

Land south of Green Lane and east of Bacons Lane, Pinchbeck, Lincolnshire, PE11 3XS

Remediation Strategy

Report on behalf of R Bratley (Quadring) Limited.

June 2022

Final Report

R22022/R03

Issued by:
Grange GeoConsulting Limited
43 Winchilsea Avenue
Newark on Trent
Nottinghamshire
NG24 4AD

Tel: 07773529385
Email: www.grangegeo.co.uk

Client:
R Bratley (Quadring) Limited

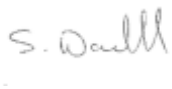
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1.0 INTRODUCTION

1.1 Terms of Reference

Consideration is being given by the Client, Mr R Bratley (Quadring) Ltd. to the residential redevelopment of a site situated off Green Lane in Pinchbeck, Lincolnshire. The site comprises three distinct field parcels, under agricultural use, separated from one another by field drains.

The site is located in a rural area of Lincolnshire, with open fields located to the north, east and west of the site. The site lies approximately 1km north of the centre of the village of Pinchbeck and approximately 4km north of Spalding Town Centre. The approximate National Grid Reference for the site is 523590, 327010 and the postcode is PE11 3XS. A Site Location Plan (Drawing R22022-DWG1) is presented in Appendix A.

The site covers an irregular-shaped area of approximately four hectares and comprises three individual agricultural fields, separated by field drains. For planning purposes, the site has historically been divided into two distinct areas. Area 1 comprises the north-eastern, eastern, and central areas of the site. The remainder of the site, known as Area 2, occupies the western and south-western areas of the site.

The site is located outside of, but adjacent to, the defined settlement limit of Pinchbeck in a rural area of Lincolnshire. The southern site boundary is marked by a drainage ditch. Beyond this lie residential houses facing Milestone Lane and associated gardens. Open countryside is present to the north and west. Surfleet Road (the B1356 road) provides access onto the site and marks the eastern site boundary, beyond which is open countryside. The western boundary is defined by Bacon´s Lane and an associated drainage ditch. Green Lane is present along the north-western site boundary. Residential properties are present beyond the site to the south and south-east. Drains run between the site and these residential areas. Birchgrove Garden Centre is located 50m south-east of the site and the River Glen is located approximately 205m west of the site.

Grange GeoConsulting Limited was commissioned by the Client to produce a Remediation Strategy in order to address geo-environmental issues previously identified at the site, and to enable the proposed development.

1.2 Proposed Development

The proposed development scheme comprises the erection of sixty-three residential dwellings with gardens, garages and parking provision, and areas of amenity space including a play area and soft landscaping. Access to the development will be from Surfleet Road. A Proposed Development Plan for the current scheme ('Site Layout Plan-As Proposed' Produced by Oglesby & Limb Ltd. in January 2019- Drawing Ref A1273-10 Rev E) is presented in Appendix A.

The current report will form part of a formal submission to secure compliance with Condition 4 of planning application H14-0137-19. The planning application was submitted to the Local Authority, South Holland District Council on the 6th February 2019, and granted on 15th July 2020.

1.3 Objectives

The Remediation Strategy aims to provide; an overview of the contaminative issues identified in a previous phase of investigation undertaken by Grange GeoConsulting in July 2019, an assessment of the pollutant pathways which could affect human users and/or controlled waters, and an overview of the remedial works that will be implemented to address the pollutant pathways and ensure they no longer pose a risk.

This document provides a platform for discussion with the Regulatory Authorities, which once agreed, will constitute the basis on which the site will be remediated. The strategy presented in this document has been developed in accordance with current guidance within Environment Agency (2021) 'Land Contamination Risk Management' (LCRM).

The present document should be read in conjunction with the following report, which has been reproduced in Appendix D:

- Grange GeoConsulting Ltd *'Phase 1 Desk Study and Phase 2 Ground Investigation Report'*. Ref. R18012/R002 dated 16th July 2019.

This report will support the above-mentioned planning application for the site (Condition 4ii of planning application reference: H14-0137-19) for the development of Areas 1 and 2 at the site.

1.4 Scope of Works

Authorisation to proceed with this report was given by Mr John Bratley in May 2022. The scope of works, as outlined in the Grange Geoconsulting Limited proposal which was provided to Mr Gordon Smith of Matrix Planning on the 18th February 2022, is summarised below:

- to evaluate the findings of the previous Phase 2 investigation, including any indicative remediation recommendations and to provide a site specific, prescriptive proposal of remediation, testing, and requirements for verification, in order to satisfy Condition 4(ii) of the planning consent.

- to allow for review of Condition 4(i) - ground gas assessment. The previous Phase 1 Desk Study and Phase 2 Site Investigation Report (included as Appendix D) is to be re-submitted for approval.

- undertake an options appraisal (as appropriate) which sets out and evaluates possible remediation options, including those initially proposed during the previous Phase 2, to establish the most cost-effective solution.

1.5 Limitations

The spacing of the exploratory holes, and the sampling and analysis undertaken as part of previous ground investigation, is considered to have provided a reasonable level of certainty about the ground conditions. However, it is important to recognise that contamination can be both widespread and relatively localised, depending on its source and nature. No investigation, however comprehensive, can be expected to determine the nature and extent of all contamination that could be present, and there will always be an element of uncertainty. The

potential for currently undetected contamination to be present must therefore be considered not only in the context of the current report, but also in consideration of future development activities, i.e., health and safety planning and risk management.

This document has been prepared specifically for the use of the Client R Bratley Quadring Ltd. as a guide to the remedial works likely to be required to render the site suitable for the proposed scheme. It is by no means a definite list or specification of the works that will be required and may require amendment in light of future findings. The document shall not be relied upon by other parties without the express written authority of Grange GeoConsulting Limited. If an unauthorised third party comes into possession of this report, then they rely on it at their own risk

2.0 SITE SETTING

The following section summarises the geo-environmental site setting established during the previous Grange GeoConsulting 'Phase 1 Desk Study and Phase 2 Ground Investigation' published in July 2019. Additional detail is available in the original document, which has been included as Appendix D, and should be read in conjunction with this report.

2.1 Published Geology

No records of Worked Ground (Undivided) or Made Ground were identified during the previous site investigation on site or within 500m. Historical mapping, however, indicated the presence of a former refuse tip on site.

At the time of the previous investigation the British Geological Survey (BGS) indicated that the site was underlain by superficial Tidal Flat Deposits. These deposits were formed up to two million years ago during the Quaternary period in a local environment dominated by shorelines. The deposits normally consist of a consolidated soft, silty Clay with layers of Sand, Gravel and Peat and are characteristic of areas exhibiting low relief.

The BGS recorded the superficial deposits to be underlain by consolidated strata from the Oxford Clay Formation. This unit was formed approximately 157 to 166 million years ago during the Jurassic period in a local environment dominated by shallow seas. The Oxford Clay Formation is a detrital marine sediment, comprising interbedded sequences of fine and coarse grained materials. Materials within the unit are typically described as grey, silicate-rich Mudstone, generally smooth to slightly silty, with sporadic beds of argillaceous Limestone nodules. The stratum is recorded by the BGS to be approximately 50m to 70m thick in this area of Lincolnshire.

2.2 Hydrogeology

Information obtained from Envirocheck Ltd. as part of the previous site investigation indicated that the site was underlain by Unproductive Strata with negligible permeability. The site was not fount to be located within a Groundwater Source Protection Zone and no Groundwater Source Protection Zones were recorded within 2km of the site.

No groundwater abstractions were identified by Envirocheck within 1km.

2.3 Hydrology

The previous investigation identified several on site surface water features, consisting of drainage channels situated along the southern, western, and north-western site boundaries. The drainage channels form part of the 'Welland' catchment. A number of additional streams and drains were identified within 1km, however the principal regional watercourse was the River Glen, situated approximately 205m west of the site boundary. The River Glen was listed as a River Quality C waterbody (based on data from 2000).

No pollution incidents to controlled waters were identified within 400m of the site at the time of the investigation.

2.4 Waste Management

One historical landfill facility was identified within the current site boundaries during the previous investigation. The landfill was located within Area 2, occupying the south-western portion of the site, off Bacon´s Lane (reference: EAHLD31105). The first input into the landfill was recorded 1967. Information on the last input into the landfill was unavailable. The deposited waste is recorded to have been commercial in origin.

No current landfill sites were recorded within 2km of the site. No further historical or BGS landfill sites are listed within 800m. No registered waste transfer, treatment, or disposal sites and no Local Authority recorded landfill sites were recorded within 1km of the site.

2.5 Site History

Based on information obtained during the previous site investigation, the site was occupied by open agricultural land during the 1880s. A building, which appeared to be residential in character, was present toward the north of the site at this time. Drainage channels were identified running alongside the site boundaries.

By 1904, two small pits/excavations were present close to the western site boundary. Ordnance survey maps dating from 1969 show a significant increase in the size of these excavations, which were now formally designated as a ‘refuse tip’. By 1982, neither the refuse tip, nor the former residential property were identified on available mapping.

An aerial photograph dating from 1999 showed the entirety of the site to be open land, under agricultural cultivation. The former refuse tip was indistinguishable.

According to available historical map sources, the area surrounding the site has been predominantly under agricultural and residential use since the 1880s.

3.0 PREVIOUS SITE INVESTIGATION

3.1 Grange GeoConsulting Ltd. 'Phase 1 Desk Study and Phase 2 Ground Investigation Report' (July 2019).

A site investigation was undertaken in July 2019 which summarised and updated the findings of a desk-based assessment (Phase 1 Desk Study), and provided the findings of an intrusive site investigation (Phase 2 Ground Investigation) undertaken in January 2019.

The site setting established during the desk-based assessment has been summarised in Section 2.0. The following section summarises the findings of the intrusive investigation works, and the subsequent risk assessment undertaken as part of the investigation. Additional detail is available in the original document, included as Appendix D, which should be read in conjunction with this report. The positions of excavations referred to in the following section are shown in Drawing R22022-DWG2, which is presented in Appendix A.

3.1.1 Ground Investigation Works Undertaken

An intrusive investigation was undertaken across both of the proposed development areas in January 2019. The investigation comprised;

the advancement of twelve window sample boreholes and the excavation of twenty-one trial pits to maximum depths of 5m and 2.1m below ground level (bgl) respectively.

These works were carried out to enable the logging of the soils encountered, to facilitate in-situ testing and to collect soil samples for chemical (contamination) and geotechnical testing.

Nine groundwater and ground gas monitoring standpipes were also installed on site and monitoring was undertaken for a period of six weeks following the ground investigation.

3.1.2 Ground Conditions Encountered

The ground conditions proven during the ground investigation were in general accordance with the published geological literature. Superficial Tidal Flat Deposits were encountered at the site, overlain by widespread thicknesses of Made Ground, which included re-worked Topsoil, re-worked natural materials and landfill / fill materials and waste. The Oxford Clay Formation bedrock was not encountered during the ground investigation.

Additional detail regarding the ground conditions encountered is presented below.

Re-worked Topsoil

In WS12, re-worked Topsoil was present at ground level and was logged as a dark grey, mottled black, clayey, slightly sandy, slightly gravelly Silt. The re-worked Topsoil was less than 0.1 thick in this location.

In TP15, TP17, TP18, TP20 and TP21, a re-worked Topsoil, logged as a friable, brown sandy, rarely gravelly Silt was present at ground level. The stratum was between 0.4m and 0.6m thick and no evidence of contamination was noted within these materials.

The re-worked Topsoil was underlain by the Tidal Flats in all locations at depths between 0.1m and 0.6m bgl.

Made Ground and Re-worked Natural Strata (Not Landfill)

Made Ground and re-worked natural strata, which did not appear to be the result of landfilling / filling at the site were recorded in several locations on site including WS3, WS5, WS6, WS7, WS8, WS10, WS11, TP11, TP13 and TP19.

Made Ground with a thickness of 1.0m was proven in WS11, consisting of silty, gravelly Sand containing concrete, possible asbestos cement sheeting, brick, glass, and Sandstone. Occasional metal fragments were also noted.

In TP19, the Made Ground was 1.2m in thickness and contained metal springs, bricks and brick rubble, breezeblocks, asphalt, occasional plastic, ceramic pipe fragments, timber, concrete and plyboard sheeting.

In WS3, the Made Ground comprised re-worked natural material, with a timber fragment present at 0.9m bgl. In WS5, the Made Ground, recorded to a depth of 0.8m bgl also consisted of re-worked natural strata and contained broken brick. In WS6, WS7 and WS8, re-worked strata was also noted. The Made Ground was 0.5m thick in WS7 and contained Limestone and brick.

In WS3, WS5 and WS6 at 1m bgl and at 1.5m bgl in WS8, a possible former ground surface was noted to be possibly present. Natural strata were found below the Made Ground and re-worked natural material in these locations. This indicates that possible land-raising has also taken place at the west of the site.

Made Ground was observed in WS10 and was 0.7m thick. The Made Ground was reworked natural strata and contained fragments of glass between 0.35m and 0.7m bgl and brick gravels. In TP11, occasional boulders of concrete were present to 0.7m bgl.

In TP13, Made Ground was present to 1.7m bgl and black Silt was encountered between 1.2m and 1.7m bgl. The material had a strong organic odour, was very wet and partially decayed, though no evidence of landfill material was noted. The overlying material between the ground level and 1.2m bgl appeared to be re-worked natural strata.

Made Ground (Filling / Landfilling)

Landfill / infill materials were encountered in WS1, WS2, WS4, WS4, TP1, TP2, TP3, TP4,TP5, TP6, TP7, TP8, TP9, TP10, TP12 and TP14.

Two boreholes (WS1 and WS3) and five of the trial pits (TP1, TP2, TP4, TP6 and TP7) were located within the area shown on historical mapping for the site covered by the former refuse tip. The extent of the filling that have taken place on site appeared to be considerably more extensive than outlined on the historical mapping. Typically, a 0.1m thickness of landfill is present at the surface of the site, underlain by relatively inert materials, which were placed over a subsurface layer of fill.

The composition of the materials encountered within these locations was highly variable. Anthropogenic materials encountered included; plastic (fragments and artefacts), plastic bags, crushed brick, ceramic pipework, ceramic pot fragments, nylon string, timber, possible asbestos cement sheeting, paper, plastic bottles, plastic banding (packaging), plastic poly-weave bags, metal fragments, metal drinks cans, metal containers, rubber bands, ceramic tiles, and metal reinforcing bars.

The thickness of lower layer of landfill material varied between 1.7m and 2.1m.

Tidal Flats Deposits

Tidal Flat Deposits were present beneath the re-worked Topsoil, Made Ground, and infill material in all of the exploratory locations on site.

The stratum was typically logged as an occasionally clayey, very silty SAND and sandy SILT. The material was noted to be frequently damp or wet within the exploratory holes.

The Tidal Flat Deposits were encountered at depths of between 0.1m bgl and 1.7m bgl. The thickness of the stratum was not proved during the ground investigation.

3.1.3 Groundwater

Groundwater strikes were encountered in Thirty-One of the excavations undertaken during the investigation, at depths of between 1.0m and 2.0m bgl. Two of the excavations (TP10, and TP11) proved a second strike, also within this depth range.

Groundwater monitoring was carried out on six occasions following the ground investigation. Visits were undertaken on the 25th and 31st January, and the 5th, 13th, 21st and 28th February 2019.

Groundwater depths were recorded during the monitoring programme to be between 0.76m and 1.37m bgl.

3.1.4 Ground Gas Monitoring

A total of six ground gas monitoring visits were carried out following the ground investigation between the 25th January, and 28th February 2019.

Methane concentrations recorded during the monitoring programme varied between 0.1% and 0.3% v/v. Maximum carbon dioxide concentrations varied between 0.7% and 7.2% v/v. Minimum oxygen concentrations of between 3.1% and 9.2% were recorded during the programme.

Flow rates were locally elevated, with maximum recorded rates of between 1.3l/hr and 11.2l/hr in WS3 and WS7, respectively. Flow rates in all other locations were below detection limits.

The findings resulted in the recommended classification of the site as Characteristic Situation 3 (CS3), requiring ground gas protection measures for future developments.

3.1.5 Contamination Assessment

As part of the laboratory analysis programme, twenty-five samples were taken from the Made Ground including landfill and fill materials, and five samples were taken from the natural strata.

The samples were subjected to analysis for a wide range of determinands appropriate to identified former activities at the site, and based on the findings of the previous investigation.

The results of the laboratory testing are detailed within the previous investigation report, and summarised below.

Human Health Assessment

The results were screened with respect to human health receptors using Generic Assessment Criteria appropriate to a Residential with Plant Uptake end use scenario.

Twenty-nine of the soil samples were screened for the presence of asbestos containing materials and fibres. One sample, taken from TP16 at a depth of 0.8m bgl, tested positive for asbestos. The sample contained loose Chrysotile (white) and Amosite (brown) asbestos fibres. The total asbestos content within the sample was recorded as 0.002%.

A piece of suspected asbestos-containing material was collected for chemical analysis as during the ground investigation. The material comprised a piece of hard chrysotile (white) asbestos cement-type material and was recovered from TP1 at a depth of 1.0m bgl.

A pesticide and herbicide screen was carried out on six samples collected during the ground investigation. None of the samples tested were confirmed to contain elevated concentrations of pesticide or herbicide compounds.

Speciated petroleum hydrocarbon analysis (TPH by CWG methodology) was carried out on nine samples collected during the ground investigation. None of the samples were found to contain concentrations of the various aliphatic and aromatic TPH fractions in excess of laboratory detection limits.

Testing for compounds collectively referred to as BTEX (Benzene, Toluene, Ethylbenzene and Xylene), PCBs, and Volatile Organic Compounds (VOCs) was undertaken on selected samples. The recorded concentrations were in all cases below laboratory detection limits.

All of the samples were tested for the presence of heavy metals, metalloids and speciated Polycyclic Aromatic Hydrocarbons (PAHs). Two of the samples were found to contain concentrations of lead marginally exceeding the GAC of 200 mg/kg. A concentration of 210 mg/kg was recorded in WS11 between 0.3m and 0.5m bgl, and a concentration of 290mg/kg was proven in a sample taken from TP16 at a depth of 0.8m bgl. No further exceedances of the adopted screening criteria (residential with plant uptake) were recorded in the samples taken during the investigation.

Based on the findings of the ground investigation, the risks posed to human health receptors at the site were considered **low to moderate**.

Controlled Waters Assessment

Two samples of groundwater were taken, and the chemical testing results compared against UK Drinking Water Standards (UK DWS) and Environmental Quality Standards (EQS). The samples were taken from WS5 and WS7.

No exceedances of the EQS were recorded in either of the samples taken.

A concentration of Nitrate (as NO2) above the UK DWS of 0.5 mg/l was recorded, with a maximum concentration of 1.6 mg/l proven in WS7.

Both of the water samples obtained during the investigation proved concentrations of Manganese of 1,800 µg/l, significantly exceeding the UK DWS of 50 µg/l. The EQS (Annual Average) for this determinand (123µg/l) is based on bioavailability. Bioavailability data has not been obtained to date.

Concentrations of ammonium (as NH4) were recorded above the UK DWS of 0.5 mg/l in both samples. The recorded concentrations were 2.2 mg/l and 45 mg/l in WS7 and WS5, respectively.

It should be noted that the sensitivity of underlying groundwater receptors is considered low, due to the classification of both the Tidal Flat Deposits, and underlying Oxford Clay Formation as Unproductive.

The proposed development does not include the construction of boreholes for purposes of potable water abstraction.

4.0 REMEDIATION STRATEGY

4.1 Remediation Objectives

The principal objective of the Remediation Scheme is to remove or mitigate risks from the identified pollutant linkages, which as a result, will render the site suitable for its intended residential end use.

The report has been produced in order to support to the discharge of Condition 4(ii) of Planning Application H14-0137-19.

The specific objectives of the remedial works are:

- Reduce the risks posed by land contamination and ground gases to site users and the environment to an acceptable level;
- Establish mechanisms for the remediation of soils, and or severance of contaminant linkages in order to reduce contamination impacts to an acceptable level
- To describe appropriate controls to be implemented during the works in order to demonstrate that they will not lead to significant impact either by enabling contaminant pathways already identified, or through the creation of new pathways associated with the construction process.
- To outline validation criteria, and provide detail regarding the requirements of verification reporting.

4.2 General

In order to achieve these objectives, the following remediation works are proposed. The adoption of this methodology has been based on the findings of previous Investigation Phases, and has been developed sympathetically with the design of the proposed development. The remedial works are proposed in order to remove or mitigate the pollutant pathways identified within a realistic framework and a suitable timescale.

The remedial works shall comprise:

- Excavation and removal from site of the contamination hotspot in the area around TP16, situated toward the centre-north of the site (within Area 1). The principal objective of these works will be to remove the source of chrysotile and amosite asbestos fibres encountered in this area, however the removal of soils around TP16 will also address the localised hotspot of lead contamination identified within the Made Ground.
- A visual inspection by a suitably licenced contractor of the existing substrate for the presence of Asbestos Containing Materials (ACMs), to be coupled where necessary with an appropriate ‘litter pick’ operation.

- The installation of ground gas protection measures within all proposed residential properties to prevent the ingress of ground gases associated with fill materials, and putrescible materials within the Tidal Flat Deposits.

- A layer of imported clean cover with a minimum thickness of 600mm and underlain by a geo-textile membrane/hard to dig layer in all soft landscaping areas. This will provide a barrier between identified contamination/fill materials/manganese impacted groundwater, and human health receptors and a provide a suitable growth medium for vegetation.

- The design of the proposed development will further mitigate controlled waters and human health risk through appropriate design of service conduits (to limit ground gas migration), the design and implementation of surface water drainage systems (to reduce infiltration, and mitigate against contaminant migration to controlled water receptors-surface waters), and through the adoption of flood levels (as stipulated in Condition 10 of planning consent H14-0137), which will enable the importation of a clean cover layer.

4.3 Remediation Criteria

All imported materials or soils remaining in-situ must comply with LQM CIEH (2015) 'Suitable for Use Levels for Human Health Risk Assessment' (S4ULs) appropriate to a residential (with plant uptake) end use scenario. Where no S4UL is available, the assessment criteria are CLEA (2009) Soil Guideline Values (SGVs) and CL:AIRE Category 4 Screening Levels (C4SLs).

The suite of analysis to be applied to site won and imported soil samples is presented in Appendix B.

4.4 Licences and Permits

The remedial works shall be undertaken in accordance with the relevant Health and Safety regulations and CDM regulations.

A system of material management shall be produced prior to commencement of works on site and maintained throughout the project. The system shall be designed to control the movement and adequate use of materials around site in accordance with current waste management legislation and guidance. This will be via means of a Material Management Plan (MMP) in accordance with the CL:AIRE 'Definition of Waste-Code of Practice'. The MMP will be provided as a separate standalone document prior to the commencement of any associated earthworks.

Off-site disposal of materials will be subject to current Waste Management Legislation. Depending on the quantity and disposal classification of materials produced at or removed from the site, it may be necessary to register the site as a hazardous waste producer.

Appropriately licensed waste carriers and disposal facilities shall be employed for the movement of materials as part of these works, and all associated documentation, including Waste Consignment Notes, and Landfill Acceptance Documentation will be retained for inclusion in subsequent validation reporting.

4.5 Stages of Remedial Works

It is proposed that remedial works are carried out in various Stages. As the 'Remedial' Works are largely coupled with the design of the development, and the implementation of the earthworks programme, these Stages are closely linked to the development programme. The designated remedial works are shown below in bold, with reference to the programme.

Stage I - *Enabling Works*

- Initial works will comprise the construction of a new vehicular entry point onto the site from Surfleet Road (B1356), along the eastern site boundary.
- The access point will enable the construction of a temporary construction compound.
- **The design and implementation criteria for site drainage and services, in order to mitigate against the possible migration of ground gases through service conduits, and the control of surface water drainage, thereby addressing potential contamination risks to controlled waters.**
- **A visual inspection of the existing substrate for the presence of Asbestos Containing Materials (ACMs), and a 'litter pick' operation of identified materials**

Stage II - *Removal of Contaminant Hotspots*

- **Excavation and removal from site of the contamination hotspot in the area around TP16, situated toward the centre-north of the site (within Area 1).**
- **Excavation and removal of any additional areas proven during the visual inspection carried out in Stage 1 which were proven to be impacted at a level in which a litter pick is not effective.**
- **Verification of resulting excavations.**
- Replacement of displaced, impacted soils with appropriate imported fill material.

Stage III - *Construction of Access Roads*

- Construction of access roads to enable the remainder of the proposed development.

Stage IV - *General Construction Phase*

- Earthworks required to achieve flood levels established in Condition 10 of Planning Application H14-0137-19, requiring ground levels to be raised by an average of 500mm to 600mm across the site.
- **The implementation of a clean cover system in soft landscaping/residential garden areas in conjunction with the earthworks exercise described above.**
- **The verification of clean cover thickness and chemical suitability for use.**
- Construction of the individual properties, inclusive of appropriate **ground gas protection measures**.

4.6 Remediation Works

The proposed remediation elements of the programme described in Section 4.5 will be discussed in further detail below.

4.6.1 Design of Drainage and Services (Stage I)

Where possible, drainage and service runs will be placed above the level of recorded groundwater. The use of granular fill material in the annulus surrounding drainage and pipework will be avoided if possible, or alternatively seals of relatively impermeable materials (clays) will be placed along service routes at regular intervals, in order to limit the creation of preferential pathways with respect to contaminated groundwater. The requirement for protected potable water pipework will be discussed and agreed with the local water authority/provider.

Arisings from the drainage runs could potentially be reused on site, providing materials are subject to chemical testing at a frequency of approximately 1 sample per 250m^3, and proven to be chemically suitable for retention. Assuming this is the case, material relocation will be undertaken in accordance with waste management regulations, and in accordance with a Material Management Plan produced under the CL:aire DoWCoP.

Excavated materials which are to be removed from site will be classified for disposal purposes in accordance with current waste management regulations, and removed from site to an appropriately licensed landfill or recycling facility by a licensed contractor. Details of the waste carrier, volumes taken off site and final disposal location as well as copies of the waste consignment notes shall be kept and collated on completion of works for their inclusion in subsequent Verification reporting.

The chemical quality of any imported clean materials used for infill purposes will need to be confirmed on the basis of 1 sample every 500m^3 prior to import. Materials shall be validated following the protocol described in Section 5.2.

4.6.2 Visual Inspection of the Substrate for Asbestos Containing Materials (Stage I)

Prior to widespread earthworks/construction works (requiring large scale importation of soils, raising site levels) a visual inspection will be undertaken of the existing substrate in order to identify and remove any fragments of asbestos containing materials.

Identified ACM fragments will be handpicked to minimise fibre release. The ACMs will be placed directly into approved waste sacks and double bagged. Waste sacks will then be placed into a secured skip for their disposal off-site into a licensed facility.

If during groundworks significant quantities of ACMs are identified which would be deemed licensable product e.g. AIB and lagging with high asbestos content, a licensed contractor may be required.

Should any areas of significant asbestos contamination be identified during the inspection, such that hand picking will not be effective, the impacted area will be designated a contamination hotspot, and dealt with in accordance with the methodology established in Section 4.6.3.

4.6.3 Excavation and Removal of Contamination Hotspots (Stage II)

A hotspot of asbestos contamination was previously identified toward the centre/north of the site (TP16) within the Made Ground at a depth of 0.8m below existing ground level. This excavation also contained nominally elevated concentrations of lead.

A 5m x 5m area centred on TP16 will be delineated and excavated to a depth of 1.2m below ground level (the depth to which Made Ground was recorded during the previous site investigation). Arisings generated during this process will be placed directly into a covered vehicle and will be removed from site for disposal at an appropriately licensed waste management facility by a suitably licensed contractor.

The resulting excavation will be subjected to validation of both the sides and base in accordance with the method described in Section 5.6.

In the event that validation testing proves contamination remaining in the faces of the excavation, the process will be repeated, extending the excavation until soil samples taken from each face are deemed chemically suitable for retention at the site.

The process above will be repeated for any additional contamination hotspots identified during the visual inspection of the site undertaken during Stage 1 of the development programme.

Copies of consignment notes and waste disposal documentation will be retained for inclusion within subsequent verification reporting.

A watching brief will be maintained throughout the earthworks programme by the Earthworks/Principal Contractor for the visible presence of asbestos containing materials. Where identified, the appointed environmental consultant will be notified, and options for disposal/remediation will be discussed and agreed with the local authority/Environmental Health officer prior to implementation.

4.6.4 Implementation of a Clean Cover System (Stage IV)

The proposed development will require the importation of between 500mm and 600mm of material across the site in order to achieve flood alleviation levels. As part of this process, it is proposed that clean soils are placed in areas of soft landscaping/garden areas, forming a clean cover system with a minimum depth of 600mm.

Prior to the placement of clean cover material, a geotextile membrane should be laid on the existing substrate, in order to limit the effects of turbation, and to provide a visual 'no dig' marker for prospective end users.

Any soils imported to create the clean cover within landscaped areas (either as a replacement, or a supplement to the existing substrate should be confirmed as suitable for use as per the validation specification in Section 7.1 below.

It is proposed that any imported materials used to create a clean cover should be sampled at a rate of 1:500m^3 to confirm its chemical suitability with respect to the proposed development. Ideally these materials will be sampled at source, prior to importation. The samples will be scheduled for the analysis suite described in Appendix B. Recorded contaminant concentrations will be screened against the assessment criteria set out in Appendix C. Materials to be used as a growth medium will also comply with the as well as the requirements of relevant British Standard for topsoil/subsoils BS3882:2015/ BS8601:2013. Any material which is found not to comply with these criteria will be rejected, and shall not be subject to importation and placement.

In-situ soils may be used in the creation of the clean cover system, providing they meet the chemical criteria described above. Site derived soils should be tested for the determinands established in Appendix B at a frequency of 1 sample per 250m^3.

Records regarding the provenance, composition and volumes of materials imported during the earthworks programme will be retained for inclusion within subsequent verification reporting.

On completion of the development stage, the thickness of the clean cover system will be verified within each proposed residential plot (garden).

4.6.5 Ground Gas Protection Measures

A programme of ground gas monitoring undertaken as part of the previous investigation Phase concluded that for purposes of development the site is designated Characteristic Situation 3 with regard to ground gases (BS8485:2015).

In accordance with BS8485:2015, the proposed residential developments have been provisionally classified as Type A structures (private ownership with small room sizes). A minimum gas protection score of 4.5 is required for this type of building, considering the Characteristic Situation.

The specification of the design will be developed in accordance with the requirements of BS8485:2015, and Characteristic Situation 3. Whilst the final design of the proposed structures

has not as yet been completed, it is anticipated that the following elements will be incorporated in order to achieve the required gas protection score.

Table 4.1. Proposed Ground Gas Mitigation (BS8485:2015)

Mitigation method	Protection Score
Reinforced Concrete Ground bearing slab	0.5
Passively sub-floor venting layer (Very good performance)	2.5
Proprietary Gas membrane & verification	2.0
Total	5.0

The final building design, inclusive of adopted ground gas protection measures will be submitted to the Local Authority for approval prior to the commencement of construction.

4.7 Unexpected Site Conditions

Based on the findings of the previous phases of Site Investigation, it is anticipated that unexpected contamination, asbestos containing materials and/or soil containing asbestos fibres may be encountered during the development. No current investigation method is capable of identifying all contaminant issues in a given area. Therefore, the potential for unexpected contamination to be encountered across the site should not be discounted.

In the event unexpected contamination and/or asbestos containing materials are found, it is the responsibility of the Contractor to immediately notify the appointed Environmental Consultant. The consultant will undertake a preliminary inspection of materials in question and potentially use in-situ testing, followed where considered necessary by the recommendation of additional laboratory testing.

An appropriate remediation method for the contamination will be agreed with the appropriate regulators prior to application. An assessment, excavation, validation and backfill protocol has been provided in Sections 5.6 in the event that material is to be excavated for off site disposal.

If the presence of contaminants for which assessment criteria have not been specified is revealed, then an appropriate assessment or remedial target criteria will be derived by the Environmental Consultant and further agreed with the regulators. Once criteria have been set, the quality of the materials will be re-assessed, to determine if they are suitable for retention or require off-site disposal/treatment.

5.0 VERIFICATION OF REMEDIAL WORKS

In order to demonstrate the remediation objectives have been met, the following verification works will be carried out:

- Validation of gas protection measures installed within the proposed building extension
- Validation of site-won and imported materials
- Validation of the clean cover system

Verification works will be carried out prior to the occupation of any residence in each identified phase of development in accordance with Condition 5 of planning application H14-0137-19.

5.1 Validation of Gas Protection Measures

The ground gas mitigation proposed for the residential development plots will include the installation of a subfloor gas membrane. It is important that an appropriate assessment/validation of the membrane is undertaken following installation, including an assessment of the lapping, sealing and taping of joints and sealing arrangements at penetrations.

This validation would be undertaken by a suitably qualified person in general accordance with BS 8485. Confirmation of compliance will be included in the validation report.

The compliance of the structural component of the protection measures will be evaluated at the design phase in conjunction with the Local Authority and/or building control.

5.2 Validation of Site Won and Imported Materials

Materials imported during the earthworks programme in order to raise site levels for flood alleviation purposes, and to create a clean cover system within garden areas, as well as any site won arisings liberated during the earthworks programme must be subject to a validation procedure to demonstrate suitability for use and/or retention on site.

The validation process will consist of:

- Visual inspection of materials
- Sampling of site-won materials at a frequency of 1 sample per 250m^3
- Sampling/verification of imported materials at a frequency of ca. 1 sample per 500m^3 (depending on provenance).
- Laboratory chemical analysis of soil samples.
- Screening of results against adopted assessment criteria, and where required as a growth medium against the criteria established in BS3882:2015.
- Reuse of suitable materials or off-site disposal of unsuitable/non-compliant materials

Site-won and Imported Materials

Site-won and imported materials will be subject to a preliminary visual and/or olfactory inspection to determine whether any evidence of gross contamination is present. Should such evidence be identified, the material should be considered 'contaminated' and should be sent for off-site disposal at an appropriately licensed facility in the case of site won materials, or rejected in the case of imported materials.

Following an acceptable visual/olfactory inspection, the chemical quality of site won or imported materials should be confirmed through laboratory testing undertaken at the following frequencies

Site Won Material

- 1No. sample per 250m^3 with a minimum of 3No. samples taken from each excavation area.

Imported Material

- 1No. sample per 500m^3 for a greenfield source (minimum 3No. samples)
- 1No. sample per 250m^3 for recycled material (inc. brownfield sources) (minimum 3No. samples)
- Natural quarry source: No specific testing required- Material source to be certified by supplier.
- Topsoil- tested for suitability depending on source as described above. Additional sampling/testing required to confirm suitability for use as topsoil in accordance with BS3882:2015.

The proposed analysis suite to be employed to determine the suitability of site won and imported materials use on site is based on the findings of chemical analysis undertaken during previous phases of investigation. A copy of the proposed analysis suite is included as Appendix B.

Samples obtained for testing will be stored in suitable containers in accordance with the type of analysis required, labelled, and placed within temperature-controlled boxes. Samples will be subsequently sent to a UKAS accredited laboratory for chemical analysis, in accordance with the suite described above.

Assessment of test data to determine suitability for re-use will be undertaken by comparison of the results with GACs established during previous investigation phases (LQM S4ULs, and DEFRA/CL:AIRE Category 4 Screening Levels (C4SLs) and Environment Agency Soil Guideline Values (SGVs)).

The assessment criteria are based on the appropriate proposed end-use criteria (residential with plant uptake).

Should there be a requirement to re-use site won materials, and testing indicates that the material is suitable for retention/re-use, records should be kept by the Principal/Earthworks Contractor of the nature of the materials, their origin and placement location as part of a Materials Management system (MMP), which is to be detailed in a separate document.

Where chemical analysis proves contamination at concentrations which exceed the adopted assessment criteria, the material will be deemed 'contaminated' and shall be disposed off-site. Materials sent for disposal must be placed into fully sheeted wagons to be transported into an appropriately licensed facility.

Photographic records of material import/relocation and waste consignments notes associated with soils sent for off-site disposal will be kept by the Main Contractor for inclusion in the final validation/verification report.

5.3 Unacceptable Materials

The following materials will be considered unsuitable for re-use/retention. Where excavated as part of the development works, such material shall be removed from site to suitably licensed facilities or treated in order to ensure suitability for intended end use.

- Materials containing visual or olfactory evidence of tar or hydrocarbons;
- Materials that contain visual evidence of asbestos;
- Materials containing more than 1% by mass of foreign objects including wood, plaster, plastic, metal, rubber and domestic waste and slag waste;
- Materials susceptible to combustion;
- Materials containing contaminants at concentrations exceeding the agreed Validation Criteria.

Materials which would otherwise be unsuitable for geotechnical reasons (i.e. peat, wet clays/silts), and which do not meet a geotechnical specification for structural fill will be considered acceptable for re-use providing it meets the contamination criteria described above, and is used in landscaping or where geotechnical competence is not critical. Assessment of geotechnical suitability will be undertaken by the site engineer and/or earthworks contractor.

5.4 Topsoil Validation

Site-won and or imported material which is to be used as topsoil within landscaping/garden areas must meet the established remediation criteria listed in Appendix C, as well as the requirements of BS3882:2015 'Specification for topsoil and requirements for use'. Compliance with the topsoil specification will be confirmed by an appointed landscape architect. The suitability of imported topsoil material should be demonstrated prior to its import onto site.

5.5 Validation of Cover System

A photographic record of the thickness and structure (i.e., topsoil/subsoil) of the cover system will be produced during and following the earthworks programme, and evidence included in the validation report. Inspections will be undertaken in each of the proposed development plots, with measurements either taken from the import face if undertaken during the works, or obtained through excavation through the substrate if validated following completion of import.

5.6 Validation of Excavations

A 5m x 5m area centred on TP16 will be delineated and excavated to a depth of 1.2m below ground level (the depth to which Made Ground was recorded during the previous site investigation). Arisings generated during this process will be placed directly into a covered vehicle and will be removed from site for disposal at an appropriately licensed waste management facility by a suitably licensed contractor.

The excavation resulting from the excavation of contaminated materials in this area will be validated in order to demonstrate that no contamination remains which could pose a risk of harm to future site users.

Excavation validation works will consist of the following items:

- Preliminary inspection of the excavation
- Sampling from base and sides of excavation
- Chemical analysis of samples
- Review of results against Adopted Assessment Criteria
- If contamination remains–further excavation and off-site disposal of materials/retesting of resulting excavation

After the removal of impacted soils, validation samples will be collected from the base and sides of the excavation. A minimum of one base sample and one sample from each face of the excavation will be taken, regardless of the excavation size. For larger areas, sampling on a more intensive sampling frequency may be implemented if deemed appropriate and depending on the nature of the contamination/distribution. This is typically based on a frequency of 1 sample per 25m^2 of excavation face.

The samples will be sent to a UKAS Accredited Laboratory and scheduled for a suite of analysis appropriate to the determinand(s) being remediated. Subsequent results will be screened against adopted Assessment Criteria (Provided in Appendix C). If the validation procedure reveals residual contamination in one or more of the pit faces, further excavation/disposal will be carried out and the validation process will be repeated until it is demonstrated the materials have achieved compliance.

6.0 VERIFICATION OF REMEDIAL WORKS

A final verification report will be produced on completion of the remedial works. The report will provide a detailed account and photographic evidence of the on-site operations (remediation and validation) as well as final assessment of the ground and groundwater conditions on site.

The report will also include:

- A description of remedial works undertaken
- A statement of the remediation objectives
- As built drawings / plans based on survey data e.g., final location of imported materials, etc
- Photographic record of the remedial works
- Records of consultations with regulators, if required
- Records of material movements and final locations
- Validation sampling plans and chemical test certificates
- Chemical analysis certificates for imported materials, as well as descriptions of composition, volumes imported and provenance
- Measurements of the thickness of the clean cover layer proposed across landscaping/garden areas
- Details and as-built plans of the gas protection measures installed
- Consignment notes for materials disposed off site (if any)
- Any post remediation arrangements that require further management
- A final summary of the ground conditions across the site

The report will be submitted on completion of works to the Regulatory Authorities for their approval. The remediation and verification works will be considered complete following written approval provided by the Regulators.

Verification works, and associated reporting will be carried/presented out prior to the occupation of any residence in each identified phase of development in accordance with Condition 5 of planning application H14-0137-19.

7.0 REFERENCES

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Appendix A DRAWINGS

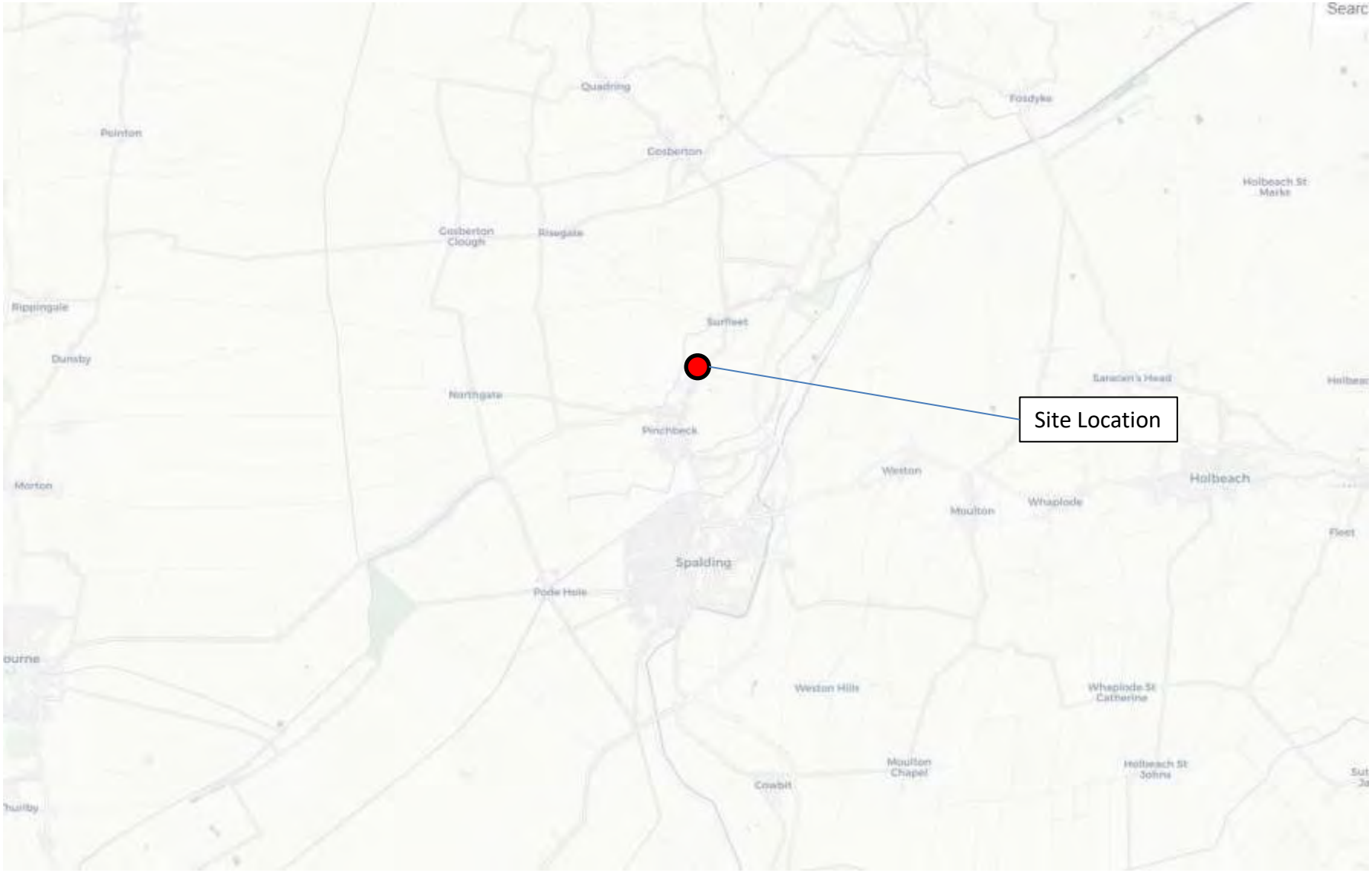
Appendix B PROPOSED ANALYSIS SUITE FOR REMEDIATION/ VERIFICATION WORKS

Appendix C ADOPTED SCREENING CRITERIA FOR VERIFICATION TESTING

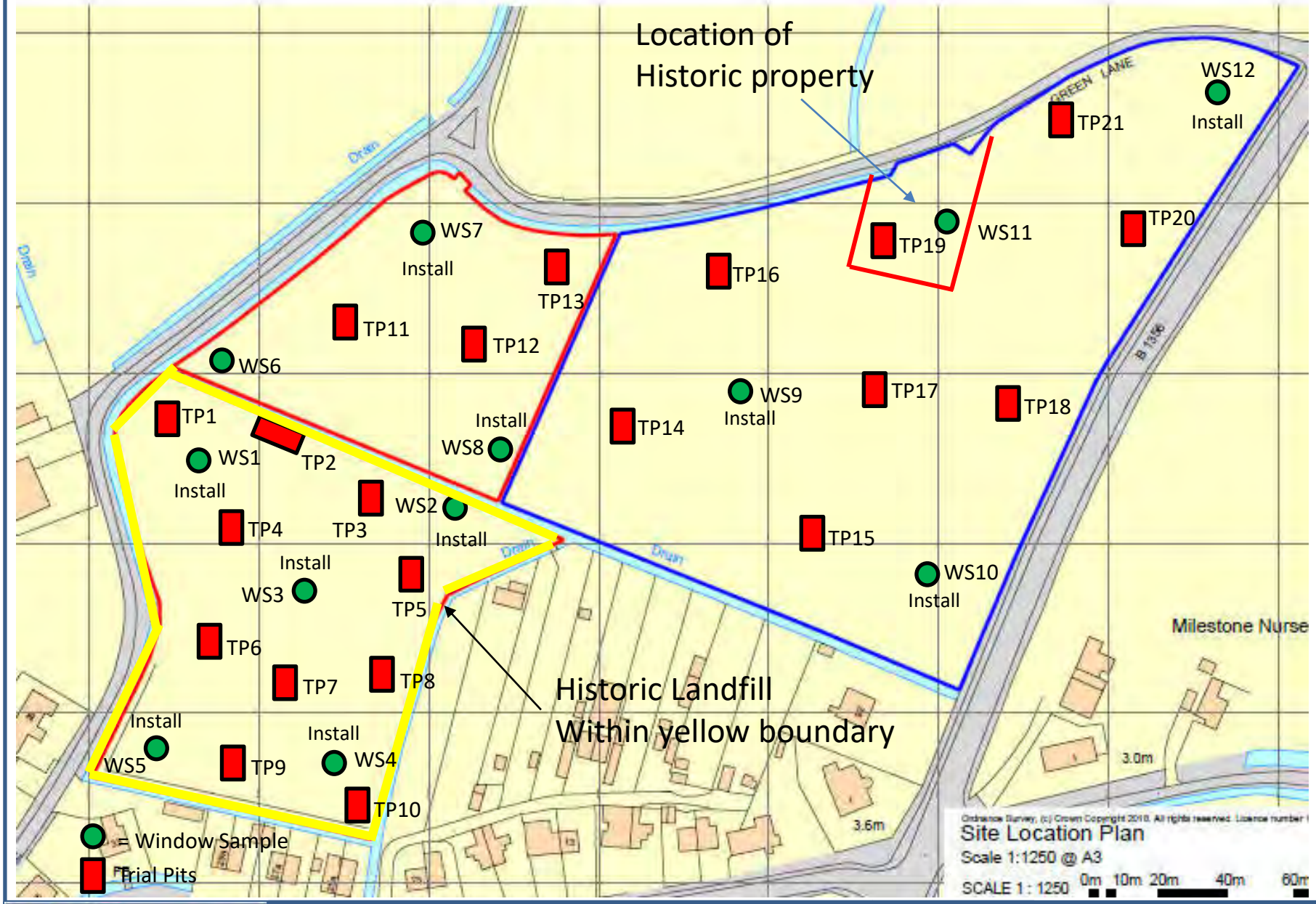
Appendix D PREVIOUS REPORTING: GRANGE GEOCONSULTING LTD *'PHASE 1 DESK STUDY AND PHASE 2 GROUND INVESTIGATION REPORT'*. REF. R18012/R002 DATED 16TH JULY 2019

Appendix A

DRAWINGS



Grange Geo	**Site Location Plan** Land South of Green Lane, Pinchbeck	**Client**- R Bratley (Quadring) Ltd.	North	**Dwg Ref.**- R22022-DWG1 **Date**- June 2022



Grange Geo

Excavation Location Plan
July 2019 Investigation
Green Lane, Pinchbeck

Client- R Bratley (Quadring) Ltd.

North

Dwg Ref.- R22022-DWG2

Date- June 2022

Site Layout Plan

Scale 1:500

SCALE 1 : 500 — 0m 5m 10m 20m 30m 40m 50m

SCALE 1 : 1 — 0m 10mm 20mm 40mm 60mm 80mm 100mm

Public Open Space Area

Total Site Area = 40703 m2

Total POS: 2469 + 825 + 2945 + 110 = 6349 = 15.6%

Area 1

Area 1 was submitted as an outline application on another application.
Reference: H14-0549-17

Surface Water Drainage System

Post flow outfall chamber with flow limiting device, surface water will flow southwards and discharge into the piped IDB drain at the junction of Milestone Lane and Surfleet Road.

Affordable Housing Contribution

Type B - 4 units	18 total affordable units
Type C - 4 units	=
Type P - 5 units	29% of 63 plots
Type Q - 2 units	
Type R - 3 units	



Building Types and Quantities

1 NR.	TYPE A - 3B4P Detached House (135m2)	
6 NR.	TYPE B - 2B3P Semi-detached House Each (74m2)	
6 NR.	TYPE C - 2B3P Semi-detached House Each (74m2)	
2 NR.	TYPE D - 4B5P Detached House (205m2)	
2 NR.	TYPE F - 5B9P Detached House (239m2)	
9 NR.	TYPE G - 5B8P Detached House (193m2)	
6 NR.	TYPE H - 3B5P Detached Bungalow (142m2)	
9 NR.	TYPE J - 2B5P Detached Bungalow (118m2)	
4 NR.	TYPE K - 3B5P Detached House (173m2)	
6 NR.	TYPE L - 2B4P Semi-detached Bungalow Each (82m2)	
1 NR.	TYPE N - 3B4P Detached House (126m2)	
6 NR.	TYPE P - 3B5P Semi-detached House Each (96m2)	
2 NR.	TYPE Q - 1B2P Semi-detached House Each (52m2)	
3 NR.	TYPE R - 2B3P Terrace House Each (74m2)	

= Surface water drainage with arrow depicting direction of flow

AH = Affordable Home

bl = Low Level Lighting Bollards

= Timber Fence

= Timber Fence Between Brick Piers

= Brick Wall

= Low Railing

= Hedge Row

DO NOT SCALE THIS DRAWING. THE CONTRACTOR IS DEEMED TO HAVE CHECKED ALL DIMENSIONS ON SITE AND REPORT ANY DISCREPANCIES TO OGLESBY & LIMB LTD.
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Ref.	Date	Description	Initial
Rev E	12.02.2020	Increase in the size of types: B,C,P,Q and R. Adjustment to the layout of plots: 13,14,15 and 16. Adjustment to POS area. Adjustment to plots 8 and 11.	EJU
Rev D	21.11.2019	Minor adjustment to plot 2 and 3 layout. New type R. Increased allocation of affordable housing to 18 units. Increase in total plots to 63. Adjustment to POS area. Details of Boundary treatment added. Location adjustment to plot 17 and 18. Location adjustment to plot 25,26 and 27.	EJU
Rev C	20.09.2019	Minor changes to layout. Hedgerows removed from easement. New types P and Q. Removal of type M (terrace). Affordable housing allocated.	EJU
Rev A	12.07.2019	Minor changes to layout. Areas changed or affected on original layout: Plots 2,3,4,5,6,11,24,25,32,33,34,35,45,46, 47,48,49,50,51,52,53,54. South East POS area increase New types M and N New drainage strategy	EJU

Oglesby & Limb Ltd
Chartered Architect
Suite 1, Market Chambers
12 Market Place, Spalding, Lincs
PE11 1SL
Tel: 01775 761196
e-mail: design@o-l-ltd.co.uk

Client:

Kirk Homes Ltd

Project:

**Proposed Residential Development,
Green Lane,
Pinchbeck,
Lincolnshire
PE11 3XT**

Drawing Title:

Site Layout Plan

As Proposed

PLANNING APPLICATION ISSUE

Date: JAN 2019	Scale: as shown
Drawn by: EJU	Checked by: AJO

Drawing Number: **A1273 - 10**

Rev: **E**

Appendix B

PROPOSED ANALYSIS SUITE FOR REMEDIATION/ VERIFICATION WORKS

Metals/Metalloids	
Cyanide	Lead
Arsenic	Mercury (elemental)
Beryllium	Mercury (inorganic)
Boron	Nickel
Cadmium	Selenium
Chromium	Vanadium
Chromium VI	Zinc
Copper	
BTEX	
Benzene	m/p Xylenes
Toluene	o Xylenes
Ethyl Benzene	Xylenes
Speciated PAHs	
Naphthalene	Benzo[a]anthracene
Acenaphthylene	Chrysene
Acenaphthene	Benzo[b]fluoranthene
Fluorene	Benzo[k]fluoranthene
Phenanthrene	Benzo[a]pyrene
Anthracene	Indeno[123-cd]pyrene
Fluoranthene	Dibenzo[ah]anthracene
Pyrene	Benzo[ghi]perylene
Asbestos	
Asbestos (Screen and ID)	
Speciated TPH	
Aliphatic C5 - C6	Aromatic C5 - C7
Aliphatic C6 - C8	Aromatic C7 - 8
Aliphatic C8 - C10	Aromatic C8 - C10
Aliphatic C10 - C12	Aromatic C10 - 12
Aliphatic C12 - C16	Aromatic C12 - C16
Aliphatic C16 - C21	Aromatic C16 - C21
Aliphatic C21 - C35	Aromatic C21 - C35

Appendix C

ADOPTED SCREENING CRITERIA FOR VERIFICATION TESTING

ADOPTED SCREENING CRITERIA

Table A presents the Generic Assessment Criteria (GAC) for a residential with plant uptake (including the consumption of home-grown produce) scenario, considered appropriate to the proposed development **.**

Table A: GAC for residential with plant uptake (including the consumption of home-grown produce)

Based on C4SL, S4UL and SGV values appropriate to a 1% Soil Organic Matter Content (considered a conservative approach).

Metals/Metalloids	
Cyanide	4.6
Arsenic	32
Beryllium	1.7
Boron	290
Cadmium	10
Chromium	627
Chromium VI	4.3
Copper	2330
Lead	200
Mercury (elemental)	1
Mercury (inorganic)	40
Nickel	130
Selenium	250
Vanadium	75
Zinc	3700
BTEX	
Benzene	0.087
Toluene	130
Ethyl Benzene	47
m/p Xylenes	56
o Xylenes	60
Xylenes	56
Speciated PAHs	
Naphthalene	1.5
Acenaphthylene	170
Acenaphthene	210
Fluorene	160
Phenanthrene	92
Anthracene	2300
Fluoranthene	260
Pyrene	560
Benzo[a]anthracene	3.1
Chrysene	6
Benzo[b]fluoranthene	2.6
Benzo[k]fluoranthene	8.5
Benzo[a]pyrene	2.2

Indeno[123-cd]pyrene	3.2
Dibenzo[ah]anthracene	0.24
Benzo[ghi]perylene	44
Asbestos	
Asbestos	Non-detected
Speciated TPH	
Aliphatic C5 - C6	30
Aliphatic C6 - C8	73
Aliphatic C8 - C10	19
Aliphatic C10 - C12	93
Aliphatic C12 - C16	740
Aliphatic C16 - C21	45000
Aliphatic C21 - C35	45000
Aromatic C5 - C7	65
Aromatic C7 - 8	120
Aromatic C8 - C10	27
Aromatic C10 - 12	69
Aromatic C12 - C16	140
Aromatic C16 - C21	250
Aromatic C21 - C35	890

Appendix D

PREVIOUS REPORTING: GRANGE GEOCONSULTING LTD *'PHASE 1 DESK STUDY AND PHASE 2 GROUND INVESTIGATION REPORT'*. REF. R18012/R002 DATED 16TH JULY 2019



Land south of Green Lane and east of Bacon´s Lane, Pinchbeck, Lincolnshire

Phase 1 Desk Study and Phase 2 Ground Investigation Report

Report on behalf of R Bratley (Quadring) Limited

July 2019

Initial Report Submission for Local Authority Review

R18012/002

Issued by:
Grange GeoConsulting Limited
43 Winchilsea Avenue
Newark on Trent
Nottinghamshire
NG24 4AD

Telephone number: 07773529385
Email: www.grangegeo.co.uk

Client:
R Bratley (Quadring) Limited

Project:
Land south of Green Lane and east of Bacon´s Lane, Pinchbeck, Lincolnshire

Title:
Phase 1 Desk Study and Phase 2 Ground Investigation Report

Status:
Initial Report Submission for Local Authority Review

Date:
July 2019

Document Production Record

Issue Number: 2	Name	Signature
Approved	Andrew Hare (BSc MSc DIC FGS)	Andrew Hare

Document Revision Record

Issue number	Date	Revision Details
R18012/002	16th July 2019	Phase 1 Desk Study and Phase 2 Ground Investigation Report replacing original Desk Study Report

Grange GeoConsulting Limited has prepared this report in accordance with the instructions of the Client, R Bratley (Quadring) Limited for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.

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EXECUTIVE SUMMARY

Purpose of This Report	Phase 1 Desk Study and Phase 2 Ground Investigation Report
Client	R Bratley (Quadring) Limited
Site	Land south of Green Lane and east of Bacon´s Lane, Pinchbeck, Lincolnshire
Site Location	The site is located in rural Lincolnshire, with open countryside to the north, and west. Beyond this lie residential houses facing Milestone Lane and associated gardens. The site lies approximately 1.2km north of the centre of the village of Pinchbeck and approximately 4km north of Spalding Town Centre. The approximate National Grid Reference for the site is 524520, 326990 and the postcode is PE11 3XT.
Current Land Use & Description	The site covers an irregular-shaped area, approximately four hectares in size. The site was in use as agricultural land at the time of writing in June 2019 and comprised three individual agricultural fields, separated by field drains.
Proposed Development	The proposed development scheme comprises the erection of sixty-four residential dwellings with gardens, garages and parking areas with amenity space including a play area and soft landscaping. Access to the development will be via Surfleet Road.
Site History	The site was occupied by open land in the 1880s and a building which appeared to be a residential unit was present at the north of the site. Drains were shown running across the site and along the site boundaries. By 1904, what appeared to be two small pits or areas of excavation were present on the western site boundary but were unlabelled. By 1969, a refuse tip was labelled in this location and the excavations had increased significantly in size. By 1982, the former residential property at the north of the site was no longer shown. The refuse tip was also no longer shown. A 1999 aerial photograph of the site showed the site to be open land, cultivated for crops. The former refuse tip was unable to be distinguished. The surrounding land has been predominantly agricultural and residential since the 1880s. No significantly contaminative activities were noted in the vicinity of the site.
Unexploded Ordnance	The site and immediate vicinity is in an area with a low bomb risk (further action to mitigate the risk is considered prudent by Zetica, although not essential).
Geology, Radon and Ground Stability	No Made Ground or Worked Ground are listed on site or within 250m of the site within the Envirocheck Report. Historical mapping, however, indicates the presence of a former refuse tip on site. As such Made Ground and fill materials are assumed to be present. The British Geological Survey (BGS) indicates that the site is underlain by Tidal Flat Superficial Deposits comprising silty Clay with layers of Sand, Gravel and Peat. The bedrock at the site is the Oxford Clay Formation, a grey, silicate-rich, slightly silty Mudstone, with Limestone nodules. The site is in a low probability radon area (with less than 1% of the homes are estimated to be at or above the Action Level). No radon protection measures are necessary in the construction of new dwellings or extensions on site. The site is listed as having a moderate risk of compressible ground and running sand. Due to the potential presence of infilled materials within the south-west of the site, excessive settlement is also considered a potential ground stability hazard.
Mining and Ground Stability	The site is not located within a coal mining area and there are no BGS Recorded Mineral Sites within 2km. No natural or man-made cavities are listed within 2km and there are no records of potentially infilled land within 750m.

Hydrogeology, Hydrology and Flood Risk	The site is listed within the Envirocheck Report as Unproductive Strata. The site is not within a Groundwater Source Protection Zone and there are no groundwater abstractions listed within 1km. There are no discharge consents listed within 225m, no surface water abstractions listed within 400m and no pollution incidents to controlled waters listed within 400m. The nearest surface water feature is listed on site and relates to the drains along the southern, western and north-western site boundaries. The River Glen is 205m west. The site is not within an area at risk of flooding by rivers or seas and is not protected by flood defences. The site and the immediate area are not listed as having the potential for groundwater flooding to take place.
Waste Management	There are no registered waste transfer sites or registered waste treatment, disposal sites or Local Authority recorded landfill sites recorded within 1km. No current landfill sites are listed within 2km of the site. There are no records relating to radioactive materials, explosive sites, or hazardous substances registered within 2km of the site. One historical landfill site is listed on site. The first input into the landfill site is recorded as having taken place in 1967. The deposited waste is listed as commercial waste. No further information is provided within the Envirocheck Report.
Ground Investigation Overview	The ground investigation comprised the advancement of twelve window sample boreholes and the excavation of twenty-one trial pits to maximum depths of 5m and 2.1m below ground level (bgl). This was carried out to enable the logging of the soils encountered, to facilitate in-situ testing and to collect soil samples for chemical (contamination) and geotechnical testing. Nine groundwater and ground gas monitoring standpipes were also installed on site and monitoring was undertaken for a period of six weeks following the ground investigation.
Findings of the Ground Investigation	<u>Re-worked Topsoil</u> Generally dark grey and brown, clayey, slightly sandy, slightly gravelly Silt with roots and rootlets. <u>Made Ground and re-worked Natural Strata (not landfill)</u> Variable re-worked natural strata and Made Ground containing timber, concrete, possible asbestos cement sheeting, brick, glass, metal, building rubble, ceramics, occasional plastic, plyboard sheeting. Hardstanding slabs and a possible infilled channel noted. <u>Made Ground (landfilling / filling)</u> Variable re-worked natural strata and Made Ground containing landfill and fill materials including plastic artefacts (bags, moulded plastic, cups, mesh, punnets, tape, bottles and banding), brick, concrete, roof tiles, ceramics, nylon string, paper, plant labels, poly-weave bags, metal and timber. Asbestos cement sheeting, coal, evidence of a fire (including charcoal, burnt paper and melted plastic) and building rubble less commonly noted. <u>Tidal Flat Deposits</u> Typically logged as occasionally clayey, very silty Sand and sandy Silt. Generally grey, brown and orangish-brown with occasional roots and rootlets. <u>Evidence of Contamination</u> In WS1, coal was present between 0.45m and 0.6m bgl. In WS11, a possible asbestos cement sheet was found in the upper 0.8m of the Made Ground. Occasional fragments of possible asbestos cement sheeting were also found in the Made Ground in TP1. Evidence of a fire was present between 0.2m and 0.95m bgl in TP7.

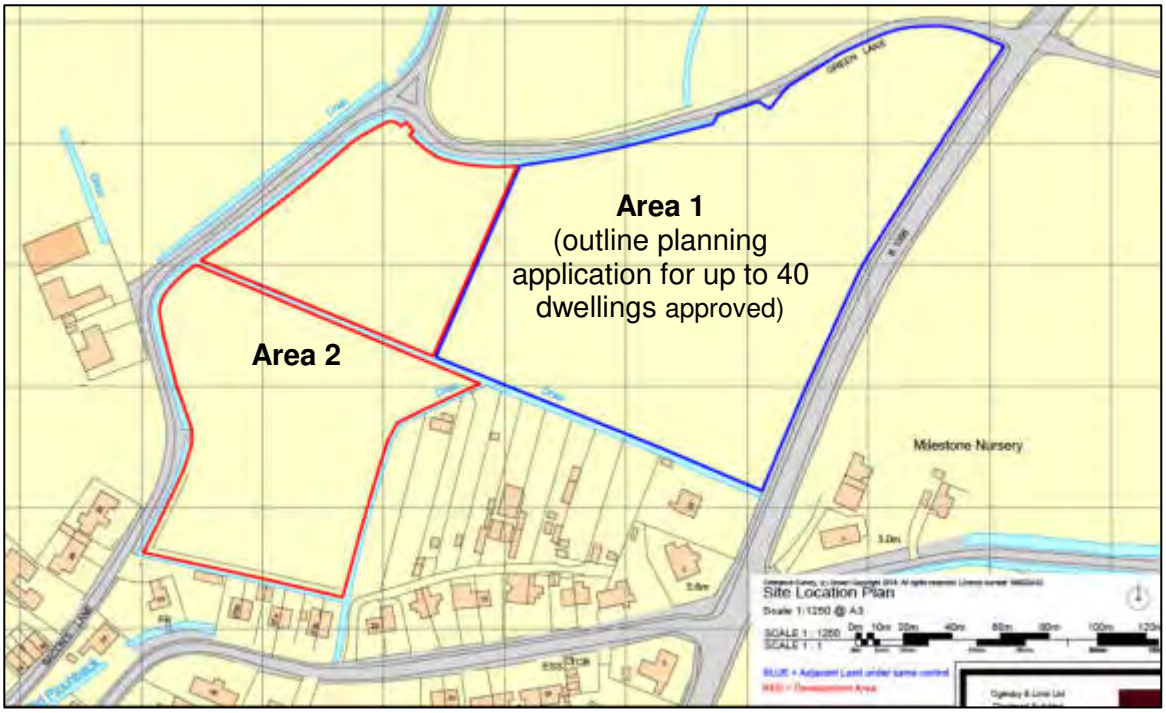
	<u>Groundwater</u> Perched groundwater was recorded. No evidence of contamination was noted in groundwater.
Contamination Testing	<u>Soils</u> Twenty-five samples were taken from the Made Ground including landfill and fill materials. Five samples were taken from the natural strata. Twenty-nine of the soil samples were tested for asbestos. Only one sample tested positive for asbestos, located within TP16 at 0.8m bgl. The asbestos was confirmed as loose Chrysotile and Amosite asbestos fibres. The total asbestos content within the sample was recorded as 0.002%. None of the samples were found to contain exceedances of the GAC for speciated TPH, BTEX or PAH. All of the samples were confirmed not to contain positive concentrations of either pesticides or herbicides. Speciated PCB testing was carried out on six samples and no positive readings for PCB were recorded. All of the samples were tested for the presence of heavy metals, metalloids and speciated PAH. Two samples contained concentrations of Lead marginally above the GAC of 200 mg/kg. Based on the observations during the ground investigation and the laboratory testing results for the site, the Made Ground and landfill / fill materials beneath the site appear to be relatively inert and generally do not contain concentrations of contaminants in excess of the GAC for residential development. <u>Groundwater</u> No exceedances of the EQS were recorded in the groundwater samples taken. A concentration of Nitrate (as NO_2) above the UK DWS was recorded in one sample. Both of the groundwater samples taken recorded highly elevated concentrations of Manganese and Ammonium (as NH_4). Due to the groundwater within the boreholes on site not being used as a potable water supply the slightly elevated concentrations recorded are not considered to pose a risk.
Geotechnical Summary	Based on the geotechnical testing results, low underlying soil strengths, thickness of Made Ground and shallow groundwater table it is likely the most suitable foundation solution would be piled.
Conclusions and Further Work	Based on the findings of the ground investigation, several data gaps have been identified and the following works will be required to fully-characterise the site. Based on the current site information, Grange GeoConsulting Limited are of the opinion that remedial options are available such that the site in its current form can be safely developed for residential use. • Further consultation with the Local Authority and other regulatory bodies. The below scope of works maybe subject to change following the receipt of further information and is therefore considered to be provision at this stage. • Further ground gas monitoring is required at the site. The scope of which will be discussed with the Local Authority. Groundwater levels will also be monitored as part of the monitoring programme and a Photo Ionisation Detector (PID) will be used to confirm the absence of TPH and VOC vapours within the boreholes; • Further groundwater samples will need to be taken across the site, particularly within the existing boreholes located within the former refuse tip to confirm the groundwater quality and direction of groundwater flow at the site. The groundwater samples collected should be tested for Speciated Total Petroleum Hydrocarbons (TPH-CWG fractions for both aliphatics and aromatics) and Volatile Organic Compounds (VOCs). A Photo Ionisation Detector (PID) will also be used to be used to confirm the absence of TPH and VOC vapours within the boreholes. The scope of the additional sampling which will be discussed with the Local Authority.

	• Further ground investigation may be required within the vicinity of TP13 to confirm the presence of the infilled channel in this area. • An invasive weeds survey will need to be undertaken on site by a specialist contractor to confirm the absence of invasive plants on site.

1.0 INTRODUCTION

1.1 Terms of Reference

Consideration is being given by the Client, R Bratley (Quadring) Limited, to the development of the site known as the Land south of Green Lane and east of Bacon´s Lane in Pinchbeck, Lincolnshire. The site covers an irregular-shaped area of approximately four hectares and comprises three individual agricultural fields, separated by field drains. For planning purposes, the site has been divided into two distinct areas. Area 1, which comprises the area outlined in blue below forms the north-eastern, eastern and central areas of the site. An outline planning application for this area of the site, which forms around 55% of the total site area, has already been approved for up to forty residential dwellings. The remainder of the site, known as Area 2, is outlined in red below and occupies the western and south-western areas of the site, and forms around 45% of the total site area. As such, the principle of development has already been accepted on over half of the site to date.



The site lies approximately 1.2km north of the centre of the village of Pinchbeck and approximately 4km north of Spalding Town Centre. The approximate National Grid Reference for the site is 524520, 326990 and the postcode is PE11 3XT. A Site Location Plan (Drawing R18012/002-DWG1) is presented in Appendix A.

The entire site was in use as agricultural land at the time of writing in June 2019, with the site boundaries formed by trees, with roads and open land beyond. The site is located outside of, but adjacent to, the defined settlement limit of Pinchbeck in a rural area of Lincolnshire. The southern site boundary is marked by a drainage ditch. Beyond this lie residential houses facing Milestone Lane and associated gardens. Open countryside is present to the north and west. Surfleet Road (the B1356 road) provides access onto the site and marks the eastern site boundary, beyond which is open countryside. The western

boundary is defined by Bacon´s Lane and an associated drainage ditch. Green Lane is present along the north-western site boundary. Residential properties are present beyond the site to the south and south-east. Drains run between the site and these residential areas. Birchgrove Garden Centre is located 50m south-east of the site and the River Glen is located approximately 205m west of the site.

This Phase 1 Desk Study and Ground Investigation Report combines the two phases of work that have been taken across the whole site to date (Areas 1 and 2). This report initially summarises the findings of the Desk Study, which informed the design of the subsequent ground investigation. The findings of the ground investigation carried out and the associated laboratory testing that have been carried out are then outline within this report. The ground investigation comprised the advancement of twelve window sample boreholes (WS1 to WS12) to a maximum depth of 5m below ground level (bgl) and twenty-one trial pits (TP1 to TP21) to a maximum depth of 2.1m bgl to observe the shallow ground and groundwater conditions and to allow the collection of soil samples for contamination analysis (chemical testing) and geotechnical testing. Nine groundwater and ground gas monitoring standpipes were also installed on site and monitoring was undertaken for a period of six weeks following the ground investigation.

A previous Desk Study Report was written in June 2018 by Grange GeoConsulting Limited (report reference: R18012/001 Land off Green Lane, Pinchbeck, Lincolnshire dated 29th June 2018) which covered Area 1 of the site only. All of the relevant information within the previous report has been reproduced in this report. As such, this report supersedes the original Desk Study Report.

1.2 Proposed Development Scheme

The proposed development scheme comprises the erection of sixty-four residential dwellings (to include twenty-five three, four and five-bedroom detached houses, twenty-four two-bedroom semi-detached houses and fifteen three-bedroom bungalows) with gardens, garages and parking provision, and areas of amenity space including a play area and soft landscaping across Area 1 and 2. Access to the development will be from Surfleet Road. A Proposed Development Plan for the current scheme (Drawing R18012/002-DWG2) is presented in Appendix A. The planning application reference for the site is H14-0137-19 and the planning application for the site was submitted to the Local Authority, South Holland District Council on the 6th February 2019. The planning application status is currently listed as undecided on the South Holland District Council Planning portal.

The original outline planning application for Area 1 on site, was for the erection of forty residential dwellings (to include thirty-nine houses and one bungalow) with gardens, garages and parking provision, and areas of amenity space and soft landscaping. Access to the development was also reported to be from Surfleet Road. The planning application reference for this scheme is H14-0549-17. This outline planning application was submitted on the 8th June 2017 and approved on the 6th March 2019.

1.3 Objectives

The objective of the work undertaken was to carry out an initial Desk Study and Preliminary Risk Assessment of the site to inform the Client of the ground conditions and any potential

environmental or ground-related risks associated with the development opportunity. The findings of the Desk Study and Preliminary Risk Assessment were then used to design a ground investigation. The aim of which was to determination of the underlying ground and groundwater conditions, including an assessment of the level of contamination on site and the provision of initial geotechnical design recommendations.

This report will support the above-mentioned planning application for the site (planning application reference: H14-0137-19) for the development of both Areas 1 and 2 on site.

1.4 Scope of Works

Authorisation to proceed with this report was given by R Bratley (Quadring) Limited in 2018 via email and was intended to support the initial outline planning application for the site. The scope of works was then extended to include both Area 1 and Area 2 of the site and was outlined in additional Grange Geoconsulting Limited fee proposals dated the 1st February 2018 and the 21st November 2018. The scope of works is summarised below and overleaf:

Phase 1 Desk Study

- A site walkover of both Areas 1 and 2;
- A review of topographical, geological and hydrogeological maps;
- A review of historical site maps to identify any former potentially contaminative uses of the site and the areas immediately surrounding it, and an assessment of the potential contaminants associated with those uses;
- Purchase and review of a Landmark Information Group Envirocheck Report for the site to identify any former flooding events, local landfill sites, pollution incidents etc. which may have had the potential to impact the site;
- Formulation of a Conceptual Site Model including the clear and tabulated identification of potential pollution linkages;
- A Qualitative Risk Assessment; and
- A review of the geological conditions, and their potential effects on route design and possible impacts during construction.

Phase 2 Ground Investigation

- 3 days of trial pitting using a machine-excavator to enable the logging of the soils encountered and the collection of soil samples for chemical (contamination) and geotechnical testing. Assessment of trench stability, over-break potential and ease of digging also be undertaken;
- 2 No. days of dynamic (window) sample boreholes for the inspection and logging of the underlying soils and for the collection of soil samples for geotechnical and chemical analysis. In addition, to facilitate in-situ testing (Standard Penetration Tests and Hand

Shear Vane testing) to assess the density of the underlying ground, and to inform the design of the foundations for the proposed building on site;

- Dynamic probing to allow correlation against the SPT results adjacent to up to 5 No. window sample locations;
- Ground gas and groundwater monitoring installation wells to be installed within nine of the window sample hole locations to a depth of up to 5m below ground level (bgl);
- Ground gas monitoring and groundwater level monitoring within the nine installation wells (six visits over a period of at least six-week);
- Chemical (contamination) and geotechnical testing of soils and groundwater (if encountered); and
- Collaboration of the findings within a Phase 1 Desk Study and Phase 2 Ground Investigation Report for the site.

1.5 Provided Information

The following were provided to Grange GeoConsulting Consulting Limited by R Bratley (Quadring) Limited for use in the preparation of this report:

- Proposed Development Block Plan (drawing reference 2802/02B) dated June 2017 produced by Remway Design Limited;
- Planning Conditions Checklist and Committee Report dated January 2018 provided by Matrix Planning; and
- Phase 2 Site Proposed Residential Development Layout (drawing reference: A1273) dated October 2018 produced by Oglesbuy & Limb Limited.

1.6 Limitations

This report is based upon information obtained from third-party sources, together with observations from the site walkovers. The third-party data has been accepted at face value and has not been independently verified. Grange GeoConsulting Limited can therefore give no warranty, representation or assurance as to the accuracy or completeness of such information.

The spacing of the exploratory holes, and the sampling and analysis undertaken as part of the ground investigation is considered to have provided a reasonable level of certainty about the ground conditions. However, it is important to recognise that contamination can be both widespread and relatively localised, depending on its source and nature. No investigation, however comprehensive, can be expected to determine the nature and extent of all contamination that could be present, and there will always be an element of uncertainty. The potential for currently undetected contamination must therefore be considered not only in the risk assessment presented within this report, but also in consideration of future development activities, i.e. health and safety planning and risk management.

This report has been prepared for the sole internal use and reliance of the Client, R Bratley (Quadring) Limited, and shall not be relied upon by other parties without the express written authority of Grange GeoConsulting Limited. If an unauthorised third-party comes into possession of this report, then they rely on it at their own risk.

2.0 PHASE 1 DESK STUDY

Several desk study sources have been used to assemble the following information, including a Landmark Information Group Envirocheck Report for the site (reference 201515819_1_1), presented in Appendix C. Other available public information, including Google Earth has been utilised. Various site walkovers and Local Authority regulatory searches have also been undertaken to supplement this desk-based review.

2.1 Site Referencing

Table 2.1: Site Referencing Information

Item	Brief description
Site name	Land south of Green Lane and east of Bacon´s Lane, Pinchbeck, Lincolnshire
Site location	The site is located in a rural area of Lincolnshire, with open countryside to the north, and west. Beyond this lie residential houses facing Milestone Lane and associated gardens. The site lies approximately 1.2km north of the centre of the village of Pinchbeck and approximately 4km north of Spalding Town Centre. The approximate National Grid Reference for the site is 524520, 326990 and the postcode is PE11 3XT. A Site Location Plan (Drawing R18012/002-DWG1) is presented in Appendix A.

2.2 Site Description and Walkover Survey

Several walkover surveys have been undertaken at the site during 2018 and 2019 to support the findings of the desk study and identify any potential hazards and receptors. Photographs taken during the site walkovers and the subsequent ground investigation are presented in Appendix B. A description of the current site conditions is summarised in Table 2.2.

Table 2.2: Site Description

Item	Brief description
Site access	The site is not gated and can be accessed from various points through gaps in the trees along the site perimeter from Bacon´s Lane, Green Lane and Surfleet Road. Formal access onto the site is via Surfleet Road to the east.
Land area	Approximately four hectares.
Elevation and topography	The site was noted to be flat and level during the site walkover, with ground levels only varying by approximately 0.5m across the site.
Site boundaries	The site boundaries are formed by trees, with roads and open land beyond. The southern site boundary is marked by a drainage ditch. Beyond this is residential houses facing Milestone Lane and associated gardens. Open countryside lies to the north, and west. Surfleet Road (the B1356 road) provides access onto the site and marks the eastern site boundary, beyond which is open countryside. The western boundary is defined by Bacons Lane and an associated drainage ditch. Green Lane is present along the north-western site boundary. Drains run between the site and the residential areas.
Geomorphic features	There was no evidence of erosion or mass movement on or near the site.

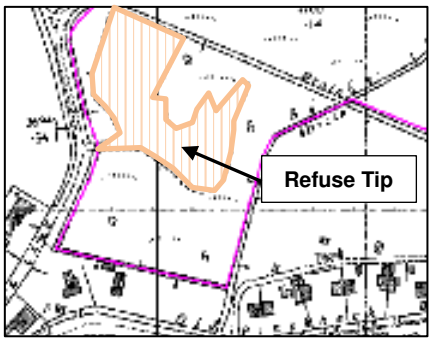
Item	Brief description
Present land use	The entire site was in use as open, agricultural land at the time of writing in June 2019. Parts of the site comprised rough vegetation, while the remainder appeared to have been recently ploughed and planted. No buildings were observed on site during the walkover. The site appeared to be reasonably well-maintained. The site was boggy in places with areas of standing water. Water was observed within the drainage ditches along the site boundaries.
Vegetation	Part of the site comprised rough vegetation, while part of the site appeared to have been recently ploughed and later planted. No invasive weeds were noted to be present on site.
Evidence of contamination	No visual or olfactory evidence of contamination was observed on site. However, some evidence of fly tipping was noted adjacent to the site boundary. Travis Perkins sacks containing building rubble, Sand and Gravel building materials were also present. Part of an old sofa and loose plastic and litter were also noted adjacent to the sacks. No fuel containers were present, and no evidence of spillages was observed on site.
Surrounding land	The surrounding land is rural and is dominated by agricultural use. The site is located outside of, but adjacent to, the defined settlement limit of Pinchbeck with residential properties present beyond the site to the south and south-east. Birchgrove Garden Centre is located 50m south-east of the site and the River Glen is located approximately 205m west of the site.
Services	No overhead services were noted to cross the site. The landowner confirmed that no below-ground services were present on site.

2.3 Site History

Detailed maps and aerial photographs of the site and surrounding area dated 1887 to 2018 (at scales of 1:2,500, 1:10,000 and 1:10,560), provided as part of the Envirocheck Report for the site, have been reviewed. This has been undertaken to identify any former land uses at the site and within the surrounding area that may have geotechnical or geo-environmental implications for the proposed development. The findings are summarised below in Table 2.3. Google Earth and other sources of publicly available information have also been reviewed to support this assessment.

Table 2.3: Key Features from Historical Mapping

Map date and Scale	Key on-site features	Key off-site features
1887 to 1888 (1:2,500 and 1:10,560)	In the 1880s, the site was occupied by open land and formed part of two large fields. A building which appeared to be a residential unit was present at the north of the site. Access from Green Lane immediately north was shown. Drains were shown running across the site and along the north-western and southern site boundaries.	Green Lane, Bacon´s Lane and Milestone Lane were labelled by 1887. Residential properties and farms were present within 500m of the site. The village of Crossgate was labelled 500m south. The surrounding area was mainly farms and rural land.
1904 to 1906 (1:2,500 and 1:10,560)	By 1904, what appeared to be two small pits or areas of excavation were present on the western site boundary but were unlabelled.	No significant changes noted in the immediate vicinity of the site.

Map date and Scale	Key on-site features	Key off-site features
1938 to 1951 (1:10,560)	No changes noted on site.	No significant changes noted in the immediate vicinity of the site.
1969 to 1977 (1:2,500 and 1:10,000)	By 1969, a refuse tip was labelled on the western site boundary in the location of the two small pits or areas of excavation observed in the early-1900s as shown below. Excavations had increased significantly in size since this time and covered approximately 25% of present-day Area 2 portion of the site. 	Surfleet Road (the A16 road) at this time was labelled immediately east by the early-1970s. A number of residential properties had been constructed immediately southeast, south and south-west of the site by the late-1960s forming part of Pinchbeck. Milestone Nursery was labelled 50m east of the site and Birchgrove Garden Centre was shown 125m south-east. Sanpit Nurseries were also shown from 250m south-east of the site by this time. A small reservoir was labelled 150m south-east associated with the garden centre and nurseries.
1982 to 1986 (1:2,500 and 1:10,000)	By 1982, the former residential property at the north of the site was no longer shown. This portion of the site had been cleared and was labelled as bracken and rough grassland on historical mapping. The refuse tip was no longer shown by the early-1980s. The 1986 historical map indicated the presence of a what appeared to be a drainage network around the former refuse tip. It is not known whether some form of venting system had been installed.	Further residential properties had been constructed beyond the site to the south. Residential properties were present within 25m of the former refuse tip to the south-west of the site.
1990 to 1996 (1:2,500 and 1:10,000)	No changes noted on site. No remnants of the former refuse tip remained.	Birchgrove Garden Centre and Milestone Nursery appeared to have been combined and were labelled as Birchgrove Garden Centre. Further residential units had been built to the south and south-east.
1999 aerial photograph	The site was occupied by open land, cultivated for crops. The former refuse tip on site was unable to be distinguished from aerial photograph.	The area around the site was agricultural in nature with residential properties to the south, south-east and south-west.
2000 to 2010 (1:2,500)	No changes noted on site.	No significant changes noted in the vicinity of the site.
2019 (1:10,000)	No changes noted on site.	Further properties had been built immediately south-east of the site, with gardens backing onto the site.

2.4 Unexploded Ordnance

In general accordance with the CIRIA report C681 (Stone *et al* 2009) a non-UXO specialist screening exercise has been carried out for the site as detailed overleaf.

The Zetica UXB map (Lincolnshire) indicates that the site and immediate vicinity is in an area with a low bomb risk (further action to mitigate the risk is considered prudent by Zetica, although not essential). This is likely to be due to the site´s location in a rural area, and distance from obvious targets including large towns, cities, water courses or heavy industries. A copy of the map extract for the site is presented in Appendix D.

2.5 Geology

There are no records of Worked Ground (Undivided) or Made Ground reported on site or within 500m of the site within the Envirocheck Report. Historical mapping, however, indicates the presence of a former refuse tip on site. As such Made Ground and fill materials are assumed to be present.

The British Geological Survey (BGS) indicates that the site is underlain by Superficial Deposits, known as Tidal Flat Deposits. These deposits were formed up to two million years ago during the Quaternary period in a local environment dominated by shorelines. The deposits normally consist of a consolidated soft, silty Clay with layers of Sand, Gravel and Peat and are characteristically low relief.

The Superficial Deposits on site are underlain by the Oxford Clay Formation bedrock. This stratum was formed approximately 157 to 166 million years ago during the Jurassic period in a local environment dominated by shallow seas. The Clay is a marine sediment and is detrital, fine to coarse-grained and is formed of interbedded sequences. The stratum is typically logged as a grey, silicate-rich Mudstone, generally smooth to slightly silty, with sporadic beds of argillaceous Limestone nodules. The stratum is typically 50m to 70m thick in this area of Lincolnshire.

2.6 Mining and Mineral Extraction

The site is not located within a coal mining area. There are no BGS Recorded Mineral Sites listed in the Envirocheck Report within 2km of the site. No natural or man-made cavities are within 2km and there are no records of potentially infilled land within 750m.

2.7 Ground Stability

The potential ground stability hazards associated with the geology at the site, as outlined in the Envirocheck Report, have been summarised below:

- Collapsible Ground – No Hazard
- Compressible Ground – Moderate
- Ground Dissolution – No Hazard
- Landslide Ground Instability – Very Low

- Running Sand – Moderate
- Shrinking or Swelling Clay – Low

Excessive settlement (creep and inundation settlement or differential settlement of any Made Ground) is also considered a potential ground stability hazard. Made Ground may be present associated with the former residential property and is likely within the fill materials within the south-western area of the site, adjacent to the western site boundary.

2.8 Soil Chemistry

A review of the BGS soil chemistry, included within the Envirocheck Report, has undertaken and is summarised in Table 2.4.

Table 2.4: Soil Chemistry

Soil Chemistry	Average Concentrations (mg/kg)
Arsenic	<15 mg/kg
Cadmium	<1.8 mg/kg
Chromium	40 to 60 mg/kg
Lead	<100 mg/kg
Nickel	15 to 30 mg/kg

2.9 Radon

The Indicative Atlas of Radon for England and Wales and the Envirocheck Report indicate that the site is in a lower probability radon area (where less than 1% of the homes are estimated to be at or above the Action Level). Consequently, the BGS and the Building Research Establishment Radon Guidance Document indicate that no radon protective measures for buildings are required in this area.

2.10 Hydrogeology

The site is listed within the Envirocheck Report as being underlain by Unproductive Strata with negligible permeability, despite having well-connected fractures, which relates to the Tidal Flat Deposits and the Oxford Clay Formation. The diltuion rates within the strata are typically <300mm/year and the rate of superficial recharge is low.

The site is not within a Groundwater Source Protection Zone and there are no Groundwater Source Protection Zones listed within 2km of the site.

There are no groundwater abstractions listed within the Envirocheck Report within 1km.

2.11 Hydrology

There are no discharge consents listed within 225m of the site. The closest discharge consent is listed 230m east, registered to Mr & Mrs Fawcett. It relates to the disposal of

sewage discharges (final treated effluent) to Old Pinchbeck Drain from a single domestic property. The consent was approved and has been in operation since 2004.

A further consent relating to the disposal of sewage discharges (final treated effluent) is listed for Sandpit Nurseries on Surfleet Road 308m south and dates back to 1995. Sewage discharges (final treated effluent) are discharged to an unnamed dyke. Two discharge consents are listed at an additional residential property 397m north of the site within the Envirocheck Report. The consents date back to 1987 for the discharge of sewage discharges (final treated effluent) to land. A further consent is listed 446m east for L&D Flowers Limited. Since 2000 sewage discharges (final treated effluent) have been discharged to a tributary of the River Glen. No further consents are listed within 450m of the site boundary.

There is one Local Authority Pollution Prevention and Control listed within 450m of the site which relates to Taylors South Holland on Surfleet Road, 185m south. This relates to a Local Authority Air Pollution Control for a petrol filling station (PG1/14) the consent is listed within the Envirocheck Report as revoked.

The closest surface water abstraction to the site is 427m north-east of the site and relates to the extraction of water from a stream by Proctor Bros (Gosberton) Limited (license number: 5/31/14/s/169). The water is used for spray irrigation (direct). A daily rate of extraction of 100m3 is listed as the average quantity able to be extracted over an annual period. Eight further water abstractions are listed 573m, 589m and 597m north-west of the site. The water is reportedly abstracted from farm drains for spray irrigation (direct and storage). Seven of the abstractions relate to Proctor Bros (Gosberton) Limited and one relates to Garden Products (Europe) Limited. The abstraction licenses date back to 2011 and 2017 and remain active. No further surface water abstractions are listed within 625m.

There are no substantial pollution incidents registered within 2km. There are no pollution incidents to controlled waters listed within 400m of the site. The closest incident is recorded 450m south-west of the site and related to a Category 2 (significant) incident. The incident occurred in October 1993 when an unknown pollutant was spilt into the River. Glen. No further details are provided within the Envirocheck Report.

The nearest surface water feature to the site is listed as on site and appears to relate to the drains along the southern, western and north-western site boundaries. The drains are recorded within the Envirocheck Report as being within the Welland catchment. Various other streams and drains are listed within 1km. The River Glen is listed 205m west of the site boundary and is listed as a River Quality C waterbody (based on data from 2000).

2.12 Flood Risk

The site is not listed as within an area at risk of flooding by rivers or seas and is not protected by flood defences. No flood defences are listed within 150m of the site. The site and immediate area surrounding the site are not listed as having the potential for groundwater flooding to take place. No further consideration of flood risk is undertaken in this report. Specialist flood risk advice should be sought with regards to drainage and flooding.

2.13 Waste Management and Hazardous Substances

There are no registered waste transfer sites or registered waste treatment, disposal sites or Local Authority recorded landfill sites recorded within 1km of the site.

One historical landfill site is listed within Area 2 of the site, occupying the south-western portion of the site, off Bacon´s Lane (reference: EAHLD31105). The first input into the landfill was listed as having taken place in 1967. Information on the last input into the landfill is not specified. The deposited waste is recorded to have been commercial waste. The area marked within the historical mapping for the site as being occupied by this former landfill site (as detailed in Section 2.3) is currently being used as agricultural land at the time of the site walkover. This site is also listed as a BGS recorded landfill site. No further information is provided within the Envirocheck Report.

No current landfill sites are listed within 2km of the site. No further historical or BGS landfill sites are listed within 800m.

There are no records relating to the storage of radioactive materials, no explosive sites, and no hazardous substances registered within 2km of the site.

No sites of potentially infilled land (non-water) are present within 2km of the site and no potentially infilled land (water) is listed within 750m of the site.

2.14 Contemporary Trade Directories

The closest trade directory to the site is GM Motors listed 85m south of the site on Milestone Lane and relates to an inactive garage known as G M Motors. The garage has been replaced by Motortech (garage services) listed as active at the same location, though is shown on mapping for the site as being located approximately 175m south of the site. The location greater than 85m from the site was also confirmed on Google Maps and internet records for the area.

No further active entries are listed within 900m of the site. Inactive entries within 500m of the site include a used car dealers 204m south, distribution services 212m south, a horticultural equipment, manufacturers and distributors 248m south-east, a carpet, curtain and upholstery cleaners 357m south-west, electrical engineers 387m south-west, ceramic manufacturers, supplies and services 399m south-west and pottery manufacturers and suppliers 427m south-west.

No tanks are listed within 475m of the site boundary. The closest fuel station is listed 176m south and was formerly operated by Taylors South Holland on Surfleet Road. The current status of the fuel station is listed as obsolete.

2.15 Sensitive Land Use

The site is located within the Glen (surface water) Nitrate Vulnerable Zone as classified by the Environment Agency.

No further sensitive land uses are listed within 2km of the site.

2.16 Local Authority Regulatory Searches

The Local Authority, South Holland District Council was contacted by Grange GeoConsulting Limited to try and obtain further information about the site, particularly relating to the historical landfill recorded within the south-western area of the site within the Envirocheck Report. As detailed in Section 2.13, limited information about the landfill site is available. The Environmental Protection Officer (EPO), Susan Armour sent a formal response to the request for information on the 22nd May 2019. The EPO indicated that a search of both electronic and paper records had been undertaken. Records dated 1991 for the village of Pinchbeck indicated three landfills in and around the town, though none of which were thought to be at this location, though only one has been successfully recorded on their GIS system. The closest landfill to the site was described as ´behind the council houses in Edinburgh Drive´ and was noted to be a refuse tip. This location is sited over 5km south of the site. No further information was provided by the Local Authority.

Further anecdotal information received from the Local Authority received in email correspondence indicated that ´the site has been subject to historic landfilling operations, including waste from the past use as a nursery as well as construction waste, but not domestic waste´. To date, the Local Authority have not yet provided further information about this information source and a lot of information considered relevant was missing from the contaminated land enquiry issued to the Local Authority. This is currently being chased by Grange GeoConsulting Limited.

The Local Authority highlighted that confidential information relating to the presence of hydrocarbon contamination at the site had been received by a member of public. The Local Authority stated that the information could not be released and no details relating to the credibility of this information or the location of concern on site has been provided to date. Grange GeoConsulting Ltd have formally requested a copy of the confidential information and are currently awaiting a response from the Local Authority, who have requested the permission of the member of the public who provided this information to enable it to be reviewed and considered.

The Local Authority confirmed that the site was not currently classified as Contaminated Land under Part 2a of the EPA 1990.

2.17 Planning Database Searches

A detailed search of the South Holland District Council planning database for the site has been carried out by Grange GeoConsulting Limited as part of this Desk Study.

There have been eleven planning applications for the site submitted between 1962 and 2019. Two of which relate to the current proposed development scheme. Outline details on these applications are provided in Table 2.5.

Nearby planning applications in the vicinity of the site have also been reviewed. No further information pertinent to the Desk Study was revealed from the searches undertaken.

Table 2.5: Summary of Site Planning History

Application Number	Planning Application Description	Decision Status
SR141-62	New residential dwelling	Refused 19th July 1962
H14-1121-77	New residential dwelling and to use the land as a touring caravan and comping site with a new site access. The land was also to be used for the sale of caravans and included the erection of a workshop, office and accessory shop and a car park.	Refused 4th October 1978
H14-0231-81	Light industrial units within a new site access.	Refused 16th September 1981
H14-0446-82	Light industrial units	Refused 20th November 1984
H14-0252-86	New residential bungalow and garage (outline application)	Refused 4th June 1986
H14-0841-87	Residential development	Refused 17th November 1997
H14-0554-88	New residential bungalow and garage	Refused 1st July 1988
H14-0549-17	Erection of forty residential dwellings with gardens, garages and parking provision, and areas of amenity space and soft landscaping (outline application)	Granted 6th March 2019
H14-0137-19	Erection of sixty-four residential dwellings with gardens, garages and parking provision, and areas of amenity space including a play area and soft landscaping areas	Pending

3.0 PRELIMINARY RISK ASSESSMENT AND EXPOSURE MODEL

A Conceptual Model represents the possible relationships between potential contaminant sources, pathways and receptors in line with the Statutory Guidance to Part 2a of the Environmental Protection Act 1990. The following Preliminary Risk Assessment is based on the results of the Desk Study and the site walkover.

3.1 Potential Contamination Sources and Contaminants of Concern

The building rubble, Sand and Gravel contained within sacks in one corner of the site, along with some waste materials are not considered to pose a risk to the site as these materials will be cleared from the site prior to development.

No off-site sources were identified in the nearby area, with no commercial or industrial activities noted within 150m of the site and no off-site infilling or landfilling recorded within 900m of the site. Due to the distance of the potential sources of contamination identified in the wider area, the nature of these land uses and the presence of Unproductive Strata beneath the site, no viable off-site pollutant linkages were identified.

The potential contaminant sources identified on site are outlined below:

- Potential for Made Ground associated with the former residential property at the north off the site. The following contaminants could potentially pose a risk to the site: Polycyclic Aromatic Hydrocarbons (PAH), asbestos, pH and heavy metals. The risk was assessed to be **very low**.

- A historical landfill site, labelled on historical mapping for the site as a refuse tip, located on the western site boundary is known to have been present between at least 1967 (when the first inputs were listed) and the early-1980s. Excavations in this area were noted on historical mapping since 1904 but it appears, based on Envirocheck Records that filling did not take place until the late-1960s. The deposited waste is listed to have included commercial waste. Potential contaminants of concern include hydrocarbons (PAH, TPH, fuel and lubricant oils), asbestos, pH, heavy metals, organics, VOC and ground gases and vapours (methane, carbon dioxide and hydrogen sulphide). There is the potential for the generation of ground gases and vapours generated within the buried waste materials to accumulate in confined spaces within the proposed development. The risk was assessed to be **moderate** in the absence of ground investigation for the site.

3.2 Potential Pathways

The potential pathways identified for the site include the following:

- Direct human contact
- Inhalation
- Ingestion
- Direct contact with aggressive ground conditions

- Leaching and migration via surface water
- Migration of ground gases and vapours via permeable soils (Made Ground and underlying natural strata)

3.3 Potential Receptors

The potential receptors identified for the site include the following:

- Site end users (future residents, visitors and neighbours)
- Groundworkers (construction and future maintenance workers)
- Building materials (buried concrete and underground services)
- Controlled waters: Surface water (drainage ditches on the site boundaries, nearby inland rivers and the River Glen from 205m west) and overland flow

3.4 Refining of Source Pathway and Receptor Linkages

Based on the Preliminary Risk Assessment undertaken for the site, it was considered that the potential for any contamination at the site to impact receptors was moderate in the absence of ground investigation data for the site. It was concluded that a ground investigation and appropriate testing and assessment would be required to confirm the risks to the proposed development scheme due to the sensitive nature of the site for residential use. A programme of ground gas monitoring would also be required as part of the ground investigation to evaluate the potential risks.

The details of the ground investigation undertaken in January and February 2019 are presented in Sections 4 to 7 of this report.

4.0 GROUND INVESTIGATION FINDINGS

4.1 Ground Investigation Rationale

The ground investigation rationale, summarised in Table 4.1, is based on the findings of the Preliminary Risk Assessment and Conceptual Model, undertaken as part of the Phase 1 Desk Study for the site and presented in Sections 2 and 3 of this report.

Table 4.1: Ground Investigation Rationale

Exploratory Holes	Purpose
WS1 to WS12 To a maximum depth of 5m bgl	• Enable logging of the soils encountered and assess shallow ground conditions. • Carry out in-situ penetration testing (SPTs) and Hand Shear Vane testing (HCV) to assess the density of the underlying ground. • Dynamic probing in five locations in the vicinity of the window sample boreholes on site. • Installation of nine groundwater and ground gas monitoring wells (WS1, WS2, WS3, WS4, WS5, WS7, WS8, WS10 and WS12) to enable the monitoring of the wells on six occasions following the ground investigation. • Allow the collection of soil samples for chemical (contamination analysis) and geotechnical testing.
TP1 to TP21 To a maximum depth of 2.1m bgl	
DP5, DP6, DP9, DP10 and DP12 To a maximum depth of 9m bgl	• Dynamic probing undertaken in five locations adjacent to the corresponding window sample borehole location. • Number of blows for each 100mm of penetration recorded to allow correlation against SPTs.

4.2 Ground Investigation Works Undertaken

The ground investigation was undertaken between the 21st and the 24th January 2019. The approximate positions of the window sample boreholes, trial pits and dynamic sampling points were surveyed using a tape measure, with distances measured from features present on or adjacent to the site. The locations of the exploratory holes are shown in the Ground Investigation Plan (Drawing R18012/002_DWG3) provided in Appendix E. Photographs taken during the works are included in Appendix B.

The ground investigation works are summarised in Table 4.2 overleaf. The window sample borehole and trial pit logs, including details of ground conditions, soil sampling, groundwater strikes, any visual or olfactory evidence of contamination and the in-situ testing and dynamic probing undertaken are presented in Appendix E.

TP19 and WS11 were located within the location of the former residential property within the north of Area 1 on site. Made Ground was anticipated to be present in this area.

Two boreholes (WS1 and WS3) and five trial pits (TP1, TP2, TP4, TP6 and TP7) were located within the area shown on historical mapping for the site covered by the former refuse tip on site (as shown in Section 3 of this report). A further three trial pits (TP3, TP5 and TP8) and one borehole (WS2) were located just outside the periphery of the former refuse tip site.

One borehole, WS9 was proposed but was not progressed at the site due to time constraints and the abundance of window sample boreholes already present on site. Dynamic probing was carried out in this location.

Table 4.2: Summary of the Ground Investigation Works

Exploratory Holes	Method	Depth (m)	In-situ testing	Comments and Installations
WS1	Window sample borehole	4m bgl	Standard Penetration Tests (SPTs) undertaken at 1m, 2m, 3m and 4m bgl. Very low SPTs recorded.	Possible water strike at approximately 1.7m bgl. Occasional plastic artefacts noted in the shallow Made Ground and plastic bags at the base of the Made Ground between 1.55m and 1.7m bgl. Coal between 0.45m and 0.6m bgl. Groundwater and ground gas monitoring standpipe installed. Response zone between 0.5m and 2m bgl.
WS2	Window sample borehole	4m bgl	SPTs undertaken at 1m, 2m, 3m and 4m bgl. Very low to low SPTs recorded.	Possible water strike at approximately 2m bgl. Plastic bags encountered within the Made Ground between 0.5m and 0.7m bgl. Groundwater and ground gas monitoring standpipe installed. Response zone between 0.5m and 2.5m bgl.
WS3	Window sample borehole	4m bgl	SPTs undertaken at 1m, 3m and 4m bgl. Very low SPTs recorded.	Possible water strike at approximately 1.6m bgl. No evidence of contamination. Groundwater and ground gas monitoring standpipe installed. Response zone between 0.5m and 3m bgl.
WS4	Window sample borehole	4m bgl	SPTs undertaken at 1m, 2m, 3m and 4m bgl. Very low SPTs recorded.	Possible water strike at approximately 1m bgl. Ceramic pipe and pot, ceramic fragments, plastic bags and nylon string found within the Made Ground between 0.6m and 1m bgl. Groundwater and ground gas monitoring standpipe installed. Response zone between 0.5m to 2.5m bgl.
WS5	Window sample borehole	4m bgl	SPTs undertaken at 1m, 2m and 3m bgl. Very low SPTs recorded.	Possible water strike at approximately 1m bgl. No evidence of contamination. Groundwater and ground gas monitoring standpipe installed. Response zone between 1m and 4m bgl.
WS6	Window sample borehole	4m bgl	SPTs undertaken at 1m, 2m and 3m bgl. Very low SPTs recorded.	Possible water strike between approximately 1.1m and 1.3m bgl. No evidence of contamination.

Exploratory Holes	Method	Depth (m)	In-situ testing	Comments and Installations
WS7	Window sample borehole	5m bgl	SPTs undertaken at 1m, 2m, 3m, 4m and 5m bgl. Very low SPTs recorded.	Possible water strike at approximately 1.5m bgl. No evidence of contamination. Groundwater and ground gas monitoring standpipe installed. Response zone between 1m and 5m bgl.
WS8	Window sample borehole	4m bgl	SPTs undertaken at 1m, 2m, 3m and 4m bgl. Very low SPTs recorded.	Possible water strike at approximately 1.5m bgl. Frequent glass fragments in Made Ground between 0.25m and 0.8m bgl. Groundwater and ground gas monitoring standpipe installed. Response zone between 1m to 3m bgl.
WS10	Window sample borehole	4m bgl	SPTs undertaken at 1m, 2m and 3m bgl. Very low SPTs recorded at 1m bgl and 0 readings recorded at 2m and 3m bgl.	Possible water strike at approximately 2m bgl. No evidence of contamination. Groundwater and ground gas monitoring standpipe installed. Response zone between 1m to 4m bgl.
WS11	Window sample borehole	4m bgl	SPTs undertaken at 1m, 2m, 3m and 4m bgl. Very low to low SPTs recorded.	Possible water strike at approximately 1.8m bgl. Possible asbestos cement sheet and glass found in the upper 0.8m of the Made Ground. Occasional metal fragments observed between 0.8m and 1.1m bgl.
WS12	Window sample borehole	4m bgl	SPTs undertaken at 2m and 3m bgl. Very low SPTs recorded.	Possible water strike between approximately 1m and 1.4m bgl. Groundwater and ground gas monitoring standpipe installed. Response zone between 1m and 4m bgl.
TP1	Machine-excavated trial pit	2.1m bgl	None undertaken.	Groundwater seepage at 1.8m bgl. Frequent fragments of plastic in upper 0.1m. Ceramic fragments and timber throughout Made Ground. Occasional fragments of possible asbestos cement sheeting, plastic and timber in Made Ground between 0.5m and 1.4m bgl.
TP2	Machine-excavated trial pit	2.1m bgl	None undertaken.	Groundwater seepage at 1.7m bgl. Frequent fragments of plastic bags, paper and moulded plastic in upper 0.1m. Frequent plastic bags, cups, mesh, propagator cups, nylon string, plastic bottles and plastic banding between 0.7m bgl and 1.2m bgl.

Exploratory Holes	Method	Depth (m)	In-situ testing	Comments and Installations
TP3	Trial Pit	2m bgl	None undertaken.	Groundwater seepage at 1.5m bgl. Rare plastic and plant labels in upper 0.1m. Plastic and plant labels between 0.4m and 1.2m and plastic pipework encountered at 1.1m bgl.
TP4	Trial Pit	2m bgl	None undertaken.	Groundwater seepage at 1.6m bgl. Rare plastic bag fragments in upper 0.1m.
TP5	Trial Pit	2m bgl	None undertaken.	No groundwater encountered. Rare plastic bag fragments and plant labels, ceramic fragments and poly-weave bags in upper 0.1m. Frequent plastic bag fragments, containers and metal fragments between 0.55m and 1.1m bgl.
TP6	Trial Pit	2.1m bgl	None undertaken.	Groundwater seepage at 1.8m bgl. Rare plastic bag fragments and timber in upper 0.1m. Plastic bag, propagation cups and nylon string between 0.5m and 1.1m bgl.
TP7	Trial Pit	2m bgl	None undertaken.	Groundwater ingress at 1.2m bgl and possible second water strike at 1.5m bgl. Plastic present in very shallow soils above 0.1m bgl. Polythene and bulk bags nylon string, metal drinks cans and evidence of a fire including charcoal, burnt paper and melted plastic present between 0.2m and 0.95m bgl. Fire-damaged timber and tree roots present between 1.2m and 1.4m bgl.
TP8	Trial Pit	2m bgl	None undertaken.	Groundwater seepage between 1.5m and 1.6m bgl. Plastic bags, tape, moulded plastic and occasional timber present in upper 0.1m. Plastic bags, punnets, propagation cups, nylon string and rubber bands were present between 0.5m bgl and 1.3m bgl.
TP9	Trial Pit	2m bgl	None undertaken.	Groundwater seepage at 2m bgl. Rare plastic bags in upper 0.1m bgl. Occasional plastic bags and moulded plastic baskets between 0.5m and 1m bgl.
TP10	Trial Pit	2.1m bgl	None undertaken.	Groundwater ingress at 1.6m bgl and possible second water strike at 1.9m bgl. Rare plastic bag fragments in the upper 0.1m. Plastic bags, moulded plastic, plastic banding and metal containers were present between 0.4m and 1.1m bgl.

Exploratory Holes	Method	Depth (m)	In-situ testing	Comments and Installations
TP11	Trial Pit	2.1m bgl	None undertaken.	Groundwater ingress at 1m bgl and possible second seepage at 1.8m bgl. No evidence of contamination.
TP12	Trial Pit	2.1m bgl	None undertaken.	Groundwater seepage at 1.5m bgl. Plastic propagation cups, labels and plastic bags between 0.35m and 0.5m bgl. Loose roof slates present between 0.65m and 0.9m bgl.
TP13	Trial Pit	2.1m bgl	None undertaken.	Groundwater seepage at 1.3m bgl and rapid groundwater ingress at 1.2m bgl. No evidence of contamination.
TP14	Trial Pit	2.1m bgl	None undertaken.	Groundwater seepage at 1.6m bgl. Ceramic pipe, plastic bags and insulation material in upper 0.1m. Plastic bags present at 0.3m bgl and 0.5m bgl. Ceramic times, metal reinforcement bars, plastic pipework within building rubble present between 0.6m and 1m bgl.
TP15	Trial Pit	2m bgl	None undertaken.	Groundwater seepage at 1.2m bgl. No evidence of contamination.
TP16	Trial Pit	2.1m bgl	None undertaken.	Groundwater seepage at 1.4m bgl. Frequent glass and plastic as well as building rubble and plastic bags noted to 0.7m bgl. Plant pot and plastic fragments noted between 0.7m and 0.9m bgl. Frequent plastic bags and brick rubble between 0.9m and 1.2m bgl.
TP17	Trial Pit	2m bgl	None undertaken.	Groundwater seepage at 1.6m bgl. No evidence of contamination.
TP18	Trial Pit	1.9m bgl	None undertaken.	Groundwater seepage at 1.5m bgl. No evidence of contamination.
TP19	Trial Pit	2m bgl	None undertaken.	Groundwater seepage at 1.9m bgl. Breezeblocks, asphalt, timber, metal springs, ceramic pipe fragments, plastic and concrete hardstanding present in upper 1.2m. Plyboard sheet and brick rubble also encountered.
TP20	Trial Pit	2.1m bgl	None undertaken.	Groundwater seepage at 1.55m bgl. No evidence of contamination.
TP21	Trial Pit		None undertaken.	Groundwater seepage at 1.2m bgl. No evidence of contamination.

4.3 Ground Conditions

The ground conditions, as proven during the ground investigation were partly in accordance with the published geological literature. Superficial Tidal Flat Deposits were encountered at the site, overlain by widespread thicknesses of Made Ground, which

included re-worked Topsoil, re-worked natural materials and landfill / fill materials and waste. The Oxford Clay Formation bedrock was not encountered during the ground investigation. The ground conditions are presented in the borehole and trial pits logs in Appendix E and summarised in Table 4.3.

Table 4.3: Geological Strata Encountered

Stratum Description	Depth to Top (m bgl)	Depth to Base (m bgl)	Thickness (m)
Re-worked Topsoil Generally dark grey and brown, clayey, slightly sandy, slightly gravelly Silt with roots and rootlets.	Ground level	0.1m to 0.6m bgl	0.1m to 0.6m bgl
Made Ground and re-worked Natural Strata (not landfill) Variable re-worked natural strata and Made Ground containing timber, concrete, possible asbestos cement sheeting, brick, glass, metal, building rubble, ceramics, occasional plastic, plyboard sheeting. Hardstanding slabs and a possible infilled channel noted.	Ground level	0.5m to 1.7m bgl	0.5m to 1.7m bgl
Made Ground (landfilling / filling) Variable re-worked natural strata and Made Ground containing landfill and fill materials including plastic artefacts (bags, moulded plastic, cups, mesh, punnets, tape, bottles and banding), brick, concrete, roof tiles, ceramics, nylon string, paper, plant labels, poly-weave bags, metal and timber. Asbestos cement sheeting, coal, evidence of a fire (including charcoal, burnt paper and melted plastic) and building rubble less commonly noted.	Ground level	0.5m to 2.1m bgl	2.1m to 1.7m bgl
Tidal Flat Deposits Typically logged as occasionally clayey, very silty Sand and sandy Silt. Generally grey, brown and orangish-brown with occasional roots and rootlets.	0.1m bgl and 1.7m bgl	Unproven (present at full investigation depth at 5m bgl)	Unproven (present at full investigation at 5m bgl)

4.3.1 Re-worked Topsoil

In WS12, re-worked Topsoil was present at ground level and was logged as a dark grey, mottled black, clayey, slightly sandy, slightly gravelly Silt. Roots and organic materials were noted. The re-worked Topsoil was less than 0.1 thick in this location.

In TP15, TP17, TP18, TP20 and TP21, a re-worked Topsoil, logged as a friable, brown sandy, rarely gravelly Silt was present at ground level. Frequent roots and rootlets were also noted, and the gravel was rounded quartz. The stratum was between 0.4m and 0.6m thick and no evidence of contamination was noted within these materials.

The re-worked Topsoil was underlain by the Tidal Flats in all locations at depths between 0.1m and 0.6m bgl.

4.3.2 Made Ground and Re-worked Natural Strata (Not Landfill)

Made Ground and re-worked natural strata, that did not appear to be the result of landfilling / filling at the site were recorded in several locations on site including WS3, WS5, WS6, WS7, WS8, WS10, WS11, TP11, TP13 and TP19.

Two of these exploratory holes were located within the area of the site where the residential property was formerly located (as detailed in Section 3). This was raised in the Desk Study assessment for the site as a potential source of Made Ground. Made Ground 1m thick was found in WS11 and comprised silty, gravelly Sand within concrete, possible asbestos cement sheeting, brick, glass and Sandstone. Occasional metal fragments were also noted. In TP19, the Made Ground was 1.2m thick and contained metal springs, bricks and brick rubble, breezeblocks, asphalt, occasional plastic, ceramic pipe fragments, timber, concrete and plyboard sheeting. These materials appeared to be building rubble associated with the former demolition works in this area of the site. Hardstanding at 0.6m and 1m bgl, assumed to be former floor slabs, was uncovered within the pit.

In WS3, the Made Ground comprised re-worked natural material, with a timber fragment present at 0.9m bgl. In WS5, the Made Ground was also re-worked natural strata and contained broken brick to 0.8m bgl. In WS6, WS7 and WS8, re-worked strata was also noted. The Made Ground was 0.5m thick in WS7 and contained Limestone and brick.

In WS3, WS5 and WS6 at 1m bgl and at 1.5m bgl in WS8, the possible former ground surface was noted to be possibly present. Natural strata was found below the Made Ground and re-worked natural material in these locations. This indicates that possible land-raising has also taken place at the west of the site.

Made Ground was observed in WS10 and was 0.7m thick. The Made Ground was re-worked natural strata and contained fragments of glass between 0.35m and 0.7m bgl and brick gravels. In TP11, occasional boulders of concrete were present to 0.7m bgl.

In TP13, Made Ground was present to 1.7m bgl and black Silt was encountered between 1.2m and 1.7m bgl. Abundant tree branches and organic material were present and appeared to have been buried. This feature appeared to be a possibly infilled channel. The material had a strong organic odour, was very wet and partially decayed, though no evidence of landfill material was noted. The overlying material between the ground level and 1.2m bgl appeared to be re-worked natural strata.

4.3.3 Made Ground (Filling / Landfilling)

Landfill / infill materials were encountered in WS1, WS2, WS4, WS4, TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP12 and TP14 on site.

Two boreholes (WS1 and WS3) and five of the trial pits (TP1, TP2, TP4, TP6 and TP7) were located within the area shown on historical mapping for the site covered by the former refuse tip on site (as shown in Section 3 of this report). The extent of the landfilling and

filling that have taken place on site appears to be considerably more extensive than outlined on the historical mapping for the site. Areas of the site appear to have also been land-raised as oppose to landfilled. Typically, a 0.1m thickness of landfill is present at the surface of the site, underlain by fairly inert materials, which were placed over a further thickness of landfill / fill. The type of filling that has taken place on site is very variable, fairly thick (varying between 0.5m and 2.1m thick) and relatively widespread as outlined below and overleaf.

No evidence of Peat an very limited buried organic materials were noted within the landfill / fill materials. The Made Ground was noted to comprise re-worked natural strata and include soft to firm, orange to brown, infrequently black, occasionally clayey sandy Silt and silty Sand.

The fill material was 1.7m thick in WS1 and 1m thick in WS2 and comprised clayey sandy Silt and silty Sand with moulded plastic artefacts, coal (between 0.45m and 0.6m in WS1 only), plastic bags, frequent organic fragments, roots and rootlets were present from ground level. Crushed brick was also recorded in WS2. In WS4, the re-worked natural strata contained brick, ceramic pipe and pot fragments, plastic bags and nylon string between 0.6m and 1m bgl.

In TP1, the fill was 1.4m thick and contained re-worked natural strata comprising sandy, gravelly Silt and silty Sand with plastic, timber and ceramics and rootlets. Occasional fragments of possible asbestos cement sheeting were seen between 0.5m and 1.4m bgl.

TP2 contained frequent fragments of plastic bags, moulded plastic and paper in the shallow soils (the upper 0.1m bgl). Deeper plastic bags, plastic cups and mesh, propagator cups, nylon string, plastic bottles and plastic banding were present between depths of 0.7m and 1.2m bgl within the re-worked natural strata.

In TP3, rare plastic artefacts within the upper 0.1m and from 0.4m bgl, brick, frequent plastic artefacts and plant labels were present with plastic pipework at 1.1.m bgl. The material was 1.2m thick in this location.

A minimal thickness of material 0.5m thick was present in TP4 and the material contained rare plastic bags in the upper 0.1m. In TP5, plant labels, plastic bags, rare ceramic fragments and poly-weave bags were present in the upper 0.1m, and between 0.55m and 1.2m bgl frequent plastic artefacts including plastic bags, propagation containers, rare metal fragments and bricks were noted.

Rare plastic bags and timber in upper 0.1m within TP6 and frequent plastic bags, propagation cups and nylon string were present between 0.5m and 1.1m bgl.

In TP7, frequent plastic artefacts including polythene and bulk bags, nylon string, metal drinks cans and evidence of a fire including charcoal, burnt paper and melted plastic were present between 0.2m and 0.95m bgl. Brick was also present to 1.4m bgl. The upper 0.1m within TP8 contained plastic bags, tape, moulded plastic and occasional timber. Between 0.5m and 1.3m bgl, frequent plastic bags, plastic punnets, propagation cups, nylon string and rubber bands (not significantly degraded) were observed.

Rare plastic bags were also present in the upper 0.1m in TP9 and TP10. In TP9, between 0.5m bgl and 1m bgl, plastic bags, bricks and broken moulded plastic baskets were seen. In TP10 between 0.4m and 1.1m bgl, plastic bags, moulded plastic, plastic banding and metal container fragments were present.

Plastic artefacts from 0.38m bgl including plastic propagation cups, bags and labels were present in TP12 and between 0.7m and 0.9m bgl lose roof slates were recovered.

Ceramic pipe, plastic bags and insulation material were present to 0.35m bgl in TP14. More plastic bags and bricks, ceramic tiles, metal reinforcing bar and plastic pipework were noted below in a Sand matrix and appeared to be buried building rubble. The underlying material appeared to be re-worked natural strata to 2.1m bgl. The thickness of the fill was not proven in this location.

Some photographs of the landfill / fill materials encountered on site are presented below. Further photographs are provided in Appendix B.





4.3.4 Tidal Flats Deposits

The Tidal Flat Deposits were present beneath the re-worked Topsoil, the Made Ground and the Made Ground which included landfill / infill material in all of the exploratory locations on site. The stratum was typically logged as an occasionally clayey, very silty Sand and a sandy Silt. The stratum was generally grey, brown and orangish-brown in colour and occasional roots and rootlets were present. The material was noted to be frequently damp or wet within the exploratory holes.

The Tidal Flat Deposits were present from as shallow as 0.1m bgl (WS12) and as deep as 1.7m bgl (WS1). The thickness of the stratum was not proved during the ground investigation and was present to the full depth of the investigation at 5m bgl in WS7.

Some photographs of the arisings from the Tidal Flat Deposits are presented overleaf. Further photographs are provided in Appendix B.





4.3.5 Oxford Clay Formation

The bedrock at the site, the Oxford Clay Formation was not encountered on site.

4.3.6 Borehole and Trial Pit Stability

No signs of instability were noted during the excavation of the boreholes on site.

Widespread trial pit collapse occurred during the excavation of the trial pits as listed below:

- Collapse below 1m bgl in TP2;
- Collapse between 1m and 1.4m bgl in TP7;
- Collapse in TP9 and TP21 below 0.9m bgl;
- Collapse below 1.1m bgl in TP10;
- Collapse below 1.2m bgl in TP11;
- Collapse below 1.5m bgl in TP12 and TP19;
- Collapse from 0.6m bgl in TP14;
- Collapse below 0.8m bgl in TP15; and
- Collapse below 1.3m bgl in TP16, TP17 and TP20.

4.4 Visual and Olfactory Evidence of Contamination

In WS1, coal was present between 0.45m and 0.6m bgl.

In WS11, a possible asbestos cement sheet was found in the upper 0.8m of the Made Ground. Occasional fragments of possible asbestos cement sheeting were also found in the Made Ground between 0.5m and 1.4m bgl in TP1.

Evidence of a fire including charcoal, burnt paper and melted plastic was present between 0.2m and 0.95m bgl in TP7. Fire-damaged timber and tree roots were also present between 1.2m and 1.4m bgl.

4.5 Groundwater Strikes

Information on the groundwater strikes recorded during the ground investigation are summarised in Table 4.4. No visual or olfactory evidence of contamination was observed in groundwater during the works.

Two groundwater samples were taken from WS7 at approximately 1.5m bgl and from WS5 at approximately 1.3m bgl following the excavation of the boreholes on site and sent for laboratory analysis, the results of which are discussed in Section 6.4 of this report. The boreholes were purged prior to sampling using a Whale groundwater pump from Stuart Well Services Limited, at a rate of approximately five litres per minute.

Table 4.4: Groundwater Strikes

Exploratory Holes	Date	Depth to Groundwater (m bgl)
WS1	24/01/2019	Possible groundwater strike at 1.7m bgl.
WS2	24/01/2019	Possible water strike at approximately 2m bgl.
WS3	24/01/2019	Possible water strike at approximately 1.6m bgl.
WS4	24/01/2019	Possible water strike at approximately 1m bgl.
WS5	24/01/2019	Possible water strike at approximately 1m bgl.
WS6	23/01/2019	Possible water strike between approximately 1.1m and 1.3m bgl.
WS7	23/01/2019	Possible water strike at approximately 1.5m bgl.
WS8	23/01/2019	Possible water strike at approximately 1.5m bgl.
WS10	23/01/2019	Possible water strike at approximately 2m bgl.
WS11	24/01/2019	Possible water strike at approximately 1.8m bgl.
WS12	23/01/2019	Possible water strike between approximately 1m and 1.4m bgl.
TP1	21/01/2019	Groundwater seepage at 1.8m bgl.
TP2	21/01/2019	Groundwater seepage at 1.7m bgl.
TP3	21/01/2019	Groundwater seepage at 1.5m bgl.
TP4	21/01/2019	Groundwater seepage at 1.6m bgl.
TP6	21/01/2019	Groundwater seepage at 1.8m bgl.

Exploratory Holes	Date	Depth to Groundwater (m bgl)
TP7	21/01/2019	Groundwater ingress at 1.2m bgl. Possible second water strike at 1.5m bgl.
TP8	21/01/2019	Groundwater seepage between 1.5m and 1.6m bgl.
TP9	21/01/2019	Groundwater seepage at 2m bgl.
TP10	22/01/2019	Groundwater ingress at 1.6m bgl and possible second water strike at 1.9m bgl.
TP11	22/01/2019	Groundwater ingress at 1m bgl and possible second seepage at 1.8m bgl.
TP12	22/01/2019	Groundwater seepage at 1.5m bgl.
TP13	22/01/2019	Groundwater seepage at 1.3m bgl and rapid groundwater ingress at 1.2m bgl.
TP14	22/01/2019	Groundwater seepage at 1.6m bgl.
TP15	22/01/2019	Groundwater seepage at 1.2m bgl.
TP16	22/01/2019	Groundwater seepage at 1.4m bgl.
TP17	22/01/2019	Groundwater seepage at 1.6m bgl.
TP18	22/01/2019	Groundwater seepage at 1.5m bgl.
TP19	22/01/2019	Groundwater seepage at 1.9m bgl.
TP20	23/01/2019	Groundwater seepage at 1.55m bgl.
TP21	23/01/2019	Groundwater seepage at 1.2m bgl.

4.6 Groundwater and Ground Gas Monitoring

Groundwater and ground gas monitoring were carried out on six occasions following the ground investigation as part of an initial programme of ground gas characterisation at the site. Visits were undertaken on the 25th and 31st January 2019 and the 5th, 13th, 21st and 28th February 2019.

The full results are presented in Appendix E and a summary is provided in Table 4.5 and Table 4.6 below and overleaf.

Table 4.5: Groundwater Monitoring Summary

Exploratory Hole	Depth to Groundwater range (m bgl)	Response Zone (m bgl)	Groundwater observations
WS7	0.76m to 0.82m bgl	1m to 5m bgl	No evidence of contamination.
WS12	1.1m to 1.14m bgl	1m to 4m bgl	No evidence of contamination.
WS10	1.05m to 1.12m bgl	1m to 4m bgl	No evidence of contamination.
WS8	1.30m to 1.37m bgl	1m to 3m bgl	No evidence of contamination.
WS2	1.08m to 1.14m bgl	0.5m to 2.5m bgl	No evidence of contamination.
WS3	1.09m to 1.13m bgl	0.5m to 3m bgl	No evidence of contamination.
WS4	1.03m to 1.07m bgl	0.5m to 2.5m bgl	No evidence of contamination.
WS5	0.98m to 1.02m bgl	1m to 4m bgl	No evidence of contamination.

Exploratory Hole	Depth to Groundwater range (m bgl)	Response Zone (m bgl)	Groundwater observations
WS1	0.95m to 0.99m bgl	0.5m to 2m bgl	No evidence of contamination.

The ground gas monitoring was carried out and recorded in accordance with the guidance and protocols presented in CIRIA, Assessing Risks Posed by Hazardous Ground Gases to Buildings (C665), British Standard 8576:2013 Guidance on Investigations for Ground Gas - Permanent Gases and Volatile Organic Compounds (VOC) and British Standard 8485:2015+A1:2019 Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings.

During each round of gas monitoring, the ground gas concentrations and groundwater level for each borehole were recorded. A portable gas meter was used to measure concentrations of Carbon Dioxide (CO_2), Methane (CH_4) and Oxygen (O_2) in percentage volume.

The monitoring device used was unable to monitor Carbon Monoxide (CO) and Hydrogen Sulphide (H_2S). Due to the presence of landfilled materials on site, it is acknowledged that future monitoring for these gases will be required at the site as detailed in Section 6.5. The use of a Photo Ionisation Detector (PID) should also be used during future ground gas monitoring at the site to verify that the elevated Carbon Dioxide and Methane concentrations recorded and confirm the absence of vapours within the boreholes.

Peak and steady state conditions were recorded. An integral flow meter was used to measure gas flow rates (initial and steady state) in litres per hour. In addition, the atmospheric pressure before and during the monitoring, together with the weather conditions, were noted.

Table 4.6: Ground Gas Monitoring Summary

Exploratory Hole	Response Zone (m bgl)	Max. flow rate (l/hr)	Max. Steady CO_2 concentration (% v/v)	Max. Peak CH_4 concentration (% v/v)
WS7	1m to 5m bgl	Peak: 11.2 Steady: 10	5.3% v/v	0.1% v/v
WS12	1m to 4m bgl	Peak and Steady: 0	2.1% v/v	0.1% v/v
WS10	1m to 4m bgl	Peak and Steady: 0	7.2% v/v	0.1% v/v
WS8	1m to 3m bgl	Peak and Steady: 0	0.7% v/v	0.1% v/v
WS2	0.5m to 2.5m bgl	Peak and Steady: 0	3.1% v/v	0.2% v/v
WS3	0.5m to 3m bgl	Peak: 1.3 Steady: 1.2	3.2% v/v	0.1% v/v
WS4	0.5m to 2.5m bgl	Peak and Steady: 0	5.5% v/v	0.1% v/v
WS5	1m to 4m bgl	Peak and Steady: 0	1.6% v/v	0.1% v/v
WS1	0.5m to 2m bgl	Peak and Steady: 0	1.3% v/v	0.3% v/v

Despite no highly elevated concentrations of Carbon Dioxide and Methane being recorded in WS4 (maximum Methane of 0.1% v/v and maximum steady Carbon Dioxide concentration of 5.5%) Oxygen depletion was recorded regularly in this location. The

Oxygen concentrations recorded varied between 3.1% and 9.2% throughout the monitoring. This is indicative of an anaerobic environment within this borehole.

The remaining boreholes did not indicative significant oxygen depletion, with oxygen levels fluctuating between 15.3% and 20.2%.

An assessment of the initial ground gas results for the site is provided in Section 6.5.

4.7 In-situ Testing (SPTs)

4.7.1 Standard Penetration Tests

Standard Penetrations Tests (SPTs) were undertaken during the advancement of the window sample boreholes on site. The SPT (N values) results are presented in Table 4.7 and presented in full in Appendix E.

Table 4.7: SPT results (N values)

Exploratory Holes	Depth SPT undertaken (m)	SPT (N values) recorded
WS1	1m bgl	2
	2m bgl	3
	3m bgl	5
	4m bgl	3
WS2	1m bgl	12
	2m bgl	3
	3m bgl	7
	4m bgl	3
WS3	1m bgl	2
	2m bgl	No recovery
	3m bgl	4
	4m bgl	4
WS4	1m bgl	8
	2m bgl	4
	3m bgl	2
	4m bgl	5
WS5	1m bgl	5
	2m bgl	3
	3m bgl	3
WS6	1m bgl	7
	2m bgl	3
	3m bgl	3

Exploratory Holes	Depth SPT undertaken (m)	SPT (N values) recorded
WS7	1m bgl	6
	2m bgl	4
	3m bgl	2
	4m bgl	3
	5m bgl	4
WS8	1m bgl	2
	2m bgl	4
	3m bgl	5
	4m bgl	9
WS10	1m bgl	7
	2m bgl	0
	3m bgl	0
WS11	1m bgl	3
	2m bgl	4
	3m bgl	5
	4m bgl	14
WS12	2m bgl	2
	3m bgl	9

4.7.2 Hand Shear Vane Tests

Hand Shear Vane Testing (HSV) was undertaken during the excavation of the trial pits on site. The HSV results provide accurate results of the residual shear strength in kilopascals (kPa) of cohesive soils (i.e. Clay and Silt) where encountered. The results are presented in Table 4.8 and presented in full in Appendix E.

Table 4.8: Hand Shear Vane Results

Exploratory Holes	Depth HSV undertaken (m)	Recorded shear strength (kPa)
TP4	0.35m bgl	11 kPa
	0.8m bgl	62 kPa
TP5	0.25m bgl	18 kPa
	0.6m bgl	42 kPa
TP6	0.6m bgl	34 kPa
TP8	0.2m bgl	16 kPa
TP9	0.3m bgl	22 kPa
TP10	0.2m bgl	20 kPa
TP11	0.2m bgl	30 kPa

Exploratory Holes	Depth HSV undertaken (m)	Recorded shear strength (kPa)
	0.4m bgl	74 kPa
TP12	0.3m bgl	32 kPa
	0.6m bgl	44 kPa
TP13	0.4m bgl	44 kPa
TP14	0.4m bgl	50 kPa
TP15	0.2m bgl	28 kPa
	0.6m bgl	24 kPa
TP17	0.3m bgl	32 kPa
	1m bgl	34 kPa
TP18	0.4m bgl	28 kPa
TP20	0.3m bgl	32 kPa
TP21	0.25m bgl	32 kPa

4.7.3 Dynamic Probing

Dynamic probing was undertaken in five locations on site (DP5, DP6, DP9, DP10 and DP12), adjacent to five of the corresponding existing window sample boreholes. The maximum depth of probing on site was 9m bgl. The full results of the probing carried out on site are presented in Appendix E.

5.0 LABORATORY TESTING SCOPE

5.1 Chemical (Contamination Analysis) Testing

5.1.1 Sampling Strategy

The following samples were taken during the ground investigation on site by Grange GeoConsulting Limited:

- 25 No. samples from the Made Ground including re-worked Topsoil, re-worked natural materials and landfill materials;
- 5 No. samples from the natural strata (Tidal Flats Deposits); and
- 2 No. groundwater samples.

All samples were taken, stored, and transported in general accordance with the British Standard 10175: 2011 Code of Practice for Investigation of Potentially Contaminated sites, and transported by courier to I2 Analytical Services; a UKAS accredited laboratory.

5.1.2 Laboratory Analyses Undertaken (Soils)

Arsenic (As), Water Soluble Boron (B), Beryllium (Be), Cadmium (Cd), Hexavalent and Total Chromium (Cr II and VI), Copper (Cu), Cyanide (Cn), Lead (Pb), Inorganic Mercury (Hg), Nickel (Ni), Selenium (Se), Vanadium (V), Zinc (Zn), pH, Organic Matter, Asbestos Screen, Speciated Total Poly-cyclic Aromatic Hydrocarbons (PAH).

Selected samples were screened for Speciated Total Petroleum Hydrocarbons (TPH-CWG aliphatic and aromatic fractions), Methyl Tertiary Butyl Ether (MTBE), BTEX (Benzene, Toluene, Ethylbenzene and Xylenes), Speciated Volatile Organic Compounds (VOC) and Speciated Semi-Volatile Organic Compounds (SVOC), Speciated PCB, pesticides and herbicides.

5.1.3 Laboratory Analyses Undertaken (Waters)

Silver (Ag), Aluminium (Al), Arsenic (As), Boron (B) (water soluble), Barium (Ba), Calcium (Ca), Cadmium (Cd), Hexavalent and Total Chromium (Cr II and VI), Copper (Cu), Iron (Fe), Mercury (Hg), Magnesium (Mg), Manganese (Mn), Molybdenum (Mo), Sodium (Na), Nickel (Ni), Lead (Pb), Antimony (Sb), Selenium (Se), Tin (Sn), Vanadium (V), Zinc (Zn), Free and Total Cyanide, pH, Sulphate, Total Phenols, Ammonium, Fluoride, Chloride, Bromate, Nitrate, Nitrite and Speciated Poly-Aromatic Hydrocarbons (PAH).

5.2 Geotechnical Testing

5.2.1 Sampling Strategy

Various samples were taken by Grange GeoConsulting Limited during the ground investigation for geotechnical testing. The samples were taken from the Made Ground and the natural strata (Tidal Flats Deposits).

Samples were taken, stored, and transported in general accordance with good practice as detailed above in Section 3.1.1.

5.2.2 Laboratory Analyses Undertaken

Laboratory analysis has been undertaken to assess the density of the underlying ground, and to inform the design of the foundations. The following analyses were undertaken:

- 4 No. Atterberg Limits (liquid and plastic limits, plasticity index and % of material passing through a 425um BS Test Sieve);
- 41 No. Natural Moisture Contents (also undertaken as part of the contamination chemical analysis);
- 37 No. pH tests (also undertaken as part of the contamination chemical analysis);
- 2 No. Remoulded CBR tests;
- 15 No. Particle Size Distribution Tests;
- 1 No. Unconsolidated Undrained Triaxial Compression Test; and
- 8 No. Total Sulphate, Water Soluble Sulphate, Water Soluble Chloride, Water Soluble Nitrate, Magnesium and Total Sulphate tests.

6.0 CONTAMINATION ANALYSIS TESTING RESULTS AND RISK ASSESSMENT

A risk-based approach is used for the assessment of contamination. This requires identification of a contaminant source, a receptor, and a realistic pathway via which the contaminant may reach the receptor. The key receptors considered in this assessment are human health (site end users, groundworkers and off-site receptors) and controlled waters (surface water features including drains on site and nearby, River Glen, surface water run-off and overland flow).

The Risk Assessment is a two-stage process. The first stage is to perform a Generic Quantitative Risk Assessment (GQRA) - the soil test results have been compared against the relevant Generic Assessment Criteria (GAC). In the absence of a complete regulatory set of screening values, derived using the CLEA Framework, Grange GeoConsulting Limited GAC screening values have been utilised and are based on the following:

- Category 4 Screening Levels (C4SLs) published by DEFRA;
- The 2014 Land Quality Management (LQM) / Chartered Institute of Environmental Health (CIEH) Suitable for Use Levels for Human Health Risk Assessment (S4ULs); and
- Guidance values produced by the Environmental Industries Commission (EIC), the Association of Geotechnical and Geo-environmental Specialists (AGS) and Contaminated Land: Application in Real Environments (CL:AIRE) in December 2009.

The second stage of the Risk Assessment process is Risk Evaluation, which comprises an authoritative review of the findings with other pertinent information in cases where the GAC are exceeded, to consider if exceedance may be acceptable in the context of the site.

6.1 Human Health Risk Assessment Criteria

This is a Tier 2 assessment, using GAC soil screening values, and involves generic human health risk assessment for the CLEA scenario:

Residential with Plant Uptake (including the consumption of home-grown produce).

The chemical (contamination analysis) testing results were screened against Grange GeoConsulting Limited GAC screening values (provided in Appendix F) to carry out an assessment of potential risks associated with contamination at the site. Justification for the criteria adopted for this Risk Assessment is given in F. In the case where all the samples tested for a given substance were below the GAC, no further consideration is necessary for that substance.

The pH of the samples collected at the site ranged between 7.3 and 8.4. The average pH across the site was 8, indicating slightly alkaline ground conditions.

The Soil Organic Matter Content (SOM) of the soils varied between 0.3% and 12%. The average SOM was 2.94% and therefore, GAC based on a SOM of 1% were utilised.

6.2 Risk Evaluation – Human Health

As part of the laboratory testing, twenty-five samples were taken from the Made Ground including landfill and fill materials, and five samples were taken from the natural strata. The results of the laboratory testing are presented in this section of the report. The full soil sample results are provided in Appendix G.

Twenty-nine of the soil samples were tested for asbestos. Only one sample tested positive for asbestos, located within TP16 at 0.8m bgl. The asbestos was confirmed as loose Chrysotile (white) and Amosite (brown) asbestos fibres. The total asbestos content within the sample was recorded as 0.002%.

A piece of suspected asbestos-containing material was collected for chemical analysis as during the ground investigation. The material comprised a piece of hard chrysotile (white) asbestos cement-type material and was recovered from TP1 at 1m bgl.

A pesticide and herbicide screen was carried out on six samples collected during the ground investigation. All of the samples were confirmed not to contain positive concentrations of either pesticides or herbicides.

Speciated TPH testing was carried out on nine samples collected as part of the ground investigation. All of the samples were found to contain concentrations of the various aliphatic and aromatic TPH fractions below the detection limits of the analysing equipment. Testing for BTEX (Benzene, Toluene, Ethylbenzene and Xylene) was also carried out on the same samples. The recorded concentrations were also below the detection limits.

Speciated PCB testing was carried out on six of the samples. No positive readings for PCB were recorded and all concentrations were below the detection limits.

A further six samples were scheduled for speciated VOC and SVOC testing. No elevated concentrations of VOC or SVOC were recorded, with the majority of concentrations below the detection limit of the analysing equipment.

All of the samples were tested for the presence of heavy metals, metalloids and speciated PAH. Two samples were found to contain concentrations of Lead marginally above the GAC of 200 mg/kg. A concentration of 210 mg/kg was recorded in WS11 between 0.3m and 0.5m bgl. In TP16 at 0.8m bgl, a concentration of 290 mg/kg was recorded. No further exceedances of the residential with plant uptake GAC were recorded in the samples taken from across the site.

Based on the observations during the ground investigation and the laboratory testing results for the site, the Made Ground and landfill / fill materials beneath the site appear to be relatively inert and generally do not contain concentrations of contaminants in excess of the GAC for residential development.

6.3 Controlled Waters Risk Assessment Criteria

The risks to groundwater and surface water from contaminants on site have been assessed against the Environment Agency (2006) Remedial Targets Methodology (RTM).

Pollutants from contaminated land sites are considered as passive inputs under the European Water Framework Directive (2000/60/EC), and as such are regulated under the Agency's 'limit' pollution objective.

Acceptable Water Quality Targets (WQT) are defined for protection of human health, based on UK Drinking Water Standards (DWS) and Environmental Quality Standards for the protection of aquatic ecosystems (EQS).

6.4 Risk Evaluation – Controlled Waters

Two samples of groundwater were taken, and the chemical testing results compared against the UK Drinking Water Standards (UK DWS) and the Environmental Quality Stands (EQS). The samples were taken from WS5 at 1.3m bgl and from WS7 at 1.5m bgl. The pH of the groundwater samples recorded was 6.9 and 7.1.

The full groundwater sample results are provided in Appendix G.

It should be noted that the use of the EQS and UK DWS to undertake a risk assessment for the site is considered a very conservative approach, particularly as the groundwater within the boreholes on site will not be used as a potable water supply. However, no other suitable assessment criteria currently exist in the UK.

The concentrations of speciated PAH and phenols recorded in the samples were all below the detection limits of the analysing equipment.

No exceedances of the EQS were recorded in either of the samples taken.

A concentration of Nitrate (as NO_2) above the UK DWS of 0.5 mg/L was recorded, with a concentration of 1.6 mg/L noted in WS7. Both samples recorded highly elevated concentrations of Manganese of 1,800 ug/L, above the UK DWS of 50 ug/L. Highly elevated concentrations of Ammonium (as NH_4) were recorded above the UK DWS of 0.5 mg/L. Concentrations of 2.2 mg/L and 45 mg/L were noted in WS7 and WS5 respectively.

Due to the minimal dataset, further groundwater sampling will need to be undertaken at the site as detailed in Section 8.5 of this report.

6.5 Ground Gas Risk Assessment Criteria

The risks associated with the ground gases methane (CH_4) and carbon dioxide (CO_2) have been assessed using British Standard 8485:2015+A1:2019 Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings and guidelines from CIRIA 665 (Wilson et al 2007), and the NHBC (Boyle and Witherington 2007).

In accordance with CIRIA 665:

- 'Situation A' covers all forms of development (residential and industrial / commercial developments), other than those in Situation B; and

- 'Situation B' is defined as the specific development of low-rise (one to three storeys in height) housing with a vented sub-floor void (minimum 150 mm).

At this stage, the proposed development requires consideration of Situation B (one to three-storey residential housing).

Consideration has been given to both CH_4 and CO_2 concentrations and flow rates.

The Gas Screening Value (GSV) is defined as the product of gas concentration multiplied by flow rate. The GSV is then considered with other parameters to define a Characteristic Situation (CS), which identifies the need for and scope of any necessary gas protection measures.

6.6 Risk Evaluation – Ground Gas

Based on the available ground gas data for the site, collected during the six rounds of groundwater and ground gas monitoring carried out between the 25th January 2019 and the 28th February 2019, the site is regarded as having a moderate potential for ground gas generation (proposed development Situation B).

Based on the available data, provided in Appendix E, the ground gas regime is considered to meet Characteristic Situation 3 (CS3). The following conclusions resulting from the interpretation of the ground gas data have been used to assist in the classification of the ground gas regime as CS3. This is considered to be a conservative approach at this stage:

- The Gas Screening Value (GSV) for CH_4 is calculated based on the worse-case initial flow rate (11.2 l/hr) and worse-case initial gas concentration (0.1% v/v). The GSV for CH4 was calculated as 0.0336;
- The GSV for CO_2 is calculated based on the worse-case steady flow rate (10 l/hr) and worse-case steady gas concentration (7.2% v/v). The GSV for CO_2 was calculated as 0.72;
- The monitoring wells were screened within the re-worked natural strata, Made Ground and landfill and fill materials on site which were considered to be the likely source of ground gas on site. No Peat and limited organic materials were found within the materials on site and within the underlying Tidal Flat Deposits. As such, the natural strata on site is considered unlikely to be a source of ground gas;
- The maximum recorded steady concentration of CO_2 (7.2%) exceeds the typical maximum for CS1 of 5%);
- The maximum recorded steady concentration of CH_4 (0.3 %) does not exceed the typical maximum for CS1 of 1%);
- The response zones within the monitoring wells contain a suitable length of unsaturated element which allows the ingress of ground gas, though it should be noted that some of the wells on site are partially flooded with groundwater; and

- The monitoring data is considered to be fairly representative given the ground conditions encountered at the site (widespread and variable thicknesses of Made Ground comprising fill and landfill materials).

According to CIRIA 665, Characteristic Situation 3 is considered typical of an old landfill site and presents a moderate risk. The GSV for Carbon Dioxide for the site is only marginally above the GSV considered appropriate for CS2 (<0.7). At this stage, and in the absence of data for Carbon Monoxide (CO) and Hydrogen Sulphide (H_2S) concentrations the CS3 will be considered appropriate until this can potentially be disproved by further monitoring work.

The full results of the gas monitoring are to be found in Appendix E. The monitoring strategy reported in Appendix E is considered suitable for assessment of ground gas risk.

The site is currently classified as Amber 2 / Red in accordance with the NHBC Traffic Light Classification and as Characteristic Situation 3 in accordance with CIRIA C655. Based on these classifications, mitigation against ground gas will be required on site.

Further work will be required to refine this risk assessment as detailed in Section 8.5 of this report and explore other potential solutions. It is possible that with a screening programme, which removes the majority of the plastic and timber at the site, and the implementation of a rigorous Materials Management Plan (MMP) that the Characteristic Situation for the site could be reduced to CS2, if these degrading materials are removed off-site.

7.0 GEOTECHNICAL LABORATORY TESTING RESULTS

Geotechnical testing was undertaken as part of the ground investigation at the site, the results of which are summarised in this section of the report.

7.1 Liquid and Plastic Limits, Plasticity Index and % passing through a 425µm BS Test Sieve

Four samples were tested to confirm their liquid and plastic limits and plasticity indexes. The percentages of material passing through a 425µm BS Test Sieve were also recorded. The samples were taken from the Made Ground and the Tidal Flat Deposits. The results are summarised in Table 7.1 and included in Appendix H.

Table 7.1: Liquid and plastic limits, plasticity index and % of material passing through a 425um BS Test Sieve

Stratum	Sample and Depth (m bgl)	Sample Description	Liquid Limit	Plastic Limit	Plasticity Index	% material passing 425µm BS Test Sieve
Made Ground	WS8 (0.8m to 1m bgl)	Brown slightly gravelly clayey silty Sand	35%	19%	16%	96%
Tidal Flat Deposits	WS5 (1.2m to 1.5 bgl)	Brown, slightly clayey, silty Sand	39%	-	-	100%
	WS11 (1.5m bgl)	Dark brown, slightly clayey, silty Clay	82%	51%	31%	87%
	WS10 (0.8m to 1m bgl)	Dark brown, slightly gravelly, clayey, sandy Silt	42%	25%	17%	92%

7.2 Moisture Content

Moisture content tests were undertaken on eleven samples collected for geotechnical testing purposes and thirty samples collected for chemical testing for geo-environmental purposes. Samples were taken from both the Made Ground and the Tidal Flats Deposits. The results are summarised in Table 7.2 and presented in Appendix G and Appendix H.

Table 7.2: Moisture Content Test Results

Stratum	Sample Depth	Type of Sample	Natural Moisture Content
Made Ground	WS8 (0.8m to 1m bgl)	Geotechnical testing sample	19% to 23%
	WS11 (0.3m to 0.5m bgl)	Contamination testing sample	18%
	TP1 (0.2m bgl)	Contamination testing sample	20%

Stratum	Sample Depth	Type of Sample	Natural Moisture Content
	TP2 (0.15m bgl)	Contamination testing sample	20%
	TP2 (0.75m bgl)	Contamination testing sample	20%
	TP8 (0.6m bgl)	Contamination testing sample	17%
	TP3 (0.2m bgl)	Contamination testing sample	18%
	TP4 (0.4m bgl)	Contamination testing sample	18%
	TP5 (0.6m bgl)	Contamination testing sample	16%
	TP6 (0.25m bgl)	Contamination testing sample	19%
	TP7 (0.5m bgl)	Contamination testing sample	20%
	TP7 (1.3m bgl)	Contamination testing sample	40%
	TP9 (0.3m bgl)	Contamination testing sample	19%
	TP9 (0.8m bgl)	Contamination testing sample	36%
	TP10 (0.5m bgl)	Contamination testing sample	16%
	TP11 (0.5m bgl)	Geotechnical testing sample	25%
	TP11 (0.5m bgl)	Contamination testing sample	16%
	TP12 (0.3m to 0.4m bgl)	Contamination testing sample	17%
	TP13 (0.5m bgl)	Contamination testing sample	15%
	TP14 (0.2m bgl)	Contamination testing sample	19%
	TP14 (0.8m bgl)	Contamination testing sample	18%
	TP15 (0.5m bgl)	Contamination testing sample	20%
	TP16 (0.4m bgl)	Contamination testing sample	16%
	TP16 (0.8m bgl)	Contamination testing sample	25%
	TP17 (0.5m bgl)	Geotechnical testing sample	20% to 28%

Stratum	Sample Depth	Type of Sample	Natural Moisture Content
	TP18 (0.4m bgl)	Contamination testing sample	16%
	TP19 (0.3m bgl)	Contamination testing sample	13%
	TP21 (0.4m bgl)	Contamination testing sample	17%
Tidal Flat Deposits	WS1 (3m to 3.45m bgl)	Geotechnical testing sample	20%
	WS2 (1.2m to 1.5m bgl)	Geotechnical testing sample	20%
	WS4 (1.5m to 2m bgl)	Geotechnical testing sample	24%
	WS5 (1.2m to 1.5m)	Geotechnical testing sample	28%
	WS10 (0.8m to 1m)	Geotechnical testing sample	18% to 25%
	WS10 (2.2m to 2.5m)	Geotechnical testing sample	23%
	WS11 (1.5m bgl)	Geotechnical testing sample	69%
	WS12 (1m to 1.45m bgl)	Geotechnical testing sample	20%
	TP2 (1.8m bgl)	Contamination testing sample	22%
	TP4 (1.8m bgl)	Contamination testing sample	23%
	TP8 (1.6m bgl)	Contamination testing sample	21%
	TP9 (1.7m bgl)	Contamination testing sample	22%
	TP19 (1.2m bgl)	Contamination testing sample	27%

7.3 California Bearing Ratio

The results of the California Bearing Ratio (CBR) testing undertaken are presented in Table 7.3 and in full in Appendix H.

Table 7.3: California Bearing Ratio Test Results

Stratum	Strata Description	Sample Depth	Curve correction applied	CBR Values %		
				2.5mm	5mm	Highest
Made Ground	Dark brown slightly sandy Clay	TP11 (0.5m bgl)	No	1.3% top 0.8% base	1.8% top 1.2% base	1.8% top 1.2% base
	Brown clayey silty Sand	TP17 (0.5m bgl)	No	0.4% top 1% base	0.8% top 1.9% base	0.8% top 1.9% base

7.4 Particle Size Distribution

Fifteen Particle Size Distribution Tests were undertaken on samples collected at the site. The results of the testing are present in Appendix H.

7.5 Unconsolidated Undrained Triaxial Compression

One Unconsolidated Undrained Triaxial Compression Test was undertaken on site in WS7 on a sample taken from between 1m and 1.45m bgl. The sample was logged as a Brown, clayey Silt and was taken from within the Tidal Flat Deposits. The results of the testing are present in Appendix H.

7.6 pH Value

A total of thirty-seven samples taken for both contamination testing and geotechnical testing were tested for pH. The pH of the samples ranged between 7.3 and 8.4. The average pH on site was 8. The full results of the testing are present in Appendix G and Appendix H.

7.7 Magnesium Content

The results of the magnesium analysis undertaken are summarised in Table 7.4 and provided in full in Appendix H.

Table 7.4: Magnesium Content (chemical testing for geotechnical purposes)

Stratum	Sample Depth (m bgl)	Water Soluble Magnesium (mg/kg)	Total Magnesium (mg/L)
Made Ground	0.8m to 1m (WS8)	15 mg/kg	7.4 mg/L
	TP17 (0.5m bgl)	8.7 mg/kg	4.3 mg/L
Tidal Flat Deposits	3m to 3.45m (WS1)	20 mg/kg	9.9 mg/L
	1.2m to 1.5m (WS2)	20 mg/kg	10 mg/L
	1.5m to 2m (WS4)	28 mg/kg	14 mg/L
	0.8m to 1m (WS10)	18 mg/kg	8.8 mg/L

Stratum	Sample Depth (m bgl)	Water Soluble Magnesium (mg/kg)	Total Magnesium (mg/L)
	2.2m to 2.5m (WS10)	35 mg/kg	18 mg/L
	1m to 1.45m (WS12)	14 mg/kg	6.8 mg/L

7.8 Sulphate Content

The results of the sulphate analysis undertaken are summarised in Table 7.5 and provided in full in Appendix H.

Table 7.5: Sulphate Content (chemical testing for geotechnical purposes)

Stratum	Sample Depth (m bgl)	Total Sulphate as SO4	Water Soluble Sulphate as SO4	Total Sulphur %
Made Ground	0.8m to 1m (WS8)	0.092 %	0.031 g/L	0.081 %
	TP17 (0.5m bgl)	0.028 %	0.019 g/L	0.018 %
Tidal Flat Deposits	3m to 3.45m (WS1)	0.048 %	0.12 g/L	0.041 %
	1.2m to 1.5m (WS2)	0.046 %	0.07 g/L	0.05 %
	1.5m to 2m (WS4)	0.062 %	0.14 g/L	0.014 %
	0.8m to 1m (WS10)	0.041 %	0.032 g/L	0.021 %
	2.2m to 2.5m (WS10)	0.064 %	0.014 g/L	0.073 %
	1m to 1.45m (WS12)	0.036%	0.065 g/L	0.015 %

7.9 Chloride Content

The results of the chloride analysis undertaken are summarised in Table 7.6 and provided in full in Appendix H.

Table 7.6: Chloride Content (chemical testing for geotechnical purposes)

Stratum	Sample Depth (m bgl)	Water Soluble Chloride (mg/L)
Made Ground	0.8m to 1m (WS8)	2.5%
	TP17 (0.5m bgl)	4.1%
Tidal Flat Deposits	3m to 3.45m (WS1)	21%
	1.2m to 1.5m (WS2)	6%
	1.5m to 2m (WS4)	9.1%
	0.8m to 1m (WS10)	4%
	2.2m to 2.5m (WS10)	7.5%
	1m to 1.45m (WS12)	3.5%

7.10 Nitrate Content

The results of the nitrate analysis undertaken are summarised in Table 7.7 and provided in full in Appendix H.

Table 7.7: Nitrate Content (chemical testing for geotechnical purposes)

Stratum	Sample Depth (m bgl)	Water Soluble Nitrate (mg/L)
Made Ground	0.8m to 1m (WS8)	2.7 mg/L
	TP17 (0.5m bgl)	4.2 mg/L
Tidal Flat Deposits	3m to 3.45m (WS1)	< 2 mg/L
	1.2m to 1.5m (WS2)	11 mg/L
	1.5m to 2m (WS4)	2.9mg/L
	0.8m to 1m (WS10)	5.8 mg/L
	2.2m to 2.5m (WS10)	< 2 mg/L
	1m to 1.45m (WS12)	4.4 mg/L

8.0 GEO-ENVIRONMENTAL CONCLUSIONS AND RECOMMENDATIONS

8.1 Ground Conditions

The natural ground conditions beneath the site, as proven during the ground investigation are in accordance with the published geological literature and comprise Tidal Flat Superficial Deposits. The Oxford Clay Formation bedrock was not encountered at the site.

Widespread thicknesses of Made Ground, which included re-worked Topsoil, re-worked natural materials and landfill / fill materials and waste were encountered on site overlying the Tidal Flat Deposits. What appeared to be the original ground level was encountered in the south-west of the site in the location of the refuse tip on site at approximately 1m to 1.5m bgl, indicating that land-raising as well as filling appears to have been carried out on site across this area of the site.

The extent of the landfilling and filling that have taken place on site appears to be considerably more extensive than outlined on the historical mapping for the site. The anticipated extent of the landfilling and filling on site is outlined in the Ground Investigation Findings Plan (Drawing R18012/002_DWG4) presented in Appendix E.

Perched groundwater was frequently encountered, particularly above cohesive horizons during the ground investigation. No evidence of contamination was noted within the groundwater on site.

8.2 Human Health

Based on the findings of the ground investigation carried out at the site, the risks posed to human health receptors at the site are considered to be low to moderate.

One sample on site was recorded to contain loose asbestos fibres and two samples contained concentrations of Lead above the GAC. No samples recorded highly elevated concentrations of contaminants.

8.3 Controlled Waters

Based on the available dataset, there does not appear to be a significant risk posed to controlled waters at the site. However, this will require further assessment as detailed in Section 8.5.

8.4 Ground Gas and Vapours

Based on the available dataset and in accordance with CIRIA 665, Characteristic Situation 3 is considered appropriate for the site at this stage. The presence of an old landfill site within the site boundary will require further assessment and characterisation as detailed in Section 8.5.

8.5 Further Works

Based on the findings of the ground investigation, several data gaps have been identified and Grange GeoConsulting Limited proposes that the following works will be required to

fully-characterise the site. It is intended that the further works will enable further assessment and risk assessment to take place, which will then enable the design of an appropriate Remediation Method Statement (RMS) for the site.

Based on the current site information, Grange GeoConsulting Limited are of the opinion that remedial options are available such that the site in its current form can be safely developed for residential use. These are as follows:

- Further consultation with the Local Authority and other regulatory bodies to ensure that a full review of all available information has been carried out. The below scope of works maybe subject to change following the receipt of further information and is therefore considered to be provision at this stage;
- Further ground gas monitoring is required on site. The scope of which will be discussed with the Local Authority. Groundwater levels will also be monitored as part of the monitoring programme and a Photo Ionisation Detector (PID) will be used to confirm the absence of TPH and VOC vapours within the boreholes;
- Further groundwater samples will need to be taken across the site, particularly within the existing boreholes located within the former refuse tip to confirm the groundwater quality and direction of groundwater flow. The groundwater samples collected should be tested for a standard suite of potential groundwater contaminants including metals, Speciated PAHs, Speciated Total Petroleum Hydrocarbons (TPH-CWG fractions for both aliphatics and aromatics) and Volatile Organic Compounds (VOCs). A Photo Ionisation Detector (PID) will also be used to be used to confirm the absence of TPH and VOC vapours within the boreholes. The scope of the additional sampling will be discussed with the Local Authority;
- Further ground investigation may be required within the vicinity of TP13 to confirm the presence of the infilled channel in this area and the potential for geotechnical issues associated within the collapse of the buried materials in this area; and
- An invasive weeds survey will need to be undertaken on site by a specialist contractor to confirm the absence of invasive plants on site.

8.6 Drainage

It is understood that initial discussions between the Planning Consultant and the Local Authority about the suitability of Sustainable Drainage Systems (SUDS) at the site have taken place. From a contamination perspective and based on the findings of the initial ground investigation works undertaken, this approach is not recommended. The current view based on the available data is that the draining of the site via infiltration through the extensive Made Ground and landfill / fill materials beneath the site would increase the leaching potential of this material. At present, based on the relatively low-permeability of the ground conditions encountered on site, characterised by perched water within the Made Ground, landfill and fill materials and the underlying cohesive Tidal Flats Deposits, SUDS are not a viable option. There is also insufficient controlled waters data to ensure that the current groundwater on site is not contaminated. It is also considered that should infiltration testing at the site be carried out, based on the ground conditions present on site, that infiltration rates would be very low and such a system relatively ineffective.

8.7 Possible Remedial Measures

Though currently able to be finalised, due to further ground investigation being required at the site, it is considered likely that the below remedial measures will need to be implemented at the site to facilitate the development of the site for residential use. It should be noted that following the completion of the exploratory and investigatory work at the site, a RMS will be produced, which will outline the proposed remedial measures for the site and be issued to the Local Authority for review and approval.

- Removal of localised contamination hotspots including the identified asbestos-containing material (ACM) identified in TP16 on site;

- Removal of the majority of the plastic and timber within the fill material present at the site, and the implementation of a rigorous Materials Management Plan (MMP) that the Characteristic Situation for the site could be reduced to CS2, if these degrading materials are removed;

- There will be the potential for ground workers to encounter site soils which will include landfill and fill materials on site, with the potential to uncover previously unidentified contamination on site. It is therefore recommended that appropriate Health & Safety precautions, dust control and PPE are adopted during any site works and that a watching brief for contamination is maintained. Good practice should be adopted during any future ground works on site;

- Ground gas protection measures, and possibly vapour protection measures will be required within all or part of the site within all residential properties to prevent against the ingress of gases and vapours, associated with the landfill and fill materials on site, into enclosed spaces within all new buildings and structures on site. The design of which is currently unknown and will be finalised on completion of a further ground gas monitoring programme at the site; and

- A clean cover Topsoil layer, at least 600m thick and underlain by a geo-textile membrane is likely to be required in all soft landscaping areas on site. This will need to be imported onto the site and will provide protection to human health receptors and a provide a growing medium for vegetation. The imported Topsoil will need to meet the British Standard (BS 3882:2015) and the residential with plant uptake (including the consumption of home-grown produce) GAC. It must be imported from a reputable supplier with appropriate chemical testing certification to confirm the suitability for use within a residential development.

9.0 GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

9.1 Foundations

Based on the geotechnical testing results, low underlying soil strengths, thickness of Made Ground and shallow groundwater table it is likely the most suitable foundation solution would be piled.

9.2 Ground Floor Slabs

As Made Ground greater than 600mm is present at the site, it is recommended that suspended floor slabs should be adopted, in accordance with NHBC Standards.

9.3 Roads and Pavements

Based on the test results, it is considered likely a CBR of 2% will be achievable over the majority of the site and can be used for preliminary design, subject to *in situ* testing during construction.

9.4 Buried Concrete

Based on guidelines provided in BRE Special Digest 1, the soils can be classified as Design Sulphate Class DS-1 and ACEC Class AC-1.

This equates to a Designated Concrete Class DC-2 for a 50-year design life (see BS 8500-1 for details).

10.0 REFERENCES

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APPENDICES

Appendix A DRAWINGS

Appendix B SITE PHOTOGRAPHS

Appendix C DESK STUDY RESEARCH INFORMATION

Appendix D ZETICA UXB PLAN

Appendix E GROUND INVESTIGATION PLANS, LOGS AND MONITORING RESULTS

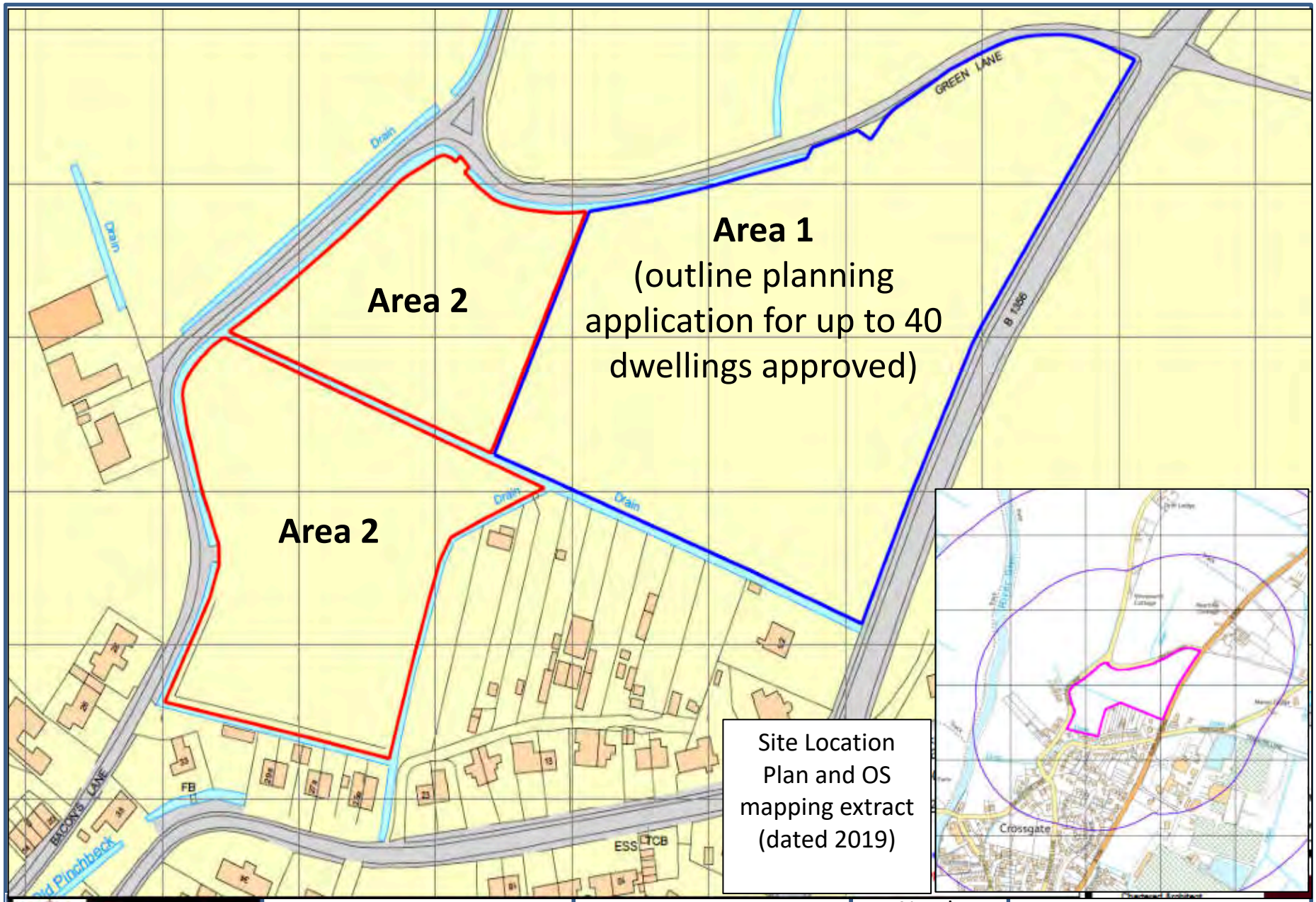
Appendix F GRANGE GEOCONSULTING LTD METHODOLOGY

Appendix G CONTAMINATION TESTING RESULTS

Appendix H GEOTECHNICAL TESTING RESULTS

Appendix A

DRAWINGS



Site Location Plan and OS mapping extract (dated 2019)

Grange Geo	**Pinchbeck Site** Site Location Plan	**Client:** Kirk Homes Ltd **Date:** June 2019	North	**Drawing:** R18012/002-DWG1



Grange Geo

Pinchbeck Site

Proposed Development Plan

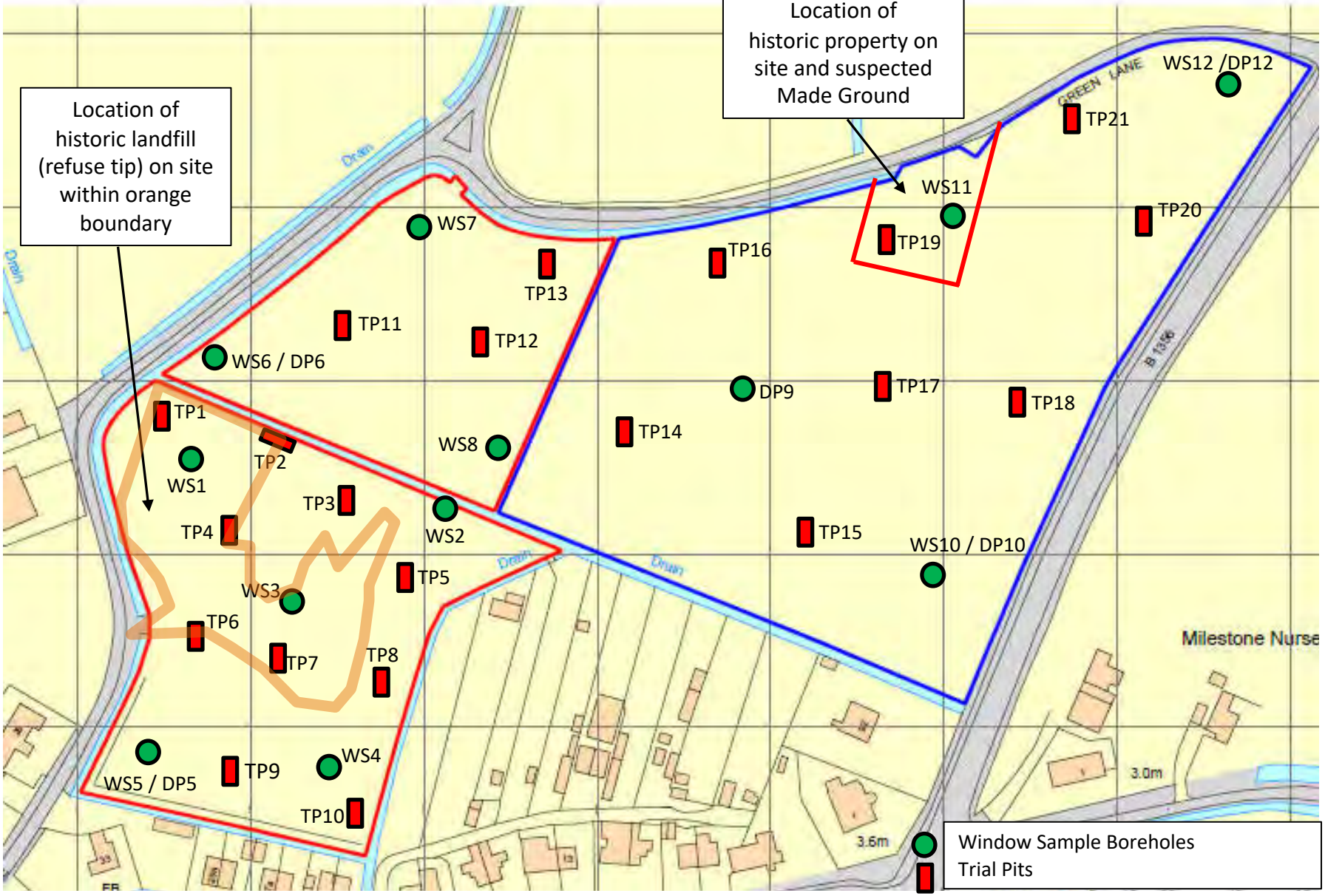
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Date: June 2019

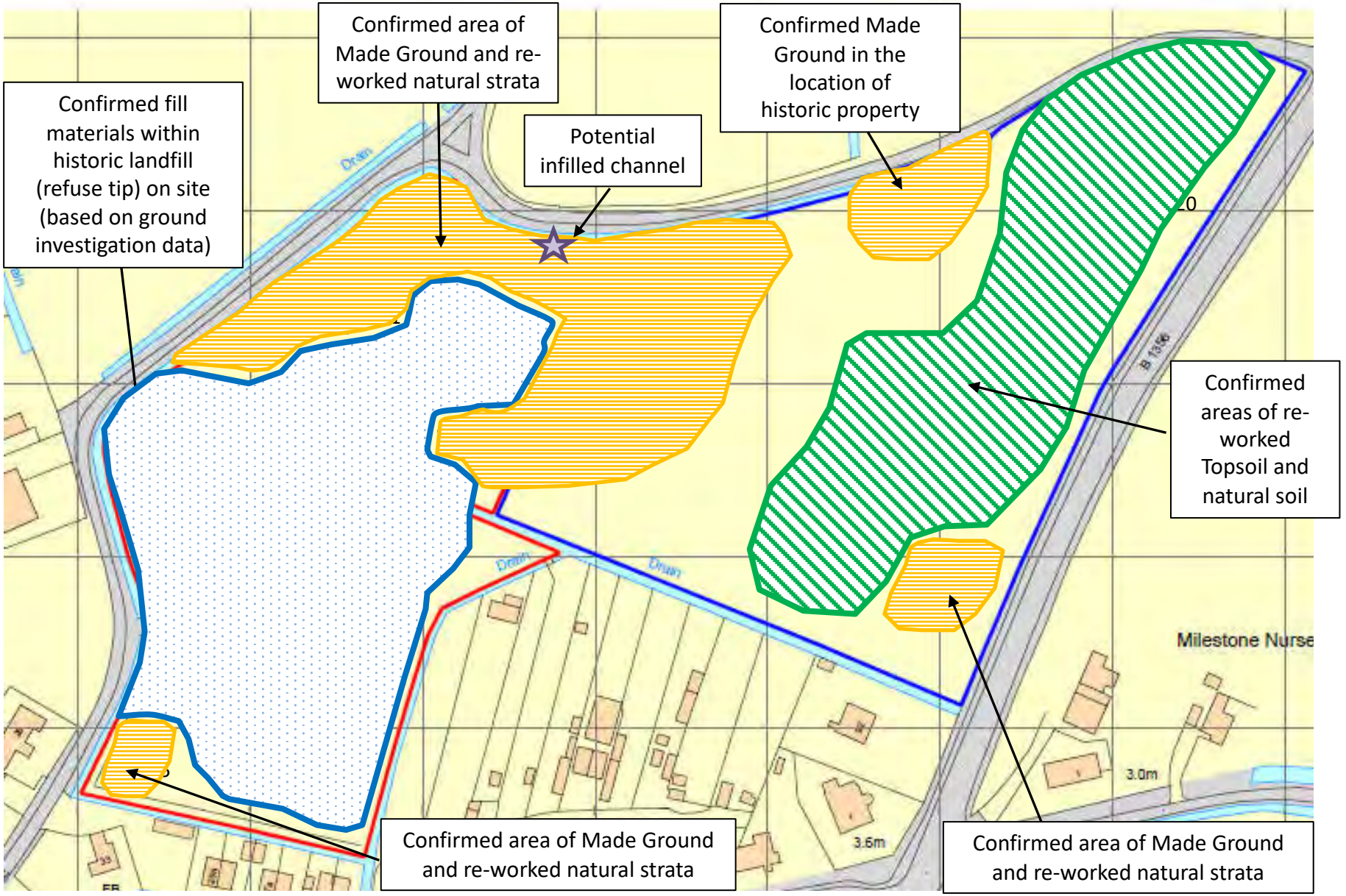
North

Drawing:

R18012/002-DWG2



Grange Geo	**Pinchbeck Site** Ground Investigation Plan	**Client:** Kirk Homes Ltd **Date:** June 2019	North	**Drawing:** R18012/002-DWG3



Grange Geo

Pinchbeck Site
Ground Investigation Findings Plan

Client: Kirk Homes Ltd
Date: June 2019

North

Drawing:
R18012/002-DWG4

Appendix B

SITE PHOTOGRAPHS



Figure 1: View across the site



Figure 2: View of the site with residential properties beyond



Figure 3: View of scrub vegetation on site



Figure 4: Drain on site boundary



Figure 5: View of standing water on site



Figure 6: Trial pitting to 2m bgl on site





Figure 7 and 8: Window sample boreholes and logging of soils to 4m bgl on site



Figure 9, 10, 11 and 12: Landfill materials uncovered on site



Figure 13: Landfill materials uncovered within a trial pit on site

Appendix C

DESK STUDY RESEARCH INFORMATION

Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	MGR	Made Ground (Undivided)	Artificial Deposit	Not Supplied - Holocene

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	TFD	Tidal Flat Deposits	Clay and Silt	Not Supplied - Holocene

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	OXC	Oxford Clay Formation	Mudstone	Not Supplied - Callovian

Grange Geo

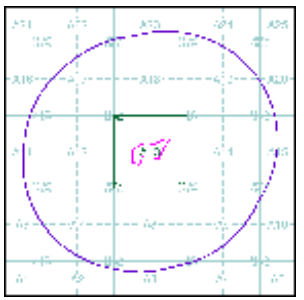
Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	**1**
Map Sheet No:	**144**
Map Name:	**Spalding**
Map Date:	**1992**
Bedrock Geology:	**Available**
Superficial Geology:	**Available**
Artificial Geology:	**Available**
Faults:	**Not Supplied**
Landslip:	**Not Available**
Rock Segments:	**Not Supplied**

Geology 1:50,000 Maps - Slice A

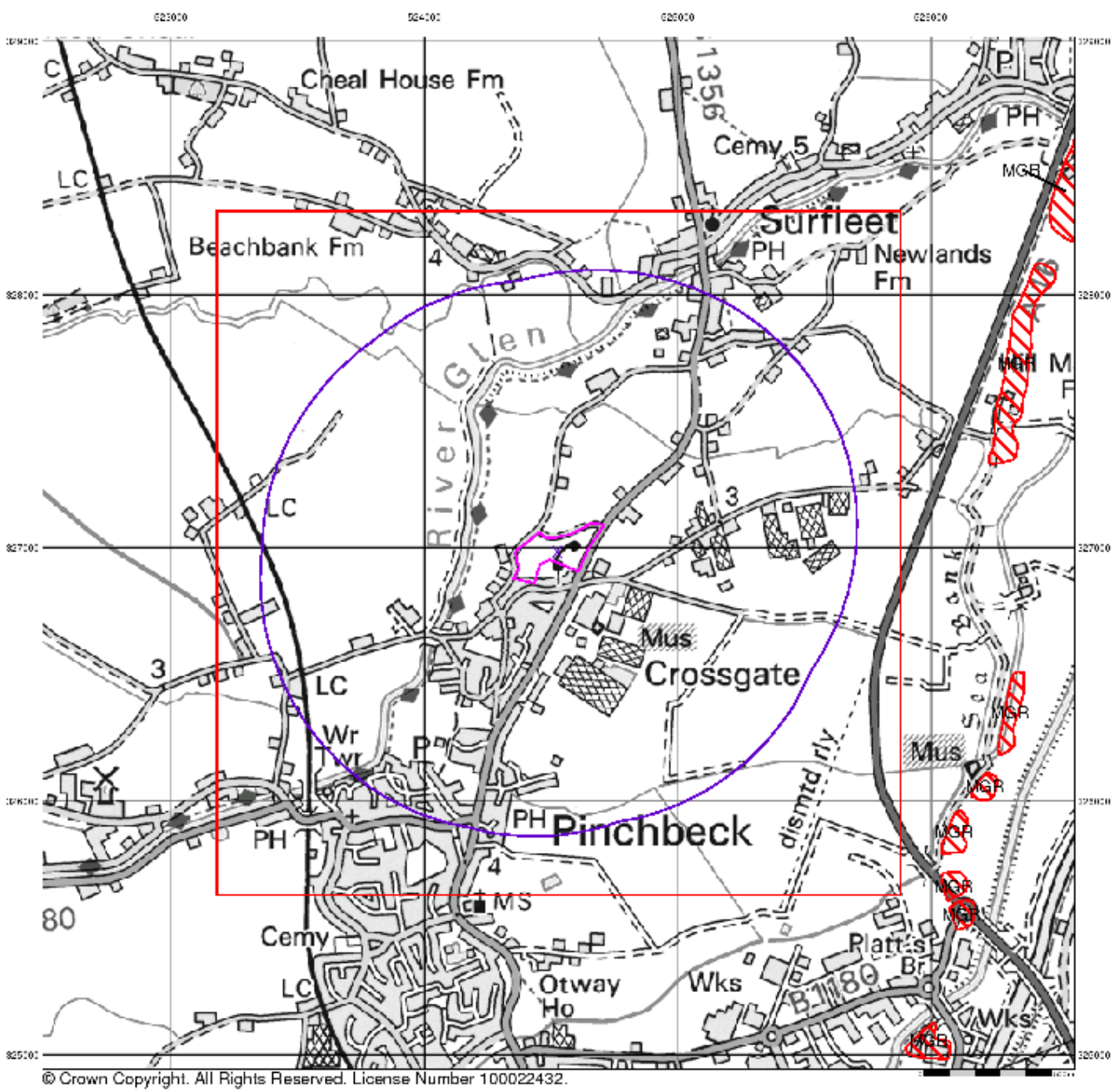


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Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details:

Site at, Pinchbeck, Lincolnshire



Artificial Ground and Landslip

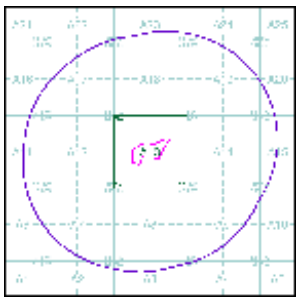
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



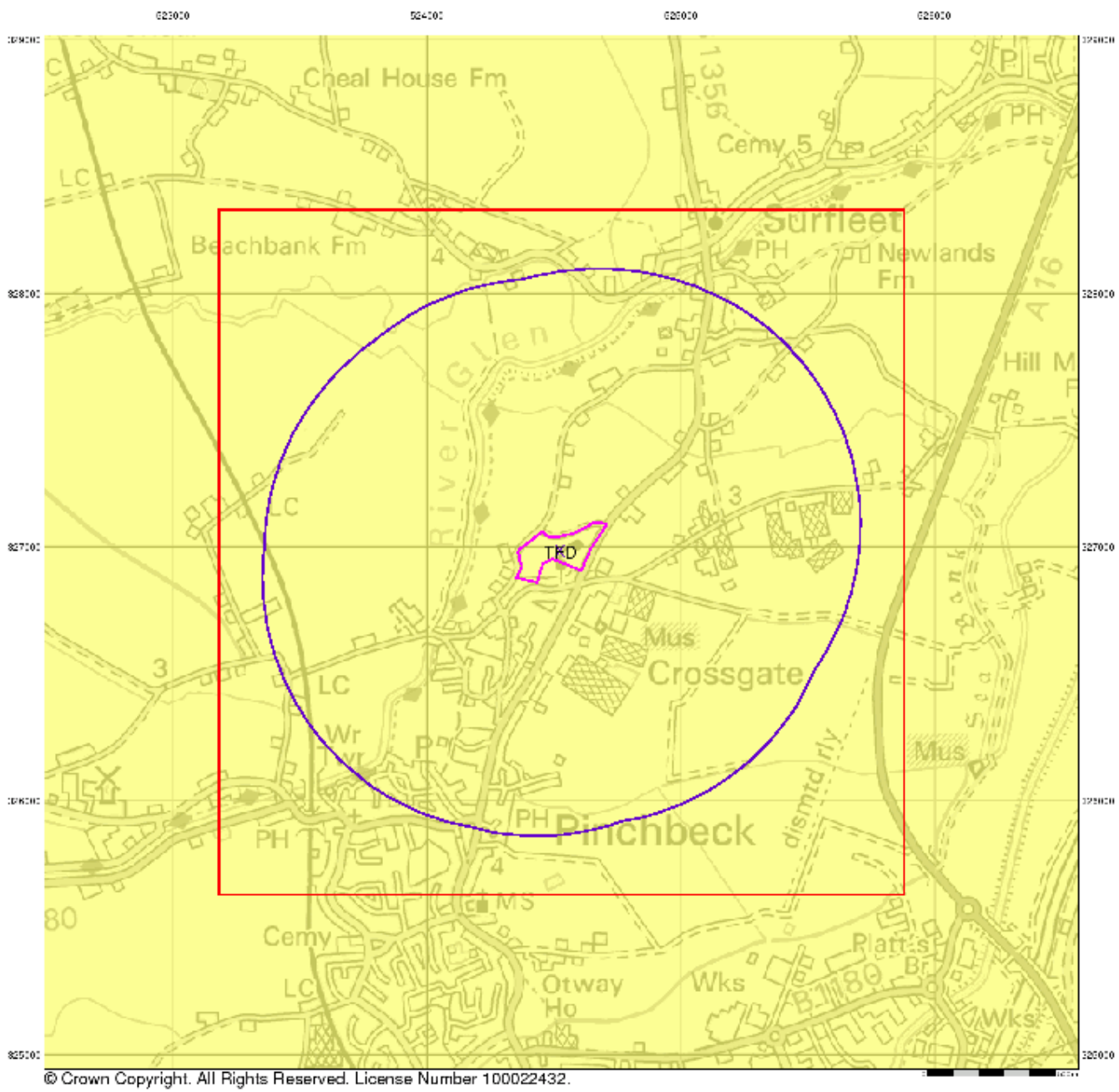
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Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details:

Site at, Pinchbeck, Lincolnshire

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



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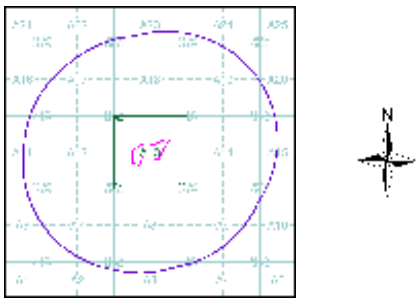
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



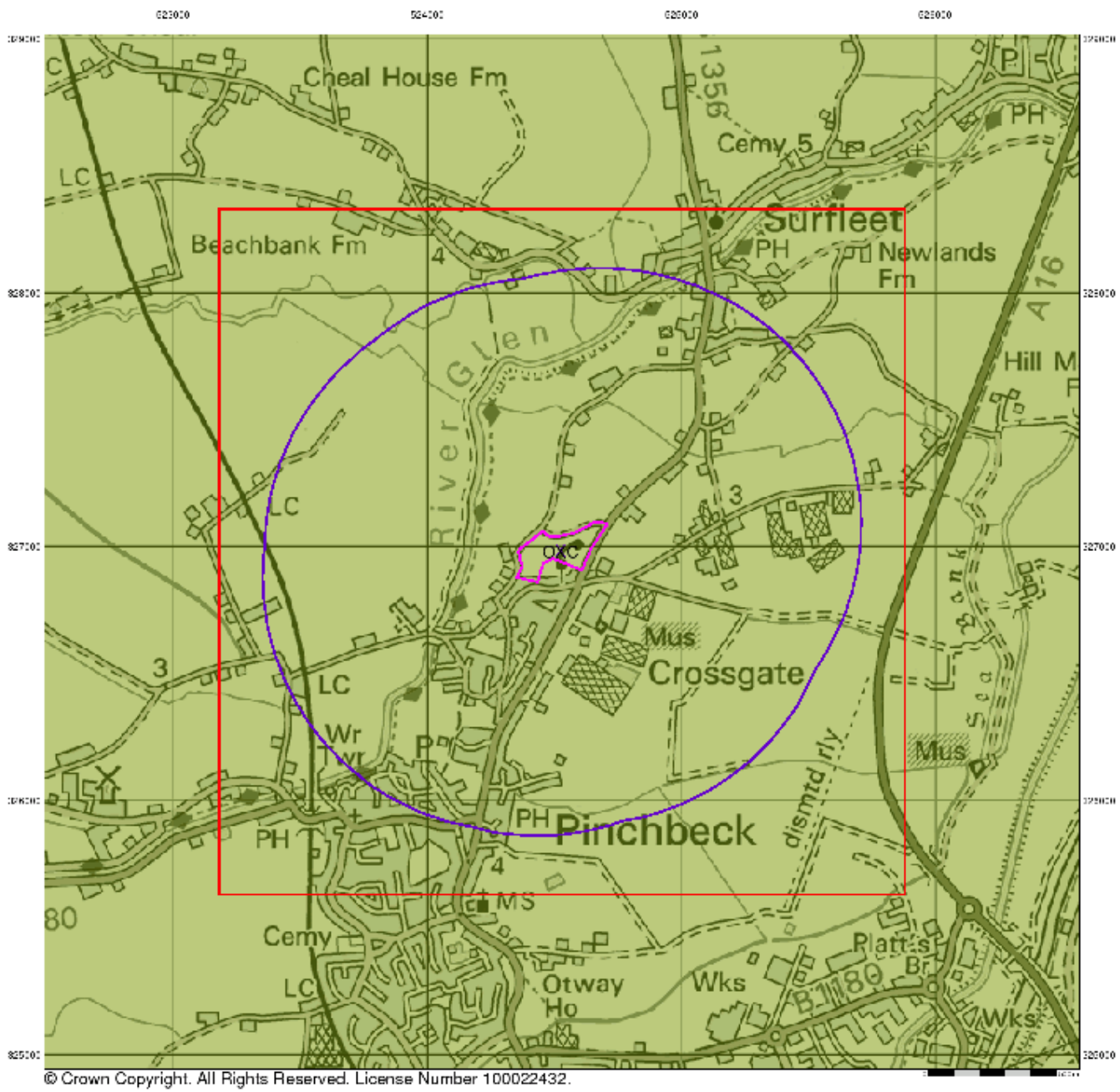
Order Details:

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Customer Reference:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details:

Site at, Pinchbeck, Lincolnshire

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Bedrock and Faults

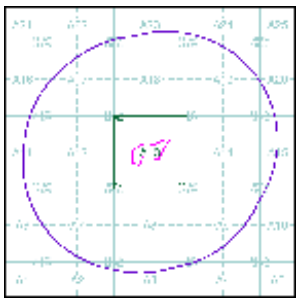
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



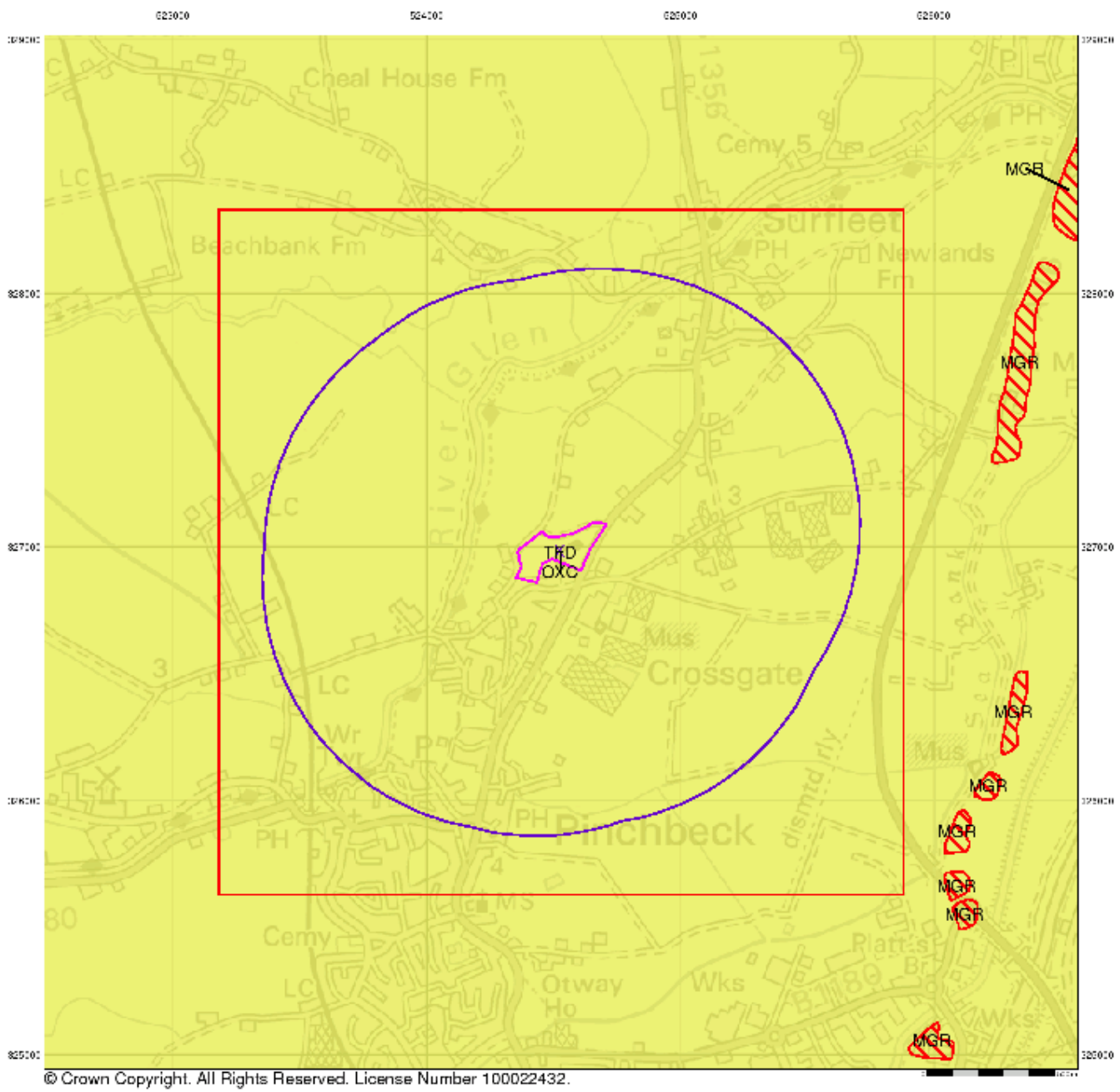
Order Details:

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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

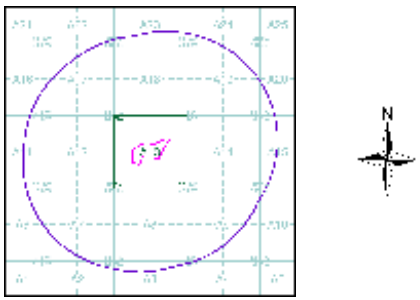
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



Order Details:

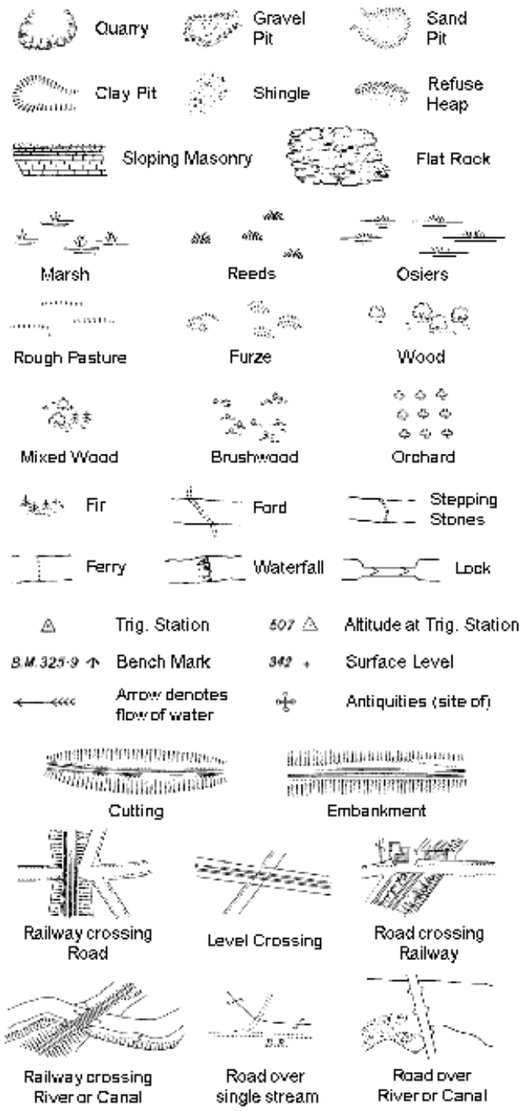
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Site Area (Ha):	3.95
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Site Details:

Site at, Pinchbeck, Lincolnshire

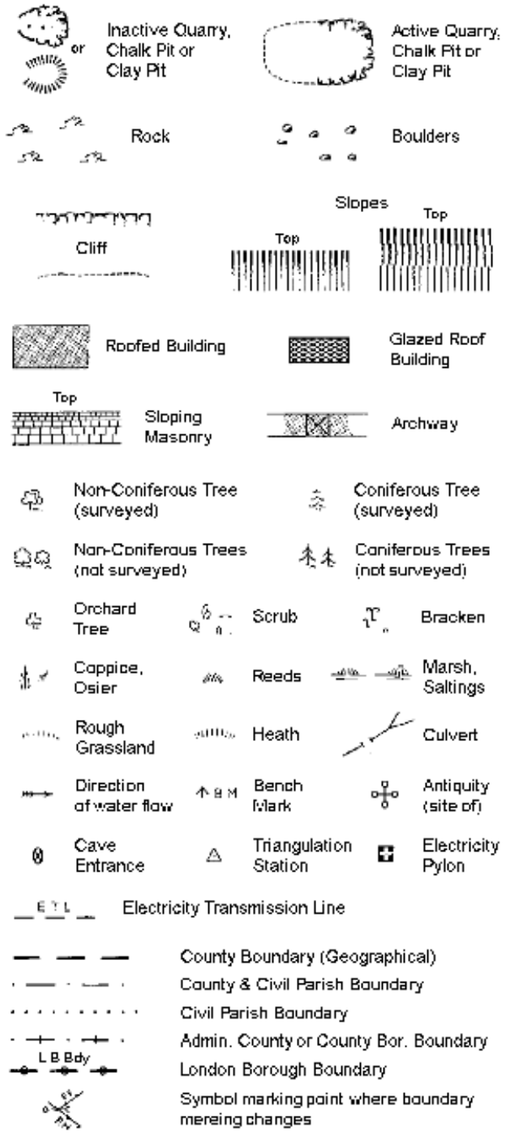
Historical Mapping Legends

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



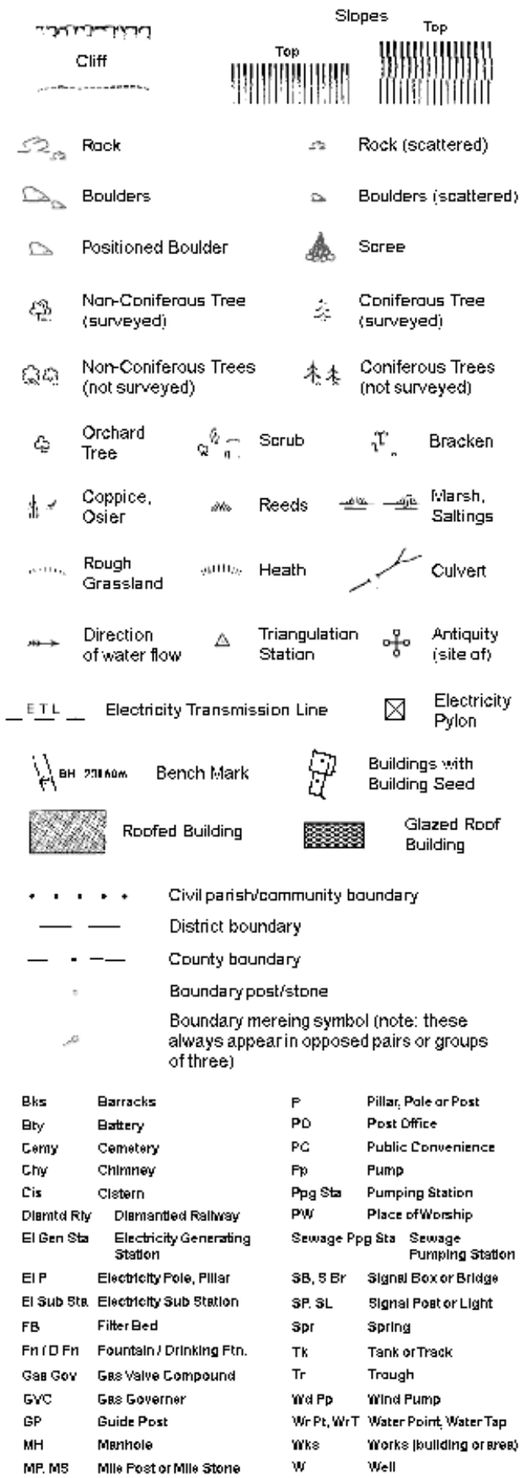
B.S B.S	Boundary Post or Stone	*P.C.B*	Police Call Box
B.R.	Bridle Road	*P*	Pump
E.P	Electricity Pylon	*S.P*	Signal Post
F.B.	Foot Bridge	*Sl.*	Sluice
F.P.	Foot Path	*Sp.*	Spring
G.P	Guide Post or Board	*T.C.B*	Telephone Call Box
M.S	Mile Stone	*Tr.*	Trough
M.P M.R	Mooring Post or Ring	*W*	Well

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



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, WrT	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



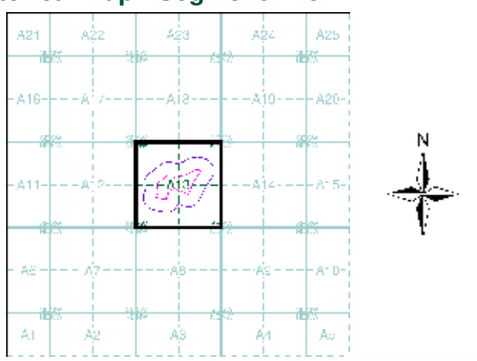
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity 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, WrT	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

Grange Geo

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lincolnshire	1:2,500	1888	2
Lincolnshire	1:2,500	1904	3
Ordnance Survey Plan	1:2,500	1969 - 1973	4
Supply of Unpublished Survey Information	1:2,500	1973	5
Additional SIMs	1:2,500	1982 - 1985	6
Additional SIMs	1:2,500	1986	7
Additional SIMs	1:2,500	1993	8
Large-Scale National Grid Data	1:2,500	1995	9
Large-Scale National Grid Data	1:2,500	1996	10
Historical Aerial Photography	1:2,500	1999	11

Historical Map - Segment A13



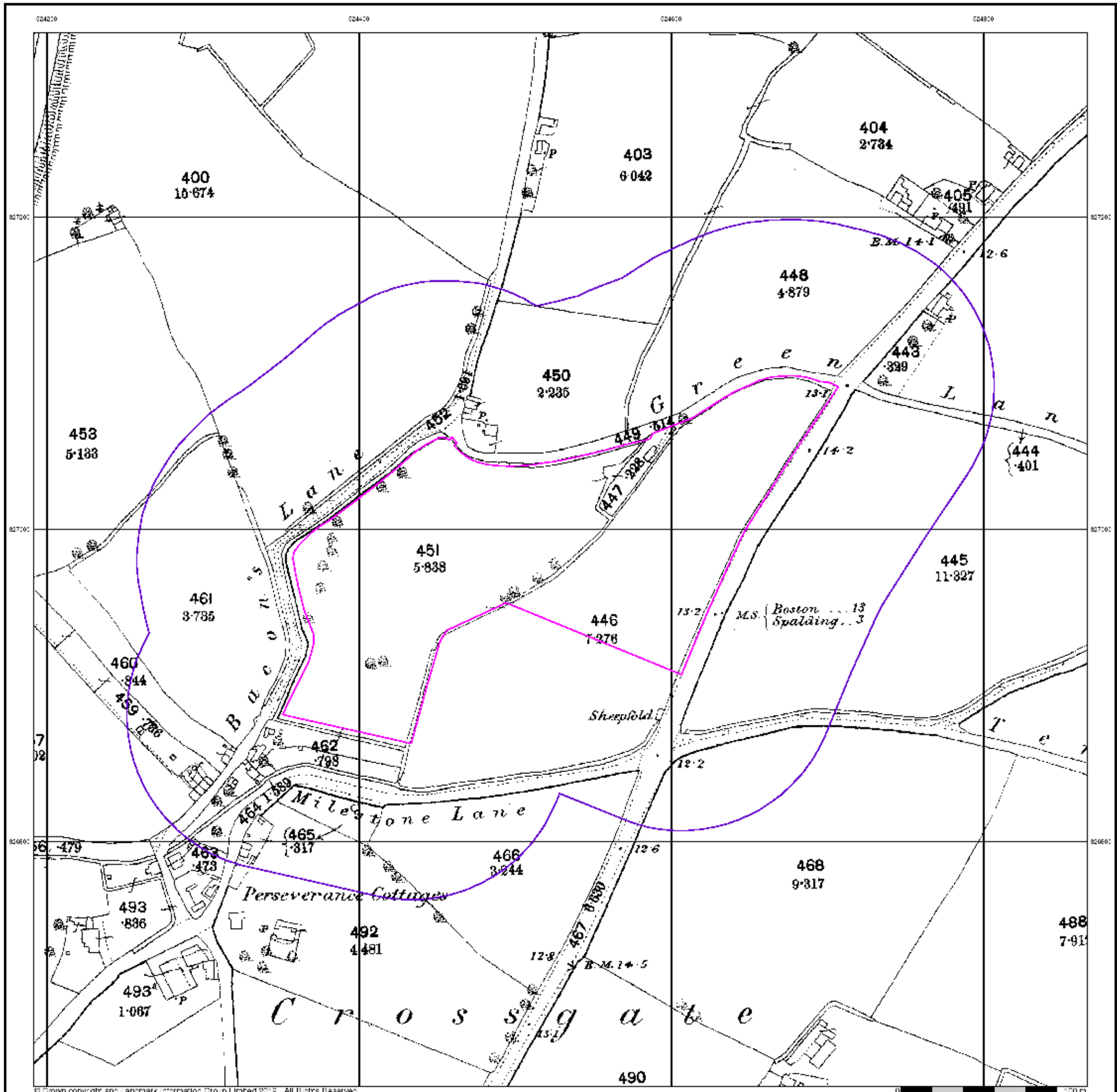
Order Details

Order Number: 201515819_1_1
Customer Ref: R18012
National Grid Reference: 524520, 326990
Slice: A
Site Area (Ha): 3.95
Search Buffer (m): 100

Site Details

Site at, Pinchbeck, Lincolnshire

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Tel: 0844 844 9952
Fax: 0844 844 9951
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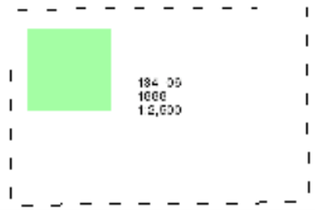
Lincolnshire

Published 1888

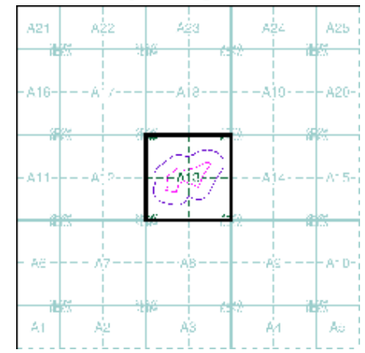
Source map scale - 1:2,500

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

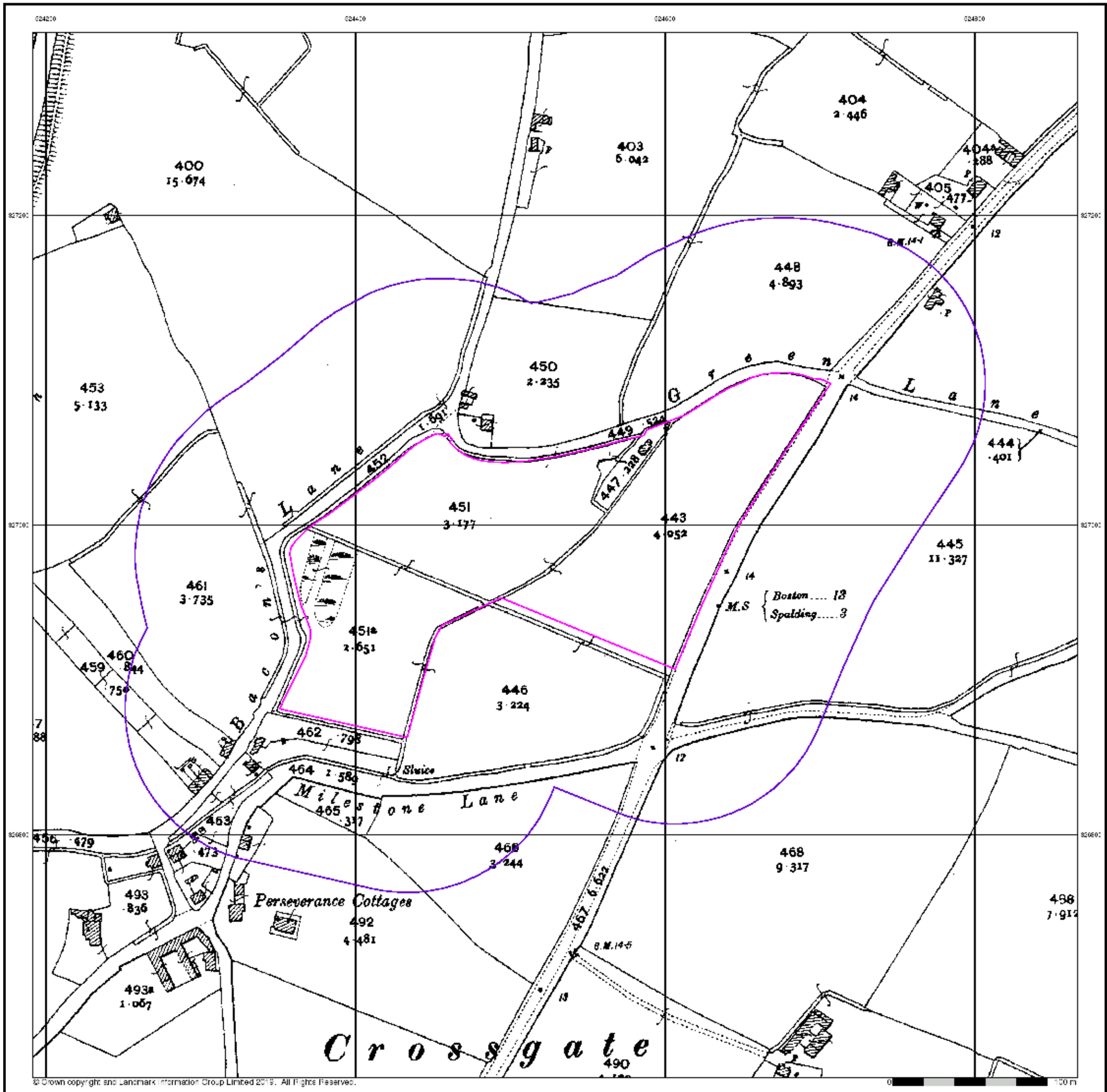


Order Details

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Site Details

Site at, Pinchbeck, Lincolnshire



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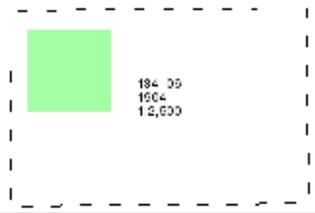
Lincolnshire

Published 1904

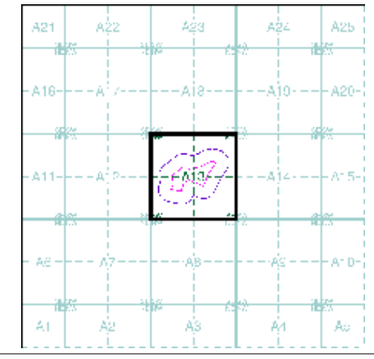
Source map scale - 1:2,500

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



Order Details

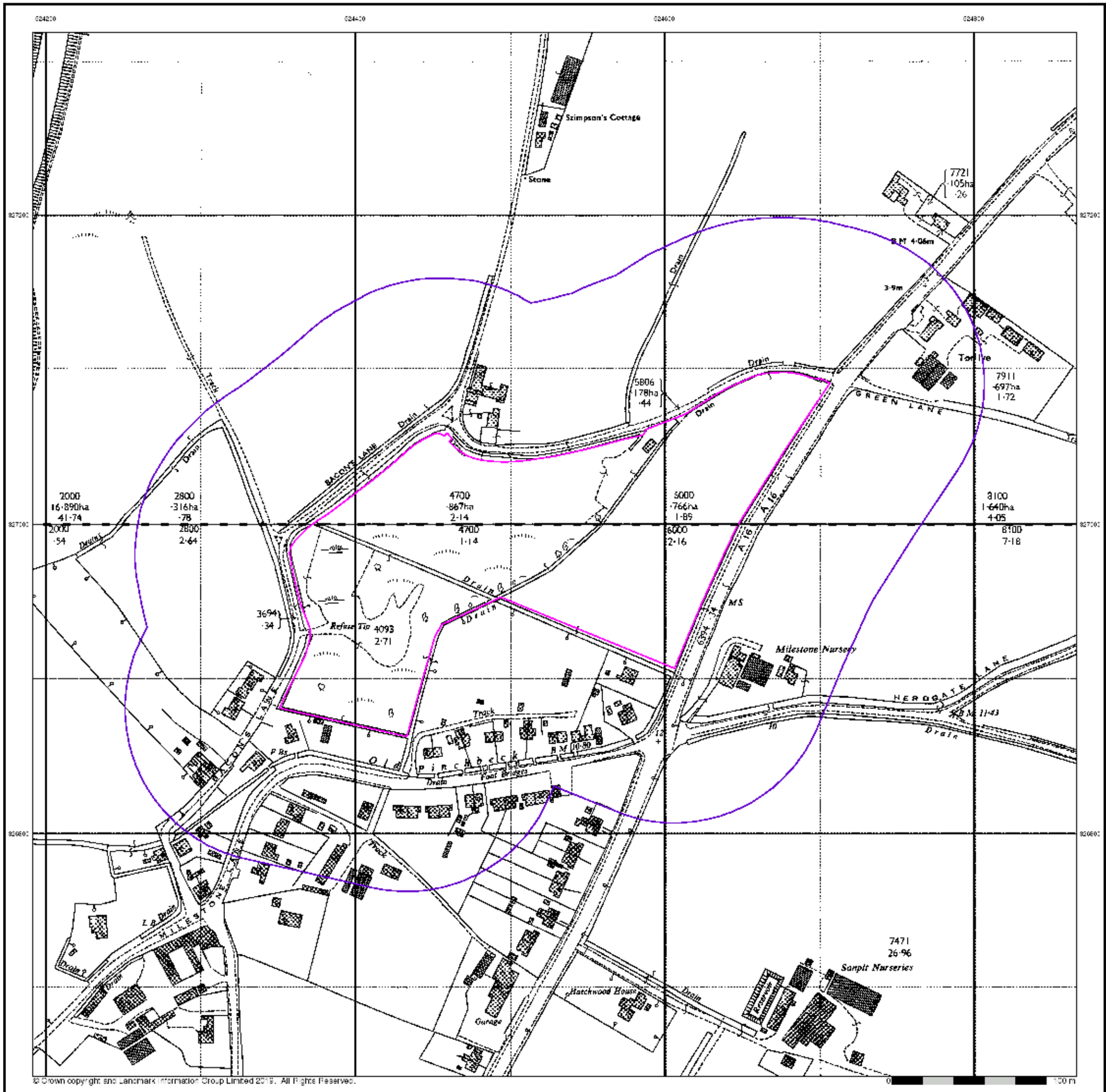
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National Grid Reference:	524520, 326990
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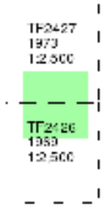
Ordnance Survey Plan

Published 1969 - 1973

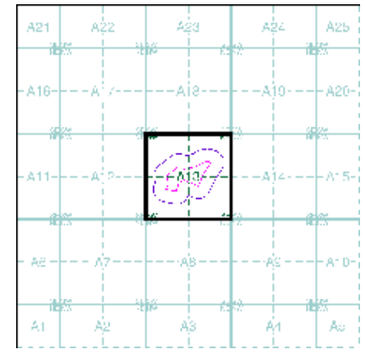
Source map scale - 1:2,500

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



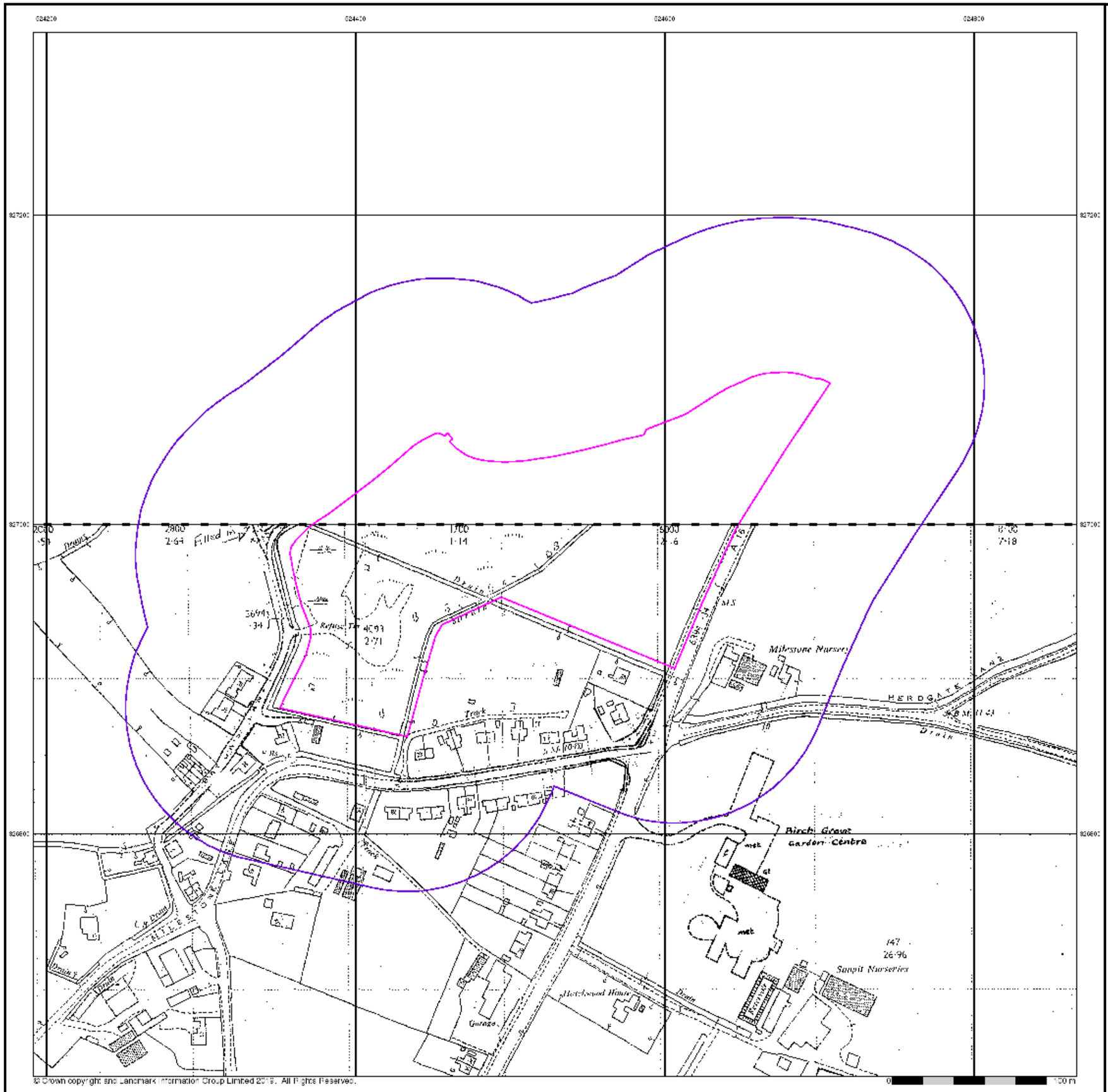
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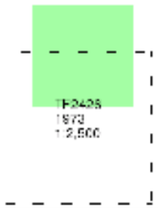
Supply of Unpublished Survey Information

Published 1973

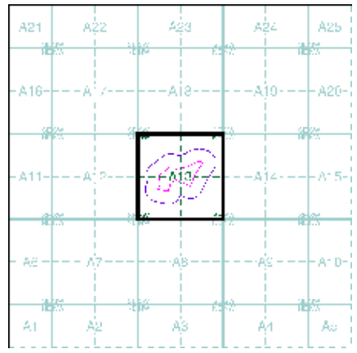
Source map scale - 1:2,500

SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a `work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13

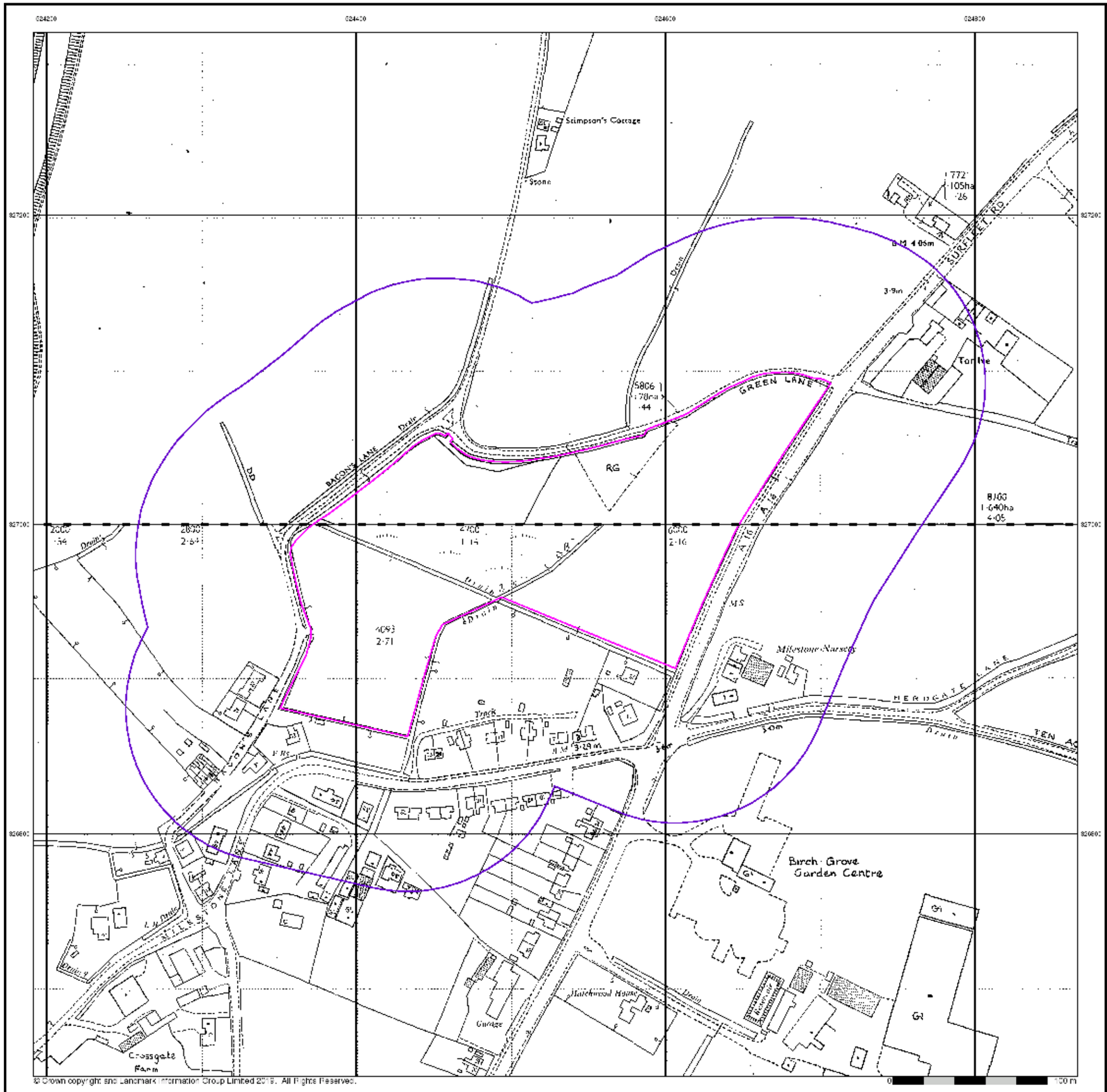


Order Details

Order Number:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	100

Site Details

Site at, Pinchbeck, Lincolnshire



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Grange Geo

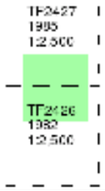
Additional SIMs

Published 1982 - 1985

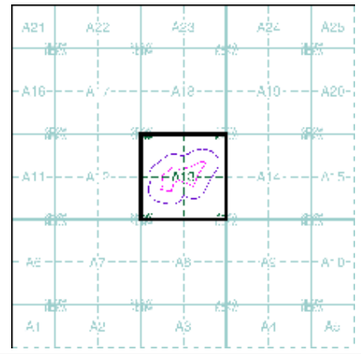
Source map scale - 1:2,500

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



Order Details

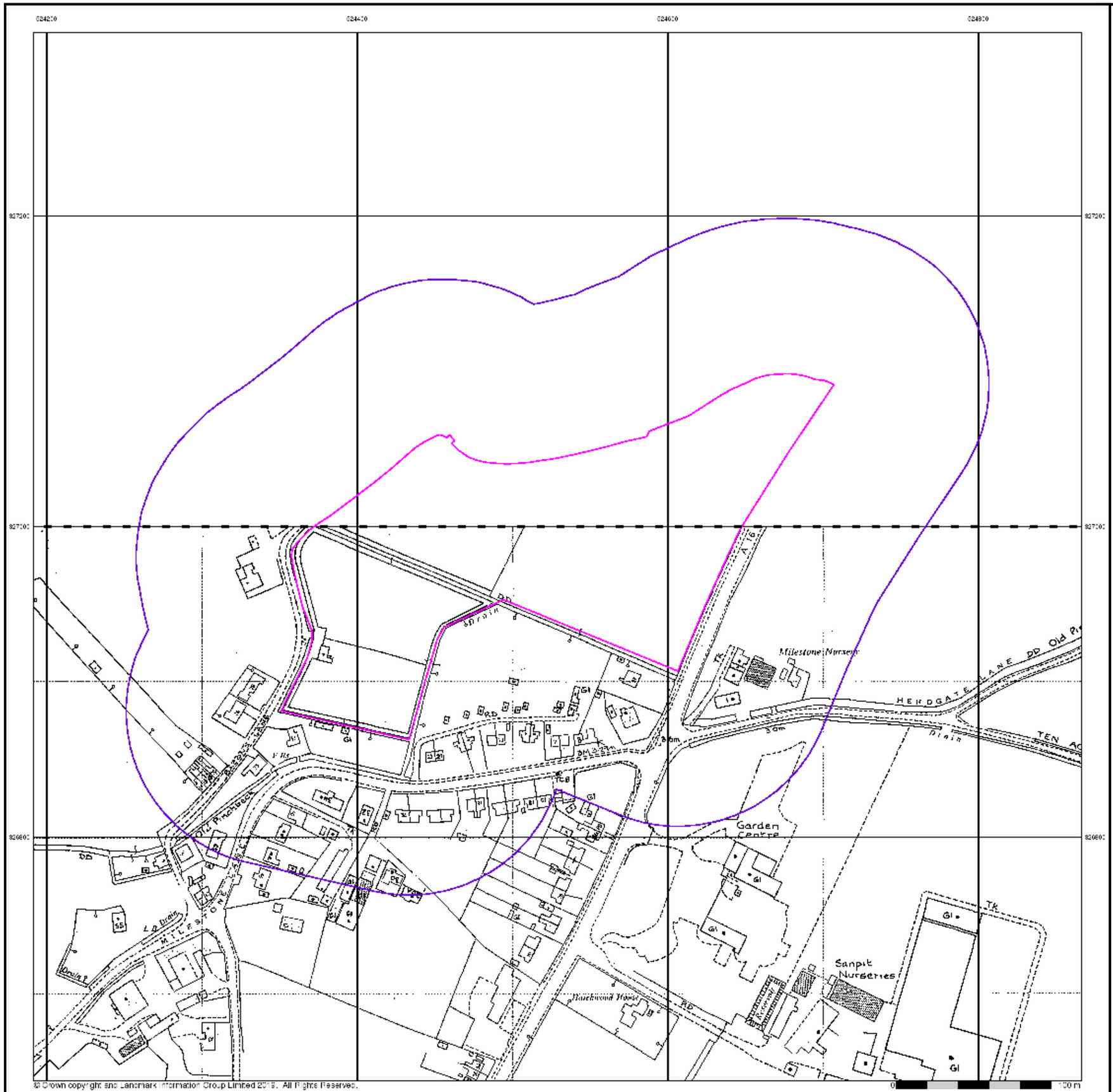
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Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
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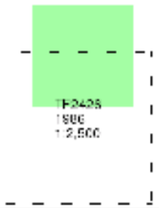
Additional SIMs

Published 1986

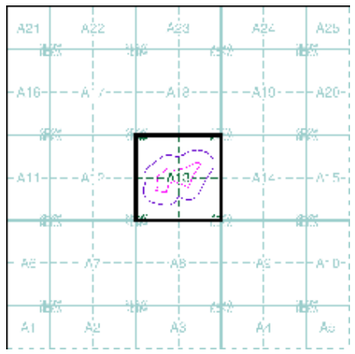
Source map scale - 1:2,500

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



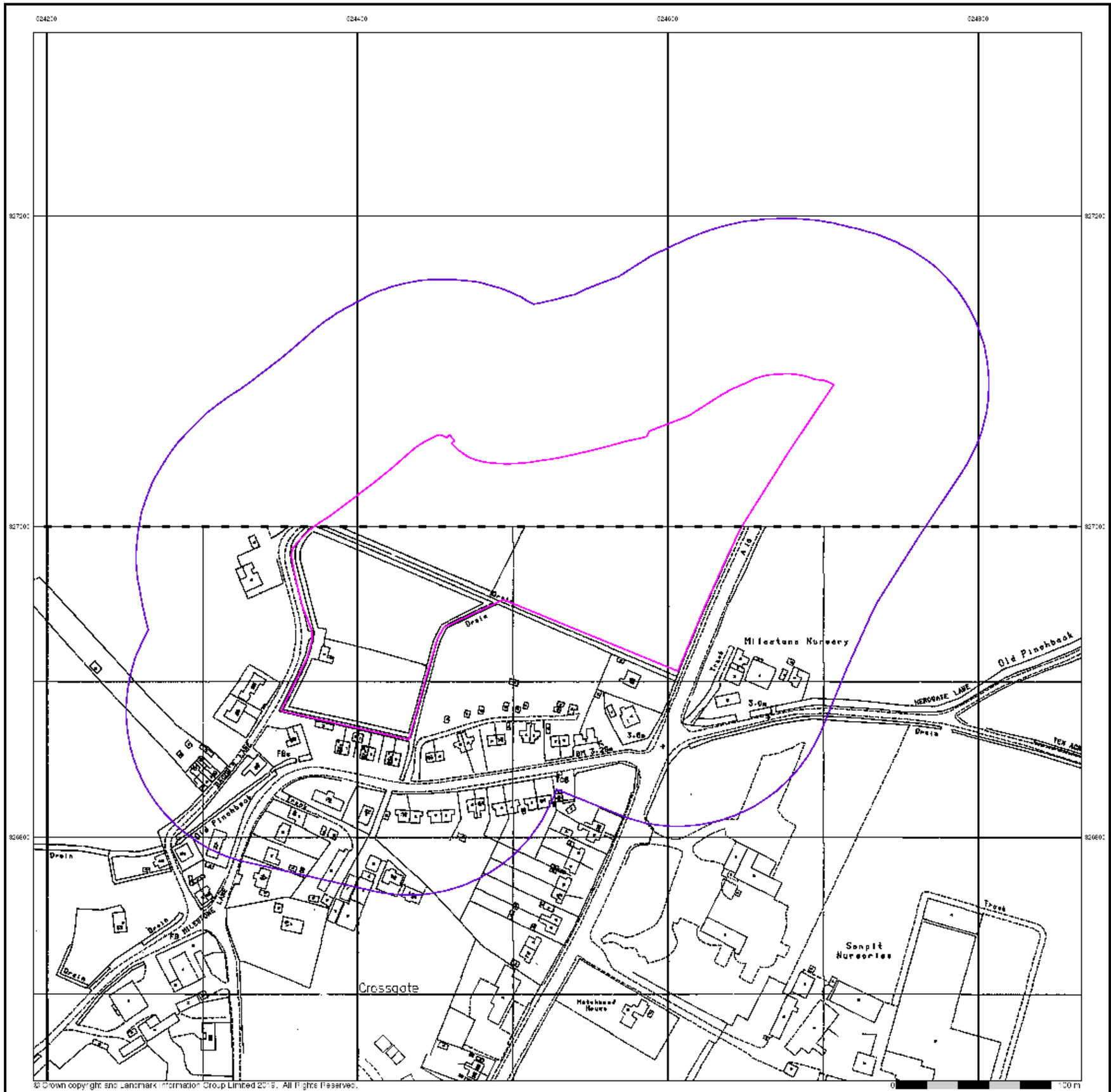
Order Details

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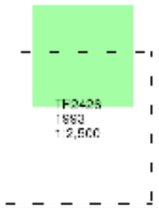
Additional SIMs

Published 1993

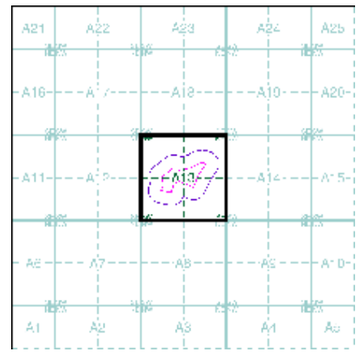
Source map scale - 1:2,500

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

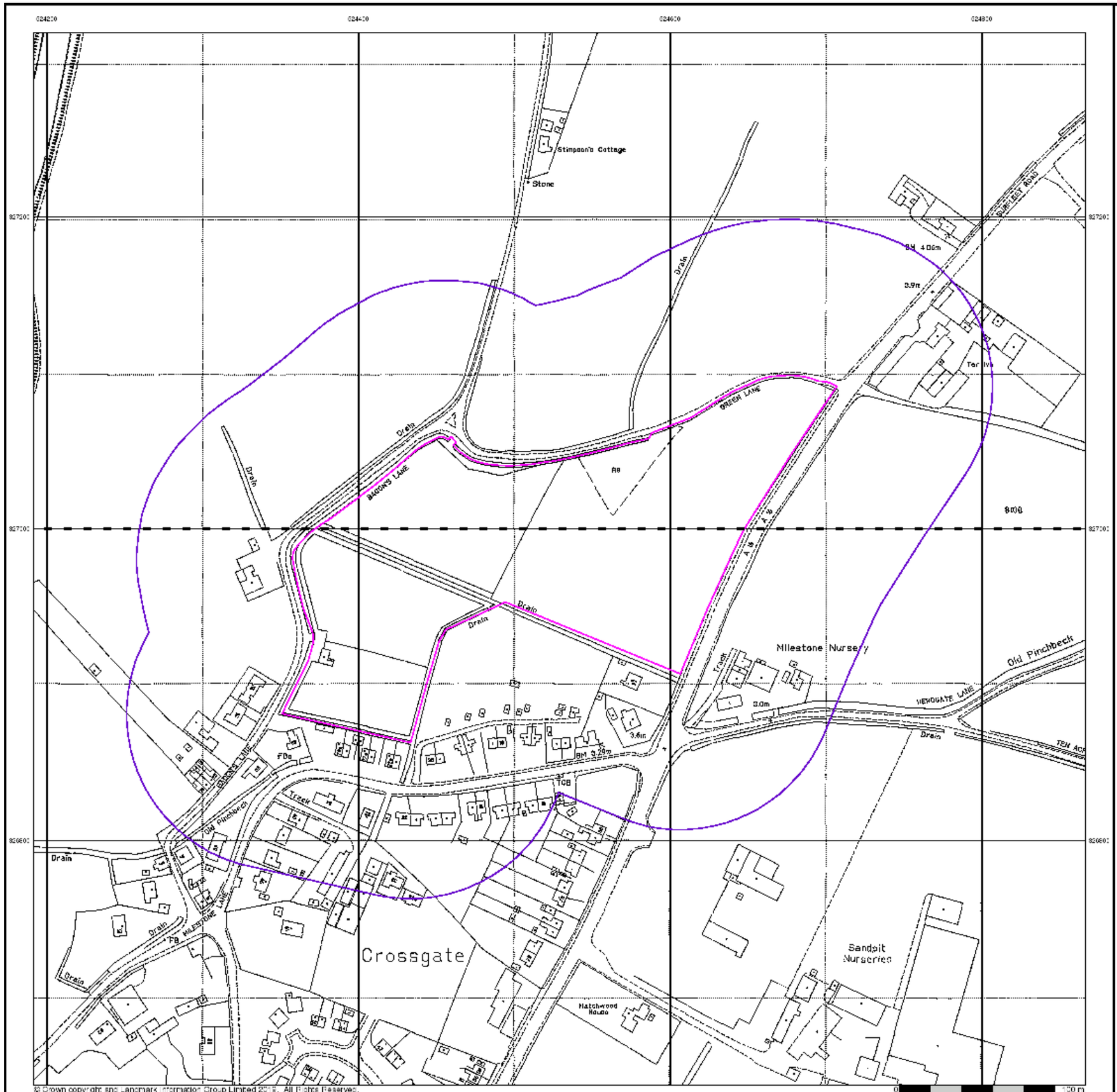


Order Details

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Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	100

Site Details

Site at, Pinchbeck, Lincolnshire



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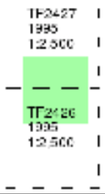
Large-Scale National Grid Data

Published 1995

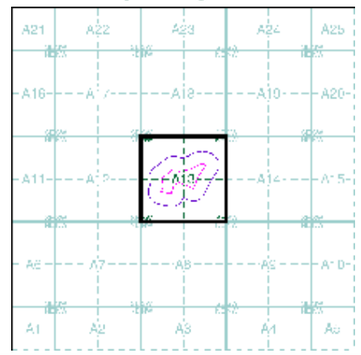
Source map scale - 1:2,500

'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



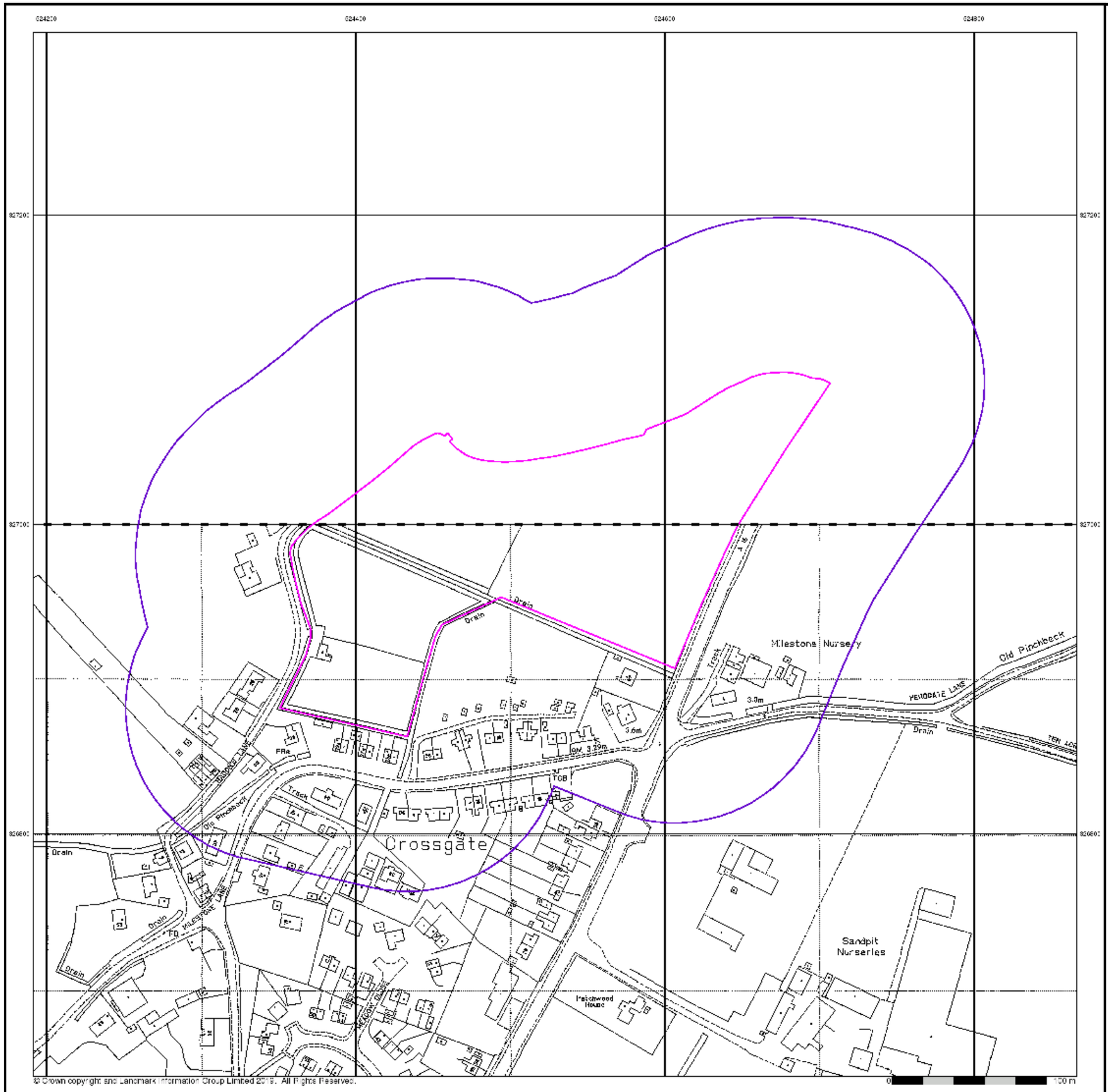
Order Details

Order Number:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	100

Site Details

Site at, Pinchbeck, Lincolnshire

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



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Grange Geo

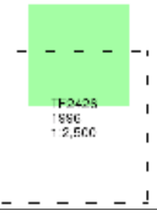
Large-Scale National Grid Data

Published 1996

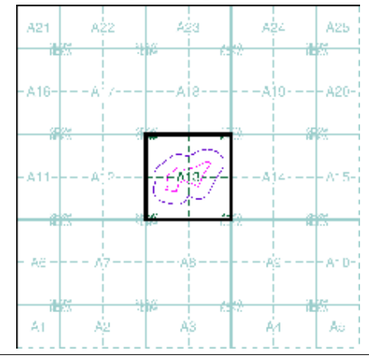
Source map scale - 1:2,500

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Map Name(s) and Date(s)



Historical Map - Segment A13



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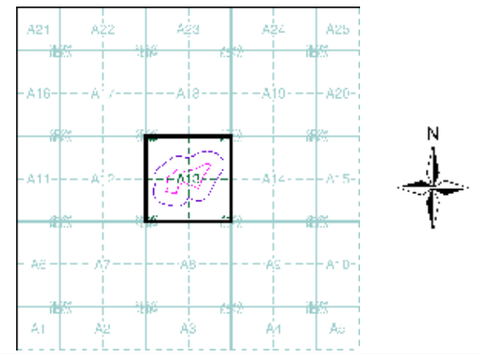
Grange Geo

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 - Segment A13

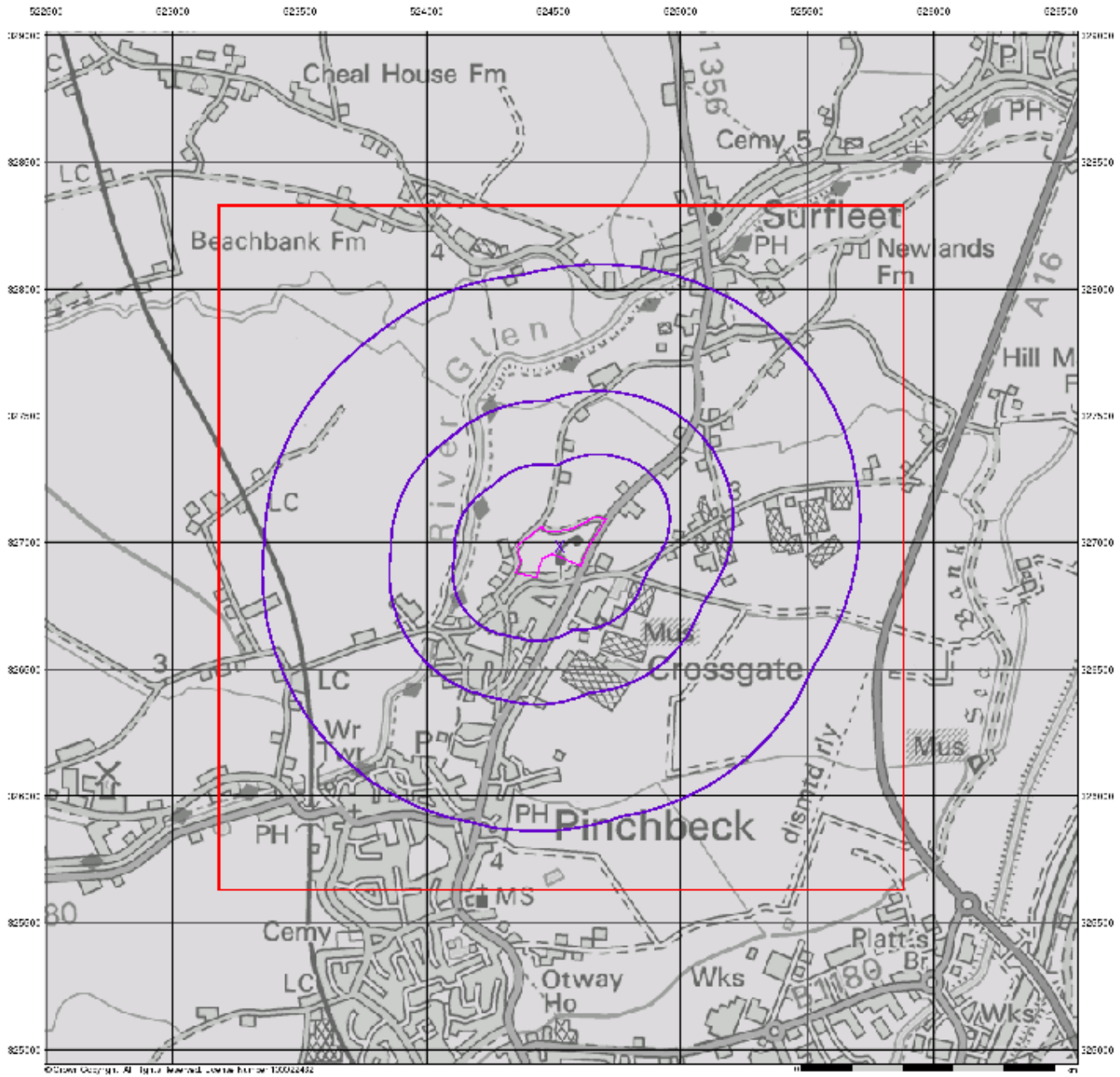


Order Details

Order Number:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	100

Site Details

Site at, Pinchbeck, Lincolnshire



Groundwater Vulnerability

General

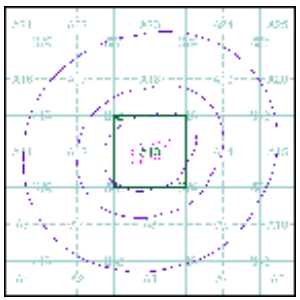
Agency and Hydrological

Bedrock Aquifers	Superficial Aquifers
High Vulnerability, Principal Aquifer	High Vulnerability, Principal Aquifer
High Vulnerability, Secondary Aquifer	High Vulnerability, Secondary Aquifer
Medium Vulnerability, Principal Aquifer	Medium Vulnerability, Principal Aquifer
Medium Vulnerability, Secondary Aquifer	Medium Vulnerability, Secondary Aquifer
Low Vulnerability, Principal Aquifer	Low Vulnerability, Principal Aquifer
Low Vulnerability, Secondary Aquifer	Low Vulnerability, Secondary Aquifer

Unproductive Aquifer

Soluble Rock

Site Sensitivity Context Map - Slice A



Order Details

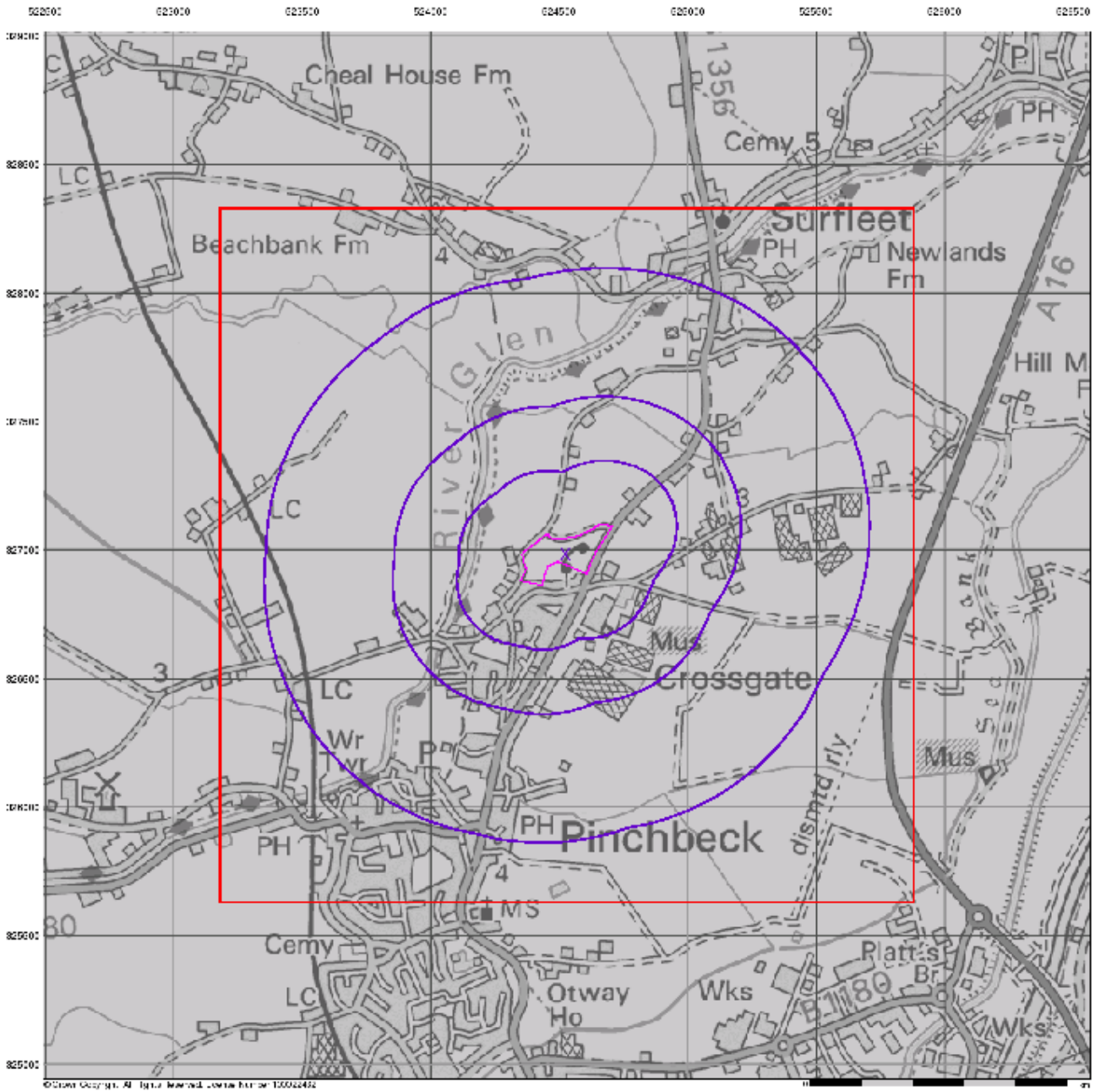
Order Number:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

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Bedrock Aquifer Designation

General

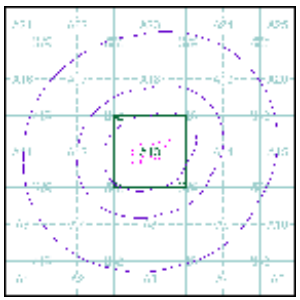
Site Boundary | Site Buffer (1000m) | Boreholes | Slice | Grid

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lacustrine and Fluvial)

Site Sensitivity Context Map - Slice A



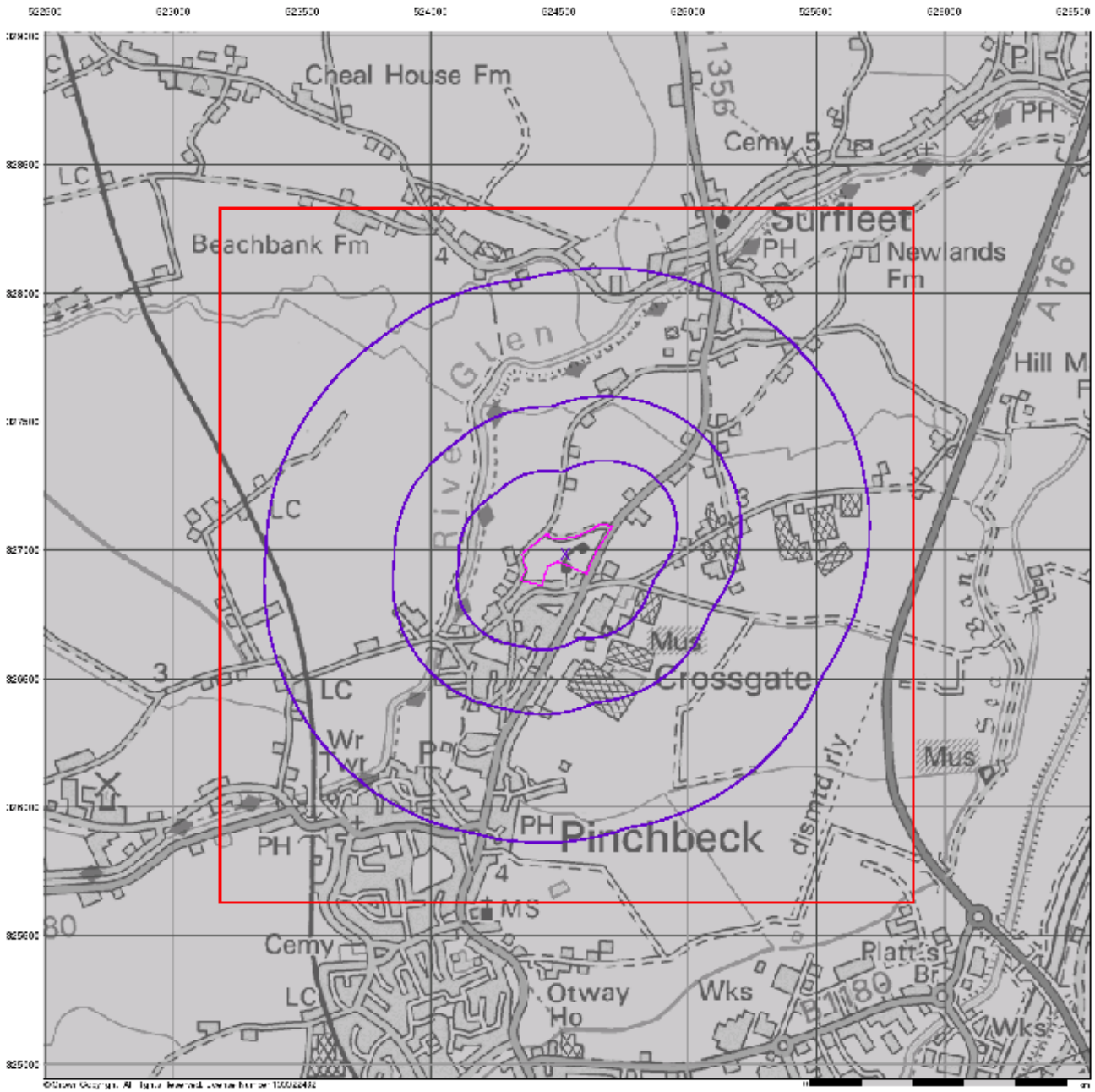
Order Details

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Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

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Superficial Aquifer Designation

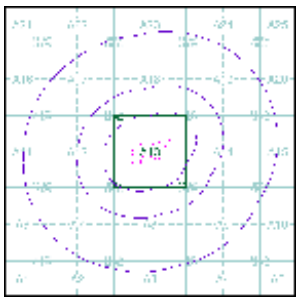
General

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lacustrine and Fluvial)

Site Sensitivity Context Map - Slice A



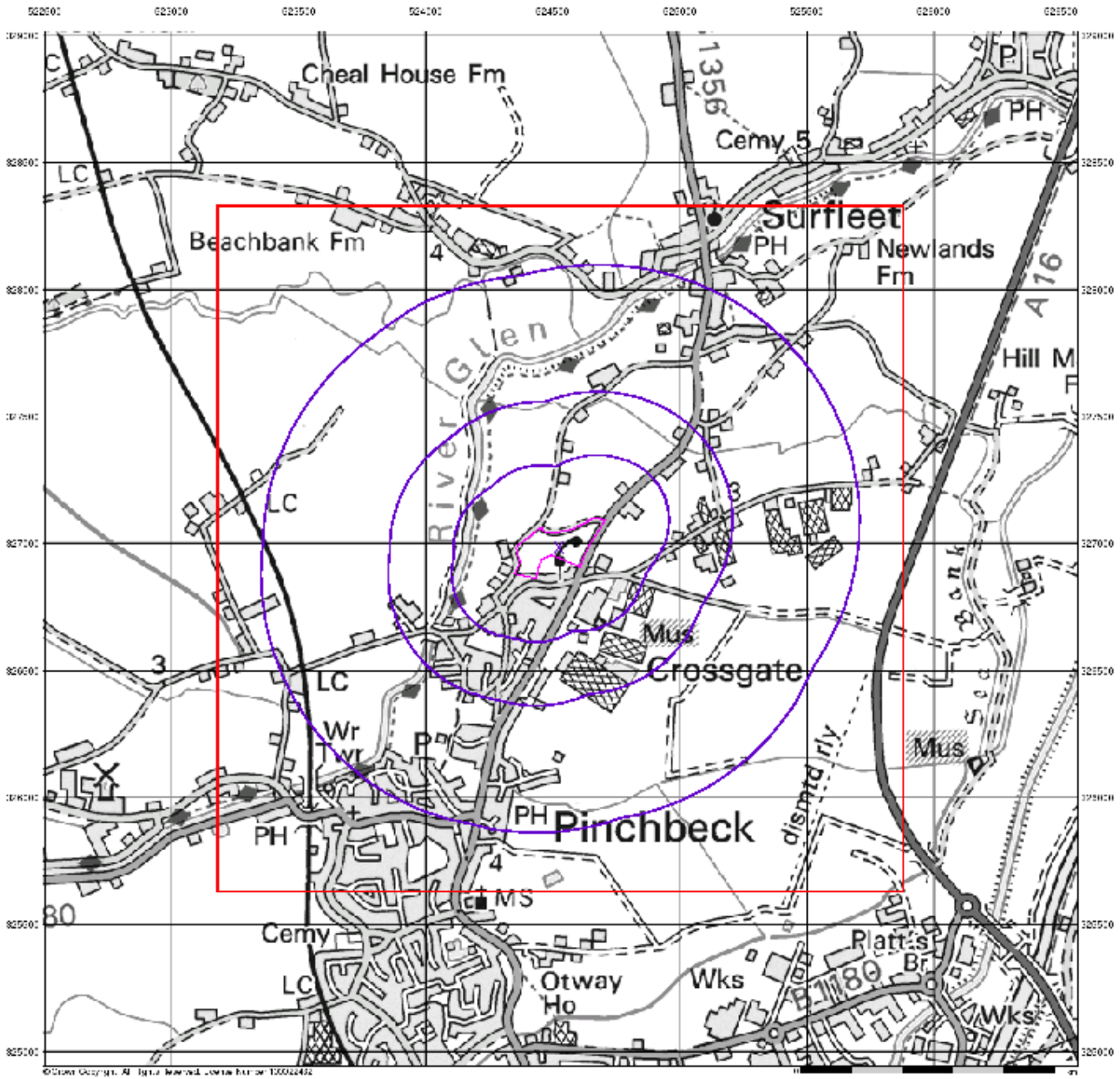
Order Details

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National Grid Reference:	524520, 326990
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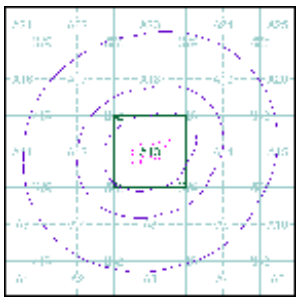


Source Protection Zones

General

Agency and Hydrological

Site Sensitivity Context Map - Slice A



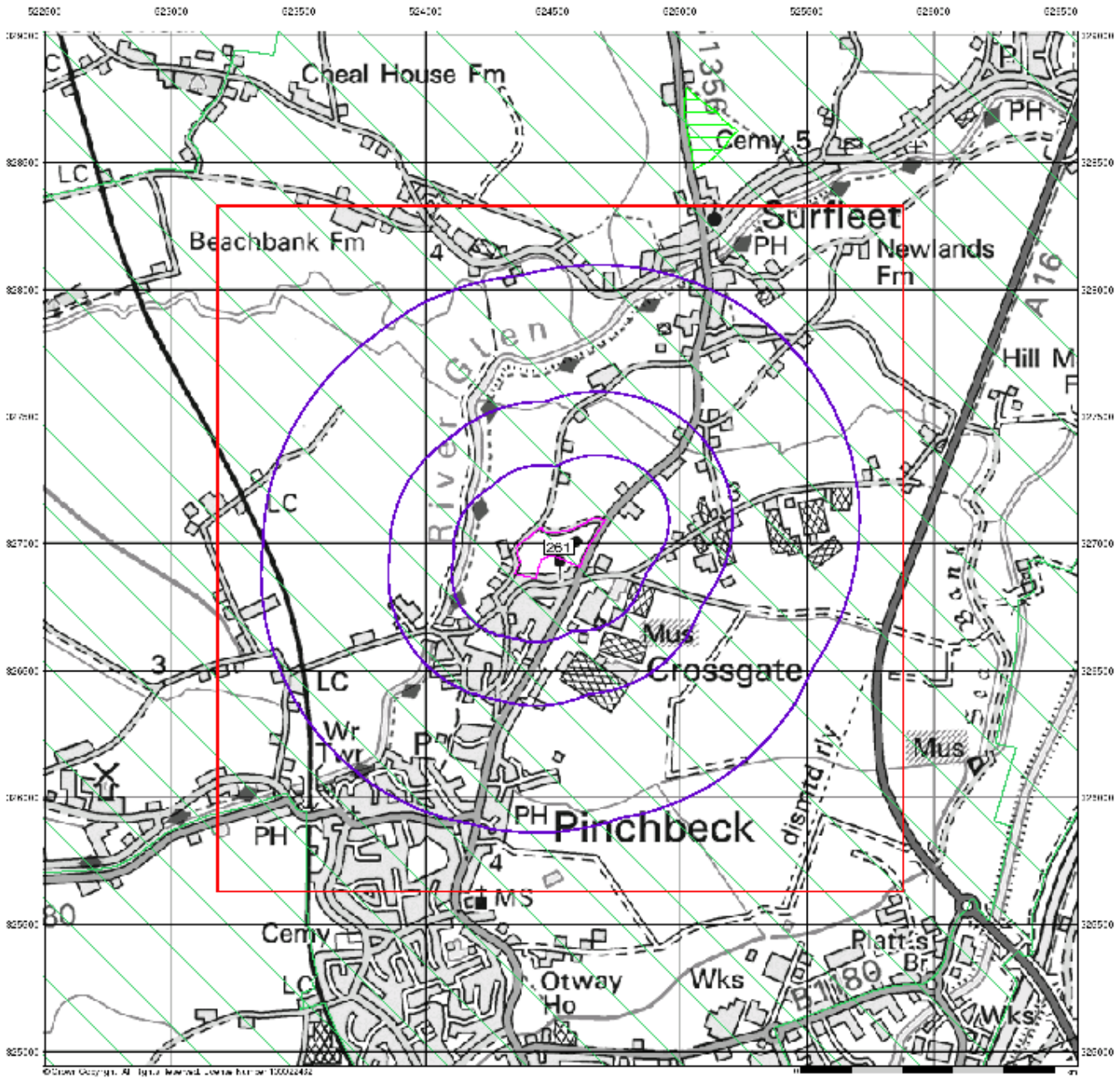
Order Details

Order Number:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

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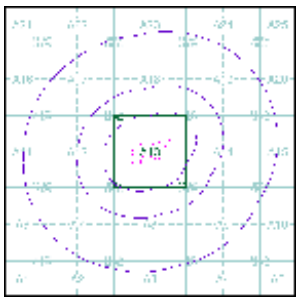
Grange Geo

Sensitive Land Uses

General

Sensitive Land Uses

Site Sensitivity Context Map - Slice A



Order Details

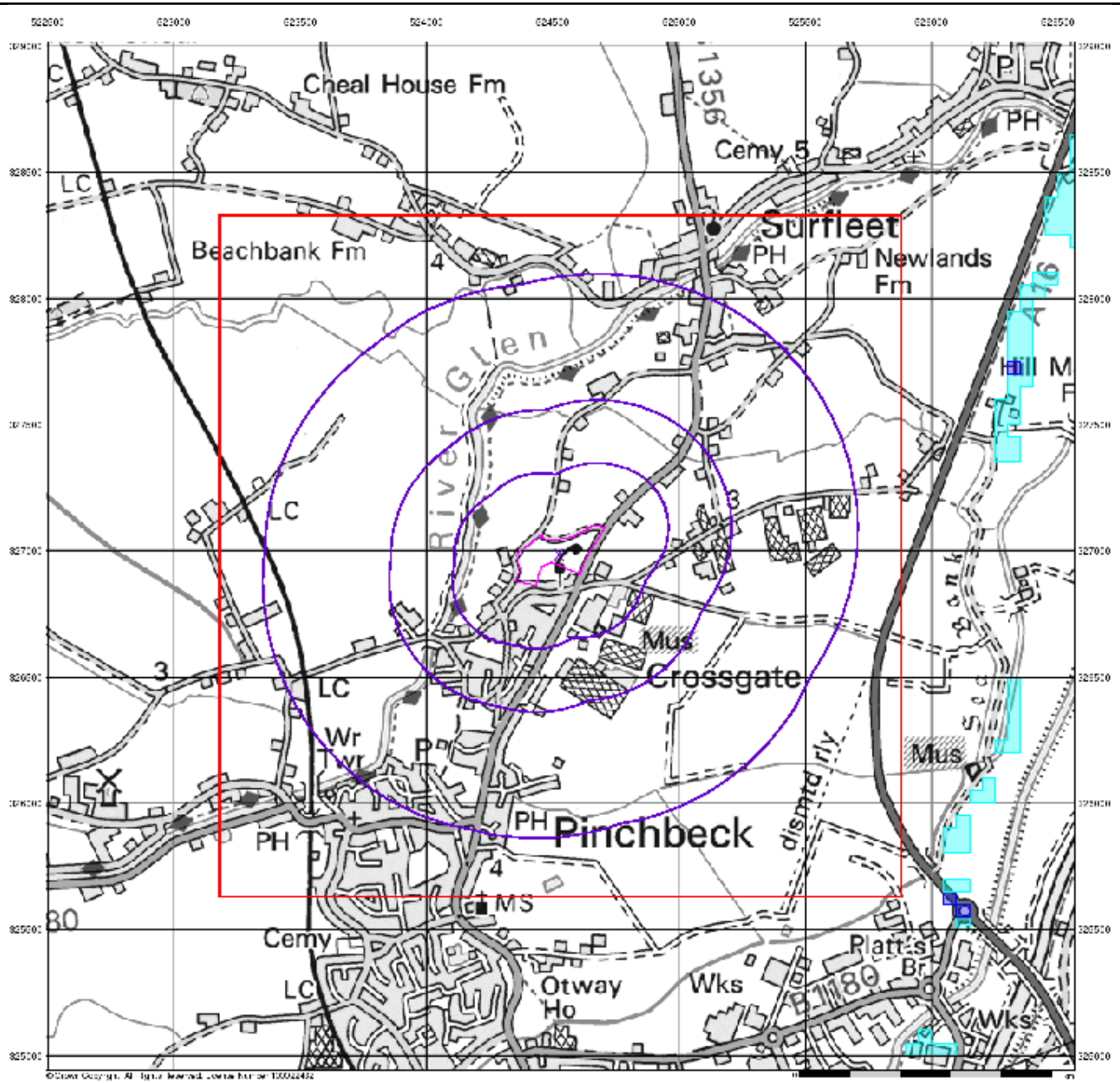
Order Number:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

Site at, Pinchbeck, Lincolnshire

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BGS Flood GFS Data

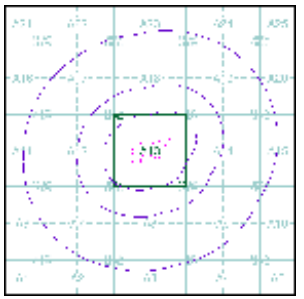
General

Site Boundary
Site for Buffer
Bedrock Borehole 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:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

Site at, Pinchbeck, Lincolnshire

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

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
201515819_1_1

Customer Reference:
R18012

National Grid Reference:
524520, 326990

Slice:
A

Site Area (Ha):
3.95

Search Buffer (m):
1000

Site Details:

Site at
Pinchbeck
Lincolnshire

Client Details:

Mr A Hare
Grange Geo Consulting Ltd
43 Winchilsea Avenue
Newark
Nottinghamshire
NG24 4AD

Contents

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	37
Hazardous Substances	-
Geological	38
Industrial Land Use	39
Sensitive Land Use	42
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Data Suppliers	48
Useful Contacts	49

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 this 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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Report Version v53.0

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility					n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1		1	5	5
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	pg 3		1	1	
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 3	Yes			
Pollution Incidents to Controlled Waters	pg 4			1	4
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality	pg 4		1		
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register					
Water Abstractions	pg 5			1	15 (*17)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 13	Yes	n/a	n/a	n/a
Groundwater Vulnerability - Soluble Rock Risk			n/a	n/a	n/a
Groundwater Vulnerability - Local Information			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 13	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 13	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences	pg 13	Yes		n/a	n/a
Flooding from Rivers or Sea without Defences	pg 13	Yes		n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences	pg 13		Yes	n/a	n/a
OS Water Network Lines	pg 14	4	24	33	145

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites	pg 37	1			
Historical Landfill Sites	pg 37	1			1
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)					
Local Authority Landfill Coverage	pg 37	2	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)					
Potentially Infilled Land (Water)	pg 37				3
Registered Landfill Sites					
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
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					

Summary

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 38	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 38	Yes		Yes	
BGS Recorded Mineral Sites					
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			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				n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 38	Yes		n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 38	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 38	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 38	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 39		5	5	2
Fuel Station Entries	pg 40		1		
Points of Interest - Commercial Services	pg 40		4		1
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 40		2	3	5
Points of Interest - Public Infrastructure	pg 41				5
Points of Interest - Recreational and Environmental					
Gas Pipelines					
Underground Electrical Cables					

Summary

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 42	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
1	**Discharge Consents** Operator: Mr & Mrs D Fawcett Property Type: Domestic Property (Single) Location: Middledene House Surfleet Road, Pinchbeck, Spalding, Lincs, Pe11 4ag Authority: Environment Agency, Anglian Region Catchment Area: Low River Welland (Spalding) Reference: Prnnf18149 Permit Version: 1 Effective Date: 25th April 2004 Issued Date: 11th May 2004 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Old Pinchbeck Drain **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	A14NW (E)	230	2	524930 327040
2	**Discharge Consents** Operator: P A Moerman Ltd Property Type: FARMS (NOT HOUSE)/CROP + ANIMAL REARING/PLANT NURSERY Location: Sandpit Nurseries Surfleet Road, Pinchbeck, Spalding, Lincs, Pe11 3xy Authority: Environment Agency, Anglian Region Catchment Area: Not Given Reference: Prnnf09828 Permit Version: 1 Effective Date: 30th January 1995 Issued Date: 30th January 1995 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Unnamed Dyke **Status: Post National Rivers Authority Legislation where issue date > 31/08/1989** Positional Accuracy: Located by supplier to within 100m	A8NE (S)	308	2	524600 326600
3	**Discharge Consents** Operator: Mr & Mrs B M Twelftree Property Type: Domestic Property (Single) Location: Drift Lodge Cuckoo Lane, Pinchbeck, Spalding. Pe11 3xt, Pe11 3xt Authority: Environment Agency, Anglian Region Catchment Area: Not Supplied Reference: Pr5lf5445 Permit Version: 2 Effective Date: 14th December 2011 Issued Date: 14th December 2011 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Land/Soakaway Receiving Water: Land **Status: Varied under EPR 2010** Positional Accuracy: Located by supplier to within 10m	A18SE (N)	397	2	524610 327490
3	**Discharge Consents** Operator: Mr & Mrs B M Twelftree Property Type: Domestic Property (Single) Location: Drift Lodge Cuckoo Lane, Pinchbeck, Spalding. Pe11 3xt, Pe11 3xt Authority: Environment Agency, Anglian Region Catchment Area: Not Supplied Reference: Pr5lf5445 Permit Version: 1 Effective Date: 3rd November 1987 Issued Date: 3rd November 1987 Revocation Date: 13th December 2011 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Land/Soakaway Receiving Water: Land **Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989** Positional Accuracy: Located by supplier to within 10m	A18SE (N)	397	2	524610 327490

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	**Discharge Consents** Operator: L & D Flowers Limited Property Type: FARMS (NOT HOUSE)/CROP + ANIMAL REARING/PLANT NURSERY Location: Herdgate Lane, Pinchbeck, Spalding, Lincolnshire, Pe11 3up Authority: Environment Agency, Anglian Region Catchment Area: Low River Welland (Spalding) Reference: Prnnf12463 Permit Version: 1 Effective Date: 15th August 2000 Issued Date: 16th April 2000 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Tributary Ofthe River Glen **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	A14NW (E)	446	2	525146 327018
5	**Discharge Consents** Operator: Anglian Water Services Ltd Property Type: Not Given Location: No 3 Sps, PINCHBECK Authority: Environment Agency, Anglian Region Catchment Area: Not Given Reference: AW5NF/613 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: 7th September 1973 Revocation Date: Not Supplied Discharge Type: Sewerage Emergency Discharge Discharge Environment: Freshwater Stream/River Receiving Water: Fen Drain **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A8NW (S)	483	2	524430 326380
6	**Discharge Consents** Operator: Winchester Growers Property Type: Arable Farming Location: Laceys Nursery Herdgate Lane, Pinchbeck, Spalding, Lincs, Pe11 3up Authority: Environment Agency, Anglian Region Catchment Area: Catchment 29 Unknown Detail Reference: Gwnlf40630 Permit Version: 1 Effective Date: 1st April 1999 Issued Date: 18th July 2000 Revocation Date: Not Supplied Discharge Type: Trade Discharge - Agricultural And Surface Discharge Environment: Onto Land Receiving Water: Groundwater **Status: Deemed Groundwater Regulations Authorisation** Positional Accuracy: Located by supplier to within 100m	A14NW (E)	506	2	525200 327200
7	**Discharge Consents** Operator: Mr & Mrs R Lamb Property Type: Domestic Property (Single) Location: The Gambles Herdgate Lane, Pinchbeck, Spalding, Lincs, Pe11 3up Authority: Environment Agency, Anglian Region Catchment Area: Low River Welland (Spalding) Reference: Prnnf18291 Permit Version: 1 Effective Date: 10th March 2005 Issued Date: 25th April 2005 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Trib Of R. Welland **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	A14NE (E)	625	2	525330 327130

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
8	**Discharge Consents** Operator: B S Tidswell Property Type: Arable Farming Location: Riseholme Farm Gosberton, Risegate, Spalding, Lincs, Pe11 4et Authority: Environment Agency, Anglian Region Catchment Area: Not Supplied Reference: Gwnlf40441 Permit Version: 1 Effective Date: 31st March 1999 Issued Date: 17th January 2001 Revocation Date: Not Supplied Discharge Type: Trade Discharge - Agricultural And Surface Discharge Environment: Onto Land Receiving Water: Groundwatefr **Status: Deemed Groundwater Regulations Authorisation** Positional Accuracy: Located by supplier to within 100m	A18NE (N)	805	2	524600 327900
9	**Discharge Consents** Operator: Anglian Water Services Ltd Property Type: Not Given Location: Woods Lane Authority: Environment Agency, Anglian Region Catchment Area: Not Given Reference: AW5NF/560 Permit Version: Not Supplied Effective Date: Not Supplied Issued Date: 10th August 1971 Revocation Date: Not Supplied Discharge Type: Sewerage Emergency Discharge Discharge Environment: Freshwater Stream/River Receiving Water: Fen Drain **Status: Not Supplied** Positional Accuracy: Located by supplier to within 100m	A19NW (NE)	897	2	525200 327840
9	**Discharge Consents** Operator: Anglian Water Services Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Woods Lane, Surfleet, Spalding, Pe11 4an Authority: Environment Agency, Anglian Region Catchment Area: Not Given Reference: Aw5nf560 Permit Version: 1 Effective Date: 10th August 1971 Issued Date: 10th August 1971 Revocation Date: Not Supplied Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Freshwater Stream/River Receiving Water: Fen Drain **Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989** Positional Accuracy: Located by supplier to within 10m	A19NW (NE)	897	2	525200 327840
10	**Local Authority Pollution Prevention and Controls** Name: Taylors South Holland Location: Surfleet Road, Pinchbeck, Spalding, Lincolnshire, PE1 Authority: South Holland District Council, Environmental Services Permit Reference: Not Supplied Dated: Not Supplied Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status: Authorisation revoked** Positional Accuracy: Manually positioned to the address or location	A13SW (S)	185	3	524491 326688
11	**Local Authority Pollution Prevention and Controls** Name: Lambs Flowers Ltd Location: The Gambles, Herdgate Lane, Pinchbeck, Spalding, Pe11 3up Authority: South Holland District Council, Environmental Services Permit Reference: SHDC10/1/LAPPC Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG1/10 Waste derived fuel combustion processes less than 3MW **Status: Not Supplied** Positional Accuracy: Manually positioned to the road within the address or location	A14NW (E)	485	3	525191 327105
	Nearest Surface Water Feature	A13SW (SW)	0	-	524485 326949

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
12	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Spalding District Authority: Environment Agency, Anglian Region Pollutant: Unknown Note: River Glen Incident Date: 31st October 1993 Incident Reference: 1688 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A7NE (SW)	450	2	524000 326600
13	**Pollution Incidents to Controlled Waters** Property Type: Construction Location: Spalding District Authority: Environment Agency, Anglian Region Pollutant: Raw Water Note: Local Dyke Incident Date: 23rd November 1998 Incident Reference: 2763 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: High Flow Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A7SE (SW)	634	2	524100 326300
14	**Pollution Incidents to Controlled Waters** Property Type: Horticultural Location: Spalding District Authority: Environment Agency, Anglian Region Pollutant: Oils - Diesel (Including Agricultural) Note: Fen Drain Incident Date: 7th February 1994 Incident Reference: 1737 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Accidental Spillage/Leakage Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A15NW (E)	900	2	525600 327200
15	**Pollution Incidents to Controlled Waters** Property Type: Other General Premises Location: Spalding District Authority: Environment Agency, Anglian Region Pollutant: Miscellaneous - Natural Note: Surfleet To Newbury Drain Incident Date: 18th September 1996 Incident Reference: 2344 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Algal Bloom Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A23SE (N)	902	2	524700 328000
16	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Spalding District Authority: Environment Agency, Anglian Region Pollutant: Unknown Note: River Glen Incident Date: 31st August 1993 Incident Reference: 1643 Catchment Area: Not Given Receiving Water: Freshwater Stream/River Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A24SW (N)	928	2	524900 328000
	River Quality Name: Glen GQA Grade: River Quality C Reach: Bourne Eau...Surfleet Estimated Distance (km): 14 Flow Rate: Flow less than 1.25 cumecs Flow Type: River Year: 2000	A13NW (W)	97	2	524271 327027

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
17	**Water Abstractions** Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*s/169 Permit Version: Not Supplied Location: Farm Drains , PINCHBECK Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 100 Yearly Rate (m3): 6000000 Details: Status: Perpetuity 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 10m	A19SW (NE)	427	2	525001 327401
18	**Water Abstractions** Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: Farm Drains, Pinchbeck-Point A Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: 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 March Authorised End: 31 October Permit Start Date: 1st April 2017 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A18SW (NW)	573	2	524202 327574
18	**Water Abstractions** Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: Farm Drains, Pinchbeck-Point A Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: 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: Not Supplied Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 1st April 2017 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A18SW (NW)	573	2	524202 327574
18	**Water Abstractions** Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 101 Location: Farm Drains, Pinchbeck-Point A Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: 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 March Authorised End: 31 October Permit Start Date: 28th September 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A18SW (NW)	573	2	524202 327574

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
18	**Water Abstractions** Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: River Glen, Pinchbeck-Point M Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: 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 March Authorised End: 31 October Permit Start Date: 1st April 2017 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17SE (NW)	589	2	524174 327578
18	**Water Abstractions** Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: River Glen, Pinchbeck-Point M Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: 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: Not Supplied Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 1st April 2017 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17SE (NW)	589	2	524174 327578
18	**Water Abstractions** Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 101 Location: River Glen, Pinchbeck-Point M Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct 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 March Authorised End: 31 October Permit Start Date: 28th September 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17SE (NW)	589	2	524174 327578
18	**Water Abstractions** Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 100 Location: Farm Drains, Pinchbeck Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: 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: Status: Perpetuity Authorised Start: 01 March Authorised End: 31 October Permit Start Date: 1st January 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A18SW (NW)	597	2	524200 327600

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
19	**Water Abstractions** Operator: Garden Products (Europe) Ltd Licence Number: 5/31/14/*s/192 Permit Version: Not Supplied Location: River Glen At, PINCHBECK Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 0 Yearly Rate (m3): 5200 Details: Status: Revoked 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 10m	A7NE (SW)	591	2	523900 326500
20	**Water Abstractions** Operator: B H Daniels Licence Number: 5/31/14/*S/0036 Permit Version: 100 Location: R Glen At Pinchbeck Authority: Environment Agency, Anglian 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: Status: Perpetuity Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 1st April 2004 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A18NW (N)	625	2	524500 327700
21	**Water Abstractions** Operator: J. L. Garner Ltd Licence Number: 5/31/14/*s/070 Permit Version: Not Supplied Location: River Glen, Cheal House Farm, SURFLEET Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 1 Yearly Rate (m3): 354590 Details: Status: Revoked 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 10m	A18NE (N)	701	2	524600 327795
21	**Water Abstractions** Operator: Mr B H Daniels Licence Number: 5/31/14/*s/036 Permit Version: Not Supplied Location: River Glen, PINCHBECK Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 3 Yearly Rate (m3): 613720 Details: Status: Perpetuity 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 10m	A18NE (N)	706	2	524600 327800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
22	**Water Abstractions** Operator: Garden Products (Europe) Ltd Licence Number: 5/31/14/*s/192 Permit Version: Not Supplied Location: River Glen At, PINCHBECK Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 0 Yearly Rate (m3): 5200 Details: Status: Revoked 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 10m	A7NW (SW)	732	2	523800 326400
23	**Water Abstractions** Operator: Lincolnshire Field Products Ltd Licence Number: 5/31/14/*S/0247 Permit Version: 1 Location: Captains Drain E - F Authority: Environment Agency, Anglian 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 March Authorised End: 31 October Permit Start Date: 27th November 1998 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A8SE (S)	901	2	524550 325970
24	**Water Abstractions** Operator: Mr A Battley Licence Number: 5/31/14/*s/031 Permit Version: Not Supplied Location: River Glen At, SURFLEET Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 0 Yearly Rate (m3): 5850 Details: Status: Revoked 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 10m	A24SW (NE)	956	2	525001 328001
25	**Water Abstractions** Operator: L W Van Geest (Farms) Ltd Licence Number: 5/31/14/*S/0018a Permit Version: 100 Location: Captain'S Drain -Pinchbeck Authority: Environment Agency, Anglian 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: Status: Perpetuity Authorised Start: 01 March Authorised End: 31 October Permit Start Date: 1st October 1996 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A3NE (S)	978	2	524600 325900

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Lincolnshire Field Products Ltd Licence Number: 4/30/12/*S/0179 Permit Version: 101 Location: Unnamed Farm Dyke Pinchbeck Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Direct 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 April Authorised End: 30 September Permit Start Date: 12th January 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A6NW (W)	1482	2	522950 326400
	Water Abstractions Operator: Grange Farm Pinchbeck Licence Number: 4/30/12/*S/0179 Permit Version: 100 Location: Unnamed Farm Dyke Pinchbeck Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Status: Perpetuity Authorised Start: 01 April Authorised End: 30 September Permit Start Date: 1st May 1986 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A6NW (W)	1482	2	522950 326400
	Water Abstractions Operator: L.W. Van Geest (Farms) Ltd Licence Number: 5/31/14/*s/018a Permit Version: Not Supplied Location: Vernatts Drain 1A Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 54 Yearly Rate (m3): 8000000 Details: Status: Perpetuity 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 10m	A15NE (E)	1494	2	526200 327095
	Water Abstractions Operator: Elsoms Seeds Ltd Licence Number: 5/31/14/*s/167 Permit Version: Not Supplied Location: Blue Gowt Drain, PINCHBECK Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 4 Yearly Rate (m3): 110000 Details: Status: Revoked 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 10m	A4SE (SE)	1667	2	525500 325500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: L.W. Van Geest (Farms) Ltd Licence Number: 5/31/14/*s/018a Permit Version: Not Supplied Location: Blue Gowt Drain B , PINCHBECK Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 54 Yearly Rate (m3): 8000000 Details: Status: Perpetuity 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 10m	A10SE (SE)	1698	2	526100 326100
	Water Abstractions Operator: Lincolnshire Field Products Ltd Licence Number: 4/30/12/*S/0179 Permit Version: 101 Location: Unnamed Farm Dyke Pinchbeck Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Direct 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 April Authorised End: 30 September Permit Start Date: 12th January 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(W)	1754	2	522620 326600
	Water Abstractions Operator: L W Van Geest (Farms) Ltd Licence Number: 5/31/14/*S/0018a Permit Version: 100 Location: Blue Gowt Drain A -Pinchbeck Authority: Environment Agency, Anglian 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 March Authorised End: 31 October Permit Start Date: 1st October 1996 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A5SW (SE)	1771	2	525800 325600
	Water Abstractions Operator: L.W. Van Geest (Farms) Ltd Licence Number: 5/31/14/*s/018a Permit Version: Not Supplied Location: Blue Gowt Drain A , PINCHBECK Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 54 Yearly Rate (m3): 8000000 Details: Status: Perpetuity 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 10m	A5SW (SE)	1771	2	525800 325600

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Grange Farm Pinchbeck Licence Number: 4/30/12/*S/0179 Permit Version: 100 Location: Unnamed Farm Dyke Pinchbeck Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Status: Perpetuity Authorised Start: 01 April Authorised End: 30 September Permit Start Date: 1st May 1986 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(W)	1774	2	522600 326600
	Water Abstractions Operator: Lincolnshire Field Products Ltd Licence Number: 5/31/14/*S/0247 Permit Version: 1 Location: Blue Gowt C - D Authority: Environment Agency, Anglian 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 March Authorised End: 31 October Permit Start Date: 27th November 1998 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A5SW (SE)	1777	2	525810 325600
	Water Abstractions Operator: Elsoms Seeds Ltd Licence Number: 5/31/14/*S/0222 Permit Version: 100 Location: Blue Gowt Drain, Pinchbeck Authority: Environment Agency, Anglian 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: Status: Perpetuity Authorised Start: 01 January Authorised End: 31 March Permit Start Date: 1st April 2004 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(SE)	1783	2	526250 326200
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: Farm Drains-Gosberton-Point N Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct 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 March Authorised End: 31 October Permit Start Date: 1st April 2017 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(N)	1803	2	524188 328842

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 102 Location: Farm Drains-Gosberton-Point N Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: 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 2017 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(N)	1803	2	524188 328842
	Water Abstractions Operator: Proctor Bros (Gosberton) Ltd Licence Number: 5/31/14/*S/0169 Permit Version: 101 Location: Farm Drains-Gosberton-Point N Authority: Environment Agency, Anglian Region Abstraction: Horticulture And Nurseries: Spray Irrigation - Direct 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 March Authorised End: 31 October Permit Start Date: 28th September 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(N)	1803	2	524188 328842
	Water Abstractions Operator: Grange Farm Pinchbeck Licence Number: 4/30/12/*S/0179 Permit Version: 100 Location: Unnamed Farm Dyke Pinchbeck Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Status: Perpetuity Authorised Start: 01 April Authorised End: 30 September Permit Start Date: 1st May 1986 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(SW)	1898	2	522600 326150
	Water Abstractions Operator: Lincolnshire Field Products Ltd Licence Number: 4/30/12/*S/0179 Permit Version: 101 Location: Unnamed Farm Dyke Pinchbeck Authority: Environment Agency, Anglian Region Abstraction: General Agriculture: Spray Irrigation - Direct 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 April Authorised End: 30 September Permit Start Date: 12th January 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(SW)	1902	2	522600 326140

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: L.W Van Geest Licence Number: 5/31/14/*s/018 Permit Version: Not Supplied Location: Vernatts Drain, PINCHBECK Authority: Environment Agency, Anglian Region Abstraction: Spray Irrigation Abstraction Type: Not Supplied Source: Stream Daily Rate (m3): 14 Yearly Rate (m3): 1091000 Details: Status: Revoked 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 10m	(E)	1961	2	526500 326300
	Groundwater Vulnerability Map Combined Classification: Unproductive Aquifer (may have productive aquifer beneath) Combined Vulnerability: Unproductive Combined Aquifer: Unproductive Bedrock Aquifer, Unproductive Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: <300 mm/year Baseflow Index: >70% Superficial Patchiness: >90% Superficial Thickness: >10m Superficial Recharge: Low	A13NW (N)	0	4	524524 327000
	Groundwater Vulnerability Map Combined Classification: Unproductive Aquifer (may have productive aquifer beneath) Combined Vulnerability: Unproductive Combined Aquifer: Unproductive Bedrock Aquifer, Unproductive Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: <300 mm/year Baseflow Index: >70% Superficial Patchiness: >90% Superficial Thickness: >10m Superficial Recharge: Low	A13NW (NW)	0	4	524524 326986
	Groundwater Vulnerability - Soluble Rock Risk None				
	Bedrock Aquifer Designations Aquifer Designation: Unproductive Strata	A13NW (NW)	0	4	524524 326986
	Superficial Aquifer Designations Aquifer Designation: Unproductive Strata	A13NW (NW)	0	4	524524 326986
	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)	0	2	524524 326986
	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 (NW)	0	2	524524 326986
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences Type: Flood Defences Reference: Not Supplied	A12NE (W)	196	2	524188 327098

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	Flood Defences Type: Flood Defences Reference: Not Supplied	A12NE (W)	207	2	524190 327105
	Flood Defences Type: Flood Defences Reference: Not Supplied	A12NE (W)	213	2	524170 327094
26	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 125.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SW (S)	0	5	524507 326946
27	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SW (SW)	0	5	524490 326953
28	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 127.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SW (SW)	0	5	524490 326953
29	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 104.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13NW (NW)	0	5	524459 327059
30	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 136.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SW (SW)	1	5	524434 326860
31	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 109.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SW (SW)	1	5	524486 326948
32	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 79.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13NW (W)	1	5	524374 327003
33	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 130.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13NW (N)	1	5	524515 327043

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
34	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 24.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SW (SW)	3	5	524434 326860
35	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 215.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13NE (NE)	10	5	524575 327065
36	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 258.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13NW (NW)	11	5	524453 327077
37	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 37.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Pinchbeck Catchment Name: Welland Primacy: 2	A13SW (SW)	25	5	524380 326850
38	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 47.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13NW (W)	33	5	524335 327010
39	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.2 Watercourse Level: Underground Permanent: True Watercourse Name: Old Pinchbeck Catchment Name: Welland Primacy: 2	A13SW (SW)	39	5	524344 326843
40	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 160.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SE (SE)	48	5	524613 326860
41	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 41.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Pinchbeck Catchment Name: Welland Primacy: 2	A13SW (SW)	49	5	524335 326835
42	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 33.3 Watercourse Level: Underground Permanent: True Watercourse Name: Old Pinchbeck Catchment Name: Welland Primacy: 2	A13SW (SW)	86	5	524302 326811

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
43	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 318.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Pinchbeck Catchment Name: Welland Primacy: 2	A13SE (SE)	87	5	524692 326887
44	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 34.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Pinchbeck Catchment Name: Welland Primacy: 2	A13SW (SW)	118	5	524274 326793
45	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 113.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Pinchbeck Catchment Name: Welland Primacy: 2	A13SW (SW)	144	5	524240 326789
46	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SW (SW)	144	5	524240 326789
47	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 57.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SW (SW)	186	5	524260 326719
48	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 118.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SE (SE)	190	5	524794 326866
49	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 35.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SW (SW)	200	5	524239 326717
50	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13633.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: River Glen Catchment Name: Welland Primacy: 1	A12NE (W)	205	5	524175 327087
51	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 197.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13NE (NE)	219	5	524850 327257

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
52	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 51.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NW (E)	230	5	524929 327034
53	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 119.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SE (E)	230	5	524836 326862
54	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 218.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NW (E)	255	5	524953 327027
55	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 97.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A13SW (SW)	272	5	524195 326659
56	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 377.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SW (E)	305	5	524980 326909
57	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 42.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SW (E)	323	5	524922 326827
58	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 181.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A12NE (W)	324	5	524052 327090
59	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 61.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NW (E)	332	5	525033 327035
60	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 340.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A8NW (S)	337	5	524435 326526

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
61	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 202.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SW (E)	355	5	524956 326824
62	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 560.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SW (E)	365	5	524962 326812
63	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 228.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SW (E)	365	5	524962 326812
64	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 197.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Pinchbeck Drain Catchment Name: Welland Primacy: 2	A14NW (E)	367	5	525072 327125
65	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 150.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A12SE (W)	397	5	523955 326901
66	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 200.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A12SE (W)	400	5	523952 326910
67	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19SW (NE)	415	5	525005 327380
68	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19SW (NE)	415	5	525004 327380
69	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 381.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Sea Drain Catchment Name: Welland Primacy: 2	A18SE (NE)	418	5	524770 327529

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70	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19SW (NE)	420	5	525007 327384
71	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 20.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19SW (NE)	422	5	525009 327385
72	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 247.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A8NW (S)	422	5	524520 326450
73	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 117.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19SW (NE)	424	5	525019 327378
74	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 99.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Sea Drain Catchment Name: Welland Primacy: 2	A18SE (N)	448	5	524611 327542
75	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.1 Watercourse Level: Underground Permanent: True Watercourse Name: Old Sea Drain Catchment Name: Welland Primacy: 2	A18SE (N)	448	5	524602 327543
76	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 395.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Sea Drain Catchment Name: Welland Primacy: 2	A18SW (N)	450	5	524520 327542
77	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 40.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A12SE (SW)	458	5	523952 326658
78	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 116.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A12SE (W)	462	5	523896 326964

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
79	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 157.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A9NW (SE)	464	5	524887 326538
80	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 268.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NW (E)	466	5	525172 327112
81	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 146.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NW (E)	472	5	525177 327126
82	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 544.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19SW (NE)	483	5	525110 327358
83	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 99.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NW (E)	489	5	525194 327124
84	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 17.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A18SE (N)	489	5	524700 327587
85	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 528.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SE (NW)	493	5	524001 327335
86	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 103.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A8NW (SW)	496	5	524210 326406
87	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 586.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A12NE (W)	507	5	523915 327229

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
88	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 174.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A12SE (SW)	509	5	523901 326646
89	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 226.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A18SE (N)	509	5	524709 327606
90	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 114.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SW (E)	515	5	525121 326784
91	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 141.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SW (E)	515	5	525138 326811
92	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 88.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A8NW (S)	528	5	524274 326358
93	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 229.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A7NE (SW)	535	5	524134 326393
94	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 484.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A9NW (SE)	549	5	524946 326477
95	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 468.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SE (NW)	550	5	524087 327474
96	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 16.5 Watercourse Level: Underground Permanent: True Watercourse Name: Old Sea Drain Catchment Name: Welland Primacy: 2	A18SW (NW)	566	5	524210 327570

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
97	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Sea Drain Catchment Name: Welland Primacy: 2	A18SW (NW)	572	5	524193 327569
98	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 76.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19SW (NE)	573	5	525112 327495
99	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1134.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: River Glen Catchment Name: Welland Primacy: 1	A17SE (NW)	579	5	524182 327571
100	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 342.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NE (E)	589	5	525291 327164
101	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 501.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SE (NW)	590	5	524158 327571
102	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 38.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SW (E)	592	5	525190 326750
103	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 121.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SE (E)	599	5	525264 326873
104	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 209.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A8NE (S)	607	5	524724 326312
105	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 352.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A12NW (W)	608	5	523750 326986

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
106	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 363.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A9NW (SE)	609	5	525131 326597
107	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 29.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19SW (NE)	613	5	525174 327487
108	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 139.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A12NW (W)	616	5	523742 326990
109	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 37.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NE (E)	618	5	525318 327179
110	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 64.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19SW (NE)	624	5	525101 327574
111	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 44.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SE (E)	630	5	525239 326755
112	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 108.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SE (E)	633	5	525238 326747
113	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 263.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A7NW (SW)	633	5	523783 326602
114	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 116.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19NW (NE)	650	5	524902 327711

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
115	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 84.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SE (E)	659	5	525281 326769
116	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 91.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19SW (NE)	666	5	525088 327637
117	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 222.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A7NW (SW)	671	5	523728 326634
118	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A7NW (SW)	671	5	523728 326634
119	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 186.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NE (E)	686	5	525384 327198
120	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 174.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A8SE (S)	686	5	524555 326188
121	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 87.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A8SE (S)	686	5	524557 326188
122	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 196.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A7NW (SW)	696	5	523716 326597
123	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 106.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A7NW (SW)	702	5	523714 326588

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
124	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 44.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Sea Drain Catchment Name: Welland Primacy: 2	A19SE (NE)	710	5	525364 327358
125	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 289.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A18NW (N)	713	5	524269 327748
126	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 221.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SE (E)	715	5	525368 326813
127	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 57.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NE (E)	721	5	525422 327007
128	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 438.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Sea Drain Catchment Name: Welland Primacy: 2	A14NE (E)	730	5	525424 327224
129	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 285.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A18NE (N)	731	5	524609 327826
130	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 21.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SE (E)	740	5	525428 326928
131	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SE (E)	740	5	525428 326928
132	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 319.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A12NW (W)	740	5	523622 327060

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
133	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 445.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A12NW (W)	741	5	523621 327059
134	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 201.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NE (E)	742	5	525446 327172
135	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 137.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SE (E)	747	5	525430 326907
136	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NE (E)	748	5	525445 327210
137	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 209.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Sea Drain Catchment Name: Welland Primacy: 2	A19SE (NE)	752	5	525403 327375
138	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 297.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14NE (E)	755	5	525452 327211
139	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 194.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A8SE (S)	758	5	524615 326127
140	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 33.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19NW (NE)	760	5	525079 327753
141	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 128.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A8SW (S)	764	5	524519 326104

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
142	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 333.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Captain's Drain Catchment Name: Welland Primacy: 2	A7SE (SW)	769	5	524078 326163
143	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 397.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SE (E)	773	5	525391 326732
144	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 29.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A8SW (S)	793	5	524361 326074
145	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 75.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A7NW (SW)	813	5	523610 326548
146	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 23.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Captain's Drain Catchment Name: Welland Primacy: 2	A8SW (S)	816	5	524340 326053
147	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Captain's Drain Catchment Name: Welland Primacy: 2	A8SW (S)	817	5	524330 326053
148	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 47.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Captain's Drain Catchment Name: Welland Primacy: 2	A8SW (S)	819	5	524326 326052
149	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 275.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A18NE (N)	819	5	524853 327899
150	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 140.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A8SW (S)	820	5	524351 326047

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
151	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 214.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Captain's Drain Catchment Name: Welland Primacy: 2	A8SW (S)	820	5	524351 326047
152	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 211.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Captain's Drain Catchment Name: Welland Primacy: 2	A8SW (S)	824	5	524272 326055
153	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 24.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Town Drain Catchment Name: Welland Primacy: 2	A8SW (S)	824	5	524279 326054
154	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 125.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A14SE (E)	829	5	525528 326981
155	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 65.3 Watercourse Level: Underground Permanent: True Watercourse Name: Captain's Drain Catchment Name: Welland Primacy: 2	A7SE (SW)	850	5	524058 326084
156	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 101.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19NW (NE)	852	5	525180 327800
157	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 13.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A18NE (N)	879	5	524716 327976
158	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A18NE (N)	882	5	524703 327980
159	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 330.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A15SW (E)	883	5	525562 326873

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
160	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 186.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A15SW (E)	883	5	525562 326873
161	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 185.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11SE (W)	883	5	523486 326701
162	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 47.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	884	5	523619 327469
163	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	884	5	523627 327481
164	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 86.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	884	5	523674 327554
165	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 85.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A18NE (N)	884	5	524698 327982
166	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 29.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	889	5	523590 327432
167	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	889	5	523679 327559
168	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 36.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	889	5	523702 327588

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
169	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 88.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A6NE (W)	889	5	523508 326600
170	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	891	5	523702 327588
171	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	891	5	523703 327590
172	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 137.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A7NW (SW)	891	5	523539 326516
173	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 155.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	892	5	523646 327526
174	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 253.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A7SW (SW)	892	5	523782 326196
175	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 196.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Captain's Drain Catchment Name: Welland Primacy: 2	A8SE (S)	892	5	524548 325979
176	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	893	5	523572 327408
177	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 96.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A18NE (N)	893	5	524700 327990

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
178	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 88.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11SE (W)	893	5	523465 326780
179	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 26.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19NE (NE)	893	5	525207 327831
180	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 42.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	895	5	523568 327403
181	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 673.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	896	5	523657 327543
182	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 119.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19NW (NE)	896	5	525195 327842
183	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 33.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (W)	900	5	523544 327368
184	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 178.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11SE (W)	902	5	523466 326704
185	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 888.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Captain's Drain Catchment Name: Welland Primacy: 2	A8SE (S)	902	5	524853 326039
186	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	905	5	523554 327400

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
187	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 711.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (NW)	905	5	523558 327407
188	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 170.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17SW (W)	906	5	523548 327390
189	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 24.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19NE (NE)	908	5	525275 327800
190	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 75.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A6NE (W)	908	5	523489 326597
191	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 186.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A6NE (W)	908	5	523489 326597
192	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 104.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11SE (W)	910	5	523448 326770
193	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 93.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11SE (W)	910	5	523448 326770
194	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 334.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A23SE (N)	914	5	524793 328005
195	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 62.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11NE (W)	915	5	523443 327016

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
196	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 59.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A3NW (S)	917	5	524284 325959
197	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 139.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11SE (W)	917	5	523435 326870
198	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 176.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Cross Dyke Catchment Name: Welland Primacy: 2	A9SW (SE)	917	5	524917 326045
199	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 142.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19NE (NE)	920	5	525240 327840
200	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 942.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17NW (NW)	920	5	523747 327675
201	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A16SE (W)	923	5	523513 327357
202	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 74.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A15NW (E)	924	5	525629 327051
203	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 182.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11SE (W)	927	5	523432 326768
204	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 49.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A6NE (SW)	928	5	523506 326499

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
205	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 65.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A16SE (W)	930	5	523505 327354
206	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 838.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A17NE (NW)	932	5	523981 327863
207	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 69.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11SE (W)	933	5	523419 326864
208	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 70.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A23SE (N)	937	5	524625 328034
209	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 71.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A6NE (SW)	938	5	523513 326462
210	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 40.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19SE (NE)	939	5	525536 327532
211	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 269.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19SE (NE)	939	5	525536 327532
212	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 134.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A3NE (S)	949	5	524613 325932
213	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 51.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Sea Drain Catchment Name: Welland Primacy: 2	A20SW (E)	952	5	525599 327424

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
214	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 120.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A20SW (E)	952	5	525597 327426
215	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 95.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A7NW (SW)	953	5	523541 326381
216	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 42.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11SE (W)	958	5	523395 326929
217	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 245.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11SE (W)	958	5	523395 326929
218	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 160.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A3NW (S)	959	5	524319 325911
219	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 88.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A7NW (SW)	967	5	523521 326386
220	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 139.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A23SE (N)	973	5	524605 328082
221	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 215.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11NE (W)	973	5	523385 327000
222	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 140.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A19NE (NE)	976	5	525360 327817

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
223	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 252.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A20SW (NE)	978	5	525575 327541
224	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 28.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A6NE (SW)	979	5	523464 326467
225	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 103.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Bowcocks Drain Catchment Name: Welland Primacy: 2	A7SE (SW)	982	5	523901 326009
226	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 346.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A15NW (E)	986	5	525688 327007
227	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A20SW (NE)	999	5	525636 327459
228	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 32.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Old Sea Drain Catchment Name: Welland Primacy: 2	A20SW (NE)	999	5	525636 327459
229	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 168.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A7SW (SW)	999	5	523548 326287
230	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 171.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A11SE (W)	999	5	523354 326933
231	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 201.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Welland Primacy: 2	A20SW (NE)	1000	5	525638 327457

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
232	**BGS Recorded Landfill Sites** Site Name: Bacons Lane Location: Pinchbeck, SPALDING, Lincs Authority: British Geological Survey, National Geoscience Information Service Ground Water: Information not available Surface Water: Information not available Geology: N/A Positional Accuracy: Positioned by the supplier Boundary Accuracy: Moderate	A13SW (SW)	0	-	524488 326957
233	**Historical Landfill Sites** Licence Holder: Not Supplied Location: Pinchbeck, Spalding, Lincolnshire Name: Bacons Lane Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD31105 First Input Date: 31st December 1967 Last Input Date: Not Supplied Specified Waste Type: Deposited Waste included Commercial Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: Not Supplied BGS Ref: 2625 Other Ref: Not Supplied	A13SW (SW)	0	2	524490 326958
234	**Historical Landfill Sites** Licence Holder: Not Supplied Location: South of Burtey Fen Lane Name: Fernleigh Farm Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD00228 First Input Date: Not Supplied Last Input Date: Not Supplied Specified Waste Type: Deposited Waste included Household Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: Not Supplied BGS Ref: Not Supplied Other Ref: RD7-22-01/89, SH-22-01/89	A12NW (W)	754	2	523611 327087
	Local Authority Landfill Coverage Name: South Holland District Council - Has no landfill data to supply		0	3	524524 326986
	Local Authority Landfill Coverage Name: Lincolnshire County Council - Had landfill data but passed it to the relevant environment agency		0	6	524524 326986
235	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A7NW (SW)	800	-	523611 326578
236	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A7NW (SW)	836	-	523579 326561
237	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1956	A7SW (SW)	957	-	523810 326093

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Kellaways Formation And Oxford Clay Formation (Undifferentiated)	A13NW (NW)	0	1	524524 326986
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (NW)	0	1	524524 326986
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil 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	A14NW (E)	294	1	525000 326986
	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: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	524524 326986
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	524524 326986
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	524524 326986
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	524524 326986
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	524524 326986
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	524524 326986
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	524524 326986
	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	1	524524 326986

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
238	**Contemporary Trade Directory Entries** Name: G M Motors Location: 95, Milestone Lane, Pinchbeck, Spalding, Lincolnshire, PE11 3XR Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (S)	84	-	524565 326834
238	**Contemporary Trade Directory Entries** Name: Motortech Location: Unit 2 Milestone Lane, Pinchbeck, Spalding, Lincolnshire, PE11 3XX Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (S)	85	-	524565 326833
239	**Contemporary Trade Directory Entries** Name: Melbros Location: 64-68 Surfleet Rd, Pinchbeck, Spalding, Lincolnshire, PE11 3XY Classification: Car Dealers - Used **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A13SW (S)	204	-	524508 326674
239	**Contemporary Trade Directory Entries** Name: Topflora Location: Surfleet Rd, Pinchbeck, Spalding, Lincolnshire, PE11 3XY Classification: Distribution Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A13SW (S)	212	-	524500 326662
240	**Contemporary Trade Directory Entries** Name: Moerman Location: Surfleet Road, Pinchbeck, Spalding, Lincolnshire, PE11 3XY Classification: Horticultural Equipment Manufacturers & Distributors **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	248	-	524759 326712
241	**Contemporary Trade Directory Entries** Name: Safeclean Location: 32, Crossgate Lane, Pinchbeck, Spalding, Lincolnshire, PE11 3XW Classification: Carpet, Curtain & Upholstery Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NW (SW)	357	-	524297 326528
242	**Contemporary Trade Directory Entries** Name: Wedcom Automation Location: Unit 1 Flaxmill La, Pinchbeck, Spalding, Lincolnshire, PE11 3XQ Classification: Electrical Engineers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	387	-	524076 326610
242	**Contemporary Trade Directory Entries** Name: Brock Business Location: Unit 6, The Flaxmill, Flaxmill Lane, Pinchbeck, Spalding, Lincolnshire, PE11 3YP Classification: Ceramic Manufacturers, Supplies & Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	399	-	524062 326607
242	**Contemporary Trade Directory Entries** Name: Cinter B V Location: Langhole Drove, Pinchbeck, Spalding, Lincolnshire, PE11 3XP Classification: Ceramic Manufacturers, Supplies & Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	399	-	524062 326607
243	**Contemporary Trade Directory Entries** Name: Brock Business Ltd Location: 20 Flaxmill La, Pinchbeck, Spalding, Lincolnshire, PE11 3XQ Classification: Pottery Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	427	-	524136 326513
244	**Contemporary Trade Directory Entries** Name: J L E Logistics Ltd Location: 28, Surfleet Road, Surfleet, Spalding, Lincolnshire, PE11 4AG Classification: Road Haulage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A19NW (NE)	899	-	525128 327885

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
245	**Contemporary Trade Directory Entries** Name: Church Street Location: 75, Church Street, Pinchbeck, Spalding, Lincolnshire, PE11 3YA Classification: Car Dealers - Used **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8SW (S)	903	-	524236 325982
246	**Fuel Station Entries** Name: Taylors South Holland Location: Surfleet Road , Pinchbeck , Spalding, Lincolnshire, PE11 3XY Brand: Jet Premises Type: Not Applicable **Status: Obsolete** Positional Accuracy: Manually positioned to the address or location	A13SW (S)	176	-	524493 326698
247	**Points of Interest - Commercial Services** Name: G M Motors Location: 95 Milestone Lane, Pinchbeck, Spalding, PE11 3XR Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13SE (S)	84	7	524565 326834
247	**Points of Interest - Commercial Services** Name: G M Motors Location: 95 Milestone Lane, Pinchbeck, Spalding, PE11 3XR Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13SE (S)	84	7	524565 326834
247	**Points of Interest - Commercial Services** Name: Motortech Location: Unit 2 Milestone Lane, Pinchbeck, Spalding, PE11 3XX Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13SE (S)	85	7	524564 326833
248	**Points of Interest - Commercial Services** Name: Melbros Location: Surfleet Road, Pinchbeck, Spalding, PE11 3XY Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13SW (S)	176	7	524493 326698
249	**Points of Interest - Commercial Services** Name: R & J Transport Location: 28 Surfleet Road, Surfleet, Spalding, PE11 4AG Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A19NW (NE)	899	7	525128 327885
250	**Points of Interest - Manufacturing and Production** Name: E & S Smith Location: 30 Bacons Lane, Pinchbeck, Spalding, PE11 3XS Category: Farming Class Code: Arable Farming Positional Accuracy: Positioned to address or location	A13SW (W)	29	7	524331 326965
251	**Points of Interest - Manufacturing and Production** Name: Birch Grove Garden Centre Location: Surfleet Road, Pinchbeck, Spalding, PE11 3XY Category: Farming Class Code: Arable Farming Positional Accuracy: Positioned to address or location	A13SE (SE)	125	7	524643 326788
252	**Points of Interest - Manufacturing and Production** Name: R Rowell & Son Location: Manor Farm, Langhole Drove, Pinchbeck, Spalding, PE11 3XP Category: Farming Class Code: Arable Farming Positional Accuracy: Positioned to address or location	A12SE (SW)	435	7	523943 326732
253	**Points of Interest - Manufacturing and Production** Name: Winchester Growers Ltd Location: Lacey's Nurseries, Herdgate Lane, Pinchbeck, Spalding, PE11 3UP Category: Farming Class Code: Arable Farming Positional Accuracy: Positioned to address or location	A14NW (E)	439	7	525145 327065
254	**Points of Interest - Manufacturing and Production** Name: Tank Location: PE11 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A8NW (S)	488	7	524464 326376

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
255	**Points of Interest - Manufacturing and Production** Name: Tank Location: PE11 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A14NE (E)	643	7	525348 327135
256	**Points of Interest - Manufacturing and Production** Name: Tank Location: PE11 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A15NW (E)	913	7	525610 327221
256	**Points of Interest - Manufacturing and Production** Name: Tank Location: PE11 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A15NW (E)	919	7	525616 327221
256	**Points of Interest - Manufacturing and Production** Name: Tanks Location: PE11 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A15NW (E)	931	7	525628 327222
257	**Points of Interest - Manufacturing and Production** Name: Dobney Location: 28 Woods Lane, Surfleet, Spalding, PE11 4AN Category: Farming Class Code: Arable Farming Positional Accuracy: Positioned to address or location	A19NE (NE)	987	7	525338 327850
258	**Points of Interest - Public Infrastructure** Name: Sluice Location: PE11 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A18SW (NW)	557	7	524210 327561
258	**Points of Interest - Public Infrastructure** Name: Sluice Location: PE11 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A17SE (NW)	595	7	524151 327572
259	**Points of Interest - Public Infrastructure** Name: Sluice Location: PE11 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A7SW (SW)	846	7	523846 326203
259	**Points of Interest - Public Infrastructure** Name: Sluice Location: PE11 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A7SW (SW)	938	7	523783 326135
260	**Points of Interest - Public Infrastructure** Name: Sluice Location: PE11 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A18NE (N)	903	7	524804 327992

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
261	**Nitrate Vulnerable Zones** Name: Glen Nvz Description: Surface Water Source: Environment Agency, Head Office	A13NW (NW)	0	4	524524 326986

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
Boston Borough Council - Pollutions Section, Environmental Health	February 2015	Annual Rolling Update
South Holland District Council - Environmental Services	October 2013	Annual Rolling Update
Discharge Consents		
Environment Agency - Anglian Region	January 2019	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - Anglian Region	March 2013	Annual Rolling Update
Integrated Pollution Controls		
Environment Agency - Anglian Region	October 2008	Variable
Integrated Pollution Prevention And Control		
Environment Agency - Anglian Region	January 2019	Quarterly
Local Authority Integrated Pollution Prevention And Control		
Boston Borough Council - Pollutions Section, Environmental Health	December 2014	Variable
South Holland District Council - Environmental Services	October 2014	Variable
Local Authority Pollution Prevention and Controls		
Boston Borough Council - Pollutions Section, Environmental Health	December 2014	Annual Rolling Update
South Holland District Council - Environmental Services	October 2014	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements		
Boston Borough Council - Pollutions Section, Environmental Health	December 2014	Variable
South Holland District Council - Environmental Services	October 2014	Variable
Nearest Surface Water Feature		
Ordnance Survey	January 2019	
Pollution Incidents to Controlled Waters		
Environment Agency - Anglian Region	September 1999	Not Applicable
Prosecutions Relating to Authorised Processes		
Environment Agency - Anglian Region	March 2013	Annual Rolling Update
Prosecutions Relating to Controlled Waters		
Environment Agency - Anglian Region	March 2013	Annual Rolling Update
Registered Radioactive Substances		
Environment Agency - Anglian Region	June 2016	
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 - Anglian Region - Northern Area	January 2019	Quarterly
Water Abstractions		
Environment Agency - Anglian Region	January 2019	Quarterly
Water Industry Act Referrals		
Environment Agency - Anglian Region	October 2017	Quarterly
Groundwater Vulnerability Map		
Environment Agency - Head Office	June 2018	Annually
Bedrock Aquifer Designations		
Environment Agency - Head Office	January 2018	Annually
Superficial Aquifer Designations		
Environment Agency - Head Office	January 2018	Annually
Source Protection Zones		
Environment Agency - Head Office	January 2019	Quarterly

Data Currency

Agency & Hydrological	Version	Update Cycle
Extreme Flooding from Rivers or Sea without Defences Environment Agency - Head Office	February 2019	Quarterly
Flooding from Rivers or Sea without Defences Environment Agency - Head Office	February 2019	Quarterly
Areas Benefiting from Flood Defences Environment Agency - Head Office	February 2019	Quarterly
Flood Water Storage Areas Environment Agency - Head Office	February 2019	Quarterly
Flood Defences Environment Agency - Head Office	February 2019	Quarterly
OS Water Network Lines Ordnance Survey	January 2019	Quarterly
Surface Water 1 in 30 year Flood Extent Environment Agency - Head Office	October 2013	Annually
Surface Water 1 in 100 year Flood Extent Environment Agency - Head Office	October 2013	Annually
Surface Water 1 in 1000 year Flood Extent Environment Agency - Head Office	October 2013	Annually
Surface Water Suitability Environment Agency - Head Office	October 2013	Annually
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	July 2018	Quarterly
Integrated Pollution Control Registered Waste Sites		
Environment Agency - Anglian Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries)		
Environment Agency - Anglian Region - Northern Area	July 2018	Quarterly
Licensed Waste Management Facilities (Locations)		
Environment Agency - Anglian Region - Northern Area	January 2019	Quarterly
Local Authority Landfill Coverage		
Boston Borough Council - Pollutions Section, Environmental Health	May 2000	Not Applicable
Lincolnshire County Council	May 2000	Not Applicable
South Holland District Council - Environmental Services	May 2000	Not Applicable
Local Authority Recorded Landfill Sites		
Boston Borough Council - Pollutions Section, Environmental Health	June 2003	Not Applicable
Lincolnshire County Council	May 2000	Not Applicable
South Holland District Council - Environmental Services	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 - Anglian Region - Northern Area	March 2003	Not Applicable
Registered Waste Transfer Sites		
Environment Agency - Anglian Region - Northern Area	March 2003	Not Applicable
Registered Waste Treatment or Disposal Sites		
Environment Agency - Anglian Region - Northern Area	March 2003	Not Applicable
Hazardous Substances	**Version**	**Update Cycle**
Control of Major Accident Hazards Sites (COMAH)		
Health and Safety Executive	April 2018	Bi-Annually
Explosive Sites		
Health and Safety Executive	March 2017	Annually
Notification of Installations Handling Hazardous Substances (NIHHS)		
Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements		
Boston Borough Council - Planning Department	February 2016	Variable
South Holland District Council	January 2016	Variable
Lincolnshire County Council - Highways and Planning Department	June 2010	Variable
Planning Hazardous Substance Consents		
Lincolnshire County Council - Highways and Planning Department	August 2007	Variable
Boston Borough Council - Planning Department	February 2016	Variable
South Holland District Council	January 2016	Variable

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	November 2018	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
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	January 2019	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	Annually
Industrial Land Use	**Version**	**Update Cycle**
Contemporary Trade Directory Entries Thomson Directories	January 2019	Quarterly
Fuel Station Entries Catalist Ltd - Experian	March 2019	Quarterly
Gas Pipelines National Grid	July 2014	
Points of Interest - Commercial Services PointX	November 2018	Quarterly
Points of Interest - Education and Health PointX	November 2018	Quarterly
Points of Interest - Manufacturing and Production PointX	November 2018	Quarterly
Points of Interest - Public Infrastructure PointX	November 2018	Quarterly
Points of Interest - Recreational and Environmental PointX	November 2018	Quarterly
Underground Electrical Cables National Grid	December 2015	

Sensitive Land Use	Version	Update Cycle
Ancient Woodland Natural England	August 2018	Bi-Annually
Areas of Outstanding Natural Beauty Natural England	August 2018	Bi-Annually
Environmentally Sensitive Areas Natural England	January 2017	
Forest Parks Forestry Commission	April 1997	Not Applicable
Local Nature Reserves Natural England	March 2019	Bi-Annually
Marine Nature Reserves Natural England	January 2018	Bi-Annually
National Nature Reserves Natural England	August 2018	Bi-Annually
National Parks Natural England	April 2017	Bi-Annually
Nitrate Vulnerable Zones Environment Agency - Head Office Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	December 2017 October 2015	Bi-Annually
Ramsar Sites Natural England	April 2019	Bi-Annually
Sites of Special Scientific Interest Natural England	March 2019	Bi-Annually
Special Areas of Conservation Natural England	August 2018	Bi-Annually
Special Protection Areas Natural England	April 2019	Bi-Annually

Data Suppliers

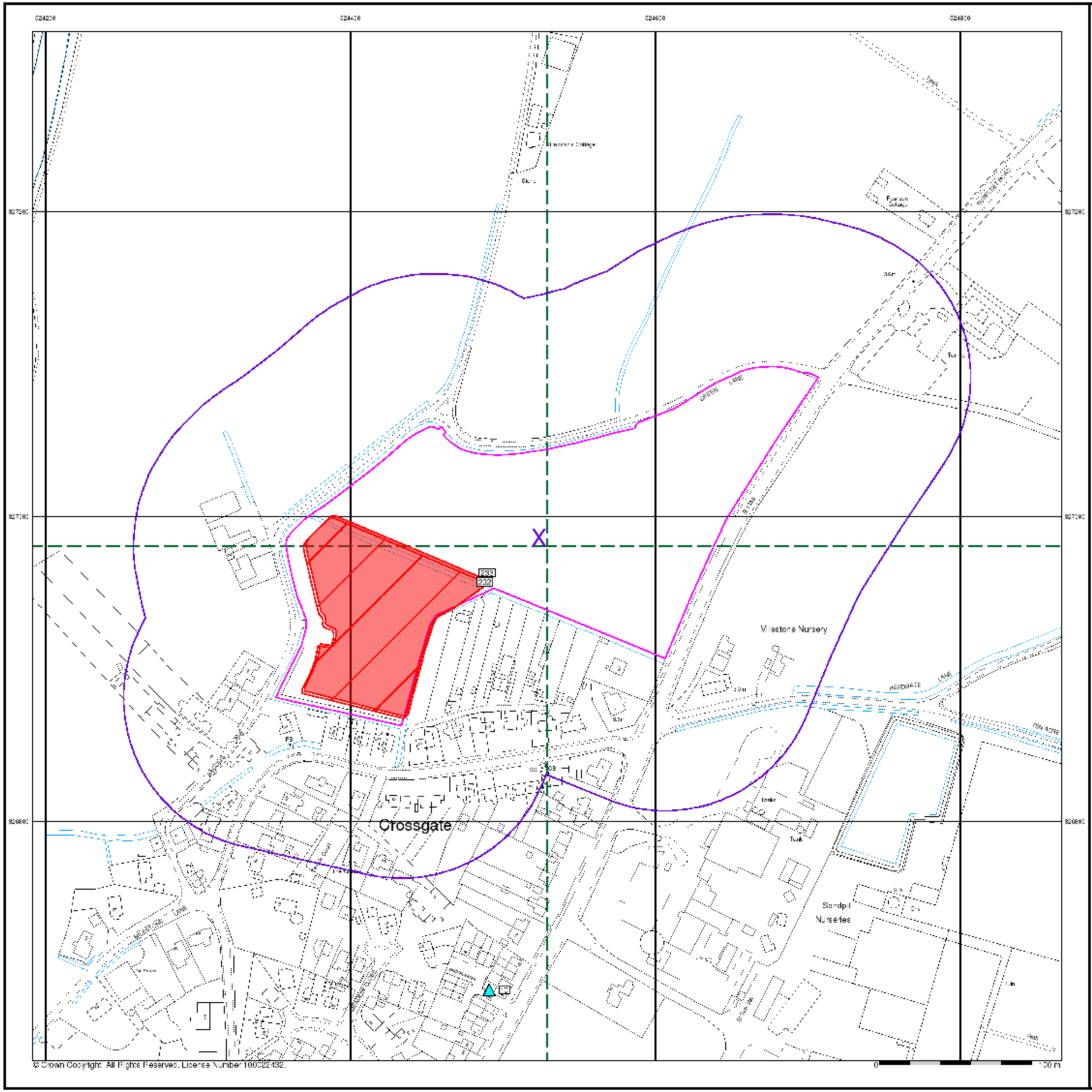
A selection of organisations who provide data within this report

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	

Useful Contacts

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	**South Holland District Council - Environmental Services** Council Offices, Priory Road, Spalding, Lincolnshire, PE11 2XE	Website: www.sholland.gov.uk
4	**Environment Agency - Head Office** Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
5	**Ordnance Survey** Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
6	**Lincolnshire County Council** 4th Floor, City Hall, Lincoln, Lincolnshire, LN1 1DN	Telephone: 01522 552222 Fax: 01522 552288 Email: PublicRelations@lincolnshire.gov.uk Website: www.lincolnshire.gov.uk
7	**PointX** 7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
8	**Natural England** County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
-	**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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General

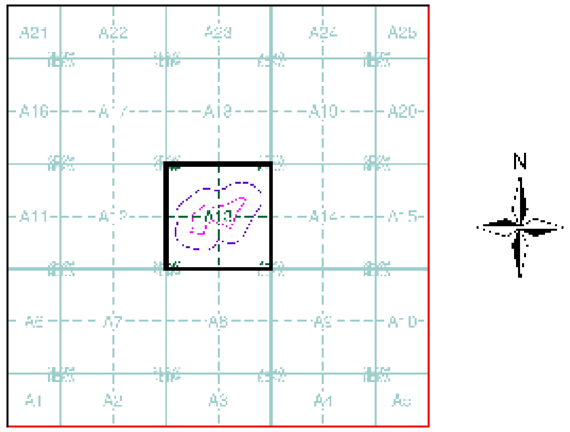
Agency and Hydrological

Waste

Hazardous Substances

Geological

Site Sensitivity Map - Segment A13



Order Details

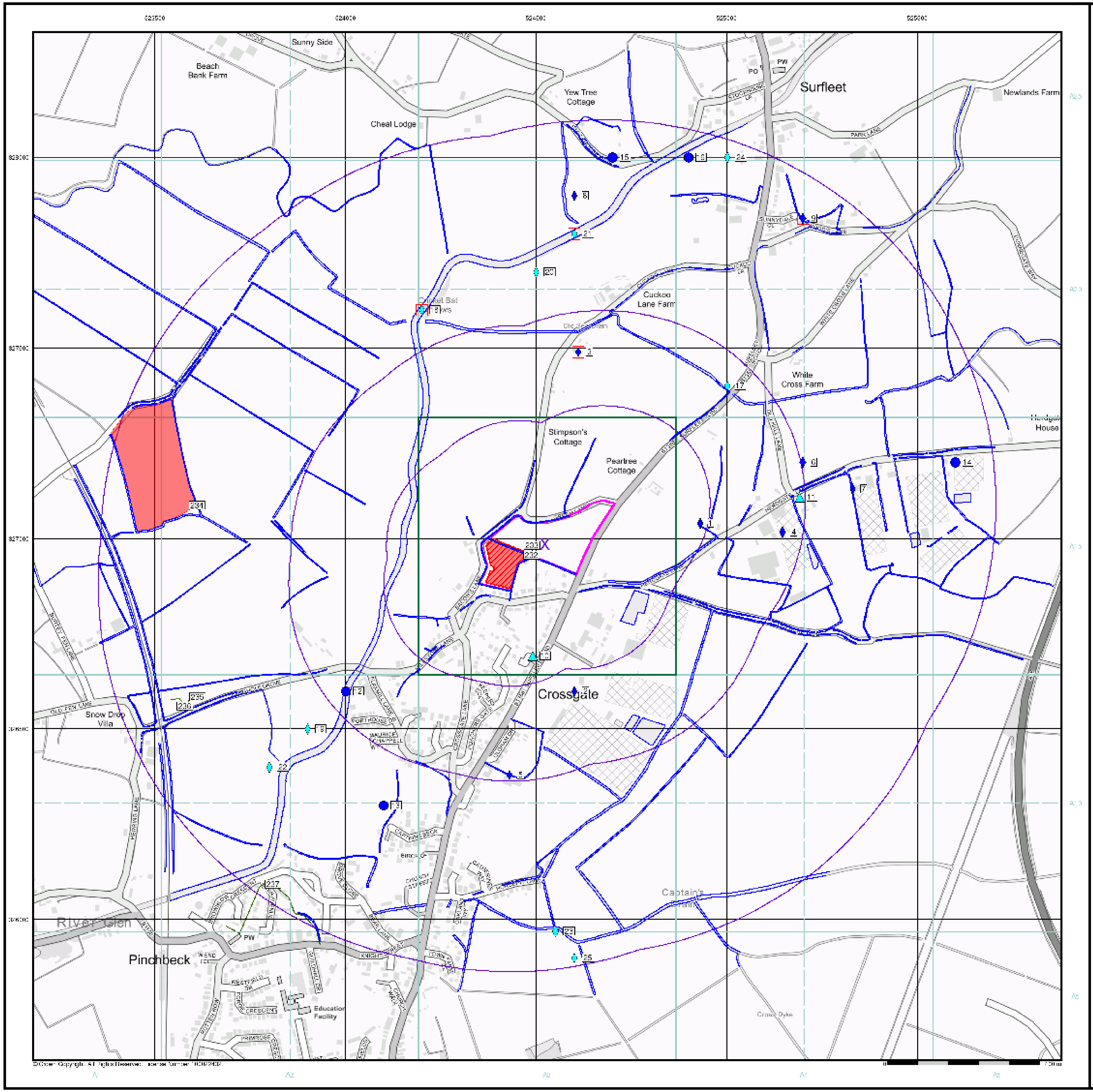
Order Number: 201515819_1_1
Customer Ref: R18012
National Grid Reference: 524520, 326990
Slice: A
Site Area (Ha): 3.95
Plot Buffer (m): 100

Site Details

Site at, Pinchbeck, Lincolnshire

Landmark INFORMATION GROUP

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



Grange Geo

General

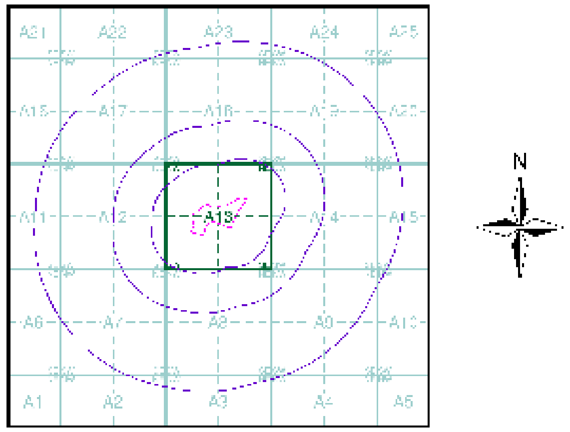
Agency and Hydrological

Waste

Hazardous Substances

Geological

Site Sensitivity Map - Slice A

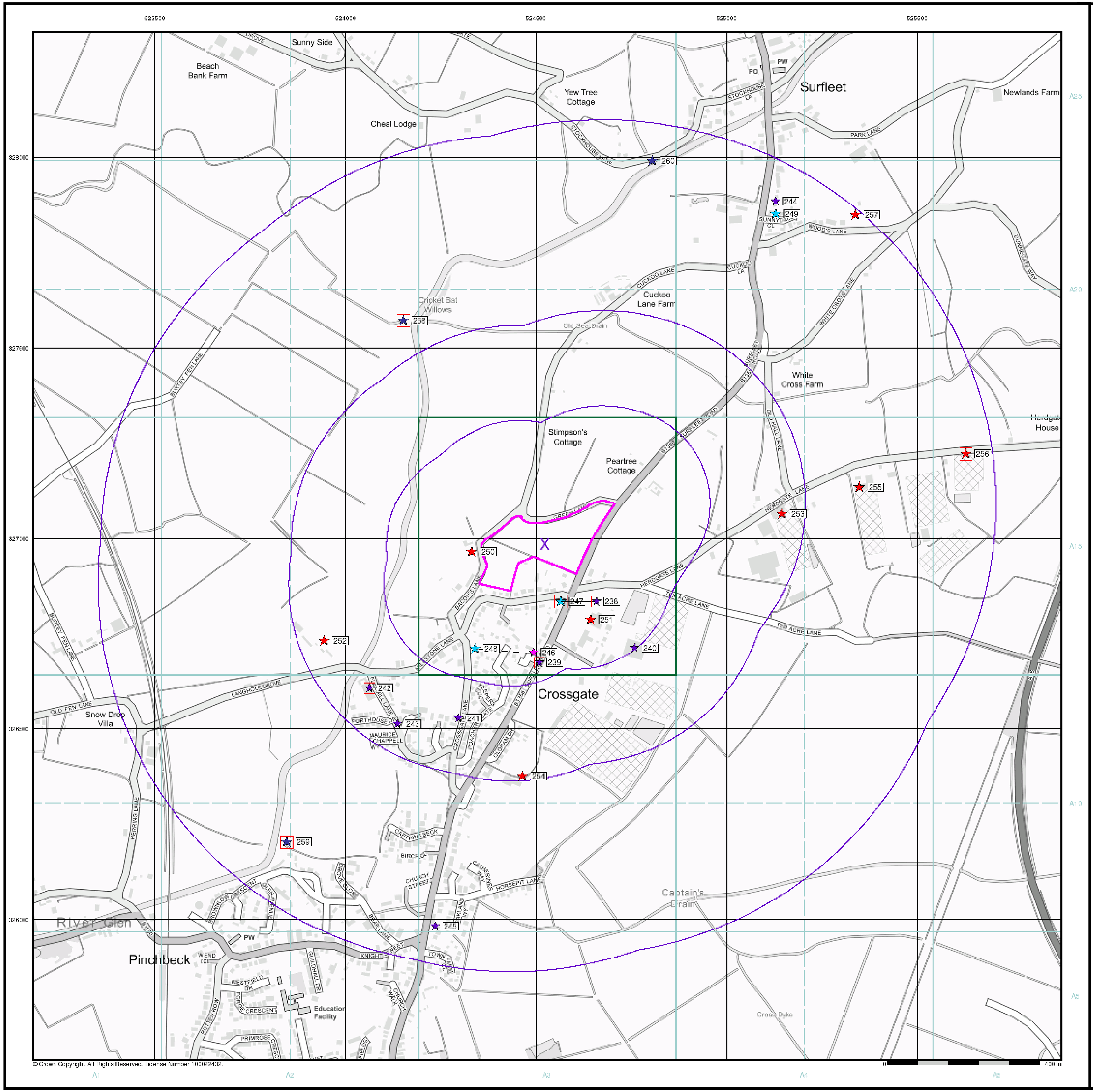


Order Details

Order Number: 201515819_1_1
Customer Ref: R18012
National Grid Reference: 524520, 326990
Slice: A
Site Area (Ha): 3.95
Search Buffer (m): 1000

Site Details

Site at, Pinchbeck, Lincolnshire



Industrial Land Use Map

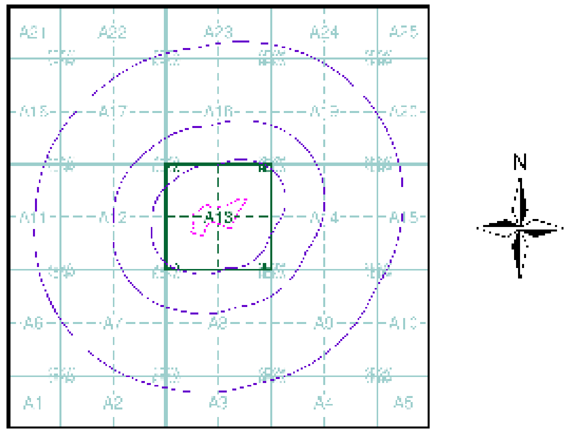
General

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

Industrial Land Use

- Contemporary Trade Directory Entries
- Fuel Station Entries
- Gas Pipelines
- 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



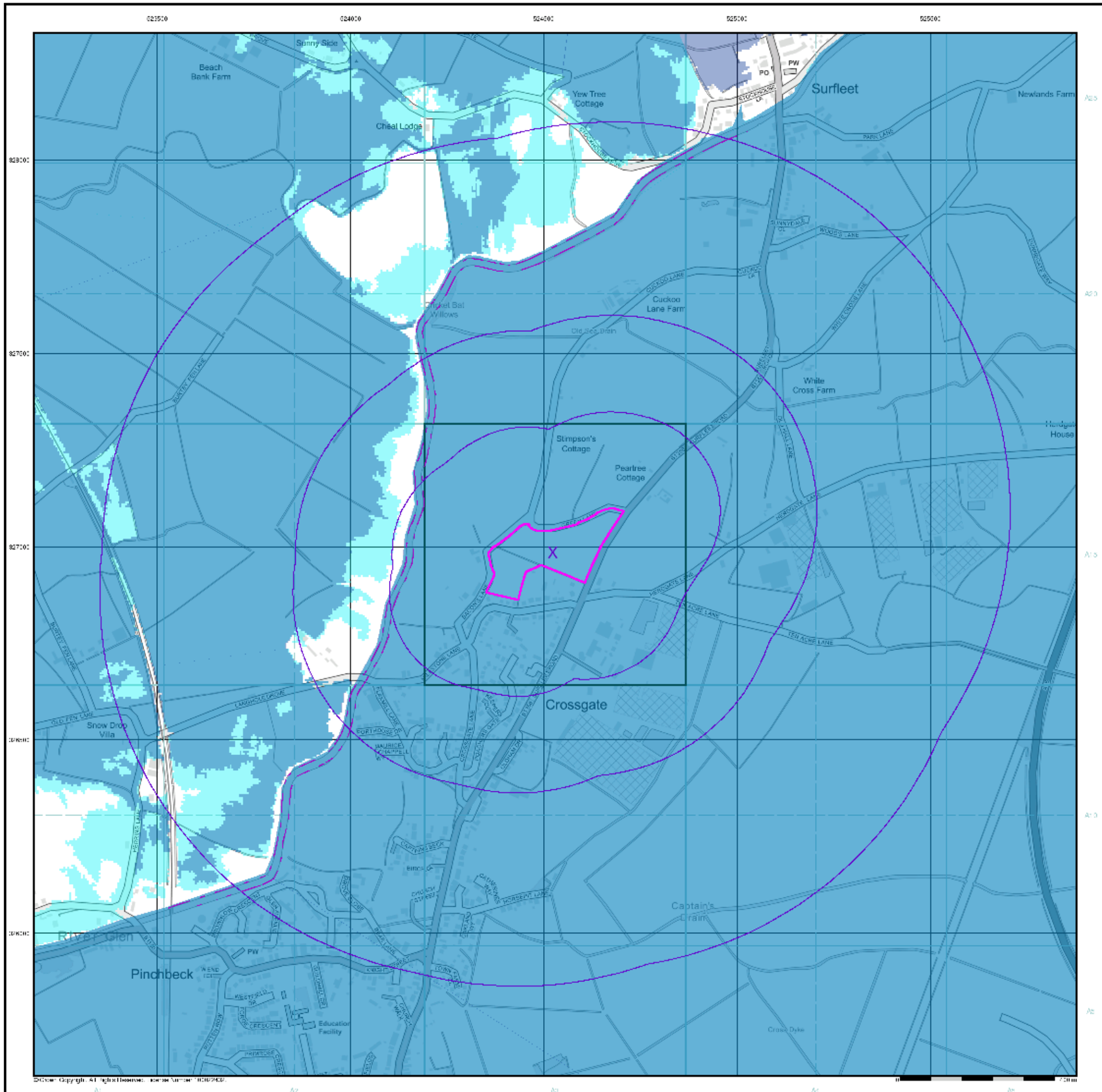
Order Details

Order Number: 201515819_1_1
Customer Ref: R18012
National Grid Reference: 524520, 326990
Slice: A
Site Area (Ha): 3.95
Search Buffer (m): 1000

Site Details

Site at, Pinchbeck, Lincolnshire

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



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Grange Geo

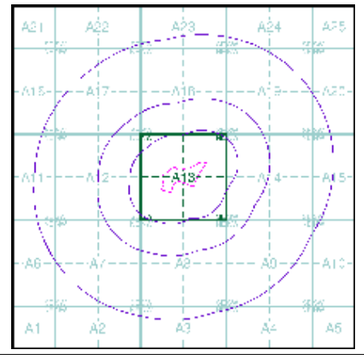
General

- Site Boundary
- 500m Buffer
- Site Centre Point

Agency and Hydrological (Flood)

- Extent of Flooding from Rivers or Sea without Defences (Zone 3)
- Flooding from rivers or sea without defences (zone 2)
- Area Benefiting from Flood Defences
- Flood Storage Areas
- Flood Defence

Flood Map - Slice A



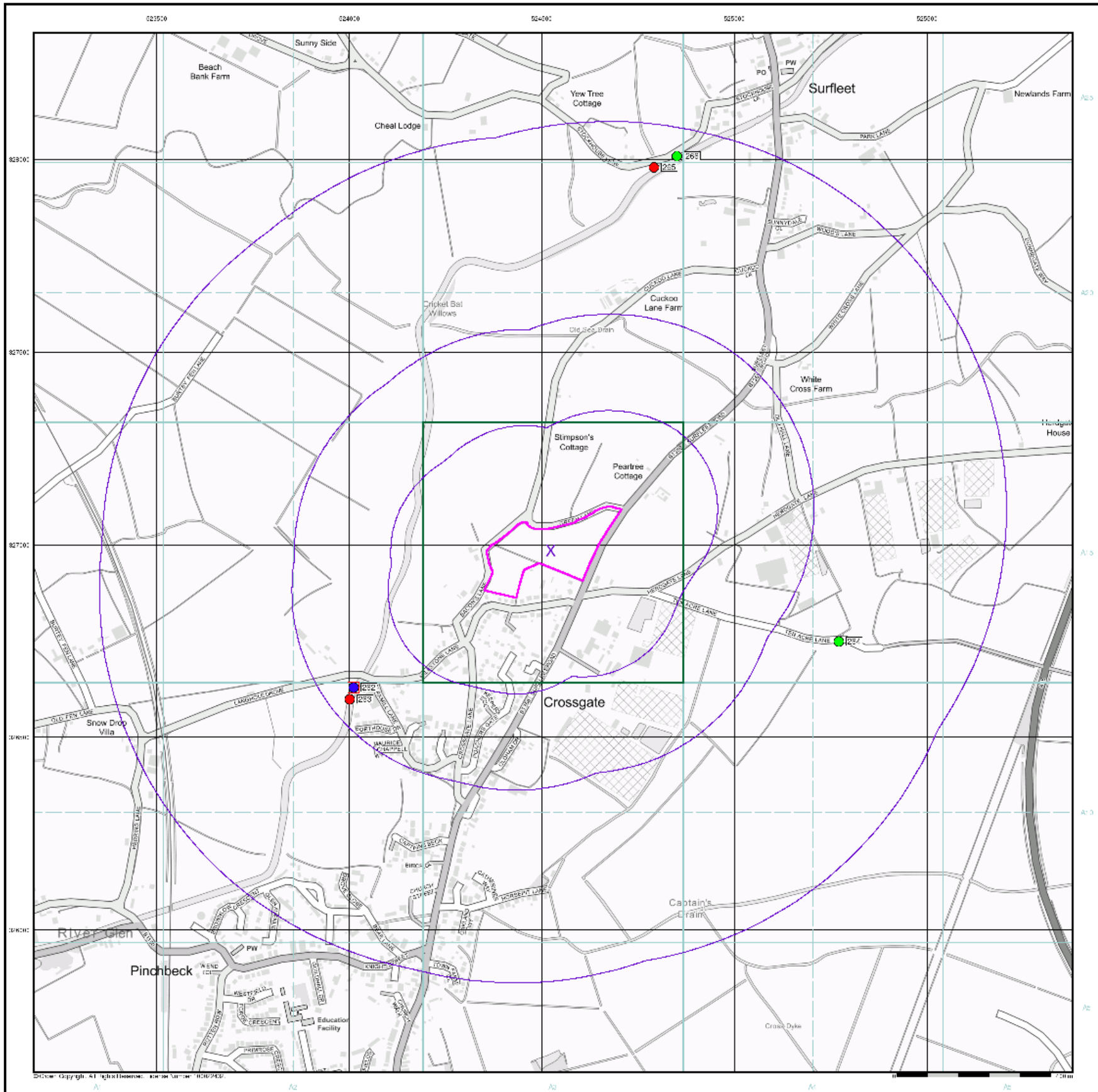
Order Details

Order Number:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

Site at, Pinchbeck, Lincolnshire

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



General

- Site Boundary
- 500m Buffer
- Historical Land Use Polygons
- Map Tile
- Current Ordnance Survey Boundary

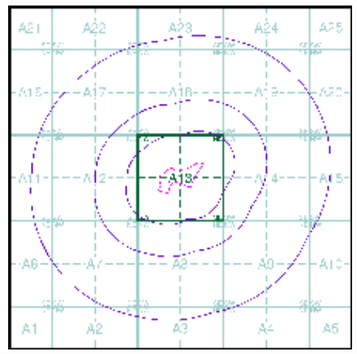
Agency and Hydrological (Boreholes)

- 1000m Environment Agency / Hydrological Borehole
- 500m Environment Agency / Hydrological Borehole
- 250m Environment Agency / Hydrological Borehole
- 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



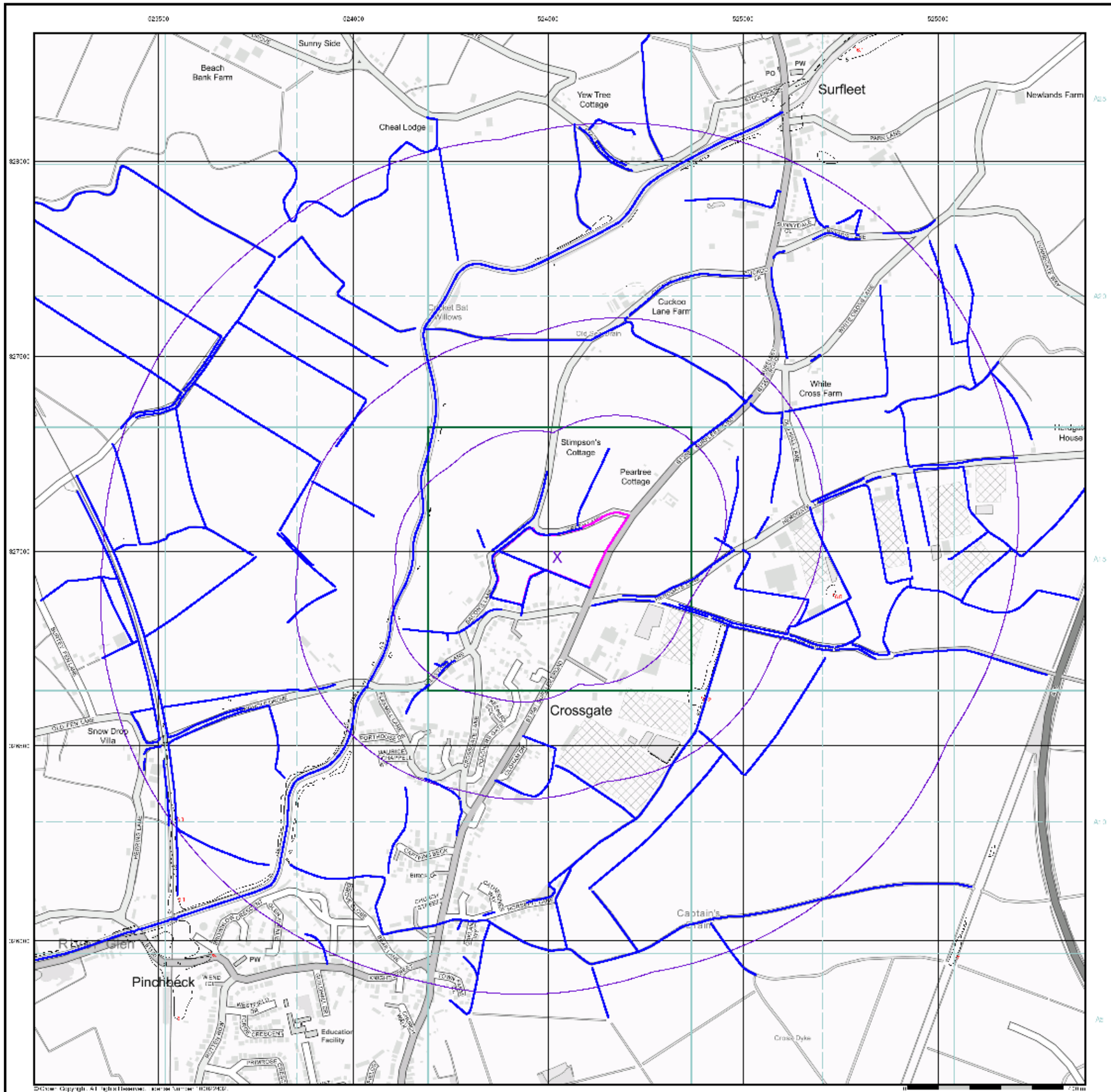
Order Details

Order Number:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

Site at, Pinchbeck, Lincolnshire

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Grange Geo

General

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

OS Water Network Data

- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

Contours (height in meters)

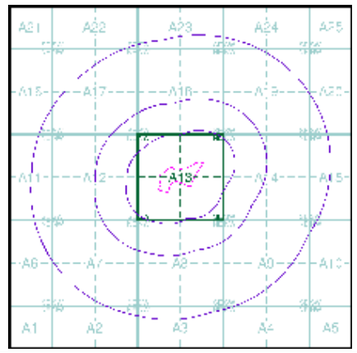
Standard Contour 105 100 95

Master Contour

Spot Height 167.3

- MLW Mean Low Water
- MHW Mean High Water

OS Water Network Map - Slice A



Order Details

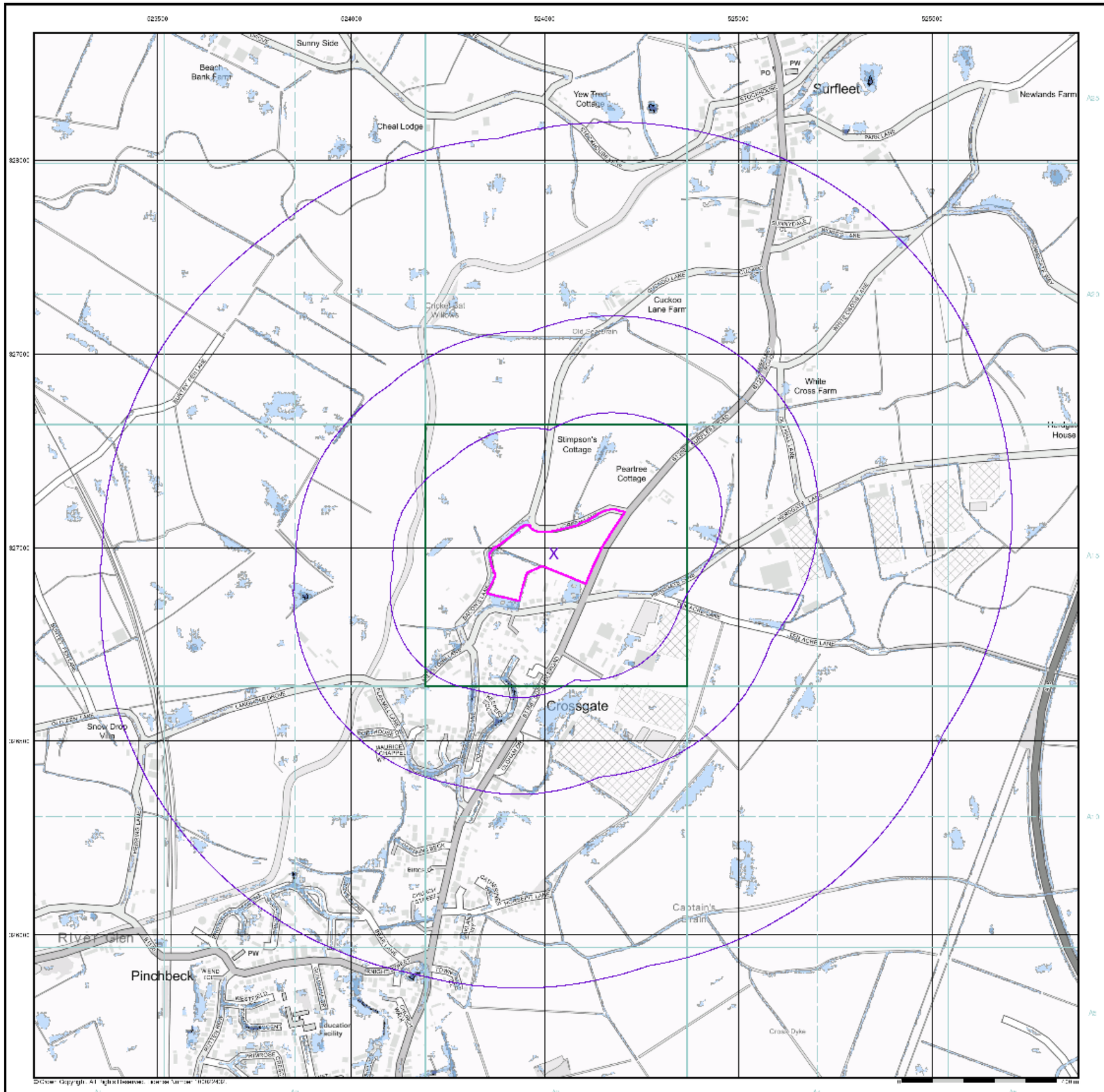
Order Number:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

Site at, Pinchbeck, Lincolnshire

Landmark INFORMATION GROUP

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



Grange Geo

General

- Site for Sale
- Search Buffer (1000m)
- Postcode Centre Point

Risk of Flooding from Surface Water

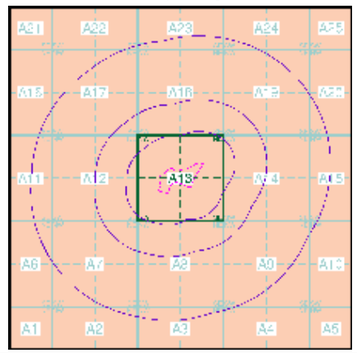
- High - 3.3% Annual Risk
- Medium - 1% to 3.3% Annual Risk
- Low - 0.1% to 1% Annual Risk

Suitability

See Landmark Suitability Map Guide

- Natural Environment
- Domestic Use
- Commercial Use
- Special Purpose Land Use
- Property

EA/NRW Suitability Map - Slice A



Order Details

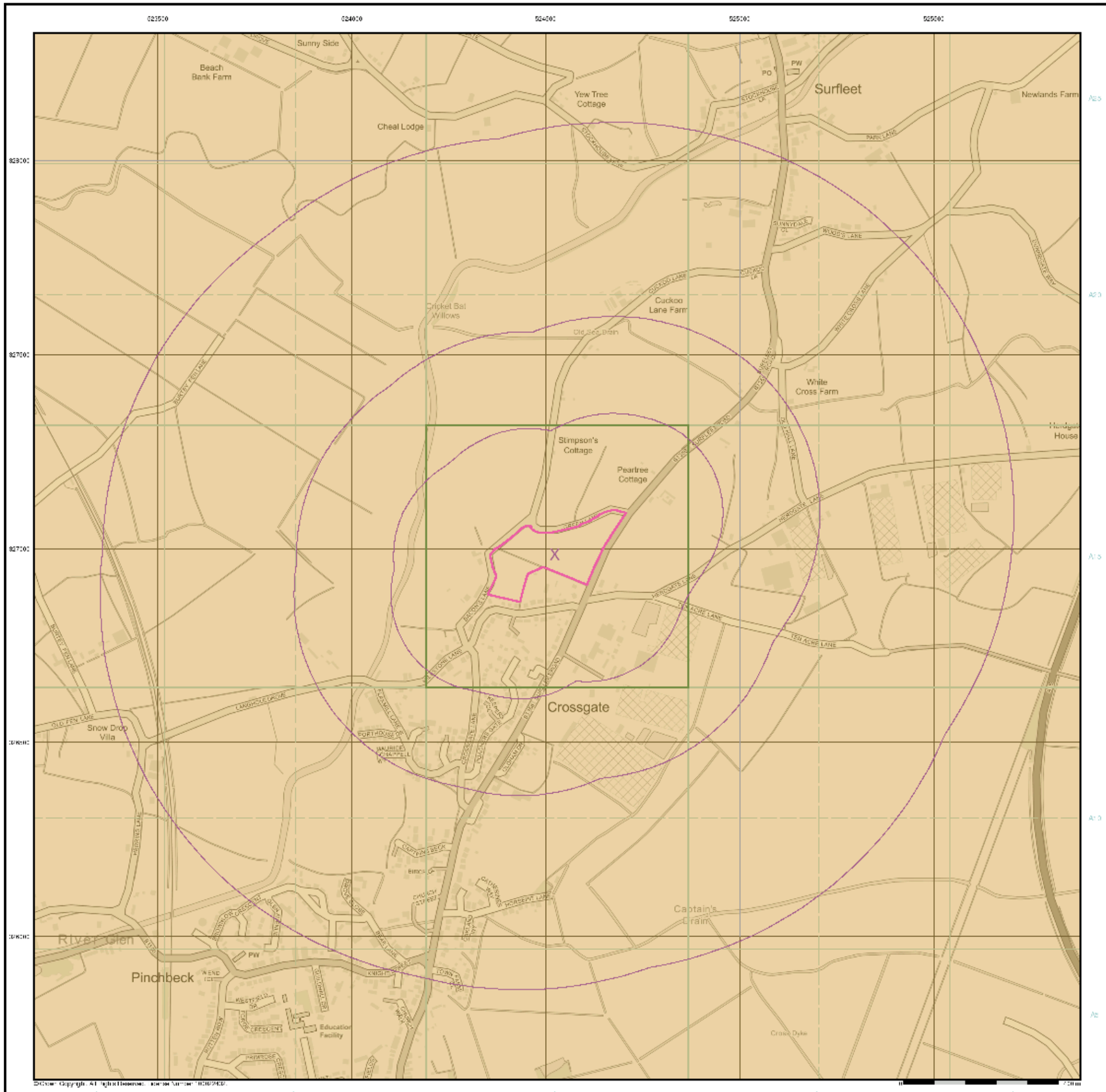
Order Number:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

Site at, Pinchbeck, Lincolnshire

Landmark INFORMATION GROUP

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



Grange Geo

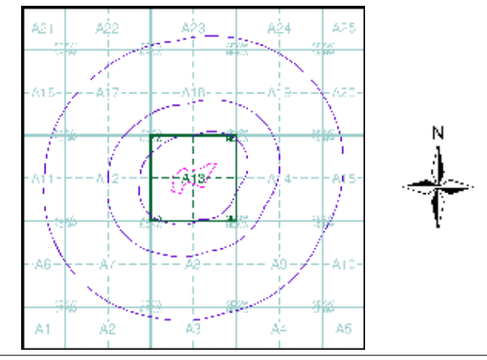
General

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



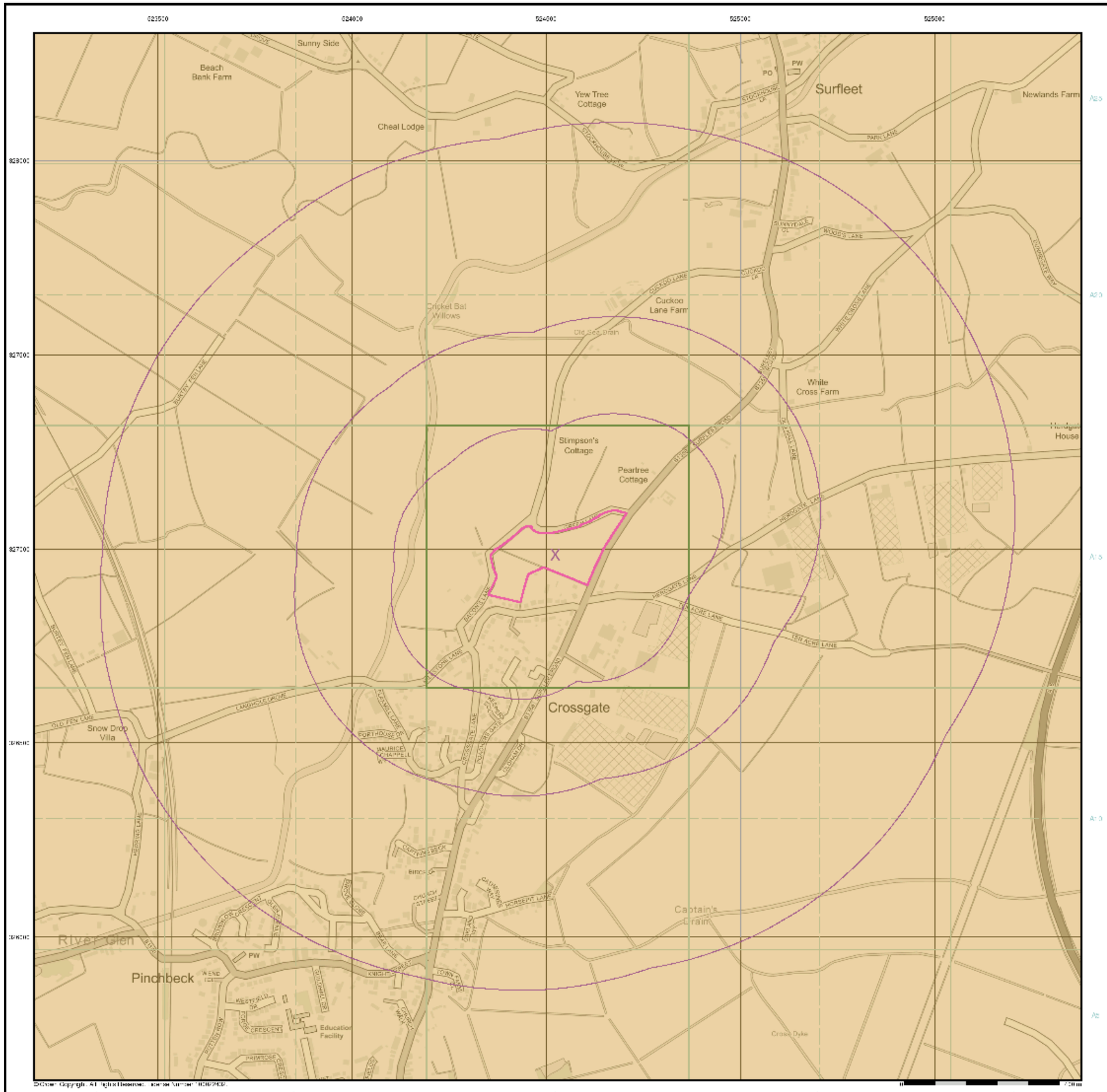
Order Details

Order Details:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

Site at, Pinchbeck, Lincolnshire

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Web: www.envirocheck.co.uk



Grange Geo

General

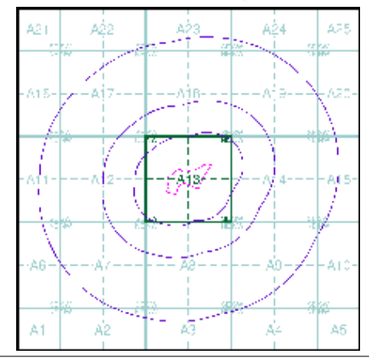
X Specified site

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



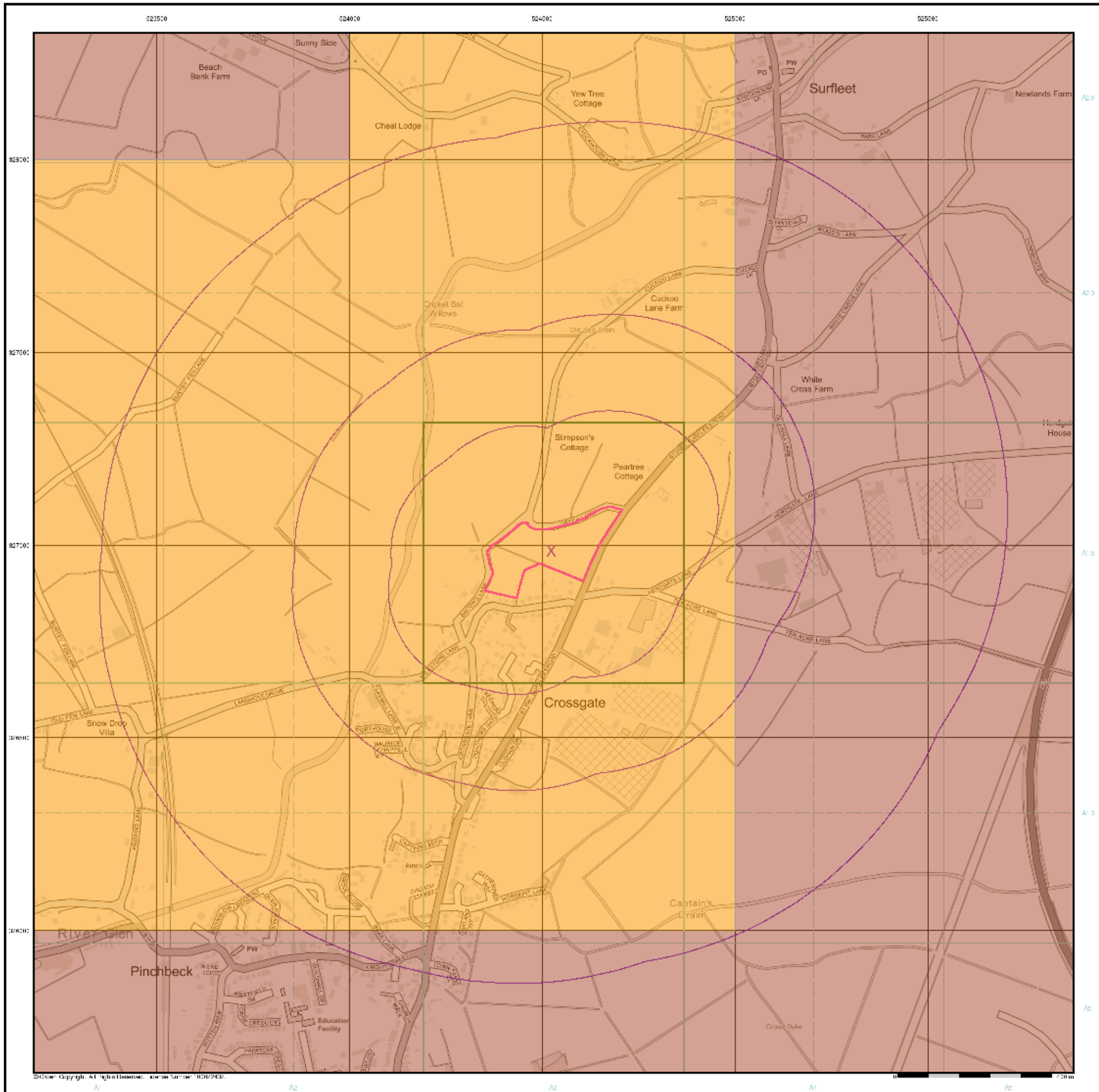
Order Details

Order Details:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

Site at, Pinchbeck, Lincolnshire

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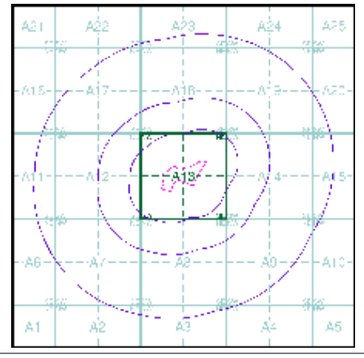
General

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



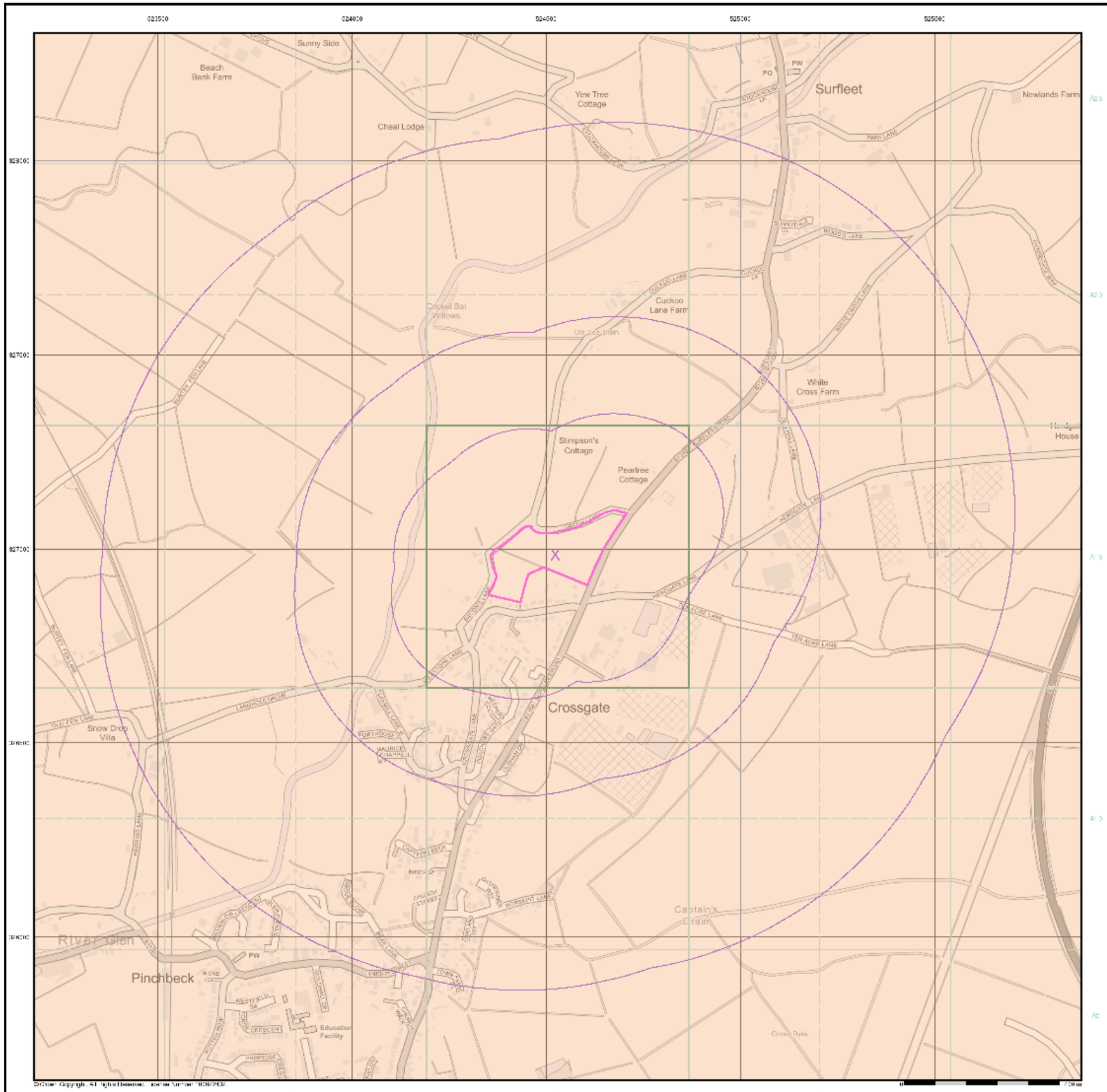
Order Details

Order Details:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

Site at, Pinchbeck, Lincolnshire

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Grange Geo

General

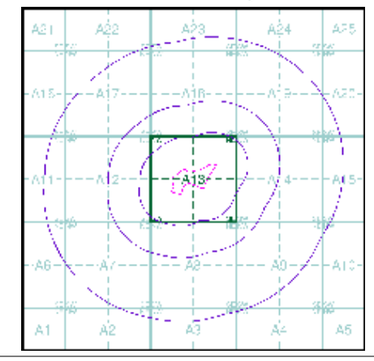
Specified Site | Specified Surface(s) | Bore / Pollution Point

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



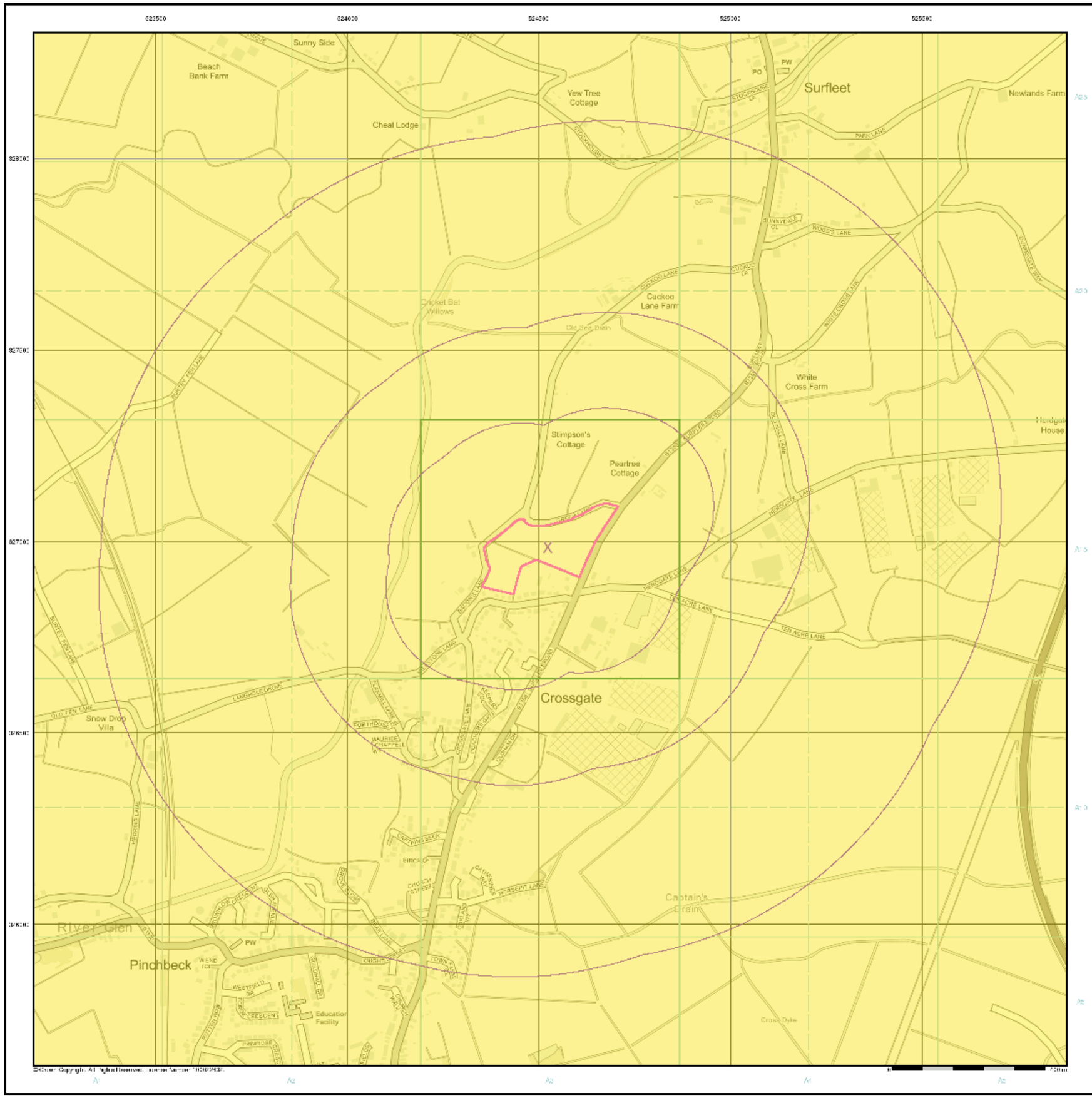
Order Details

Order Details:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

Site at, Pinchbeck, Lincolnshire

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Grange Geo

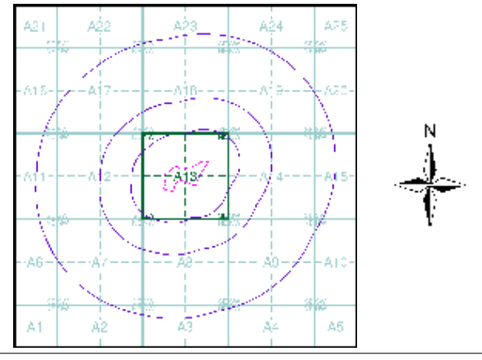
General

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



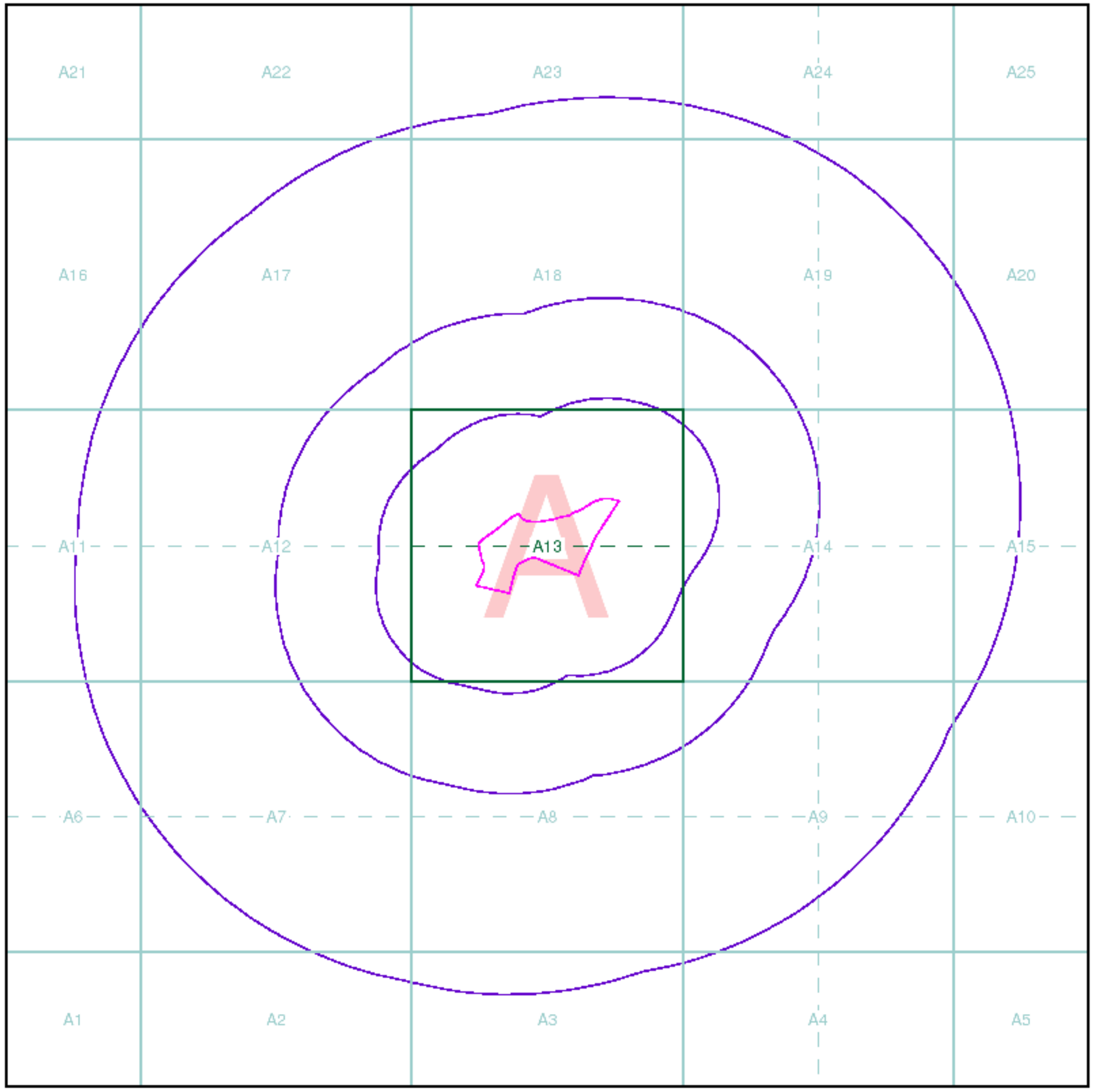
Order Details

Order Details:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524520, 326990
Slice:	A
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

Site at, Pinchbeck, Lincolnshire

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



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:

Envirocheck reports are compiled from 136 different sources of data.

Client Details

Mr A Hare, Grange Geo Consulting Ltd, 43 Winchilsea Avenue, Newark, Nottinghamshire, NG24 4AD

Order Details

Order Number:	201515819_1_1
Customer Ref:	R18012
National Grid Reference:	524510, 326990
Site Area (Ha):	3.95
Search Buffer (m):	1000

Site Details

Site at, Pinchbeck, Lincolnshire

Full Terms and Conditions can be found on the following link:
http://www.landmarkinfo.co.uk/Terms/Show/515

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

Appendix D

ZETICA UXB MAP

UNEXPLODED BOMB RISK MAP

zeticauxo

SITE LOCATION

Location: Pinchbeck, Lincolnshire
Map Centre: 523500,325500



LEGEND

High: Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.

Moderate: Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.

Low: Areas indicated as having 15 bombs per 1000acre or less.

miltary **industry** **UXO find**

transport **dock** **Luftwaffe targets**

utilities **other**

How to use your Unexploded Bomb (UXB) risk map?

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment* is necessary.

What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

If I have any questions, who do I contact?

tel: **+44 (0) 1993 886682**

email: **uxo@zetica.com**

web: **www.zeticauxo.com**

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: **(https://zeticauxo.com/downloads-and-resources/risk-maps/)**

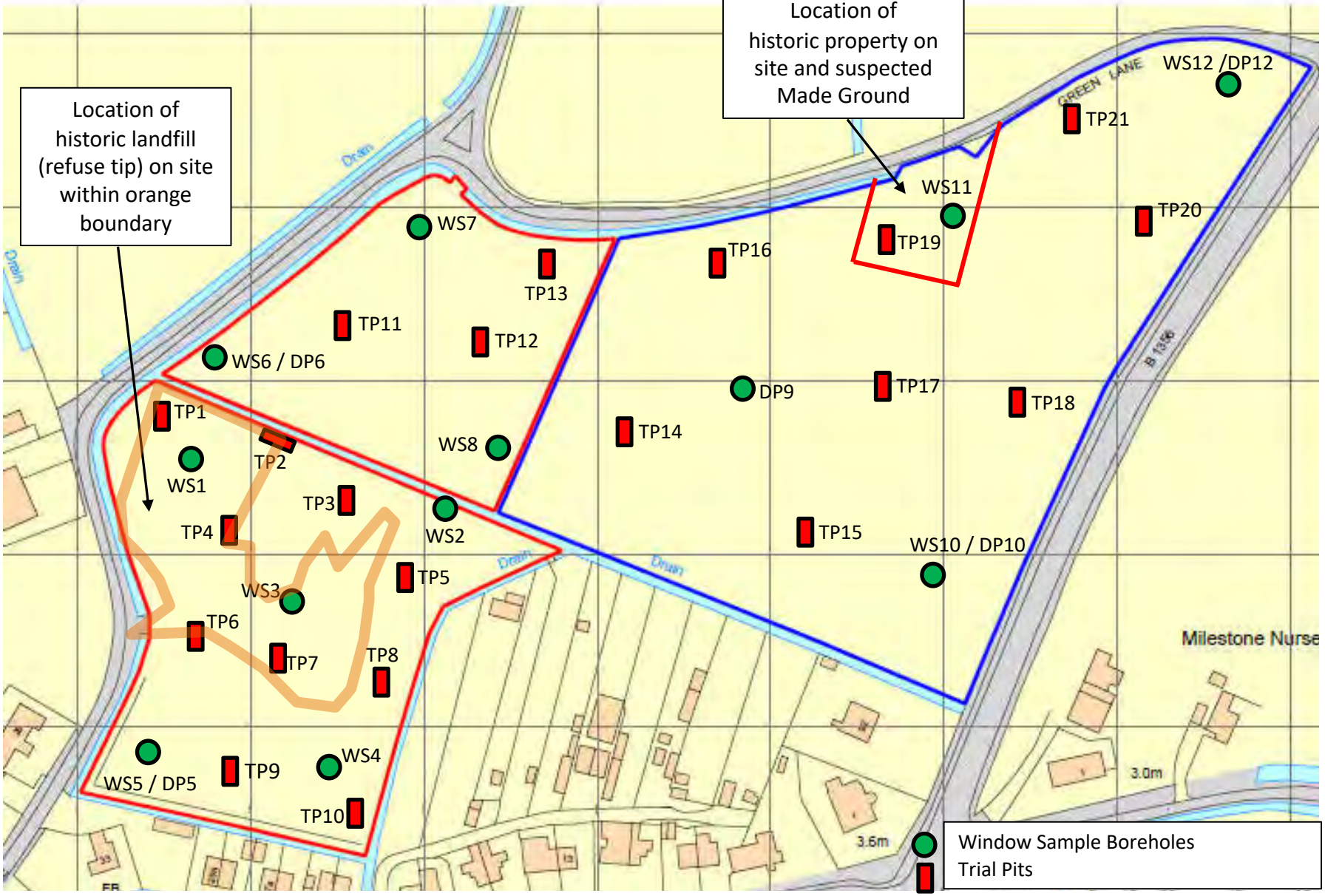
Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgment. The copyright remains with Zetica Ltd.

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.

Appendix E

GROUND INVESTIGATION PLANS, LOGS AND MONITORING RESULTS



Grange Geo	**Pinchbeck Site** Ground Investigation Plan	**Client:** Kirk Homes Ltd **Date:** June 2019	North	**Drawing:** R18012/002-DWG3

Window Sample Log

WS No: 1

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Firm, friable dark brown slightly clayey, sandy Silt. Sand is fine. Occasional moulded plastic artefacts. Frequent roots and rootlets. [Made Ground]		
			Orangeish brown very sandy Silt. Sand is fine. Occasional roots / rootlets [Made Ground]	0.1	
0.5			Firm, friable dark brown slightly clayey, sandy Silt. Sand is fine. Occasional roots / rootlets. [Made Ground]	0.25	
			Orange slightly clayey to clayey, sandy slightly gravelly silt. Sand is fine. Gravel is occasional fine to coarse, angular coal and concrete. [Made Ground]	0.45	
			Orangeish brown very sandy silt. Sand is fine. Occasional roots and rootlets. [Made Ground]	0.6	
1.0	SPT	1,0/1,0,0,1 = 2			
			Grey / dark grey slightly silty Sand. [Made Ground]	1.0	
			Very soft, dark grey / black very sandy Silt. Frequent fine shells and shell fragments. [Made Ground]	1.1	
1.5					
1.55-1.7	ES		Black very silty sand. Sand is fine. Frequent organic fragments, roots and rootlets. Plastic artefacts (bags) at the base of the unit. [Made Ground]	1.55	
			Soft brown slightly sandy to sandy SILT. Sand is fine. [Tidal Flat Deposits]	1.7	x x x x
2.0	SPT	0,0/0,1,1,1 =3	Damp		x x x
2.0-2.4	D		Grey very silty SAND. Sand is fine. [Tidal Flat Deposits]	2.0	. . .
			Wet		. . . .
					. . .
					. . . .
			Soft grey sandy to very sandy SILT. Sand is fine. [Tidal Flat Deposits]	2.4	x x x
			Very Wet.		x x x x
					x x x
					x x x x
					x x x
3.0	SPT	0,2/1,1,1,2= 5			x x x x
3.0-3.5	D,B		Very loose, brown slightly clayey, silty, SAND. Sand is fine. [Tidal Flat Deposits]	3.0	. . .
					. . . .
			Wet.		. . .
					. . . .
					. . .
					. . . .
					. . .
					. . . .
					. . .
4.0	SPT	1,1/0,1,1,1 = 3			. . . .
			End of borehole.	4.0	
				5.0	

General Comments:

1. Excavation terminated at 4m bgl.
2. Possible water strike at approximately 1.7m bgl based on material observations.
3. Standpipe installed to 2m bgl, response zone 0.5m-2m bgl.

Scale:
Date: 24/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Window Sample Log

WS No: 2

Client: Kirk Homes
Project: Pinchbeck, Spalding
Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Brown very silty Sand. Sand is fine. Frequent roots and rootlets. [Made Ground]		
			Orange / black slightly silty, slightly sandy Gravel. Sand is fine to medium, gravel is fine to coarse, angular of crushed brick. Plastic artefacts (bags) at upper interface. [Made Ground]	0.5 0.6	
1.0	SPT	2,2/3,3,2,4 = 12	Soft to firm, friable dark brown sandy silt. Sand is fine. Frequent shell fragments, frequent roots and rootlets. Plastic artefacts in upper 0.05m. [Made Ground]	1.0	
1.2-1.5	B,D		Medium dense, orangeish brown / orange slightly clayey, silty SAND. Sand is fine. [Tidal Flat Deposits]	1.1	
2.0	SPT	0,0/0,1,1,1 = 3			
			Very soft greyish brown sandy SILT. Very wet. [Tidal Flat Deposits]	2.0	
2.5-2.8	D		Loose, dark grey very silty SAND. Sand is fine. [Tidal Flat Deposits] Wet	2.25	
3.0	SPT	0,0/2,2,2,1 = 7		3.0	
			Soft, greyish brown very sandy SILT. Sand is fine. [Tidal Flat Deposits]	3.2	
			Very wet	3.3	
3.5-4.0	B		Loose, dark grey very silty SAND. Sand is fine. [Tidal Flat Deposits] Wet		
4.0	SPT	0,1/0,1,1,1 = 3			
			End of borehole	4.0	
				5.0	

General Comments:

1. Excavation terminated at 4m bgl.
2. Possible water strike at approximately 2m bgl based on material observations.
3. Standpipe installed to 2.5m bgl, response zone 0.5m-2.5m bgl.

Scale:
Date: 24/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Window Sample Log

WS No: 3

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft, friable brown very sandy Silt. Sand is fine. Frequent roots and rootlets in upper 0.5m, rare to absent below. [Made Ground] Firm from 0.65m bgl. Timber fragment at 0.9m bgl.		
1.0	SPT	0,0/0,1,0,1 = 2	Dark brown very silty sand. Abundent roots and rootlets. Frequent fine shells and shell fragments. [Made Ground / Possible Former Ground Surface]	0.95 1.0	
			Very loose, greyish brown slightly clayey, silty SAND. Sand is fine, frequent fine shell fragments. [Tidal Flat Deposits]	1.1	
1.4	D				
1.8-2.0	B		Very loose, dark grey very silty SAND. Sand is fine. [Tidal Flat Deposits] Damp from 1.6m, Wet from 1.8m.	1.6	
2.0	UT100	No recovery			
			Very soft dark grey sandy SILT. [Tidal Flat Deposits] Very wet.	2.0	
			Loose, dark grey very silty SAND. Sand is fine. [Tidal Flat Deposits] Very wet.	2.2	
2.5-3.0	B				
3.0	SPT	0,0/0,1,1,2 = 4			
			Soft dark grey sandy SILT. [Tidal Flat Deposits] Very wet.	3.0	
			Dark grey very silty SAND. Sand is fine. [Tidal Flat Deposits] Very wet.	3.3	
3.5	D				
4.0	SPT	0,0/1,0,1,2 = 4			
			End of borehole	4.0	
				5.0	

General Comments:

1. Excavation terminated at 4m bgl.
2. Possible water strike at approximately 1.6m bgl based on material observations.
3. Standpipe installed to 3m bgl, response zone 0.5m-3.0m bgl.

Scale:
Date: 24/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Window Sample Log

WS No: 4

Client: Kirk Homes
Project: Pinchbeck, Spalding
Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft to firm, friable brown / dark brown very sandy Silt. Sand is fine. Occasional rootlets in top 0.1m. Soft from 0.1m [Made Ground]		
			Dark brown silty, gravelly Sand. Gravel is fine to coarse, angular of brick, ceramic pipe / pot fragments, plastic (bags) and nylon string. [Made Ground]	0.6	
1.0	SPT	0,1/1,2,2,3 = 8			
1.0-1.2	D		Soft, friable grey / brown very sandy SILT. Sand is fine. Very wet. [Tidal Flat Deposits]	1.0	
			Loose, orangish brown slightly clayey, silty, SAND. Sand is fine. Wet. [Tidal Flat Deposits]	1.2	
1.5-2.0	B				
2.0	SPT	0,0/1,1,1,1 = 4			
			Soft greyish brown very sandy SILT. Sand is fine. [Tidal Flat Deposits] Very wet.	2.0	
			Very loose, dark grey very silty SAND. Sand is fine. [Tidal Flat Deposits]	2.4	
2.5	D		Wet		
3.0	SPT	0,0/0,0,1,1 = 2			
				3.0	
3.0-4.0	B,D				
4.0	SPT	0,0/1,1,1,2 = 5			
			End of borehole	4.0	
				5.0	

General Comments:

1. Excavation terminated at 4m bgl.
2. Possible water strike at approximately 1m bgl based on material observations.
3. Standpipe installed to 2.5m bgl, response zone 0.5m-2.5m bgl.

Scale:
Date: 24/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Window Sample Log

WS No: 5

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Firm, friable brown/dark brown very sandy silghtly gravelly Silt. Sand is fine. Gravel is occasional, angular, coarse, of broken brick. [Made Ground]		
			Dark brown silty Sand. Frequent fine shells and shell fragments [Made Ground / Possible	0.8	
1.0	SPT	0,0/1,1,2,1 = 5	Former Ground Surface]	0.87	
			Light brown / orange silty to very silty SAND. Dry	1.0	
			Orangeish brown/brown silty to very silty SAND. [Tidal Flat Deposits]		
1.2-1.5	B,D		Wet		
2.0	SPT	0,0/1,0,1,1 = 3			
			Very soft orangeish brown very sandy SILT. Sand is fine. Very wet. [Tidal Flat Deposits]	2.0	
			Brown, becoming greyish brown from 2.4m silty SAND. Sand is fine. [Tidal Flat Deposits]	2.3	
2.5-3.0	B,D		Damp		
3.0	SPT	0,0/0,1,1,1 = 3		3.0	
3.15-3.5	D		Very soft greyish brown very sandy SILT. Very Wet. [Tidal Flat Deposits]	3.15	
			Greyish brown very silty SAND. Sand is fine. [Tidal Flat Deposits]	3.3	
3.5-4.0	B				
			End of borehole	4.0	
				5.0	

General Comments:

1. Excavation terminated at 4m bgl.
2. Possible water strike at approximately 1m bgl based on material observations.
3. Standpipe installed to 4m bgl, response zone 1m-4m bgl.
4. Dynamic Probing undertaken adjacent (see DP Log).

Scale:
Date: 24/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Window Sample Log

WS No: 6

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Firm, friable brown very sandy Silt. Sand is fine. Occasional fine shells / shell fragments. Frequent roots and rootlets. [Made Ground / Topsoil]	0.1	
			Firm, friable orangeish brown very sandy silt. Sand is fine [Made Ground / Reworked natural strata]		
0.8-1.0	D		Firm, friable dark brown very sandy silt. Sand is fine. Frequent fine shells and shell fragments. Frequent roots and rootlets [Possible Made Ground / Possible Former Ground Surface]	0.7	
1.0	SPT	2,3/2,2,1,2 = 7			
			Loose, Light brown/orange very silty SAND. Sand is Fine. [Tidal Flat Deposits] Wet.	1.0	
1.3-1.5	D				
			Soft to firm, friable orange/light brown very sandy SILT. Sand is fine. [Tidal Flat Deposits] Wet	1.87	
2.0	SPT	0,0/0,1,1,1 = 3			
			Very loose, greyish brown very silty SAND. [Tidal Flat Deposits] Very Wet.	1.95, 2.0	
2.8-3.0	D				
3.0	SPT	0,0/1,0,1,1		3.0	
			End of borehole	4.0	
				5.0	

General Comments:

1. Excavation terminated at 4m bgl.
2. Possible water strike at approximately 1.1m- 1.3m bgl based on material observations.
3. Hole backfilled.
4. Dynamic Probing undertaken from 4m bgl (See DP Log).

Scale:
Date: 23/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Window Sample Log

WS No: 7

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Brown and orange mottled, slightly gravelly, sandy CLAY. Gravels of fine to coarse, angular to sub-rounded brick. Limestone and quartzite. [Made Ground]		
			Brown and grey mottled, silty CLAY. [Tidal Flat Deposits]		
1.0	SPT	2,3/2,1,1,2 = 6	Firm, orange brown, clayey SILT. [Tidal Flat Deposits]	1.0	
			Loose, grey, silty fine SAND. [Tidal Flat Deposits]		
2.0	SPT	0,0/0,2,1,1 = 4		2.0	
3.0	SPT	0,0/1,0,1,0 = 2		3.0	
4.0	SPT	0,0/1,0,1,1 = 3		4.0	
5	SPT	0,0/1,1,1,1 = 4			
			End of borehole.	5.0	

General Comments:

1. Excavation terminated at 5m bgl.
2. Possible water strike at approximately 1.5m bgl based on material observations.
3. Groundwater monitoring well installed with response zone from 1m to 5.0m bgl.
4.

Scale:
Date: 23/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Window Sample Log

WS No: 8

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Firm, friable brown/dark brown very sandy Silt / silty Sand. Sand is fine. Frequent roots and rootlets. Occasional fine shells and shell fragments. [Made Ground / Re-worked Topsoil]		
			Dark brown very silty Sand. Sand is fine. Frequent glass fragments at upper interface. [Made Ground]	0.25	
0.8-1.0	D				
1.0	SPT	0,0/0,0,1,1 = 2	Orangeish light brown slightly silty to silty sand. Sand is fine. [Possible Made Ground / Reworked Material]	0.8	
				1.0	
			Very soft orangeish light brown sandy silt. Sand is fine. [Possible Made Ground/Reworked]	1.1	
			Dark brown slightly silty to silty sand. Sand is fine. Occasional fine shells and shell fragments. [Possible Made Ground / Former Ground Surface]	1.2	
1.6-1.8	D		Very loose, light brown/orange slightly silty to silty SAND. Sand is fine. [Tidal Flat Deposits] Damp.	1.5	
2.0	SPT	0,0/0,1,1,2 = 4			
			Loose, Greyish brown very silty SAND. Sand is fine. [Tidal Flat Deposits]	2.0	
			Very Wet.		
3.0	SPT	0,0/1,1,1,2 = 5		3.0	
3.5-4.0	D				
4.0	SPT	1,1/3,3,2,1 = 9			
			End of borehole	4.0	
				5.0	

General Comments:

1. Excavation terminated at 4m bgl.
2. Possible water strike at approximately 1.5m bgl based on material observations.
3. Standpipe installed to 3m bgl, response zone 1m-3m bgl.

Scale:
Date: 23/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Window Sample Log

WS No: 10

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Firm, friable brown / dark brown sandy slightly gravelly Silt. Sand is fine. Gravel is occasional, fine, rounded quartz. Frequent roots and rootlets. [Made Ground]		
			Black, very silty sand. Occasional coarse, angular fragments of glass. Frequent roots and rootlets. [Made Ground]	0.2	
			Firm, friable brown/dark brown sandy slightly gravelly Silt. Sand is fine. Gravel is occasional, fine, rounded, of quartz. Occasional cobbles of angular brick. Frequent roots and rootlets. [Made Ground]	0.3 0.5	
0.8-1.0	D		Firm, friable, brown/dark brown slightly clayey, slightly sandy, slightly gravelly SILT. Sand is fine. Gravel is fine to medium, subrounded to rounded of quartz and flint. Frequent roots and rootlets.		
1.0	SPT	1,2/2,2,1,2 = 7	Clayey and damp from 1.0m.	1.0	
2.0	SPT	0,0/0,0,0,0 = 0			
2.2-2.5	B		Very loose, dark grey / greyish brown silty SAND. Sand is fine. [Tidal Flat Deposits] Very wet	2.0	
2.8-3.0	D		Very soft greyish brown slightly sandy to sandy SILT. Sand is fine. [Tidal Flat Deposits]	2.8	
3.0	SPT	0,0/0,0,0,0 = 0			
			Very loose, greyish brown silty SAND. Sand is fine. [Tidal Flat Deposits] Very wet	3.0	
			End of borehole	4.0 5.0	

General Comments:

1. Excavation terminated at 4m bgl.
2. Possible water strike at approximately 2m bgl based on material observations.
3. Standpipe installed to 4m bgl, response zone 1m-4m bgl.
4. Dynamic Probing undertaken from 4m bgl (See DP Log).

Scale:
Date: 23/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Window Sample Log

WS No: 11

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
0.3-0.5	ES		Dark brown silty, gravelly Sand. Sand is fine to medium, gravel is fine to coarse, occasional cobbles of concrete, possible asbestos cement sheet, brick, glass and Sandstone. Frequent roots and rootlets. [Made Ground]		
1.0	SPT	0,0/1,0,1,1 = 3	Soft, friable dark brown very sandy gravelly Silt. Sand is fine. Gravel is fine to coarse, angular of crushed brick. Occasional metal fragments. [Made Ground]	0.8 1.0	
1.5	D		Loose, dark grey / greyish brown slightly clayey, silty SAND. Sand is fine. Frequent roots and rootlets. [Tidal Flat Deposits] Occasional fine, subrounded gravel of feldspar from 1.3m bgl.	1.1	
2.0	SPT	0,1/1,1,1,1 = 4	Loose, dark grey slightly silty SAND. Sand is fine. Damp from 1.8mbgl, wet and very silty from 2m bgl [Tidal Flat Deposits]	1.8 2.0	
2.5	B				
3.0	SPT	0,1/1,1,1,2 = 5		3.0	
			Firm, dark grey very sandy SILT. Sand is fine. Very Wet. [Tidal Flat Deposits]	3.35	
			Dark grey slightly silty SAND. Sand is fine. Wet.[Tidal Flat Deposits]	3.6	
			Very soft, dark grey very sandy SILT. Sand is fine. Very Wet. [Tidal Flat Deposits]	3.8	
4.0	SPT	1,2/3,3,4,4 = 14	Dark grey slightly silty SAND. Sand is fine. Wet. [Tidal Flat Deposits]	3.85	
			End of borehole	4.0 5.0	

General Comments:

1. Excavation terminated at 4m bgl.
2. Possible water strike at approximately 1.8m bgl based on material observations.
3. Hole backfilled.

Scale:
Date: 24/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Window Sample Log

WS No: 12

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL
			Soft, dark grey mottled black clayey, slightly sandy, slightly gravelly Silt. Sand is fine. Frequent roots, rootlets and organics. Gravel is rounded, fine, of quartz. [Topsoil / Made Ground]	0.05
			Firm, friable orangeish brown silty SAND. Sand is fine. Occasional roots and rootlets.	
0.5-0.9	B		Orangeish light brown slightly silty SAND. Sand is fine.	0.5
1.0	UT100		Firm, friable, orangeish light brown sandy SILT. Sand is fine.	0.9
				1.0
			Soft, friable orangeish brown very sandy SILT. Sand is fine. Very wet.	1.45
			Very loose to loose, orangeish light brown, clayey, silty SAND. Sand is fine.	1.6
2.0	SPT	0,0/0,0,1,1 = 2		
			Very silty and wet between 2.1 and 2.3m.	2.0
2.3-2.5	B			
3.0	SPT	0,0/1,2,3,3 = 9		3.0
3.65-3.85	D		Very soft orangeish brown very sandy SILT. Sand is fine. Very wet.	3.65
			Loose, orangeish brown very silty SAND. Sand is fine. Wet.	3.85
			End of borehole	4.0
				5.0

General Comments:

1. Excavation terminated at 4m bgl.
2. Possible water strike between 1m and 1.45m bgl based on material observations.
3. Standpipe installed to 4m bgl, response zone 1m-4m bgl.
4. Dynamic Probing undertaken from 4m bgl (See DP Log).

Scale:
Date: 23/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 1

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
0.2	ES		Soft, friable dark brown very sandy, slightly gravelly silt. Sand is fine, gravel is occasional, coarse, rounded of feldspar and quartz. Frequent fragments of plastic within upper 0.1m. Occasional ceramic fragments and timber throughout. Frequent fine shells and shell fragments. Frequent roots and rootlets. [Made Ground]		
0.4	B,D				
			Soft, friable orangeish dark brown very sandy silt/very silty sand. Sand is fine. Occasional fragments of possible asbestos cement sheeting, plastic and timber. Occasional roots/ rootlets. [Made Ground]	0.5	
1.0	ASB			1.0	
1.2	ES				
			Soft, friable dark grey very sandy SILT. Sand is fine. Occasional fine shells and shell fragments. [Tidal Flat Deposits]	1.4	x x x x
1.5	D,B			1.5	x x x x
			Wet from 1.8m bgl.		x x x x
				2.0	x x x x
			End of pit	2.1	
				3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.8m bgl.
3. Sides Stable.

Scale:
Date: 21/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 2

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
0.15	ES		Soft, friable dark brown very sandy, slightly gravelly Silt. Sand is fine, gravel is occasional, coarse, rounded of feldspar and quartz. Frequent fragments of plastic bag, moulded plastic, and paper within upper 0.1m, rare below. Frequent fine shells and shell fragments. Frequent roots and rootlets. [Made Ground]	0.5	
0.75	ES D,B		Soft, friable dark brown very sandy silt. Sand is fine. Frequent plastic bags, plastic cups, plastic mesh, propegator cups, nylon string, plastic bottles and plastic banding. [Made Ground]	0.7 1.0	
1.8	ES, D		Soft, friable orangeish brown very sandy SILT. Sand is fine. [Tidal Flat Deposits] Wet from 1.7m bgl.	1.2 1.5 2.0	
			End of pit	2.1 3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.7m bgl.
3. Collapse below 1m bgl.

Scale:
Date: 21/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 3

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Dark brown very silty Sand. Sand is fine. Rare plastic artefacts and plant labels within upper 0.1m. Frequent roots and rootlets. [Made Ground]		
0.2	ES				
			Dark brown / black slightly silty, slightly sandy Gravel. Sand is fine to medium. Gravel is fine, angular of brick, and shell fragments. Frequent plastic artefacts. [Made Ground]	0.4	
			Soft friable dark brown very sandy silt. Sand is fine. Rare plastic artefacts and plant labels. [Made Ground]	0.55	
1.0	D		Plastic pipework at 1.1m.	1.0	
			Soft dark brown very sandy SILT. Sand is fine. Frequent fine shells and shell fragments. [Tidal Flat Deposits]	1.2	
			Orangeish brown silty to very silty SAND. Sand is fine. [Tidal Flat Deposits]	1.4	
1.6	ES			1.5	
			Very soft, greyish brown sandy to very sandy SILT. [Tidal Flat Deposits] Wet.	1.75	
			End of pit	2.0	
				3.0	

General Comments:

1. Excavation terminated at 2m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.5m bgl.
3. Sides Stable.

Scale:
Date: 21/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 4

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft friable dark brown very sandy Silt. Sand is fine. Rare plastic artefacts (bag fragments) in upper 0.1m. Frequent roots and rootlets. [Made Ground]		
			Firm below 0.5m.		
0.35	HSV	11 kPa			
0.4	ES, D				
				0.5	
0.8	HSV	62kPa			
			Orangeish brown very silty SAND. Sand is fine. [Tidal Flat Deposits]	0.9	
				1.0	
				1.5	
			Soft, friable, greyish brown very sandy SILT. Sand is fine. Occasional fine shells and shell fragments. [Tidal Flat Deposits]	1.6	
			Orangeish brown very silty SAND. Sand is fine. [Tidal Flat Deposits]	1.7	
1.8	ES B,D				
1.9	D		Soft, friable, dark grey very sandy SILT. Sand is fine. Wet. [Tidal Flat Deposits]	1.9	
			End of pit	2.0	
				3.0	

General Comments:

1. Excavation terminated at 2m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.6m bgl.
3. Sides Stable.

Scale:
Date: 21/01/2019
Logged by: SW
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Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 5

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
0.15	ES		Soft, friable brown very sandy Silt. Sand is fine. Occasional fragments of plastic (plant labels and plastic bags),and rare ceramic fragments, poly weave bags in top 100mm. Frequent roots and rootlets. [Made Ground] Anthropogenic artefacts rare below 0.1m.		
0.25	HSV	18kPa		0.5	
0.6	ES		Soft to firm dark brown very sandy silt. Frequent plastic artefacts including bag fragments, propagation containers. Rare metal fragments and ex-situ housebricks. Frequent roots and rootlets. [Made Ground]	0.55	
0.6	HSV	42kPa		1.0	
			Orangeish brown very silty SAND. Sand is fine. [Tidal Flat Deposits]	1.2	
1.7	ES B,D			1.5	
			End of pit	2.0	
				3.0	

General Comments:

1. Excavation terminated at 2m bgl. Approximate excavator depth limit.
2. No groundwater encountered
3. Sides Stable.

Scale:
Date: 21/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 6

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
0.2	HSV	Too friable to test	Soft friable brown / dark brownvery sandy slightly gravelly Silt. Sand is fine. Gravel is occasional, rounded, coarse, of feldspar and quartz. Rare plastic bag fragments and timber within upper 100mm. Frequent roots and rootlets. [Made Ground]		
0.25	ES				
0.6	HSV	34kPa	Soft dark brown very sandy silt. Frequent plastic artefacts including bags, propagation cups and nylon string. [Made Ground] Artefacts rare below 0.8m bgl.	0.5 1.0	
1.4	B,D		Orangeish brown very silty SAND. Sand is fine. [Tidal Flat Deposits] Damp/wet from 1.8m	1.1 1.5	
			Very soft greyish brown very sandy SILT. [Tidal Flat Deposits]	1.9 2.0	
			End of pit	2.1 3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.8m bgl.
3. Sides Stable.

Scale:
Date: 21/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 7

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft friable brown / dark brown very sandy Silt. Sand is fine. Rare to frequent plastic artefacts within top 50mm. Frequent roots and rootlets. [Made Ground] Anthropogenic artefacts absent below 0.05m bgl.		
0.2	HSV	12kPa			
			Dark brown / dark grey silty Sand. Sand is fine. Frequent plastic artefacts including polythene and bulk bags, nylon string, frequent metal drinks cans and evidence of a fire including charcoal, burnt paper, and melted plastic. [Made Ground]		
0.5	ES			0.5	
			Orange very gravelly Sand. Sand is fine, gravel is fine to coarse, subrounded of broken brick. [Made Ground]	0.95 1.0	
			Dark grey/black slightly silty, sandy gravel. Sand is fine to medium, gravel is fine to coarse, angular to rounded of ash and quartz. Frequent black/fire damaged timber and tree roots. [Made Ground/Fire Remnants]	1.2	
1.3	ES				
			Firm, friable brownvery sandy SILT. Sand is fine. [Tidal Flat Deposits]	1.4	x x x x x x x x
			Greyish brown mottled dark grey silty SAND. Sand is fine. [Tidal Flat Deposits]	1.5	
1.6	ES B,D		Wet.		
			End of pit	2.0	
				3.0	

General Comments:

1. Excavation terminated at 2m bgl. Approximate excavator depth limit.
2. Groundwater ingress at 1.2m bgl. Possible second strike at 1.5m bgl.
3. Collapse between 1m and 1.4m bgl.

Scale:
Date: 21/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 8

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
0.2	HSV	16kPa	Soft, friable brown / dark brown very sandy Silt. Frequent plastic artefacts including bags, tape, and moulded plastic in upper 0.1m. Occasional timber within upper 0.1m. Frequent roots and rootlets. [Made Ground] Anthropogenic artefacts rare below 0.1m bgl.		
0.6	ES,D		Dark brown silty sand. Sand is fine. Occasional to frequent plastic bags, punnets, propagation cups. Occasional nylon string and rubber bands (not significantly degraded) [Made Ground]	0.5 1.0	
1.6	ES, B		Orangeish brown silty SAND. Sand is fine. [Tidal Flat Deposits]	1.3 1.5	
			Soft greyish brown very sandy SILT. Sand is fine. [Tidal Flat Deposits]	1.8 2.0	
			End of pit	3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.5-1.6m bgl.
3. Sides Stable.

Scale:
Date: 21/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 9

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft, friable brown sandy to very sandy Silt. Rare plastic artefacts (bags) within upper 0.1m. Frequent roots and rootlets. [Made Ground]		
			Anthropogenic materials absent below 0.1m.		
0.3	HSV	22kPa			
0.3	ES				
			Soft, friable dark brown / dark grey very sandy Silt / silty Sand. Occasional plastic bags and broken moulded plastic baskets. Rare ex-situ house bricks. Frequent fine shells and shell fragments. [Made Ground]	0.5	
0.6	HSV	Too friable to test.			
0.8	ES				
			Orangeish brown slightly silty to silty SAND. Sand is fine. [Tidal Flat Deposits]	1.0	
1.2	D				
				1.5	
1.7	ES				
			End of pit	2.0	
				3.0	

General Comments:

1. Excavation terminated at 2m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.7m bgl.
3. Collapse below 0.9m bgl.

Scale:
Date: 21/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 10

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
0.2	HSV	20kPa	Soft, friable brown / dark brown very sandy Silt. Sand is fine. Rare plastic bag fragments in upper 0.1m. Frequent roots and rootlets. [Made Ground]		
0.5	ES		Dark brown very silty sand. Sand is fine. Occasional to frequent plastic bags, moulded plastic plastic banding and metal container fragments. Frequent roots and rootlets. Occasional fine shells and shell fragments. [Made Ground]	0.4 0.5 1.0	
1.3	ES B		Soft, friable orangeish light brown very sandy SILT. Sand is fine. Rare plastic bags in upper 0.1m. Wet below 1.6m bgl.	1.1 1.5	
1.95	D		Very soft, grey ish brown/ dark grey very sandy SILT. Sand is fine. Rare plastic bags in upper 0.1m. Wet	1.9 2.0	
			End of pit	2.1 3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.6m bgl. Possible second strike at 1.9m bgl.
3. Collapse below 1.1m bgl.

Scale:
Date: 22/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 11

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft, friable, brown very sandy Silt / silty Sand. Sand is fine. Occasional boulders of concrete. Frequent roots and rootlets. Occasional fine to medium shells and shell fragments.		
0.2	HSV	30kPa	Firm from 0.3m bgl.		
0.4	HSV	74kPa			
0.5	ES B,D			0.5	
			Firm, dark brown slightly gravelly SILT. Sand is fine. Gravel is fine, angular to subrounded of quartz, feldspar and flint. Frequent fine shells and shell fragments. [Assumed Tidal Flat Deposits]	0.7	
0.8	B		Abundent shells and shell fragments between 1.1m and 1.2m bgl.	1.0	
			Soft, friable orangeish brown very sandy SILT. Sand is fine. Rare plastic bags in upper 0.1m. Damp to wet.	1.2	
1.5	B		Orangeish brown silty SAND. Sand is fine. Rare plastic bags in upper 0.1m. Damp to wet.	1.5	
			Soft, friable orangeish brown very sandy SILT. Sand is fine. Rare plastic bags in upper 0.1m.	1.7	
1.9	D		Grey / dark grey very silty SAND. Sand is fine. Rare plastic bags in upper 0.1m.	1.8	
				2.0	
			End of pit	2.1	
				3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1m bgl. Possible second seepage at 1.8m bgl.
3. Collapse below 1.2m bgl.

Scale:
Date: 22/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 12

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft, friable brown / dark brown very sandy, slightly gravelly Silt. Sand is fine. Gravel is occasional, subangular, coarse of Sandstone. Frequent roots and rootlets. [Made Ground]		
			Plastic artefacts from 0.38m bgl, including plastic propagation cups, plastic bags, and labels.		
0.3	HSV	32kPa	Firm by 0.4m bgl.		
0.3-0.4	ES				
				0.5	
0.6	HSV	44kPa			
			Loose roof slates recovered as dark grey fine to coarse, angular gravel and cobbles. [Made Ground]	0.7	
			Soft, friable, orangeish brown very sandy SILT. Sand is fine. [Tidal Flat Deposits] Damp.	0.9	
				1.0	
1.1	ES B,D				
			Orangeish brown very silty SAND. Sand is fine. [Tidal Flat Deposits] Wet.	1.5	
1.9	D				
				2.0	
			End of pit	2.1	
				3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.5m bgl.
3. Collapse from 1.5m bgl to the base of excavation.

Scale:
Date: 22/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 13

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Dark brown very silty, slightly gravelly Sand. Sand is fine. Gravel is occasional, subangular to subrounded, medium to coarse, of feldspar, sandstone and flint. Frequent roots and rootlets. [Re-worked Topsoil]		
			Firm, friable dark brown very sandy silt. Sand is fine. [Possible Made Ground]	0.2	
0.4	HSV	44kPa			
0.5	ES B,D			0.5	
			Orangeish light brown slightly silty to silty sand. Sand is fine. [Possible Made Ground]	0.6	
			Firm, friable dark brown sandy, slightly gravelly silt. Sand is fine, gravel is fine, subangular to subrounded of mixed lithologies including quartz and flint. Occasional fine shells and shell fragments. Occasional roots and rootlets. [Possible Made Ground]	0.7	
				1.0	
1.1	B,D				
			Black silt. Abundant tree branches (not roots) and organic material. Partially decayed.	1.2	
1.2	B		Organic odour. Very wet. [Possible Made Ground/Former Buried Channel]		
				1.5	
			Greyish brown / dark grey very silty SAND. Sand is fine. [Tidal Flat Deposits]	1.7	
1.7	D				
				2.0	
			End of pit	2.1	
				3.0	

General Comments:

1. Excavation terminated at 2.1m. Approximate excavator depth limit.
2. Groundwater seepage at 1.3m. Rapid ingress at 1.2m
3. Sides Stable.

Scale:
Date: 22/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 14

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
0.2	ES		Brown/dark brown very silty, slightly gravelly sand. Sand is fine. Gravel is occasional, fine to coarse, angular to rounded of sandstone, quartz and flint. Occasional fragments of ceramic pipe, plastic bags and insulation material in upper 0.1m. [Made Ground]		
0.2	ASB		Plastic artefacts at 0.3m (bags)		
			Firm, friable dark brown very sandy silt. Sand is fine. Plastic bag fragments at 0.5m bgl. Occasional to frequent fine shells and shell fragments. [Made Ground]	0.35	
0.4	HSV	50kPa		0.5	
			Ex-situ broken bricks, ceramic tiles, metal reinforcing bar and plastic pipework within a dark brown/orange gravelly sand matrix. Sand is fine to coarse, gravel is medium to coarse, angular of broken bricks. [Made Ground - Building Rubble]	0.6	
0.8	ES	(Matrix)		1.0	
			Orangeish light brown slightly silty to silty SAND. Sand is fine. [Possible Made Ground]	1.05	
1.1	B		Damp from 1.6m bgl.		
			Very silty from 1.8m bgl.	1.5	
2.1	D		Very soft orangeish light brown very sandy SILT. [Possible Made Ground] Wet.	2.0	
			End of pit.	2.1	
				3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.6m bgl.
3. Collapse from 0.6m bgl.

Scale:
Date: 22/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 15

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft, friable, brown / dark brown very sandy Silt. Sand is fine. Frequent roots and rootlets. [Re-worked Topsoil]		
0.2	HSV	28kPa			
			Soft, friable orangeish brown sandy to very sandy SILT. Sand is fine. [Tidal Flat Deposits]	0.45	
0.5	ES			0.5	
	B,D				
0.6	HSV	24kPa			
			Orangeish brown silty to very silty SAND. Sand is fine. [Tidal Flat Deposits] Damp.	0.8	
			Wet from 1.3m.	1.0	
1.5	D			1.5	
2.0	D			2.0	
			End of pit	3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.2m bgl.
3. Collapse to base from 0.8m bgl.

Scale:
Date: 22/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 16

Client: Kirk Homes
Sheet:
Project: Pinchbeck, Spalding
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
0.4	ES		Dark brown very silty, slightly gravelly to gravelly sand. Sand is fine. Gravel is medium to coarse, occasional cobbles of rounded to subangular quartz, sandstone and flint. Frequent fine to coarse fragments of brick, glass, and plastic (unlike other landfill types). Frequent roots and rootlets. Plastic bag fragments at 0.4m. Frequent housebricks and buidling rubble in southern third of the pit. [Made Ground]	0.5	
0.8	ES		Dark brown slightly gravelly sand. Sand is medium to coarse, gravel is fine, angular to subrounded of mixed lithologies. Frequent perlite spheres. Occasional fragments of plastic plant pots. Frequent roots and rootlets. [Made Ground]	0.7	
			Dark brown very silty, slightly gravelly to gravelly sand. Sand is fine. Gravel is medium to coarse, occasional cobbles of rounded to subangular quartz, sandstone and flint. Frequent brick rubble including ex-situ brickwork in southern third of pit. Frequent plastic bags and artefacts in northern two thirds. Metal pipework at 1.0m. [Made Ground]	0.9 1.0	
1.4	ES B,D		Soft, friable greyish brown clayey, slightly sandy SILT. Sand is fine.	1.2 1.5	
1.8	D		Orangeish brown very silty SAND. Sand is fine.	1.6	
2.0	D		Greyish brown very silty SAND.	1.9 2.0	
				2.1 3.0	

General Comments:

1. Excavation terminated at 2.1m. Approximate excavator depth limit.
2. Groundwater seepage at 1.4m.
3. Collapse to base from 1.3m.

Scale:
Date: 22/01/2019
Logged by: SW
Checked:
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 17

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft brown / dark brown very sandy Silt. Sand is fine. Frequent roots and rootlets. [Re-worked Topsoil]		
0.3	HSV	32kPa			
			Loose, friable orangeish light brown clayey, silty SAND. Sand is fine. [Tidal Flat Deposits]	0.4	
0.5	ES, B,D			0.5	
1.0	HSV	34kPa		1.0	
			Orangeish light brown silty SAND. Sand is fine. [Tidal Flat Deposits]	1.1	
1.5	D			1.5	
			Firm, friable greyish brown very sandy SILT. Sand is fine. [Tidal Flat Deposits]		
			Wet.		
1.9	B,D			2.0	
			End of pit	3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.6m bgl.
3. Collapse to base from 1.3m bgl.

Scale:
Date: 22/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 18

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft friable brown/dark brown very sandy, very gravelly Silt. Sand is fine. Frequent roots and rootlets. Gravel is fine, rounded of quartz. [Re-worked Topsoil]		
0.4	HSV	28kPa			
0.4	ES			0.5	
			Firm friable orangeish light brown very sandy SILT. Sand is fine. [Tidal Flat Deposits]	0.6	
0.8	HSV	Too friable to test.		1.0	
			Orangeish light brown/brown slightly silty to silty SAND. Sand is fine.[Tidal Flat Deposits]	1.3	
1.5	ES, D			1.5	
			End of pit.	1.9	
				2.0	
				3.0	

General Comments:

1. Excavation terminated at 1.9m bgl.
2. Groundwater seepage at 1.5m bgl.
3. Sides Stable.

Scale:
Date: 22/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 19

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft brown / dark brown sandy, clayey very gravelly Silt. Sand is fine to coarse, Gravel is fine to coarse, frequent cobbles of angular broken brick, breezeblock, asphalt, timber metal springs, quartz and flint. Occasional ceramic pipe fragment, occasional plastic.		
0.3	ES		Frequent roots and rootlets [Made Ground]		
			Hardstanding obstruction at 0.6m bgl in southof the excavation. Extended to the north.		
			Concrete hardstanding in north of pit at 0.6m - penetrated.		
			Plyboard sheet at 1m bgl.		
			Concrete hardstanding at 1m bgl in northern section of excavation.	0.5	
			Brick rubble throughout the layer.		
				1.0	
			Soft, dark grey friable silty, slightly gravelly CLAY. Gravel is occasional fine, rounded of quartz. Frequent roots and rootlets, occasional fine shells and shell fragments. [Tidal Flat Deposits]	1.2	
1.3	ES, D			1.5	
			Firm, friable greyish dark brown very sandy SILT. Sand is fine. [Tidal Flat Deposits]	1.6	
1.8	D				
			Soft, greyish brown very sandy SILT. Sand is fine. [Tidal Flat Deposits]	1.9	
				2.0	
			End of pit		
				3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.9m bgl.
3. Collapse to base from 1.5m bgl.

Scale:
Date: 22/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 20

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft, friable brown / dark brown very sandy Silt. Sand is fine. Frequent roots and rootlets. [Re-worked Topsoil]		
0.3	HSV	32kPa			
0.45	ES B,D		Firm, orangeish light brown very sandy SILT. Sand is fine. [Tidal Flat Deposits]	0.45	
				0.5	
			Orangeish light brown silty SAND. Sand is fine. [Tidal Flat Deposits]	0.7	
1.2	B,D		Firm, orangeish light brown very sandy SILT. Sand is fine. [Tidal Flat Deposits] Damp/Wet.	1.0	
			Orangeish light brown silty SAND. Sand is fine. [Tidal Flat Deposits] Damp	1.3	
1.5	B			1.5	
			Firm, greyish brown very sandy SILT. Sand is fine. [Tidal Flat Deposits]	1.7	
1.8	D		Very wet.		
				2.0	
			End of pit	2.1	
				3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.55m bgl.
3. Collapse to base from 1.3m bgl.

Scale:
Date: 23/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Trial Pit Log

TP No: 21

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet:
Method: 3T Rubber Tracked Excavator

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
			Soft, friable brown / dark brown very sandy Silt. Sand is fine. Frequent roots and rootlets. [Re-worked Topsoil]		
0.25	HSV	32kPa			
0.4	ES				
			Firm, friable orangeish light brown sandy to very sandy SILT. Sand is fine. [Tidal Flat Deposits]	0.45	
0.5	B,D			0.5	
			Orangeish light brown very silty SAND. Sand is fine. [Tidal Flat Deposits]		
				1.0	
			Firm, friable orangeish light brown sandy to very sandy SILT. Sand is fine. [Tidal Flat Deposits]	1.2	
			Orangeish light brown very silty SAND. Sand is fine. [Tidal Flat Deposits]	1.3	
1.4	B		Wet.		
				1.5	
1.9	ES, D				
				2.0	
			End of pit.		
				3.0	

General Comments:

1. Excavation terminated at 2.1m bgl. Approximate excavator depth limit.
2. Groundwater seepage at 1.2m bgl.
3. Collapse to base from 0.9m bgl.

Scale:
Date: 23/01/2019
Logged by: SW
Checked: MPS
Job No: R18012

Grange Geo Consulting Ltd

Super Heavy Dynamic Probe Log

DP No: **5**

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
1.0	DP	0,0,0,1,0,1,1,1,0,1		1.0	
2.0	DP	0,0,0,0,0,1,0,1,0,1		2.0	
3.0	DP	2,2,2,1,0,1,1,2,2,2		3.0	
4.0	DP	2,3,2,2,2,2,3,3,3,3		4.0	
5.0	DP	4,4,3,3,3,3,3,3,3,2		5.0	
6.0	DP	3,4,6,5,6,6,7,7,7,7		6.0	
7.0	DP	10,10,12,11,11,10,10,11,12,12		7.0	
8.0	DP	13,12,12,12,15,15,15,17,18,18		8.0	
				9.0	
				10.0	

General Comments:

1. Probing terminated at 9m bgl.
2. Probing commenced from surface level, adjacent the corresponding WS Excavation

Scale:
Date: 24/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Super Heavy Dynamic Probe Log

DP No: **6**

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
				1.0	
				2.0	
				3.0	
4.0	DP	0,0,2,3,2,2,3,4,4,4		4.0	
5.0	DP	3,3,3,3,3,2,3,3,3,3		5.0	
6.0	DP	3,4,4,5,5,4,5,5,5,5		6.0	
7.0	DP	4,4,4,5,9,10,10,12,13,13		7.0	
8.0	DP	13,13,13,14,14,15,14,14,16,16		8.0	
				9.0	
				10.0	

General Comments:

1. Probing terminated at 9m bgl.
2. Probing commenced at the base of corresponding WS Excavation.

Scale:
Date: 23/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Super Heavy Dynamic Probe Log

DP No: **9**

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Type	Testing result	Description	Depth mBGL	Legend
1.0	DP	0,0,1,0,1,0,1,0,0,1		1.0	
2.0	DP	1,2,3,3,2,3,3,2,1,1		2.0	
3.0	DP	2,1,1,1,1,2,1,1,1,1		3.0	
4.0	DP	2,2,2,4,5,6,5,4,4,4		4.0	
5.0	DP	5,4,3,3,3,3,3,4,3,3		5.0	
6.0	DP	3,4,3,3,4,5,5,4,4,4		6.0	
7.0	DP	5,5,6,5,5,7,7,8,8,8		7.0	
8.0	DP	7,6,7,7,7,11,12,12,15,19		8.0	
				9.0	
				10.0	

General Comments:

1. Probing terminated at 9m bgl.
2. Probing commenced from surface level.

Scale:
Date: 23/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Super Heavy Dynamic Probe Log

DP No: 10

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
4.0	DP	0,0,2,2,1,2,2,2,2,1		1.0	
5.0	DP	2,1,2,2,2,4,4,3,3,3		2.0	
6.0	DP	4,4,3,3,3,5,4,4,4,4		3.0	
7.0	DP	5,3,5,8,9,9,11,11,12,11		4.0	
8.0	DP	13,13,13,14,12,11,11,11,12,11		5.0	
				6.0	
				7.0	
				8.0	
				9.0	
				10.0	

General Comments:

1. Probing terminated at 9m bgl.
2. Probing commenced at the base of corresponding WS Excavation.

Scale:
Date: 23/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Super Heavy Dynamic Probe Log

DP No: 12

Client: Kirk Homes
Project: Pinchbeck, Spalding

Sheet: 1 of 1
Method: Window Sampling

Sample Depth (m)	Sample Type	Testing result	Description	Depth mBGL	Legend
4.0	DP	0,2,3,2,2,3,3,3,4,3		4.0	
5.0	DP	4,5,4,3,2,2,4,4,5,5		5.0	
6.0	DP	3,3,3,2,3,3,4,4,4,3		6.0	
7.0	DP	3,4,4,4,5,4,3,3,8,8		7.0	
8.0	DP	12,10,8,8,9,9,8,8,8,8		8.0	

1.0
2.0
3.0
9.0
10.0

General Comments:

1. Probing terminated at 9m bgl.
2. Probing commenced at the base of corresponding WS Excavation.

Scale:
Date: 23/01/2019
Logged by: SW
Checked: MPS
Job No: R18102

Grange Geo Consulting Ltd

Grange Geo GAS AND GROUNDWATER MONITORING

Site:		Pinchbeck
Client:		
Job No.:		R18012
Date:		25/01/2019
Start / End Time:		10am
Engineer:		A.Cowley
Monitoring Equipment:	**Gas Meter ID**	**GG001**
	PID ID	
	Dip Tape	**In-Situ 30m**
	Other	

NR = Not Recorded
Dry = No Groundwater

Weather Conditions	**Start**	**End**
(Dry / Raining)	dry	dry
Cloud Cover (Oktas)	6/8	6/8
Wind Strength (mph)	9.0	9.0
Wind Direction (from)	sw	sw
Temperature (°C)	10.0	10.0
Barometric Pressure (mb)	1011	1011
(Rising/ Falling)		
PID - Air	0	
PID - Calibration Gas	100	

Location Reference	**Relative Pressure (mbar)**	**Flow (l/hr)**		**Methane (%v/v)**		**Carbon Dioxide (%v/v)**		**Oxygen (%v/v)**		**Hydrogen Sulphide (ppm)**	**Carbon Monoxide (ppm)**		**Depth to water (m)**	**Base of Response Zone (m)**	**Free-Phase Product Level Top (m)**	**Groundwater Elevation (m AOD)**	**Notes**
		Peak	**Steady**	**Peak**	**Steady**	**Peak**	**Steady**	**Min**	**Steady**								
Ambient Air Start (Calibration)																	
Ambient Air Finish (Calibration)																	
WS7		4.8	4.6	0.1	0.1	2.0	2.0	19.8	19.8				0.79				
WS12		0.0	0.0	0.1	0.1	1.7	1.7	17.4	17.4				1.10				
WS10		0.0	0.0	0.1	0.1	1.7	1.7	19.5	19.5				1.10				
WS8		0.0	0.0	0.1	0.1	0.4	0.4	20.2	20.2				1.35				
WS2		0.0	0.0	0.2	0.2	2.0	2.0	15.3	15.4				1.10				
WS3		0.9	0.8	0.1	0.1	2.4	2.4	18.0	18.0				1.10				
WS4		0.0	0.0	0.1	0.1	3.2	3.1	7.2	7.4				1.05				
WS5		0.0	0.0	0.1	0.1	1.6	1.6	19.4	19.4				0.98				
WS1		0.0	0.0	0.3	0.3	1.0	1.0	19.3	19.3				0.95				

Grange Geo GAS AND GROUNDWATER MONITORING

Site:		Pinchbeck
Client:		
Job No.:		R18012
Date:		31/01/2019
Start / End Time:		11am
Engineer:		A.Cowley
Monitoring Equipment:	**Gas Meter ID**	**GG001**
	PID ID	
	Dip Tape	**30 m**
	Other	

NR = Not Recorded
Dry = No Groundwater

Weather Conditions	**Start**	**End**
(Dry / Raining)	dry	dry
Cloud Cover (Oktas)	4/8	5/8
Wind Strength (mph)	14.0	14.0
Wind Direction (from)	ese	ese
Temperature (°C)	4.0	4.0
Barometric Pressure (mb)	988	987
(Rising/ Falling)		
PID - Air	0	
PID - Calibration Gas		

Location Reference	**Relative Pressure (mbar)**	**Flow (l/hr)**		**Methane (%v/v)**		**Carbon Dioxide (%v/v)**		**Oxygen (%v/v)**		**Hydrogen Sulphide (ppm)**	**Carbon Monoxide (ppm)**	**PID (ppm)**	**Depth to water (m)**	**Base of Response Zone (m)**	**Free-Phase Product Level Top (m)**	**Groundwater Elevation (m AOD)**	**Notes**
		Peak	**Steady**	**Peak**	**Steady**	**Peak**	**Steady**	**Min**	**Steady**								
Ambient Air Start (Calibration)																	
Ambient Air Finish (Calibration)																	
WS7		7.6	7.0	0.1	0.1	3.4	3.4	18.2	18.2				0.80				
WS12		0.0	0.0	0.1	0.1	1.5	1.5	17.8	17.8				1.12				
WS10		0.0	0.0	0.1	0.1	3.4	3.4	17.2	17.2				1.12				
WS8		0.0	0.0	0.1	0.1	0.5	0.5	19.6	19.6				1.33				
WS2		0.0	0.0	0.2	0.2	2.5	2.5	13.9	14.0				1.11				
WS3		1.3	1.2	0.1	0.1	2.6	2.6	18.1	18.2				1.13				
WS4		0.0	0.0	0.1	0.1	4.4	4.4	6.5	6.5				1.06				
WS5		0.0	0.0	0.1	0.1	0.8	0.8	19.9	19.9				1.00				
WS1		0.0	0.0	0.2	0.2	1.3	1.3	19.5	19.5				0.99				

Grange Geo GAS AND GROUNDWATER MONITORING

Site:		Pinchbeck
Client:		
Job No.:		R18012
Date:		05/02/2019
Start / End Time:		2pm
Engineer:		A.Hare
Monitoring Equipment:	**Gas Meter ID**	**GG001**
	PID ID	
	Dip Tape	**In-Situ 30m**
	Other	

NR = Not Recorded
Dry = No Groundwater

Weather Conditions	**Start**	**End**
(Dry / Raining)	dry	dry
Cloud Cover (Oktas)	8/8	8/8
Wind Strength (mph)	10.0	10.0
Wind Direction (from)	S	S
Temperature (°C)	7.0	7.0
Barometric Pressure (mb)	1022	1021
(Rising/ Falling)	rising	
PID - Air		
PID - Calibration Gas		

Location Reference	**Relative Pressure (mbar)**	**Flow (l/hr)**		**Methane (%v/v)**		**Carbon Dioxide (%v/v)**		**Oxygen (%v/v)**		**Hydrogen Sulphide (ppm)**	**Carbon Monoxide (ppm)**	**PID (ppm)**	**Depth to water (m)**	**Base of Response Zone (m)**	**Free-Phase Product Level Top (m)**	**Groundwater Elevation (m AOD)**	**Notes**
		Peak	**Steady**	**Peak**	**Steady**	**Peak**	**Steady**	**Min**	**Steady**								
Ambient Air Start (Calibration)																	
Ambient Air Finish (Calibration)																	
WS7		3.2	3.2	0.1	0.1	4.4	4.4	19.5	19.5				0.76				
WS12		0.0	0.0	0.1	0.1	2.1	2.1	18.6	18.6				1.14				
WS10		0.0	0.0	0.1	0.1	2.7	2.7	17.2	17.2				1.05				
WS8		0.0	0.0	0.1	0.1	0.3	0.3	19.8	19.8				1.37				
WS2		0.0	0.0	0.1	0.1	2.2	2.2	14.8	14.8				1.14				
WS3		0.0	0.0	0.1	0.1	2.9	2.8	18.5	18.5				1.11				
WS4		0.0	0.0	0.1	0.1	3.8	3.8	9.2	9.2				1.07				
WS5		0.0	0.0	0.1	0.1	0.8	0.8	19.8	19.8				1.02				
WS1		0.0	0.0	0.1	0.1	1.2	1.2	19.0	19.0				0.99				

Site:		Pinchbeck
Client:		
Job No.:		R18012
Date:		13/02/2019
Start / End Time:		1pm
Engineer:		A.Hare
Monitoring Equipment:	**Gas Meter ID**	**GG001**
	PID ID	
	Dip Tape	**In-Situ 30m**
	Other	

NR = Not Recorded
Dry = No Groundwater

Weather Conditions	**Start**	**End**
(Dry / Raining)	dry	dry
Cloud Cover (Oktas)	2/8	2/8
Wind Strength (mph)	14.0	15.0
Wind Direction (from)	S	S
Temperature (°C)	11.0	11.0
Barometric Pressure (mb)	1030	1030
(Rising/ Falling)	falling	
PID - Air	0	
PID - Calibration Gas	100	

Location Reference	**Relative Pressure (mbar)**	**Flow (l/hr)**		**Methane (%v/v)**		**Carbon Dioxide (%v/v)**		**Oxygen (%v/v)**		**Hydrogen Sulphide (ppm)**	**Carbon Monoxide (ppm)**	**PID (ppm)**	**Depth to water (m)**	**Base of Response Zone (m)**	**Free-Phase Product Level Top (m)**	**Groundwater Elevation (m AOD)**	**Notes**
		Peak	**Steady**	**Peak**	**Steady**	**Peak**	**Steady**	**Min**	**Steady**								
WS7		9.8	9.4	0.1	0.1	5.3	5.3	18.0	18.0				0.82				
WS12		0.0	0.0	0.1	0.1	1.8	1.8	18.8	18.8				1.14				
WS10		0.0	0.0	0.1	0.1	7.2	7.2	16.3	16.3				1.08				
WS8		0.0	0.0	0.1	0.1	0.7	0.7	20.0	20.0				1.30				
WS2		0.0	0.0	0.1	0.1	3.1	3.1	12.6	12.6				1.12				
WS3		0.0	0.0	0.1	0.1	3.2	3.2	18.3	18.3				1.09				
WS4		0.0	0.0	0.1	0.1	5.5	5.5	3.1	3.1				1.03				
WS5		0.0	0.0	0.1	0.1	0.1	0.1	20.5	20.5				1.00				
WS1		0.0	0.0	0.1	0.1	0.8	0.8	19.9	19.9				0.98				

GAS AND GROUNDWATER MONITORING

Site:		Pinchbeck
Client:		
Job No.:		R18012
Date:		21/02/2019
Start / End Time:		1pm
Engineer:		A.Hare
Monitoring Equipment:	**Gas Meter ID**	**GG01**
	PID ID	
	Dip Tape	
	Other	

NR = Not Recorded
Dry = No Groundwater

Weather Conditions	**Start**	**End**
(Dry / Raining)	dry	dry
Cloud Cover (Oktas)	1/8	1/8
Wind Strength (m/s)	12.0	12.0
Wind Direction (from)	wsw	wsw
Temperature (°C)	13.0	13.0
Barometric Pressure (mb)	1025	1026
(Rising/ Falling)	stable	
PID - Air		
PID - Calibration Gas		

Location Reference	**Relative Pressure (mbar)**	**Flow (l/hr)**		**Methane (%v/v)**		**Carbon Dioxide (%v/v)**		**Oxygen (%v/v)**		**Hydrogen Sulphide (ppm)**	**Carbon Monoxide (ppm)**	**PID (ppm)**	**Depth to water (m)**	**Base of Response Zone (m)**	**Free-Phase Product Level Top (m)**	**Groundwater Elevation (m AOD)**	**Notes**
		Peak	**Steady**	**Peak**	**Steady**	**Peak**	**Steady**	**Min**	**Steady**								
Ambient Air Start (Calibration)																	
Ambient Air Finish (Calibration)																	
WS7		9.8	9.4	0.1	0.1	5.3	5.3	18.0	18.0				0.82				
WS12		0.0	0.0	0.1	0.1	1.8	1.8	18.8	18.8				1.14				
WS10		0.0	0.0	0.1	0.1	7.2	7.2	16.3	16.3				1.08				
WS8		0.0	0.0	0.1	0.1	0.7	0.7	20.0	20.0				1.30				
WS2		0.0	0.0	0.1	0.1	3.1	3.1	12.6	12.6				1.12				
WS3		0.0	0.0	0.1	0.1	3.2	3.2	18.3	18.3				1.09				
WS4		0.0	0.0	0.1	0.1	5.5	5.5	3.1	3.1				1.03				
WS5		0.0	0.0	0.1	0.1	0.1	0.1	20.5	20.5				1.00				
WS1		0.0	0.0	0.1	0.1	0.8	0.8	19.9	19.9				0.98				

GAS AND GROUNDWATER MONITORING

Site:		Pinchbeck
Client:		
Job No.:		R18012
Date:		28/02/2019
Start / End Time:		1pm
Engineer:		A.Hare
Monitoring Equipment:	**Gas Meter ID**	**GG01**
	PID ID	
	Dip Tape	
	Other	

NR = Not Recorded
Dry = No Groundwater

Weather Conditions	**Start**	**End**
(Dry / Raining)	raining	raining
Cloud Cover (Oktas)	8/8	8/8
Wind Strength (m/s)	9.0	9.0
Wind Direction (from)	wsw	wsw
Temperature (°C)	11.0	11.0
Barometric Pressure (mb)	1014	1013
(Rising/ Falling)	falling	
PID - Air		
PID - Calibration Gas		

Location Reference	**Relative Pressure (mbar)**	**Flow (l/hr)**		**Methane (%v/v)**		**Carbon Dioxide (%v/v)**		**Oxygen (%v/v)**		**Hydrogen Sulphide (ppm)**	**Carbon Monoxide (ppm)**	**PID (ppm)**	**Depth to water (m)**	**Base of Response Zone (m)**	**Free-Phase Product Level Top (m)**	**Groundwater Elevation (m AOD)**	**Notes**
		Peak	**Steady**	**Peak**	**Steady**	**Peak**	**Steady**	**Min**	**Steady**								
Ambient Air Start (Calibration)																	
Ambient Air Finish (Calibration)																	
WS7		11.2	10.0	0.1	0.1	4.3	4.2	18.2	18.2				0.80				
WS12		0.0	0.0	0.1	0.1	1.5	1.5	19.0	19.0				1.12				
WS10		0.0	0.0	0.1	0.1	4.4	4.3	18.8	18.8				1.12				
WS8		0.0	0.0	0.1	0.1	0.5	0.5	20.1	20.1				1.33			-1.33	
WS2		0.0	0.0	0.1	0.1	2.2	2.2	15.7	15.7				1.08			-1.08	
WS3		0.0	0.0	0.1	0.1	2.6	2.6	18.2	18.2				1.12			-1.12	
WS4		0.0	0.0	0.1	0.1	3.5	3.5	6.9	6.9				1.07			-1.07	
WS5		0.0	0.0	0.1	0.1	0.9	0.9	19.9	19.9				1.02			-1.02	
WS1		0.0	0.0	0.2	0.2	0.9	0.9	19.8	19.8				0.98			-0.98	

Appendix F

GRANGE GEOCONSULTING LTD METHODOLOGY

RISK ASSESSMENT RATIONALE

The work presented in this report has been carried out in general accordance with recognised best practice as detailed in guidance documents such as in BS5930:1999 and BS10175:2001. Important aspects of the risk assessment process are transparency and justification. The rationale behind the risk assessments presented is given in this appendix.

A preliminary risk assessment is made of both geotechnical and geo-environmental hazards identified at the desk study stage and confirmed (or amended) at the ground investigation stage. This is based on a simple matrix of probability of occurrence versus the consequence, as explained below. In the case of geo-environmental hazards, the risk assessment process proceeds to the next level, the generic risk assessment, in which actual contaminant concentrations are considered.

Preliminary Risk Assessment (Geotechnical Risk Register)

The preliminary geotechnical risk register is compiled in accordance with the Highways Agency Design Manual for Roads and Bridges HD/02. This requires an estimation of the *probability* of an event happening multiplied by the *impact* or consequences of that event. Five levels of probability and impact are given scores, and these are multiplied to give a risk rating and a qualitative risk level is assigned as in Table A, based on the terminology of Clayton (2001).

Table A: Geotechnical Risk Rating

Assessment of Geotechnical Risks (Risk Register)				
Probability (P)	**Impact (I)**	**Impact in terms of cost or time (% of construction cost or time)**	**Risk Rating (R = P x I)**	**Risk Level**
Very likely (5)	Very High (5)	>25%	17 to 25	Intolerable
Likely (4)	High (4)	10 to 25%	13 to 16	Intolerable
Probable (3)	Medium (3)	4 to 10%	9 to 12	Substantial
Unlikely (2)	Low (2)	1 to 4%	5 to 8	Tolerable
Negligible (1)	Very Low (1)	<1%	1 to 4	Trivial

Preliminary Risk Assessment (Geoenvironmental Consequences and Probability)

The Preliminary Risk Assessment includes a geo-environmental Hazard Identification, which seeks to list all the suspected contaminant **sources**, the **receptors** that might be harmed by those sources and the **pathways** via which the sources might reach the receptors to cause the harm. The source-pathway-receptor concept is known as a pollution linkage, and only when a linkage is complete is there any possibility of risk of harm arising.

The Hazard Identification evaluates all the **possible** pollution linkages in tabular form. Professional judgement is then used to evaluate which of these pollution linkages may be considered as **plausible**. Plausible pollution linkages are unacceptable risks in terms of the current contaminated land regime legal framework and require either remediation or further assessment. These are normally addressed via intrusive ground investigation and the chemical analysis of soil and water samples.

Where no plausible linkage identified, the linkage is classed as ‘no linkage’ in the summary table and no further action is required. If a linkage is plausible, a comparison is made of consequence against probability in general accordance with the guidance given in CIRIA Report C552 (Rudland *et al* 2001). Classification of consequences and probability are given in CIRIA C552 Tables 6.3 and 6.4, respectively, but there are

several inconsistencies in the original Table 6.3, in particular relating to 'significant harm or significant possibility of significant harm' (SH/SPOSH). Consequently, the table has been updated by Grange GeoConsulting Ltd in line with current practice and is given in Table B below. Also added are scores from 1 to 4 for each category.

The basis of the classification is that 'severe' and 'major' are likely to result in SH/SPOSH as defined by the EPA 1990, Part 2A, with 'severe' resulting in acute harm. 'Moderate' lies below the level of SH/SPOSH but above the level of 'no harm' as implied by the relevant Generic assessment criterion (GAC, see below). Minor lies below the 'no harm' level.

Table B: Classification of Consequences of Geoenvironmental Risks

Classification of Consequences for Geoenvironmental Risks		
Classification	**Definition**	**Examples**
Severe (4 points)	Concentration of contaminants is likely to (or is known from previous data to) exceed that indicative of unacceptable intake or contact. I.e. >>SH/SPOSH, concentrations are high enough to cause acute (short-term) effects.	Human health: short-term (acute) effects likely to result in significant harm. E.g. high conc. of cyanide at the surface of an informal recreational area. Planting: complete and rapid die-back of landscaped areas. Controlled waters: short-term pollution, e.g. major spillage into controlled water. Buildings etc.: catastrophic damage, e.g. explosion causing collapse. Ecosystems: short-term risk to an ecosystem or organism forming part of that ecosystem in a designated protected area, e.g. by contamination spillage. Site workers: risk assessment required to determine PPE and this may involve USEPA Level A, B or C protection.
Major (3 points)	Concentration of contaminants is likely to (or is known from previous data to) exceed that indicative of unacceptable intake or contact. I.e. >SH/SPOSH.	Human health: long-term (chronic) effects likely to result in significant harm. E.g. high conc. of contaminants close to the surface of a development site. Planting: stressed or dead plants in landscaped areas. Controlled waters: pollution of sensitive water resources, e.g. leaching into major or minor aquifers or rivers. Buildings etc.: damage renders unsafe to occupy. Ecosystems: death of species in an ecosystem in a designated protected area, e.g. by contamination spillage. Site workers: risk assessment required to determine PPE and this may involve USEPA Level B, C or D protection.

Classification of Consequences for Geoenvironmental Risks		
Classification	**Definition**	**Examples**
Moderate (2 points)	Concentration of contaminants is likely to (or is known from previous data to) exceed that indicative of no harm but not unacceptable intake or contact. I.e. >SVG/GAC but <SH/SPOSH.	Human health: harm but probably not significant harm unless particularly sensitive individual within the receptor group. May be aesthetic/olfactory impacts. Planting: damage to plants in landscaped areas, e.g. stunted growth, discoloration. Controlled waters: pollution of non-sensitive water bodies e.g. leaching into non-classified groundwater or minor ditches. Buildings etc.: damage to sensitive buildings etc. Ecosystems: minor change in an ecosystem in a designated protected area, but not significant harm. Site workers: risk assessment required to determine PPE and this may involve USEPA Level C or D protection.
Minor (1 point)	Concentration of contaminants is likely to (or is known from previous data to) be less than that indicative of no harm. I.e. <SGV/GAC.	No measurable effects, but simple PPE required (USEPA Level D protection, i.e. overalls, boots, goggles, hard hat).

CIRIA Table 6.4 is reproduced as Table C below, but also with the addition of scores from 1 to 4. This provides an estimate of the probability that the event described by the pollution linkage will occur. For example, the likelihood that pollution of groundwater will occur by leaching of metals into the aquifer.

Table C: Classification of Probability of Geoenvironmental Risks

Classification of Probability of Geoenvironmental Risks	
Classification	**Definition**
High (4 points)	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.
Medium (3 points)	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 in not inevitable, but possible in the short term and likely over the long term.
Low (2 points)	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is no means certain that even over a longer period such event could take place, and is less likely in the shorter term.
Unlikely (1 point)	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

The perceived level of risk for each pathway is then derived from the probability versus consequences matrix, modified after CIRIA C552 Table 6.5, given in Table D. The scores are summed accordingly, and the result assigned a risk level by dividing the range between the minimum score of 1 and the maximum score of 16 equally into 5 categories i.e. 1 to <4 is very low risk, 4 to <7 is low risk, 7 to <10 is moderate risk, 10 to <13 is high risk and 13 to 16 is very high risk.

Table D: Qualitative Risk Level from Consequence and Probability

		Consequence			
		Severe (4)	**Major (3)**	**Moderate (2)**	**Minor (1)**
Probability	**High (4)**	16 = Very high risk	12 = High risk	8 = Moderate risk	4 = Low risk
	Medium (3)	12 = High risk	9 = Moderate risk	6 = Low risk	3 = Very low risk
	Low (2)	8 = Moderate risk	6 = Low risk	4 = Low risk	2 = Very low risk
	Unlikely (1)	4 = Low risk	3 = Very low risk	2 = Very low risk	1 = Very low risk

This approach assumes an equivalence between probability and consequences and ignores the difficulty that can arise where to probability of occurrence appears to be almost negligible but the consequences are very severe. In such conditions, there is a degree of subjectivity in assessing the level of risk and it could be low, moderate or high. Such risks may require specialist consideration beyond the scope of this standard report.

A description of the classified risks and the likely action required can be determined from Table E.

Table E: Description of the Classified Risks and Likely Action Required

Description of Classified Risks and Likely Action Required	
Very High Risk	A significant pollution linkage, including actual evidence of significant harm or significant possibility and significant harm, is clearly identifiable at the site (e.g. from visual or documentary evidence) under current conditions, with potential for legal and/or financial consequences for the site owner or other Responsible Person. Remediation advisable based on acute impacts being likely. Immediate action should be considered.
High Risk	A pollution linkage is identifiable at the site under current and future use conditions. Although likely, there is no obvious actual evidence of significant harm or significant possibility and significant harm under current conditions. Extent of risk is therefore subject to confirmation by investigation and risk assessment and most likely to be deemed significant. Remediation required for redevelopment and may also be required under Part 2A for existing receptors.
Moderate Risk	A pollution linkage is identifiable at the site under current and future use conditions. However, it is not likely to be a significant linkage under current conditions. Actual extent of risk subject to confirmation by additional investigation and risk assessment and most likely to lie between no possibility of harm (under current conditions) and significant possibility of significant harm (under conditions created by new use). Remediation may be required for redevelopment.
Low risk	Potential pathways and receptors exist but history of contaminative use or site conditions indicates that contamination is likely to be of limited extent and below the level of no possibility of harm. Precautionary investigations and risk assessment advisable on change of use.
Very Low Risk	No pollution linkage likely to exist under current or future conditions. Site not capable of being determined under Part 2A (in accordance with PPS23) where the Local Authority inspects the site. No further action recommended.

Contaminant Analysis of Samples

CLR 8 (Environment Agency 2002b), the DoE Industry Profile documents and ISO10381-5 provide good summaries of priority pollutants for UK sites. Additionally, the Environment Agency has produced a list of priority pollutants for ecological risk assessment in a consultation document (Environment Agency 2003a). These documents have been used, with the findings of the Phase 1 investigation, to scope the analyses of chemicals of potential concern. Grange GeoConsulting Ltd considers there to be a minimum requirement for soil chemical analysis, even for Greenfield sites, to satisfy the 'suitable for use' criterion of the planning regime. The GAC adopted by Grange GeoConsulting Ltd for the site are given in Table F.

There is no safe acceptable level for asbestos in soils, detect or non-detect is recorded with asbestos quantification undertaken on samples found to contain asbestos.

Table F presents the Generic Assessment Criteria (GAC) for the residential with plant uptake (including the consumption of home-grown produce)**.**

Table F: GAC for residential with plant uptake (including the consumption of home-grown produce)

Based on a 1% Soil Organic Matter Content (conservative approach) and SGVs, C4SL and S4UL values

Heavy Metals	
Cyanide	4.6
Arsenic	32
Beryllium	1.7
Boron	290
Cadmium	10
Chromium	627
Chromium VI	4.3
Copper	2330
Lead	200
Mercury (elemental)	1
Mercury (inorganic)	40
Nickel	130
Selenium	250
Vanadium	75
Zinc	3700
BTEX	
Benzene	0.087
Toluene	130
Ethyl Benzene	47
m/p Xylenes	56
o Xylenes	60
Xylenes	56
Speciated PAHs	
Naphthalene	1.5
Acenaphthylene	170
Acenaphthene	210
Fluorene	160
Phenanthrene	92
Anthracene	2300
Fluoranthene	260
Pyrene	560
Benzo[a]anthracene	3.1
Chrysene	6
Benzo[b]fluoranthene	2.6
Benzo[k]fluoranthene	8.5
Benzo[a]pyrene	2.2
Indeno[123-cd]pyrene	3.2
Dibenzo[ah]anthracene	0.24

Benzo[ghi]perylene	44
Asbestos	
Asbestos	Non-detected
Speciated TPH	
Aliphatic C5 - C6	30
Aliphatic C6 - C8	73
Aliphatic C8 - C10	19
Aliphatic C10 - C12	93
Aliphatic C12 - C16	740
Aliphatic C16 - C21	45000
Aliphatic C21 - C35	45000
Aromatic C5 - C7	65
Aromatic C7 - 8	120
Aromatic C8 - C10	27
Aromatic C10 - 12	69
Aromatic C12 - C16	140
Aromatic C16 - C21	250
Aromatic C21 - C35	890

Appendix G

CONTAMINATION TESTING RESULTS

Andrew Hare
Grange Geo Consulting Ltd
43 Winchilsea Avenue
Newark
Notts
NG24 4AD

e: andrew.hare@grangegeo.co.uk

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

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-27129

Replaces Analytical Report Number : 19-27129, issue no. 2

Project / Site name:	Pinchbeck	**Samples received on:**	28/01/2019
Your job number:	R18012	**Samples instructed on:**	31/01/2019
Your order number:		**Analysis completed by:**	06/03/2019
Report Issue Number:	3	**Report issued on:**	10/07/2019
Samples Analysed:	2 bulk samples - 30 soil samples - 2 water samples		

Signed:

Rexona Rahman
Head of Customer Services
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

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145255	1145256	1145257	1145258	1145259
Sample Reference				TP8	TP8	TP9	TP9	TP9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	1.60	0.30	0.80	1.70
Date Sampled				21/01/2019	21/01/2019	21/01/2019	21/01/2019	21/01/2019
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	17	21	19	36	22
Total mass of sample received	kg	0.001	NONE	1.1	1.3	1.3	0.99	1.4
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0	8.4	8.0	7.8	8.4
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Organic Matter	%	0.1	MCERTS	2.5	1.2	2.0	8.8	0.3
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.48	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.40	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	0.88	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	8.7	9.5	21	4.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.3	0.3	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	11	17	14	7.6
Copper (aqua regia extractable)	mg/kg	1	MCERTS	28	5.6	12	14	2.7
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	5.6	12	31	3.9
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	0.8
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	9.4	15	11	6.0
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	32	18	24	23	14
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	49	24	45	46	18

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Depth (m)				0.60	1.60	0.30	0.80	1.70
Date Sampled				21/01/2019	21/01/2019	21/01/2019	21/01/2019	21/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/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-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
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	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
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	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	< 10	-

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Sample Reference				TP8	TP8	TP9	TP9	TP9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	1.60	0.30	0.80	1.70
Date Sampled				21/01/2019	21/01/2019	21/01/2019	21/01/2019	21/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Lab Sample Number				1145255	1145256	1145257	1145258	1145259
Sample Reference				TP8	TP8	TP9	TP9	TP9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	1.60	0.30	0.80	1.70
Date Sampled				21/01/2019	21/01/2019	21/01/2019	21/01/2019	21/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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Lab Sample Number				1145255	1145256	1145257	1145258	1145259
Sample Reference				TP8	TP8	TP9	TP9	TP9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	1.60	0.30	0.80	1.70
Date Sampled				21/01/2019	21/01/2019	21/01/2019	21/01/2019	21/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145260	1145261	1145262	1145263	1145264
Sample Reference				TP10	TP11	TP12	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.30-0.40	0.50	0.20
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	22/01/2019
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	16	16	17	15	19
Total mass of sample received	kg	0.001	NONE	1.1	1.1	0.96	1.8	0.95
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	7.9	7.6	8.0	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Organic Matter	%	0.1	MCERTS	2.4	3.1	4.6	2.2	3.7
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	16	31	18	14
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	1.7	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	21	26	23	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	11	39	53	46	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	17	21	190	24	34
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	18	15	21	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	25	31	21	42	34
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	46	56	390	58	69

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145260	1145261	1145262	1145263	1145264
Sample Reference				TP10	TP11	TP12	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.30-0.40	0.50	0.20
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	22/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	< 2.0	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	< 8.0	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	< 8.0	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	< 10	-	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	< 2.0	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	< 10	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	-	22	-	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	24	-	< 10

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Lab Sample Number				1145260	1145261	1145262	1145263	1145264
Sample Reference				TP10	TP11	TP12	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.30-0.40	0.50	0.20
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	22/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145260	1145261	1145262	1145263	1145264
Sample Reference				TP10	TP11	TP12	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.30-0.40	0.50	0.20
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	22/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	-	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145260	1145261	1145262	1145263	1145264
Sample Reference				TP10	TP11	TP12	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.30-0.40	0.50	0.20
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	22/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	Absent	-	-	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145265	1145266	1145267	1145268	1145269
Sample Reference				TP14	WS11	TP1	TP2	TP2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.30-0.50	0.20	0.15	0.75
Date Sampled				22/01/2019	24/01/2019	21/01/2019	21/01/2019	21/01/2019
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	18	18	20	20	20
Total mass of sample received	kg	0.001	NONE	1.1	1.4	1.1	1.5	0.57
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	8.3	8.1	8.1	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	2
Organic Matter	%	0.1	MCERTS	3.2	3.8	2.6	2.7	6.9
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.84	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.5	< 0.05	< 0.05	0.42
Pyrene	mg/kg	0.05	MCERTS	< 0.05	1.4	< 0.05	< 0.05	0.38
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.51	< 0.05	< 0.05	0.20
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.69	< 0.05	< 0.05	0.25
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.3	< 0.05	< 0.05	0.39
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.28	< 0.05	< 0.05	0.20
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.68	< 0.05	< 0.05	0.33
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.42	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.51	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	8.06	< 0.80	< 0.80	2.17
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	15	13	8.8	12
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.4	< 0.2	0.3	1.3
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	14	13	13	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	58	38	8.5	12	44
Lead (aqua regia extractable)	mg/kg	1	MCERTS	50	210	15	12	39
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	1.0	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	15	12	12	15
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	4.7	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	34	28	24	23	26
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	220	50	45	140

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145265	1145266	1145267	1145268	1145269
Sample Reference				TP14	WS11	TP1	TP2	TP2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.30-0.50	0.20	0.15	0.75
Date Sampled				22/01/2019	24/01/2019	21/01/2019	21/01/2019	21/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145265	1145266	1145267	1145268	1145269
Sample Reference				TP14	WS11	TP1	TP2	TP2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.30-0.50	0.20	0.15	0.75
Date Sampled				22/01/2019	24/01/2019	21/01/2019	21/01/2019	21/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145265	1145266	1145267	1145268	1145269
Sample Reference				TP14	WS11	TP1	TP2	TP2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.30-0.50	0.20	0.15	0.75
Date Sampled				22/01/2019	24/01/2019	21/01/2019	21/01/2019	21/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145265	1145266	1145267	1145268	1145269
Sample Reference				TP14	WS11	TP1	TP2	TP2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.30-0.50	0.20	0.15	0.75
Date Sampled				22/01/2019	24/01/2019	21/01/2019	21/01/2019	21/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	Absent	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145270	1145271	1145272	1145273	1145274
Sample Reference				TP2	TP3	TP4	TP4	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.20	0.40	1.80	0.60
Date Sampled				21/01/2019	21/01/2019	21/01/2019	21/01/2019	21/01/2019
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	22	18	18	23	16
Total mass of sample received	kg	0.001	NONE	1.3	0.72	0.64	0.70	1.2
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	8.0	8.0	8.3	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	6
Organic Matter	%	0.1	MCERTS	0.3	2.7	2.7	0.5	2.6
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.92
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.98
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.24
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.62
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.70
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.27
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.37
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.31
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.46
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	4.87
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.6	9.1	11	6.4	13
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.6	0.7	< 0.2	1.0
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	7.7	16	16	11	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	4.0	13	15	5.5	18
Lead (aqua regia extractable)	mg/kg	1	MCERTS	3.9	15	17	5.7	27
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	6.9	14	15	8.0	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	15	26	27	16	29
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	18	50	55	21	67

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145270	1145271	1145272	1145273	1145274
Sample Reference				TP2	TP3	TP4	TP4	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.20	0.40	1.80	0.60
Date Sampled				21/01/2019	21/01/2019	21/01/2019	21/01/2019	21/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	< 10

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145270	1145271	1145272	1145273	1145274
Sample Reference				TP2	TP3	TP4	TP4	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.20	0.40	1.80	0.60
Date Sampled				21/01/2019	21/01/2019	21/01/2019	21/01/2019	21/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Chloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,1,2-Tetrachloroethane	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
Styrene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Tribromomethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145270	1145271	1145272	1145273	1145274
Sample Reference				TP2	TP3	TP4	TP4	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.20	0.40	1.80	0.60
Date Sampled				21/01/2019	21/01/2019	21/01/2019	21/01/2019	21/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.92
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.98
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.24
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.62
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.70
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.27
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.37
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.31
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	0.46

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145270	1145271	1145272	1145273	1145274
Sample Reference				TP2	TP3	TP4	TP4	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.80	0.20	0.40	1.80	0.60
Date Sampled				21/01/2019	21/01/2019	21/01/2019	21/01/2019	21/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	< 0.001	-	-	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	-	< 0.001	-	-	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	-	< 0.001	-	-	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	-	< 0.001	-	-	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	-	< 0.001	-	-	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	-	< 0.001	-	-	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	-	< 0.001	-	-	< 0.001
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	< 0.007	-	-	< 0.007
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	Absent	-	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145275	1145276	1145277	1145278	1145279
Sample Reference				TP6	TP7	TP7	TP15	TP16
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.50	1.30	0.50	0.40
Date Sampled				21/01/2019	21/01/2019	21/01/2019	22/01/2019	22/01/2019
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	19	20	40	20	16
Total mass of sample received	kg	0.001	NONE	1.1	1.1	0.83	1.3	1.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	7.7	7.4	8.4	7.9
Total Cyanide	mg/kg	1	MCERTS	-	< 1	< 1	< 1	< 1
Organic Matter	%	0.1	MCERTS	-	4.0	12	0.4	2.9
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	0.82	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	1.2	< 0.05	< 0.05	0.77
Pyrene	mg/kg	0.05	MCERTS	-	0.93	< 0.05	< 0.05	0.71
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	0.25	< 0.05	< 0.05	0.20
Chrysene	mg/kg	0.05	MCERTS	-	0.56	< 0.05	< 0.05	0.56
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	0.36	< 0.05	< 0.05	0.50
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	0.16	< 0.05	< 0.05	0.21
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	0.34
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	4.31	< 0.80	< 0.80	3.29
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	12	9.4	7.1	9.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	1.2	8.8	< 0.2	0.3
Chromium (hexavalent)	mg/kg	4	MCERTS	-	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	17	20	9.7	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	16	27	4.8	29
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	15	22	5.4	150
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	0.9	2.7	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	13	16	8.2	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	25	31	17	24
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	43	66	20	92

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145275	1145276	1145277	1145278	1145279
Sample Reference				TP6	TP7	TP7	TP15	TP16
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.50	1.30	0.50	0.40
Date Sampled				21/01/2019	21/01/2019	21/01/2019	22/01/2019	22/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
o-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8.0	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145275	1145276	1145277	1145278	1145279
Sample Reference				TP6	TP7	TP7	TP15	TP16
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.50	1.30	0.50	0.40
Date Sampled				21/01/2019	21/01/2019	21/01/2019	22/01/2019	22/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Chloroethane	µg/kg	1	NONE	-	< 1.0	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	-
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Styrene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Tribromomethane	µg/kg	1	NONE	-	< 1.0	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145275	1145276	1145277	1145278	1145279
Sample Reference				TP6	TP7	TP7	TP15	TP16
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.50	1.30	0.50	0.40
Date Sampled				21/01/2019	21/01/2019	21/01/2019	22/01/2019	22/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	< 0.1	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	0.82	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	1.2	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	0.93	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	0.25	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	0.56	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	0.36	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	0.16	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145275	1145276	1145277	1145278	1145279
Sample Reference				TP6	TP7	TP7	TP15	TP16
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.50	1.30	0.50	0.40
Date Sampled				21/01/2019	21/01/2019	21/01/2019	22/01/2019	22/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	< 0.007	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	Absent	-	-	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145280	1145281	1145282	1145283	1145284
Sample Reference				TP16	TP18	TP19	TP19	TP21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.40	0.30	1.20	0.40
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	23/01/2019
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	25	16	13	27	17
Total mass of sample received	kg	0.001	NONE	0.90	1.7	1.7	1.6	1.6
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile & Amosite	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.002	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	0.002	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	7.5	8.0	7.7	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Organic Matter	%	0.1	MCERTS	7.5	1.9	1.7	2.5	1.5
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.85	< 0.05	0.88	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.85	< 0.05	0.78	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.51	< 0.05	0.22	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.70	< 0.05	0.48	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.2	< 0.05	0.54	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.48	< 0.05	0.19	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.82	< 0.05	0.29	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.64	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.79	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	6.86	< 0.80	3.38	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	11	15	14	8.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.1	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	38	13	19	11	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	380	11	17	16	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	290	21	28	33	18
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	0.6	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	14	16	11	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	1.1
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	27	26	31	20	26
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	320	44	58	35	40

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145280	1145281	1145282	1145283	1145284
Sample Reference				TP16	TP18	TP19	TP19	TP21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.40	0.30	1.20	0.40
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	23/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	< 8.0	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	< 8.0	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	< 10	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	< 10	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	< 10	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	< 10	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145280	1145281	1145282	1145283	1145284
Sample Reference				TP16	TP18	TP19	TP19	TP21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.40	0.30	1.20	0.40
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	23/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145280	1145281	1145282	1145283	1145284
Sample Reference				TP16	TP18	TP19	TP19	TP21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.40	0.30	1.20	0.40
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	23/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145280	1145281	1145282	1145283	1145284
Sample Reference				TP16	TP18	TP19	TP19	TP21
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.40	0.30	1.20	0.40
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	23/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	Absent	-	-	Absent

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Analytical Report Number: 19-27129
Project / Site name: Pinchbeck
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1145280	TP16	0.80	101	Loose Fibres	**Chrysotile & Amosite**	0.002	**0.002**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145287	1145288			
Sample Reference				WS7	WS5			
Sample Number				None Supplied	None Supplied			
Depth (m)				1.50	1.30			
Date Sampled				24/01/2019	24/01/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.1	6.9			
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10			
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10			
Sulphate as SO_4	µg/l	45	ISO 17025	131000	93800			
Sulphate as SO_4	mg/l	0.045	ISO 17025	131	93.8			
Chloride	mg/l	0.15	ISO 17025	35	47			
Fluoride	µg/l	50	ISO 17025	390	530			
Ammonium as NH_4	µg/l	15	ISO 17025	2200	45000			
Nitrate as N	mg/l	0.01	ISO 17025	1.61	0.48			
Nitrate as NO_3	mg/l	0.05	ISO 17025	7.12	2.12			
Nitrite as N	µg/l	1	ISO 17025	490	40			
Nitrite as NO_2	µg/l	5	ISO 17025	1600	130			
Hardness - Total	mgCaCO3/l	1	ISO 17025	804	1220			
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002	< 0.002			
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10			
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16			

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145287	1145288			
Sample Reference				WS7	WS5			
Sample Number				None Supplied	None Supplied			
Depth (m)				1.50	1.30			
Date Sampled				24/01/2019	24/01/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Zinc (total)	µg/l	0.5	ISO 17025	35	11			
Aluminium (dissolved)	ug/l	1	ISO 17025	17	< 1.0			
Antimony (dissolved)	µg/l	0.4	ISO 17025	1.5	2.2			
Arsenic (dissolved)	µg/l	0.15	ISO 17025	2.72	2.78			
Barium (dissolved)	µg/l	0.06	ISO 17025	190	330			
Boron (dissolved)	µg/l	10	ISO 17025	400	440			
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02			
Calcium (dissolved)	mg/l	0.012	ISO 17025	260	410			
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0			
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0			
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.5			
Cobalt (dissolved)	µg/l	0.2	ISO 17025	4.8	4.0			
Copper (dissolved)	µg/l	0.5	ISO 17025	1.2	< 0.5			
Iron (dissolved)	mg/l	0.004	ISO 17025	0.041	0.20			
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2			
Magnesium (dissolved)	mg/l	0.005	ISO 17025	36	47			
Manganese (dissolved)	µg/l	0.05	ISO 17025	1800	1800			
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05			
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	13	4.9			
Nickel (dissolved)	µg/l	0.5	ISO 17025	6.1	4.8			
Selenium (dissolved)	µg/l	0.6	ISO 17025	3.5	3.0			
Silver (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05			
Sodium (dissolved)	mg/l	0.01	ISO 17025	29	58			
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20	< 0.20			
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.6	0.4			
Zinc (dissolved)	µg/l	0.5	ISO 17025	3.6	6.8			

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 19-27129

Project / Site name: Pinchbeck

Lab Sample Number				1145285	1145286			
Sample Reference				TP14	TP1			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.20	1.00			
Date Sampled				Deviating	Deviating			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Bulk Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Asbestos Identification Name	Type	N/A	ISO 17025	No Asbestos Detected	Chrysotile-Hard/Cement Type Material			

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Analytical Report Number : 19-27129

Project / Site name: Pinchbeck

* 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 *
1145255	TP8	None Supplied	0.60	Brown loam and clay with vegetation.
1145256	TP8	None Supplied	1.60	Brown sandy clay.
1145257	TP9	None Supplied	0.30	Brown sandy clay.
1145258	TP9	None Supplied	0.80	Brown sandy clay.
1145259	TP9	None Supplied	1.70	Light brown sandy clay.
1145260	TP10	None Supplied	0.50	Brown loam and clay.
1145261	TP11	None Supplied	0.50	Brown loam and clay.
1145262	TP12	None Supplied	0.30-0.40	Brown loam and clay with vegetation.
1145263	TP13	None Supplied	0.50	Brown clay and loam with vegetation.
1145264	TP14	None Supplied	0.20	Brown loam and clay with vegetation.
1145265	TP14	None Supplied	0.80	Brown clay and loam.
1145266	WS11	None Supplied	0.30-0.50	Brown loam and clay with gravel and vegetation.
1145267	TP1	None Supplied	0.20	Brown loam and clay with vegetation and gravel
1145268	TP2	None Supplied	0.15	Brown loam and clay with vegetation and gravel
1145269	TP2	None Supplied	0.75	Brown loam and clay with gravel.
1145270	TP2	None Supplied	1.80	Brown sand.
1145271	TP3	None Supplied	0.20	Brown sandy clay.
1145272	TP4	None Supplied	0.40	Brown loam and clay with vegetation.
1145273	TP4	None Supplied	1.80	Brown sand.
1145274	TP5	None Supplied	0.60	Brown loam and clay with vegetation.
1145275	TP6	None Supplied	0.25	Brown loam and clay with vegetation.
1145276	TP7	None Supplied	0.50	Brown clay and loam with vegetation.
1145277	TP7	None Supplied	1.30	Black sandy clay with gravel.
1145278	TP15	None Supplied	0.50	Light brown sand.
1145279	TP16	None Supplied	0.40	Brown loam and clay with vegetation.
1145280	TP16	None Supplied	0.80	Black loam and sand with gravel.
1145281	TP18	None Supplied	0.40	Brown loam and sand.
1145282	TP19	None Supplied	0.30	Brown loam and clay with gravel and brick.
1145283	TP19	None Supplied	1.20	Brown sandy clay.
1145284	TP21	None Supplied	0.40	Brown sandy clay.

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Analytical Report Number : 19-27129

Project / Site name: Pinchbeck

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Asbestos identification in Bulks	Asbestos Identification in bulk material with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	W	ISO 17025
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
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
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
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Cr (III) in water	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in soil	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
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
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
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE

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Analytical Report Number : 19-27129

Project / Site name: Pinchbeck

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
Pesticides and Herbicides in soil screening	In-house method	In-house method	L055-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
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
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-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
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
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 in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
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 cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025

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Analytical Report Number : 19-27129

Project / Site name: Pinchbeck

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

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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Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
TP1		B	19-27129	1145286	a			
TP1		S	19-27129	1145267	c	Total cyanide in soil	L080-PL	c
TP10		S	19-27129	1145260	c	Total cyanide in soil	L080-PL	c
TP11		S	19-27129	1145261	c	Total cyanide in soil	L080-PL	c
TP12		S	19-27129	1145262	c	Total cyanide in soil	L080-PL	c
TP13		S	19-27129	1145263	c	Total cyanide in soil	L080-PL	c
TP14		B	19-27129	1145285	a			
TP14		S	19-27129	1145264	c	Total cyanide in soil	L080-PL	c
TP14		S	19-27129	1145265	c	Total cyanide in soil	L080-PL	c
TP15		S	19-27129	1145278	c	Total cyanide in soil	L080-PL	c
TP16		S	19-27129	1145279	c	Total cyanide in soil	L080-PL	c
TP16		S	19-27129	1145280	c	Total cyanide in soil	L080-PL	c
TP18		S	19-27129	1145281	c	Total cyanide in soil	L080-PL	c
TP19		S	19-27129	1145282	c	Total cyanide in soil	L080-PL	c
TP19		S	19-27129	1145283	c	Total cyanide in soil	L080-PL	c
TP2		S	19-27129	1145268	c	Total cyanide in soil	L080-PL	c
TP2		S	19-27129	1145269	bc	Speciated EPA-16 PAHs in soil	L064-PL	b
TP2		S	19-27129	1145269	bc	Total cyanide in soil	L080-PL	c
TP2		S	19-27129	1145270	c	Total cyanide in soil	L080-PL	c
TP21		S	19-27129	1145284	c	Total cyanide in soil	L080-PL	c
TP3		S	19-27129	1145271	bc	PCB's By GC-MS in soil	L027-PL	b
TP3		S	19-27129	1145271	bc	Pesticides and Herbicides in soil screening	L055-PL	b
TP3		S	19-27129	1145271	bc	Semi-volatile organic compounds in soil	L064-PL	b
TP3		S	19-27129	1145271	bc	Speciated EPA-16 PAHs in soil	L064-PL	b
TP3		S	19-27129	1145271	bc	Total cyanide in soil	L080-PL	c
TP3		S	19-27129	1145271	bc	Volatile organic compounds in soil	L073B-PL	b
TP4		S	19-27129	1145272	bc	Speciated EPA-16 PAHs in soil	L064-PL	b
TP4		S	19-27129	1145272	bc	Total cyanide in soil	L080-PL	c
TP4		S	19-27129	1145273	bc	Speciated EPA-16 PAHs in soil	L064-PL	b
TP4		S	19-27129	1145273	bc	Total cyanide in soil	L080-PL	c
TP5		S	19-27129	1145274	c	Total cyanide in soil	L080-PL	c
TP7		S	19-27129	1145276	c	Total cyanide in soil	L080-PL	c
TP7		S	19-27129	1145277	c	Total cyanide in soil	L080-PL	c
TP8		S	19-27129	1145255	c	Total cyanide in soil	L080-PL	c
TP8		S	19-27129	1145256	bc	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP8		S	19-27129	1145256	bc	TPHCWG (Soil)	L088/76-PL	b
TP8		S	19-27129	1145256	bc	Total cyanide in soil	L080-PL	c
TP9		S	19-27129	1145257	c	Total cyanide in soil	L080-PL	c
TP9		S	19-27129	1145258	c	Total cyanide in soil	L080-PL	c
TP9		S	19-27129	1145259	c	Total cyanide in soil	L080-PL	c
WS11		S	19-27129	1145266	c	Total cyanide in soil	L080-PL	c
WS5		W	19-27129	1145288	c	Hexavalent chromium in water	L080-PL	c
WS5		W	19-27129	1145288	c	Ammoniacal Nitrogen as N in water	L082-PL	c
WS5		W	19-27129	1145288	c	Ammonium as NH4 in water	L082-PL	c
WS5		W	19-27129	1145288	c	Boron in water	L039-PL	c
WS5		W	19-27129	1145288	c	Bromate in Water	L008-PL	c
WS5		W	19-27129	1145288	c	Cr (III) in water	L080-PL	c
WS5		W	19-27129	1145288	c	Free cyanide in water	L080-PL	c
WS5		W	19-27129	1145288	c	Metals in water by ICP-MS (dissolved)	L012-PL	c
WS5		W	19-27129	1145288	c	Metals in water by ICP-MS (total)	L012-PL	c
WS5		W	19-27129	1145288	c	Metals in water by ICP-OES (dissolved)	L039-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

WS5		W	19-27129	1145288	c	Nitrate as N in water	L078-PL	c
WS5		W	19-27129	1145288	c	Nitrate in water	L078-PL	c
WS5		W	19-27129	1145288	c	Nitrite as N in water	L082-PL	c
WS5		W	19-27129	1145288	c	Nitrite in water	L082-PL	c
WS5		W	19-27129	1145288	c	Sulphate in water	L039-PL	c
WS5		W	19-27129	1145288	c	Total Hardness of water	L045-PL	c
WS5		W	19-27129	1145288	c	Total cyanide in water	L080-PL	c
WS5		W	19-27129	1145288	c	pH at 20oC in water (automated)	L099-PL	c
WS7		W	19-27129	1145287	c	Hexavalent chromium in water	L080-PL	c
WS7		W	19-27129	1145287	c	Ammoniacal Nitrogen as N in water	L082-PL	c
WS7		W	19-27129	1145287	c	Ammonium as NH4 in water	L082-PL	c
WS7		W	19-27129	1145287	c	Boron in water	L039-PL	c
WS7		W	19-27129	1145287	c	Bromate in Water	L008-PL	c
WS7		W	19-27129	1145287	c	Cr (III) in water	L080-PL	c
WS7		W	19-27129	1145287	c	Free cyanide in water	L080-PL	c
WS7		W	19-27129	1145287	c	Metals in water by ICP-MS (dissolved)	L012-PL	c
WS7		W	19-27129	1145287	c	Metals in water by ICP-MS (total)	L012-PL	c
WS7		W	19-27129	1145287	c	Metals in water by ICP-OES (dissolved)	L039-PL	c
WS7		W	19-27129	1145287	c	Nitrate as N in water	L078-PL	c
WS7		W	19-27129	1145287	c	Nitrate in water	L078-PL	c
WS7		W	19-27129	1145287	c	Nitrite as N in water	L082-PL	c
WS7		W	19-27129	1145287	c	Nitrite in water	L082-PL	c
WS7		W	19-27129	1145287	c	Sulphate in water	L039-PL	c
WS7		W	19-27129	1145287	c	Total Hardness of water	L045-PL	c
WS7		W	19-27129	1145287	c	Total cyanide in water	L080-PL	c
WS7		W	19-27129	1145287	c	pH at 20oC in water (automated)	L099-PL	c

Andrew Hare
Grange Geo Consulting Ltd
43 Winchilsea Avenue
Newark
Notts
NG24 4AD

e: andrew.hare@grangegeo.co.uk

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

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-27228

Replaces Analytical Report Number : 19-27228, issue no. 1

Project / Site name:	Pinchbeck	**Samples received on:**	28/01/2019
Your job number:	R18012	**Samples instructed on:**	31/01/2019
Your order number:		**Analysis completed by:**	13/02/2019
Report Issue Number:	2	**Report issued on:**	10/07/2019
Samples Analysed:	8 soil samples		

Signed:

Rexona Rahman
Head of Customer Services
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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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 19-27228

Project / Site name: Pinchbeck

Lab Sample Number				1146002	1146003	1146004	1146005	1146006
Sample Reference				WS1	WS2	WS4	WS8	WS10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.00-3.45	1.20-1.50	1.50-2.00	0.80-1.00	0.80-1.00
Date Sampled				24/01/2019	24/01/2019	24/01/2019	23/01/2019	23/01/2019
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	20	20	24	19	18
Total mass of sample received	kg	0.001	NONE	0.30	0.29	0.36	0.35	0.30
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.3	8.0	8.1	8.0	7.8
Total Sulphate as SO_4	%	0.005	MCERTS	0.048	0.046	0.062	0.041	0.092
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.12	0.070	0.14	0.032	0.031
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	21	6.0	9.1	2.5	4.0
Total Sulphur	%	0.005	MCERTS	0.041	0.025	0.050	0.021	0.081
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	11	2.9	5.8	2.7
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	20	20	28	15	18
Magnesium (leachate equivalent)	mg/l	2.5	NONE	9.9	10	14	7.4	8.8

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

Analytical Report Number: 19-27228

Project / Site name: Pinchbeck

Lab Sample Number				1146007	1146008	1146009		
Sample Reference				WS10	WS12	TP17		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				2.20-2.50	1.00-1.45	0.50		
Date Sampled				23/01/2019	23/01/2019	22/01/2019		
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	23	20	20		
Total mass of sample received	kg	0.001	NONE	0.35	0.34	0.39		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	8.5	8.4		
Total Sulphate as SO_4	%	0.005	MCERTS	0.064	0.036	0.028		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.14	0.065	0.019		
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	7.5	3.5	4.1		
Total Sulphur	%	0.005	MCERTS	0.073	0.015	0.018		
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	4.4	4.2		
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	35	14	8.7		
Magnesium (leachate equivalent)	mg/l	2.5	NONE	18	6.8	4.3		

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Analytical Report Number : 19-27228

Project / Site name: Pinchbeck

* 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 *
1146002	WS1	None Supplied	3.00-3.45	Brown sand.
1146003	WS2	None Supplied	1.20-1.50	Light brown sand.
1146004	WS4	None Supplied	1.50-2.00	Brown sand.
1146005	WS8	None Supplied	0.80-1.00	Light brown sand.
1146006	WS10	None Supplied	0.80-1.00	Brown loam and clay with vegetation and gravel
1146007	WS10	None Supplied	2.20-2.50	Grey sand.
1146008	WS12	None Supplied	1.00-1.45	Light brown sand with vegetation.
1146009	TP17	None Supplied	0.50	Light brown sand.

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Analytical Report Number : 19-27228

Project / Site name: Pinchbeck

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
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
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
Total Sulphate in soil as %	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
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE

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 H

GEOTECHNICAL TESTING RESULTS

TEST CERTIFICATE

Liquid and Plastic Limits

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

4041

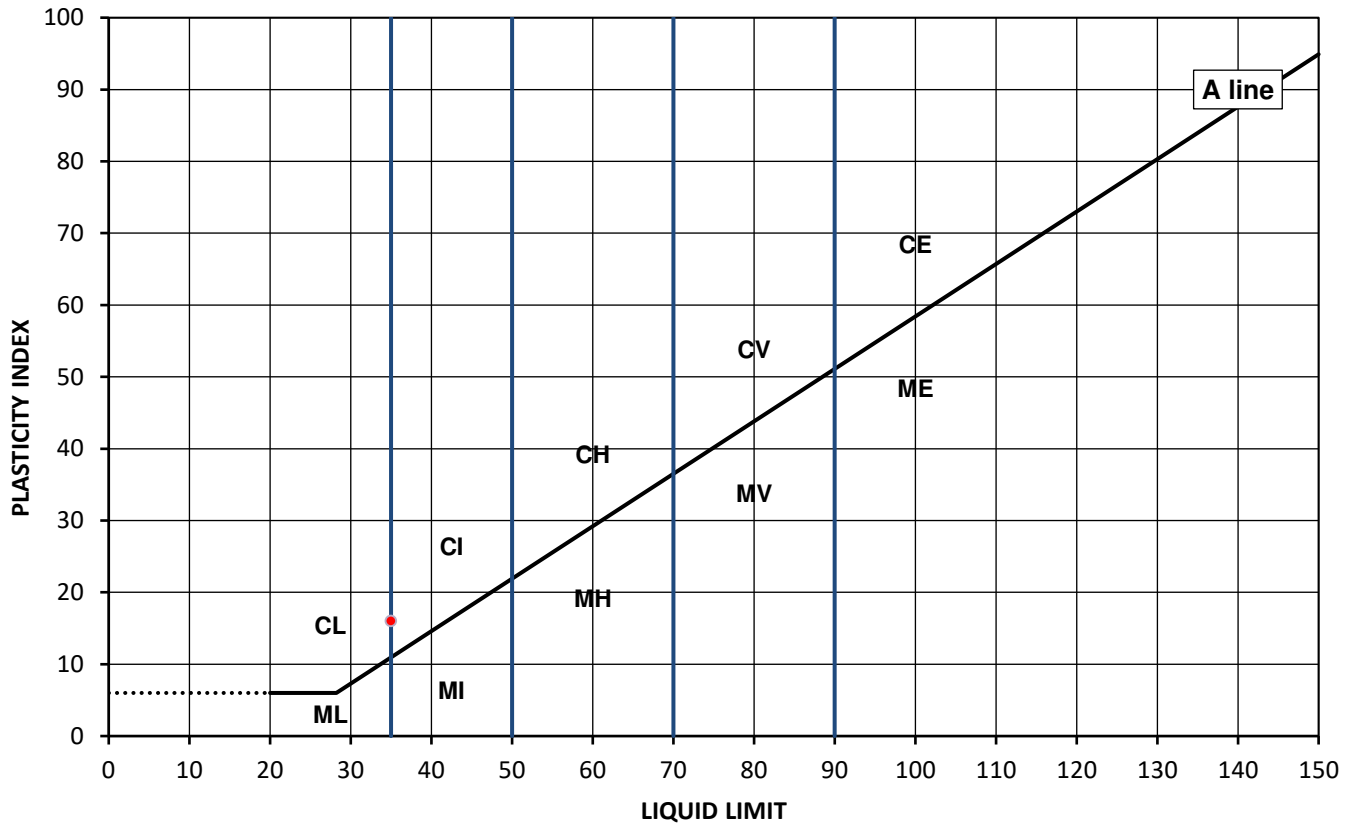
Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	23/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results

Laboratory Reference:	1145855	Depth Top [m]:	0.80
Hole No.:	WS8	Depth Base [m]:	1.00
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly clayey silty SAND		
Sample Preparation:	Tested after washing to remove >425um		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
23	35	19	16	96



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

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

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 232.3

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Liquid and Plastic Limits

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

UKAS TESTING 4041

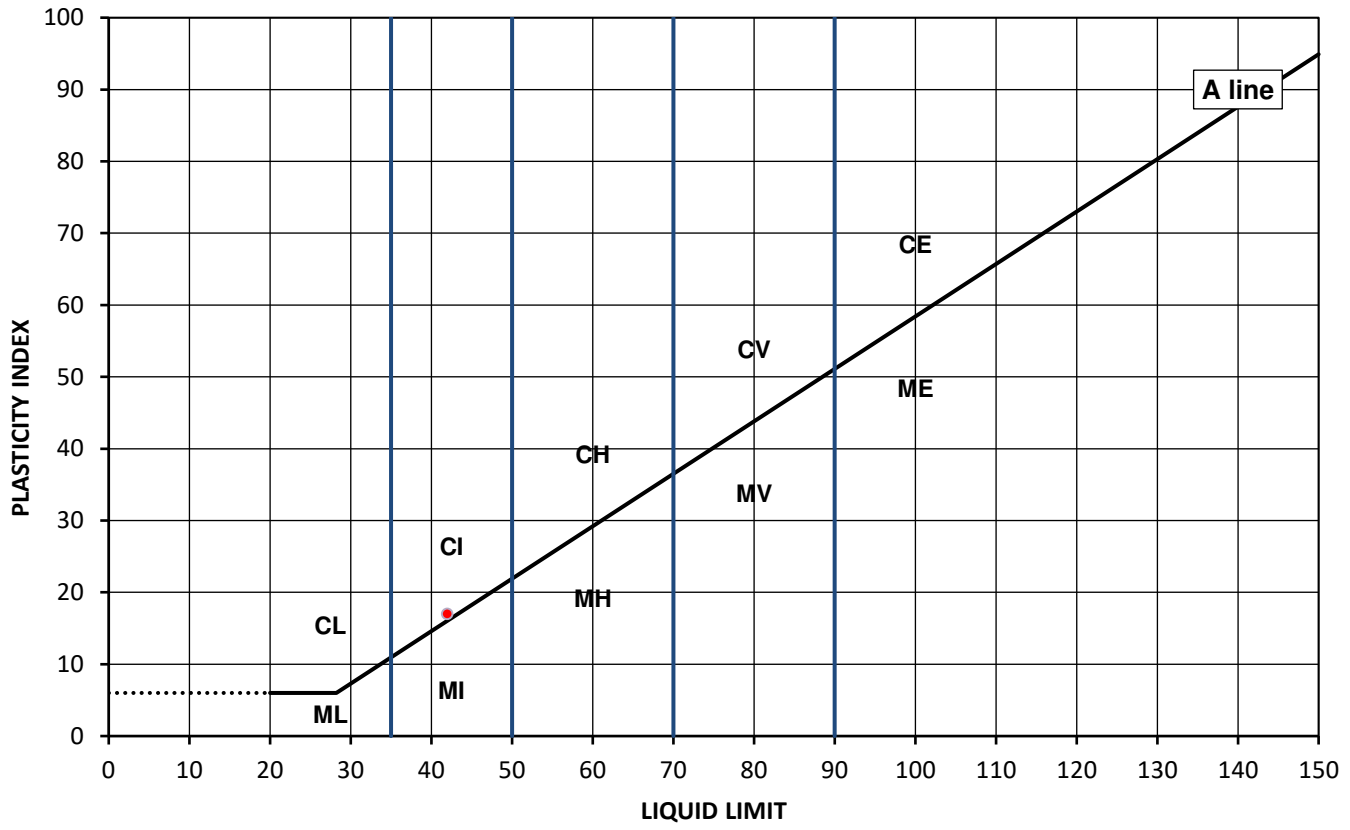
Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	23/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results

Laboratory Reference:	1145856	Depth Top [m]:	0.80
Hole No.:	WS10	Depth Base [m]:	1.00
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Dark brown slightly gravelly clayey sandy SILT		
Sample Preparation:	Tested after washing to remove >425um		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
25	42	25	17	92



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

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

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 232.3

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for and on behalf of i2 Analytical Ltd

SUMMARY REPORT

Summary of Classification Test Results

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

UKAS TESTING 4041

Tested in Accordance with:

MC by BS 1377-2: 1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3, Clause 4.4 and 5; PD by BS 1377-2: 1990: Clause 8.2

Client: Grange Geo Consulting Ltd

Client Address: 43 Winchilsea Avenue, Newark, Notts, NG24 4AD

Contact: Andrew Hare

Site Name: Pinchbeck

Site Address: Not Given

Client Reference: R18012

Job Number: 19-27208

Date Sampled: 23/01/2019

Date Received: 28/01/2019

Date Tested: 07/02/2019

Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC#	Atterberg#				Density		Total Porosity				
		Reference	Depth Top	Depth Base	Type				% Passing 425um	LL	PL	PI	bulk	PD					
			m	m				%	%	%	%	%	Mg/m3	Mg/m3	%				
1145856	WS10	Not Given	0.80	1.00	D	Dark brown slightly gravelly clayey sandy SILT	Atterberg 1 Point	25	92	42	25	17							
1145859	WS12	Not Given	1.00	1.45	U	Brown SILT		27											
1145854	WS7	Not Given	1.00	1.45	U	Brown clayey silty SAND		31											
1145855	WS8	Not Given	0.80	1.00	D	Brown slightly gravelly clayey silty SAND	Atterberg 1 Point	23	96	35	19	16							

Note: # UKAS accredited; NP - Non plastic

Comments: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 234.5

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for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Particle Size Distribution

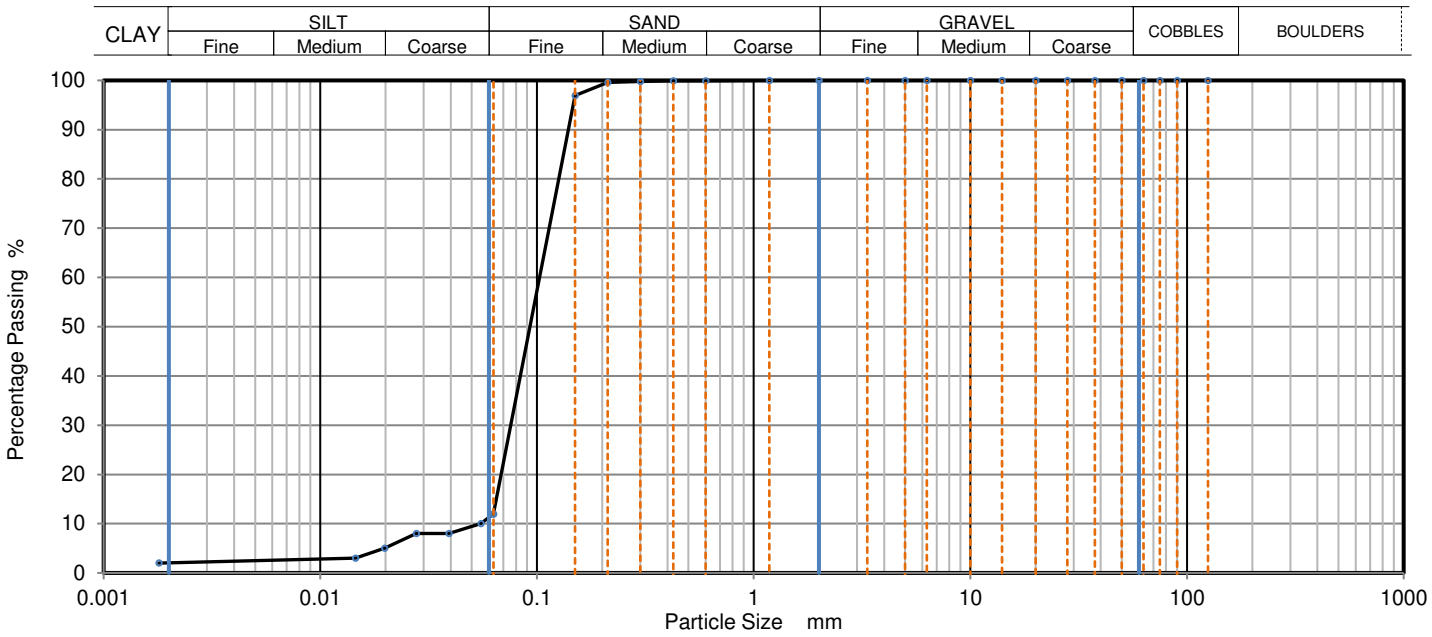
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	24/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1145849	Depth Top [m]:	3.00
Hole No.:	WS1	Depth Base [m]:	3.45
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown slightly clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	12
90	100	0.0551	10
75	100	0.0392	8
63	100	0.0277	8
50	100	0.0198	5
37.5	100	0.0145	3
28	100	0.0018	2
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density	(assumed)
0.425	100	2.65	Mg/m3
0.3	100		
0.212	100		
0.15	97		
0.063	12		

Dry Mass of sample [g]: 881

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	88.20
Silt	10.00
Clay	1.80

Grading Analysis		
D100	mm	2
D60	mm	0.103
D30	mm	0.0759
D10	mm	0.0538
Uniformity Coefficient		1.9
Curvature Coefficient		1

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

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for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Particle Size Distribution

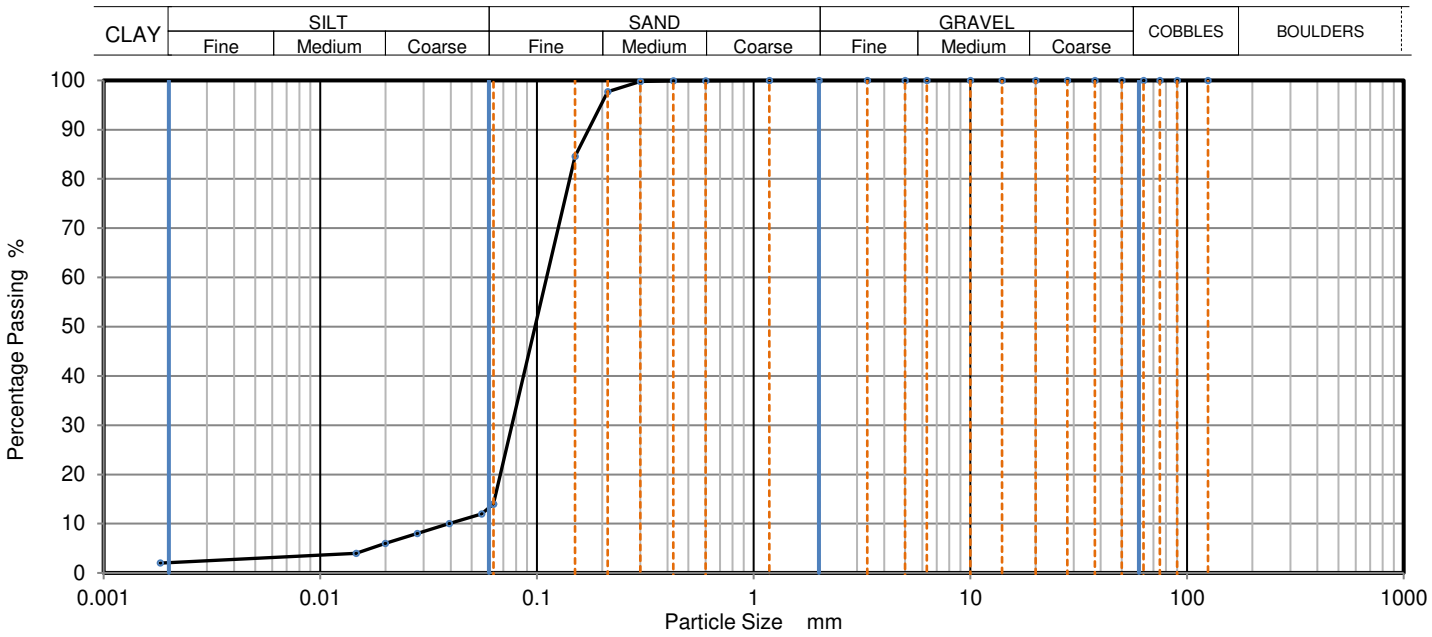
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	24/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1145850	Depth Top [m]:	1.20
Hole No.:	WS2	Depth Base [m]:	1.50
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown slightly clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	14
90	100	0.0555	12
75	100	0.0394	10
63	100	0.0280	8
50	100	0.0199	6
37.5	100	0.0146	4
28	100	0.0018	2
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density	(assumed)
0.425	100	2.65	Mg/m3
0.3	100		
0.212	98		
0.15	85		
0.063	14		

Dry Mass of sample [g]: 379

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	85.60
Silt	12.30
Clay	2.10

Grading Analysis		
D100	mm	2
D60	mm	0.111
D30	mm	0.0764
D10	mm	0.0376
Uniformity Coefficient		2.9
Curvature Coefficient		1.4

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

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for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Particle Size Distribution

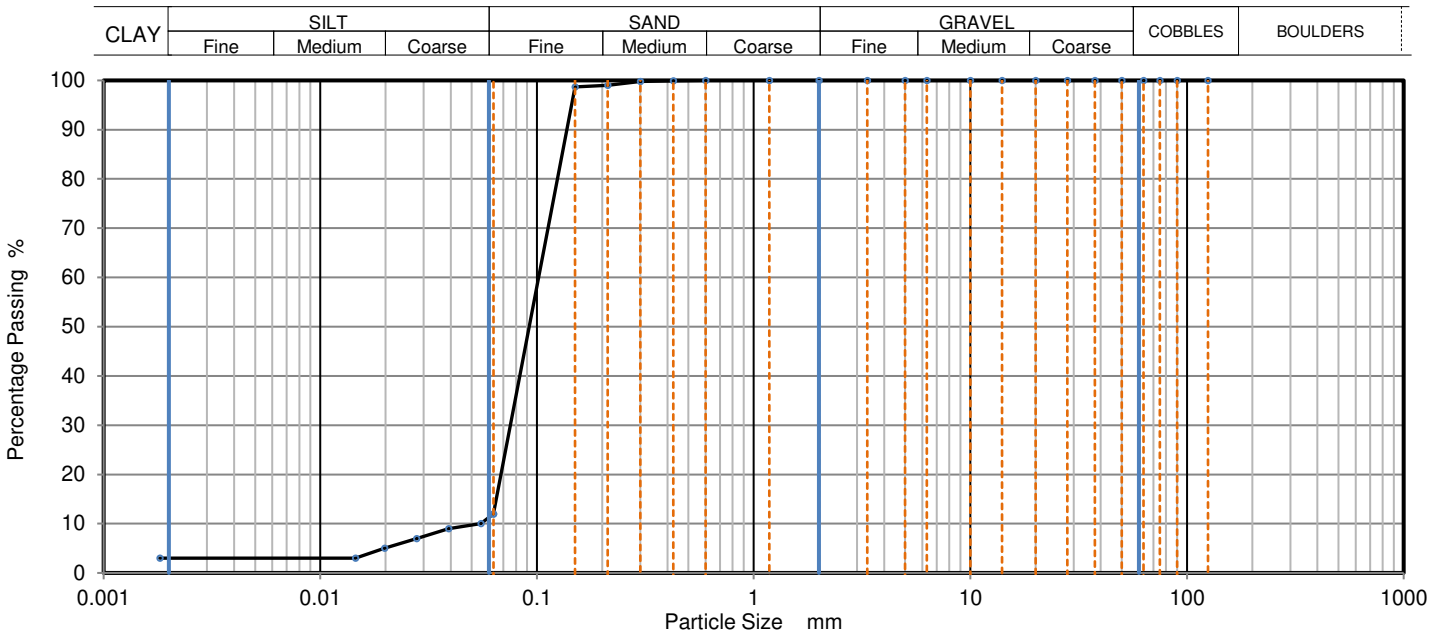
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	24/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1145851	Depth Top [m]:	2.50
Hole No.:	WS3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Greyish brown slightly clayey slightly silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	12
90	100	0.0551	10
75	100	0.0391	9
63	100	0.0278	7
50	100	0.0198	5
37.5	100	0.0145	3
28	100	0.0018	3
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density	(assumed)
0.425	100	2.65	Mg/m3
0.3	100		
0.212	99		
0.15	99		
0.063	12		

Dry Mass of sample [g]: 385

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	87.90
Silt	8.60
Clay	3.50

Grading Analysis		
D100	mm	2
D60	mm	0.102
D30	mm	0.0753
D10	mm	0.0512
Uniformity Coefficient		2
Curvature Coefficient		1.1

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

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for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Particle Size Distribution

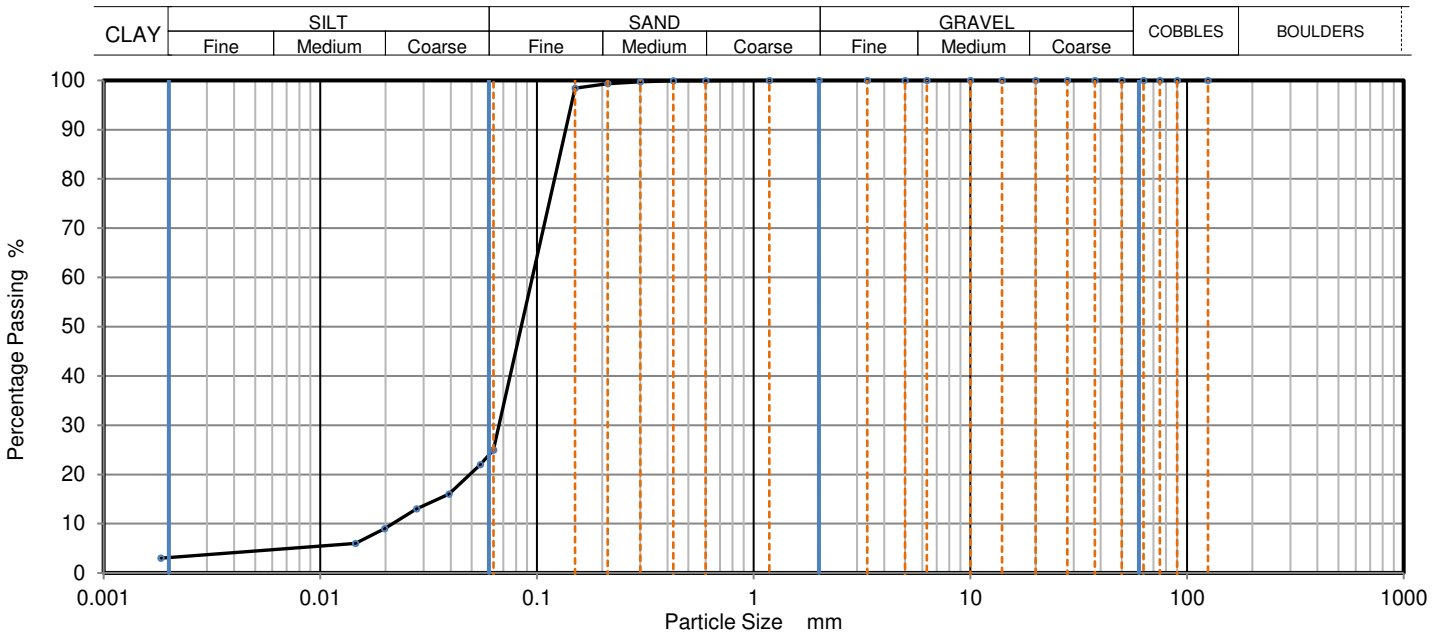
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	24/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1145852	Depth Top [m]:	1.50
Hole No.:	WS4	Depth Base [m]:	2.00
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown mottled dark grey slightly clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	25
90	100	0.0548	22
75	100	0.0392	16
63	100	0.0278	13
50	100	0.0198	9
37.5	100	0.0145	6
28	100	0.0018	3
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density	(assumed)
0.425	100	2.65	Mg/m3
0.3	100		
0.212	99		
0.15	98		
0.063	25		

Dry Mass of sample [g]: 403

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	74.90
Silt	21.80
Clay	3.30

Grading Analysis		
D100	mm	2
D60	mm	0.0952
D30	mm	0.0667
D10	mm	0.0211
Uniformity Coefficient		4.5
Curvature Coefficient		2.2

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Particle Size Distribution

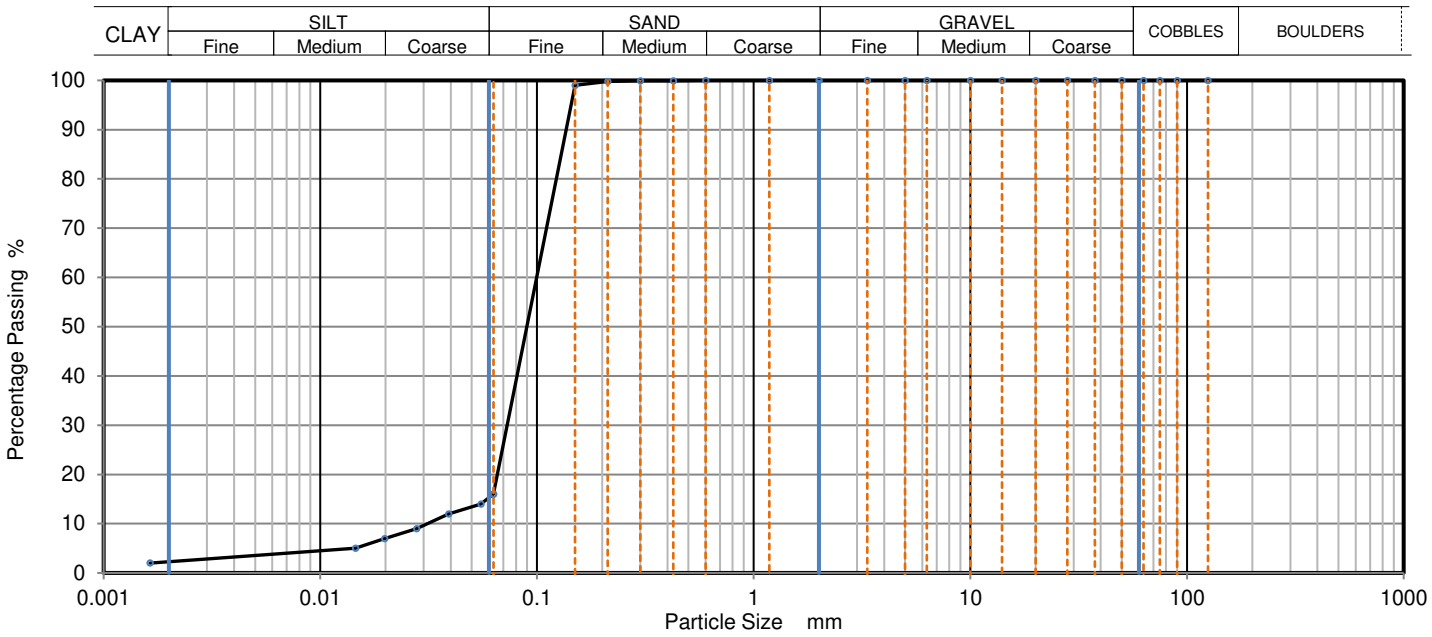
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	24/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1145853	Depth Top [m]:	3.15
Hole No.:	WS5	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	16
90	100	0.0550	14
75	100	0.0391	12
63	100	0.0278	9
50	100	0.0198	7
37.5	100	0.0145	5
28	100	0.0016	2
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density	(assumed)
0.425	100	2.65	Mg/m3
0.3	100		
0.212	100		
0.15	99		
0.063	16		

Dry Mass of sample [g]: 212

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	83.60
Silt	13.80
Clay	2.60

Grading Analysis		
D100	mm	1.18
D60	mm	0.0996
D30	mm	0.0727
D10	mm	0.0305
Uniformity Coefficient		3.3
Curvature Coefficient		1.7

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

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for and on behalf of i2 Analytical Ltd

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Particle Size Distribution

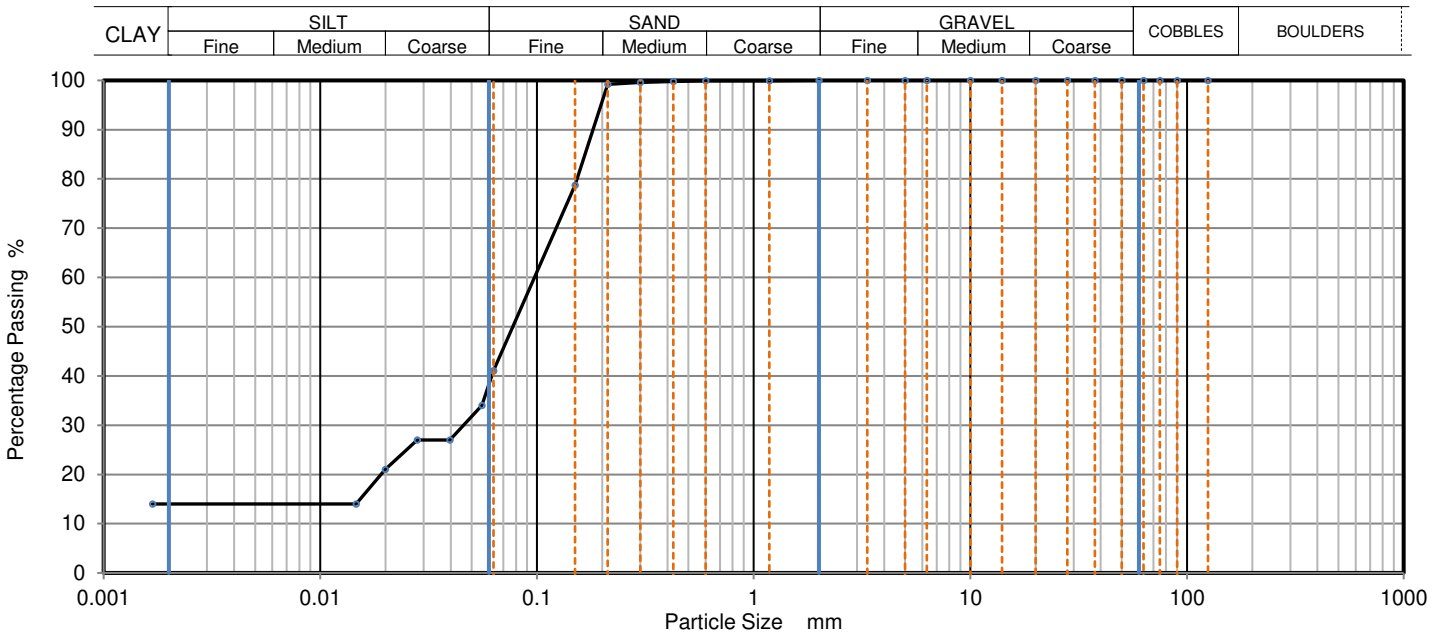
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	23/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1145854	Depth Top [m]:	1.00
Hole No.:	WS7	Depth Base [m]:	1.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	41
90	100	0.0557	34
75	100	0.0396	27
63	100	0.0280	27
50	100	0.0199	21
37.5	100	0.0146	14
28	100	0.0017	14
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density	(assumed)
0.425	100	2.65	Mg/m3
0.3	100		
0.212	99		
0.15	79		
0.063	41		

Dry Mass of sample [g]: 235

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	59.00
Silt	27.30
Clay	13.70

Grading Analysis		
D100	mm	2
D60	mm	0.0975
D30	mm	0.0453
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

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for and on behalf of i2 Analytical Ltd

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Particle Size Distribution

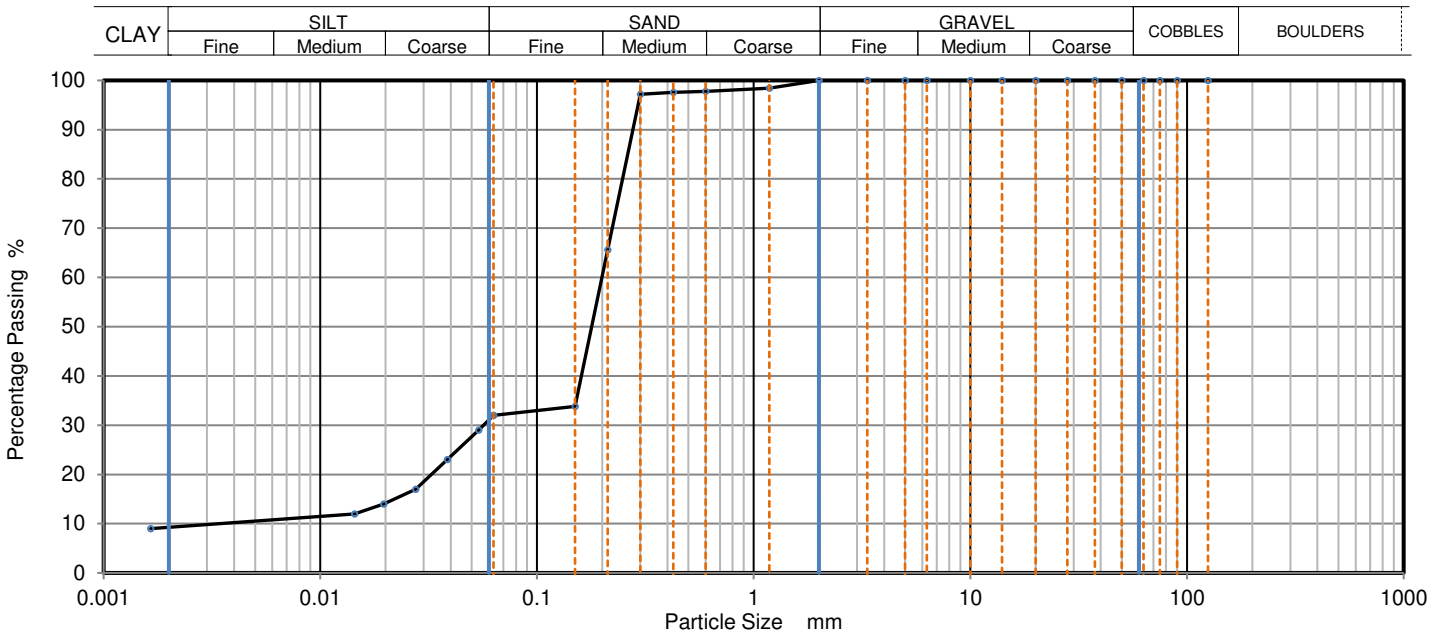
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	23/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1145855	Depth Top [m]:	0.80
Hole No.:	WS8	Depth Base [m]:	1.00
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	32
90	100	0.0539	29
75	100	0.0385	23
63	100	0.0275	17
50	100	0.0196	14
37.5	100	0.0144	12
28	100	0.0016	9
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	98		
0.6	98	Particle density	(assumed)
0.425	98	2.65	Mg/m3
0.3	97		
0.212	66		
0.15	34		
0.063	32		

Dry Mass of sample [g]: 269

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	68.20
Silt	22.90
Clay	8.90

Grading Analysis		
D100	mm	2
D60	mm	0.2
D30	mm	0.0571
D10	mm	0.00445
Uniformity Coefficient		45
Curvature Coefficient		3.7

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

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for and on behalf of i2 Analytical Ltd

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Particle Size Distribution

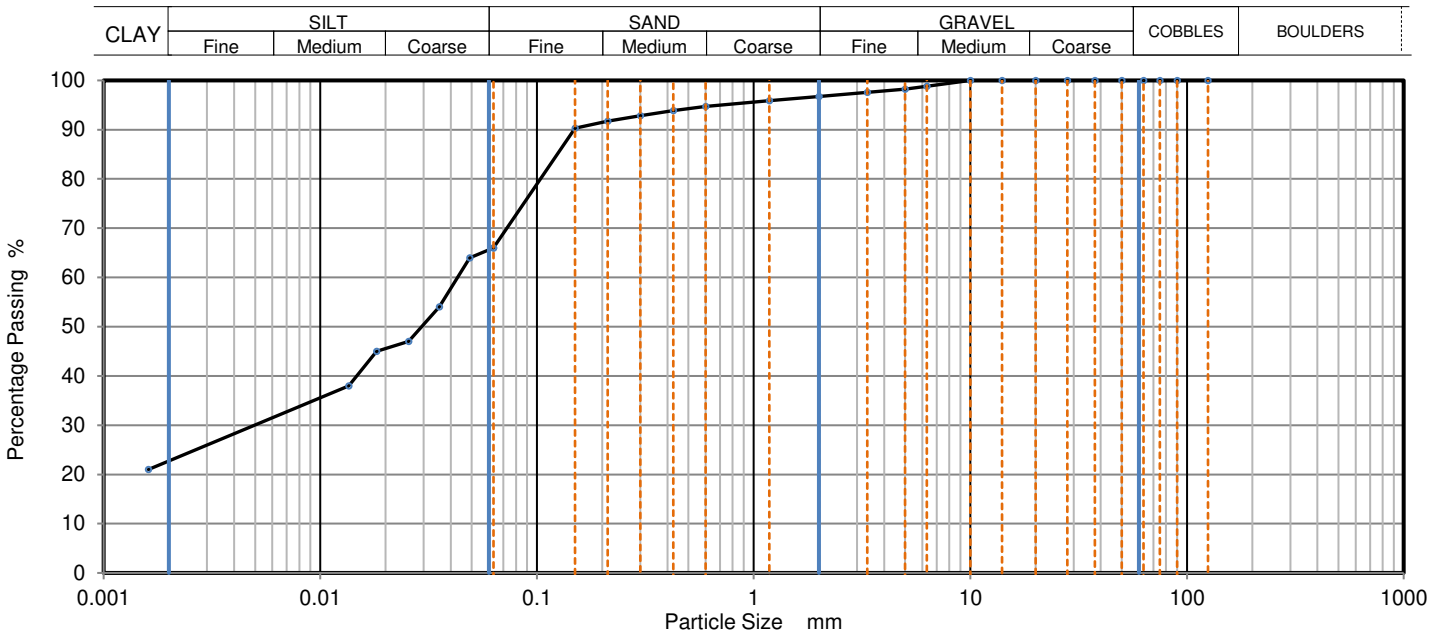
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	23/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1145856	Depth Top [m]:	0.80
Hole No.:	WS10	Depth Base [m]:	1.00
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Dark brown slightly gravelly clayey sandy SILT		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	66
90	100	0.0488	64
75	100	0.0355	54
63	100	0.0256	47
50	100	0.0182	45
37.5	100	0.0135	38
28	100	0.0016	21
20	100		
14	100		
10	100		
6.3	99		
5	98		
3.35	98		
2	97		
1.18	96		
0.6	95	Particle density	(assumed)
0.425	94	2.65	Mg/m3
0.3	93		
0.212	92		
0.15	90		
0.063	66		

Dry Mass of sample [g]: 300

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	3.30
Sand	30.50
Silt	43.20
Clay	23.00

Grading Analysis		
D100	mm	10
D60	mm	0.0429
D30	mm	0.00494
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

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for and on behalf of i2 Analytical Ltd

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Particle Size Distribution

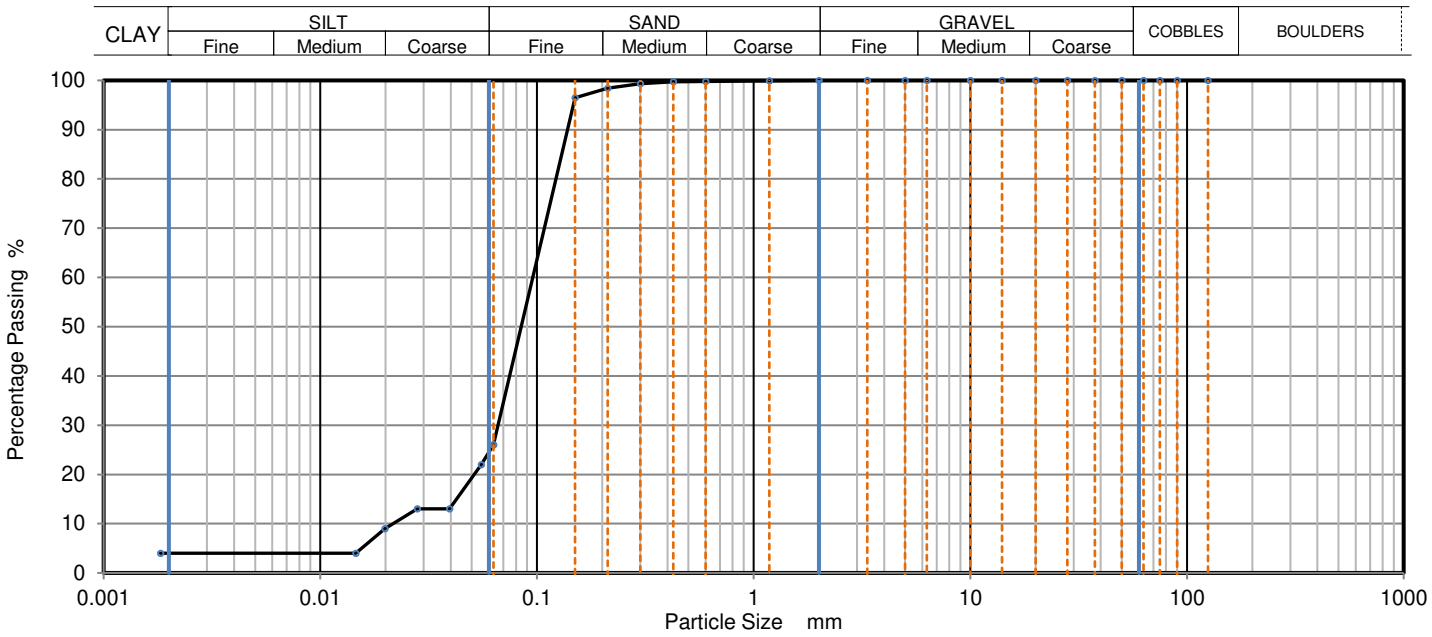
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	23/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1145857	Depth Top [m]:	2.20
Hole No.:	WS10	Depth Base [m]:	2.50
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Greyish brown slightly clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	26
90	100	0.0554	22
75	100	0.0396	13
63	100	0.0280	13
50	100	0.0199	9
37.5	100	0.0146	4
28	100	0.0018	4
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density	(assumed)
0.425	100	2.65	Mg/m3
0.3	99		
0.212	98		
0.15	97		
0.063	26		

Dry Mass of sample [g]: 345

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	73.80
Silt	21.80
Clay	4.40

Grading Analysis		
D100	mm	2
D60	mm	0.0956
D30	mm	0.066
D10	mm	0.0219
Uniformity Coefficient		4.4
Curvature Coefficient		2.1

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

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for and on behalf of i2 Analytical Ltd

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Particle Size Distribution

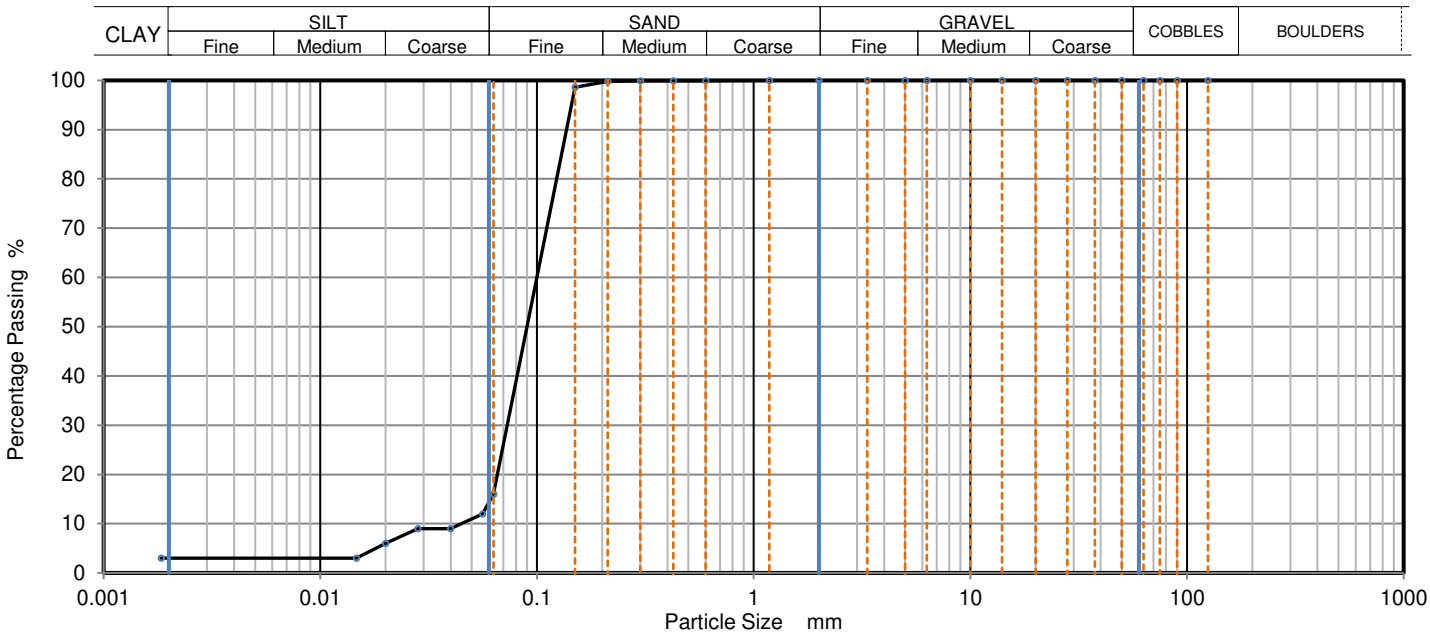
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	24/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1145858	Depth Top [m]:	2.50
Hole No.:	WS11	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Greyish brown slightly clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	16
90	100	0.0560	12
75	100	0.0398	9
63	100	0.0282	9
50	100	0.0200	6
37.5	100	0.0147	3
28	100	0.0018	3
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density	(assumed)
0.425	100	2.65	Mg/m3
0.3	100		
0.212	100		
0.15	99		
0.063	16		

Dry Mass of sample [g]: 372

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	84.50
Silt	12.40
Clay	3.10

Grading Analysis		
D100	mm	1.18
D60	mm	0.1
D30	mm	0.0733
D10	mm	0.043
Uniformity Coefficient		2.3
Curvature Coefficient		1.2

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

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for and on behalf of i2 Analytical Ltd

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Particle Size Distribution

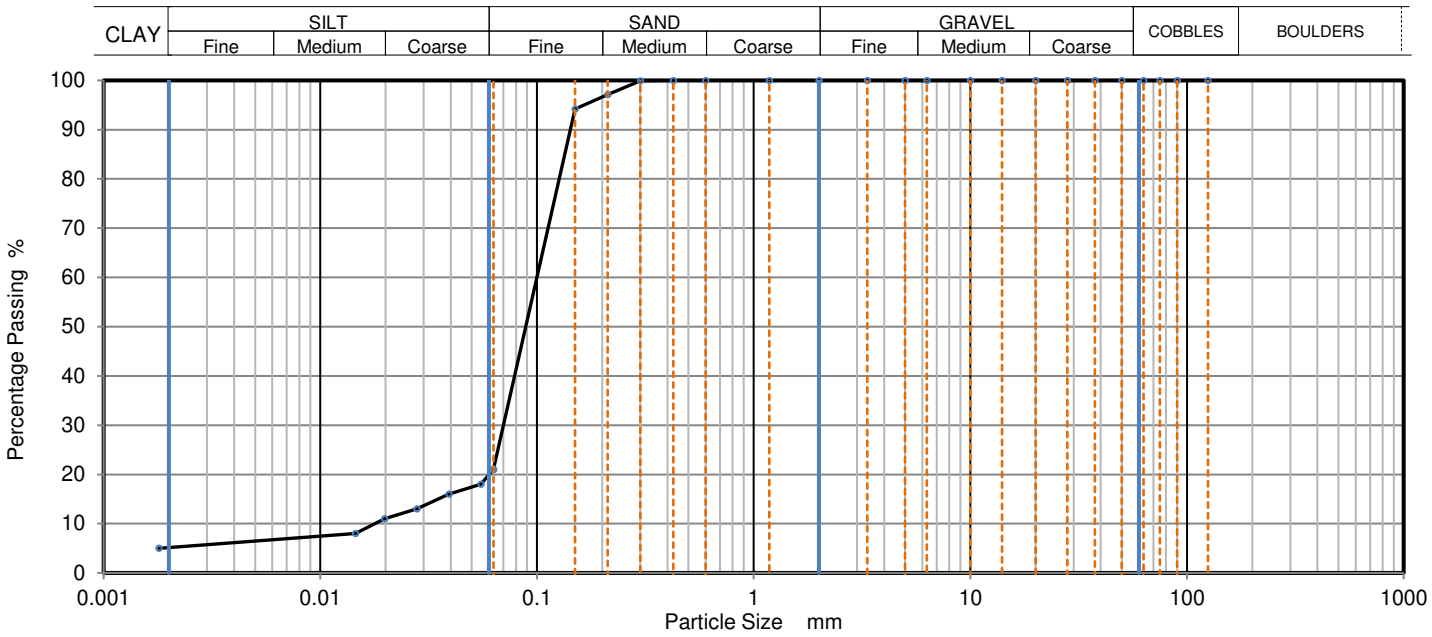
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	23/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1145860	Depth Top [m]:	2.30
Hole No.:	WS12	Depth Base [m]:	2.50
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	21
90	100	0.0551	18
75	100	0.0392	16
63	100	0.0279	13
50	100	0.0198	11
37.5	100	0.0145	8
28	100	0.0018	5
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density	(assumed)
0.425	100	2.65	Mg/m3
0.3	100		
0.212	97		
0.15	94		
0.063	21		

Dry Mass of sample [g]: 426

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	79.00
Silt	15.60
Clay	5.40

Grading Analysis		
D100	mm	1.18
D60	mm	0.1
D30	mm	0.0701
D10	mm	0.0187
Uniformity Coefficient		5.4
Curvature Coefficient		2.6

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

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for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Particle Size Distribution

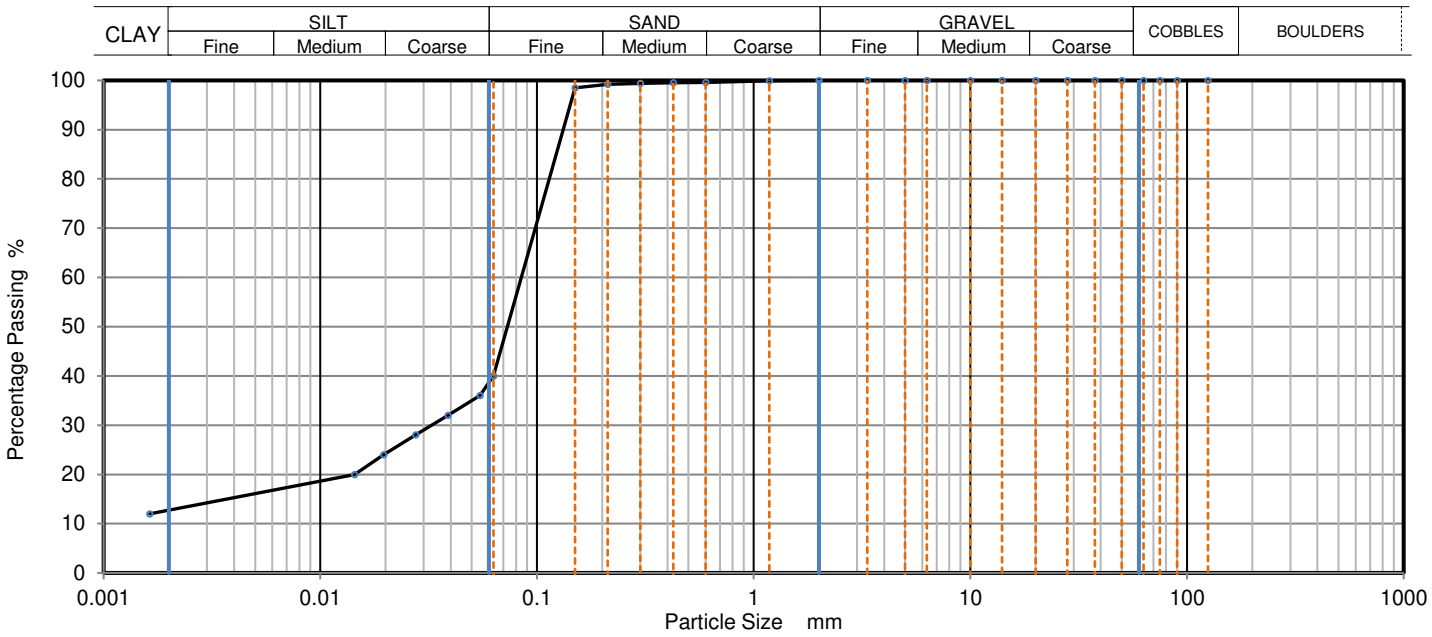
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	22/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	07/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1145862	Depth Top [m]:	0.50
Hole No.:	TP17	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	40
90	100	0.0545	36
75	100	0.0388	32
63	100	0.0276	28
50	100	0.0196	24
37.5	100	0.0144	20
28	100	0.0016	12
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density	(assumed)
0.425	100	2.65	Mg/m3
0.3	99		
0.212	99		
0.15	99		
0.063	40		

Dry Mass of sample [g]: 391

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	60.30
Silt	27.00
Clay	12.70

Grading Analysis		
D100	mm	2
D60	mm	0.085
D30	mm	0.0333
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

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for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Determination of California Bearing Ratio

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

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	22/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	09/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

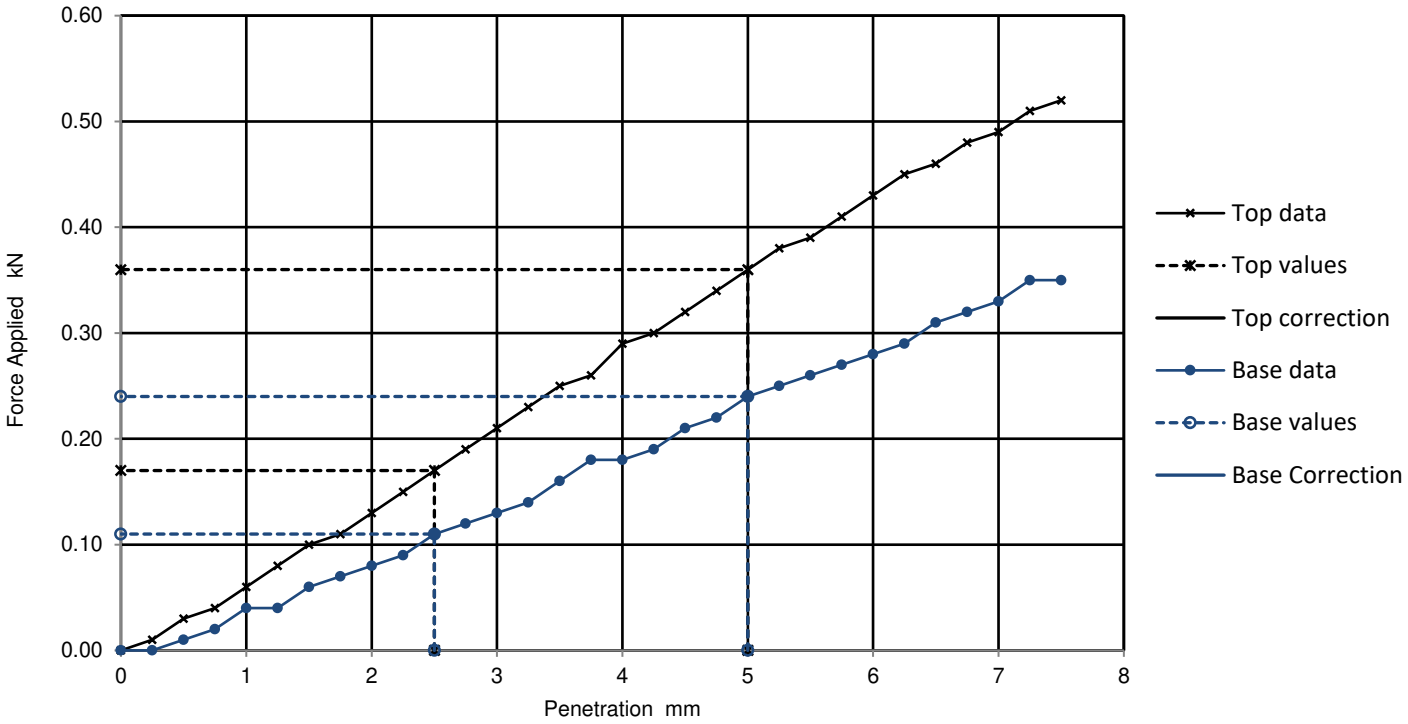
Laboratory Reference:	1145861	Depth Top [m]:	0.50
Hole No.:	TP11	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Dark brown slightly sandy CLAY		

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	0 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	1.93	Mg/m3	Surcharge applied	8 kg
	Dry density	1.55	Mg/m3		11.7 kPa
	Moisture content	25	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP	No	1.3	1.8	1.8		25
BASE	No	0.8	1.2	1.2		25

Remarks: Re-issue 1: Date Sampled amended as per client request

Test/ Specimen specific remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 108.10

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Determination of California Bearing Ratio

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

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	22/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	12/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

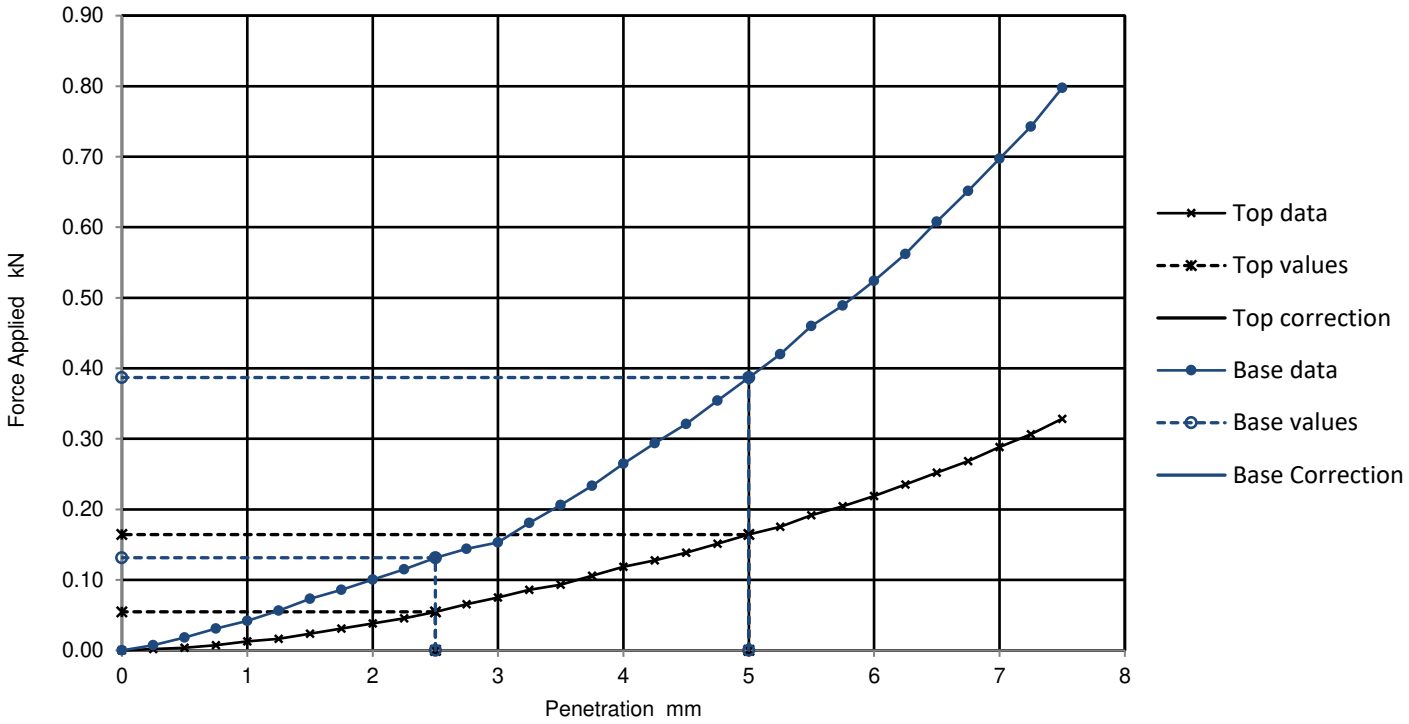
Laboratory Reference:	1145862	Depth Top [m]:	0.50
Hole No.:	TP17	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown clayey silty SAND		

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	0 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	1.89	Mg/m3	Surcharge applied	0 kg
	Dry density	1.50	Mg/m3		0.0 kPa
	Moisture content	26	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP	No	0.4	0.8	0.8		26
BASE	No	1.0	1.9	1.9		28

Remarks: Re-issue 1: Date Sampled amended as per client request

Test/ Specimen specific remarks:

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 108.10

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for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

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

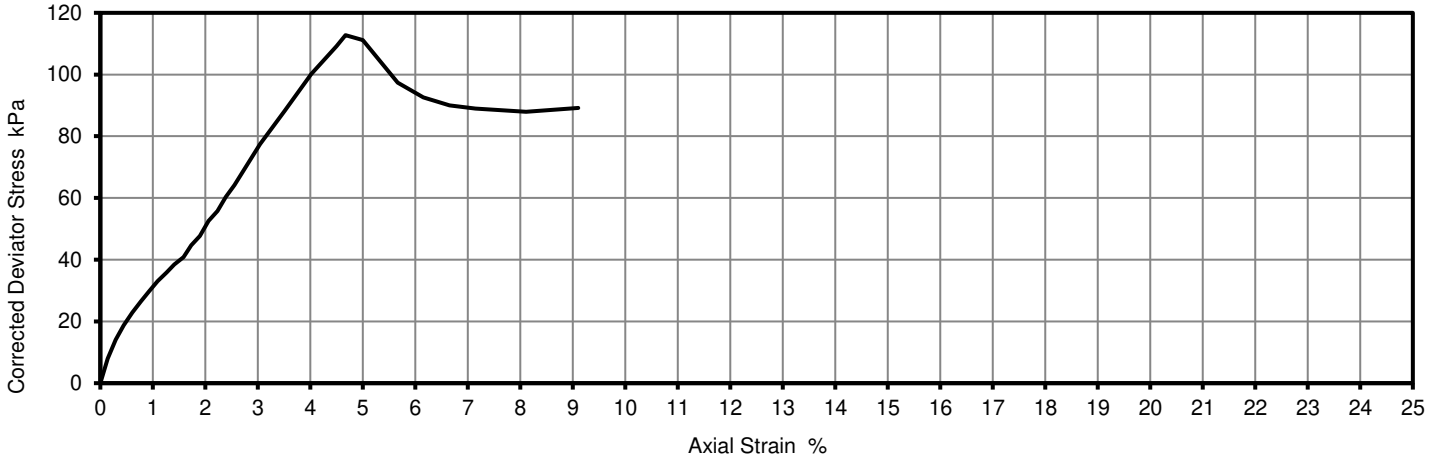
Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27208
		Date Sampled:	23/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	08/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Result

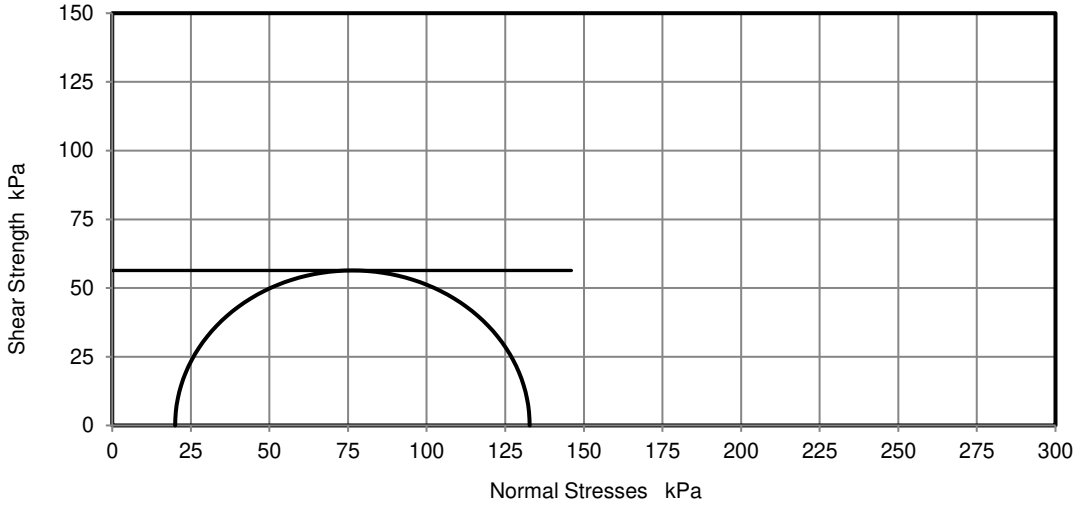
Laboratory Reference:	1145854	Depth Top [m]:	1.00
Hole No.:	WS7	Depth Base [m]:	1.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown clayey SILT		

Test Number	1		Rate of Strain	2.00	%/min	
Length	198.39	mm	Cell Pressure	20	kPa	
Diameter	102.73	mm	Axial Strain at failure	4.7	%	
Bulk Density	1.93	Mg/m3	Deviator Stress, (σ1 - σ3)f	113	kPa	
Moisture Content	31	%	Undrained Shear Strength, cu	56	kPa	½(σ1 - σ3)f
Dry Density	1.47	Mg/m3	Mode of Failure	Compound		
Membrane Correction	0.30	kPa	Membrane thickness	0.24	mm	

Deviator Stress v Axial Strain

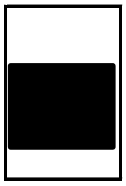


Mohr Circles





Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 184.6

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for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Liquid and Plastic Limits

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

4041

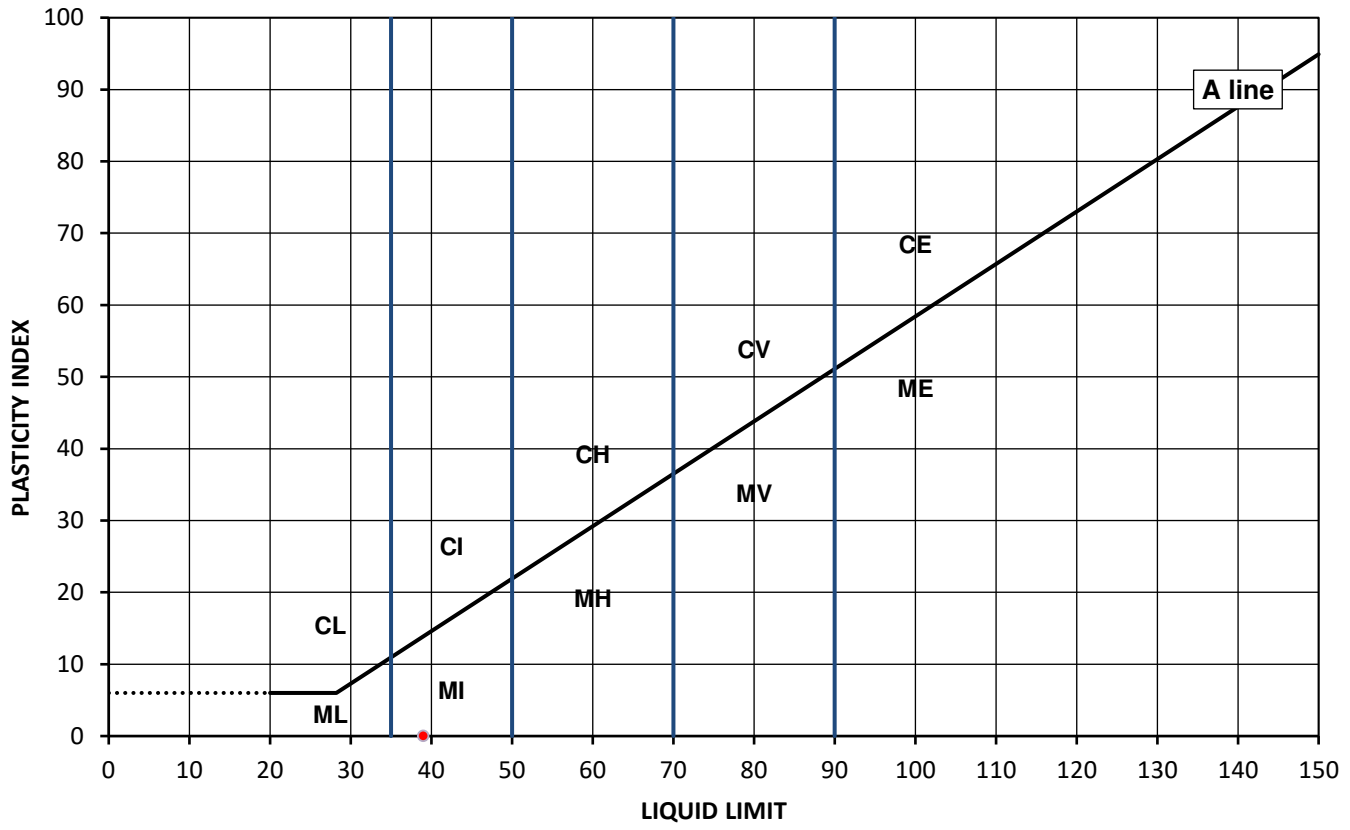
Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27406
		Date Sampled:	24/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	08/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results

Laboratory Reference:	1146975	Depth Top [m]:	1.20
Hole No.:	WS5	Depth Base [m]:	1.50
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly clayey silty SAND		
Sample Preparation:	Tested in natural condiotion		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
28	39	NP	NP.	100



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

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

Remarks: NP – non plastic
Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 232.3

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for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Liquid and Plastic Limits

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

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

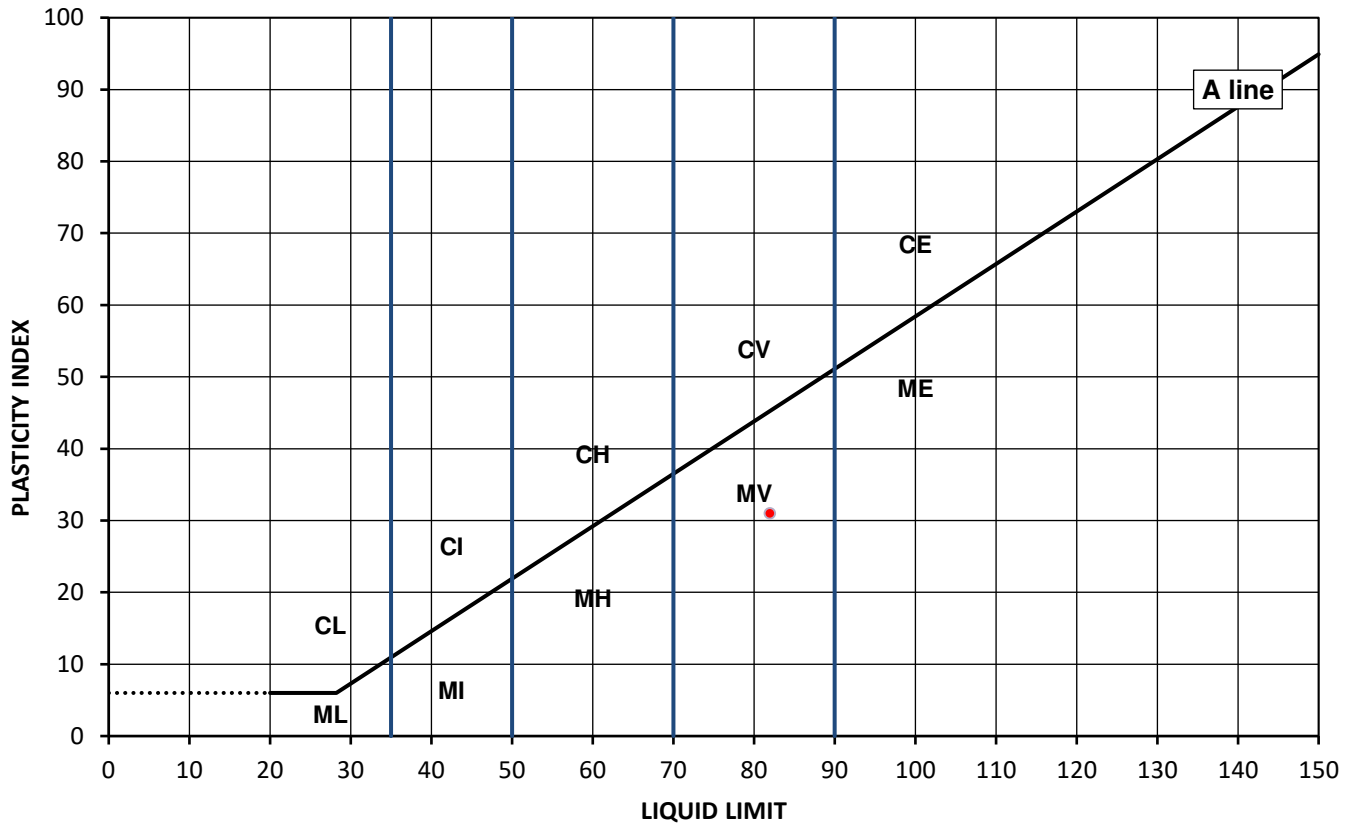
Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27406
		Date Sampled:	24/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	08/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results

Laboratory Reference:	1146976	Depth Top [m]:	1.50
Hole No.:	WS11	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Dark brown slightly clayey silty SAND		

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
69	82	51	31	87



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

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

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 232.3

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for and on behalf of i2 Analytical Ltd

SUMMARY REPORT

Summary of Classification Test Results

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

UKAS TESTING 4041

Tested in Accordance with:

MC by BS 1377-2: 1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3, Clause 4.4 and 5; PD by BS 1377-2: 1990: Clause 8.2

Client: Grange Geo Consulting Ltd

Client Address: 43 Winchilsea Avenue, Newark, Notts, NG24 4AD

Contact: Andrew Hare

Site Name: Pinchbeck

Site Address: Not Given

Client Reference: R18012

Job Number: 19-27406

Date Sampled: 24/01/2019

Date Received: 28/01/2019

Date Tested: 08/02/2019

Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC#	Atterberg#				Density		Total Porosity				
		Reference	Depth Top m	Depth Base m	Type			%	% Passing 425um %	LL %	PL %	PI %	bulk Mg/m3	PD Mg/m3	%				
1146976	WS11	Not Given	1.50	Not Given	D	Dark brown slightly clayey silty SAND	Atterberg 1 Point	69	87	82	51	31							
1146975	WS5	Not Given	1.20	1.50	D	Brown slightly clayey silty SAND	Atterberg 1 Point	28	100	39	NP	NP.							

Note: # UKAS accredited; NP - Non plastic

Comments: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 234.5

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for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Particle Size Distribution

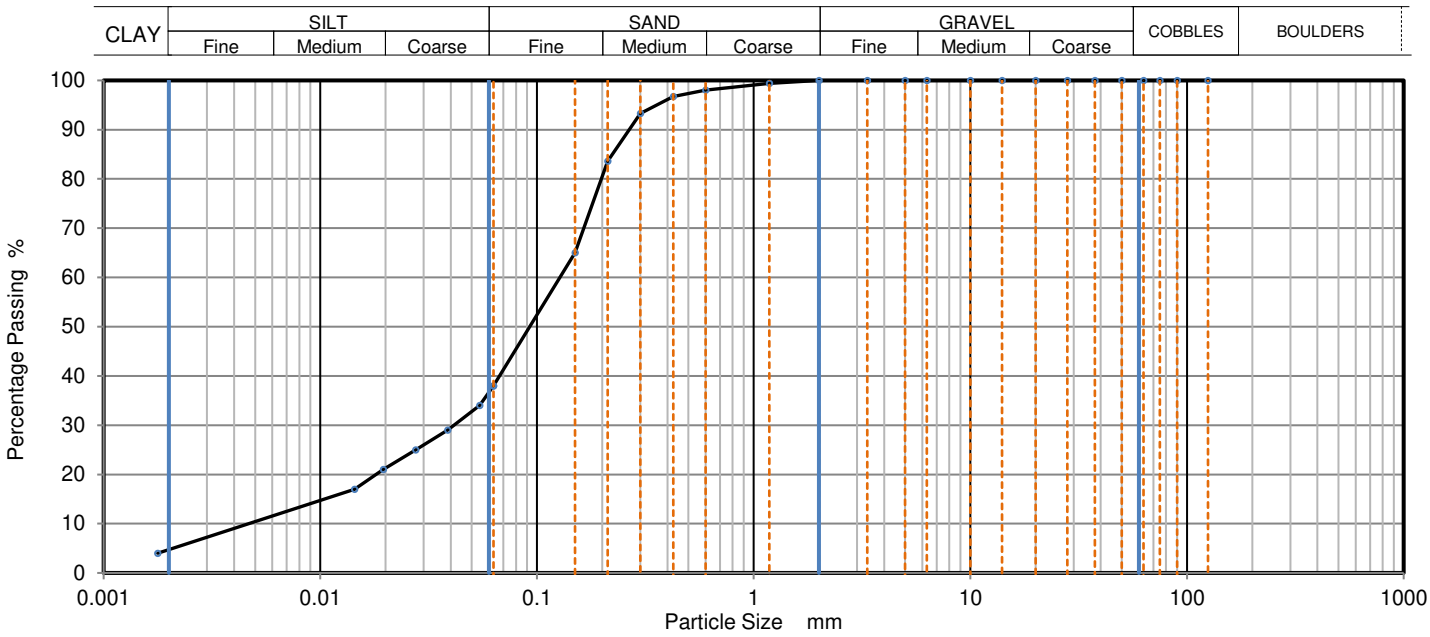
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27406
		Date Sampled:	24/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	08/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1146974	Depth Top [m]:	1.40
Hole No.:	WS3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	38
90	100	0.0544	34
75	100	0.0387	29
63	100	0.0275	25
50	100	0.0196	21
37.5	100	0.0144	17
28	100	0.0018	4
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	98	Particle density	(assumed)
0.425	97	2.65	Mg/m3
0.3	93		
0.212	84		
0.15	65		
0.063	38		

Dry Mass of sample [g]: 177

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	62.30
Silt	32.80
Clay	4.90

Grading Analysis		
D100	mm	2
D60	mm	0.128
D30	mm	0.0409
D10	mm	0.00467
Uniformity Coefficient		27
Curvature Coefficient		2.8

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

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for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Particle Size Distribution

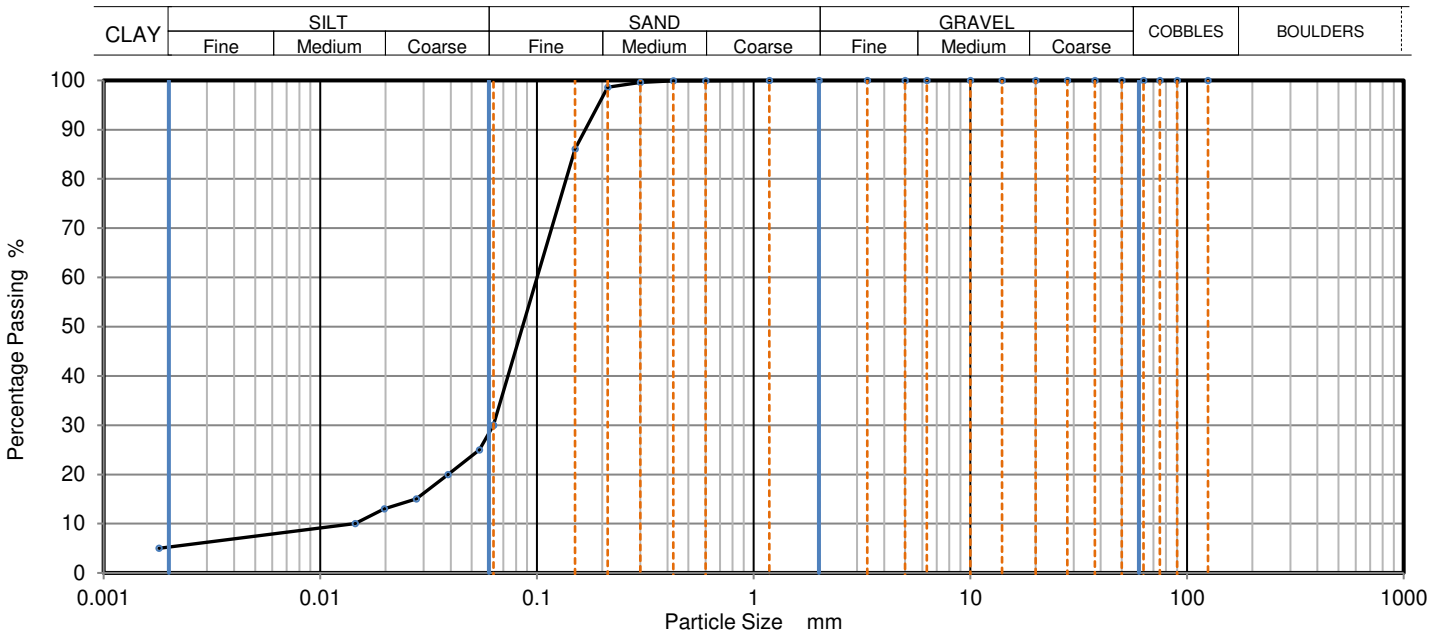
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27406
		Date Sampled:	24/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	08/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1146975	Depth Top [m]:	1.20
Hole No.:	WS5	Depth Base [m]:	1.50
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	30
90	100	0.0543	25
75	100	0.0388	20
63	100	0.0277	15
50	100	0.0197	13
37.5	100	0.0145	10
28	100	0.0018	5
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density	(assumed)
0.425	100	2.65	Mg/m3
0.3	100		
0.212	99		
0.15	86		
0.063	30		

Dry Mass of sample [g]: 241

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	70.00
Silt	24.70
Clay	5.30

Grading Analysis		
D100	mm	2
D60	mm	0.1
D30	mm	0.259
D10	mm	0.0145
Uniformity Coefficient		6.9
Curvature Coefficient		46

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

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for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Particle Size Distribution

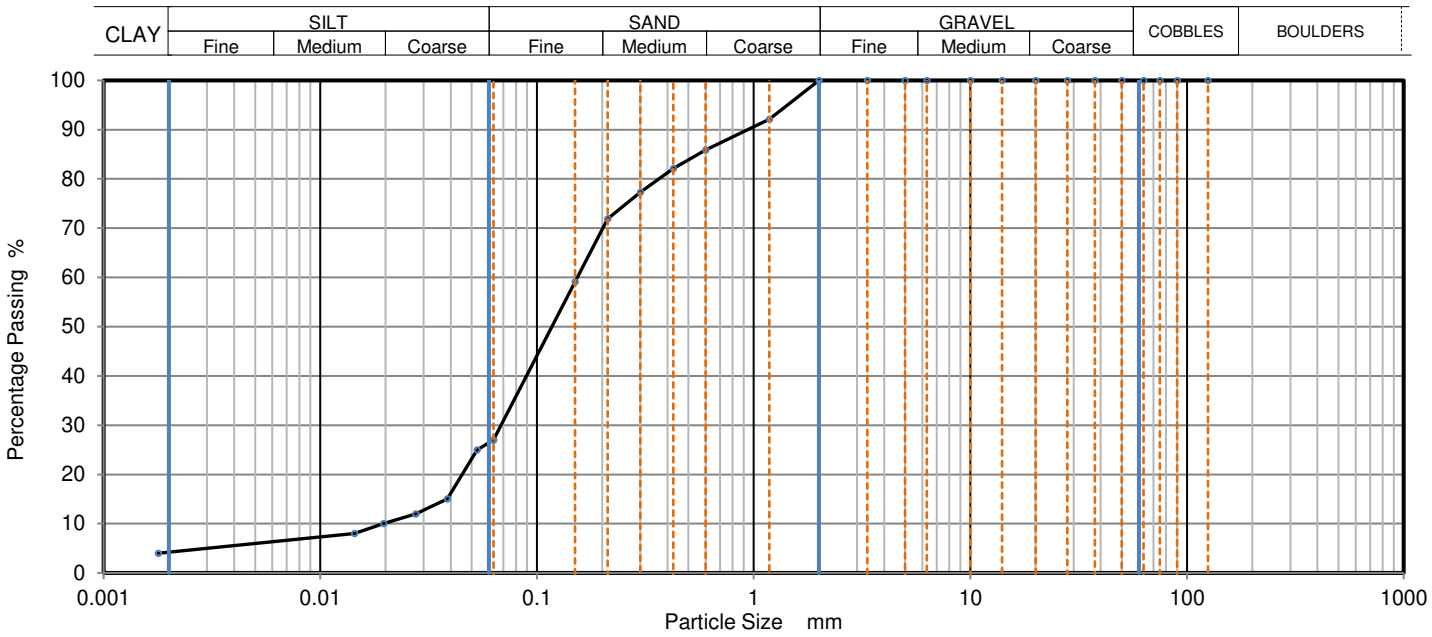
Tested in Accordance with: BS 1377-2: 1990

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

Client:	Grange Geo Consulting Ltd	Client Reference:	R18012
Client Address:	43 Winchilsea Avenue, Newark, Notts, NG24 4AD	Job Number:	19-27406
		Date Sampled:	24/01/2019
		Date Received:	28/01/2019
Contact:	Andrew Hare	Date Tested:	08/02/2019
Site Name:	Pinchbeck	Sampled By:	Not Given
Site Address:	Not Given		

Test Results:

Laboratory Reference:	1146976	Depth Top [m]:	1.50
Hole No.:	WS11	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Dark brown slightly clayey silty SAND		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	27
90	100	0.0530	25
75	100	0.0385	15
63	100	0.0275	12
50	100	0.0196	10
37.5	100	0.0144	8
28	100	0.0018	4
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	92		
0.6	86	Particle density	(assumed)
0.425	82	2.65	Mg/m3
0.3	77		
0.212	72		
0.15	59		
0.063	27		

Dry Mass of sample [g]: 183

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.00
Sand	72.90
Silt	23.00
Clay	4.10

Grading Analysis		
D100	mm	2
D60	mm	0.154
D30	mm	0.0682
D10	mm	0.0207
Uniformity Coefficient		7.4
Curvature Coefficient		1.5

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Re-issue 1: Date Sampled amended as per client request

Approved: Dariusz Piotrowski
PL Geotechnical Laboratory Manager
Date Reported: 10/07/2019

Signed: Darren Berrill
Geotechnical General Manager

GF 100.10

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for and on behalf of i2 Analytical Ltd