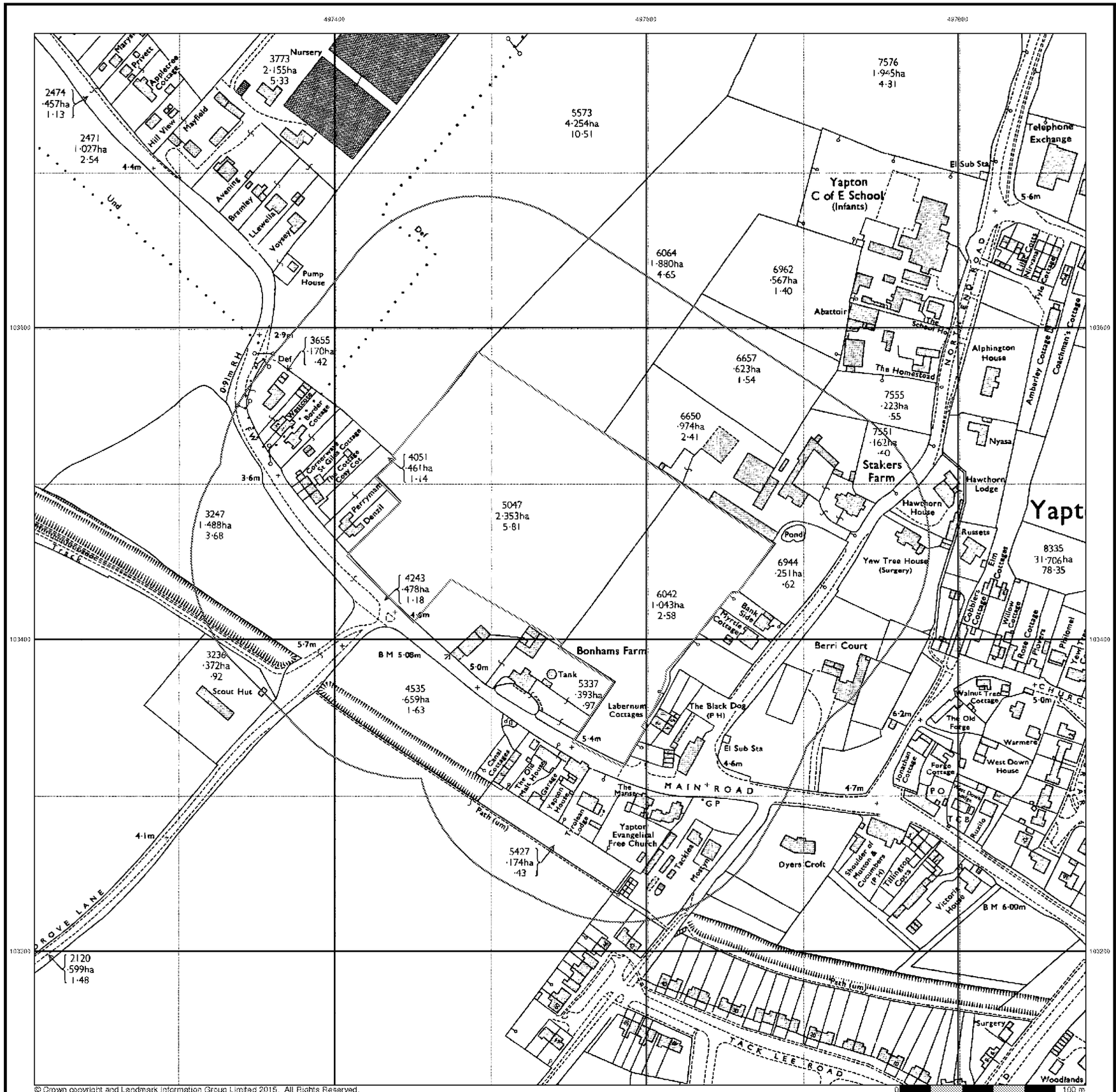
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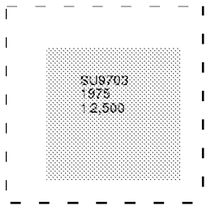
Ordnance Survey Plan

Published 1975

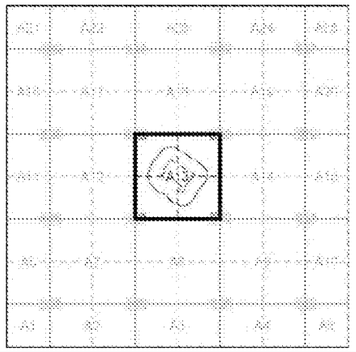
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



N

Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	100

Site Details

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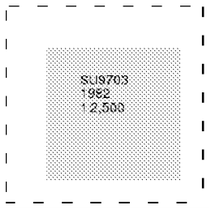
Additional SIMs

Published 1982

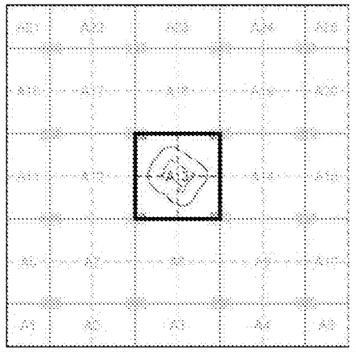
Source map scale - 1:2,500

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



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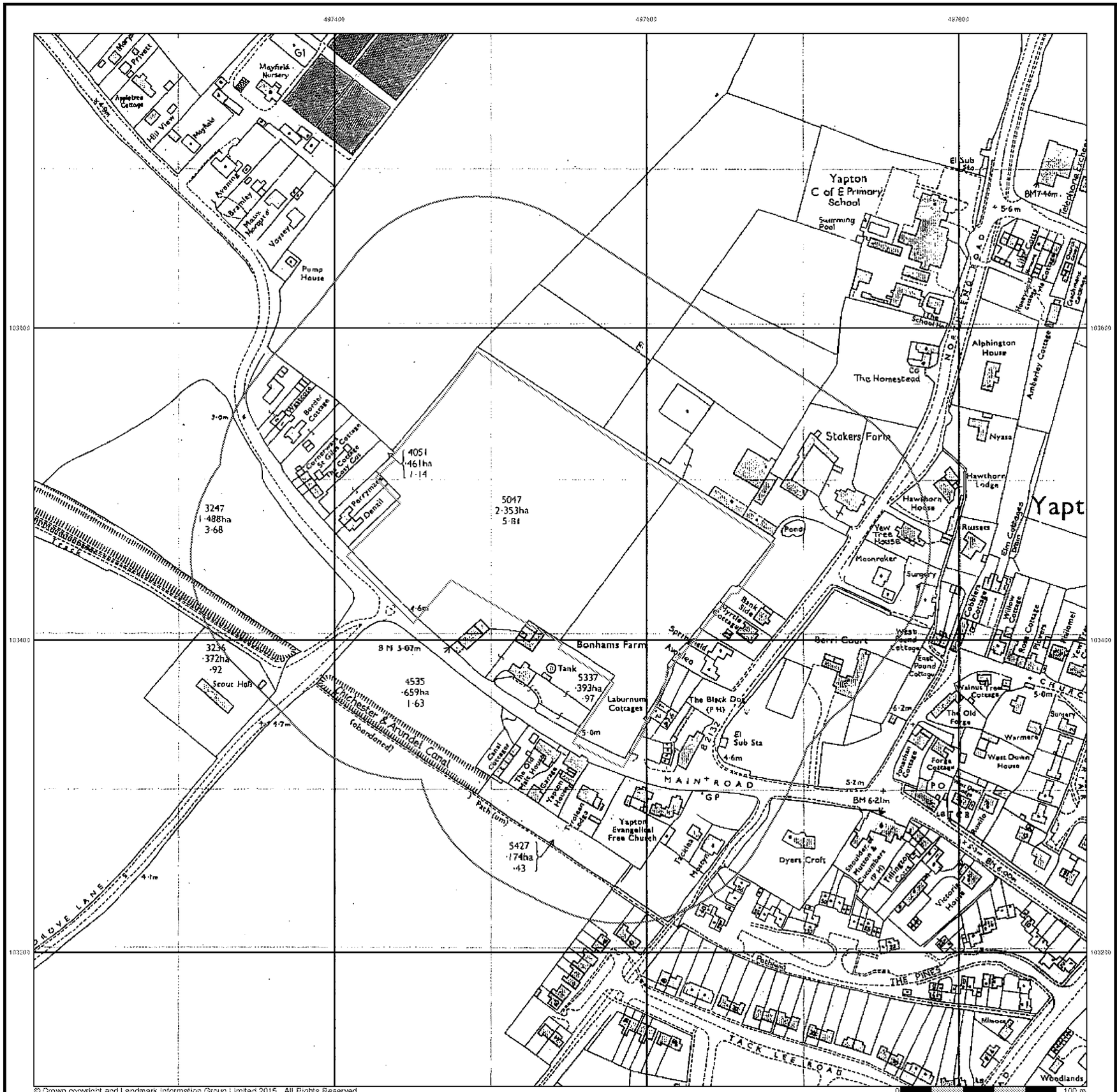
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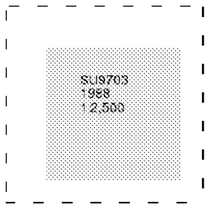
Additional SIMs

Published 1988

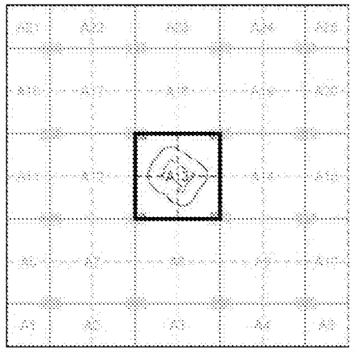
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



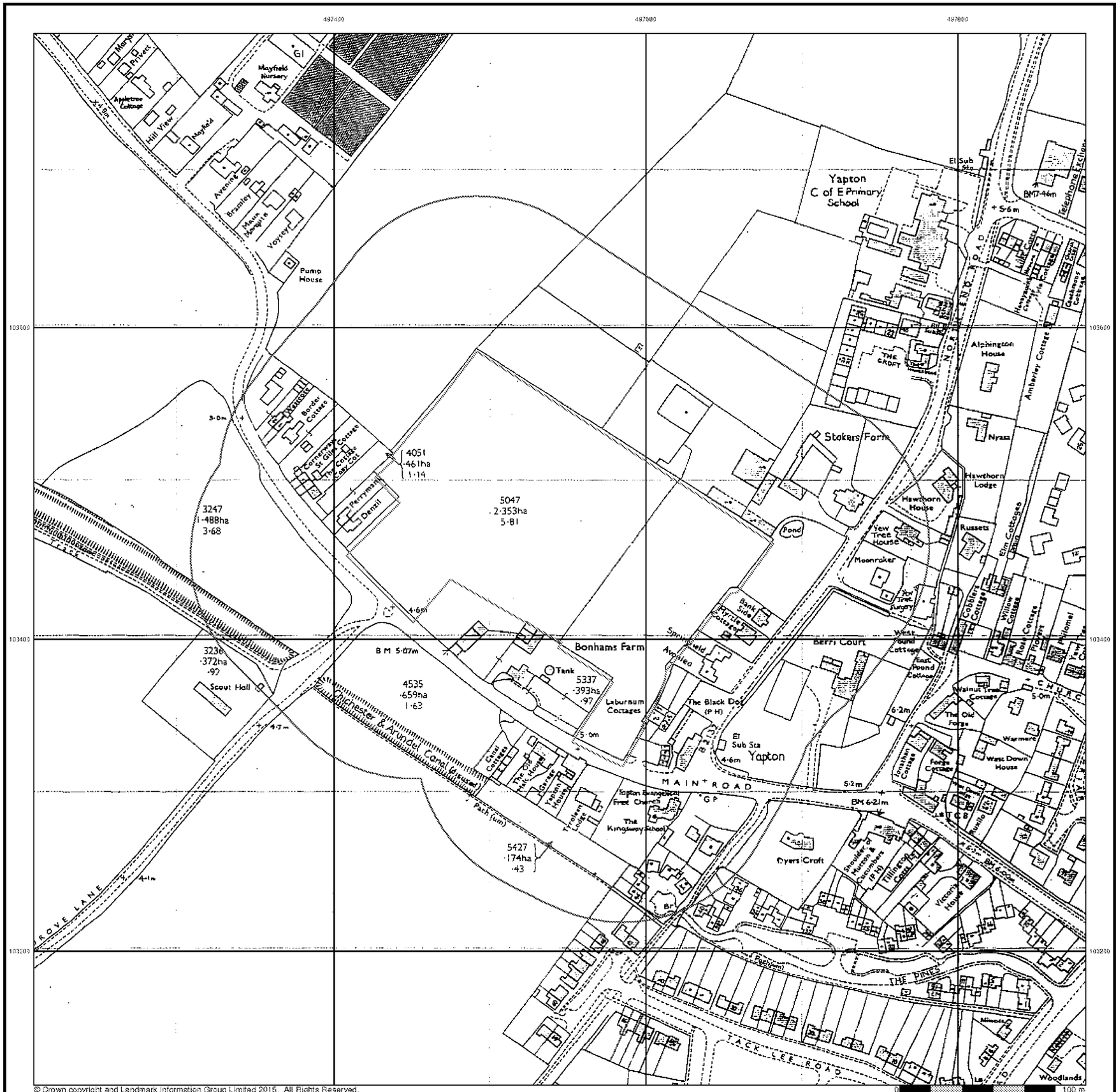
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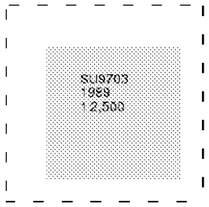
Additional SIMs

Published 1989

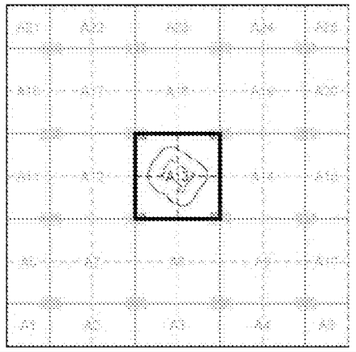
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



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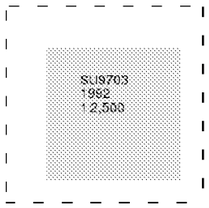
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Published 1992

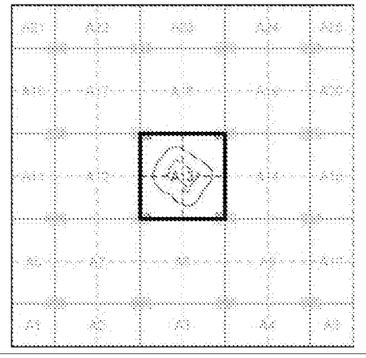
Source map scale - 1:2,500

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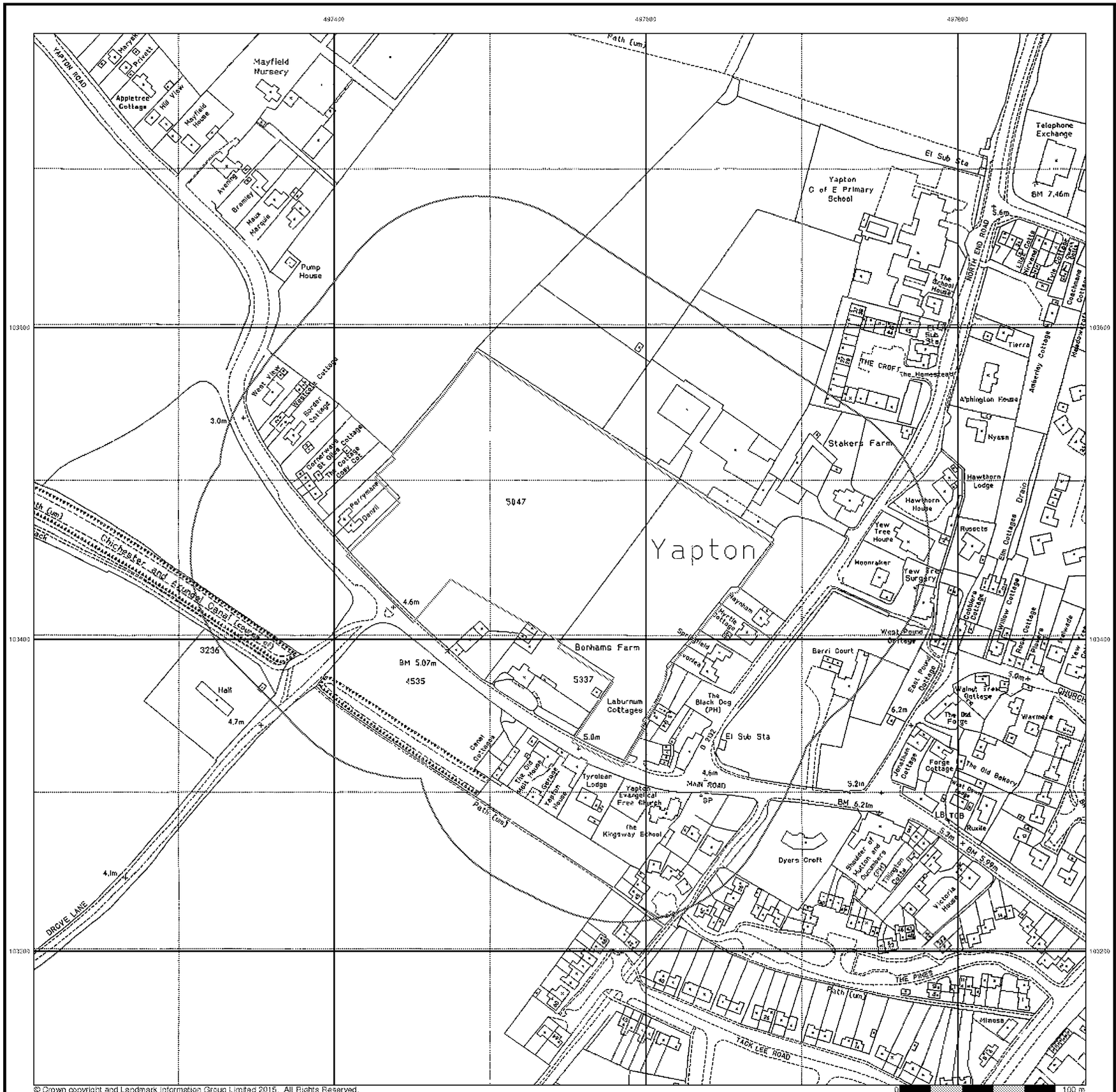
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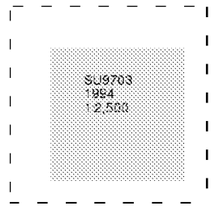
Large-Scale National Grid Data

Published 1994

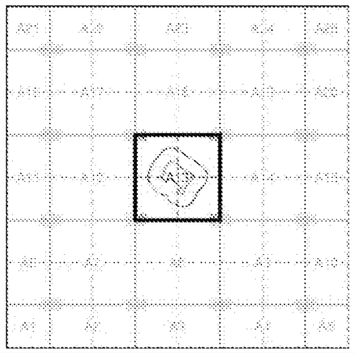
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



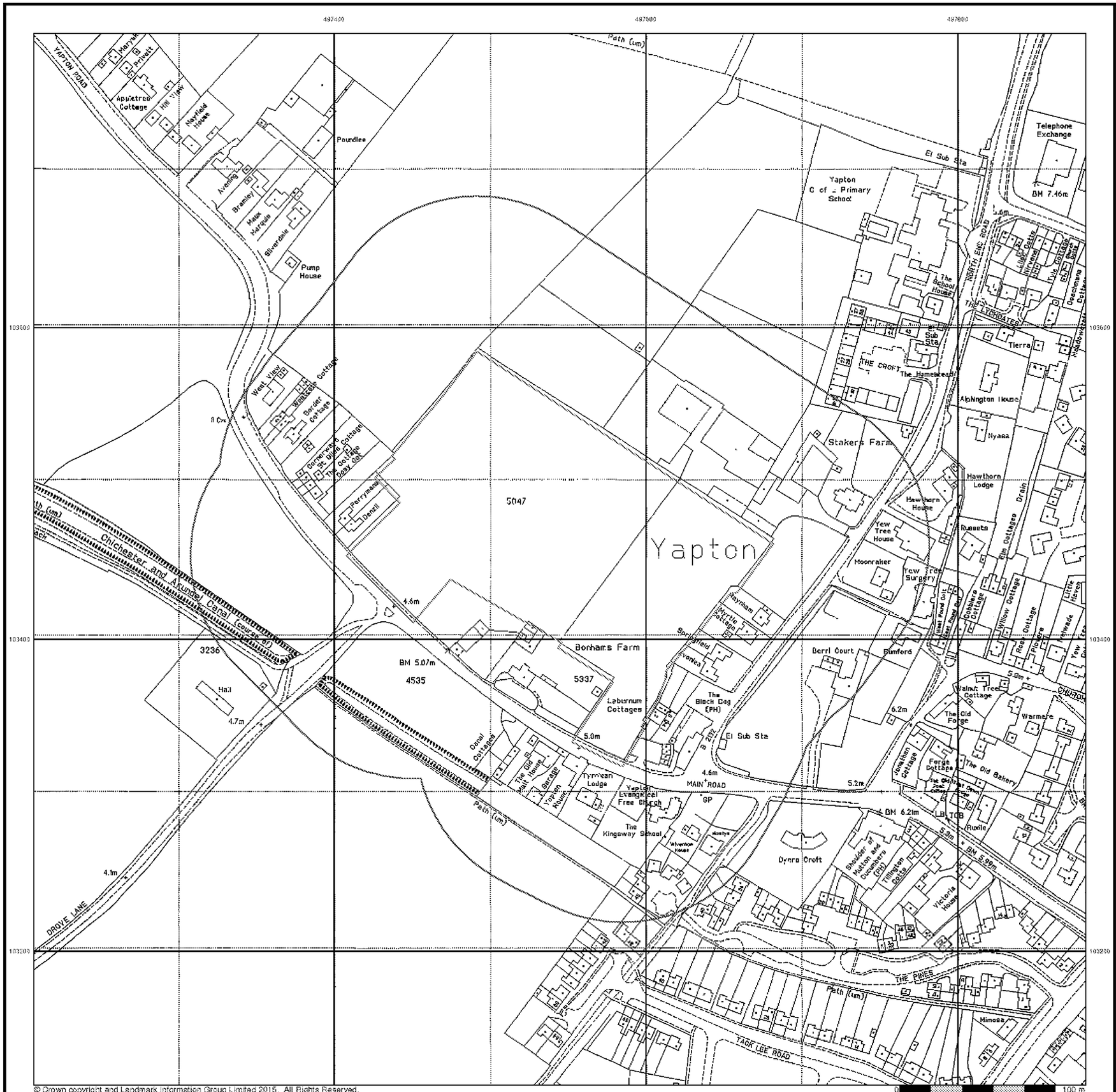
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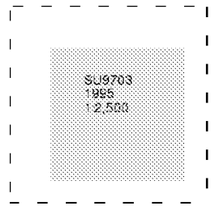
Large-Scale National Grid Data

Published 1995

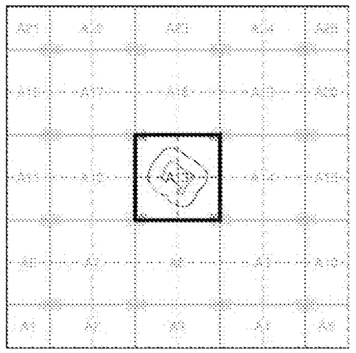
Source map scale - 1:2,500

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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
•285 Surface Level

Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream

County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. County Borough Boundary (England)
Co. Burgh Bdy. County Burgh Boundary (Scotland)
R.D. Bdy. Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Sloping Masonry
Electricity Transmission Line
Pole

Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge

Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

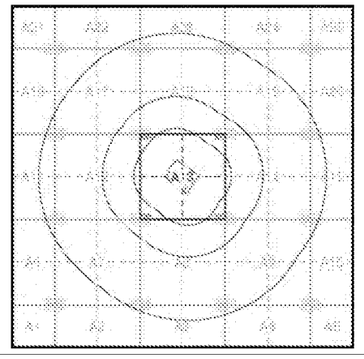
Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
Mean high water (springs)
Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Sussex	1:10,560	1880	2
Sussex	1:10,560	1899	3
Sussex	1:10,560	1913 - 1914	4
Sussex	1:10,560	1913 - 1914	5
Sussex	1:10,560	1913 - 1914	6
Sussex	1:10,560	1914	7
Historical Aerial Photography	1:10,560	1947	8
Sussex	1:10,560	1951	9
Ordnance Survey Plan	1:10,000	1962	10
Ordnance Survey Plan	1:10,000	1967	11
Ordnance Survey Plan	1:10,000	1980	12
Ordnance Survey Plan	1:10,000	1992	13
Historical Aerial Photography	1:10,000	1999	14
10K Raster Mapping	1:10,000	2000	15
10K Raster Mapping	1:10,000	2006	16
VectorMap Local	1:10,000	2016	17

Historical Map - Slice A



Order Details

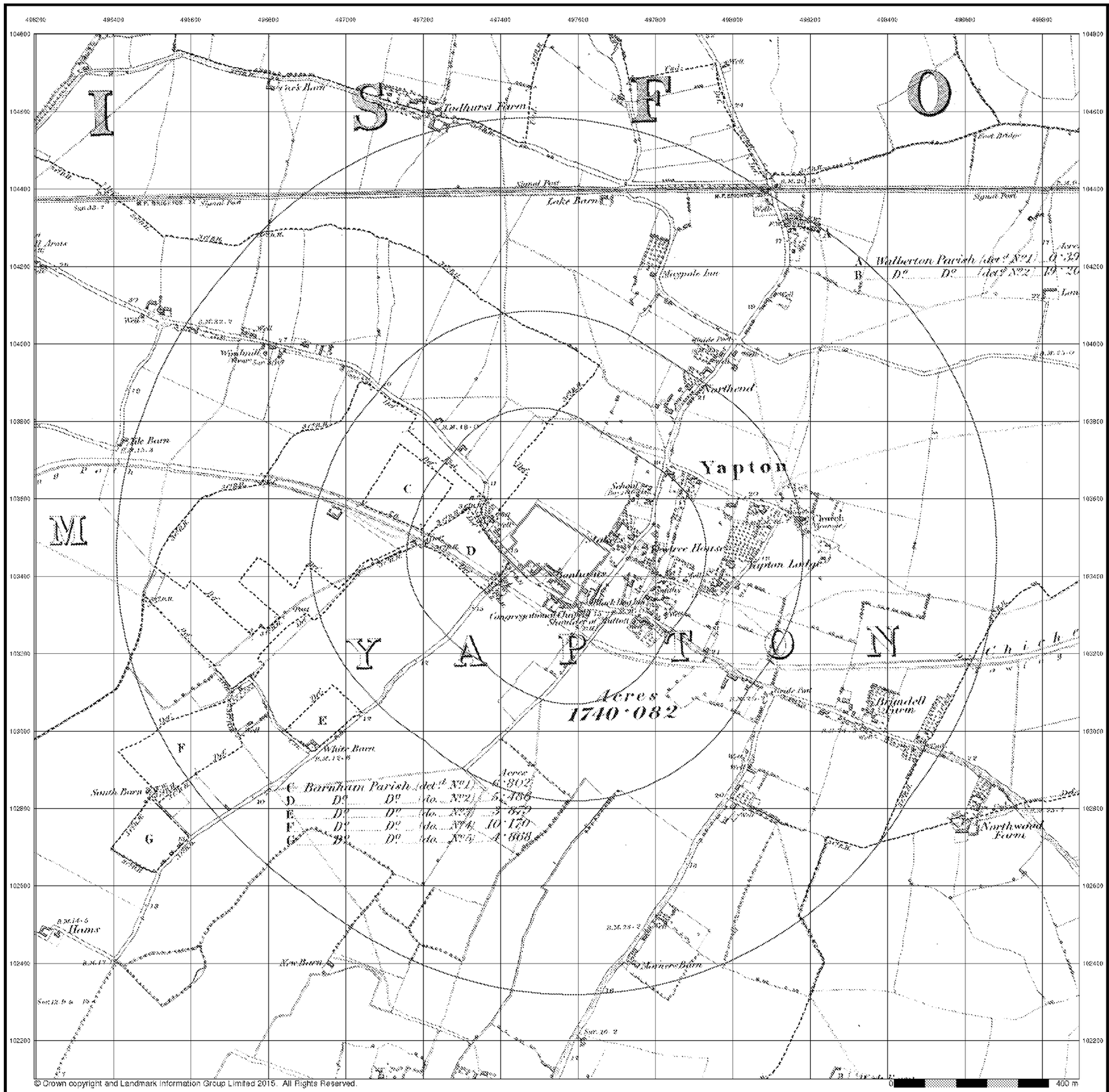
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National Grid Reference: 497540, 103450
Slice: A
Site Area (Ha): 3.23
Search Buffer (m): 1000

Site Details

Bonhams Field, Yapton, Arundel, BN18 0DX

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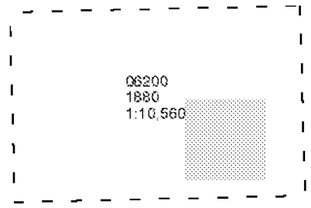
Sussex

Published 1880

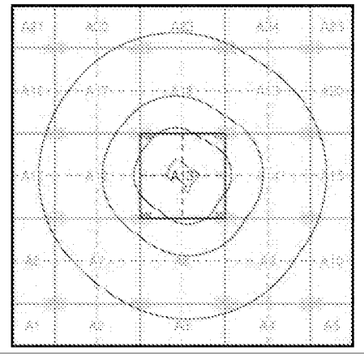
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

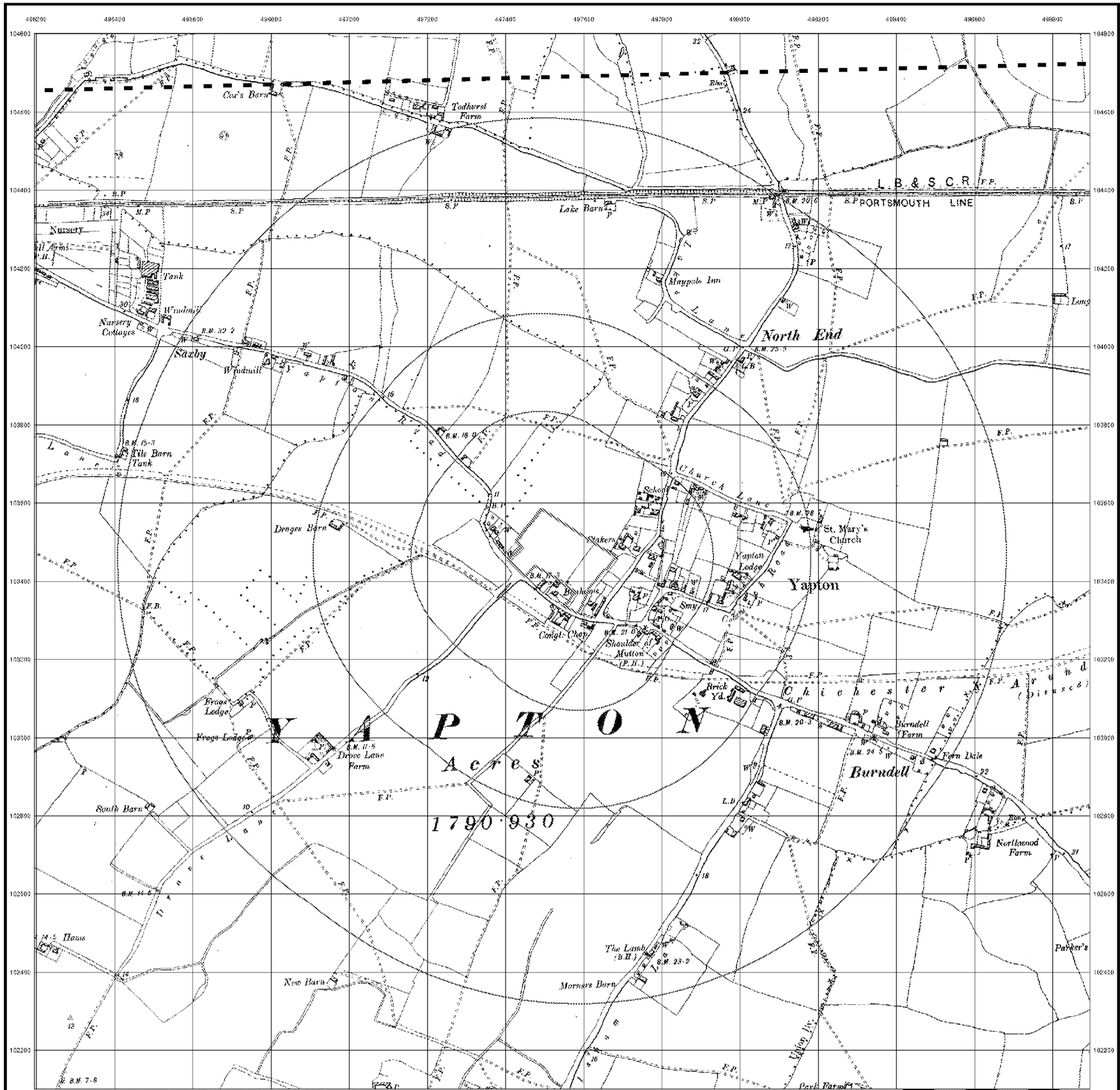
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Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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Sussex

Published 1899

Source map scale - 1:10,560

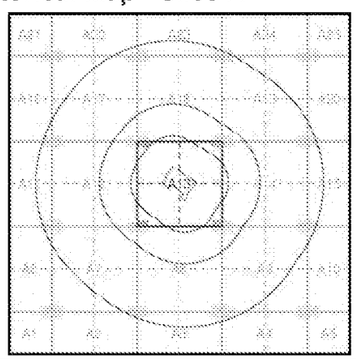
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

062NE
1899
1:10,560

062SE
1899
1:10,560

Historical Map - Slice A



N

Order Details

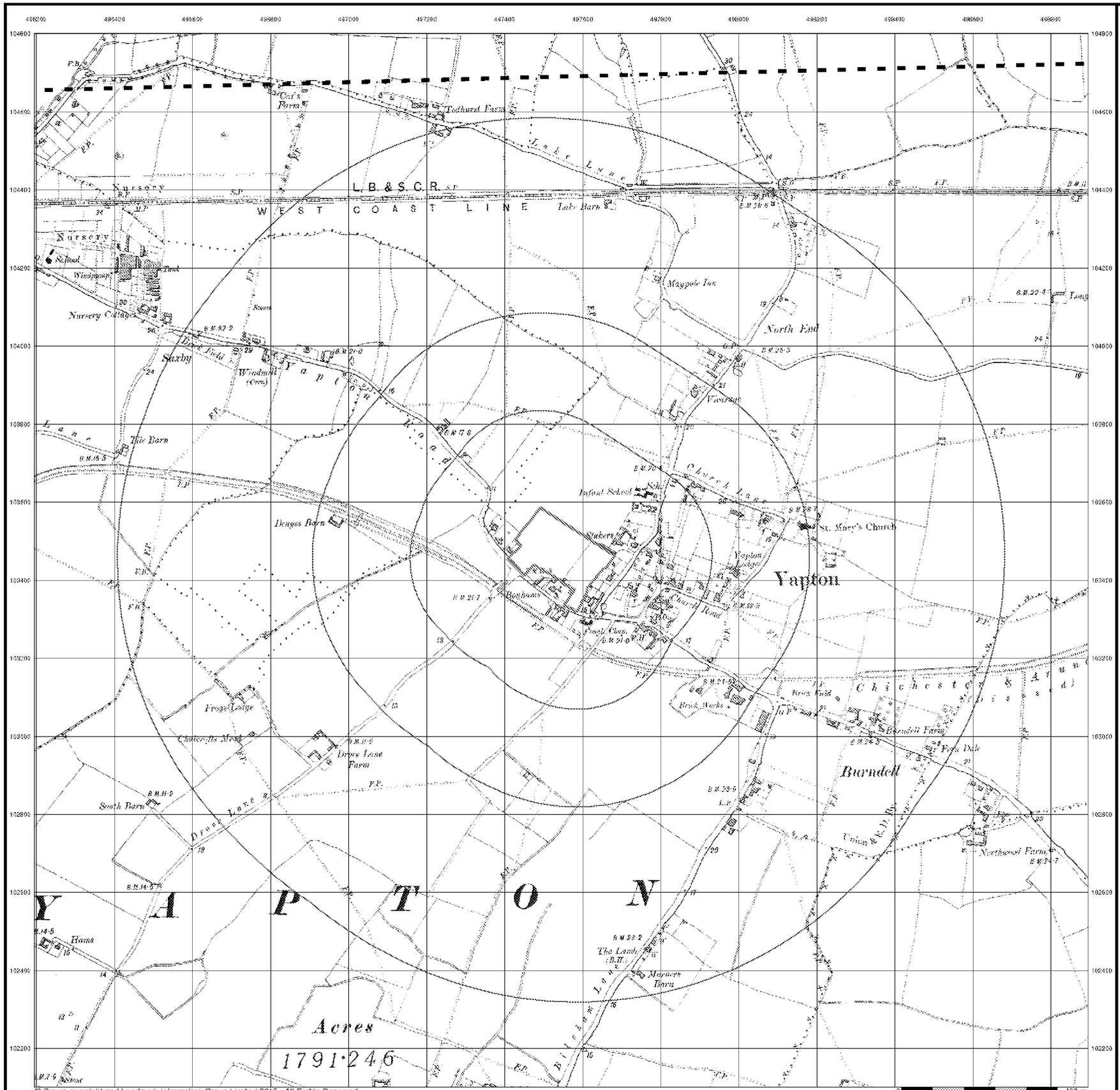
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Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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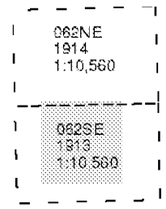
Sussex

Published 1913 - 1914

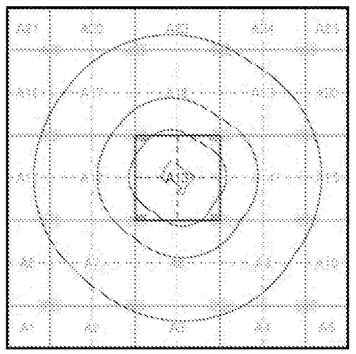
Source map scale - 1:10,560

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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

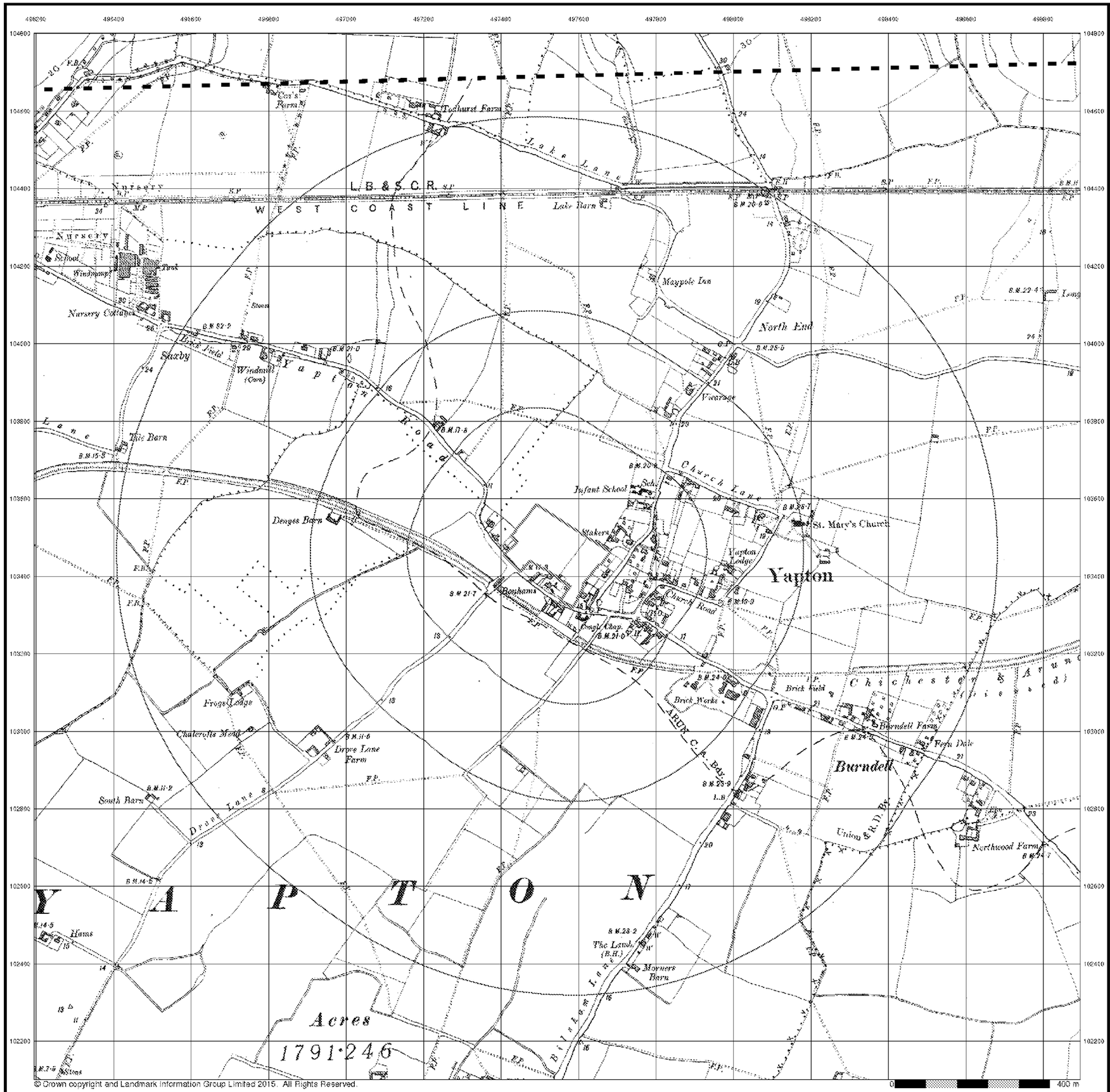
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Site Details

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TWEEDIE EVANS CONSULTING

Sussex

Published 1913 - 1914

Source map scale - 1:10,560

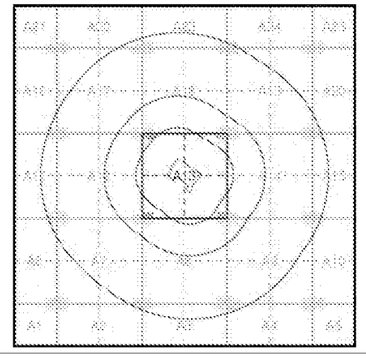
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Map Name(s) and Date(s)

062NE
1914
1:10,560

062SE
1913
1:10,560

Historical Map - Slice A



Order Details

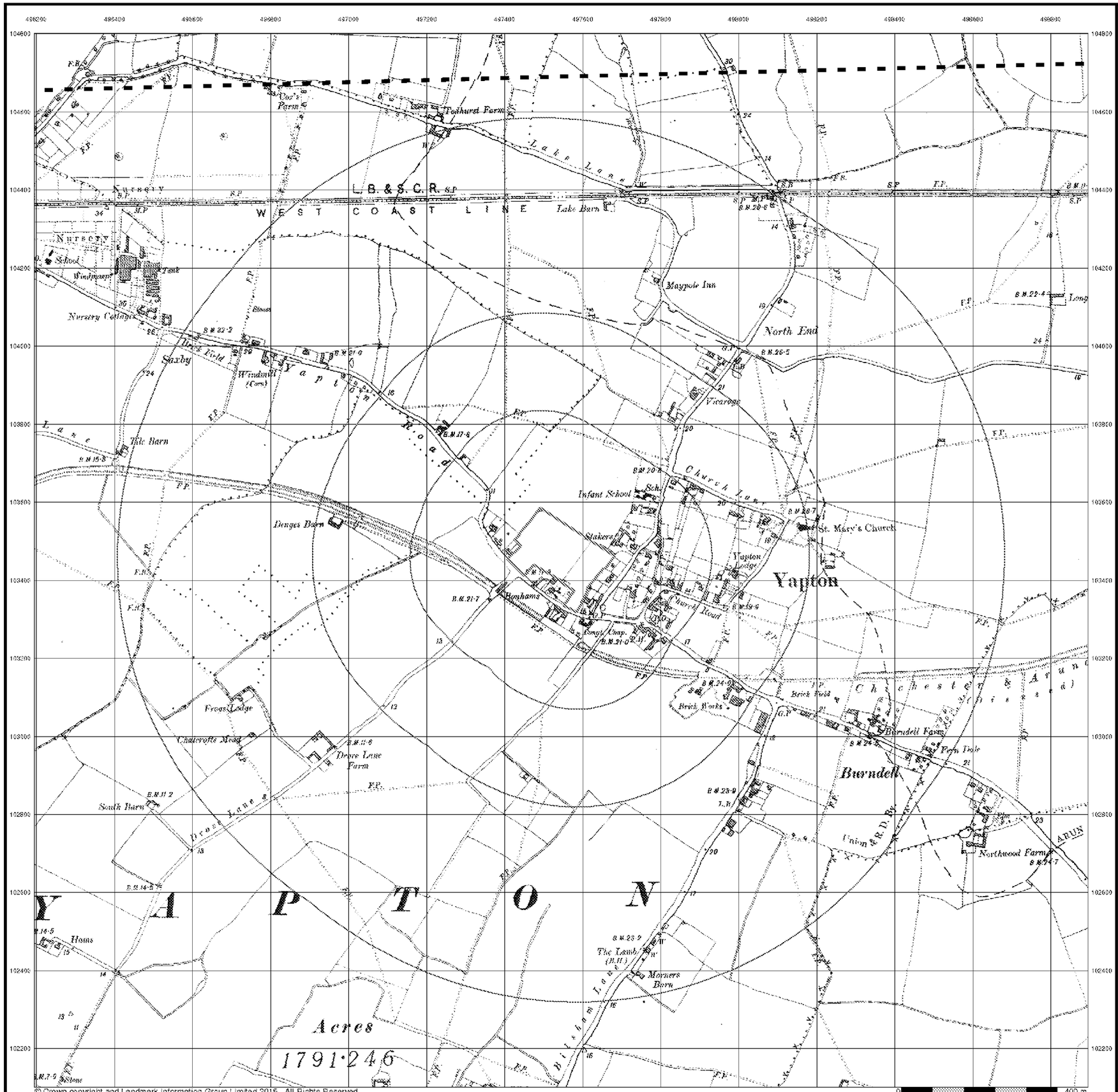
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Customer Ref:	1608012
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Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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TWEEDIE EVANS CONSULTING

Sussex

Published 1913 - 1914

Source map scale - 1:10,560

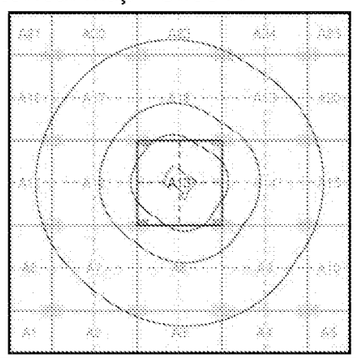
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Map Name(s) and Date(s)

062NE
1914
1:10,560

062SE
1913
1:10,560

Historical Map - Slice A



N

Order Details

Order Number:	95074607_1_1
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National Grid Reference:	497540, 103450
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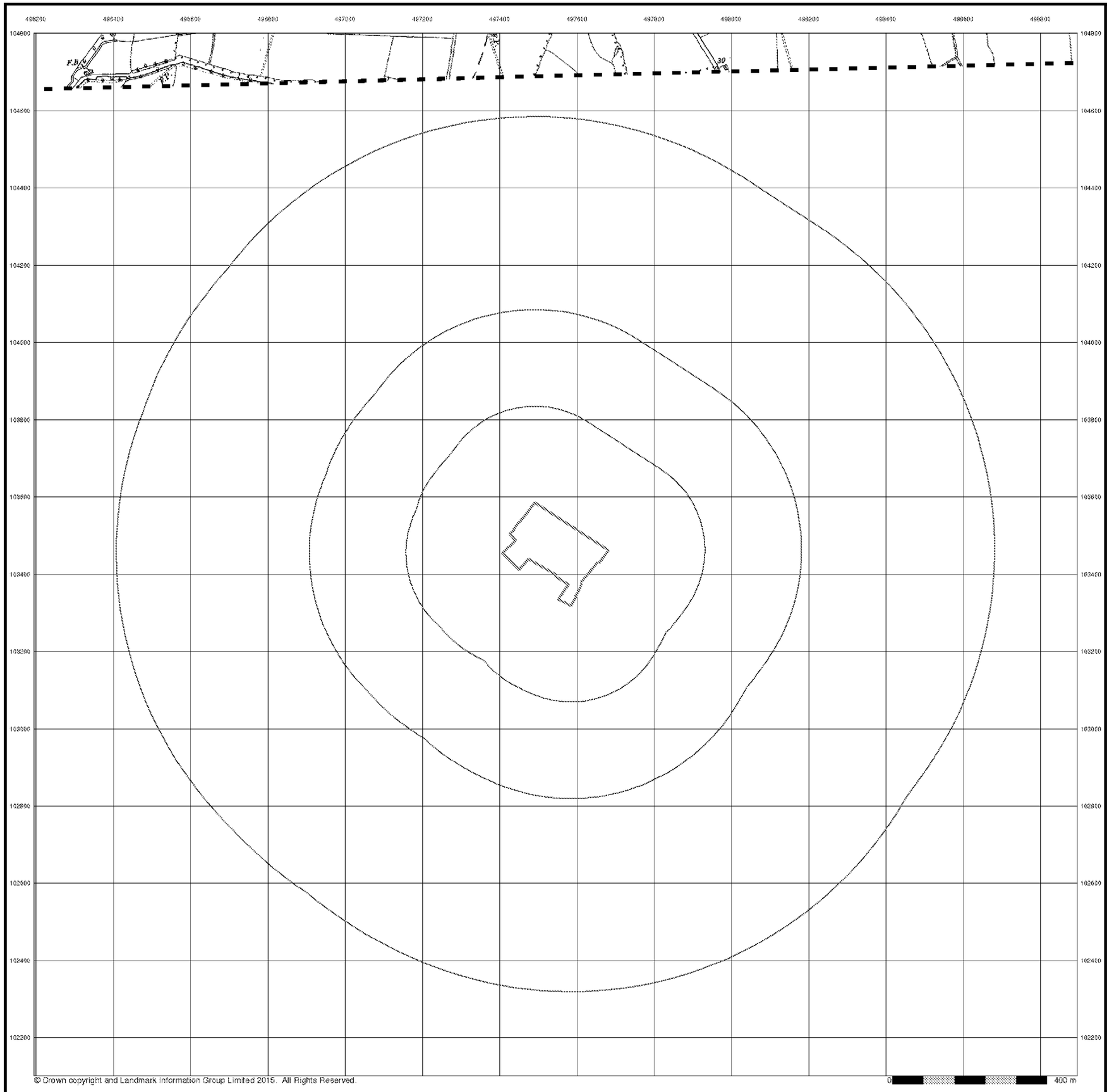
Site Details

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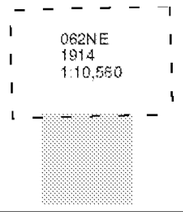
Sussex

Published 1914

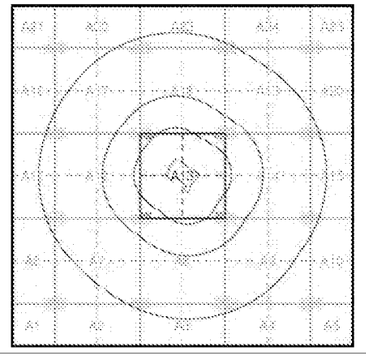
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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Historical Aerial Photography

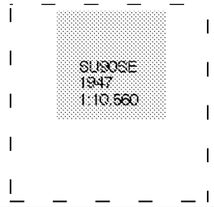
Published 1947

Source map scale - 1:10,560

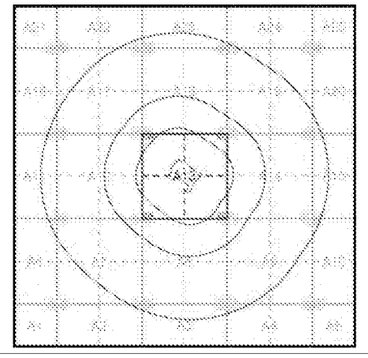
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

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Map Name(s) and Date(s)



Historical Aerial Photography - Slice A



Order Details

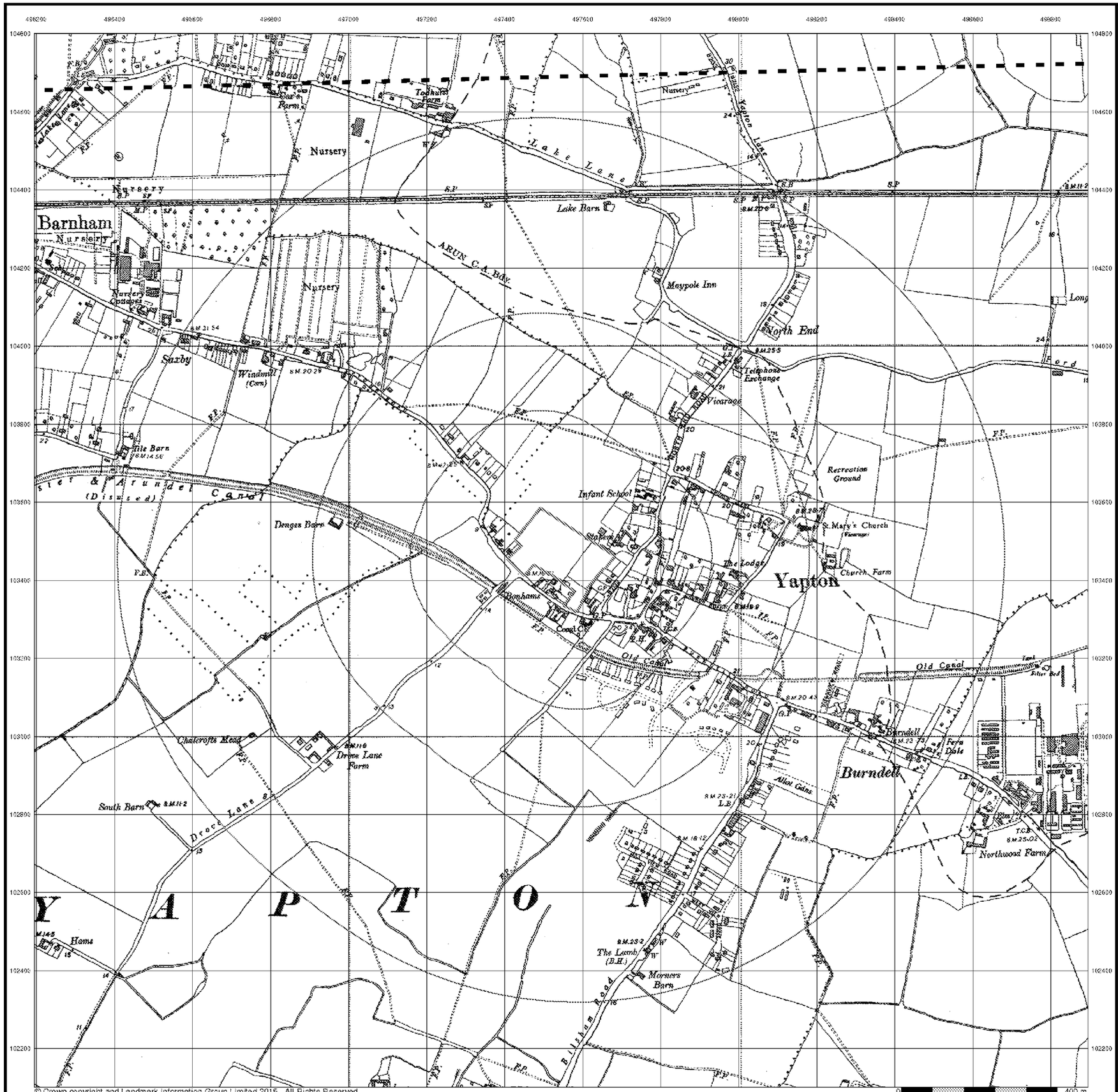
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Sussex

Published 1951

Source map scale - 1:10,560

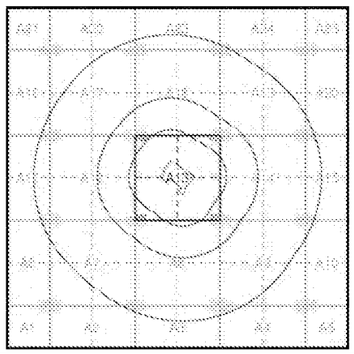
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Map Name(s) and Date(s)

062NE
1951
1:10,560

062SE
1951
1:10,560

Historical Map - Slice A



N

Order Details

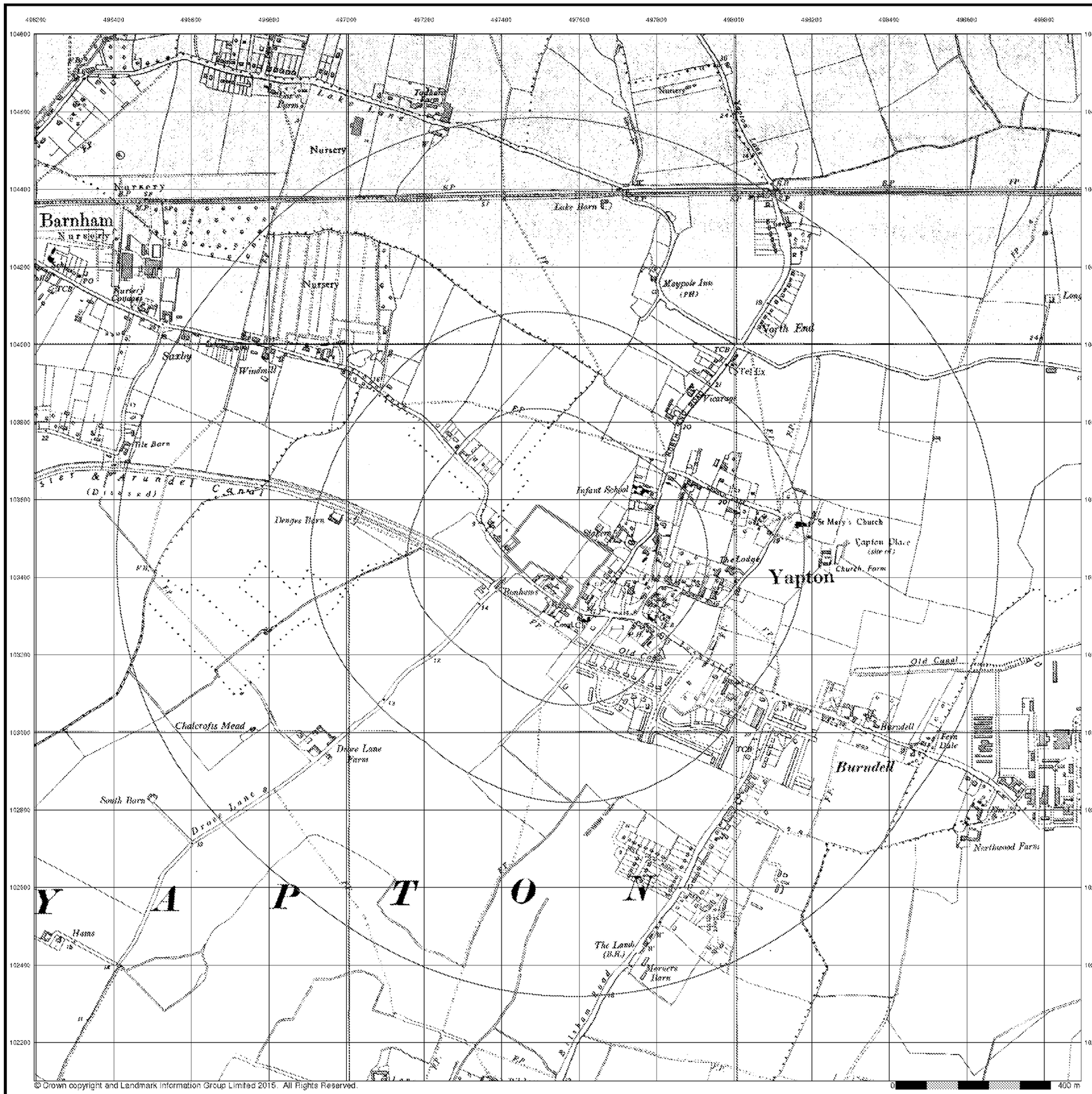
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Search Buffer (m):	1000

Site Details

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Ordnance Survey Plan

Published 1962

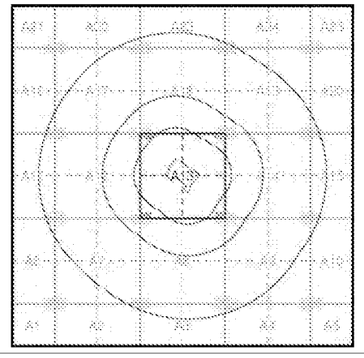
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SU90SE
1962
1:10,560

Historical Map - Slice A



Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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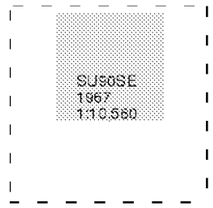
Ordnance Survey Plan

Published 1967

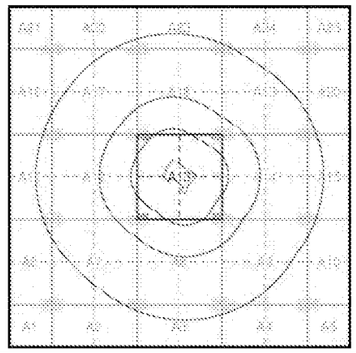
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

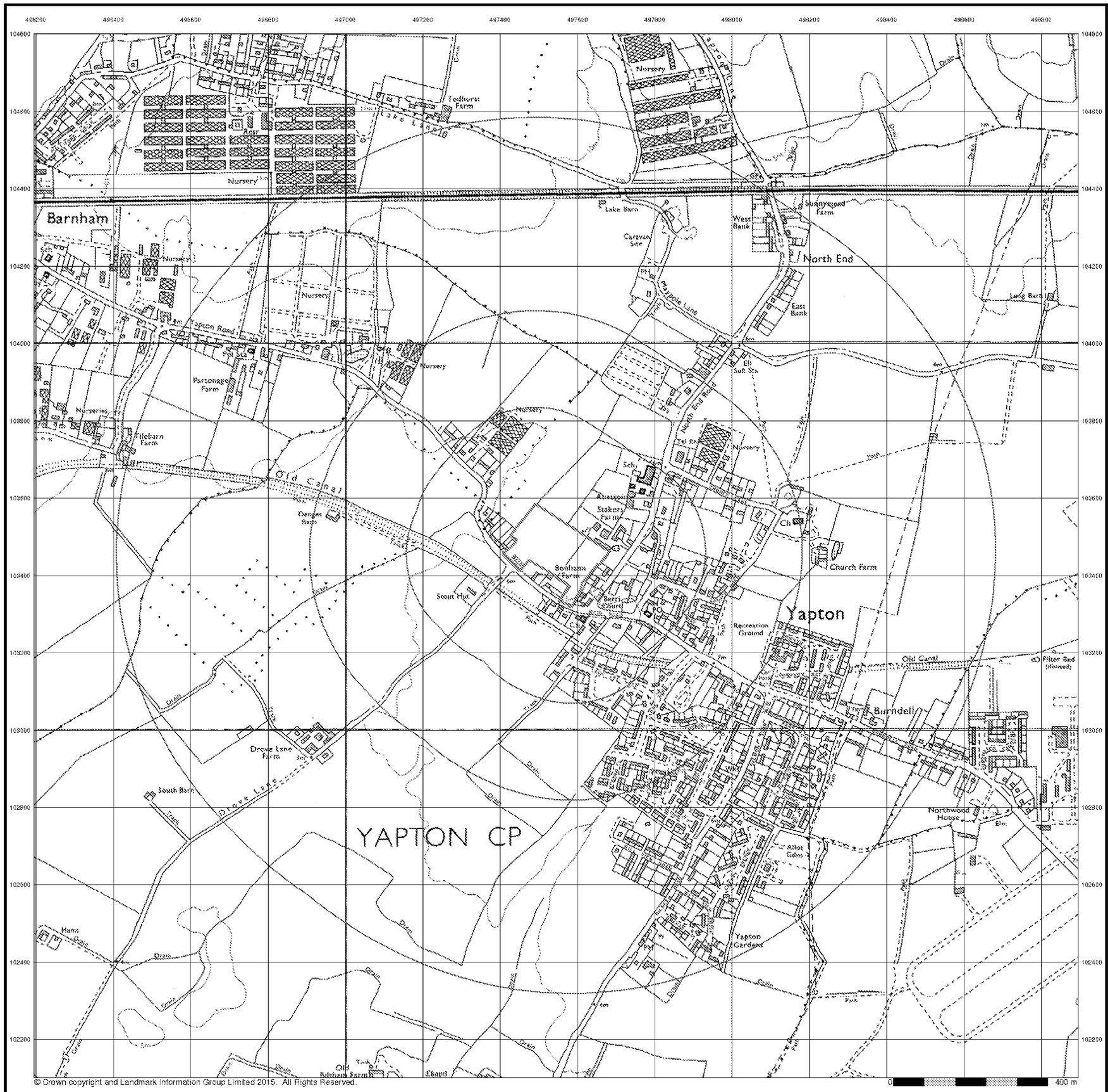
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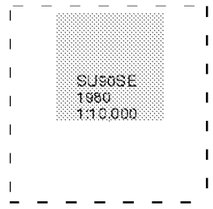
Ordnance Survey Plan

Published 1980

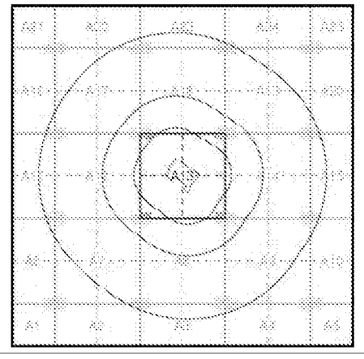
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

Bonhams Field, Yapton, Arundel, BN18 0DX

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



TWEEDIE EVANS CONSULTING

Ordnance Survey Plan

Published 1992

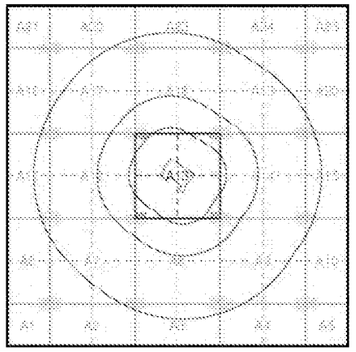
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SU90SE
1992
1:10,000

Historical Map - Slice A



Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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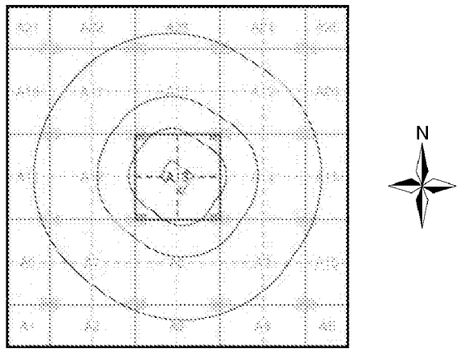
TWEEDIE EVANS CONSULTING

Historical Aerial Photography

Published 1999

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Slice A



Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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TWEEDIE EVANS CONSULTING

10k Raster Mapping

Published 2000

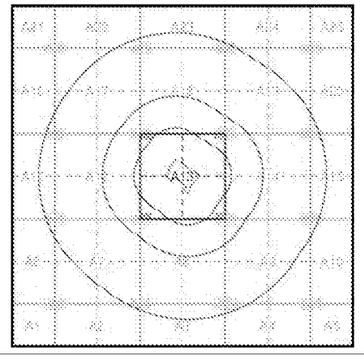
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

SU90SE
2000
1:10,000

Historical Map - Slice A



Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

Bonhams Field, Yapton, Arundel, BN18 0DX

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
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TWEEDIE EVANS CONSULTING

10k Raster Mapping

Published 2006

Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

SU90SE
2006
1:10,000

Historical Map - Slice A

N

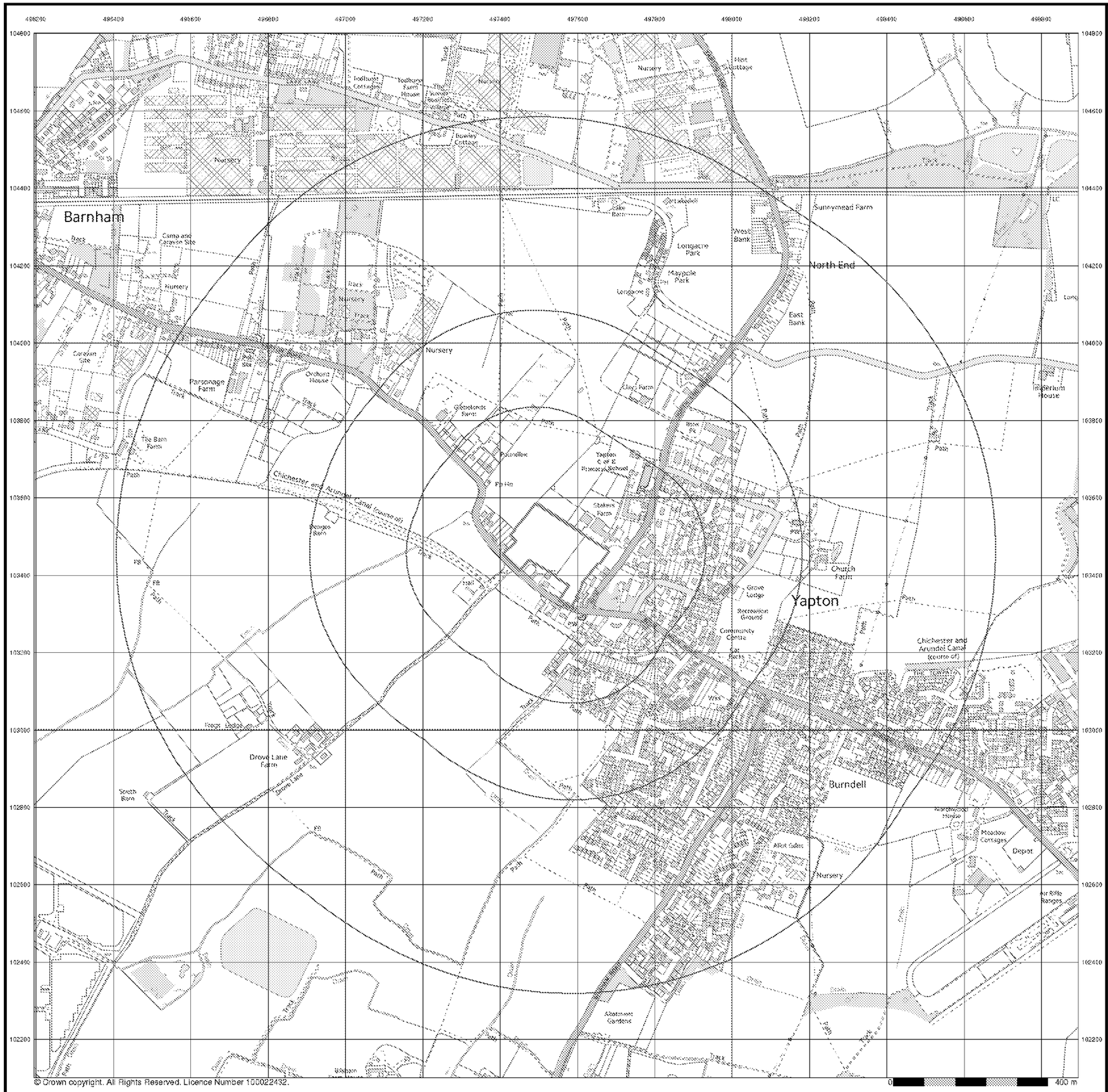
Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

Bonhams Field, Yapton, Arundel, BN18 0DX

Landmark Information Group
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Web: www.envirocheck.co.uk



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TWEEDIE EVANS CONSULTING

VectorMap Local

Published 2016

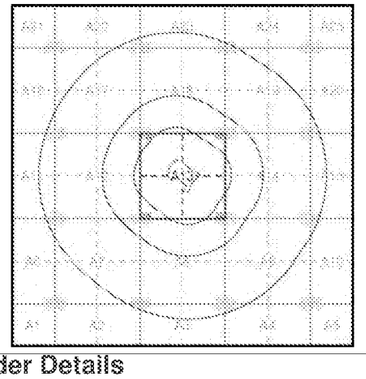
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

Bonhams Field, Yapton, Arundel, BN18 0DX

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Web: www.envirocheck.co.uk

APPENDIX B

Envirocheck®

TWEEDIE EVANS CONSULTING

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
95074607_1_1

Customer Reference:
1608012

National Grid Reference:
497540, 103450

Slice:
A

Site Area (Ha):
3.23

Search Buffer (m):
1000

Site Details:

Bonhams Field
Yapton
Arundel
BN18 0DX

Client Details:

Mr E Tweedie
Tweedie Evans Consulting Ltd
The Old Chapel
35a Southover
Wells
Somerset
BA5 1UH

TWEEDIE EVANS CONSULTING

Contents

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	14
Hazardous Substances	-
Geological	17
Industrial Land Use	19
Sensitive Land Use	25
Data Currency	26
Data Suppliers	31
Useful Contacts	32

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.

In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Radon Potential dataset Copyright Notice

Information supplied from a joint dataset compiled by The British Geological Survey and Public Health England.

Report Version v50.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1				10
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls					
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 3		Yes		
Pollution Incidents to Controlled Waters	pg 4				2
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register					
Water Abstractions	pg 4			1	3 (*27)
Water Industry Act Referrals					
Groundwater Vulnerability	pg 11	Yes	n/a	n/a	n/a
Drift Deposits			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 12	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 12	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences	pg 12		Yes	n/a	n/a
Flooding from Rivers or Sea without Defences	pg 12		Yes	n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
Detailed River Network Lines	pg 12		Yes	Yes	n/a
Detailed River Network Offline Drainage					n/a

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites	pg 14		1		1
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)	pg 14				1
Local Authority Landfill Coverage	pg 14	2	n/a	n/a	n/a
Local Authority Recorded Landfill Sites	pg 14				1
Potentially Infilled Land (Non-Water)	pg 14			1	2
Potentially Infilled Land (Water)	pg 15		1	1	9
Registered Landfill Sites	pg 15				1
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites	pg 16				1
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 17	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 17	Yes			Yes
BGS Recorded Mineral Sites	pg 17			1	2
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
Brine Compensation Area			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability			n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 18	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards				n/a	n/a
Potential for Ground Dissolution Stability Hazards	pg 18	Yes		n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 18	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 18	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 18	Yes		n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 19		3	19	19
Fuel Station Entries	pg 22		1		1
Points of Interest - Commercial Services	pg 22			4	3
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 23			2	5
Points of Interest - Public Infrastructure					
Points of Interest - Recreational and Environmental	pg 24			2	1
Gas Pipelines					
Underground Electrical Cables					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland					
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones	pg 25	1			
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (NW)	0	2	497543 103453
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (W)	8	2	497400 103453
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (SE)	95	2	497650 103250
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (E)	169	2	497850 103453
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (NE)	219	2	497850 103600
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A12SE (W)	412	2	497000 103400
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SW (NW)	439	2	497250 103950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (E)	469	2	498150 103453
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SW (N)	475	2	497400 104050
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A18SW (N)	487	2	497350 104050
1	**Discharge Consents** Operator: Mr Richard Hocking Property Type: Mixed Farming Location: Drove Lane Farm, Yapton, Arundel, West Sussex, Bn18 0eb Authority: Environment Agency, Southern Region Catchment Area: Not Supplied Reference: App/So/107su Permit Version: 1 Effective Date: 1st April 1999 Issued Date: 1st April 1999 Revocation Date: Not Supplied Discharge Type: Trade Discharge - Process Water Discharge Environment: Into Land Receiving Water: Into Land **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	702	3	496940 102930
2	**Discharge Consents** Operator: Enterprising Developments Ltd Property Type: Domestic Property (Multiple) Location: New Estate At Belmont Estate, YAPTON Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: S02741 Permit Version: 1 Effective Date: 1st July 1991 Issued Date: 1st July 1991 Revocation Date: 31st March 1997 Discharge Type: Discharge Of Other Matter-Surface Water Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: Lapsed (under Environment Act 1995, Schedule 23)** Positional Accuracy: Located by supplier to within 100m	A9SW (SE)	774	3	498110 102750

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
3	**Discharge Consents** Operator: Ambleside Developments Ltd. Property Type: General Construction Work Location: Residential Development, Off Cherry Lane, Yapton West Sussex Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: S02208 Permit Version: 1 Effective Date: 21st August 1973 Issued Date: 21st August 1973 Revocation Date: 31st March 1997 Discharge Type: Discharge Of Other Matter-Surface Water Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: Lapsed (under Environment Act 1995, Schedule 23)** Positional Accuracy: Located by supplier to within 100m	A9SW (SE)	799	3	498090 102700
4	**Discharge Consents** Operator: Mitcham Tyre Mart Property Type: Domestic Property (Single) Location: Lake Barn, Maypole Lane, Yapton Lake Barn, Maypole Lane, Yapton, West Sussex, Bn18 0dr Authority: Environment Agency, Southern Region Catchment Area: Adur Estuary & Freshwater Tributaries Reference: P11155 Permit Version: 1 Effective Date: 8th July 2003 Issued Date: 8th July 2003 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Land/Soakaway Receiving Water: Soakaway **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A18NE (N)	804	3	497700 104360
5	**Discharge Consents** Operator: Ambleside Developments Ltd. Property Type: General Construction Work Location: Residential Development, Off Cherry Lane, Yapton West Sussex Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: S02208 Permit Version: 1 Effective Date: 21st August 1973 Issued Date: 21st August 1973 Revocation Date: 31st March 1997 Discharge Type: Discharge Of Other Matter-Surface Water Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: Lapsed (under Environment Act 1995, Schedule 23)** Positional Accuracy: Located by supplier to within 100m	A9SW (SE)	871	3	498030 102570
6	**Discharge Consents** Operator: R. Taylor Esq. Property Type: Undefined Or Other Location: Bilsham Road, Yapton West Sussex Authority: Environment Agency, Southern Region Catchment Area: Not Supplied Reference: S01639 Permit Version: 1 Effective Date: 6th October 1967 Issued Date: 6th October 1967 Revocation Date: 1st July 1991 Discharge Type: Discharge Of Other Matter-Surface Water Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989** Positional Accuracy: Located by supplier to within 10m	A8SE (S)	874	3	497830 102480

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
6	**Discharge Consents** Operator: R. Taylor Esq. Property Type: Undefined Or Other Location: Bilsham Road, Yapton West Sussex Authority: Environment Agency, Southern Region Catchment Area: Not Supplied Reference: S01639 Permit Version: 1 Effective Date: 6th October 1967 Issued Date: 6th October 1967 Revocation Date: 1st July 1991 Discharge Type: Discharge Of Other Matter-Surface Water Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989** Positional Accuracy: Located by supplier to within 10m	A8SE (S)	902	3	497860 102460
7	**Discharge Consents** Operator: Mrs A.M.Cooper Property Type: Domestic Property (Single) Location: Lake Dell, Maypole Lane, Yapton , Arundel West Sussex Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: P00609 Permit Version: 1 Effective Date: 11th September 1986 Issued Date: 11th September 1986 Revocation Date: 31st March 1997 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Into Land Receiving Water: Into Land **Status: Lapsed (under Environment Act 1995, Schedule 23)** Positional Accuracy: Located by supplier to within 100m	A18NE (N)	891	3	497740 104440
8	**Discharge Consents** Operator: R. Taylor Esq. Property Type: Undefined Or Other Location: Bilsham Road, Yapton West Sussex Authority: Environment Agency, Southern Region Catchment Area: Not Supplied Reference: S01639 Permit Version: 1 Effective Date: 6th October 1967 Issued Date: 6th October 1967 Revocation Date: 1st July 1991 Discharge Type: Discharge Of Other Matter-Surface Water Discharge Environment: Freshwater Stream/River Receiving Water: Freshwater River **Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989** Positional Accuracy: Located by supplier to within 10m	A4NW (S)	953	3	497900 102420
9	**Discharge Consents** Operator: Mr M Tristram & Mr D Tristram Property Type: Domestic Property (Single) Location: Binsted Nursery Lake Lane Site Lake Lane, Barnham, ., West Sussex, Po22 0al Authority: Environment Agency, Southern Region Catchment Area: Aldingbourne/Barnham Rife Reference: Npswqd003181 Permit Version: 1 Effective Date: 18th June 2008 Issued Date: 18th June 2008 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Tributary Of Ryebank Rife **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A23SW (N)	999	3	497344 104572
	Nearest Surface Water Feature	A13SE (E)	150	-	497831 103449

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
10	**Pollution Incidents to Controlled Waters** Property Type: Water Company Sewage: Treated Water Distribution System Location: Location Description Not Available Authority: Environment Agency, Southern Region Pollutant: Surcharged Sewage Note: Sewage Flooding Garden;Running Along Road;Entering W/C Incident Date: 7th January 1998 Incident Reference: 2362 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Water Company STW Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18NE (N)	872	3	497800 104400
11	**Pollution Incidents to Controlled Waters** Property Type: Agricultural Location: Rear Of Cinders Lane Nursery, YAPTON Authority: Environment Agency, Southern Region Pollutant: Oils - Diesel (Including Agricultural) Note: Red Diesel In Ditch; Horticultural Incident Date: 27th February 1995 Incident Reference: 1232 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Oils/Related Products Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A9SE (SE)	916	3	498250 102690
12	**Water Abstractions** Operator: Mr A Clay Esq Licence Number: 10/41/411007 Permit Version: 100 Location: The Streddles, North End Road, Yapton Authority: Environment Agency, Southern Region Abstraction: Agriculture: Horticultural Watering Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: See Licence Map Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 18th July 1979 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A18SE (NE)	396	3	497840 103830
13	**Water Abstractions** Operator: Adviserate T/A Southdown Flowers Licence Number: 412002 Permit Version: Not Supplied Location: Adviserate Limited Authority: Environment Agency, Southern Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): 68 Yearly Rate (m3): 18181 Details: Todhurst Rife (Trib Arun) Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A19NW (NE)	962	3	498000 104400
14	**Water Abstractions** Operator: Mr R Lonsdale Licence Number: 10/41/542008 Permit Version: 101 Location: Point A At Tile Barn Farm,Barnham Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Water Abstracted Shall Be Used On Land And Buildings In The Occupation Of The Licence Holder At Tile Barn Farm Authorised Start: 01 April Authorised End: 30 September Permit Start Date: 17th January 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A11NE (W)	977	3	496460 103690

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	**Water Abstractions** Operator: Mr R Lonsdale Licence Number: 10/41/542008 Permit Version: 100 Location: Point A At Tile Barn Farm,Barnham Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Water Abstracted Shall Be Used On Land And Buildings In The Occupation Of The Licence Holder At Tile Barn Farm Authorised Start: 01 April Authorised End: 30 September Permit Start Date: 14th January 1974 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A11NE (W)	977	3	496460 103690
	Water Abstractions Operator: Fresh Acres Nurseries Ltd Licence Number: 10/41/412002 Permit Version: 100 Location: Todhurst Rife At Yapton Lane, Walberton Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): 68 Yearly Rate (m3): 18181.6 Details: See Licence Map Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 29th June 1998 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A23SE (N)	1024	3	497730 104580
	Water Abstractions Operator: Eric Wall Holdings Ltd Licence Number: 10/41/542208 Permit Version: 100 Location: Point B, Lake Lane,Barnham Authority: Environment Agency, Southern Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: The Water Abstracted Shall Only Be Used On Land And Buildings On The Occupation Of The Licence Holder At Lake Lane,Barnham Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 10th June 2009 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A22SE (N)	1067	3	497110 104580
	Water Abstractions Operator: Star Nurseries Ltd Licence Number: 27/176 Permit Version: 100 Location: Todhurst Rife At Star Nurseries, Barnham Authority: Environment Agency, Southern Region Abstraction: Horticulture and Nurseries: Spray Irrigation - Spray Irrigation Definition Order Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Outlined On Map Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 16th June 2009 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A23SE (N)	1135	3	497700 104700

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Keith Langmead Ltd Licence Number: 10/41/412007 Permit Version: 101 Location: Wicks Farm, Ford Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: See Licence Map Authorised Start: 01 June Authorised End: 30 September Permit Start Date: 31st March 2016 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A20SW (E)	1204	3	498790 103930
	Water Abstractions Operator: Mr A C Langmead Esq Licence Number: 10/41/412007 Permit Version: 100 Location: Wicks Farm, Ford Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: See Licence Map Authorised Start: 01 June Authorised End: 30 September Permit Start Date: 30th May 1989 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A20SW (E)	1204	3	498790 103930
	Water Abstractions Operator: Eric Wall Holdings Ltd Licence Number: 10/41/542208 Permit Version: 100 Location: Point A, Lake Lane,Barnham Authority: Environment Agency, Southern Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 545 Yearly Rate (m3): 100000 Details: The Water Abstracted Shall Only Be Used On Land And Buildings On The Occupation Of The Licence Holder At Lake Lane,Barnham Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 10th June 2009 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A22SW (NW)	1240	3	496740 104570
	Water Abstractions Operator: Walberton Nursery Llp Licence Number: 10/41/412006 Permit Version: 101 Location: Todhurst Barn, Yapton Lane, Walberton Authority: Environment Agency, Southern Region Abstraction: Agriculture: Horticultural Watering Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: See Licence Map Authorised Start: 01 April Authorised End: 30 September Permit Start Date: 24th January 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A23NE (N)	1391	3	497610 104970

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: D Tristram T/A Walberton Nurseries Licence Number: 10/41/412006 Permit Version: 100 Location: Todhurst Barn, Yapton Lane, Walberton Authority: Environment Agency, Southern Region Abstraction: Agriculture: Horticultural Watering Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: See Licence Map Authorised Start: 01 April Authorised End: 30 September Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A23NE (N)	1391	3	497610 104970
	Water Abstractions Operator: Keith Langmead Ltd Licence Number: 27/190 Permit Version: 102 Location: Point A On Binstead Rife, Wicks Farm, Yapton Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Shown Outlined In Red On Licence Map Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 4th December 2010 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A25SW (NE)	1541	3	498810 104510
	Water Abstractions Operator: Keith Langmead Ltd Licence Number: 27/190 Permit Version: 101 Location: Point A On Binstead Rife, Wicks Farm, Yapton Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Shown Outlined In Black On Licence Map Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 1st April 2001 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A25SW (NE)	1541	3	498810 104510
	Water Abstractions Operator: A.C. Langmead Ltd Licence Number: 27/190 Permit Version: 100 Location: Point A On Binstead Rife, Wicks Farm, Yapton Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Shown Outlined In Black On Licence Map Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 16th August 1996 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A25SW (NE)	1541	3	498810 104510

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Walberton Nursery Llp Licence Number: 27/194a/R01 Permit Version: 1 Location: Point A At Walberton Nurseries, Walberton Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: No Longer Applicable Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st April 2016 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(N)	1603	3	497640 105180
	Water Abstractions Operator: Walberton Nursery Llp Licence Number: 27/194a Permit Version: 2 Location: Point A At Walberton Nurseries, Walberton Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: No Longer Applicable Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 17th April 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(N)	1603	3	497640 105180
	Water Abstractions Operator: D Tristram T/A Walberton Nurseries Licence Number: 27/194a Permit Version: 1 Location: Point A At Walberton Nurseries, Walberton Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: No Longer Applicable Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 16th June 2009 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(N)	1603	3	497640 105180
	Water Abstractions Operator: D Tristram T/A Walberton Nurseries Licence Number: 27/194 Permit Version: 100 Location: Point A At Walberton Nurseries, Walberton Authority: Environment Agency, Southern Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Shown Outlined Black On Attached Map Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 2nd April 1998 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(N)	1603	3	497640 105180

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Mr A Langmead Licence Number: 10/41/412004 Permit Version: 100 Location: Wicks Farm, Yapton Authority: Environment Agency, Southern Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: See Licence Map Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 2nd April 1987 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(E)	1709	3	499330 103910
	Water Abstractions Operator: Toddington Nurseries Limited Licence Number: 10/41/542209 Permit Version: 102 Location: At Lake Lane,Barnham Authority: Environment Agency, Southern Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Water Abstracted Shall Only Be Used On Land And Buildings Marked In Pink On The Plan Accompanying The Licence Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 9th August 2013 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(NW)	1746	3	496740 105160
	Water Abstractions Operator: Kirin Agribo Toddington Ltd Licence Number: 10/41/542209 Permit Version: 101 Location: At Lake Lane,Barnham Authority: Environment Agency, Southern Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Water Abstracted Shall Only Be Used On Land And Buildings Marked In Pink On The Plan Accompanying The Licence Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 10th June 2009 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(NW)	1746	3	496740 105160
	Water Abstractions Operator: Southern Glasshouse Produce Ltd Licence Number: 10/41/542209 Permit Version: 100 Location: At Lake Lane,Barnham Authority: Environment Agency, Southern Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Water Abstracted Shall Only Be Used On Land And Buildings Marked In Pink On The Plan Accompanying The Licence Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 15th June 1992 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(NW)	1746	3	496740 105160

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Tarmac Ltd Licence Number: 27/198 Permit Version: 1 Location: Ford Industrial Estate, Arundel Authority: Environment Agency, Southern Region Abstraction: Construction: Process Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Outlined In Black On Attached Map Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 4th January 2001 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(E)	1850	3	499530 103390
	Water Abstractions Operator: Tarmac Heavy Building Materials Ltd Licence Number: 27/196 Permit Version: 1 Location: Ford Industrial Estate, Arundel Authority: Environment Agency, Southern Region Abstraction: Construction: Process Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Outlined On Licence Map Authorised Start: 13 March Authorised End: 31 December Permit Start Date: 13th March 2000 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(E)	1850	3	499530 103390
	Water Abstractions Operator: Langmead Farms Ltd Licence Number: 27/209/R01 Permit Version: 1 Location: Ryebank Rife, Point A - Bilsham Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 1st April 2016 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A1SE (SW)	1901	3	496359 101855
	Water Abstractions Operator: Langmead Farms Ltd Licence Number: 27/209 Permit Version: 1 Location: Ryebank Rife, Point A - Bilsham Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 16th June 2009 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A1SE (SW)	1902	3	496390 101830

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: The Donald Langmead Partnership Licence Number: 10/41/541002 Permit Version: 100 Location: Point 2 At Shripney Farm & Flansham Farm Authority: Environment Agency, Southern Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Water Abstracted Shall Be Used On Land And Buildings In The Occupation Of The Licence Holder At Shripney And Flansham Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 21st March 2001 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(SW)	1928	3	496440 101760
	Water Abstractions Operator: James D Baird (Home Farm) Ltd Licence Number: 10/41/411016 Permit Version: 101 Location: Ryebank Rife - New Reach Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 30 September Permit Start Date: 8th June 2009 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A1SW (SW)	1937	3	496190 101940
	Water Abstractions Operator: Langmead Farms Ltd Licence Number: So/041/0024/005 Permit Version: 1 Location: Ryebank Rife - Stakers Farm, Yapton Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 1st April 2013 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(SW)	1959	3	495837 102285
	Water Abstractions Operator: I R Gibbs Licence Number: 10/41/542011 Permit Version: 100 Location: Points C&D At Ryebank Rife,Middleton Authority: Environment Agency, Southern Region Abstraction: General Agriculture: Spray Irrigation - Storage Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: For Spray Irrigation Within Land Bodly Marked Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 10th June 2009 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(S)	1993	3	498000 101370
	Groundwater Vulnerability Soil Classification: Soils of Intermediate Leaching Potential (I1) - Soils which can possibly transmit a wide range of pollutants Map Sheet: Sheet 45 West Sussex and Surrey Scale: 1:100,000	A13NW (NW)	0	3	497543 103453
	Drift Deposits None				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Bedrock Aquifer Designations Aquifer Designation: Principal Aquifer	A13NW (NW)	0	2	497543 103453
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13NW (NW)	0	2	497543 103453
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13NW (W)	49	3	497370 103485
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13NW (NW)	130	3	497390 103665
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (W)	238	3	497170 103460
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13NW (W)	49	3	497370 103485
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A13NW (W)	171	3	497240 103485
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (W)	238	3	497170 103460
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
15	**Detailed River Network Lines** River Type: Extended Culvert (greater than 50m) River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Below Surface Drain Feature: Not a Drain Flood Risk Management Status: Currently Undefined Water Course Name: Yapton Rife Water Course Reference: N406	A13NW (NW)	113	3	497327 103555
16	**Detailed River Network Lines** River Type: Primary River River Name: Drain Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Currently Undefined Flood Risk Management Status: Other Rivers Water Course Name: Yapton Rife Water Course Reference: N406	A12NE (W)	223	3	497186 103473

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
17	**Detailed River Network Lines** River Type: Tertiary River River Name: Drain Hydrographic Area: D007 River Flow Type: Secondary Flow Path River Surface Level: Surface Drain Feature: Drain (ditch, Reen, Rhyne, Drain) Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A8NW (S)	399	3	497397 102966
18	**Detailed River Network Lines** River Type: Secondary River River Name: Drain Hydrographic Area: D007 River Flow Type: Secondary Flow Path River Surface Level: Surface Drain Feature: Drain (ditch, Reen, Rhyne, Drain) Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A8NW (S)	399	3	497397 102966
19	**Detailed River Network Lines** River Type: Secondary River River Name: Drain Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Drain (ditch, Reen, Rhyne, Drain) Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A8NE (S)	460	3	497612 102860
20	**Detailed River Network Lines** River Type: Secondary River River Name: Not Supplied Hydrographic Area: D007 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A8NE (S)	500	3	497582 102819
	Detailed River Network Offline Drainage None				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
21	**Historical Landfill Sites** Licence Holder: Not Supplied Location: Barnham, Sussex Name: Disused Canal at Barnham Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD20083 First Input Date: 31st December 1970 Last Input Date: 31st December 1970 Specified Waste Type: Deposited Waste included Inert Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 3800/8225 BGS Ref: Not Supplied Other Ref: WD27/023	A13SW (W)	69	3	497375 103390
22	**Historical Landfill Sites** Licence Holder: A C Langmead Location: Yapton, Sussex Name: Disused Canal at Yapton Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD20084 First Input Date: 31st December 1980 Last Input Date: 26th March 1981 Specified Waste Type: Deposited Waste included Inert Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 3800/8018 BGS Ref: Not Supplied Other Ref: WD27/243, WD13/66	A14SE (E)	701	3	498312 103156
23	**Licensed Waste Management Facilities (Locations)** Licence Number: 100156 Location: Northwood Farm (Hanger No8), Burndell Road, Yapton, West Sussex, BN18 0HR Operator Name: T J Waste & Recycling Limited Operator Location: Not Supplied Authority: Environment Agency - South East Region, Solent & South Downs Area Site Category: Household, Commercial And Industrial Transfer Stations **Licence Status:** **Modified** Issued: 28th January 2008 Last Modified: 27th July 2012 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A9NE (SE)	952	3	498471 102930
	Local Authority Landfill Coverage Name: Arun District Council - Has no landfill data to supply		0	5	497543 103453
	Local Authority Landfill Coverage Name: West Sussex County Council - Has supplied landfill data		0	4	497543 103453
24	**Local Authority Recorded Landfill Sites** Location: Old Canal, East Of Downview Road, Yapton Reference: Y/50/79 Authority: West Sussex County Council, Environment & Development **Last Reported Status:** **Unknown** Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Located by supplier to within 100m Boundary Quality: Not Applicable	A14SE (E)	765	4	498400 103200
25	**Potentially Infilled Land (Non-Water)** Bearing Ref: SE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1992	A13SE (SE)	327	-	497856 103129
26	**Potentially Infilled Land (Non-Water)** Bearing Ref: SE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1992	A14SW (SE)	541	-	498114 103137

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
27	**Potentially Infilled Land (Non-Water)** Bearing Ref: NW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1992	A17SW (NW)	855	-	496693 103943
28	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1962	A13SE (SE)	52	-	497652 103335
29	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1951	A8NE (S)	458	-	497619 102862
30	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1899	A8NE (S)	517	-	497696 102814
31	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1899	A8SE (S)	549	-	497657 102775
32	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1962	A17SE (NW)	572	-	497073 103975
33	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1962	A17SE (NW)	584	-	497041 103955
34	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1962	A9SW (SE)	780	-	498098 102731
35	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1962	A18NE (N)	871	-	497730 104422
36	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1962	A17NE (NW)	897	-	497123 104402
37	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1962	A18NE (N)	902	-	497746 104449
38	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1962	A17NE (NW)	936	-	497029 104398
39	**Registered Landfill Sites** Licence Holder: A C Langmead Licence Reference: 5/AP/79 Site Location: Disused Chichester/Arundel Canal, North Of Burndell Road, Yapton, Arundel, West Sussex Licence Easting: 498400 Licence Northing: 103160 Operator Location: Wicks Farm, Yapton, Arundel, West Sussex Authority: Environment Agency - Southern Region, Sussex Area Site Category: Landfill Max Input Rate: Undefined Waste Source Restrictions: No known restriction on source of waste Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 10th December 1979 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Construction And Demolition Wastes Excavated Natural Materials $ Prohibited Waste: Contaminated Rubble Contaminated Soil	A14SE (E)	780	3	498400 103160

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Registered Waste Treatment or Disposal Sites				
40	Licence Holder: P Hill Jones Licence Reference: WSX/L1/0052/1 Site Location: Jones & Co, Burndell Road, Yapton, Arundel, West Sussex, Bn18 0hp Operator Location: 148 Barnham Road, BOGNOR REGIS, West Sussex, PO22 0EH Authority: Environment Agency - Southern Region, Sussex Area Site Category: Scrapyard Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Site exempt from licenceExempt Dated: 31st March 1994 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste: Elec/Electronic Compts/Fitt/Fixt/Apps Empty Used Containers > 25 L Lead/Acid Batteries Max.Waste Permitted By Licence Scrap Metal Prohibited Waste: Asbestos Metallic Powders Pcb'S And Analogues Percussive/Explosive/Similar Waste Spec.Waste (Epa'90:S62/1996 Regs)N.O.S Sub'S Control. Radioactive Subs Act'60 Waste N.O.S. Waste React.Violently W/ Water Or Air	A9NE (SE)	772	3	498300 103000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: White Chalk Subgroup	A13NW (NW)	0	2	497543 103453
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (NW)	0	2	497543 103453
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: 100 - 200 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (W)	0	2	497500 103453
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SW (N)	512	2	497338 104072
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18NE (N)	859	2	497750 104403
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: 100 - 200 mg/kg Nickel Concentration: 15 - 30 mg/kg	A16SE (W)	986	2	496500 103840
41	**BGS Recorded Mineral Sites** Site Name: Burndell Brick Yard Location: , Yapton, Arundel, West Sussex Source: British Geological Survey, National Geoscience Information Service Reference: 157582 Type: Opencast **Status: Ceased** Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Quaternary Geology: River Terrace Deposits (Undifferentiated) Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A8NE (SE)	371	2	497877 103090

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
42	**BGS Recorded Mineral Sites** Site Name: Burndell Brick Field Location: , Yapton, Arundel, West Sussex Source: British Geological Survey, National Geoscience Information Service Reference: 157583 Type: Opencast **Status: Ceased** Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Quaternary Geology: River Terrace Deposits (Undifferentiated) Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	618	2	498190 103111
43	**BGS Recorded Mineral Sites** Site Name: Barnham Brick Field Location: , Barnham, Bognor Regis, West Sussex Source: British Geological Survey, National Geoscience Information Service Reference: 157584 Type: Opencast **Status: Ceased** Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Quaternary Geology: River Terrace Deposits (Undifferentiated) Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	935	2	496631 103995
	BGS Measured Urban Soil Chemistry No data available				
	BGS Urban Soil Chemistry Averages No data available				
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	2	497543 103453
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	2	497543 103453
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	2	497543 103453
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	2	497543 103453
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	2	497543 103453
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	2	497543 103453
	Radon Potential - Radon Affected Areas Affected Area: The property is in a lower probability radon area, as less than 1% of homes are above the action level Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	2	497543 103453
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	2	497543 103453

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
44	**Contemporary Trade Directory Entries** Name: G S Auto Recovery Location: Main Road, Yapton, Arundel, West Sussex, BN18 0EA Classification: Mechanical Engineers **Status: Inactive** Positional Accuracy: Automatically positioned in the proximity of the address	A13SE (S)	22	-	497581 103297
44	**Contemporary Trade Directory Entries** Name: Reptune Motors Location: Main Road, Yapton, Arundel, West Sussex, BN18 0EA Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned in the proximity of the address	A13SE (S)	22	-	497581 103297
45	**Contemporary Trade Directory Entries** Name: Equipet Location: North End Rd, Yapton, Arundel, West Sussex, BN18 0DU Classification: Pet Foods & Animal Feeds **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A13NE (NE)	244	-	497817 103664
46	**Contemporary Trade Directory Entries** Name: Arun Pest Control Service Location: 23, Briar Close, Church Road, Yapton, Arundel, West Sussex, BN18 0ES Classification: Pest & Vermin Control **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SW (SE)	305	-	497930 103285
47	**Contemporary Trade Directory Entries** Name: Sfp Location: 9, Canal Road, Yapton, Arundel, West Sussex, BN18 0HA Classification: Engineering Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NE (SE)	355	-	497801 103037
48	**Contemporary Trade Directory Entries** Name: Diamond Location: 24, Canal Road, Yapton, Arundel, West Sussex, BN18 0HD Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NE (SE)	371	-	497746 102985
48	**Contemporary Trade Directory Entries** Name: Diamond Carpet & Upholstery Cleaning Services Location: 24, Canal Road, Yapton, Arundel, West Sussex, BN18 0HD Classification: Carpet, Curtain & Upholstery Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NE (SE)	371	-	497746 102985
49	**Contemporary Trade Directory Entries** Name: Barnham Car Centre Location: Unit 25, Orchard Business Park, North End Road, Yapton, Arundel, West Sussex, BN18 0GA Classification: Car Dealers - Used **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14NW (NE)	373	-	497932 103737
49	**Contemporary Trade Directory Entries** Name: Classic Perfections Location: Unit 25, Orchard Business Park, North End Road, Yapton, Arundel, BN18 0GA Classification: Classic Car Specialists **Status: Active** Positional Accuracy: Automatically positioned to the address	A14NW (NE)	373	-	497932 103737
49	**Contemporary Trade Directory Entries** Name: Express Aftercare Services Location: Unit 5, Orchard Business Park, North End Road, Yapton, Arundel, West Sussex, BN18 0GA Classification: Electrical Goods Sales, Manufacturers & Wholesalers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14NW (NE)	385	-	497980 103703
49	**Contemporary Trade Directory Entries** Name: Pptek Location: Unit 22, Orchard Business Park, North End Road, Yapton, Arundel, West Sussex, BN18 0GA Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14NW (NE)	390	-	497961 103732

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
49	**Contemporary Trade Directory Entries** Name: V & C Auto Sales Location: Unit 11,Orchard Business Park,North End Rd, Yapton, Arundel, West Sussex, BN18 0DS Classification: Car Dealers - Used **Status:** **Inactive** Positional Accuracy: Manually positioned within the geographical locality	A14NW (NE)	394	-	497961 103739
49	**Contemporary Trade Directory Entries** Name: C & W Seals Location: Unit 15-16, Orchard Business Park, North End Road, Yapton, Arundel, West Sussex, BN18 0GA Classification: Seal & Joint Manufacturers **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A14NW (NE)	422	-	497961 103778
49	**Contemporary Trade Directory Entries** Name: Arun Ltd Location: Unit 18, Orchard Business Park, North End Road, Yapton, Arundel, West Sussex, BN18 0GA Classification: Waste Disposal Services **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A14NW (NE)	422	-	497961 103778
49	**Contemporary Trade Directory Entries** Name: V Dubz R Us Location: Unit 10, Orchard Business Park, North End Road, Yapton, Arundel, West Sussex, BN18 0GA Classification: Car Body Repairs **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A14NW (NE)	422	-	497961 103778
49	**Contemporary Trade Directory Entries** Name: Mailtec Ltd Location: Unit 15, Orchard Business Park, North End Road, Yapton, Arundel, BN18 0GA Classification: Printers **Status:** **Active** Positional Accuracy: Automatically positioned to the address	A14NW (NE)	424	-	497975 103767
49	**Contemporary Trade Directory Entries** Name: E M S Animal Feeds Location: Unit 11, Orchard Business Park, North End Road, Yapton, Arundel, BN18 0GA Classification: Pet Foods & Animal Feeds **Status:** **Active** Positional Accuracy: Automatically positioned to the address	A14NW (NE)	434	-	497999 103757
49	**Contemporary Trade Directory Entries** Name: B P S Garden Machinery Ltd Location: Unit 15-16, Orchard Business Park, North End Road, Yapton, Arundel, West Sussex, BN18 0GA Classification: Lawnmowers & Garden Machinery - Sales & Service **Status:** **Active** Positional Accuracy: Automatically positioned to the address	A14NW (NE)	440	-	498002 103762
50	**Contemporary Trade Directory Entries** Name: Arun Meat & Livestock Co Ltd Location: The Steddlers, North End Road, Yapton, Arundel, West Sussex, BN18 0DT Classification: Meat - Wholesale **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A18SE (NE)	401	-	497829 103843
51	**Contemporary Trade Directory Entries** Name: Obsessive Cleaning Divas Location: 6, Cobham Close, Yapton, Arundel, West Sussex, BN18 0LF Classification: Cleaning Services - Domestic **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A8NE (S)	448	-	497718 102892
51	**Contemporary Trade Directory Entries** Name: O C D 2015 Ltd Location: 6, Cobham Close, Yapton, Arundel, West Sussex, BN18 0LF Classification: Commercial Cleaning Services **Status:** **Active** Positional Accuracy: Automatically positioned to the address	A8NE (S)	448	-	497718 102892
52	**Contemporary Trade Directory Entries** Name: Barnly Engineering Location: Kings Close, Yapton, Arundel, West Sussex, BN18 0EX Classification: Precision Engineers **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A14SW (SE)	452	-	497990 103116

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
53	**Contemporary Trade Directory Entries** Name: P & H Plumbing & Heating Location: 10, Park Road, Yapton, Arundel, West Sussex, BN18 0JE Classification: Boilers - Servicing, Replacements & Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NW (SE)	654	-	498146 102983
54	**Contemporary Trade Directory Entries** Name: Mowercare Location: Unit 14,Bilsham Ind Est, Yapton, Arundel, West Sussex, BN18 0JN Classification: Lawnmowers & Garden Machinery - Sales & Service **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A9SW (SE)	719	-	497970 102712
55	**Contemporary Trade Directory Entries** Name: Access Scaffolding Location: 3, Ryebank Walk, Burndell Road, Yapton, Arundel, West Sussex, BN18 0FJ Classification: Scaffolding & Work Platforms **Status: Active** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	721	-	498257 103028
56	**Contemporary Trade Directory Entries** Name: Needin Feedin Location: Unit 15,Parsonage Farm,Yapton Rd, Barnham, Bognor Regis, West Sussex, PO22 0BD Classification: Pet Foods & Animal Feeds **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A17SW (NW)	770	-	496779 103920
56	**Contemporary Trade Directory Entries** Name: Styles In Stone Location: Barnham Windmill, Yapton Road, Barnham, Bognor Regis, West Sussex, PO22 0BD Classification: Fireplaces & Mantelpieces **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SW (NW)	785	-	496791 103963
57	**Contemporary Trade Directory Entries** Name: Maison Belles Location: 8, Fairholme Drive, Yapton, Arundel, West Sussex, BN18 0JH Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NW (SE)	777	-	498161 102798
57	**Contemporary Trade Directory Entries** Name: K S W Vehicle Inspections Location: 21, Fairholme Drive, Yapton, Arundel, West Sussex, BN18 0JH Classification: Vehicle Inspection Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NW (SE)	807	-	498199 102795
58	**Contemporary Trade Directory Entries** Name: Ayrlect Associates Location: 23, Cherry Avenue, Yapton, Arundel, West Sussex, BN18 0LB Classification: Electrical Engineers **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	787	-	497998 102649
59	**Contemporary Trade Directory Entries** Name: Yapton Metal Co Location: Wayside, Burndell Road, Yapton, Arundel, West Sussex, BN18 0HP Classification: Scrap Metal Merchants **Status: Active** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	799	-	498331 102996
59	**Contemporary Trade Directory Entries** Name: Burndell Location: Wayside, Burndell Road, Yapton, Arundel, West Sussex, BN18 0HP Classification: Salvage Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	799	-	498331 102996
60	**Contemporary Trade Directory Entries** Name: El Molino Location: Unit 7/11, Parsonage Farm, Yapton Road, Barnham, Bognor Regis, West Sussex, PO22 0BD Classification: Pottery Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A17SW (NW)	803	-	496730 103904

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
60	**Contemporary Trade Directory Entries** Name: The Iron Away Shop Location: Parsonage Farm, Yapton Road, Barnham, Bognor Regis, West Sussex, PO22 0BD Classification: Ironing & Home Laundry Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A17SW (NW)	804	-	496730 103904
60	**Contemporary Trade Directory Entries** Name: Kay'S Location: Unit 32, Parsonage Farm, Yapton Road, Barnham, Bognor Regis, West Sussex, PO22 0BD Classification: Domestic Appliances - Servicing, Repairs & Parts **Status: Active** Positional Accuracy: Automatically positioned to the address	A17SW (NW)	835	-	496718 103945
61	**Contemporary Trade Directory Entries** Name: A J F Hydraulic Services Location: West Bank,North End Rd, Yapton, Arundel, West Sussex, BN18 0DW Classification: Hydraulic Engineers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A19NW (NE)	902	-	498063 104288
61	**Contemporary Trade Directory Entries** Name: Action Eyewear Location: 22, West Bank, North End Road, Yapton, Arundel, West Sussex, BN18 0DW Classification: Cosmetic Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A19NW (NE)	914	-	498096 104282
62	**Contemporary Trade Directory Entries** Name: R & D Ayling Location: Unit 13, Bilsham Road, Yapton, Arundel, West Sussex, BN18 0JN Classification: Wrought Ironwork **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A3NE (S)	945	-	497780 102395
62	**Contemporary Trade Directory Entries** Name: Felpham Mowers Location: Unit 9, Bilsham Road, Yapton, ARUNDEL, West Sussex, BN18 0JN Classification: Lawnmowers & Garden Machinery - Sales & Service **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A3NE (S)	969	-	497792 102372
62	**Contemporary Trade Directory Entries** Name: Hydro Art Location: Unit 9, Bilsham Road, Yapton, Arundel, West Sussex, BN18 0JN Classification: Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A3NE (S)	969	-	497792 102372
63	**Contemporary Trade Directory Entries** Name: Klean It Division Ltd Location: 32, Taylors Close, Yapton, Arundel, West Sussex, BN18 0FN Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A3NE (S)	972	-	497868 102389
64	**Fuel Station Entries** Name: Central Garage Location: Main Road, Yapton, ARUNDEL, West Sussex, BN18 0EA Brand: Obsolete Premises Type: Not Applicable **Status: Obsolete** Positional Accuracy: Automatically positioned to the address	A13SE (S)	22	-	497581 103297
65	**Fuel Station Entries** Name: Noble Autos Location: Burndell Road, Yapton, ARUNDEL, West Sussex, BN18 0HP Brand: Proteus Premises Type: Not Applicable **Status: Obsolete** Positional Accuracy: Manually positioned to the road within the address or location	A9NE (SE)	758	-	498299 103022
66	**Points of Interest - Commercial Services** Name: Arun Pest Control Service Location: 23 Briar Close, Church Road, Yapton, Arundel, BN18 0ES Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location	A14SW (SE)	305	6	497930 103285

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
66	**Points of Interest - Commercial Services** Name: Arun Pest Control Service Location: 23 Briar Close, Church Road, Yapton, Arundel, BN18 0ES Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location	A14SW (SE)	305	6	497930 103285
67	**Points of Interest - Commercial Services** Name: Classic Perfections Location: Unit 25 Orchard Business Park, North End Road, Yapton, Arundel, BN18 0GA Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A14NW (NE)	373	6	497932 103737
67	**Points of Interest - Commercial Services** Name: V Dubz R Us Ltd Location: Unit 10 Orchard Business Park, North End Road, Yapton, Arundel, BN18 0GA Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A14NW (NE)	422	6	497961 103778
68	**Points of Interest - Commercial Services** Name: C K Mobile Mechanics Location: 40 The Millers, Yapton, Arundel, BN18 0LE Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A8NE (S)	554	6	497721 102782
69	**Points of Interest - Commercial Services** Name: Noble Autos Location: Georgedale, Burndell Road, Yapton, Arundel, BN18 0HP Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A9NW (SE)	608	6	498145 103066
70	**Points of Interest - Commercial Services** Name: Yapton Metal Co Location: Wayside, Burndell Road, Yapton, Arundel, BN18 0HP Category: Recycling Services Class Code: Scrap Metal Merchants Positional Accuracy: Positioned to address or location	A9NE (SE)	799	6	498331 102996
71	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A9NW (SE)	441	6	497974 103112
71	**Points of Interest - Manufacturing and Production** Name: Works Location: BN18 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A9NW (SE)	441	6	497974 103111
72	**Points of Interest - Manufacturing and Production** Name: Drove Lane Farm Location: Drove Lane, Main Road, Yapton, Arundel, BN18 0EB Category: Farming Class Code: Arable Farming Positional Accuracy: Positioned to address or location	A7NE (SW)	697	6	496945 102932
72	**Points of Interest - Manufacturing and Production** Name: Drove Lane Farm Location: Drove Lane Farm Drove Lane, Main Road, Yapton, Arundel, BN18 0EB Category: Farming Class Code: Arable Farming Positional Accuracy: Positioned to address or location	A7NE (SW)	697	6	496945 102932
73	**Points of Interest - Manufacturing and Production** Name: Tank Location: PO22 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A17SW (NW)	821	6	496793 104026

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
74	**Points of Interest - Manufacturing and Production** Name: Works Location: BN18 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A9SW (SE)	888	6	498080 102582
74	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A9SW (SE)	893	6	498088 102581
75	**Points of Interest - Recreational and Environmental** Name: Play Area Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A14SW (SE)	476	6	498088 103215
75	**Points of Interest - Recreational and Environmental** Name: Play Area Location: Main Road, BN18 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A14SW (SE)	477	6	498052 103161
75	**Points of Interest - Recreational and Environmental** Name: Play Area Location: Downview Way, BN18 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A14SW (SE)	513	6	498089 103150

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
76	**Nitrate Vulnerable Zones** Name: Not Supplied Description: Surface Water Source: Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	A13NW (NW)	0	8	497543 103453

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
Arun District Council - Environmental Health Department	July 2013	Annual Rolling Update
Chichester District Council - Environmental Health Department	July 2013	Annual Rolling Update
Discharge Consents		
Environment Agency - Southern Region	July 2016	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - Southern Region	March 2013	As notified
Integrated Pollution Controls		
Environment Agency - Southern Region	October 2008	Not Applicable
Integrated Pollution Prevention And Control		
Environment Agency - Southern Region	July 2016	Quarterly
Local Authority Integrated Pollution Prevention And Control		
Arun District Council - Environmental Health Department	December 2014	Annual Rolling Update
Chichester District Council - Environmental Health Department	October 2014	Annual Rolling Update
Local Authority Pollution Prevention and Controls		
Arun District Council - Environmental Health Department	December 2014	Annual Rolling Update
Chichester District Council - Environmental Health Department	October 2014	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements		
Arun District Council - Environmental Health Department	December 2014	Annual Rolling Update
Chichester District Council - Environmental Health Department	October 2014	Annual Rolling Update
Nearest Surface Water Feature		
Ordnance Survey	July 2012	Quarterly
Pollution Incidents to Controlled Waters		
Environment Agency - Southern Region	December 1999	Not Applicable
Prosecutions Relating to Authorised Processes		
Environment Agency - Southern Region	March 2013	As notified
Prosecutions Relating to Controlled Waters		
Environment Agency - Southern Region	March 2013	As notified
River Quality		
Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points		
Environment Agency - Head Office	July 2012	Annually
River Quality Chemistry Sampling Points		
Environment Agency - Head Office	July 2012	Annually
Substantiated Pollution Incident Register		
Environment Agency - Southern Region - Solent and South Downs	July 2016	Quarterly
Environment Agency - Southern Region - Sussex Area	July 2016	Quarterly
Water Abstractions		
Environment Agency - Southern Region	July 2016	Quarterly
Water Industry Act Referrals		
Environment Agency - Southern Region	July 2016	Quarterly
Groundwater Vulnerability		
Environment Agency - Head Office	April 2015	Not Applicable
Drift Deposits		
Environment Agency - Head Office	January 1999	Not Applicable
Bedrock Aquifer Designations		
British Geological Survey - National Geoscience Information Service	August 2015	As notified
Superficial Aquifer Designations		
British Geological Survey - National Geoscience Information Service	August 2015	As notified
Source Protection Zones		
Environment Agency - Head Office	August 2016	Quarterly

Agency & Hydrological	Version	Update Cycle
Extreme Flooding from Rivers or Sea without Defences Environment Agency - Head Office	February 2016	Quarterly
Flooding from Rivers or Sea without Defences Environment Agency - Head Office	February 2016	Quarterly
Areas Benefiting from Flood Defences Environment Agency - Head Office	February 2016	Quarterly
Flood Water Storage Areas Environment Agency - Head Office	February 2016	Quarterly
Flood Defences Environment Agency - Head Office	February 2016	Quarterly
Detailed River Network Lines Environment Agency - Head Office	March 2012	Annually
Detailed River Network Offline Drainage Environment Agency - Head Office	March 2012	Annually
Surface Water 1 in 30 year Flood Extent Environment Agency - Head Office	October 2013	As notified
Surface Water 1 in 100 year Flood Extent Environment Agency - Head Office	October 2013	As notified
Surface Water 1 in 1000 year Flood Extent Environment Agency - Head Office	October 2013	As notified
Surface Water Suitability Environment Agency - Head Office	October 2013	As notified
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	Annually

Waste	Version	Update Cycle
BGS Recorded Landfill Sites		
British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Historical Landfill Sites		
Environment Agency - Head Office	August 2016	Quarterly
Integrated Pollution Control Registered Waste Sites		
Environment Agency - Southern Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries)		
Environment Agency - Southern Region - Solent and South Downs	August 2016	Quarterly
Environment Agency - Southern Region - Sussex Area	August 2016	Quarterly
Licensed Waste Management Facilities (Locations)		
Environment Agency - South East Region - Solent & South Downs Area	July 2016	Quarterly
Environment Agency - Southern Region - Solent and South Downs	July 2016	Quarterly
Environment Agency - Southern Region - Sussex Area	July 2016	Quarterly
Local Authority Landfill Coverage		
Arun District Council - Technical Support Unit	May 2000	Not Applicable
Chichester District Council - Environmental Health Department	May 2000	Not Applicable
West Sussex County Council - Environment & Development	May 2000	Not Applicable
Local Authority Recorded Landfill Sites		
Arun District Council - Technical Support Unit	May 2000	Not Applicable
Chichester District Council - Environmental Health Department	May 2000	Not Applicable
West Sussex County Council - Environment & Development	May 2000	Not Applicable
Potentially Infilled Land (Non-Water)		
Landmark Information Group Limited	December 1999	Not Applicable
Potentially Infilled Land (Water)		
Landmark Information Group Limited	December 1999	Not Applicable
Registered Landfill Sites		
Environment Agency - Southern Region - Sussex Area	March 2003	Not Applicable
Registered Waste Transfer Sites		
Environment Agency - Southern Region - Sussex Area	March 2003	Not Applicable
Registered Waste Treatment or Disposal Sites		
Environment Agency - Southern Region - Sussex Area	March 2003	Not Applicable

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH)		
Health and Safety Executive	July 2016	Bi-Annually
Explosive Sites		
Health and Safety Executive	February 2016	Bi-Annually
Notification of Installations Handling Hazardous Substances (NIHHS)		
Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements		
Arun District Council - Technical Support Unit	February 2016	Annual Rolling Update
Chichester District Council - Planning Department	February 2016	Annual Rolling Update
West Sussex County Council - Environment & Development	October 2006	Annual Rolling Update
Planning Hazardous Substance Consents		
Arun District Council - Technical Support Unit	February 2016	Annual Rolling Update
Chichester District Council - Planning Department	February 2016	Annual Rolling Update
West Sussex County Council - Environment & Development	October 2006	Annual Rolling Update

Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	Not Applicable
BGS Estimated Soil Chemistry British Geological Survey - National Geoscience Information Service	October 2015	Annually
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	May 2016	Bi-Annually
Brine Compensation Area Cheshire Brine Subsidence Compensation Board	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	As notified
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	As notified
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	As notified
Industrial Land Use	**Version**	**Update Cycle**
Contemporary Trade Directory Entries Thomson Directories	June 2016	Quarterly
Fuel Station Entries Catalist Ltd - Experian	July 2016	Quarterly
Gas Pipelines National Grid	July 2014	Quarterly
Points of Interest - Commercial Services PointX	June 2016	Quarterly
Points of Interest - Education and Health PointX	June 2016	Quarterly
Points of Interest - Manufacturing and Production PointX	June 2016	Quarterly
Points of Interest - Public Infrastructure PointX	June 2016	Quarterly
Points of Interest - Recreational and Environmental PointX	June 2016	Quarterly
Underground Electrical Cables National Grid	January 2016	Bi-Annually

Sensitive Land Use	Version	Update Cycle
Ancient Woodland Natural England	August 2016	Bi-Annually
Areas of Outstanding Natural Beauty Natural England	April 2016	Bi-Annually
Environmentally Sensitive Areas Natural England	April 2016	Annually
Forest Parks Forestry Commission	April 1997	Not Applicable
Local Nature Reserves Natural England	April 2016	Bi-Annually
Marine Nature Reserves Natural England	April 2016	Bi-Annually
National Nature Reserves Natural England	April 2016	Bi-Annually
National Parks Natural England	August 2016	Bi-Annually
Nitrate Sensitive Areas Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	April 2016	Not Applicable
Nitrate Vulnerable Zones Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	October 2015	Annually
Ramsar Sites Natural England	April 2016	Bi-Annually
Sites of Special Scientific Interest Natural England	April 2016	Bi-Annually
Special Areas of Conservation Natural England	April 2016	Bi-Annually
Special Protection Areas Natural England	April 2016	Bi-Annually
World Heritage Sites English Heritage - National Monument Record Centre	September 2015	Bi-Annually

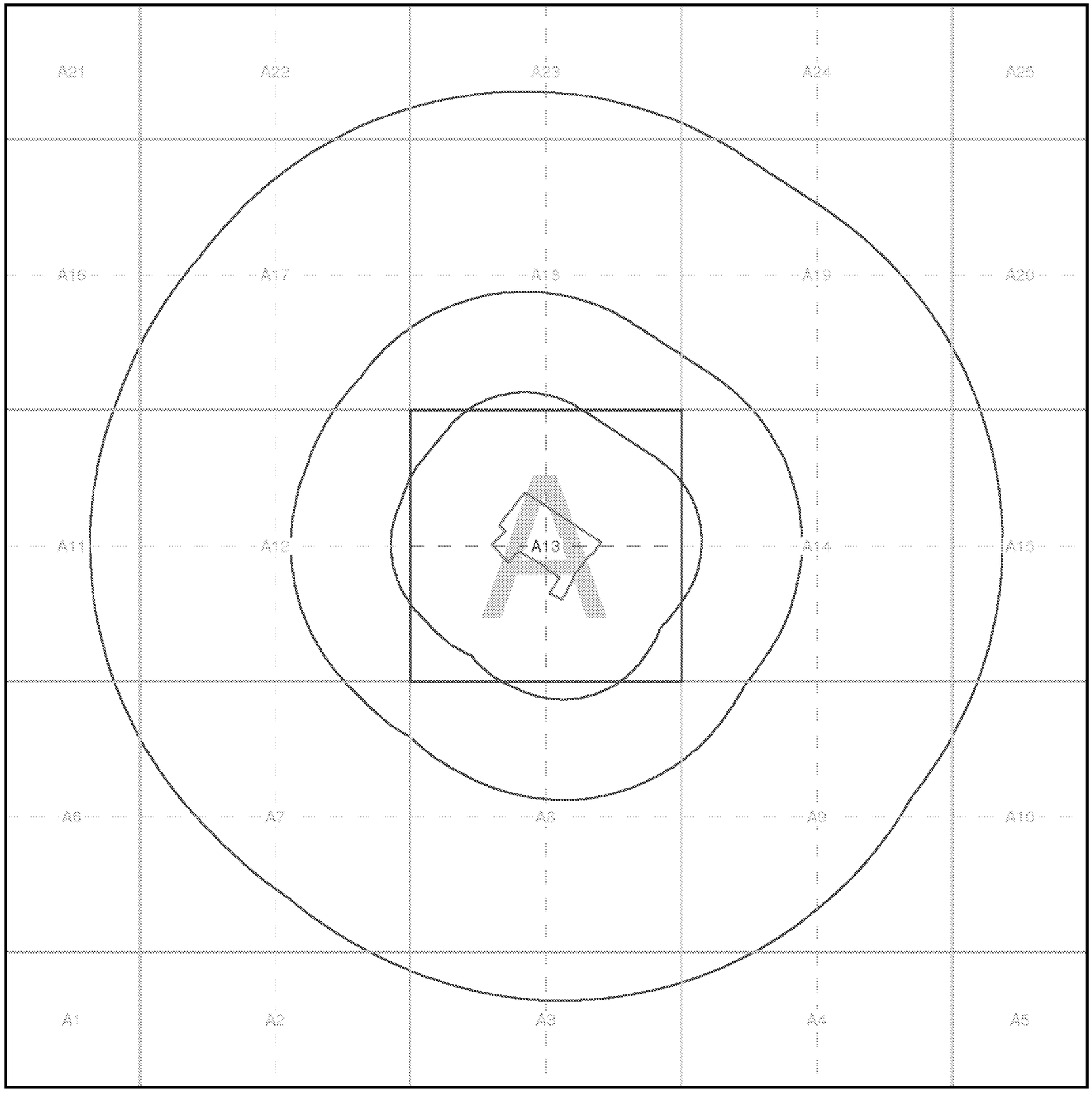
Data Suppliers

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	
Centre for Ecology and Hydrology	
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Peter Brett Associates	

Contact	Name and Address	Contact Details
2	**British Geological Survey - Enquiry Service** British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
3	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
4	**West Sussex County Council - Environment & Development** County Hall, Tower hall, Chichester, West Sussex, PO19 1RH	Telephone: 01243 777100 Website: www.westsussex.gov.uk
5	**Arun District Council - Technical Support Unit** Civic Centre, Maltravers Road, Littlehampton, Sussex, BN17 5LF	Telephone: 01903 737500 Fax: 01903 730442 Website: www.arun.gov.uk
6	**PointX** 7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
7	**Natural England** County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
8	**Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)** Government Buildings, Otley Road, Lawnswood, Leeds, West Yorkshire, LS16 5QT	Telephone: 0113 2613333 Fax: 0113 230 0879
9	**Environment Agency - Head Office** Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.



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Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:

Map data

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Environment Agency

ENGLAND

Envirocheck reports are compiled from 136 different sources of data.

Client Details

Mr E Tweedie, Tweedie Evans Consulting Ltd, The Old Chapel, 35a Southover, Wells, Somerset, BA5 1UH

Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103460
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

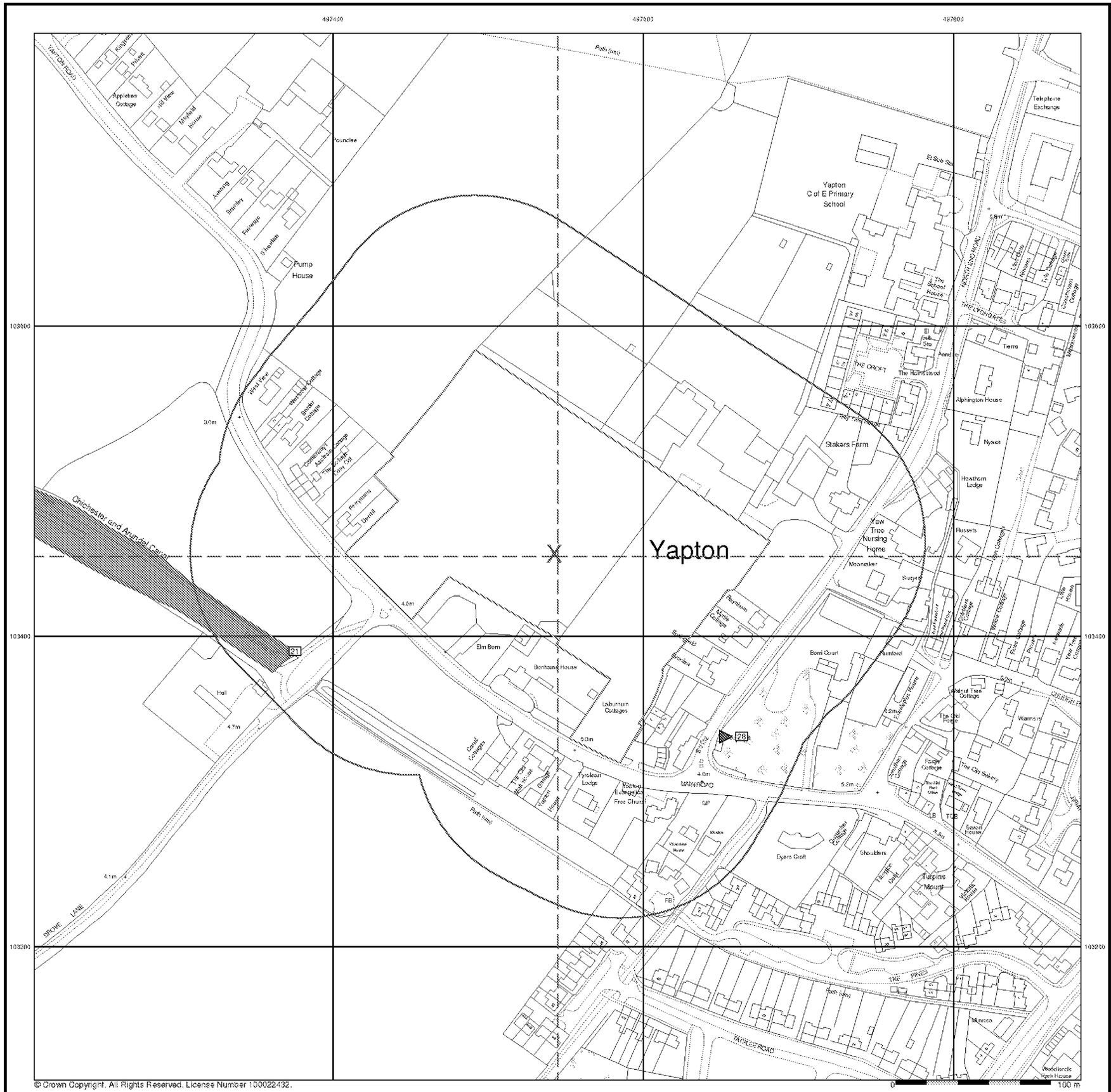
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Web: www.envirocheck.co.uk

ARUN DISTRICT COUNCIL Y/1/17/OUT



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TEC

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

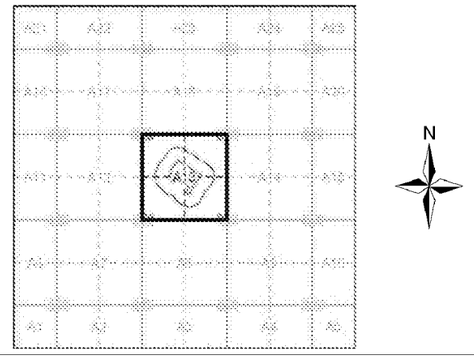
Geological

- BGS Recorded Mineral Site

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Segment A13



Order Details

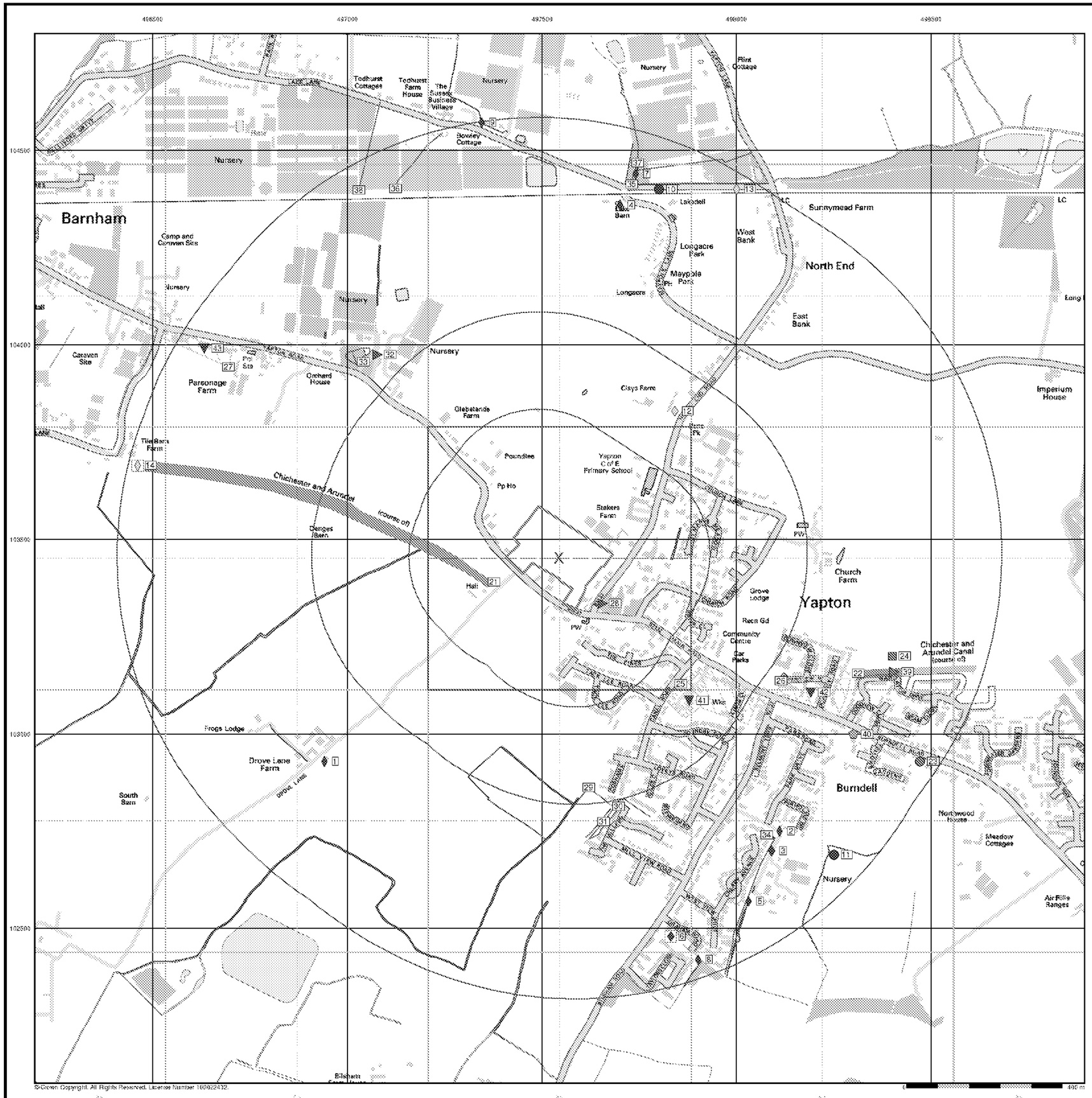
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Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Plot Buffer (m):	100

Site Details

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General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Hazardous Substances

COMAH Site | Explosive Site | NIHHS Site

- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

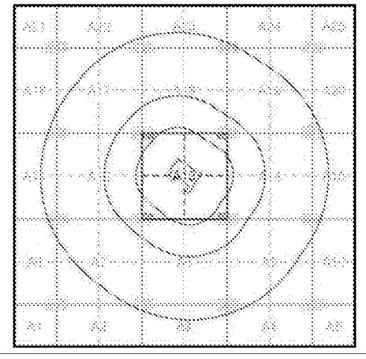
Geological

- BGS Recorded Mineral Site

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
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- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
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- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Slice A



N

Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

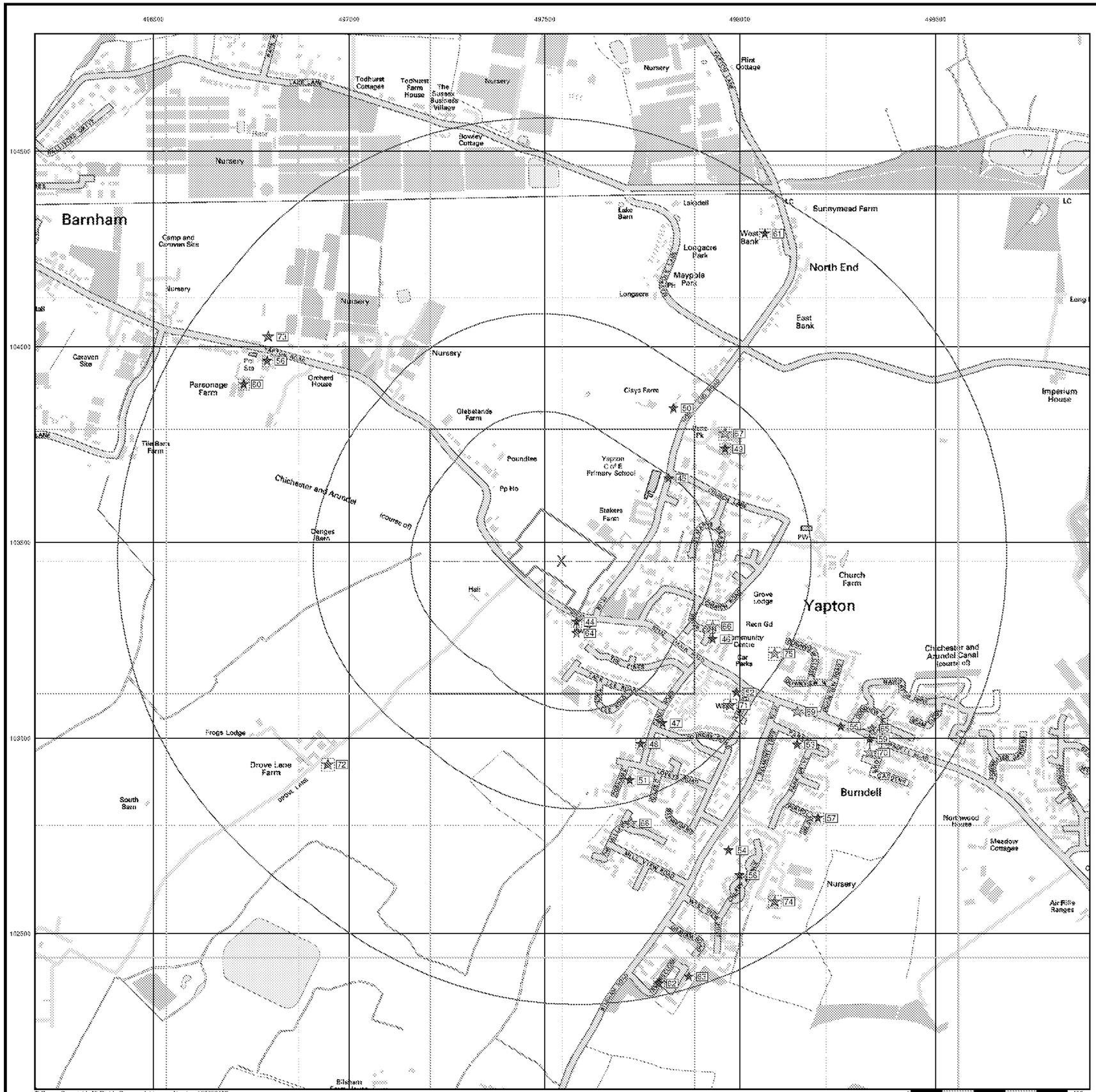
Site Details

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Industrial Land Use Map

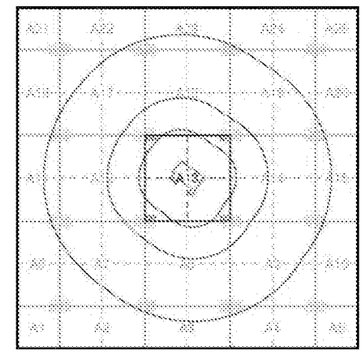
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Gas Pipeline
- Points of Interest - Commercial Services
- Points of Interest - Education and Health
- Points of Interest - Manufacturing and Production
- Points of Interest - Public Infrastructure
- Points of Interest - Recreational and Environmental
- Underground Electrical Cables

Industrial Land Use Map - Slice A



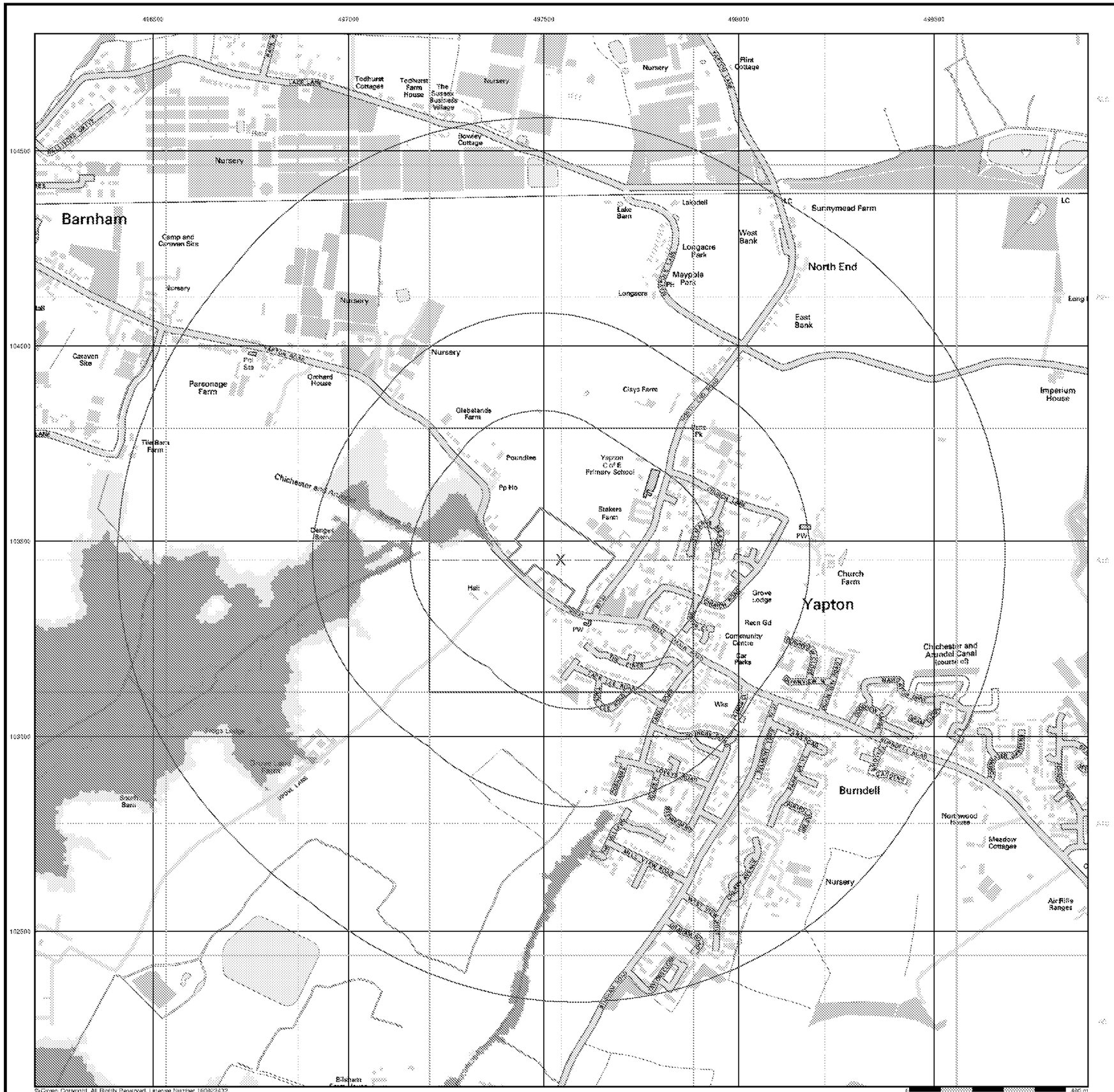
Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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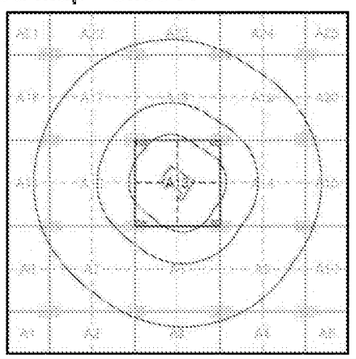
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



N

Order Details

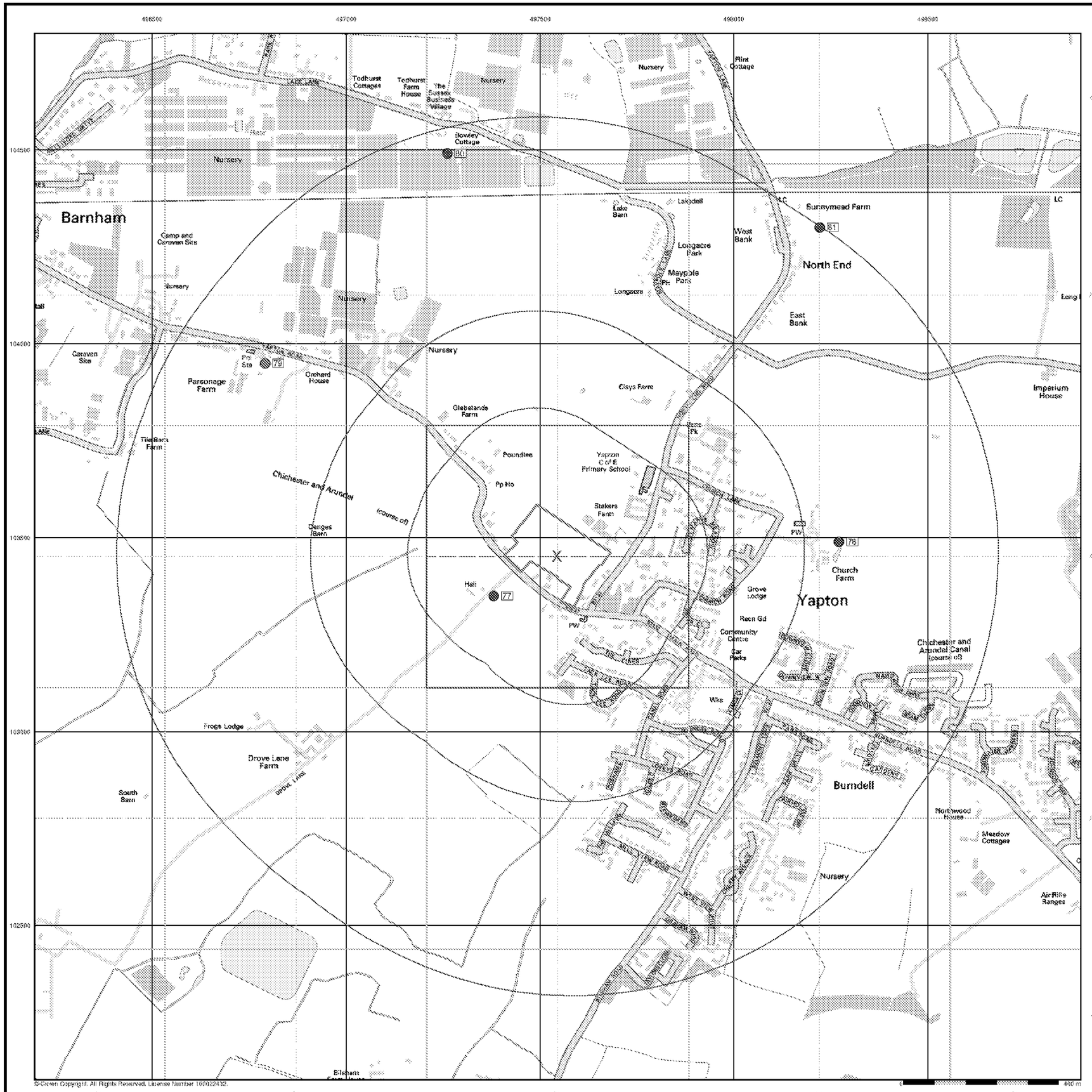
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Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

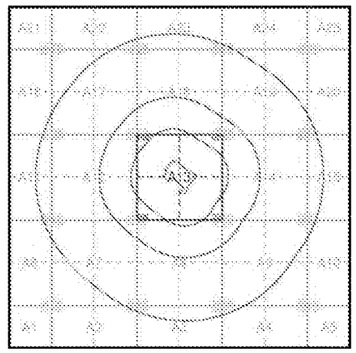
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



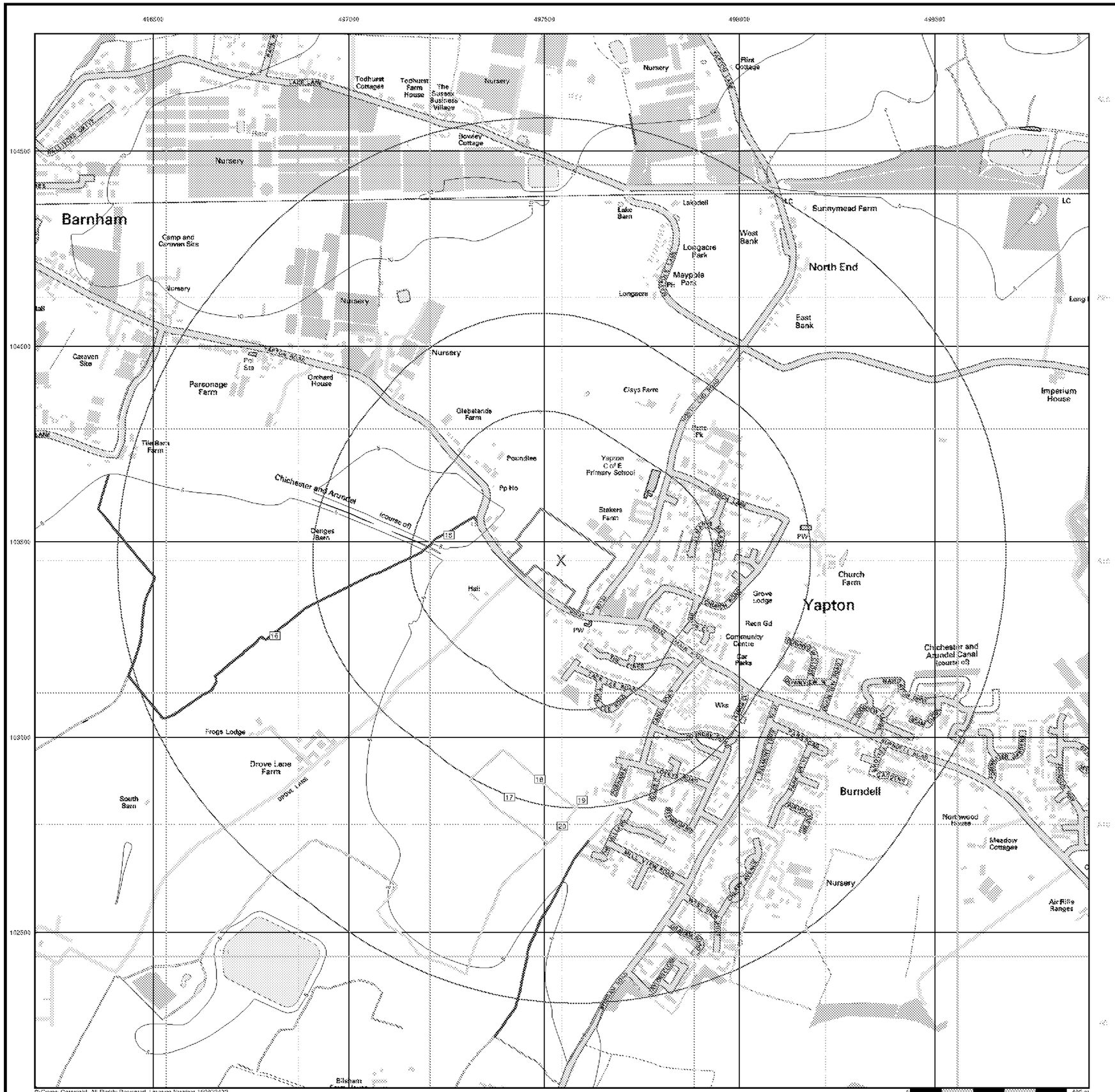
Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID

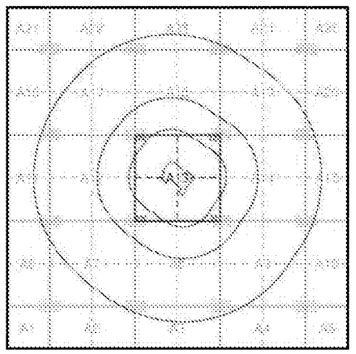
Detailed River Network Data

- Primary River
- Secondary River
- Tertiary River
- Canal
- Canal Tunnel
- Undefined River
- Lake/Reservoir
- Offline Drainage Feature
- Extended Culvert (greater than 50m)
- Underground River (inferred)
- Underground River (local knowledge)
- Downstream of High Water Mark
- Downstream of Seaward Extension
- Not assigned River feature

Contours (height in metres)

- Standard Contour
- Master Contour
- Spot Height
- Mean Low Water
- Mean High Water

EA/NRW Detailed River Network Map - Slice A



Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

Bonhams Field, Yapton, Arundel, BN18 0DX

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TEC
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General

Specified Site

Specified Buffer(s)

X Bearing Reference Point

Risk of Flooding from Surface Water

High - 30 Year Return

Medium - 100 Year Return

Low - 1000 Year Return

Suitability

See the suitability map below

National to county

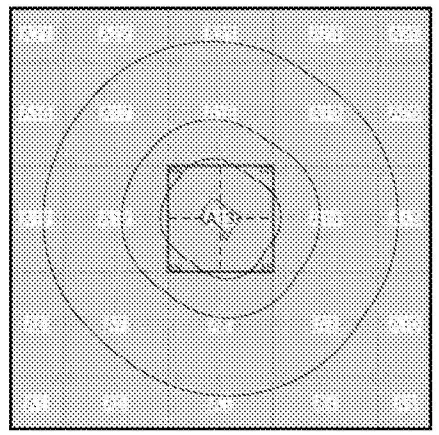
County to town

Town to street

Street to parcels of land

Property

EA/NRW Suitability Map - Slice A



N

Order Details

Order Number: 95074607_1_1
Customer Ref: 1608012
National Grid Reference: 497540, 103450
Slice: A
Site Area (Ha): 3.23
Search Buffer (m): 1000

Site Details

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Landmark Information Group
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Web: www.envirocheck.co.uk



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General

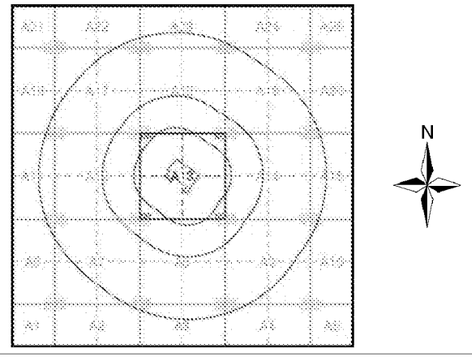
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Arsenic

Arsenic Concentrations mg/kg

- < 15
- 15 - 25
- 25 - 35
- 35 - 45
- 45 - 60
- 60 - 120
- > 120

Estimated Soil Chemistry Arsenic - Slice A



Order Details

Order Details:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

Bonhams Field, Yapton, Arundel, BN18 0DX

Landmark Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

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General

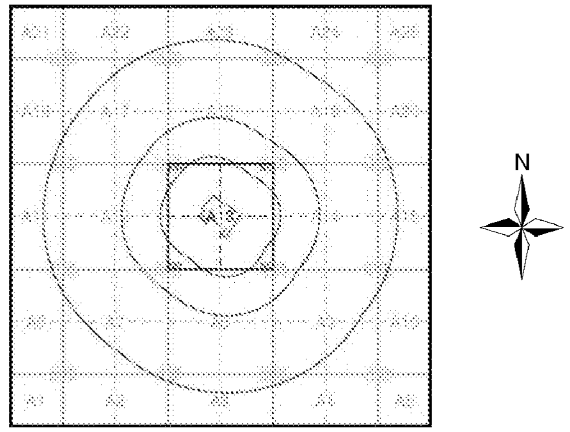
Specified Site | Specified Buffer(s) | Bearing Reference Point

Estimated Soil Chemistry Cadmium

Cadmium Concentrations mg/kg

- < 1.8
- 1.8 - 2.2
- 2.2 - 3.0
- > 3.0

Estimated Soil Chemistry Cadmium - Slice A



Order Details

Order Details: 95074607_1_1
Customer Ref: 1608012
National Grid Reference: 497540, 103450
Slice: A
Site Area (Ha): 3.23
Search Buffer (m): 1000

Site Details

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0 400 m

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General

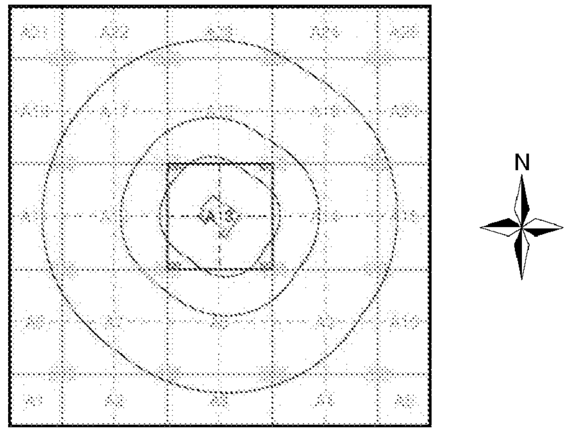
Specified Site   Specified Buffer(s)   Bearing Reference Point

Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg

- < 20
- 20 - 40
- 40 - 60
- 60 - 90
- 90 - 120
- 120 - 180
- > 180

Estimated Soil Chemistry Chromium - Slice A



Order Details

Order Details: 95074607_1_1
Customer Ref: 1608012
National Grid Reference: 497540, 103450
Slice: A
Site Area (Ha): 3.23
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Site Details

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General

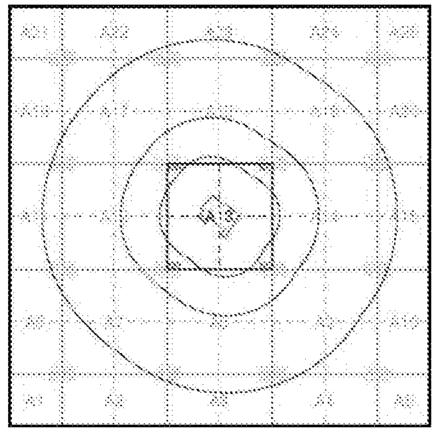
Specified Site　Specified Buffer(s)　X Bearing Reference Point

Estimated Soil Chemistry Lead

Lead Concentrations mg/kg

- <100 mg/kg
- 100 - 200
- 200 - 300
- 300 - 600
- 600 - 1200
- >1200

Estimated Soil Chemistry Lead - Slice A



N

Order Details

Order Details: 95074607_1_1
Customer Ref: 1608012
National Grid Reference: 497540, 103450
Slice: A
Site Area (Ha): 3.23
Search Buffer (m): 1000

Site Details

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General

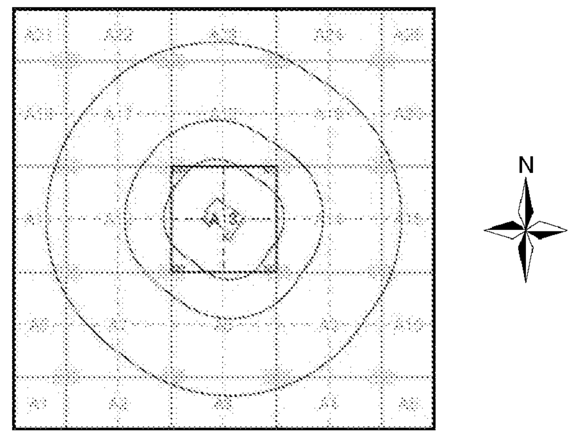
Specified Site   Specified Buffer(s)   Bearing Reference Point

Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg

- < 15
- 15 - 30
- 30 - 45
- 45 - 60
- 60 - 80
- 80 - 100
- > 100

Estimated Soil Chemistry Nickel - Slice A



Order Details

Order Details:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

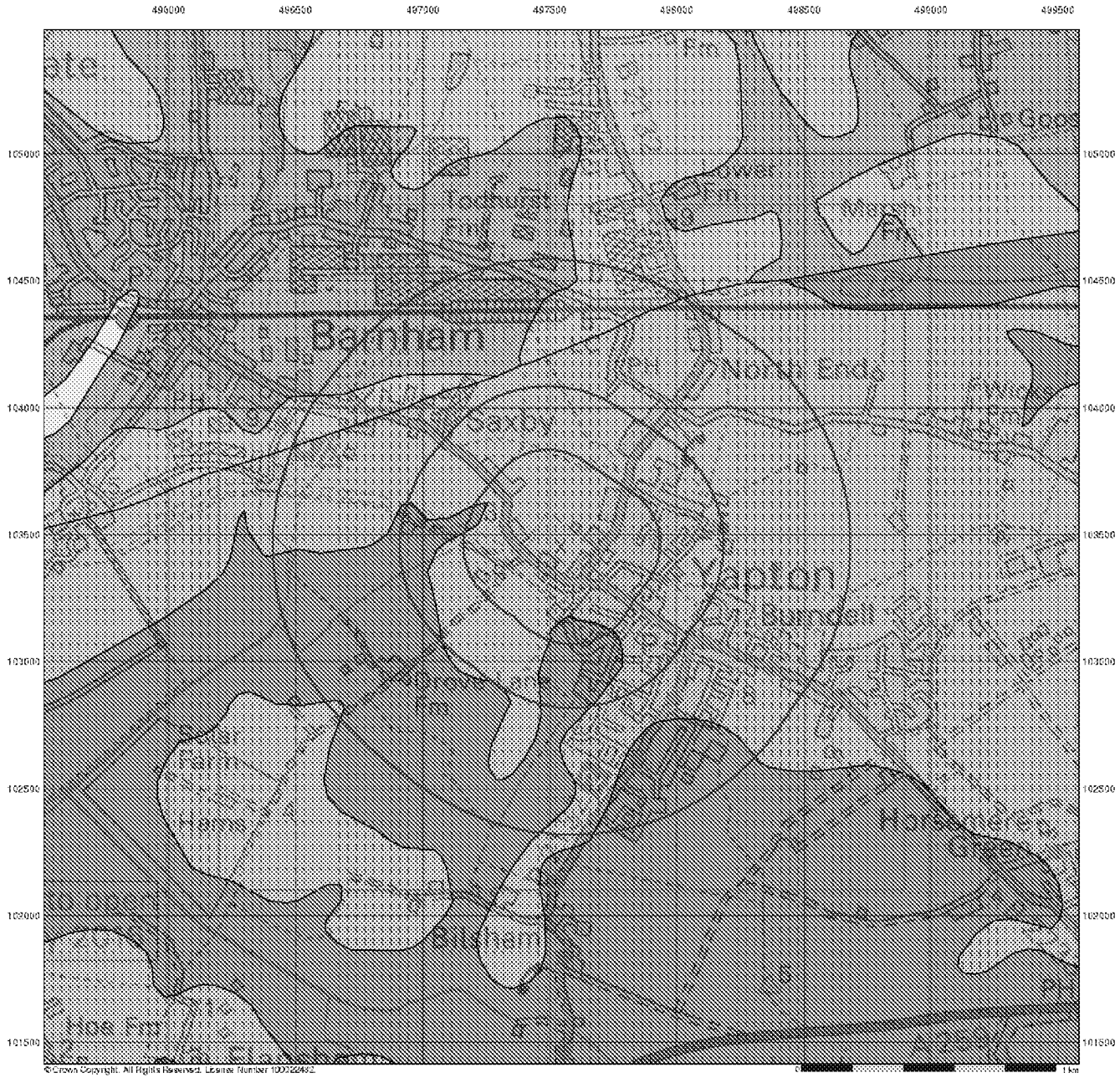
Site Details

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Groundwater Vulnerability

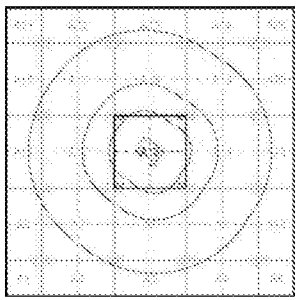
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes	Soil Classes
Major Aquifer (Highly Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Minor Aquifer (Variably Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Non Aquifer (Negligibly Permeable)	
Water or Sea	
Drift Deposit	

Site Sensitivity Context Map - Slice A



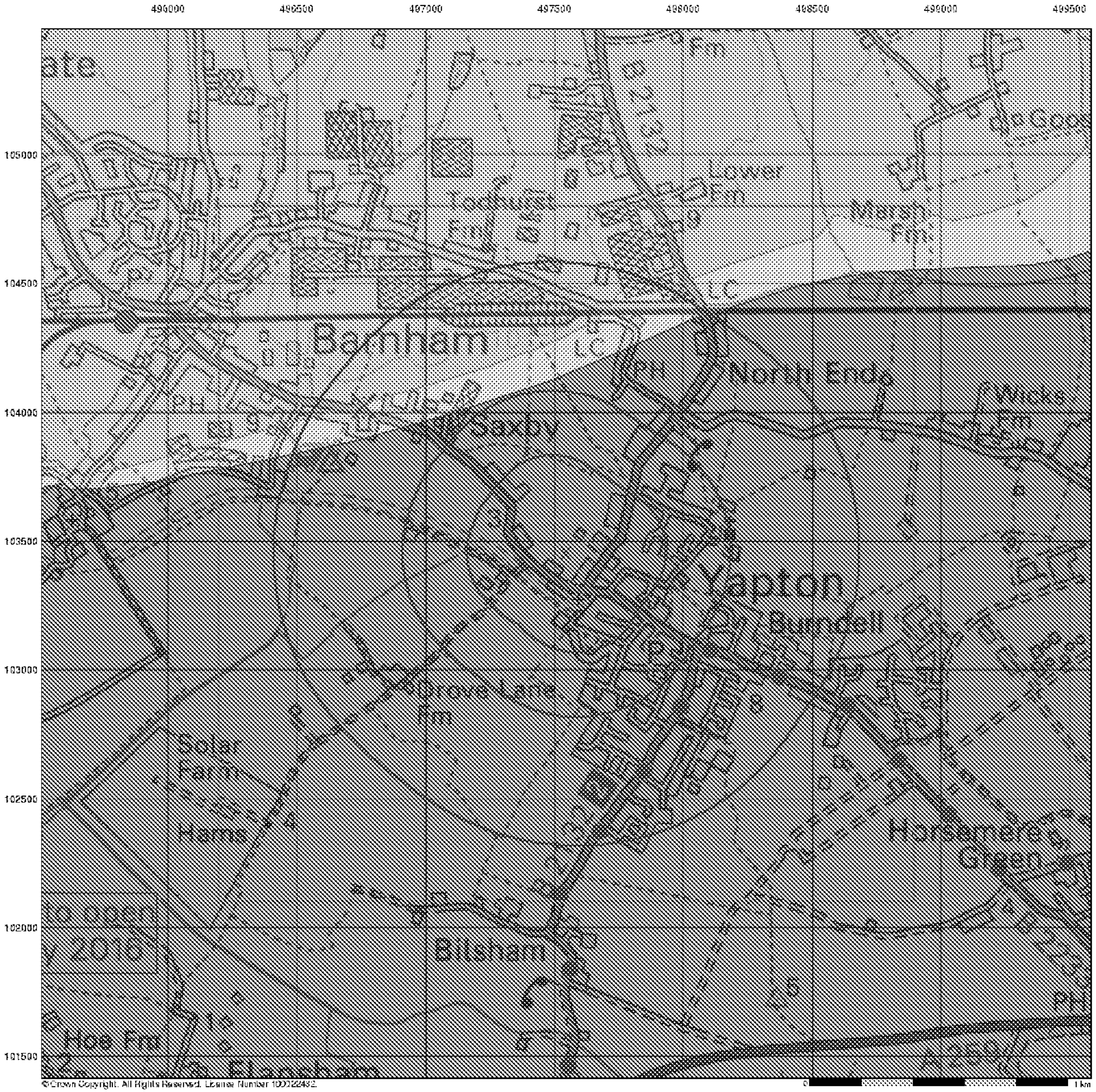
Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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Bedrock Aquifer Designation

General

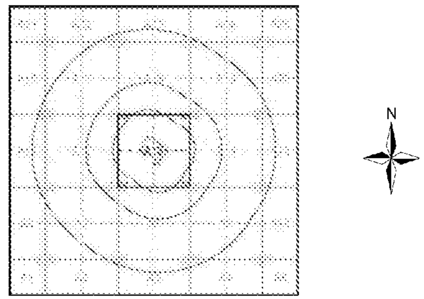
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



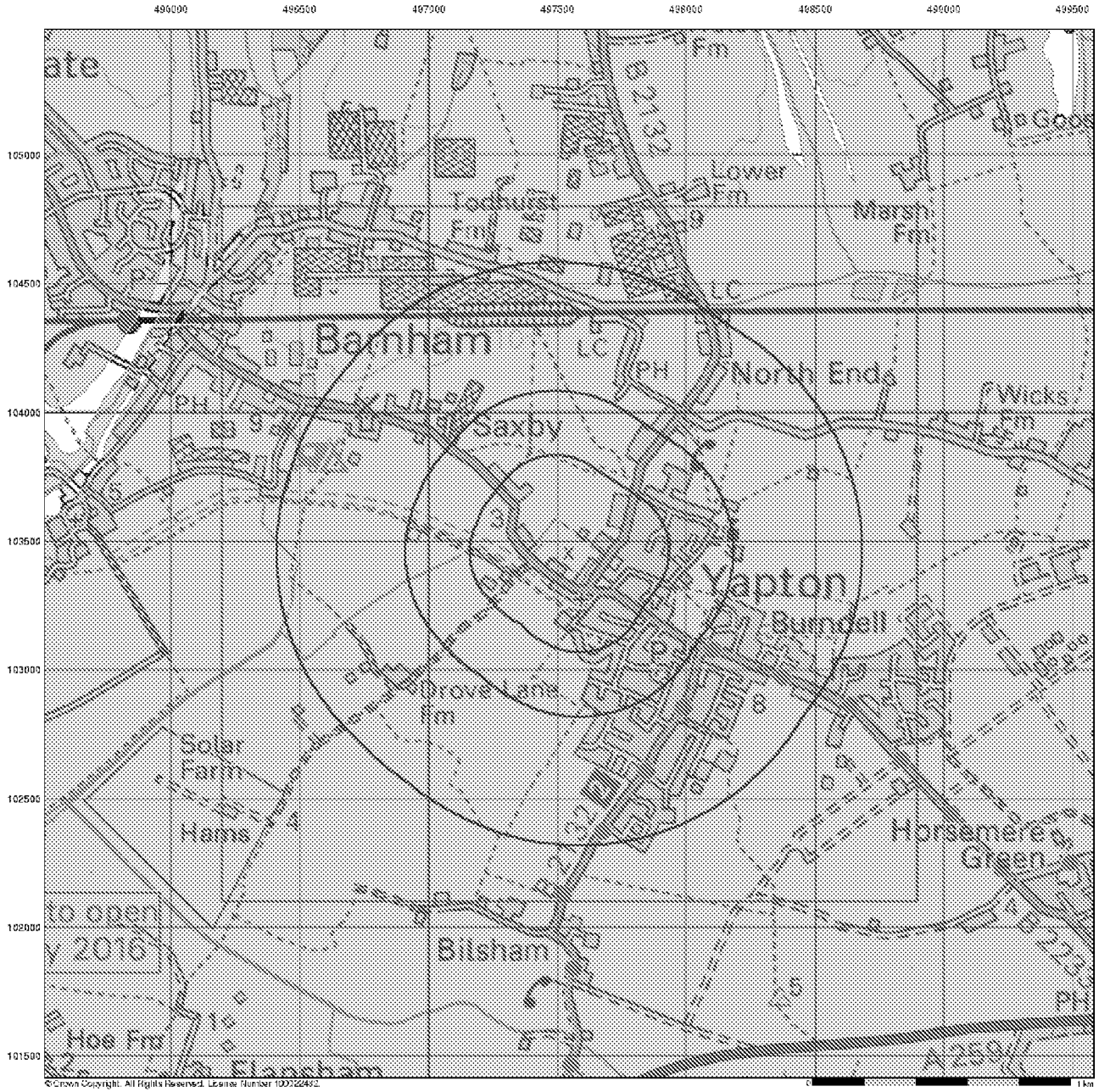
Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

Bonhams Field, Yapton, Arundel, BN18 0DX

Landmark



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Superficial Aquifer Designation

General

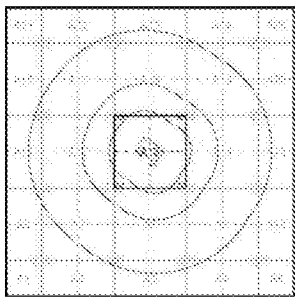
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



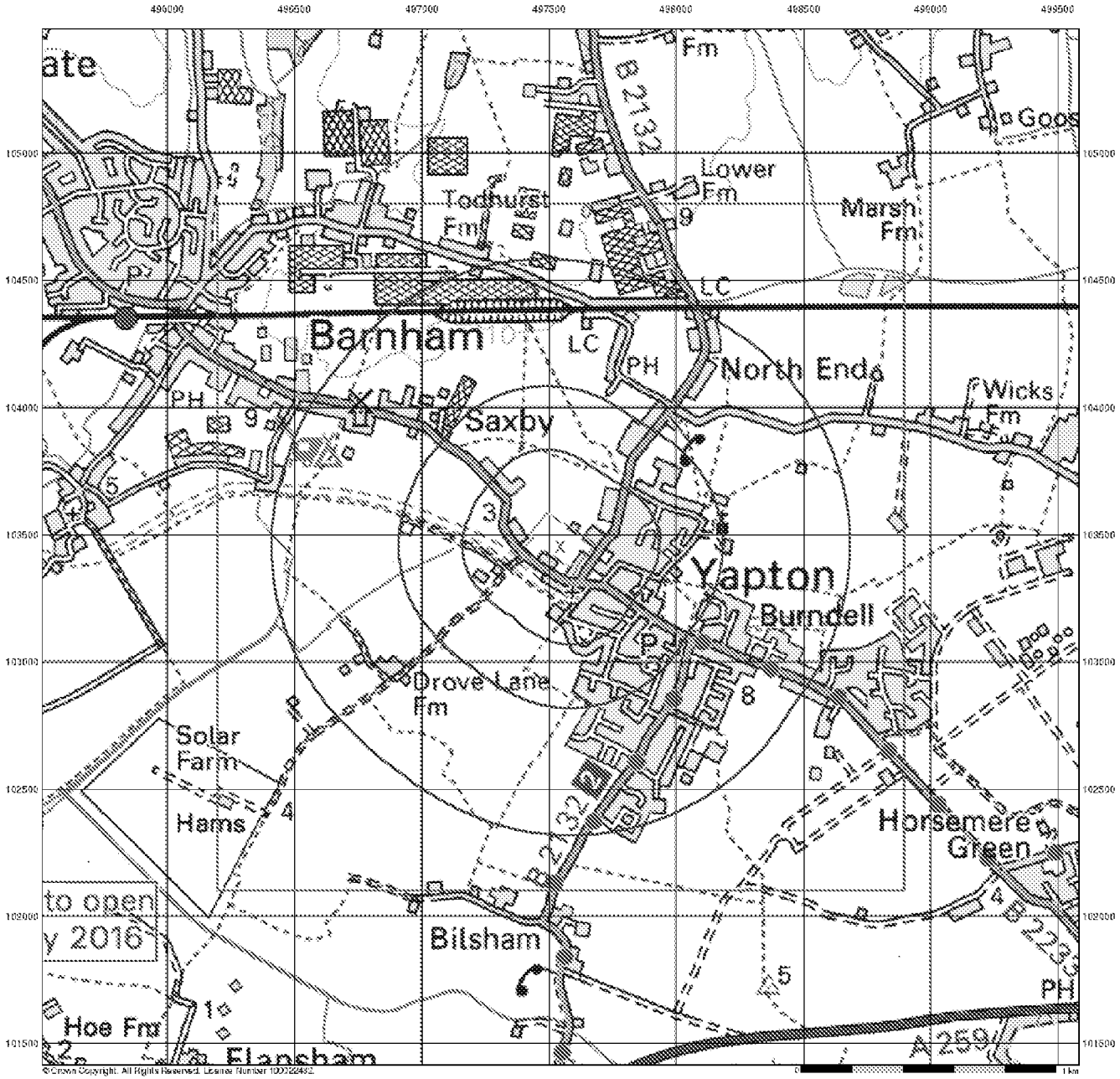
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Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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Source Protection Zones

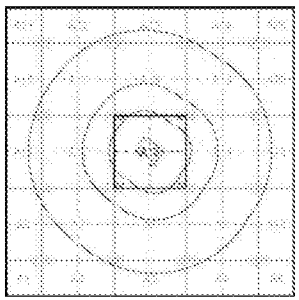
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)
- Source Protection Zone Borehole

Site Sensitivity Context Map - Slice A



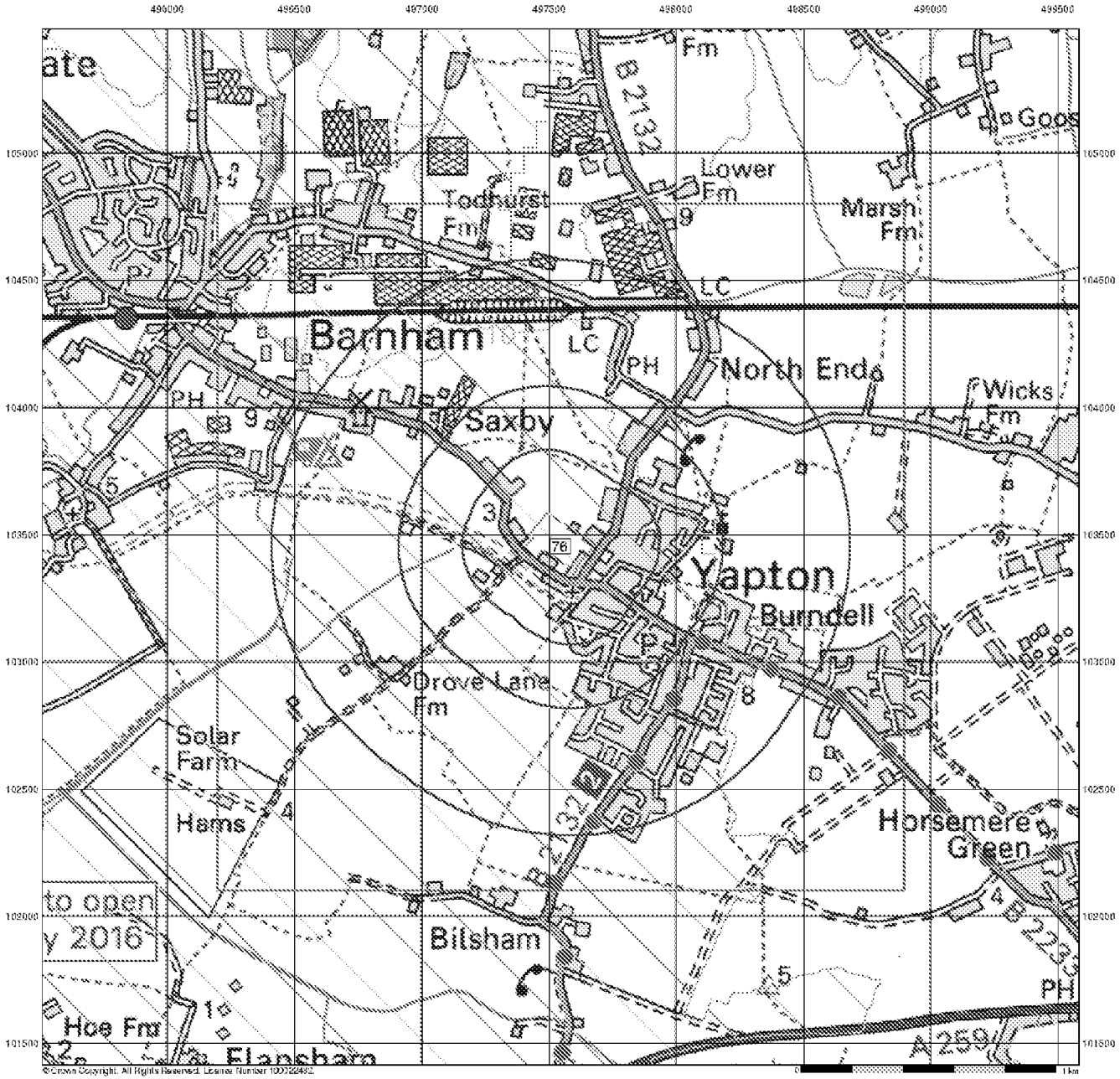
Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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Landmark
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Sensitive Land Uses

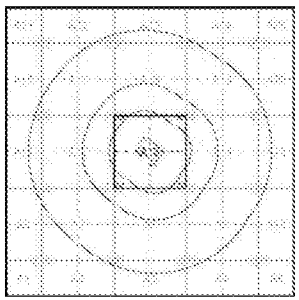
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



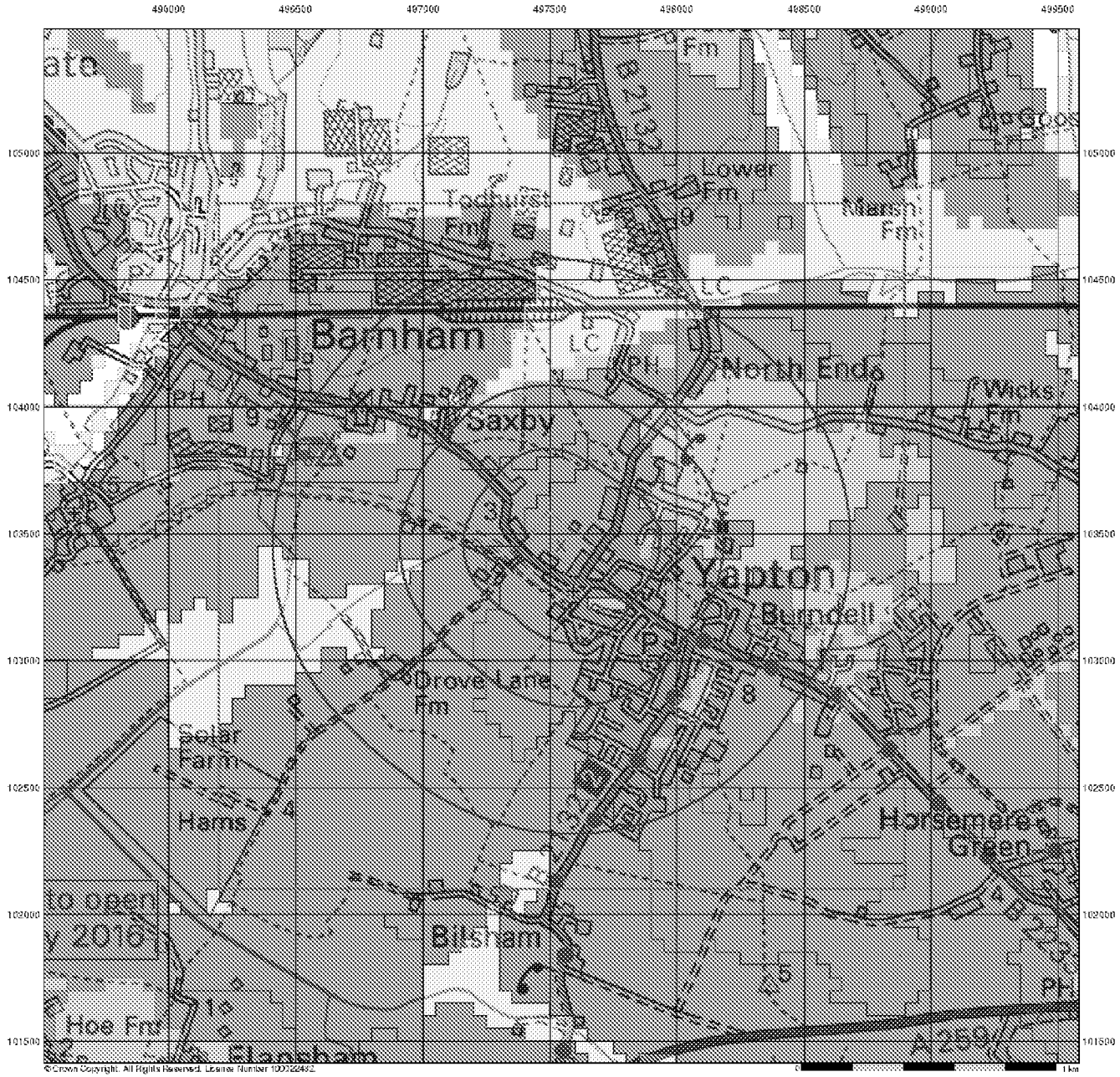
Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

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BGS Flood GFS Data

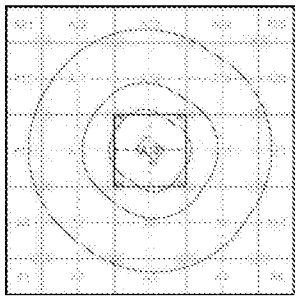
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



Order Details

Order Number:	95074607_1_1
Customer Ref:	1608012
National Grid Reference:	497540, 103450
Slice:	A
Site Area (Ha):	3.23
Search Buffer (m):	1000

Site Details

Bonhams Field, Yapton, Arundel, BN18 0DX

Landmark
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

APPENDIX C

Regulatory Correspondence

Caroline Moule

From: Matthew Kennett <Matthew.Kennett@arun.gov.uk>
Sent: 31 August 2016 10:50
To: Rhys Plummer
Subject: RE: Environmental search enquiry: Bonhams Field, Yapton
Attachments: 201608311046.pdf

Dear Rhys,

Please find below your information request and receipt attached;

1. Pre-license landfill sites within 500m of the subject site, including:
   - license holder
   - location of landfill/grid reference
   - nature of fill material
   - dates of operation
   - details of any leachate/landfill gas problems

75m to the southwest of the western corner of the site there is ground that is known to be infilled with inert waste. This ground was formerly a canal and was filled prior to 1970. We hold no leachate or gas data. The closest part is at grid ref; 497374, 103389.

2. Pollution incidents/known areas of contaminated land within 500m of the subject site, including:
   - location/grid reference
   - previous uses
   - nature/source of pollution
   - any further details

There is no land determined as contaminated within 500m of the site or any pollution incidents.

3. Part B APC authorisations within 500m of the subject site, including:
   - authorisation holder
   - location/grid reference
   - nature of authorisation

There are no Part installations within 500m

4. Private water supplies within 500m of the subject site, including:
   - location/grid reference
   - details of source and abstraction purpose

There are no Private Water Supplies within 500m

5. Storage of Petroleum Hydrocarbons.

There is a underground fuel storage tank on a site formerly known as reptune motors approximately 12m from the south of the site at grid ref 497545, 103322. This was made safe by derv filling in April 2000.

6. Records of any previous Site Investigations on or in close proximity to the site

We do not hold any previous site investigations on the land or in close proximity.

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7. Records of any unexploded ordnance in the site area

No records

8. Any known problems with ground gas in the site area

No records

9. Any potential issues regarding naturally elevated contaminant concentrations

No records

10. Any other information held by your authority which may have an impact upon the contaminative status of the site

The site is not listed as potentially contaminated ground under Part 2A of the Environmental Protection Act 1990.

thanks

Matthew Kennett
Pollution Officer
Environmental Health Department
01903 737696 (direct line)
Arun Civic Centre, Maltravers Road, Littlehampton BN17 5LF
http://www.arun.gov.uk/eh

http://www.arun.gov.uk

NLPG UPRN 100062237016
DX 57406 Littlehampton

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APPENDIX D

Risk Evaluation

Risk Evaluation

The qualitative assessment methodology presented in Ciria publication C552 (2001) titled *'Contaminated Land Risk Assessment: A Guide to Good Practice'* has been used by TEC for the basis of evaluating potential risk.

The method requires an assessment of the:

- magnitude of the probability or likelihood of the risk occurring (Table 1); and
- magnitude of the potential consequence or severity of the risk occurring (Table 2)

Table 1. Classification of Probability

Classification	Definition
High likelihood	There is a pollution linkage and an event that either appears very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such an event would take place, and is less likely in the short-term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.

Table 2. Classification of Consequence

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resource. (Note: Water Resources Act contains no scope for considering significance of pollution). Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem, or organisation forming part of such ecosystem (note: the definitions of ecological systems within the draft circular on Contaminated Land, DETR, 2000).	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to human health ("significant harm" as defined in DETR, 2000). Pollution of sensitive water resources. (Note: Water Resources Act contains no scope for considering significance of pollution). A significant change in a particular ecosystem, or organism forming part of such ecosystem, (note: the definitions of ecological systems within draft circular on Contaminated Land, DETR, 2000).	Concentration of a contaminant from site exceeding the generic or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer. Death of a species within a designated nature reserve.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ("significant harm" as defined in the draft circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (for example foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc), easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discolouration of concrete.

The combination of the two factors is determined using Table 3 and the resulting level of risk is described in Table 4. The evaluation can be applied to each of the scenarios identified in the risk model and the overall risk assessed.

Table 3. Combination of Consequence with Probability

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	**Very High Risk**	**High Risk**	**Moderate Risk**	**Moderate/Low Risk**
	Likely	**High Risk**	**Moderate Risk**	**Moderate/Low Risk**	**Low Risk**
	Low Likelihood	**Moderate Risk**	**Moderate/Low Risk**	**Low Risk**	**Very Low Risk**
	Unlikely	**Moderate/Low Risk**	**Low Risk**	**Very Low Risk**	**Very Low Risk**

Table 4. Description of risks and likely action required

Very High Risk	There is a 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 a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer-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 (if not already undertaken) is normally required to clarify the risk and to determine the 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	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Using the risk model the pollutant linkages are identified and a preliminary estimate of risk undertaken. If there is no pollutant linkage identified, then there is no risk. If the estimate of risk for all the linkages and exposure scenarios is very low at this stage then it is likely that no further assessment will be required.

APPENDIX E

Exploratory Hole Logs

DYNAMIC SAMPLING RECORD

Project Title: Bonhams Field, Yapton	**Borehole:** WS1
Project No: 1608013.001	**Dates:** 5th September 2016
Client: Seaward Properties Ltd	

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www.tecon.co.uk
info@tecon.co.uk

Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
	MADE GROUND Soft brown clay with frequent rootlets.							Concrete
0.50	MADE GROUND Stiff brown silty clay with occasional gravel of sub-rounded chert and rare black carbonaceous material.							
	Firm to stiff high strength orangish brown slightly sandy CLAY with frequent bioturbation holes.		T				HSV @ 0.8m = 150, 150, 160 kPa	Bentonite
1.00				1.0	(3, 3) 2, 2, 2, 2.	8		
1.20	Firm medium to high strength orangish brown slightly sandy CLAY.						HSV @ 1.1m = 85, 90, 75 kPa	
	Soft to firm low to medium strength very sandy CLAY		T				HSV @ 1.5m = 60, 65, 55 kPa	3-6mm Pea Gravel
2.00				3.0	(2, 2) 2, 2, 3, 3.	16		
2.25	Firm locally soft locally gravelly sandy CLAY with gravel of fine sub-angular to sub-rounded chalk and fine to coarse sub-rounded to angular flint.							
2.60	Soft orangish brown sandy CLAY							
	Soft to firm locally gravelly sandy CLAY with gravel of fine sub-angular to sub-rounded chalk and fine to coarse sub-rounded to angular flint.		T	3.0	(2, 4) 4, 5, 5, 6.	20		50mm HPDE pipe
3.00	Firm to stiff white and creamish brown gravelly sandy CLAY. Frequent gravel of fine to coarse sub-angular to sub-rounded chalk and occasional gravel of fine to coarse sub-angular to sub-rounded flint.			4.0	(5, 5) 5, 6, 6, 6.	23		
			T					
5.00	Borehole Terminated			5.0				

Notes:
- A: 250ml and 60ml Amber Glass Jars
- T: Plastic Tub (1Kg)
- SPT: Standard Penetration Test
- HSV: Hand Shear Vane
- PP: Pocket Penetrometer
- PID: Photo-Ionisation Detector

Plant: Archway Competitior Dart

Water observations: No groundwater was encountered.

General remarks:

Logged by: MB | Checked by: CH | Approved by: RE

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DYNAMIC SAMPLING RECORD

Project Title: Bonhams Field, Yapton

Borehole: WS2

Project No: 1608013.001

Dates: 5th September 2016

Client: Seaward Properties Ltd

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Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.30	MADE GROUND / NEAR SYRFACE MATERIALS Dark brown slightly silty clay with many rootlets.							
0.80	MADE GROUND / NEAR SURFACE MATERIALS Dark brown slightly clayey sandy silt with occasional gravel of chert.		T					
1.00	Stiff orangish brown slightly clayey SILT with a friable texture and occasional gravel of fine rounded to sub-angular flint. Frequent bioturbation holes and occasional rootlets.		T	1.0	(1, 1) 2, 2, 2, 2.	8	PP @ 0.9m = 2.25, 2.25, 2.25, 2.75, 2.5 kg/cm2 HSV @ 1.2m = 12.5, 15, 15kPa	
1.60	Stiff brown slightly sandy slightly silty CLAY							
2.00	Soft very low strength orangish brown sandy CLAY wiith rare fine rounded gravel of flint and chalk. Occasional dark brown organic material.						HSV @ 1.8m = 65, 65, 60 kPa	
2.50	Soft to firm low to medium strength orangish brown sandy CLAY with rare fine rounded gravel of flint and chalk. Occasional dark brown organic remains.		T	2.0	(0, 0) 0, 1, 1, 1.	3	HSV @ 2.3m = 45, 40, 30 kPa	
3.50	Very soft to soft very low to low strength orangish brown very sandy CLAY with rare gravel of fine sub-angular flint. Firm orangish brown slightly gravelly very sandy CLAY with gravel of fine rounded chalk.			3.0	(2, 2) 3, 3, 3, 3.	12		
4.90	Firm creamish brown and white gravelly sandy CLAY. Gravel of fine rounded chalk and rare fine angular to sub-rounded flint.		T	4.0	(3, 3) 3, 3, 3, 4.	13		
5.00	CHALK (recovered as a white cobble of weak medium dense chalk).			5.0	(12, 12) 13, 13, 13, 11/60.	> 50		
	Borehole Terminated							

Notes:

A: 250ml and 60ml Amber Glass Jars
T: Plastic Tub (1Kg)
SPT: Standard Penetration Test
HSV: Hand Shear Vane
PP: Pocket Penetrometer
PID: Photo-Ionisation Detector

Plant: Archway Competitior Dart

Water observations: No groundwater was encountered.

General remarks:

Logged by: MB | Checked by: CH | Approved by: RE

DYNAMIC SAMPLING RECORD

Project Title: Bonhams Field, Yapton

Borehole: WS3

Project No: 1608013.001

Dates: 5th September 2016

Client: Seaward Properties Ltd

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Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.30	MADE GROUND / NEAR SURFACE MATERIALS Dark brown slightly silty clay with many rootlets.							
0.70	MADE GROUND / NEAR SURFACE MATERIALS Dark brown slightly clayey slightly sandy silt with a friable texture.							
1.00	Stiff orangish brownslightly sandy slightly clayey SILT. Frequent bioturbation holes and occasional rootlets.		T	1.0	(1, 1) 1, 1, 2, 2.	6	HSV @ 0.8m = 75, 80, 75 kPa	
1.40	Firm medium to high strength brown slightly silty CLAY. Frequent bioturnation holes and rare rootlets.						HSV @ 1.2m = 75, 80, 75 kPa	
	Firm medium to high strength orangish brown slightly sandy CLAY.		T					
2.80	Soft to firm low to medium strength orangish brown sandy CLAY. Occasional black organic material.			2.0	(1, 1) 2, 2, 2, 2.	8	HSV @ 1.75m = 45, 50, 55 kPa	
3.00	Very soft to soft very low to low strength orange brown locally grey mottled sandy CLAY.			3.0	(2, 3) 3, 3, 3, 3.	12	HSV @ 2.9m = 25, 25, 30 kPa	
3.25	Soft to firm low to medium strength orangish brown very sandy CLAY.						HSV @ 3.1 = 50, 45, 40 kPa	
3.70	Firm gravelly very sandy CLAY with gravel of fine sub-rounded chalk.							
3.95	Light brown slightly clayey SAND						PP @ 3.8m = 0.75, 0.5, 0.75, 1.25, 1.0 kg/cm2	
5.00	Structureless CHALK composed of cream gravelly sandy SILT. Clasts are weak, medium density, white with localised orange staining and occasional black specks. (Grade Dm)		T	4.0	(2, 2) 2, 2, 3, 3.	10		
	Borehole Terminated			5.0	(7, 7) 8, 8, 9, 9.	34		

Notes:

A: 250ml and 60ml Amber Glass Jars
T: Plastic Tub (1Kg)
SPT: Standard Penetration Test
HSV: Hand Shear Vane
PP: Pocket Penetrometer
PID: Photo-Ionisation Detector

Plant: Archway Competitior Dart

Water observations: No groundwater was encountered.

General remarks:

Logged by: MB | Checked by: CH | Approved by: RE

DYNAMIC SAMPLING RECORD

Project Title: Bonhams Field, Yapton	**Borehole:** WS4
Project No: 1608013.001	**Dates:** 5th September 2016
Client: Seaward Properties Ltd	

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Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.10	MADE GROUND Dark brown clayey silt with frequent rootlets.							Concrete
0.30	MADE GROUND Brown silt with rare fine gravel of red brick and chalk.		A					Bentonite
0.60	MADE GROUND Dark brown slightly sandy silt with occasional gravel of chalk and rare gravel of red brick.							
	Firm locally stiff orangish brown slightly clayey SILT with occasional fine gravel of chalk and rare fine gravel of sub-angular flint. Rare rootlets.			1.0	(2, 3) 2, 2, 3, 3.	10	PP @ 1.2m = 2.25, 3.25, 2.5, 3.5, 2.5 kg/cm2	
1.30								3-6mm Pea Gravel
1.60	Firm to stiff medium to high strength orangish brown slightly sandy slightly silty CLAY. Rare gravel of fine angular flint and rare coarse sand of chalk.						HSV @ 1.5m = 70, 85, 80 kPa	
			T					
	Firm to stiff cream gravelly sandy CLAY. Gravel of fine to medium sub-angular chalk and rare sub-angular flint.			3.0	(2, 3) 3, 2, 3, 2.	9		
2.45								
	Soft to firm low to medium strength creamish brown very sandy CLAY with rare fine gravel of sub-angular chalk.						HSV @ 2.5m = 45, 45, 45 kPa	
2.80								
3.00	Firm cream slightly sandy gravelly CLAY with gravel of fine angular to sub-rounded chalk and rare cobbles of flint.			3.8	(7, 7) 7, 7, 8, 14.	36		50mm HPDE pipe
	Structureless CHALK composed of cream gravelly sandy SILT. Clasts are weak, medium density, white with localised orange staining and occasional black specks. With occasional locally frequent cobbles of flint. (Grade Dm)		T					
3.70					(13, 18/60) 14, 16, 16, 4/10.	>50	SPT refusing on flints.	
	Borehole Terminated			4.0				
				5.0				

Notes:
- A: 250ml and 60ml Amber Glass Jars
- T: Plastic Tub (1Kg)
- SPT: Standard Penetration Test
- HSV: Hand Shear Vane
- PP: Pocket Penetrometer
- PID: Photo-Ionisation Detector

Plant: Archway Competitior Dart

Water observations: No groundwater was encountered.

General remarks:

Logged by: MB | Checked by: CH | Approved by: RE

ARUN DISTRICT COUNCIL Y/1/17/OUT

DYNAMIC SAMPLING RECORD

Project Title: Bonhams Field, Yapton

Borehole: WS5

Project No: 1608013.001

Dates: 5th September 2016

Client: Seaward Properties Ltd

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Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.20	MADE GROUND / NEAR SURFACE MATERIALS Brown clayey silt with many rootlets.							
0.30	MADE GROUND / NEAR SURFACE MATERIALS Brown locally grey and orange mottled sandy silt							
0.90	Stiff brown slightly clayey SILT with a friable texture and frequent bioturbation holes and occasional rootlets.						PP @ 0.8m = 3.5, 4.5, >5, >5, 4.75 kg/cm2	
				1.0	(1, 1) 2, 2, 2, 2.	8		
1.95	Firm to stiff medium to high strength orangish brown slightly sandy silty CLAY with rare organic material and rare rootlets.						PP @ 1.1m = 2.5, 2.5, 2, 3, 2.25 kg/cm2 HSV @ 1.3m= 75, 85, 75 kPa	
2.45	Soft to firm low to medium strength orange and grey mottled very sandy CLAY. Rare gravel of fine angular to sub-angular flint and rare chalk.			2.0	(2, 2) 2, 2, 2, 2.	8	HSV @ 1.9m = 70, 75, 75 kPa	
2.60	Soft low to medium strength very sandy CLAY.						HSV @ 2.35m = 40, 50, 45 kPa HSV @ 2.5m = 45, 45, 50 kPa	
4.00	Stiff white and orange brown very gravelly sandy CLAY with gravel of fine sub-angular chalk.		T	3.0	(2, 5) 5, 5, 4, 4.	18		
5.00	Structureless CHALK composed of cream gravelly sandy SILT. Clasts are extremely weak to very weak, low to medium density, white with localised orange staining and occasional black specks. With occasional medium sub-angular flint. (Grade Dm)		T	4.0	(6, 7) 6, 6, 6, 21.	39		
	Borehole Terminated			5.0	(5, 4) 7, 7, 7, 7.	28		

Notes:

A: 250ml and 60ml Amber Glass Jars
T: Plastic Tub (1Kg)
SPT: Standard Penetration Test
HSV: Hand Shear Vane
PP: Pocket Penetrometer
PID: Photo-Ionisation Detector

Plant: Archway Competitior Dart

Water observations: Groundwater encountered at 5mbgl in SPT sample.

General remarks:

Logged by: MB | Checked by: CH | Approved by: RE

DYNAMIC SAMPLING RECORD

Project Title: Bonhams Field, Yapton

Borehole: WS6

Project No: 1608013.001

Dates: 5th September 2016

Client: Seaward Properties Ltd

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Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.10	MADE GROUND / NEAR SURFACE MATERIALS Dark brown silty clay with many rootlets.							
	Stiff light brown slightly sandy clayey SILT with a friable texture and frequent bioturbation holes and occasional rootlets.		T				PP @ 0.5m = >5, >5, >5, >5, >5 kg/cm2	
0.90								
	Firm to stiff high strength orangish brown slightly sandy silty CLAY with occasional black organic relics.			1.0	(1, 1) 2, 2, 2, 2.	8	HSV @ 0.9m = 110, 110, 125 kPa	
			T				HSV @ 1.2m = 85, 100, 125 kPa	
1.80								
	Stiff cream and orangish brown sandy very gravelly CLAY with gravel of fine to coarse sub-angular chalk.			3.0	(3, 3) 5, 6, 6, 6.	23		
				3.0	(2, 2) 4, 4, 4, 4.	16		
3.60								
	Structureless CHALK composed of cream sandy clayey GRAVEL. Clasts are extremely weak to very weak, low to medium density, white with localised orange staining and occasional black specks. With occasional flint cobbles. (Grade Dc)			4.0	(4, 3) 4, 7, 9, 9.	29		
4.60								
	Weak, medium dense CHALK white with localised orange staining. Occasional flint cobbles.							
5.00								
	Borehole Terminated			5.0	(7, 9) 9, 12, 14, 14.	49		

Concrete

Bentonite

3-6mm Pea Gravel

50mm HPDE pipe

Notes:

A: 250ml and 60ml Amber Glass Jars
T: Plastic Tub (1Kg)
SPT: Standard Penetration Test
HSV: Hand Shear Vane
PP: Pocket Penetrometer
PID: Photo-Ionisation Detector

Plant: Archway Competitior Dart

Water observations: No groundwater was encountered.

General remarks:

Logged by: MB | Checked by: CH | Approved by: RE

ARUN DISTRICT COUNCIL Y/1/17/OUT

TRIAL PIT RECORD:

Project Title: Bonhams Field, Yapton	**Trial Pit:** TP1
Project No: 1608013.001	**Dates:** 6th September 2016
Client: Seaward Properties Ltd	

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Depth (m)	Description	Legend Side B	Depth (m)	Sample Details	Remarks
0.0	Ground Surface		0.00		
0.1	MADE GROUND Brown sandy silt with frequent rootlets.				
0.4	MADE GROUND Light brown slightly sandy silt with a friable texture and occasional gravel of flint and rare gravel of porcelain and red brick.				
0.8	Stiff light brown slightly sandy slightly clayey SILT with a friable texture and occasional gravel of flint.				PP @ 0.6m = 2.5, 2.5, 2.0, 2.5, 2.75 kg/cm2
1.3	Stiff high strength orangish brown slightly sandy silty CLAY with rare fine to medium gravel of angular to sub-rounded flint.		1.00		HSV @ 1.1m = 80, 90, 85 kPa
2.1	Firm to stiff medium to high strength slightly orangish brown slightly gravelly sandy CLAY. Gravel of fine to coarse angular to rounded flint.		2.00		HSV @ 1.4m = 70, 80, 80 kPa HSV @ 2.0m = 80, 75, 80 kPa
2.4	Soft orangish brown slightly gravelly very sandy CLAY. Gravel of fine sub-angular chalk.				PP @ 2.3m = 0.75, 0.75, 0.5, 0.5, 0.5 kg/cm2
	Trial Pit Terminated		3.00		
			4.00		

Excavation Details:	Dimensions:	Notes and Remarks: Soakage test conducted within trial pit.
Date excavated: 06/09/2016 Date backfilled: 06/09/2016 Plant: JCB 3CX Shoring: N/A Stability: Stable	B: 0.5m A: 1.7m	Water observations: No groundwater was encountered.
		Logged by: MB | Checked by: CH | Approved by: RE

TRIAL PIT RECORD:

Project Title: Bonhams Field, Yapton	**Trial Pit:** TP2
Project No: 1608013.001	**Dates:** 6th September 2016
Client: Seaward Properties Ltd	

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Depth (m)	Description	Legend Side B	Depth (m)	Sample Details	Remarks
0.0	Ground Surface		0.00		
0.1	MADE GROUND Brown sandy silt with frequent rootlets.				
0.3	MADE GROUND Light orangish brown brown slightly sandy slightly clayey silt with rare gravel of flint and red brick.				
0.8	Stiff light orangish brown slightly sandy slightly clayey SILT with rare fine gravel of sub-rounded to sub-angular flint.				PP @ 0.6m = >5, >5, >5, 4.75, >5 kg/cm2
1.7	Firm to stiff medium to high strength orangish brown slightly sandy silty CLAY with occasional fine gravel of sub-angular to sub-rounded flint, and rare flint cobbles.		1.00		HSV @ 1.1m = 70, 90, 90 kPa
1.8	Firm to stiff medium to high strength grey and orange mottled slightly sandy CLAY with rare gravel of fine to coarse sub-angular to rounded flint. Occasional black organic material.				HSV @ 1.75m = 70, 80, 90 kPa
	Soft to firm light orangish brown and white sandy very gravelly CLAY. Gravel of sub-angular chalk and rare angular to rounded flint.		2.00		
3.1	Trial Pit Terminated		3.00		
			4.00		

Excavation Details:	Dimensions:	Notes and Remarks: Soakage test conducted within trial pit.
Date excavated: 06/09/2016 Date backfilled: 06/09/2016 Plant: JCB 3CX Shoring: N/A Stability: Stable	B: 0.5m A: 1.85m	Water observations: No groundwater was encountered.
		Logged by: MB | Checked by: CH | Approved by: RE

TRIAL PIT RECORD:

Project Title: Bonhams Field, Yapton	**Trial Pit:** TP3
Project No: 1608013.001	**Dates:** 6th September 2016
Client: Seaward Properties Ltd	

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Depth (m)	Description	Legend Side B	Depth (m)	Sample Details	Remarks
0.0	Ground Surface		0.00		
0.3	MADE GROUND Brown sandy silt with frequent rootlets.				
0.8	Stiff orangish brown slightly sandy SILT with a friable texture and rare fine gravel of angular chert. Frequent bioturbation holes.				
1.4	Firm to stiff medium to high strength orangish brown locally grey mottled slightly sandy CLAY with rare fine gravel of sub-angular to sub-rounded flint and rare flint cobbles.		1.00		HSV @ 1.2m = 70, 80, 80 kPa
2.1	Soft to firm low to medium strength orangish brown slightly sandy CLAY with rare gravel of coarse sub-angular chert.		2.00		HSV @ 2m = 35, 45, 55 kPa
2.6	Soft locally firm low to medium strength orangish brown locally grey mottled very sandy CLAY with rare fine gravel of sub-angular to sub-rounded flint.				HSV @ 2.4m = 35, 45, 55 kPa
3.2	Firm orangish brown and white gravelly very sandy CLAY with frequent fine gravel of sub-angular chalk and occasional fine to coarse gravel of sub-angular to sub-rounded flint.		3.00		
3.5	Structureless CHALK composed of gravelly sandy SILT. Gravel is weak, medium density, white with brown and orange staining. (Grade Dm)				
	Trial Pit Terminated		4.00		

Excavation Details:	Dimensions:	Notes and Remarks:
Date excavated: 06/09/2016 Date backfilled: 06/09/2016 Plant: JCB 3CX Shoring: N/A Stability: Stable	B: 0.5m A: 1.8m	Water observations: No groundwater was encountered.

Logged by: MB	Checked by: CH	Approved by: RE

TRIAL PIT RECORD:

Project Title: Bonhams Field, Yapton	**Trial Pit:** TP4
Project No: 1608013.001	**Dates:** 6th September 2016
Client: Seaward Properties Ltd	

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Depth (m)	Description	Legend Side B	Depth (m)	Sample Details	Remarks
0.0	Ground Surface		0.00		
0.1	MADE GROUND Brown slightly sandy slightly clayey silt with frequent rootlets.				
	Stiff orangish brown sandy SILT with a friable texture.				
0.6					
	Stiff high strength orangish brown slightly sandy silty CLAY.				HSV @ 0.7m = 125, 135, 150 kPa PP @ 0.85m = 3.5, 4, 4.5, 4.25, > 5 kg/cm2
0.9					
	Firm creamish brown gravelly clayey SILT with frequent fine sub-angular chalk and occasional coarse sub-rounded flint.		1.00		
			2.00		
2.4					
	Structureless CHALK composed of cream gravelly sandy SILT. Gravel is very weak, medium density, white with brown and orange staining and sub-angular. (Grade Dm)		3.00		
3.4					
	Structureless CHALK composed of white gravelly very sandy SILT. Gravel is very weak, medium density, white with brown and orange staining and sub-angular to sub-rounded. (Grade Dm)			D	
4.0			4.00		
	Trial Pit Terminated				

Excavation Details:	Dimensions:	Notes and Remarks:
Date excavated: 06/09/2016 Date backfilled: 06/09/2016 Plant: JCB 3CX Shoring: N/A Stability: Stable	B: 0.5m A: 1.85m	A: 250ml and 60ml Amber Glass Jars D: Disturbed Sample Water observations: No groundwater was encountered.

Logged by: MB	Checked by: CH	Approved by: RE

TRIAL PIT RECORD:

Project Title: Bonhams Field, Yapton	**Trial Pit:** TP5
Project No: 1608013.001	**Dates:** 6th September 2016
Client: Seaward Properties Ltd	

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Depth (m)	Description	Legend Side B	Depth (m)	Sample Details	Remarks
0.0	Ground Surface				
0.2	MADE GROUND Dark brown slightly sandy slightly clayey silt with frequent rootlets.		0.00	A	
0.8	Stiff orangish brown slightly sandy SILT with a friable texture.				PP @ 0.7m = 4.5, 4, 5, 4.25, 5 kg/cm2
2.0	Stiff high strength orangish brown slightly sandy silty CLAY.		1.00		HSV @ 1.1m = 100, 100, 150 kPa
2.4	Firm to stiff medium to high strength orangish brown silty CLAY		2.00		HSV @ 2.2m = 80, 90, 75 kPa
3.2	Very soft creamish brown slightly gravelly very sandy CLAY. Gravel of fine sub-angular chalk.		3.00		PP @ 3m = <0.5, <0.5, <0.5, <0.5, <0.5 kg/cm2
	Trial Pit Terminated		4.00		

Excavation Details:	Dimensions:	Notes and Remarks:
Date excavated: 06/09/2016 Date backfilled: 06/09/2016 Plant: JCB 3CX Shoring: N/A Stability: Stable	B: 0.45m A: 1.85m	A: 250ml and 60ml Amber Glass Jars D: Disturbed Sample Water observations: No groundwater was encountered.

Logged by: MB | Checked by: CH | Approved by: RE

TRIAL PIT RECORD:

Project Title: Bonhams Field, Yapton	**Trial Pit:** TP6
Project No: 1608013.001	**Dates:** 6th September 2016
Client: Seaward Properties Ltd	

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Depth (m)	Description	Legend Side B	Depth (m)	Sample Details	Remarks
0.0	Ground Surface				
	MADE GROUND Dark brown sandy silt with frequent rootlets.		0.00	A	
0.3					
0.4	MADE GROUND Dark brown gravelly very sandy silt with rare gravel of red brick and chert.				
	Stiff orangish brown locally grey slightly gravelly sandy CLAY with rare gravel of angular to sub-rounded flint and fine sub-angular chalk.				PP @ 0.8m = 2.25, 2.5, 2.25, 2, 2.5 kg/cm2
			1.00		
1.3					
	Firm light brown slightly gravelly slightly sandy CLAY with gravel of fine sub-angular chalk.				PP @ 1.8m = 2, 2, 2.5, 2.5, 2.25 kg/cm2
			2.00		
2.4					
	Structureless CHALK composed of white cream very gravelly SILT. Gravel is extremely weak, low density, white with frequent black specks and brown staining. Rare cobbles of flint. (Grade Dm)				
3.0			3.00		
	Trial Pit Terminated				
			4.00		

Excavation Details:	Dimensions:	Notes and Remarks:
Date excavated: 06/09/2016 Date backfilled: 06/09/2016 Plant: JCB 3CX Shoring: N/A Stability: Stable	B: 0.45m A: 1.85m	A: 250ml and 60ml Amber Glass Jars D: Disturbed Sample Water observations: No groundwater was encountered.

Logged by: MB | Checked by: CH | Approved by: RE

TRIAL PIT RECORD:

Project Title: Bonhams Field, Yapton	**Trial Pit:** TP7
Project No: 1608013.001	**Dates:** 6th September 2016
Client: Seaward Properties Ltd	

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Depth (m)	Description	Legend Side B	Depth (m)	Sample Details	Remarks
0.0	Ground Surface				
0.1	MADE GROUND / NEAR SURFACE MATERIALS Dark brown slightly clayey sandy silt with frequent rootlets.		0.00	A	
	Firm to stiff slightly clayey sandy SILT				
0.8					
	Firm to stiff medium to high strength orangish brown slightly gravelly sandy CLAY with gravel of angular to sub-rounded flint.		1.00		HSV @ 1m = 70, 85, 70 kPa
1.8					
	Soft to firm low to medium strength orangish brown slightly gravelly sandy CLAY with gravel of fine to coarse angular to sub-rounded flint.		2.00		HSV @ 1.9m = 60, 50, 60 kPa HSV @ 2.4m = 45, 50, 50 kPa
2.6					
	Soft to firm low to medium strength very sandy CLAY with occasional coarse gravel of andular to sub-rounded flint.				HSV @ 2.8m = 35, 35, 50 kPa
3.0	...Localised pockets of slightly sandy clay.		3.00	D	
	Structureless CHALK composed of white very gravelly SILT. Gravel is very weak, medium density, white with frequent black speck and brown staining. Rare cobbles of flint. (Grade Dm)				
3.3	Trial Pit Terminated				
			4.00		

Excavation Details:	Dimensions:	Notes and Remarks:
Date excavated: 06/09/2016 Date backfilled: 06/09/2016 Plant: JCB 3CX Shoring: N/A Stability: Stable	B: 0.45m A: 1.85m	A: 250ml and 60ml Amber Glass Jars D: Disturbed Sample Water observations: No groundwater was encountered.

Logged by: MB | Checked by: CH | Approved by: RE

TRIAL PIT RECORD:

Project Title: Bonhams Field, Yapton	**Trial Pit:** TP8
Project No: 1608013.001	**Dates:** 6th September 2016
Client: Seaward Properties Ltd	

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Depth (m)	Description	Legend Side B	Depth (m)	Sample Details	Remarks
0.0	Ground Surface				
0.1	MADE GROUND / NEAR SURFACE MATERIALS Dark brown sandy silt with frequent rootlets.		0.00	A	
	Stiff slightly clayey sandy SILT.				
0.8	Firm to stiff medium to high strength orangish brown slightly sandy CLAY with rare cobbles of flint.		1.00		HSV @ 1m = 80, 90, 85 kPa
			2.00		HSV @ 1.9m = 75, 75, 65 kPa
2.4	Soft to firm low to medium strength slightly gravelly very sandy CLAY with fine gravel of sub-angular chalk and rare fine to medium angular flint.				HSV @ 2.4m = 35, 35, 45 kPa
			3.00		HSV @ 3m = 75, 60, 50 kPa
3.7	Structureless CHALK composed of white very gravelly SILT. (Grade Dm)				
	Trial Pit Terminated		4.00		

Excavation Details:	Dimensions:	Notes and Remarks:
Date excavated: 06/09/2016 Date backfilled: 06/09/2016 Plant: JCB 3CX Shoring: N/A Stability: Stable	B: 0.45m A: 1.85m	A: 250ml and 60ml Amber Glass Jars D: Disturbed Sample Water observations: No groundwater was encountered.

Logged by: MB	Checked by: CH	Approved by: RE

APPENDIX F

Geochemical Certificates of Analysis

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Analytical Report Number : 16-27338

Project / Site name:	Bonhams Field, Yapton	**Samples received on:**	09/09/2016
Your job number:	1608013.001	**Samples instructed on:**	09/09/2016
Your order number:		**Analysis completed by:**	22/09/2016
Report Issue Number:	1	**Report issued on:**	22/09/2016
Samples Analysed:	8 soil samples		

Signed:

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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

Analytical Report Number: 16-27338

Project / Site name: Bonhams Field, Yapton

Lab Sample Number				627053	627054	627055	627056	627057
Sample Reference				WS1	WS3	WS4	TP3	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.20	0.05-0.10	0.30-0.60	0.00-0.10	0.00-0.20
Date Sampled				05/09/2016	05/09/2016	05/09/2016	06/09/2016	06/09/2016
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	12	16	15	13	14
Total mass of sample received	kg	0.001	NONE	0.40	0.42	0.39	0.44	0.42
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	5.8	5.8	7.8	5.6	6.3
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	590	-	1100	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013	0.018	0.11	0.014	0.015
Sulphide	mg/kg	1	MCERTS	17	5.0	2.1	7.3	3.2
Total Organic Carbon (TOC)	%	0.1	MCERTS	2.7	2.2	3.7	1.9	2.3
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.6	< 1.0	1.5
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	0.18	< 0.10	0.41	< 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	1.7	< 0.10	1.3	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	1.5	< 0.10	1.1	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.92	< 0.10	0.51	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	1.1	< 0.05	0.75	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	1.3	< 0.10	0.99	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.53	< 0.10	0.49	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.92	< 0.10	0.78	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.48	< 0.10	0.41	< 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	0.57	< 0.05	0.49	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	9.25	< 1.60	7.18	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	8.4	5.4	8.4	6.2
Barium (aqua regia extractable)	mg/kg	1	MCERTS	63	52	80	52	52
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.81	0.59	0.60	0.63	0.59
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	< 0.2	2.2	0.3	1.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	< 0.2	0.3	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32	25	24	27	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	14	21	15	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	71	55	83	41	38
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	< 0.3	0.6	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	14	17	15	15
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.4	2.2	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	49	36	36	40	36
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	62	100	61	49

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Analytical Report Number: 16-27338

Project / Site name: Bonhams Field, Yapton

Lab Sample Number				627053	627054	627055	627056	627057
Sample Reference				WS1	WS3	WS4	TP3	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.20	0.05-0.10	0.30-0.60	0.00-0.10	0.00-0.20
Date Sampled				05/09/2016	05/09/2016	05/09/2016	06/09/2016	06/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	-
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	< 10	-	46	-	-
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	< 2.0	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	< 8.0	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	< 8.0	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	< 10	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	< 2.0	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	< 10	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	-	28	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	33	-	-

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Analytical Report Number: 16-27338

Project / Site name: Bonhams Field, Yapton

Lab Sample Number				627058	627059	627060		
Sample Reference				TP6	TP7	TP8		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.30-0.40	0.00-0.15	0.00-0.15		
Date Sampled				06/09/2016	06/09/2016	06/09/2016		
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	12	13	12		
Total mass of sample received	kg	0.001	NONE	0.40	0.43	0.41		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.7	5.6	5.7		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	-		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.014	0.014	0.043		
Sulphide	mg/kg	1	MCERTS	28	< 1.0	< 1.0		
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.8	2.1	2.8		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	2.1		
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	0.74	0.43	0.39		
Pyrene	mg/kg	0.1	MCERTS	0.61	0.34	0.36		
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.34	0.18	0.25		
Chrysene	mg/kg	0.05	MCERTS	0.44	0.28	0.27		
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.61	0.30	0.43		
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.28	0.19	0.22		
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.41	0.24	0.30		
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.26	< 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	0.31	< 0.05	< 0.05		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	4.00	1.96	2.22		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	9.0	11		
Barium (aqua regia extractable)	mg/kg	1	MCERTS	58	56	59		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.87	0.59	0.67		
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	< 0.2	1.1		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	24	25		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	17	16		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	63	56	55		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.9	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	14	16		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	44	34	38		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	68	65	90		

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Analytical Report Number: 16-27338

Project / Site name: Bonhams Field, Yapton

Lab Sample Number				627058	627059	627060		
Sample Reference				TP6	TP7	TP8		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.30-0.40	0.00-0.15	0.00-0.15		
Date Sampled				06/09/2016	06/09/2016	06/09/2016		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-		
Toluene	µg/kg	1	MCERTS	-	-	-		
Ethylbenzene	µg/kg	1	MCERTS	-	-	-		
p & m-xylene	µg/kg	1	MCERTS	-	-	-		
o-xylene	µg/kg	1	MCERTS	-	-	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-		
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-		

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Analytical Report Number : 16-27338

Project / Site name: Bonhams Field, Yapton

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
627053	WS1	None Supplied	0.10-0.20	Brown loam and clay with gravel and vegetation.
627054	WS3	None Supplied	0.05-0.10	Brown loam and clay with gravel and vegetation.
627055	WS4	None Supplied	0.30-0.60	Brown loam and clay with gravel and vegetation.
627056	TP3	None Supplied	0.00-0.10	Brown loam and clay with gravel and vegetation.
627057	TP5	None Supplied	0.00-0.20	Brown loam and clay with gravel and vegetation.
627058	TP6	None Supplied	0.30-0.40	Brown loam and clay with gravel and vegetation.
627059	TP7	None Supplied	0.00-0.15	Brown loam and clay with gravel and vegetation.
627060	TP8	None Supplied	0.00-0.15	Brown loam and clay with gravel and vegetation.

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Analytical Report Number : 16-27338

Project / Site name: Bonhams Field, Yapton

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding.	L076-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

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Analytical Report Number : 16-27338

Project / Site name: Bonhams Field, Yapton

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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APPENDIX G

Soil Geotechnical Certificates of Analysis

Summary of Natural Moisture Content, Liquid Limit and Plastic Limit Results

Job No.	Project Name	Programme	
21559	Bonhams Field, Yapton	Samples received	08/09/2016
		Schedule received	09/09/2016
Project No.	Client	Project started	09/09/2016
1608013.001	TEC	Testing Started	20/09/2016

Hole No.	Sample				Soil Description	NMC	Passing 425µm	LL	PL	PI	Remarks
	Ref	Top	Base	Type		%	%	%	%	%	
WS1	-	0.80	-	D	Light brown very silty CLAY with traces of fine rootlets	17	100	43	19	24	
WS1	-	2.90	-	D	Brown gravelly very silty CLAY with occasional fm chalk gravel and fragments (gravel is fmc and sub-angular to angular)	34	50	50	18	32	
WS2	-	0.40	-	D	Brown slightly fine sandy clayey SILT with occasional rootlets	12					
WS2	-	1.00	-	D	Brown silty CLAY with occasional black fleks and rare fine gravel	21	99	47	20	27	
WS2	-	2.00	-	D	Brown slightly gravelly sandy silty CLAY with traces of fine rootlets (gravel is fine and sub-angular)	19	97	33	15	18	
WS3	-	0.80	-	D	Brown silty CLAY	23					
WS3	-	1.50	-	D	Brown very silty CLAY with traces of fine rootlets and occasioanl black flecks	24	100	42	20	22	
WS5	-	3.50	-	D	Pale brown slightly gravelly silty CLAY with occasional putty chalk pockets and fmc intact chalk fragments (gravel is fmc and sub-angular to angular)	14	80	25	13	12	
WS6	-	0.50	-	D	Brown clayey SILT with numerous fine rootlets	12	100	37	19	18	

Test Methods: BS1377: Part 2: 1990:
Natural Moisture Content : clause 3.2
Atterberg Limits: clause 4.3 and 5.0

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU

Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved

Initials J.P

Date: 26/09/2016

UKAS TESTING 2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

MSF-5-R1

ARUN DISTRICT COUNCIL Y/1/17/OUT

Saturation Moisture Content - Summary of Results
Tested in accordance with BS1377 : Part 2 : 1990, clause 3.3 unless annotated otherwise.

Job No.	Project Name	Programme	
21559	Bonhams Field, Yapton	Samples received	08/09/2016
		Schedule received	09/09/2016
Project No.	Client	Project started	09/09/2016
1608013.001	TEC	Testing Started	15/09/2016

Hole No.	Sample				Description	SMC	NMC	Bulk Density	Dry Density	Remarks - Sample size complies with BS1377:1990: Part 2 (Yes/No)
	Ref	Top	Base	Type		%	%	Mg/m3	Mg/m3	
TP4	-	3.70	-	D	Off white coarse CHALK fragments	24	23	2.03	1.65	No
TP7	-	3.00	-	D	Off white coarse CHALK fragments	26	26	2.01	1.60	No

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved

Initials **J.P**

Date: **26/09/2016**

2519 Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) MSF-5-R18

Sulphate Content (Gravimetric Method) for 2:1 Soil: Water Extract and pH Value - Summary of Results

Tested in accordance with BS1377 : Part 3 : 1990, clause 5.3 and clause 9

Job No.	Project Name	Programme	
21559	Bonhams Field, Yapton	Samples received	08/09/2016
		Schedule received	09/09/2016
Project No.	Client	Project started	09/09/2016
1608013.001	TEC	Testing Started	22/09/2016

Hole No.	Sample				Soil description	Dry Mass passing 2mm	SO3 Content	SO4 Content	pH	Remarks
	Ref	Top	Base	Type		%	g/l	g/l		
WS1	-	0.80	-	D	Light brown very silty CLAY with traces of fine rootlets	100	0.19	0.22	7.40	
WS2	-	2.00	-	D	Brown slightly gravelly sandy silty CLAY with traces of fine rootlets (gravel is fine and sub-angular)	99	0.12	0.15	7.61	
WS2	-	3.30	-	D	Brown slightly gravelly sandy silty CLAY with pockets of putty chalk and occasional fmc intact chalk fragments (gravel is fm and sub-angular to angular)	85	0.13	0.16	7.78	
WS5	-	3.50	-	D	Pale brown slightly gravelly silty CLAY with occasional putty chalk pockets and fmc intact chalk fragments (gravel is fmc and sub-angular to angular)	85	0.17	0.20	7.80	
WS5	-	4.50	-	D	Off white slightly gravelly putty CHALK with traces of fm intact chalk fragments (gravel is fm and sub-angular to angular)	85	0.15	0.18	7.75	
WS6	-	0.50	-	D	Brown clayey SILT with numerous fine rootlets	100	0.25	0.30	6.90	
TP3	-	3.30	-	D	Off white slightly gravelly putty CHALK with numerous fmc intact chalk fragments (gravel is fm and sub-angular to angular)	63	0.20	0.24	7.73	

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved

Initials **J.P**

Date: **26/09/2016**

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

MSF-5-R29

APPENDIX H

Ground Gas Monitoring Results

Ground Gas Monitoring Data Sheet

TEC

Name of Site: Bonhams Field, Yapton

Project Code: 1608013

Date: 06/09/2016

Completed by: ML

Authorised by: AK

Equipment

Gas Analyser: GFM430

Condition: Good, calibrated

Dipmeter: Blue 100m

Condition: Good

Last Three Days

Atmospheric Trend: 1011-1023mbar (generally rising)

Temperature Range: 16-21°c

Rainfall: 0.0-2.8mm

On-site Weather Conditions: Humid, overcast, no wind

General Site Conditions / Ground Conditions / On site Activities: Trial pitting. No other activities.

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	LEL (%)	Groundwater Level	Borehole Depth	Comments
BH ref: WS1	0	0.0	0	0.0	0.0	20.1						
Time: 10:03	15	0-1.5	0-5	0.0	1.0	19.9						
Atmospheric Pressure (mb)	30	0-28	0-15	0.0	1.0	20.2						
Before: 1026	45	0.0	0	0.0	1.3	19.7						
After: 1016	60	0.0	0	0.0	1.7	19.6						
Well Condition: Good	120	0-0.9	0-2	0.0	1.1	19.5						
	180	0.0	0	0.0	1.2	19.3						
Well Diameter:50mm	240			0.0	1.3	19.3	Fault recorded with H2S and CO Flow cells					
	300			0.0	1.4	19.2						
	360			0.0	1.8	19.0						
	420			0.0	1.9	18.9						
	480			0.0	1.9	18.8						
	540			0.0	2.0	18.8						
	600			0.0	2.0	18.8						
	660			0.0	1.9	18.9				4.00	4.94	
	720			0.0	1.9	19.0						

Ground Gas Monitoring Data Sheet

TEC

Name of Site: Bonhams Field, Yapton

Project Code: 1608013

Date: 06/09/2016

Completed by: ML

Authorised by: AK

Equipment

Gas Analyser: GFM430

Condition: Good, calibrated

Dipmeter: Blue 100m

Condition: Good

Last Three Days

Atmospheric Trend: 1011-1023mbar (generally rising)

Temperature Range: 16-21°c

Rainfall: 0.0-2.8mm

On-site Weather Conditions: Humid, overcast, no wind

General Site Conditions / Ground Conditions / On site Activities: Trial pitting. No other activities.

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS4	0	0.1	1	1.4	4.0	18.4	-	-	0			
Time: 9:35	15	0.3	1	0.0	3.2	18	0	3	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	3.3	18.0	0	2	0			
Before: 1027	45	0.3	0-1	0.0	3.3	17.9	0	3	0			
After: 1016	60	0-0.1	0-1	0.0	3.5	17.9	0	1	0			
Well Condition: Good	120	0-1.0	0-4	0.0	3.5	17.3	6	2	0			
	180	0-0.3	0-1	0.0	3.6	17.7	0	4	0			
Well Diameter:50mm	240			0.0	3.8	17.7	1	2	0			
	300			0.0	3.8	17.6	0	3	0			
										Dry	3.49	

Ground Gas Monitoring Data Sheet

TEC

Name of Site: Bonhams Field, Yapton

Project Code: 1608013

Date: 06/09/2016

Completed by: ML

Authorised by: AK

Equipment

Gas Analyser: GFM430

Condition: Good, calibrated

Dipmeter: Blue 100m

Condition: Good

Last Three Days

Atmospheric Trend: 1011-1023mbar (generally rising)

Temperature Range: 16-21°c

Rainfall: 0.0-2.8mm

On-site Weather Conditions: Humid, overcast, no wind

General Site Conditions / Ground Conditions / On site Activities: Trial pitting. No other activities.

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS6	0	0.0	0	0.0	0.1	19.8	0	3	0			
Time: 9:49	15	0.0	0	0.0	0.4	20.4	0	3	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	0.5	20.4	0	5	0			
Before: 1026	45	0-0.2	0	0.0	0.5	19.9	0	1	0			
After: 1016	60	0-0.4	0	0.0	0.5	19.9	1	0	0			
Well Condition: Good	120	0-0.2	0	0.0	0.5	19.8	2	5	0			
	180	0-0.2	0	0.0	0.5	19.7	3	1	0			
Well Diameter:50mm	240											
	300											
										4.45	4.99	

Ground Gas Monitoring Data Sheet

TEC

Name of Site: Bonhams Field, Yapton

Project Code: 1608013

Date: 20/ 09/ 2016

Completed by: ET

Authorised by: AK

Equipment

Gas Analyser: GFM430

Condition: Good, calibrated

Dipmeter: Blue 100m

Condition: Good

Last Three Days

Atmospheric Trend: 1018-1021mbar

Temperature Range: 13-20°c

Rainfall: 0.0-0.4mm

On-site Weather Conditions: Overcast and warm with a light breeze

General Site Conditions / Ground Conditions / On site Activities: Ankle length grass cover. Damp.

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/ hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (% v/ v)	CO2 (% v/ v)	O2 (% v/ v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS1	0	0.0		0.0	0.0	20.1	2	0				
Time: 13:56	60			0.0	3.8	18.0	2	0				
Atmospheric Pressure (mb)	180			0.0	4.0	17.8	2	0				
Before: 1021	300			0.0	4.1	17.7	2	0				
After: 1021	480			0.0	3.5	18.4	2	0				
Well Condition: Good	540			0.0	3.5	18.4	2	0				
Well Diameter:50mm												H2S reading 2ppm in air
										3.99	4.98	

Ground Gas Monitoring Data Sheet

Name of Site: Bonhams Field, Yapton

Project Code: 1608013

Date: 20/ 09/ 2016

Completed by: ET

Authorised by: AK

Equipment

Gas Analyser: GFM430

Condition: Good, calibrated

Dipmeter: Blue 100m

Condition: Good

Last Three Days

Atmospheric Trend: 1018-1021mbar

Temperature Range: 13-20°c

Rainfall: 0.0-0.4mm

On-site Weather Conditions: Overcast and warm with a light breeze

General Site Conditions / Ground Conditions / On site Activities: Ankle length grass cover. Damp.

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/ hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (% v/ v)	CO2 (% v/ v)	O2 (% v/ v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS4	0	-0.1		0.0	0.0	20.4	2	0				
Time: 13:28	20	0.0		0.0	3.8	18.0	2	0				
Atmospheric Pressure (mb)	180	0.0		0.0	3.8	18.0	2	0				
Before: 1021												
After: 1021												
Well Condition: Good												
Well Diameter:50mm												H2S reading 2ppm in air
										Dry	3.54	

Ground Gas Monitoring Data Sheet

TEC

Name of Site: Bonhams Field, Yapton

Project Code: 1608013

Date: 20/ 09/ 2016

Completed by: ET

Authorised by: AK

Equipment

Gas Analyser: GFM430

Condition: Good, calibrated

Dipmeter: Blue 100m

Condition: Good

Last Three Days

Atmospheric Trend: 1018-1021mbar

Temperature Range: 13-20°c

Rainfall: 0.0-0.4mm

On-site Weather Conditions: Overcast and warm with a light breeze

General Site Conditions / Ground Conditions / On site Activities: Ankle length grass cover. Damp.

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/ hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (% v/ v)	CO2 (% v/ v)	O2 (% v/ v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS6	0	0.0		0.0	0.0	20.3	2	0				
Time: 13:38	240	0.0		0.0	3.0	18.6	2	0				
Atmospheric Pressure (mb)	300	0.0		0.0	3.2	18.5	2	0				
Before: 1021	480	0.0		0.0	3.5	18.4	2	0				
After: 1021	600	0.0		0.0	3.5	18.4	2	0				
Well Condition: Good												
Well Diameter:50mm												H2S reading 2ppm in air
										4.57	5.00	

Ground Gas Monitoring Data Sheet

Name of Site: Bonhams Field, Yapton

Project Code: 1608013

Date: 24/ 11/ 2016

Completed by: ST

Authorised by: AK

Equipment

Gas Analyser: GFM430

Condition: Good, calibrated

Dipmeter: Green dip meter

Condition: Good

Last Three Days

Atmospheric Trend:)85-1016mbar (Generally increasing

Temperature Range: 2-12°C

Rainfall: 0.0mm

On-site Weather Conditions: Cloudy with light breeze

General Site Conditions / Ground Conditions / On site Activities: Ankle length grass cover. Damp.

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/ hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (% v/ v)	CO2 (% v/ v)	O2 (% v/ v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS1	0	0.0	0	0.0	0.1	20.4	0	0	0			
Time: 09:56	15	0.0	0	0.0	0.5	20.7	0	0	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	0.4	20.5	0	0	0			
Before: 1013	45	0.0	0	0.0	0.6	20.5	0	0	0			
After: 1013	60	0.0	0	0.0	0.4	20.4	0	0	0			
Well Condition: Good	120	0.0	0	0.0	0.6	20.3	0	0	0			
	180	0.0	0	0.0	0.5	20.5	0	0	0			
Well Diameter: 50mm	240	0.0	0	0.0	0	20.3	0	0	0			Gas cap not fully secure on install on arrival
	300	0.0	0	0.0	0.3	20.5	0	0	0			
										4.11	4.85	

Ground Gas Monitoring Data Sheet

Name of Site: Bonhams Field, Yapton

Project Code: 1608013

Date: 24/ 11/ 2016

Completed by: ST

Authorised by: AK

Equipment

Gas Analyser: GFM430

Condition: Good, calibrated

Dipmeter: Green dip meter

Condition: Good

Last Three Days

Atmospheric Trend:)85-1016mbar (Generally increasing

Temperature Range: 2-12°C

Rainfall: 0.0mm

On-site Weather Conditions: Cloudy with light breeze

General Site Conditions / Ground Conditions / On site Activities: Ankle length grass cover. Damp.

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/ hr)	DP (Pa)	Gas Concentrations CH4 (% v/ v)	CO2 (% v/ v)	O2 (% v/ v)	H2S (ppm)	CO (ppm)	LEL (%)	Groundwater Level	Borehole Depth	Comments
BH ref: WS4	0	0.0	0	0.0	-	20.1	0	0	0			
Time: 09:37	15	0.0	0	0.0	2.0	18.3	0	0	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	2.1	18.2	0	0	0			
Before: 1018	45	0.0	0	0.0	2.2	18.0	0	0	0			
After: 1017	60	0.0	0	0.0	2.3	17.9	0	0	0			
Well Condition: Good	120	0.0	0	0.0	2.3	17.7	0	0	0			
	180	0.0	0	0.0	2.7	17.4	0	0	0			
Well Diameter: 50mm	240	0.0	0	0.0	2.5	17.6	0	0	0			
	300	0.0	0	0.0	2.8	17.4	0	0	0			
										Dry	3.92	

Ground Gas Monitoring Data Sheet

Name of Site: Bonhams Field, Yapton

Project Code: 1608013

Date: 24/ 11/ 2016

Completed by: ST

Authorised by: AK

Equipment

Gas Analyser: GFM430

Condition: Good, calibrated

Dipmeter: Green dip meter

Condition: Good

Last Three Days

Atmospheric Trend:)85-1016mbar (Generally increasing

Temperature Range: 2-12°C

Rainfall: 0.0mm

On-site Weather Conditions: Cloudy with light breeze

General Site Conditions / Ground Conditions / On site Activities: Ankle length grass cover. Damp.

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/ hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (% v/ v)	CO2 (% v/ v)	O2 (% v/ v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS6	0	0.0	0	0.0	0.3	20.2	0	0	0			
Time: 10:15	15	0.0	0	0.0	0.0	20.8	0	0	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	0.0	20.7	0	0	0			
Before: 1017	45	0.0	0	0.0	0.0	20.7	0	0	0			
After: 1017	60	0.0	0	0.0	0.0	20.7	0	0	0			
Well Condition: Good	120	0.0	0	0.0	0.0	20.7	0	0	0			
	180	0.0	0	0.0	0.0	20.6	0	0	0			
Well Diameter: 50mm	240	0.0	0	0.0	0.0	20.6	0	0	0			
	300	0.0	0	0.0	0.0	20.5	0	0	0			
										4.39	5.00	

APPENDIX I

Soakage Test Results

Trial Pit Soakage Test Summary Sheet

BRE Digest 365 (2007) Soakaway Design

TWEEDIE EVANS CONSULTING

Site:	**Bonhams Field, Yapton**
Test Pit Reference:	**TP1 / SA1**
Site Reference:	1608013.001
Client:	Seaward Properties Ltd
Operator:	ML
Test Date:	6th September 2016

Test 1

Time (min)	Depth (mm bgl)
0	1235
1	1240
2	1243
3	1245
4	1250
5	1256
6	1262
7	1268
8	1271
9	1275
10	1277
15	1288
20	1294
25	1310
30	1326
35	1336
38	1340
47	1357
68	1393
105	1452
174	1516
221	1550
292	1603

Test 2

Time (min)	Depth (mm bgl)

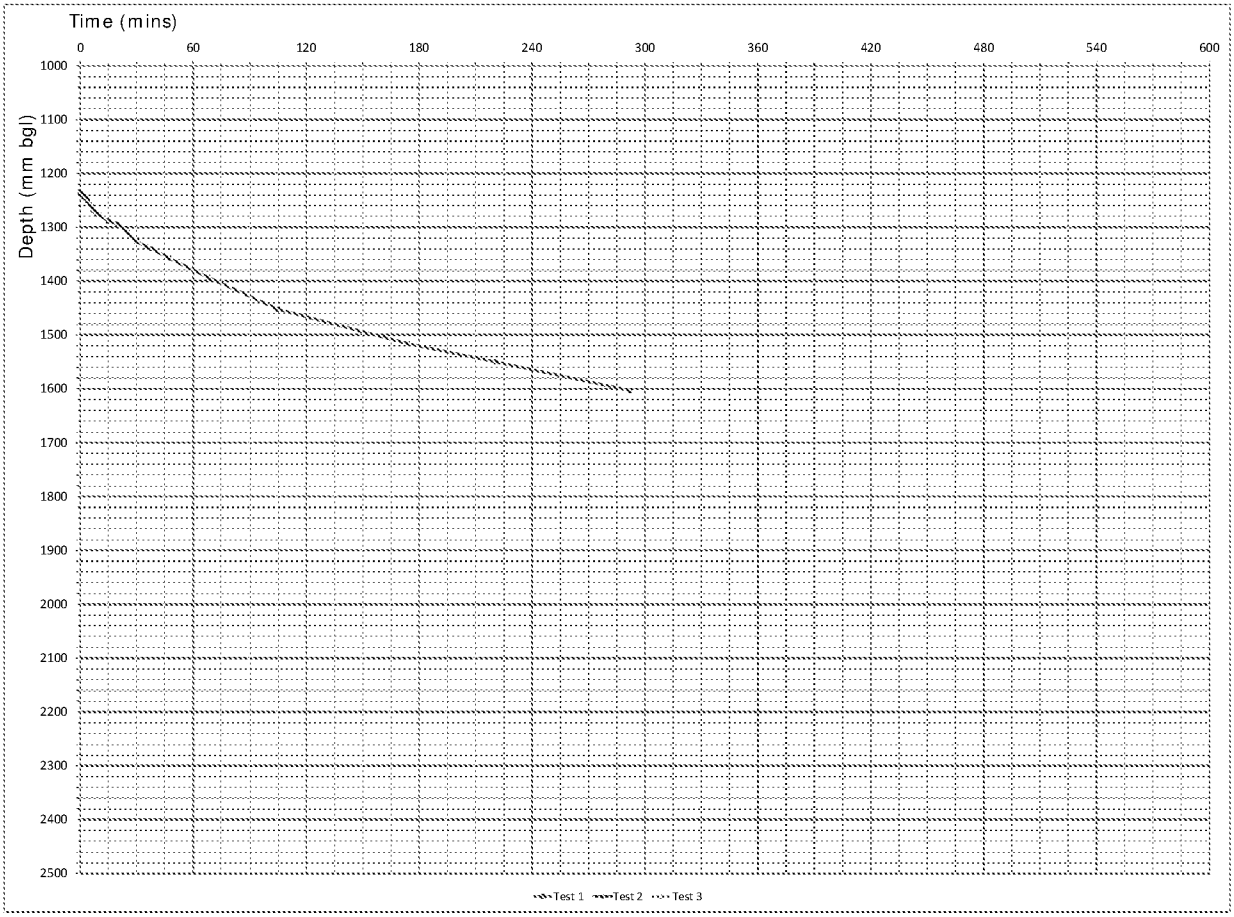
Test 3

Time (min)	Depth (mm bgl)

Ground Conditions / Comments
Dry.
Conducted in predominantly slightly gravelly sandy clay with gravel of chert.
As test 1 failed to drain fully, tests 2 and 3 were not carried out.

Pit reference	TP1 : SA1
Pit depth (m)	2.50
Pit width (m)	0.50
Pit length (m)	1.70
Depth to standing water (m)	-

	Test 1	Test 2	Test 3
Max. depth (mm)	2500		
Effective depth (mm bgl)	1235		
Effective drop (mm)	1265		
25% effective depth (mm bgl)	1551		
50% effective depth (mm bgl)	1868		
75% effective depth (mm bgl)	2184		
t_{25} (min)	224		
t_{75} (min)	900		
V_{p75-25} (m^3)	5.38		
a_{50} (m^2)			
t_{p75-25} (min)			
Soil Infiltration Rate (m/sec)			
Soil Infiltration Rate (mm/hr)			



Infiltration calculated to method in BRE Digest 365 (2007) Soakaway Design

Trial Pit Soakage Test Summary Sheet

BRE Digest 365 (2007) Soakaway Design

TWEEDIE EVANS CONSULTING

Site:	**Bonhams Field, Yapton**
Test Pit Reference:	**TP2 / SA2**
Site Reference:	1608013.001
Client:	Seaward Properties Ltd
Operator:	ML
Test Date:	6th September 2016

Test 1

Time (min)	Depth (mm bgl)
0	1915
1	1990
2	2056
3	2120
4	2179
5	2223
6	2264
7	2302
8	2346
9	2374
10	2406
12	2460
16	2552
18	2580
20	2611
23	2645
25	2652
28	2681
30	2694
34	2709
38	2739
42	2751
45	2760
50	2774
56	2791
61	2803
66	2820

Test 2

Time (min)	Depth (mm bgl)
0	1755
1	1837
2	1891
3	1958
4	2001
5	2052
7	2174
8	2205
9	2239
10	2278
12	2350
15	2417
22	2554
25	2591
30	2628
36	2660
40	2675
46	2700
53	2721
58	2730
66	2742
72	2750
75	2755
80	2758
85	2762
93	2770

Test 3

Time (min)	Depth (mm bgl)
0	1860
2	1942
3	2010
4	2067
5	2121
6	2150
7	2207
8	2230
9	2263
10	2298
13	2385
15	2431
20	2524
25	2563
31	2621
42	2664
47	2680
64	2700
79	2720
92	2740

Ground Conditions / Comments
Dry. Conducted within sandy gravelly clay with gravel of chalk.

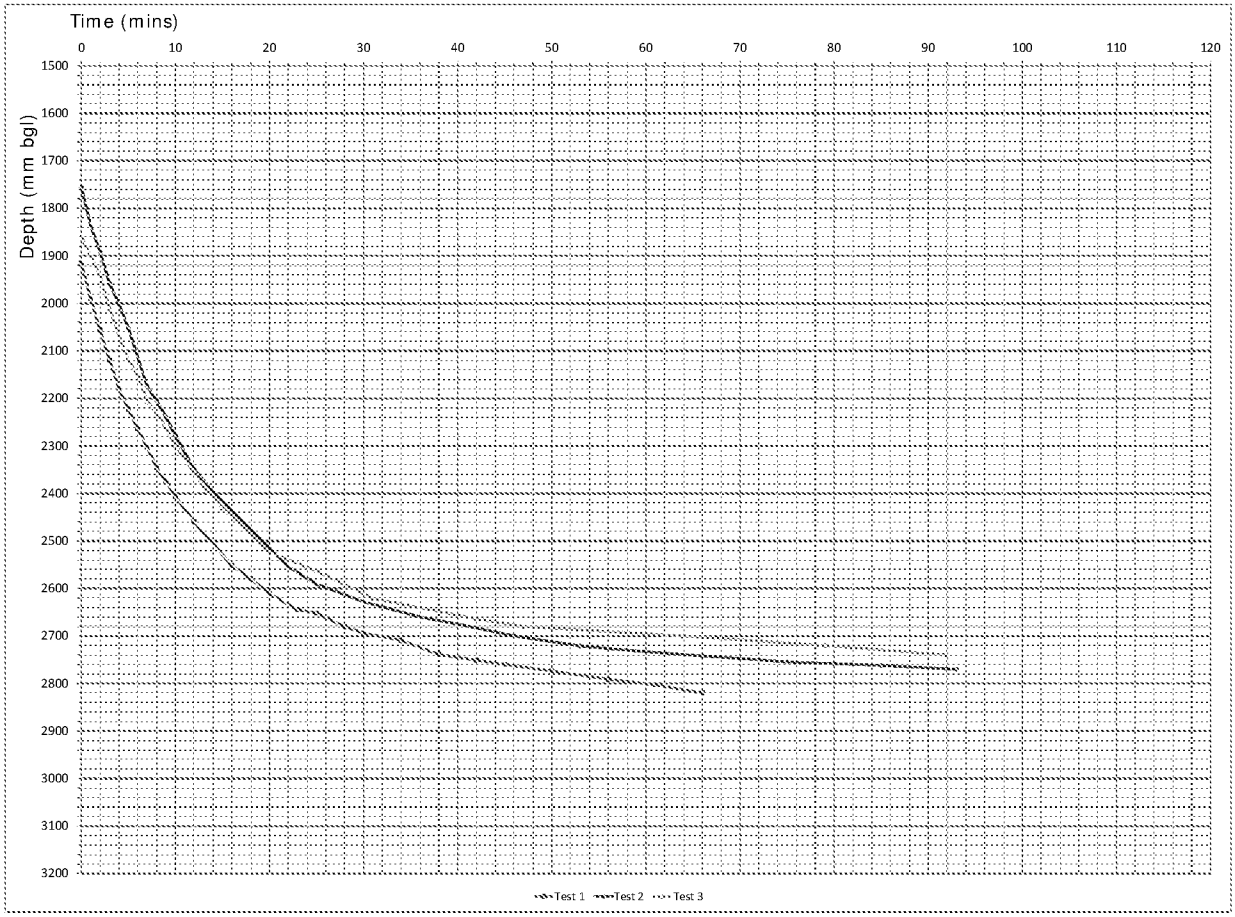
Pit reference	TP2 - SA2
Pit depth (m)	3.015
Pit width (m)	0.50
Pit length (m)	1.85
Depth to standing water (m)	-

	Test 1	Test 2	Test 3
Max. depth (mm)	3015	3015	3015
Effective depth (mm bgl)	1915	1755	1860
Effective drop (mm)	1100	1260	1155
25% effective depth (mm bgl)	2190	2070	2149
50% effective depth (mm bgl)	2465	2385	2438
75% effective depth (mm bgl)	2740	2700	2726

t_{25} (min)	4.2	5.5	6
t_{75} (min)	40	46	67

V_{p75-25} (m^3)	0.51	0.58	0.53
a_{50} (m^2)	3.51	3.89	3.64
t_{p75-25} (min)	36	41	81

Soil Infiltration Rate (m/sec)	**6.75E-05**	**6.17E-05**	**3.02E-05**
Soil Infiltration Rate (mm/hr)	**2.43E+02**	**2.22E+02**	**1.09E+02**



Infiltration calculated to method in BRE Digest 365 (2007) Soakaway Design

APPENDIX J

DCP-TRL Results

Dynamic Cone Penetration Test Data (DCP-TRL)

Bonhams Field, Yapton DCP1

Cumulative Blow Number	Penetration (mm)	Penetration this Blow (mm per blow)	Estimated DPI (mm per blow)	Adjusted CBR (%)
0	16	-	-	-
1	45	29.0	8.6	6.2
2	65	20.0	12.7	9.3
4	97	16.0	16.1	11.9
7	134	12.3	21.2	15.9
10	168	11.3	23.2	17.6
12	196	14.0	18.6	14.2
14	222	13.0	20.1	15.5
17	245	7.7	35.1	27.4
21	273	7.0	38.6	30.5
23	316	21.5	11.8	9.5
25	360	22.0	11.5	9.4
27	402	21.0	12.1	10.0
29	444	21.0	12.1	10.1
31	478	17.0	15.1	12.8
33	516	19.0	13.4	11.6
35	557	20.5	12.4	10.8
37	593	18.0	14.2	12.5
39	637	22.0	11.5	10.3
41	684	23.5	10.7	9.8
43	729	22.5	11.2	10.4
45	773	22.0	11.5	10.8
47	835	31.0	8.0	7.6

	5th September
	Bonhams Field, Yapton
	1608013
	DCP1
	MB
	Topsoil over cohesive superficial deposits
	Moderate

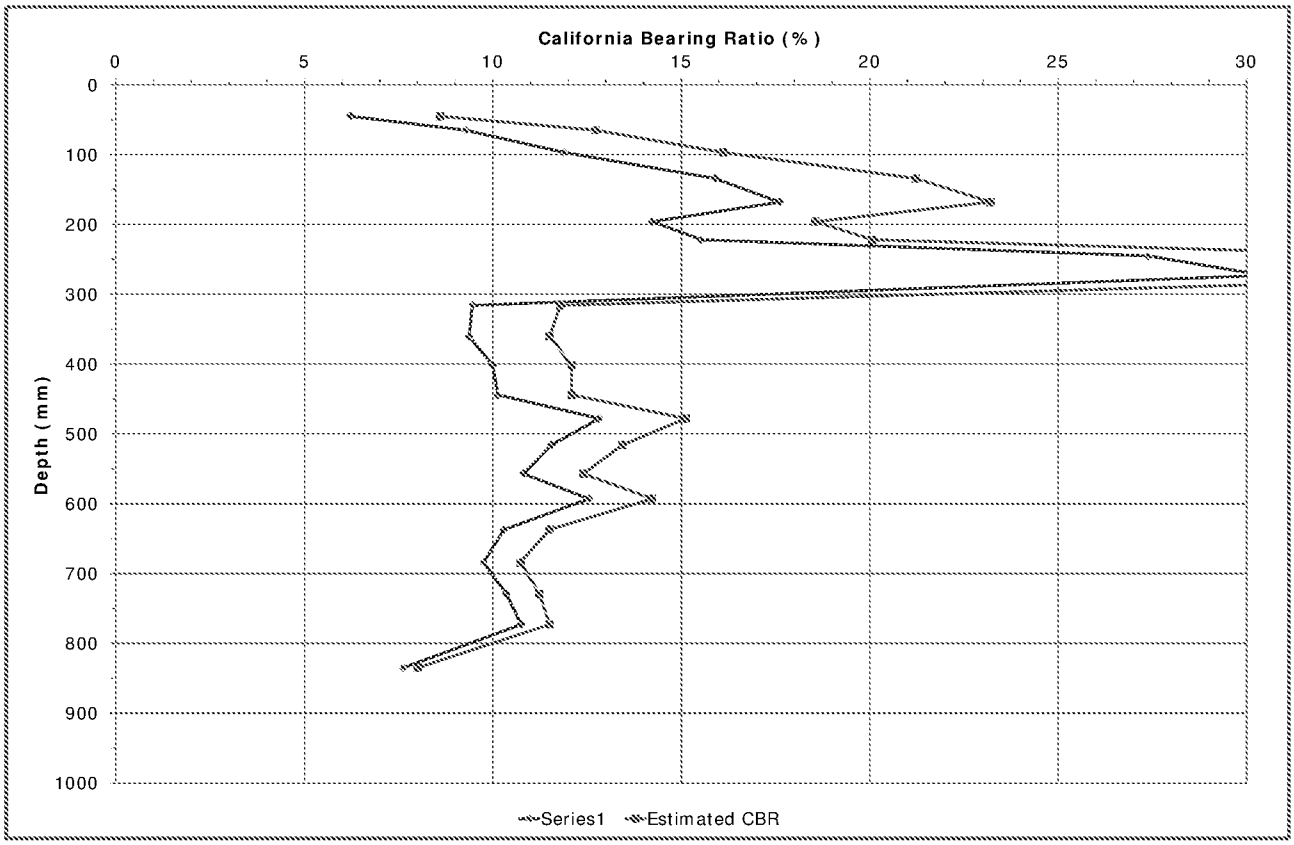
Notes:

1. CBR Value calculated using Jones C R and J Rolt (1991), "*Operating instructions for the TRL dynamic cone penetrometer*" (2nd edition). Information Note. Crowthorne: Transport Research Laboratory, as follows:

$$Log_{10}(CBR) = 2.48 - 1.057\ Log_{10}(DPI)$$

2. Adjusted CBR vaules obtined from Table 4.2 of Simon Done and Piouslin Samuel (2006), "*Measuring Road Pavement Strength and Designing Low Volume Sealed Roads using the Dynamic Cone Penetrometer*" Unpublished TRL Project Report UPR/IE/76/06 Project Record No R7783.

The CBR Adjustment Factors are applied to unpaved roads on the assumption that the effect of moisture will be a maximum at the top surface and will reduce linearly to zero at a depth of 1000 mm.



Dynamic Cone Penetration Test Data (DCP-TRL)

Bonhams Field, Yapton DCP2

Cumulative Blows	Penetration	Penetration this Stage	CBR value (TRL)	Adjusted CBR
Blows	mm	mm per blow	%	%
0	12	-	-	-
1	56	44.0	5.5	4.0
2	87	31.0	8.0	5.9
3	112	25.0	10.1	7.5
5	148	18.0	14.2	10.7
7	187	19.5	13.1	10.0
9	241	27.0	9.3	7.2
10	274	33.0	7.5	5.9
12	308	17.0	15.1	12.1
14	337	14.5	17.9	14.4
16	363	13.0	20.1	16.4
18	398	17.5	14.7	12.1
20	435	18.5	13.8	11.6
22	476	20.5	12.4	10.5
24	518	21.0	12.1	10.4
25	538	20.0	12.7	11.0
26	560	22.0	11.5	10.0
27	582	22.0	11.5	10.1
28	608	26.0	9.6	8.5
30	650	21.0	12.1	10.9
31	678	28.0	8.9	8.1
33	720	21.0	12.1	11.1
34	753	33.0	7.5	7.0
35	789	36.0	6.8	6.4
36	825	36.0	6.8	6.5

Date	5th September
Site Name	Bonhams Field, Yapton
Job Number	1608013
Test No	DCP2
Operator	MB
Pavement Type	Topsoil over cohesive superficial deposits
Subgrade Type	Moderate

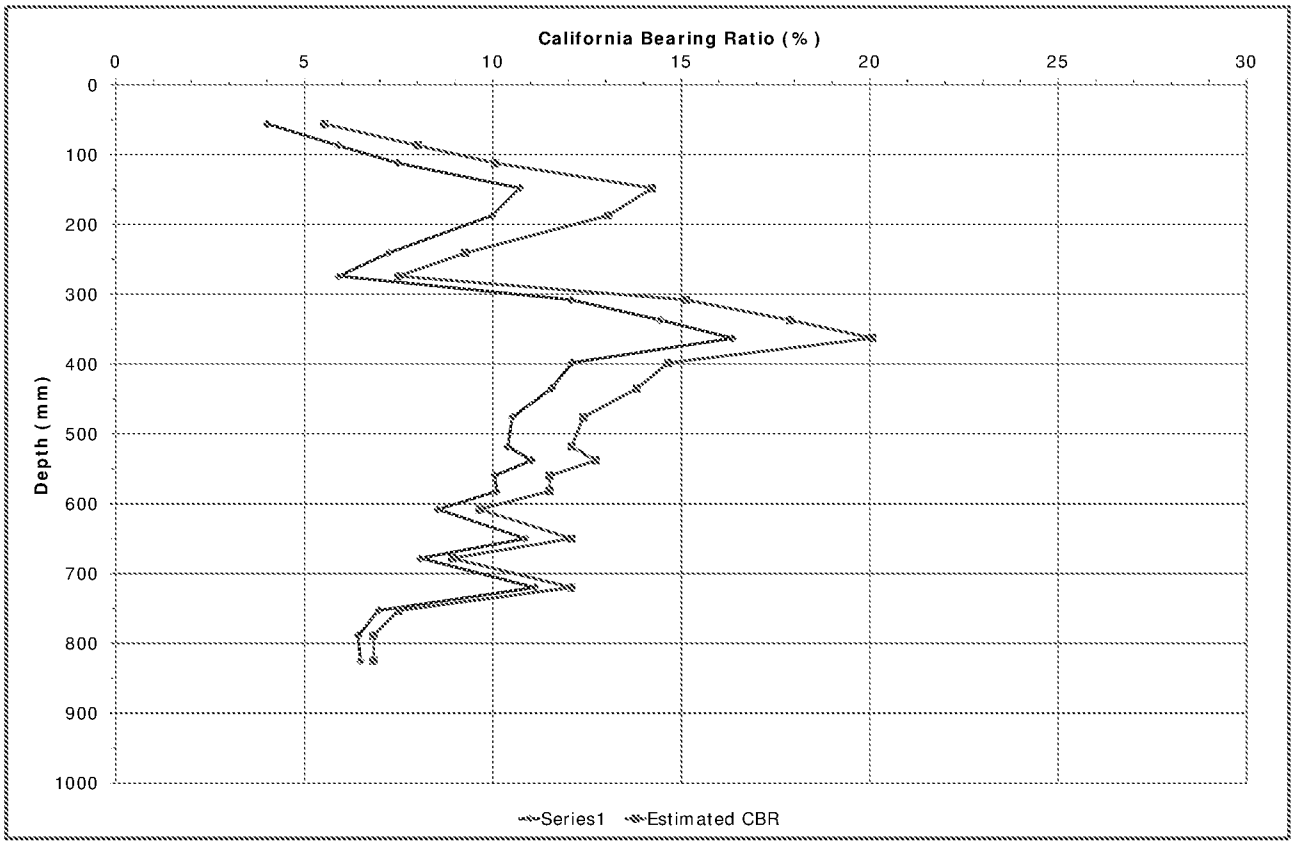
Notes:

1. CBR Value calculated using Jones C R and J Rolt (1991), "*Operating instructions for the TRL dynamic cone penetrometer*" (2nd edition). Information Note. Crowthorne: Transport Research Laboratory, as follows:

$$\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057\ \text{Log}_{10}(\text{DPI})$$

2. Adjusted CBR vaules obtined from Table 4.2 of Simon Done and Piouslin Samuel (2006), "*Measuring Road Pavement Strength and Designing Low Volume Sealed Roads using the Dynamic Cone Penetrometer*" Unpublished TRL Project Report UPR/IE/76/06 Project Record No R7783.

The CBR Adjustment Factors are applied to unpaved roads on the assumption that the effect of moisture will be a maximum at the top surface and will reduce linearly to zero at a depth of 1000 mm.



Dynamic Cone Penetration Test Data (DCP-TRL)

Bonhams Field, Yapton DCP3

TWEEDIE EVANS CONSULTING

Blow number	Penetration (mm)	Penetration rate (mm per blow)	CBR (%)	Adjusted CBR (%)
0	4	-	-	-
1	56	52.0	4.6	3.4
2	92	36.0	6.8	5.0
4	136	22.0	11.5	8.6
5	157	21.0	12.1	9.1
6	182	25.0	10.1	7.7
8	217	17.5	14.7	11.3
10	245	14.0	18.6	14.5
13	280	11.7	22.5	17.8
15	305	12.5	20.9	16.7
17	330	12.5	20.9	16.9
19	358	14.0	18.6	15.1
21	386	14.0	18.6	15.3
23	418	16.0	16.1	13.4
25	446	14.0	18.6	15.6
27	475	14.5	17.9	15.2
29	513	19.0	13.4	11.5
31	549	18.0	14.2	12.4
33	588	19.5	13.1	11.5
35	632	22.0	11.5	10.3
37	685	26.5	9.5	8.6
38	710	25.0	10.1	9.2
39	737	27.0	9.3	8.6
40	765	28.0	8.9	8.3
41	804	39.0	6.3	5.9
42	830	26.0	9.6	9.2

Date:	5th September
Site:	Bonhams Field, Yapton
Job No:	1608013
Test No:	DCP3
Operator:	MB
Soil Type:	Topsoil over cohesive superficial deposits
Ground Conditions:	Moderate

Comments

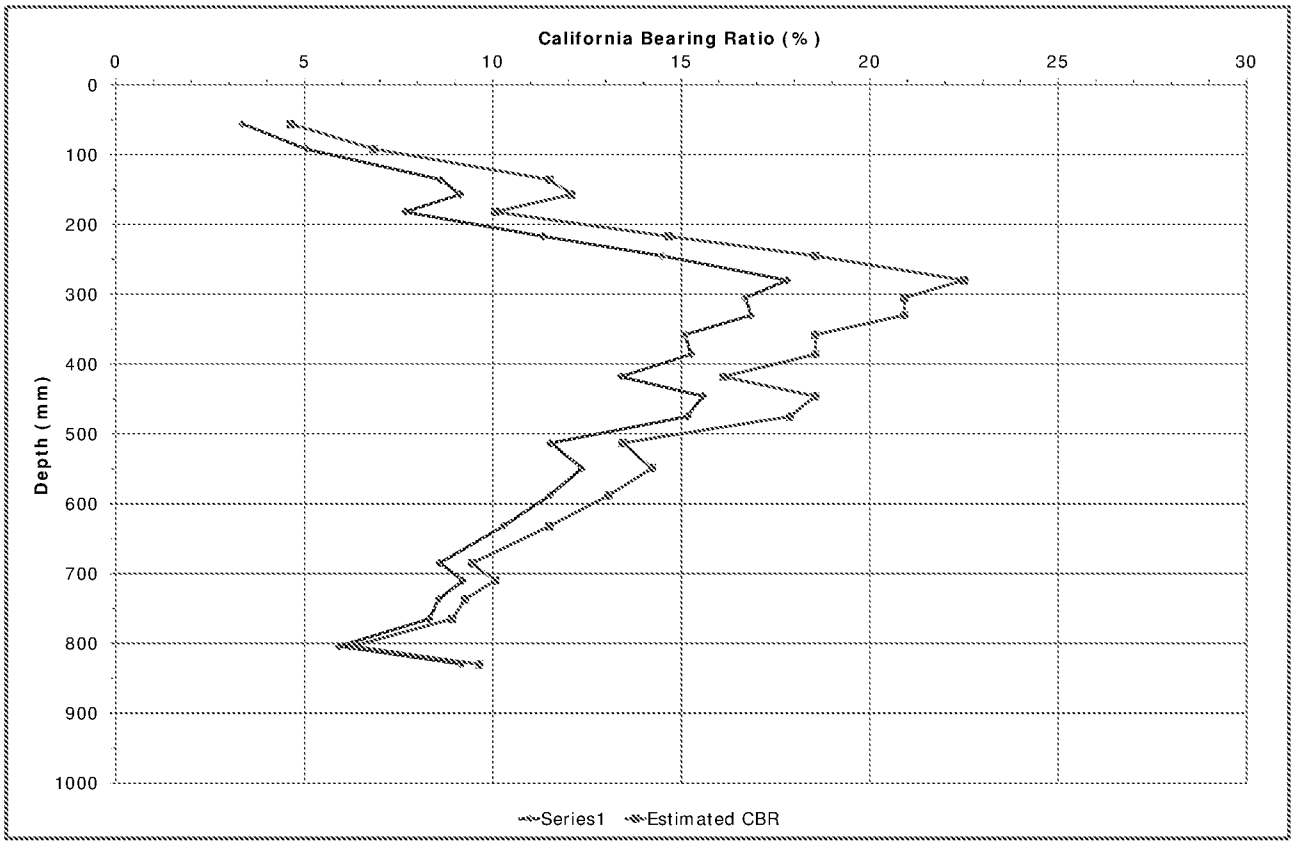
Notes:

1. CBR Value calculated using Jones C R and J Rolt (1991), "*Operating instructions for the TRL dynamic cone penetrometer*" (2nd edition). Information Note. Crowthorne: Transport Research Laboratory, as follows:

$$Log_{10}(CBR) = 2.48 - 1.057\ Log_{10}(DPI)$$

2. Adjusted CBR vaules obtined from Table 4.2 of Simon Done and Piouslin Samuel (2006), "*Measuring Road Pavement Strength and Designing Law Volume Sealed Roads using the Dynamic Cone Penetrometer*" Unpublished TRL Project Report UPR/IE/76/06 Project Record No R7783.

The CBR Adjustment Factors are applied to unpaved roads on the assumption that the effect of moisture will be a maximum at the top surface and will reduce linearly to zero at a depth of 1000 mm.



Dynamic Cone Penetration Test Data (DCP-TRL)

Bonhams Field, Yapton DCP4

Cumulative Blow Number	Penetration (mm)	Penetration (mm) Per Blow	CBR (%)	Adjusted CBR (%)
0	47	-	-	-
1	76	29.0	8.6	6.3
2	97	21.0	12.1	8.9
4	126	14.5	17.9	13.4
7	156	10.0	26.5	20.0
9	178	11.0	23.9	18.2
11	196	9.0	29.6	22.7
13	214	9.0	29.6	22.9
15	233	9.5	28.0	21.7
17	251	9.0	29.6	23.2
19	270	9.5	28.0	22.0
21	290	10.0	26.5	21.0
23	312	11.0	23.9	19.2
25	335	11.5	22.8	18.4
27	360	12.5	20.9	17.0
29	383	11.5	22.8	18.8
31	401	9.0	29.6	24.5
33	421	10.0	26.5	22.0
35	451	15.0	17.3	14.5
36	470	19.0	13.4	11.4
38	508	19.0	13.4	11.5
39	530	22.0	11.5	9.9
40	551	21.0	12.1	10.5
41	571	20.0	12.7	11.1
43	604	16.5	15.6	13.8
45	639	17.5	14.7	13.1
47	670	15.5	16.7	15.1
49	705	17.5	14.7	13.4
50	728	23.0	11.0	10.1
51	753	25.0	10.1	9.3
52	782	29.0	8.6	8.1
53	814	32.0	7.7	7.3
54	849	35.0	7.0	6.7
55	887	38.0	6.5	6.2
56	926	39.0	6.3	6.1
57	941	15.0	17.3	17.0

	6th September
	Bonhams Field, Yapton
	1608013
	DCP4
	ML
	Topsoil over cohesive superficial deposits
	Moderate

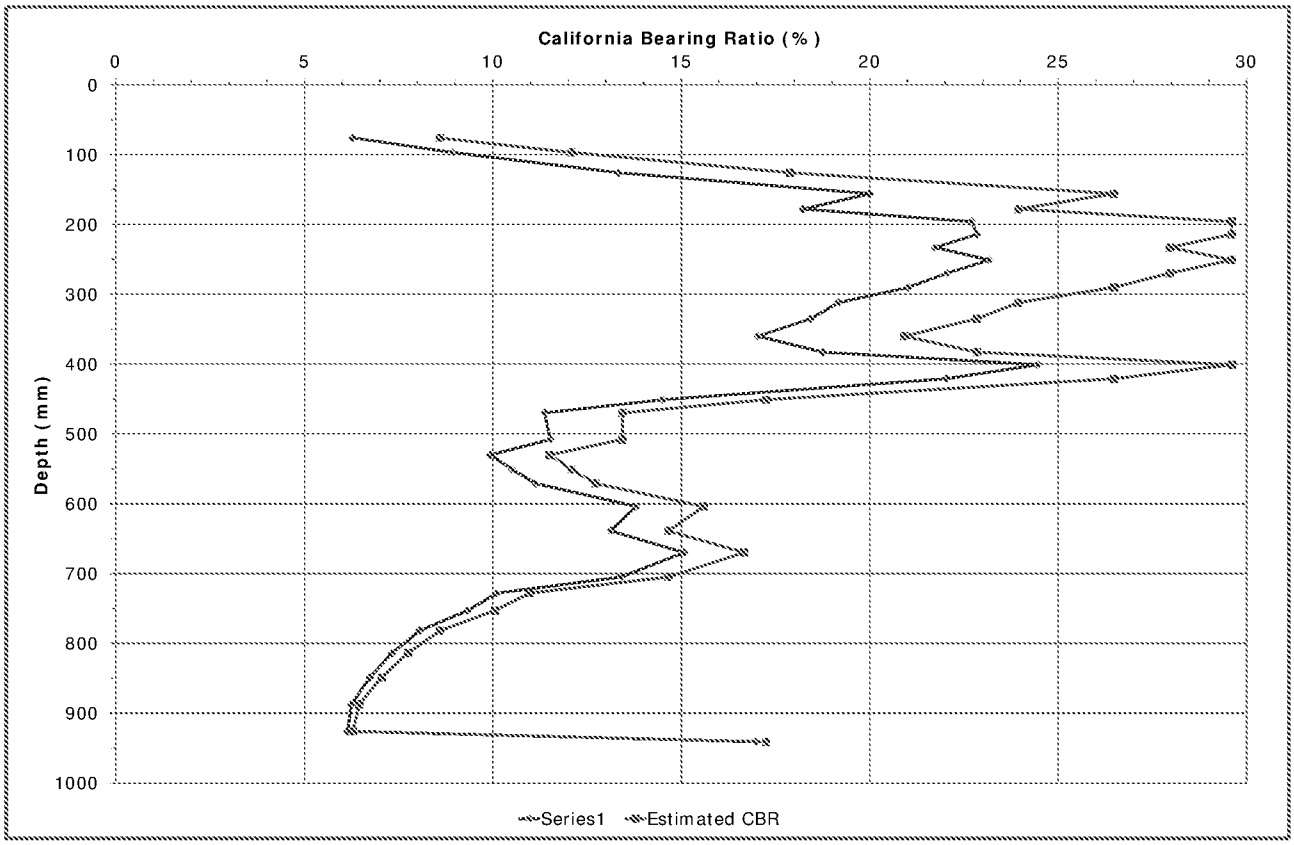
Notes:

1. CBR Value calculated using Jones C R and J Rolt (1991), "*Operating instructions for the TRL dynamic cone penetrometer*" (2nd edition). Information Note. Crowthorne: Transport Research Laboratory, as follows:

$$Log_{10}(CBR) = 2.48 - 1.057\ Log_{10}(DPI)$$

2. Adjusted CBR vaules obtined from Table 4.2 of Simon Done and Picuslin Samuel (2006), "*Measuring Road Pavement Strength and Designing Low Volume Sealed Roads using the Dynamic Cone Penetrometer*" Unpublished TRL Project Report UPR/IE/76/06 Project Record No R7783.

The CBR Adjustment Factors are applied to unpaved roads on the assumption that the effect of moisture will be a maximum at the top surface and will reduce linearly to zero at a depth of 1000 mm.



Dynamic Cone Penetration Test Data (DCP-TRL)

Bonhams Field, Yapton DCP5

Cumulative Blows	Penetration (mm)	Penetration (mm) per Blow	Soil strength (DCP) CBR	Adjusted CBR
0	60	-	-	-
1	101	41.0	6.0	4.4
2	130	29.0	8.6	6.4
4	179	24.5	10.3	7.8
6	217	19.0	13.4	10.4
8	250	16.5	15.6	12.2
10	276	13.0	20.1	15.9
13	310	11.3	23.2	18.6
16	348	12.7	20.6	16.7
18	374	13.0	20.1	16.4
20	400	13.0	20.1	16.6
23	440	13.3	19.5	16.4
25	468	14.0	18.6	15.7
27	500	16.0	16.1	13.8
29	528	14.0	18.6	16.0
31	559	15.5	16.7	14.5
33	597	19.0	13.4	11.9
35	637	20.0	12.7	11.4
37	670	16.5	15.6	14.1
40	693	7.7	35.1	32.0
42	767	37.0	6.6	6.2
44	808	20.5	12.4	11.7
45	841	33.0	7.5	7.2
46	879	38.0	6.5	6.2
47	916	37.0	6.6	6.5
48	943	27.0	9.3	9.1

	6th September
	Bonhams Field, Yapton
	1608013
	DCP5
	ML
	Topsoil over cohesive superficial deposits
	Moderate

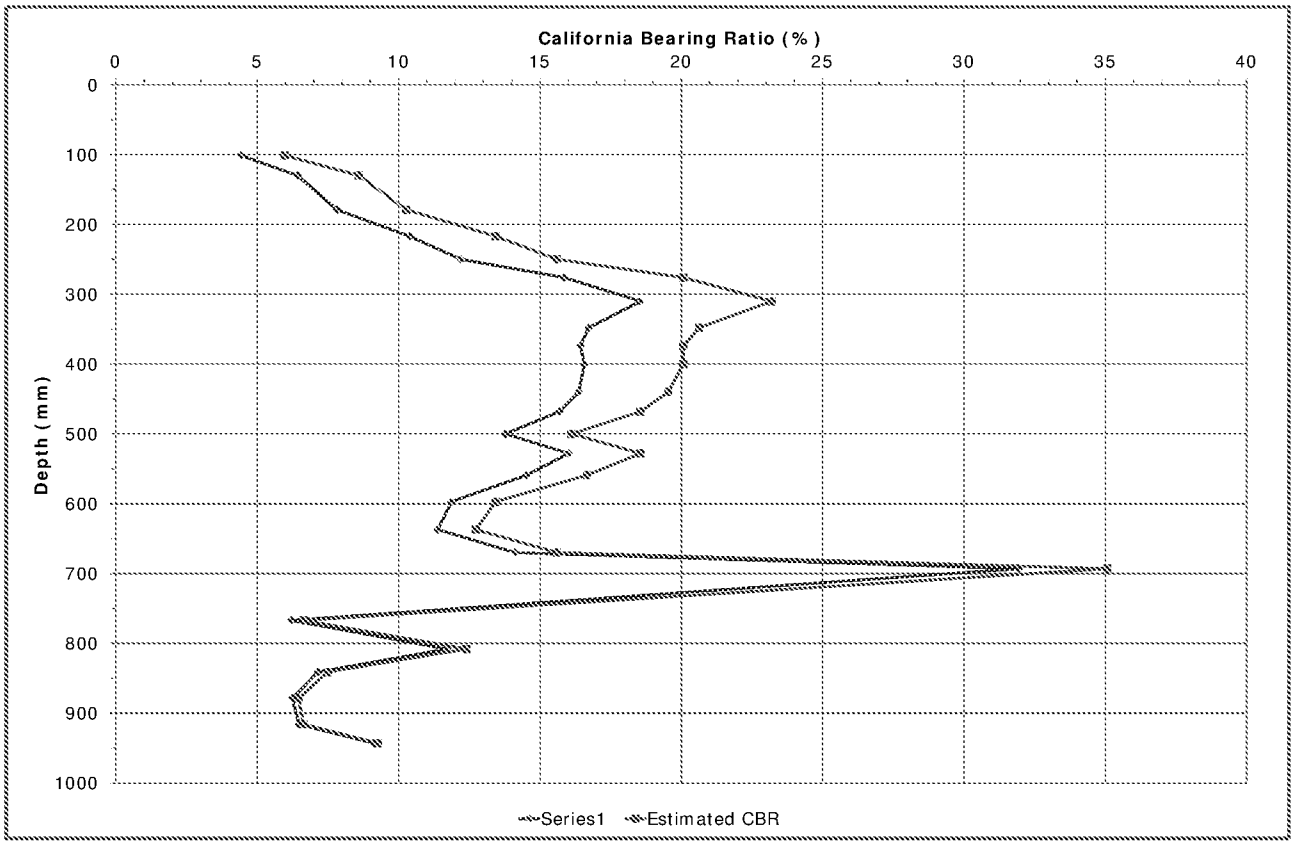
Notes:

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The CBR Adjustment Factors are applied to unpaved roads on the assumption that the effect of moisture will be a maximum at the top surface and will reduce linearly to zero at a depth of 1000 mm.



Dynamic Cone Penetration Test Data (DCP-TRL)

Bonhams Field, Yapton DCP6

Cumulative Blows	Penetration	Penetration this Blow	CBR	Adjusted CBR
Blows	mm	mm per blow	%	%
0	0	-	-	-
1	35	35.0	7.0	5.1
2	53	18.0	14.2	10.3
4	82	14.5	17.9	13.1
6	110	14.0	18.6	13.8
8	132	11.0	23.9	17.9
10	153	10.5	25.2	19.0
14	186	8.3	32.5	24.8
17	212	8.7	30.8	23.8
20	240	9.3	28.5	22.2
23	266	8.7	30.8	24.3
26	287	7.0	38.6	30.6
28	308	10.5	25.2	20.1
30	328	10.0	26.5	21.3
33	353	8.3	32.1	26.1
36	383	10.0	26.5	21.7
38	404	10.5	25.2	20.8
40	423	9.5	28.0	23.3
42	444	10.5	25.2	21.1
44	465	10.5	25.2	21.3
46	488	11.5	22.8	19.5
48	513	12.5	20.9	18.0
50	540	13.5	19.3	16.7
52	573	16.5	15.6	13.7
54	607	17.0	15.1	13.4
55	629	22.0	11.5	10.3
57	660	15.5	16.7	15.0
59	694	17.0	15.1	13.8
61	729	17.5	14.7	13.5
63	762	16.5	15.6	14.5
64	780	18.0	14.2	13.3
65	801	21.0	12.1	11.4
66	826	25.0	10.1	9.5
67	850	24.0	10.5	10.0
68	879	29.0	8.6	8.3

	6th September
	Bonhams Field, Yapton
	1608013
	DCP6
	ML
	Topsoil over cohesive superficial deposits
	Moderate

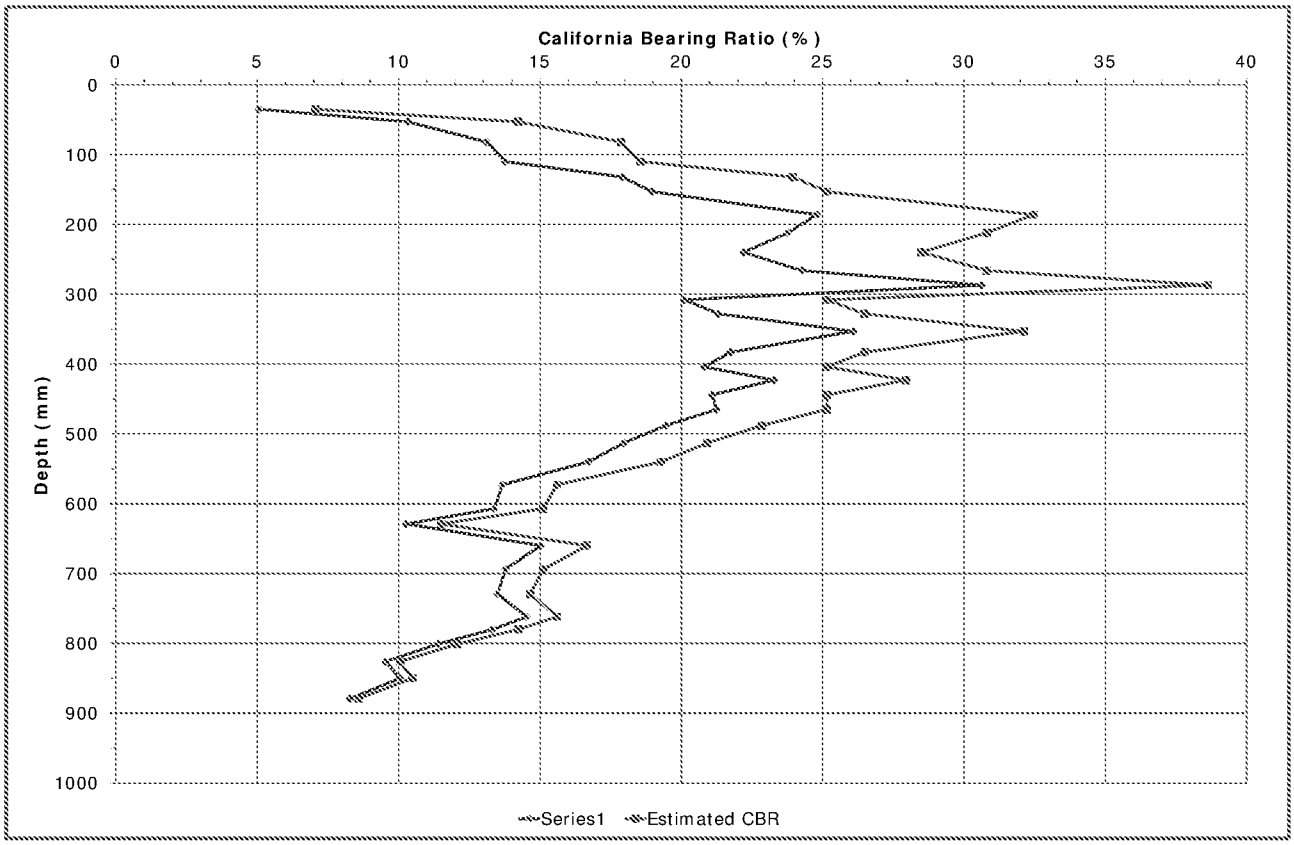
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APPENDIX K

Site Photographs



Photograph 1: Facing west-east of left hand field from B2233 main road.



Photograph 2: Facing west-east of right hand field from B2233 main road.



Photograph 3: Facing west-east onto B2233 main road showing WS4.



Photograph 4: Facing west-east onto B2233 main road showing WS6.