Goldfinch
ENVIRONMENTAL LTD

PROPOSED RESIDENTIAL DEVELOPMENT
LAND OFF DRAWDIKE
SUTTON ST JAMES
SPALDING
LINCS.

PROPOSED RESIDENTIAL DEVELOPMENT LAND OFF DRAWDIKE SUTTON ST JAMES SPALDING LINCS.

GEOENVIRONMENTAL DESK STUDY

Report Ref.: 0439/1

Prepared by :

D Sargeant

D Sargeant
BSc FGS

Date:

May 2017

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

CONTENTS

1.	INTRODUCTION	3
2.	LIMITATIONS	4
3.	LEGISLATIVE AND REGULATORY SETTING	5
4.	SITE LOCATION AND DESCRIPTION	6
5.	SITE HISTORY	8
6.	PRELIMINARY QUALITATIVE RISK ASSESSMENT	15
7.	RECOMMENDATIONS FOLLOWING PRELIMINARY RISK ASSESSMENT	18
8.	CONCLUSIONS	19

FIGURES

- Figure 1 Site Location Plan
- Figure 2 Proposed Layout Plan

APPENDICES

- Appendix 1 'Groundsure' Report

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

PROPOSED RESIDENTIAL DEVELOPMENT

LAND OFF DRAWDIKE, SUTTON ST JAMES

SPALDING

LINCS.

1. INTRODUCTION.

1.1 General.

This report describes the findings of a geoenvironmental desk study undertaken by Goldfinch Environmental Limited on the instruction of Mr M Campling (the Client), via the offices of G R Merchant Architects, at a site off Drawdike, Sutton St James, Spalding, Lincolnshire.

A site location plan has been included as Figure 1 with the proposed layout shown in Figure 2 towards the back of this report to assist the reader.

The Desk Study was required to support a planning application for the development of the site to a residential land use by establishment of five new residential dwellings.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

2. LIMITATIONS.

This report is for the sole reliance and use of the Client. Any Third Party coming into possession of this report relies on it at their risk, unless written permission is expressly sought from; and provided by, Goldfinch Environmental Limited. The author owes them no duty of care and skill. Goldfinch Environmental Ltd accepts no responsibility or liability for the consequences of this document being used for purposes other than that for which it was commissioned and the assessments provided herein should not be relied on as a legal opinion.

The findings and opinions expressed are relevant to the time of the site visit and information review and should not be relied upon to represent conditions at substantially later dates. The assessments and opinions given in this report are based upon information available at the time of the report. Where additional information comes available which may affect or identify a need to review our conclusions or assessments we request the opportunity (and reserve the right), to review the information and where warranted, modify our assessment / opinion in part or wholly, accordingly.

The purpose of this desk study report was to determine the historical use of the site and adjacent areas from searches of Public Registers and a review of available historical maps and included a site reconnaissance ('walkover') survey together with brief internet searches. The outcome of these activities is described below and this information was used to construct a conceptual model for the site from which a risk assessment was completed in the context of the proposed residential development of the site.

The risk assessment was based on the source-pathway-receptor framework, with respect to the geoenvironmental condition of the site in the context of various sensitive receptors. Goldfinch Environmental Ltd have based this desk study upon the sources given in this report, and believes them to be reliable but cannot and does not guarantee the authenticity or reliability of the data it has relied upon.

This desk study does not include any geotechnical considerations pertaining to the site as these were outside the agreed brief.

The recommendations given in this report are based on guidance and best practice in place at the time of issue of the report, the information available at the time of the investigation, the nature of the indicated proposed development and associated end user behaviour patterns. Should any of the foregoing change at any time, then this report should be reviewed in the context of proposed changes.

The absence of indicators in search data, or from on site observations does not rule out their presence in other parts of the site. This desk study report has been based on information supplied in the 'GroundSure' report and its component parts included at Appendix 1 towards the back of this report, discussions with the Client and in-house searches.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

3. LEGISLATIVE & REGULATORY SETTING.

The Environmental Protection Act of 1990 created the framework for the identification and remediation of contaminated land. The Act defines "contaminated land" as any land, which appears by the Local Authority to be "in such a condition, by reason of substances, in, on, or under the land that significant harm is being caused or there is significant possibility of such harm being caused, or, pollution of Controlled Waters is being, or is likely to be, caused".

Land potentially affected by 'contamination' is a material consideration for planning purposes together with its relationship with 'regulatory intervention' (Part IIa), and 'voluntary' investigation (which includes redevelopment of sites which may be affected by contamination). The Model Procedures (CLR-11, Environment Agency 2004), provide a generic framework indicating key technical activities applicable in each of these contexts.

The management of land contamination broadly comprises three components that are identified as 'Risk assessment', 'Options appraisal' and 'Implementation'. These, in turn, determine if any *un*acceptable risks exist, ascertain the most appropriate remediation strategy for the site and, finally, demonstrate that the strategy will be effective.

In accordance with this and other current guidance, where a 'land quality' risk assessment is required each 'Relevant Pollutant Linkage' (RPL, formerly referred to as "source-pathway-receptor" framework), is separately identified and a level of risk attached. This is documented in the form of a 'Conceptual Model'.

The outcome of the assessment of established, plausible relevant pollutant linkages is used to determine qualitatively the need for further investigation, or remediation with ensuing mitigation of the determined unacceptable risk. (In accordance with the Model Procedures and Regulatory preference, detailed remedial measures should be provided in a separate phase).

The risk assessment takes account of the local environment, end user behaviour patterns, and the nature of the development in relation to proven 'unacceptable' risk. This is the approach advocated by current guidance (CLR-11 and BS10175 etc), and therefore has been adopted in the assessment of this site.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

4. SITE LOCATION AND DESCRIPTION.

4.1 Introduction

A site visit was carried out during 18 May 2017 the purpose being to:-

I. Collect additional/relevant information about the site its environs and any site-specific potential contaminants, pathways and receptors.

II. Record any aspects of the site not revealed by documentary searches. (e.g. the presence of above- or belowground hydrocarbon storage tanks.).

III. Collect any information that will assist in the planning of any subsequent phases of field investigation where the Desk Study deems this is necessary.

Approximate Grid Reference ^{5}40148, ^{3}18471 refers.

The site comprised a subrectangular plot of land on the northern side of Drawdike to the east of the village of Sutton St James.

Topographic levels at the site, by visual inspection, appeared to change little across the site.

At the time of the site walkover survey the site was capped with soft cover of grass and occasional patches of exposed soil as can be seen in Photograph 1 below.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681



There were no buildings on site, and neither was there any evidence of the former existence of structures at the site.

At the time of the site walkover survey the site was being used for grazing horses.

Following visual inspection of the site there were no notable features with regard to land contamination and there was no apparent evidence of:~

1. The presence of Made Ground.
2. The presence or storage of potentially leachable materials/chemicals.
3. Demolition or dispersal of *contaminated* rubble or other materials.
4. Importation of potentially contaminated fill onto the site.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

5. SITE HISTORY.

5.1 Historical Maps.

Where the attached maps are compiled from a composite of editions, the year of map upon which the majority of the site may be found is quoted below. These are reproduced at Appendix 1. Annotation, as it appears on the maps, is indicated by italics.

Land use in excess of 250m from the site is considered of potentially negligible to low risk to the application site and on that basis is generally excluded from the summary provided below (unless record review by this author suggests otherwise). However, should the reader require this additional detail, full disclosure records are included in Appendix 1 towards the back of this report.

(The reader should note at this point that occasionally on the older map editions the site boundaries can be slightly 'shifted' relative to more recent maps.).

1886 Edition {County Series - Scale 1:10 560}

The site and surrounding land was not shown on this map edition.

1887 Edition {County Series - Scale 1:10 560}

The site was shown as an undeveloped plot of land.

Surrounding land was sparsely developed.

The village of Sutton St James was established to the west of the site.

1888 Edition {County Series - Scale 1:2 500}

There were no further apparent changes to the site at this scale of mapping.

There were no apparent change to the immediate environs of the site at this scale of mapping.

1888 Edition {County Series - Scale 1:2 500}

The site and surrounding land were not shown on this map edition.

1900 Edition {County Series - Scale 1:10 560}

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

There were no apparent changes to the site or its immediate environs except that land to the west of the site had now been developed.

1900-03 Edition {County Series - Scale 1:10 560}

There were no apparent changes to the site.

There were no further pertinent land use changes to the immediate environs of the site.

1903-5 Edition {County Series – Scale 1:10 560}

There were no apparent changes to the site or its immediate environs at this scale of mapping.

1904 Edition {County Series - Scale 1:2 500}

There were no apparent changes to the site or its immediate environs at this scale of mapping.

1950 Edition {County Series - Scale 1:10 560}

There were no apparent changes to the site.

There were no apparent changes to the immediate environs of the site in the context of land quality.

1950-55 Edition {Provisonal - Scale 1:10 560}

There were no apparent changes to the site or its immediate environs.

1974 Edition {National Grid - Scale 1:2 500}

There were no apparent changes to the site.

Land to the south east, south, south west and west had undergone further development as shown by changes in the number and layout of structures in those areas.

Land to the south of the site was annotated '*Piggery*'.

A '*Filling Station*' was established on land to the south east of the site with a '*Pavilion*' within the curtilage of a '*Sports Field*', on its southern side.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

1975 Edition {National Grid - Scale 1:2 500}

The site and its immediate environs were not shown on this map edition.

1979-80 Edition {National Grid - Scale 1:10 000}

There were no apparent changes to the site or its immediate environs at this scale of mapping.

1991 Edition {National Grid - Scale 1:2 500}

The site and its immediate environs were not shown on this map edition.

1992 Edition {National Grid - Scale 1:10 000}

There were no apparent changes to the site or its immediate environs at this scale of mapping.

1995 Edition {National Grid - Scale 1:2 500}

There were no apparent changes to the site.

There were no apparent changes to surrounding land.

2002 Edition {Raster - Scale 1:10 000}

There were no apparent changes to the site.

Land to the south and south west of the site had undergone further development.

2010 Edition {National Grid - Scale 1:10 000}

There were no further changes to the site.

There were no apparent changes to the surrounding environs with respect to land contamination.

2014 Edition {National Grid - Scale 1:10 000}

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

There were no apparent changes to the site or surrounding environs with respect to land contamination.

5.2 Public Registers.

A search of public register information has been made using an Internet-based system. A disclosure report is reproduced at Appendix 1. The following commentary is restricted to entries within a 250m search radius of the site. Appendix 1 should be referred to for details on entries beyond of this range.

5.2.1 Historical Industrial Sites

There was one record for the category 'Potentially Contaminative Uses identified from 1:10 000 scale mapping' within this dataset for the referred search radius. Supplied information indicated none of them were for the site, none were within 50m of the site and the remaining one was located approximately 246m distant from the site and was for: '*Police Station*'.

There were no records for the category 'Additional Information – Historical Tank Database' within this dataset for the referred search radius.

There were no records for the category 'Additional Information – Historical Energy Features Database' within this dataset for the referred search radius.

There were no records for the category 'Additional Information – Historical Petrol and Fuel Site Database' within this dataset for the referred search radius.

There were no records for the category 'Additional Information – Historical Garage and Motor Vehicle Repair Database' within this dataset for the referred search radius.

There were no records for the category 'Potentially Infilled Land' within this dataset for the referred search radius.

5.2.2 Environmental Permits, Incidents and Registers.

There were sixteen records for the category 'Records of Licensed Discharge Consents' within this dataset for the referred search radius. Supplied information indicated there were none for the site, two were within approximately 50m of the site and the remaining fourteen were located between approximately 60 and 209m distant from the site. These were generally for '*Unspecified*' and '*Final/Treated Effluent*'.

There was one record for the category 'National Incidents Recording System, List 2' within this dataset for the referred search radius. Supplied information indicated there were none for the site, none were within approximately 50m of the site and the

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

remaining one was located approximately 237m distant from the site and was given as '*Sewage Materials*'.

5.2.3 Landfill and Other Wastes.

There were no records within this category for the referred search radius.

5.2.4 Current Land Uses.

There was one record within this category. Supplied information indicated none were for the site, none were within 50m of the site and the remaining one was located approximately 62m distant from the site and was given as '*Electricity Substation*'.

5.2.4.i Petrol & Fuel Sites.

There were no records within this dataset for the referred search radius.

5.2.5 Geology.

There were no records for the site within the category 'Artificial Ground and Made Ground'.

There were records listed within the category 'Superficial Ground and Drift Geology present beneath the site'. Supplied information indicated Tidal Flat Deposits (Clay and Silt).

The Bedrock & Solid Geology was given as Ampthill Clay Formation (Mudstone).

5.2.6 Hydrogeology and Hydrology.

For the category 'Are there any records of Strata Classification in the Superficial Geology within 500m of the site' a 'Yes' response was provided. Supplied information indicated the site was underlain by a 'Unproductive' aquifer.

For the category 'Are there any records of Strata Classification in the Bedrock geology within 500m of the site' a 'Yes' response was provided. Supplied records showed that the site was underlain by an 'Unproductive' Aquifer.

There were no records for the category 'Groundwater Abstraction Licences' within the referred search radius for the site.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

There were no records for the category 'Surface Water Abstraction Licences' within the referred search radius for the site.

There were no records for the category 'Potable Water Abstraction Licences' within the referred search radius for the site.

There were no records for the category 'Source Protection Zones' within the search radius for the site.

There were no records for the category 'Groundwater Vulnerability and Soil Leaching Potential' for the site.

There were no records of Environment Agency information on River Quality available within 1500m of the site.

There were no records for the category 'Detailed River Networks' within the search radius for the site.

There were eleven 'Surface Water Features' reportedly within 250m of the study site that were not represented on mapping.

5.2.7 Flooding.

There were Environment Agency Flood Zone 2 floodplains within 250m of the site.

There were Environment Agency Flood Zone 3 floodplains within 250m of the site.

There was a 'Low' risk of flooding from Rivers and Sea for the site.

There were no Flood Defence areas within the search radius of 250m for the site.

There were no areas benefitting from Flood Defences within 250m of the site.

There were no areas used for Flood Storage within 250m of the site.

For the category 'What is the maximum BGS Groundwater Flooding Susceptibility within 50m of the study site'. The response 'Not Prone' was given in the supplied information.

For the category 'What is the BGS confidence rating for the Groundwater Flooding susceptibility areas' the provided response was 'Not Applicable'.

5.2.8 Designated Environmentally Sensitive Sites.

There were no records for the site within this dataset.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

5.2.9 Natural Hazards.

Search records indicated there was a 'Moderate' maximum risk of natural ground subsidence.

5.2.10 Mining.

Searches indicated there were no coal mining areas within 75m of the site.

There were no 'Non-Coal Mining areas' within 50m of the study site.

There are no brine affected areas within 75m of the site.

5.2.11 Radon.

Searches indicated that the site is in an area where less than 1% of properties are above the 'Action Level' therefore radon protection measures are not necessary in extensions and new dwellings.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

6. PRELIMINARY QUALITATIVE RISK ASSESSMENT.

6.1 Introduction.

There are three factors that are taken into account whilst undertaking a qualitative risk assessment. These have been described in Section 3 of this document. At the time of this report, the site had been proposed for residential development.

6.2 Conceptual Model.

Source (s) (Potential)	Pathway	Target	Risk
Soil: The site has existed as 'undeveloped' plot of land from the time of the earliest available map edition until (and including) the time of the site walkover survey carried out by this Author during 18 May 2017. There were no site-specific indicators of potential soil-borne contamination. Visual and olfactory indicators of potential contamination immediately nearby off site were not noted.	❖ Dermal contact, ingestion and inhalation	• Present users • End users • Construction workers • General public	• Low • Low • Low • Low
	❖ Wind erosion and atmospheric dispersion	• Adjacent properties • General public • Ecological Systems • Archaeological Sites & Monuments	• Low • Low • Low • n/a
	❖ Leaching	• Adjacent properties • Shallow groundwater • Services/construction materials • Plant life • Surface water • Ecological Systems • Arch. & Monuments	• Low • Low • Low • Low • Low • Low • Low
Shallow groundwater: The site overlies 'Unproductive' aquifers, which were not considered to be pollution sources.	❖ Groundwater migration	• Adjacent properties • Deep groundwater • Services/construction materials • Plant life • Ecological Systems • Archaeological Sites & Monuments	• Low • Low • Low • n/a • Low • Low
	❖ Dermal contact, ingestion and inhalation	• Present users • End users • Construction workers • General public	• Low • Low • Low • Neg-Low
Gas: Measurable (background) concentrations of ground gas would not (reasonably) be anticipated to be present as a result of historical site use or the underlying natural geology.	❖ Direct inhalation ❖ Soil migration ❖ Services migration	• End users • Construction workers • Buildings • Ecological Systems • Arch. Sites & Monuments	• Low • Low • Low • Low • Neg

Negligible Risk	Defined as the site should be considered suitable for present or future use and environmental setting. Contaminants unlikely to be present, which might have unacceptable impact on key targets.
Low Risk	Defined as the site should be considered suitable for present or future use and environmental setting. Contaminants may be present but unlikely to have unacceptable impact on key targets.
Medium Risk	Defined as the site may not be suitable for present or future use and environmental setting. Contaminants are probably present and might have unacceptable impact on key targets.
High Risk	Defined as the site is probably or certainly not suitable for present or future use and environmental setting. Contaminants probably or certainly present and likely to have an unacceptable impact on key targets.
Notes:	n/a = not applicable

The risk assessment follows below:-

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

6.3 Targets.

Potential targets, in the context of the risk assessment (based on the relevant pollutant linkage), where a plausible pathway can be proven, are discussed as follows.

At the time of this report, the proposed scheme comprised residential development.

6.3.1 Human Health (Site Users & Construction Workers)

The site had no documented development history as described above. There is little o r no potential for the presence of limited thicknesses of Made Ground.

Based upon the foregoing and the final paragraph of this report, regarding 'unanticipated contamination:-

A *Low* risk has been identified until proven otherwise.

6.3.2 Services and Construction Materials

6.3.2.1 Concrete & Potable water supplies.

Adverse effects on services and construction materials may be anticipated where soils are impacted by localised raised/lowered pH values, PAH's, TPHs and metals contamination and where these are present in Made Ground materials. However, in this instance and based on the absence of Made Ground and the foregoing:-

A *Low* risk has been identified.

6.4 Landscaping & Planting

Based on the foregoing a '*Low*' risk is presented to this receptor from the Made Ground present at the site.

6.5 Groundwater (Controlled Waters)

The site is underlain by 'Unproductive' Aquifers. However, there remains the potential for small quantities of perched groundwater in any superficial fills (or Made Ground), where these are present. However, searches indicated in this instance that the presence of significant thicknesses of Made Ground would not be reasonably anticipated given the documented history of the site.

A *Low* risk to deeper groundwater has been identified.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

6.6 Ground Gas

Measurable concentrations of soil gases (predominantly carbon dioxide) would not be reasonably anticipated to be present as a function of any made ground present. However, where present, any granular overburden would mitigate the risk of ground gas buildup via natural ventilation of ground gas to atmosphere.

On the basis of the foregoing:~

A *Low* risk has been identified.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

7. RECOMMENDATIONS FOLLOWING PRELIMINARY RISK ASSESSMENT.

7.1 Overview.

The desk study information (including the outcome of the walkover survey), showed the site had no documented developmental history.

The site walkover survey and the searches carried out as part of this Desk Study indicated that there were no readily identifiable sources of contamination.

Made Ground was not present.

On that basis, and subject to the final paragraph in this report (in blue text), the need for a Phase 2 intrusive investigation is considered *un*warranted.

The opinions and recommendations in this report are subject to the agreement of the Regulators.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

8. CONCLUSIONS.

This geoenvironmental desk study prepared by Goldfinch Environmental Limited was undertaken on the instruction of Mr M Campling (the Client), via the offices of G R Merchant Architects, at a site off Drawdike, Sutton St James, Spalding, Lincolnshire.

The site was proposed for residential development.

There were no notable features present in the context of land contamination other than inert Made Ground as described above.

Desk Study searches have shown that the site rests on Tidal Flat Deposits underlain by Mudstone.

An *overall Low* risk is associated with the site *subject to the final paragraph in this report.*

Recommendations for the need for further work (or otherwise) have been discussed in Section 7 of this report.

Also, at all times especially once any necessary groundworks have commenced, the final paragraph below applies regarding 'unanticipated' contamination.

The reader should note that the opinions, recommendations and conclusions in this report are subject to the agreement of the Local Authority who are the final arbiters in these matters.

Based on the foregoing, a *Low* risk to construction workers and services installations has been associated with the site until proven otherwise. Site personnel, particularly groundworkers, should follow sound health and safety welfare practices that will further mitigate this level of risk.

Should unanticipated contamination be suspected, or revealed during any groundworks, then the area should be temporarily isolated and further advice sought by a suitably independent qualified person and a management strategy for these occurrences should be submitted to the Local Authority for their approval prior to proceeding, as required by Regulatory Offices.

Goldfinch Environmental Limited
19 Palmer Street, Walsham-le-Willows, Bury St Edmunds, Suffolk, IP31 3BZ
Tel: 01359 258681

FIGURES

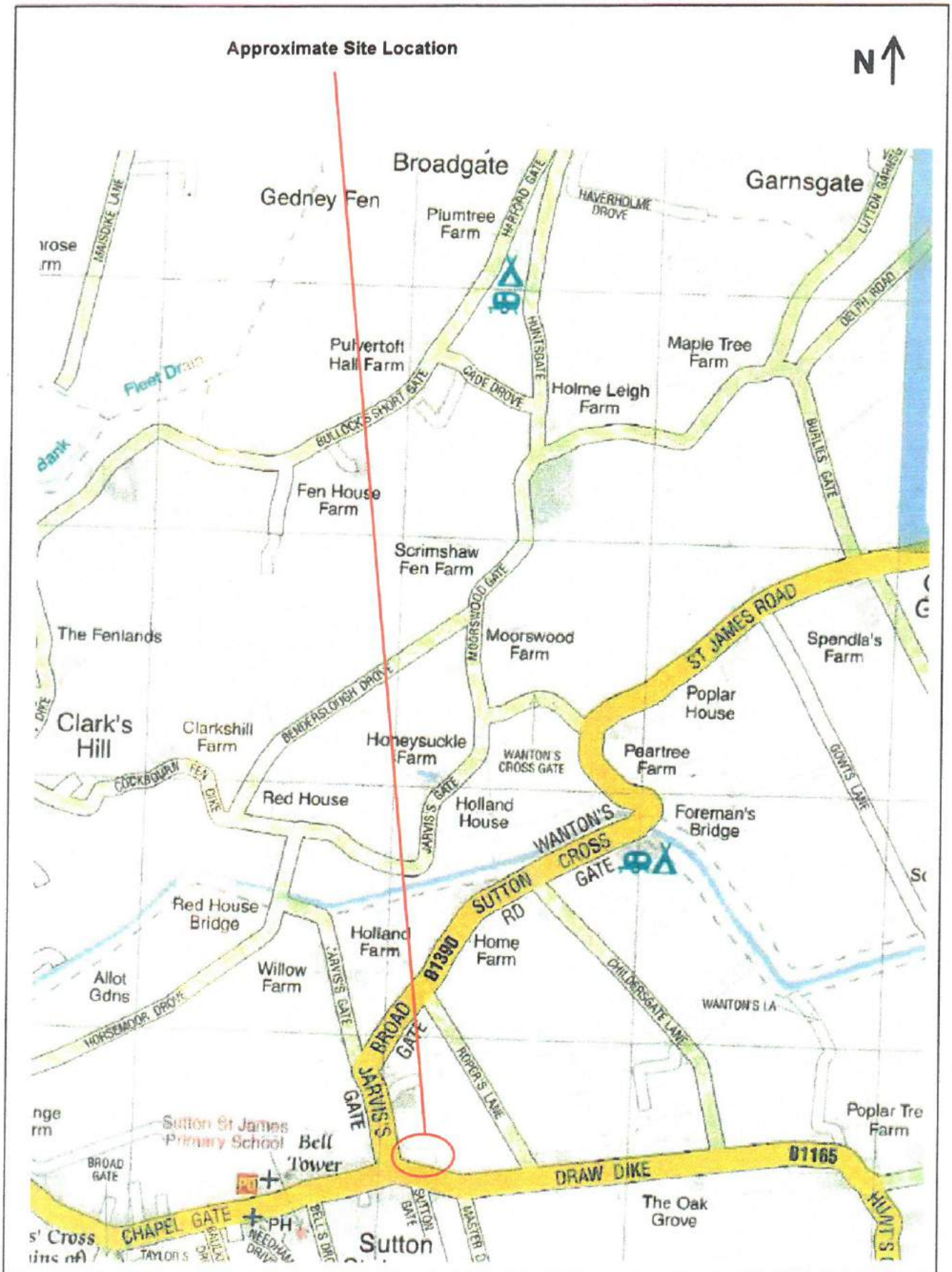


Figure 1	Site Location Plan	**Goldfinch** Environmental Ltd
Ref: 0439/1		



Figure 2	Proposed Layout Plan	**Goldfinch** Environmental Limited
Ref: 0439/1		