

DAY'S PROPERTY HOLDINGS LIMITED

LAND OFF SEVEN STILES AVENUE, NEWPORT RETAIL PARK, NEWPORT, NP19 4TX

SITE INVESTIGATION REPORT

The Granary
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Report No. CCL03796.CU99

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1. INTRODUCTION

A commercial development is proposed at land off Seven Stiles Avenue, Newport Retail Park, Newport. The site is currently occupied by a vacant development plot comprising an area of gravel surfacing within the northern part of the site and overgrown shrub vegetation elsewhere. The proposed development comprises a van rental premises to include a van workshop and wash bays with an office/reception area together with car/van parking and limited areas of managed soft landscaping.

Crossfield Consulting Limited has been commissioned to undertake an investigation of the site to identify potential constraints to redevelopment relating to the ground conditions and including a risk-based environmental assessment and recommendations for remediation works, and recommendations regarding ground stability/support, and recommendations for foundations, road pavement design and general construction advice in the context of the above development proposals.

This report presents the information obtained from a desk study and ground investigation. Sections 2 to 5 of the report, together with the associated Figures and Appendices, provides a Ground Investigation Report (GIR), as defined in BS EN 1997-1:2004 and BS EN 1997-2:2007.

A risk-based assessment of potential contamination is included in Section 7 of the report. This assessment makes reference to the desk study, ground investigation information and a Conceptual Site Model. It is considered that the report complies with Planning Policy Wales (Edition 12, 2024) and is in general accordance with guidance published by the Welsh Government. The ground investigation to inform the risk assessment of potential contamination is an exploratory investigation, as defined in Environment Agency Land Contamination Risk Management (LCRM) (2023) and BS 10175:2011+A2:2017.

The report also includes a geotechnical assessment and the salient information, assessments and recommendations are presented in Sections 9 to 15 of the report, together with the associated Figures and Appendices.

The report has been prepared under the direction and supervision of a Chartered Geologist. It is considered that the report is suitable for submission in support of a planning application and the report is appropriate to assist in an appraisal of development solutions and costs, together with the preparation of engineering designs for the development. The report also complies with the published guidance relating to the requirements of a Building Control authority.

2. THE SITE

2.1 Location

The site is located to the east of Seven Stiles Avenue within the northeastern part of the Newport Retail Park and approximately 4 km east of Newport city centre and 2 km east of the River Usk, as shown on Figure 1. The National Grid Reference for the site is ST 3481 8693. The site is bounded to the west by Seven Stiles Avenue, to the north by a car park for a Matalan store and to the south by a vegetated vacant area and then a car park and commercial building, as shown on Figure 2. To the east of the site is a wooded area and a stream/drain. To the west of Seven Stiles Avenue, various commercial shopping units and car parking areas associated with the retail park are present.

2.2 Site Description

This site description is based on observations made during a ground investigation undertaken in September 2024. A topographical survey is presented as Figure 3.

The site is a rectangular plot of land with an approximate area of 0.81 ha. The site and wider area is generally relatively flat and level.

The site comprises a vacant development plot with a gravel surfaced area present within the northern section of the site. The gravel surfaced area has two existing vehicular access entrances, one along the northern site boundary to the Matalan car park access road, and the other on the western site boundary to Seven Stiles Avenue. The western entrance is currently blocked by a vegetated soil bund and a caravan is parked on the Seven Stiles Avenue side of the bund within the entrance. The remaining site area is covered by variable overgrown and rough/shrub vegetation and dense brambles. Soil bunds are also present along the northern and western site boundaries and are covered with brambles. Two existing stockpiles are located within the northeastern part of the site and to the southeast of the gravel surfaced area is a shallow trench, as shown on Figure 3.

An electricity substation is present along the western site boundary, adjacent to Seven Stiles Avenue. Mature trees are present along the eastern site boundary.

2.3 Site History

The site history has been researched with reference to old editions of the County Series and National Grid Ordnance Survey Plans obtained from Emapsite. Extracts from a selection of these plans are presented in Appendix I. Reference is also made to aerial photographs provided in the information in Appendix II. The plans and information indicate that the following development has taken place on and around the site.

The earliest County Series plans dated 1882 and 1884 indicate that the site was located within an area of farmland adjacent to Longditch lane, shown to the east of the site at that time.

The site and surrounding area remained largely unchanged until publication of the 1967-1968 map edition when the area to the east of the site is shown as marshland with drains and two overhead power cables are shown to be trending north to south within that area. A significant area beyond the marshland was associated with steel works.

The 1973 map shows a sports ground to the north of the site.

Newport Retail Park is shown to have been constructed to the west and south of the site by 1986 together with Seven Stiles Avenue and other access roads.

By 1995, the site appears to have formed a vacant development plot with an indicative area of hardstanding shown that extends beyond the northern site boundary and has two entrances via Seven Stiles Avenue to the west. The area may have been used as a contractors' compound during construction works in areas of the retail park. An adjoining vacant development plot is shown to the north.

No change is indicated at the site by 2003. The existing Matalan building, car park and access road had been constructed to the north and the existing building and car park to the south of the site are also shown at that time. The aerial photographs presented within Appendix II show that the building and car park to the south of the site was under construction in 2000 and 2001 and a haul road into that development area crossed the site at that time.

Steel works features to the east of the site and largely been removed by 2010 and residential development is ongoing in that area (as shown on the 2024 map edition). No other significant changes to the site or surrounding area within the Newport Retail Park are indicated.

3. PUBLISHED GEOLOGY

Geological map data, published by the British Geological Survey (BGS), online and in print, on the 1:50,000 scale Sheet No. 249 (Newport) and 1:10,560 Scale Sheet ST 38 NW indicate that the site is underlain by superficial Tidal Flat Deposits, described on Sheet ST 38 NW as alluvial flat of bluish grey silts and clays.

The bedrock geology underlying the site is indicated to be the Triassic Mercia Mudstone Group, described as mudstone.

4. DESK STUDY ENQUIRIES

Enquiries were made to the Groundsure Environmental and Geological Databases regarding the site and surrounding area. Information obtained from these enquiries is presented in Appendix II and summarised below.

There are no active or historical landfills recorded within 250 m of the site. A historical waste site is recorded 235 m southwest of the site and is associated with a supermarket recycling unit. A waste exemption is listed 58 m to the west at Cineworld and is associated with the storage of waste in a secure place.

An electricity substation is located along the western site boundary, adjacent to Seven Stiles Avenue. Other listed industrial land uses within 250 m relate to other electricity infrastructure and new vehicle sales premises. A petrol fuel station is located 232 m to 265 m to the west of the site at the Newport Retail Park Tesco. The petrol station is associated with a licensed pollutant release Part B permit for the unloading of petrol into storage.

There are no premises located within 500 m of the site determined as Contaminated Land under Part 2A of the Environmental Protection Act 1990. A pollution incident on site occurred in 2013 with the pollutant is described as inert construction and demolition materials and wastes (and may relate to the stockpiles in the northeastern part of the site). Minor impact to air is noted but land impact is noted as Category 4 (no impact).

Hydrogeological information indicates that the superficial deposits beneath the site are designated as unproductive and the bedrock is designated as a 'Secondary B' aquifer. The groundwater vulnerability is classified as low in the bedrock. There are no groundwater/surface or potable water abstractions within 1 km of the site and the site is not located within a groundwater source protection zone. Based on the Natural Resources Wales Water Framework Directive (WFD) data, the site is located within the Usk Devonian Old Red Sandstone groundwater body, which is indicated to have a 'Good' chemical rating and 'Good' overall status.

The nearest surface water feature is an inland river, 10 m to the east. The site is located within a coastal catchment area and is not within a river water body catchment. The site is located within a Flood Zone 2 and Zone 3, as defined by Natural Resources Wales. The site is located within an area benefitting from flood defences.

There are no environmentally sensitive land use designations listed in close proximity to the site.

Natural ground subsidence geohazards, as classified by the BGS, are indicated to be 'moderate' for the potential for running sands and compressible deposits beneath the site and 'low' to 'negligible' for all other geohazards.

There are no records of underground workings within 1 km of the site and there are no records of non-coal mining or mining cavities within 500 m of the site. Unspecified surface ground workings are recorded 219 m southeast of the site and works relating to the creation of ponds are listed 235 m southeast of the site. With reference to the Stantec UK database, there are no natural or mining cavities recorded within 500 m of the site.

The Groundsure report (based on UK Health Security Agency and British Geological Survey data, updated December 2022) indicates that the site is not within an area where radon precautions are required in new buildings.

5. GROUND CONDITIONS AND GEOLOGICAL MODEL

5.1 Ground Investigation

Details of the rationale and scope of the ground investigation and laboratory testing, together with exploratory hole logs, monitoring, in situ and laboratory test results, are given in Appendix III. The investigation has identified the presence of the following, below the site.

5.2 Buried Foundations and Services

No buried foundations were encountered during the ground investigation. No obstructions were encountered but the Made Ground across the site included densely compacted and cemented layers of gravel that had to be broken out by the excavator. Within the southwestern part of the gravel surfaced area, an inactive existing electricity duct aligned north to south was encountered between 0.8 m and 0.9 m depth and to the east of that, an inactive electricity cable aligned west to east was encountered (beneath the compacted and cemented gravel) at approximately 0.8 m depth.

5.3 Strata Encountered

Made Ground

Made Ground was encountered across the site to depths of between 0.80 m and 1.50 m and comprises a thin cover of relatively loose gravelly sand with rootlets to approximately 0.1 m depth and is underlain by dense to very dense layers of sandy gravel with cobbles, which appears to have been placed and compacted and includes thin cemented layers. The Made Ground contains some brick and concrete fragments and rare, possible slag fragments. Within the northeastern part of the site, large concrete boulders were also encountered within the Made Ground, similar to those observed within the adjacent stockpile.

A stockpile to the southeast of the gravel surfaced area comprises brown gravelly sand with cobbles and concrete boulders with rebar and some metal fragments and other demolition materials.

A stockpile located to the east of the gravel surfaced area of the site is recorded to comprise brown and grey sandy fine to coarse angular gravel with brick fragments and possible rare crushed slag materials.

The perimeter bund to the north and west of the gravel surfaced area comprises a thin covering of topsoil materials underlain by grey and brown gravelly sand with brick, concrete and plastic pipe fragments.

Tidal Flats Deposits

Beneath the Made Ground across the site, initially a firm to stiff consistency, light bluish grey mottled brown, silty clay was encountered. The clay varied in strength with depth but typically became firm consistency below 2 m depth and soft consistency, below 3 m depth and sometimes became firm to stiff consistency again below 4 m depth. Horizons of spongy pseudo-fibrous peat, up to 0.6 m thick, were also recorded within the clay from approximately 2.5 m depth.

Hand vane tests undertaken within these strata recorded undrained shear strengths of around 75 kN/m² and above at around 1 m depth, indicating medium strength materials, and typically between 30 kN/m² and 45 kN/m² below 2 m, indicating low strength materials.

Standard penetration tests undertaken within these strata typically recorded N values of below 10 and locally below 5 with an indicated overall decrease in strength with depth.

Geotechnical laboratory testing has been undertaken on samples of the Tidal Flat Deposits. Moisture content values of between 31% and 41% have been recorded with plasticity index values of between 40% and 53%, indicating high volume change potential soils.

Mercia Mudstone Group

Mercia Mudstone Group strata are indicated (on published geological maps) to be present below the superficial deposits at the site. The strata have not been encountered in trial pits or dynamic sample boreholes. However, two dynamic sample holes were extended to depths of 10 m using dynamic probing. It is noted that the probing records indicate an increase in ground strength or density at a depth of approximately 8.5 m to 9.0 m and the interface between the Tidal Flat Deposits and the Mercia Mudstone Group may be present within that depth range.

5.4 Groundwater

Perched groundwater was encountered at the base of the Made Ground within TP1 at 1.15 m depth. No groundwater was encountered elsewhere across the site. Groundwater depths have been recorded between 0.89 m and 1.21 m (levels of 5.61 m OD and 5.39 m OD respectively) during the monitoring period following the intrusive ground investigation.

The groundwater conditions are based on observations made at the time of the fieldwork. It should be noted that groundwater levels may vary due to seasonal and other effects.

5.5 Ground Gases

Ground gas monitoring has been undertaken on four occasions (between 4 October and 23 October 2024). The results of the monitoring are provided in Appendix III and are summarised in Table 3.

The ground gas monitoring has recorded typical methane concentrations of <0.1% and carbon dioxide concentrations of between 0.1% and 3.9%. The recorded ground gas flow rates are between <0.1 l/hr and 0.2 l/hr. The ground gas monitoring has been undertaken during high falling and low falling and rising atmospheric pressure during the monitoring period.

6. PROPOSED DEVELOPMENT

The proposed development comprises a van rental premises that will comprise a single building, of two-storey equivalent height, that will include office and reception areas and workshop/valeting bays and vehicle wash bays. It is assumed that the structure will be steel framed with cladding.

In addition to the building, areas of staff car parking and collection vehicle parking will be included to the west and north of the building. A large area to the south of the building will be used as a compound to store stock vehicles. A proposed development layout is provided as Figure 4.

7. ASSESSMENT OF POTENTIAL CONTAMINATION AND GROUND GASES

7.1 Assessment Criteria

Assessment of potential contamination and ground gases has been undertaken using a risk assessment based approach, as recommended within the Environmental Protection Act (1990) (and subsequent amendments), Environment Agency LCRM (2023), CLEA Model (2004-2009), BS 10175:2011+A2:2017 and CIRIA C552 (2001) together with information published by the Welsh Government and the Welsh Land Contamination Working Group. This approach considers the likely source of contamination, given the history and location of the site, and the possible migration pathways by which these potentially hazardous substances may reach likely receptors, such as end users of the site, controlled waters or the wider environment, in the context of the proposed development.

Part IIA of the Environmental Protection Act (1990) states that

‘Contaminated Land is any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that –

- (a) significant harm is being caused or there is a significant possibility of such harm being caused; or
- (b) significant pollution of controlled waters is being caused or there is significant possibility of such pollution being caused;’

All risk assessments carried out as part of this investigation have been carried out with respect to the definition of ‘contaminated land’ within Part IIA of the Environmental Protection Act (1990) and have considered the site both before and on completion of the development. The basis of the risk assessment is the Conceptual Site Model, which is derived from the desk study and initial information and identifies potential contaminant linkages that could affect receptors relevant to the site and the wider environment. The Conceptual Site Model is presented in Table 1.

Based on the model, a ground investigation was designed to obtain relevant information to assess further the identified contaminant linkages. Where relevant, this included the recovery of representative samples and subsequent analytical laboratory testing. The rationale for the sampling and testing is set out in Appendix III. The results of the analytical testing are presented in Appendix III and summarised in Table 2. The results of ground gas monitoring are summarised in Table 3 and an assessment of gas data sufficiency is provided in Table 4. On the basis of the conceptual site model and the results of the analytical laboratory testing, an assessment of the identified contaminant linkages is presented in Table 5.

7.2 Potential Sources of Contamination

Based on the site history, no significant previous development is indicated at the site, although there is evidence to suggest that the site has either previously been prepared for construction or has been used as a compound area during development on surrounding land. The site appears to have undergone some earthworks during the early 1990s to form a development platform or compound. The existing development to the south of the site is shown to have been under construction in 2000 with an associated access haul road and indicative material storage seen within the site in aerial photographs at this time. A record of a pollution incident relating to inert construction and demolition materials and wastes on the site is also recorded in 2003.

It is evident that imported Made Ground materials have been brought to and placed on the site. Depending on the provenance of such materials, they may include demolition materials or ashy materials such that they may be associated with potential; sources of toxic/phytotoxic metals and/or polyaromatic hydrocarbons (PAHs). Demolition rubble may also be associated with asbestos containing materials (ACMs).

Made Ground has been confirmed, during the ground investigation, to include demolition rubble and rare, possible slag material. Therefore, potential contaminants identified above may be applicable to the site.

The materials recorded within one of the existing stockpiles on the site were also observed to contain demolition materials, as possibly relating to the recorded pollution incident materials. The other existing stockpile appears to contain excess surfacing materials, brick and concrete fragments. These stockpiles together with the perimeter bund materials may also potentially be associated with the above identified potential contaminants.

With regards to off-site sources of potential contamination, the current land uses surrounding the site comprise commercial premises within Newport Retail Park and an overgrown vegetated area to the east with overhead power cables beyond which is a residential development. It is considered that current land uses within influencing distance of the site are not associated with bulk storage of potentially mobile contaminants and that historical land uses, such as storage and processing areas within the former steel works land to the east, are unlikely to have been within influencing distance. Therefore, there are no significant potential off-site sources of mobile contaminants identified that could have an adverse effect on the site.

Based on the available information, representative soil samples were recovered from the Made Ground materials encountered beneath the site. Samples were also recovered from the existing stockpiles and perimeter bunds (largely for waste classification assessment as it is likely that the majority of materials will be removed from site but data is also assessed here in case there is a requirement to reuse some materials to form development levels). The samples were tested for the potential contaminants identified above. The test results are summarised in Table 2 and are presented against generic assessment criteria (GAC) and Category 4 Screening Levels (C4SL), relevant to the protection of human health in a commercial development. As can be seen from Table 2, all potential contaminant concentrations are recorded below the GAC (negligible risk to human health) and C4SL (low but acceptable risk to human health) and, therefore, do not represent an unacceptable risk to end users. Asbestos fibres and ACM have not been detected. Additional comments relevant to human health risk assessment are provided in Section 7.3.1.

Based on appropriate laboratory test data, risks to construction materials are assessed in Section 7.3.2.

No significant concentrations of potentially phytotoxic chemicals have been recorded. However, as the site is predominantly devoid of topsoil, a suitable thickness of topsoil is likely to be required to provide a suitable growing medium in proposed soft landscaping areas. Further comment is provided in Section 7.3.3.

Based on the available information, no sources of mobile contaminants have been identified within the site that could impact controlled waters. In addition, the analytical laboratory testing that has been undertaken has not identified significant concentrations of potentially mobile contaminants in the shallow soils. Therefore, it is indicated that risks to controlled waters are negligible, and no further risk assessment is required.

Based on the site and wider area history, the potential for significant thicknesses of deep Made Ground of unknown provenance beneath the site was identified. However, the ground investigation confirmed that Made Ground thickness beneath the site extend to between 0.8 m and 1.5 m and no putrescible material has been identified at the site. The superficial Tidal Flat Deposits include organic clays and horizons of peat. Such organic-rich soils can be a source of ground gases, such as methane and carbon dioxide. However, the gases in such soils are generated very slowly and, therefore, significant volumes of gas are not generated and there is negligible potential for ground gas flow, migration and emission of gases at the surface. There are no recorded landfills within influencing distance and the site is not within an area where precautions against the ingress of radon gas are required in new dwellings. On this basis, it is considered that there should be no sources of hazardous ground gases at the site. Notwithstanding this assessment, ground gas monitoring standpipes were installed within selected holes across the site and a programme of ground gas monitoring has been undertaken to confirm the qualitative assessment (and on the basis that gas protection measures may have been installed within buildings in other areas of the Newport Retail Park). Further discussion of ground gas data is presented in Section 7.4.

7.3 Contaminant Linkages – Solids and Liquids

Based on the Conceptual Site Model, consideration is given below to identified contaminant linkages and a risk evaluation is undertaken of each possible source-pathway-receptor linkage that may occur at the site. The risk evaluation considers the potential consequences and probability of occurrence in accordance with CIRIA C552 (2001). Where risks are identified as 'negligible', then by implication such risks are within normally accepted levels for the proposed development, and the further reduction of such risks by remediation works is considered unnecessary. Where risks are identified that are 'low' as defined in CIRIA C552 (2001), or worse, then consideration is given to the management of the identified risks, with appropriate recommended actions that may include engineering solutions/remediation works as described in the following sections.

7.3.1 Human Health

Potential contaminants associated with the site history have been identified at concentrations below relevant GAC and C4SL values. On this basis and considering the proposed end use, comprising a commercial van rental premises together with car/van parking and limited areas of soft landscaping, it is considered that no further risk assessment is required in respect of the health of end-users of the site in relation to the ground conditions recorded at the site and no remediation works or other mitigation measures are required in this regard.

Groundworkers involved in the construction of the new development are unlikely to be exposed to short term (acute) risks. However, in line with good practice, it is recommended that personal protective equipment (PPE) be worn and high levels of personal hygiene be maintained by groundworkers. To minimise soils at the site becoming airborne and moving beyond the site boundaries during earth moving operations, it is recommended that soil dampening equipment be maintained on site during dry periods to minimise dust generation.

7.3.2 Durability of Buried Structures and Services

Natural strata below the site are indicated to be associated with relatively low soluble sulphate concentrations but some elevated soluble sulphates are noted in the Made Ground. Soil pH for both materials is noted to be alkaline. In view of the sulphate conditions, it is recommended that an allowance be made for appropriate precautions for the protection of good quality buried foundation concrete. Based on guidance within BRE

Special Digest 1 (2005), the specified DC Class of concrete for buried structures and foundations should be suitable for an ACEC site classification of AC-2.

The site has not been associated with past fuel and/or chemical storage and there are no such storage facilities in close proximity. Therefore, the site should not be considered to be 'brownfield' under the definition provided by UKWIR (2010) with respect to the assessment of ground for water supply pipes. Based on the guidance provided by UKWIR, conventional plastic materials can be used for potable water supply pipes without any requirements for specific testing.

It should be noted that individual water companies may have in-house requirements for the assessment of ground conditions for potable water supply pipes and these requirements may be in addition to, or may contradict, the guidance provided by UKWIR. Therefore, it is recommended that the relevant water supply company be consulted prior to finalising the potable water supply design.

7.3.3 Landscape Areas

No significant concentrations of potentially phytotoxic chemicals have been recorded. However, the site comprises minimal topsoil materials such that, within soft landscaping areas, it is likely to be necessary to import a suitable thickness of topsoil to provide a growing medium compatible with the proposed landscaping/planting. Imported topsoil/subsoil materials should be accompanied by documentation (including analytical test data) to confirm that the materials do not contain substances that would be an unacceptable risk to human health or the wider environment and to confirm that the materials would not be classified as a waste product.

7.4 Contaminant Linkages – Gases

The following section is based on data from two of four planned monitoring visits. Therefore, the assessment provided below may be updated for the final issue of this report.

Based on the Conceptual Site Model, consideration is given below to identified contaminant linkages and a risk evaluation is undertaken of each possible source-pathway-receptor linkage that may occur at the site. Where risks are identified as 'negligible', then by implication such risks are within normally accepted levels for the proposed development, and the further reduction of such risks by remediation works is considered unnecessary. Where risks are identified that are 'low' as defined in CIRIA C552 (2001), or worse, then consideration is given to the management of the identified risks, with appropriate recommended actions that may include engineering solutions with remediation works or ground gas protection and control systems as described below. Reference is made to guidance published in BRE BR211 (2023), as referenced by the Building Regulations, to relevant assessment criteria published in BS 8485:2015+A1:2019 and to best-practice guidance as published in BS 8576:2013 and CIRIA C665 (2007), as listed in the References.

There are no recorded landfills within influencing distance and the site is not within an area where precautions against the ingress of radon gas are required in new dwellings.

Based on the site and wider area history, the potential for significant thicknesses of deep Made Ground of unknown provenance beneath the site was identified. However, the ground investigation confirmed that Made Ground thicknesses beneath the site extend to between 0.8 m and 1.5 m depth and no putrescible material has been identified in the Made Ground such that the Made Ground beneath the site appears not to be a viable potential source of ground gases.

The superficial Tidal Flat Deposits include organic clays and horizons of peat. Such organic-rich soils can be a source of ground gases, such as methane and carbon dioxide. However, the gases in such soils are generated

very slowly and, therefore, significant volumes of gas are not generated and there is negligible potential for ground gas flow, migration and emission of gases at the surface. Based on information in publications such as CIRIA C665 *Assessing Risks Posed by Hazardous Ground Gases to Buildings* (2007) and *The Ground Gas Handbook* (2009), such soils are considered to have limited potential as a ground gas source.

Notwithstanding the above qualitative assessment, ground gas monitoring standpipes were installed within selected holes across the site and a programme of ground gas monitoring has been undertaken. The results of the monitoring are provided in Appendix III, summarised in Table 3, and data sufficiency is assessed in Table 4.

The ground gas monitoring recorded typical methane concentrations of <0.1% and carbon dioxide concentrations of between 0.2% and 3.9%. The recorded ground gas flow rates are between <0.1 l/hr and 0.2 l/hr. The ground gas monitoring was undertaken during both high and low atmospheric pressure conditions.

With reference to the summary data in Table 3, it is noted that the maximum gas concentration and gas flow rates are compatible with Gas Characteristic Situation 1 (CS1), as defined in BS 8485:2015+A1:2019. As outlined in Table 4 and based on the guidance in BS8576:2013, there is effectively no likelihood of a significant change in the ground gas regime and no ground gas protection measures are required within the proposed development.

7.5 Recommended Remedial Works

Based on the risk assessments presented in Section 7.3, it is considered that remediation works are not required to permit development to commence and construction stage remediation/mitigation measures are also not required.

7.6 Construction Management/Best Practice

In compliance with normal good practice, and in compliance with building control requirements, consideration should be given to the following:

- Soils should be kept damp during groundworks undertaken in dry weather to minimise the potential of aerial migration of dust to neighbouring properties and public areas.
- As outlined in Section 7.3.3, imported topsoil/subsoil materials should be accompanied by documentation (including analytical test data) to confirm that the materials do not contain substances that would be an unacceptable risk to human health or the wider environment and to confirm that the materials would not be classified as a waste product.
- Buried concrete design should be suitable for an ACEC site classification of AC-2.

7.7 Potential Liabilities

Based on the available data and the associated risk assessments, it is considered that there should be no significant environmental liabilities associated with the ground conditions and site ownership. Provided the work outlined in Section 7.6 are undertaken, there should be no such liabilities following completion of the development.

8. ASSESSMENT OF MINING, QUARRYING AND OVERALL GROUND STABILITY

The site is not within an area of recorded underground mining or mineral extraction. There are no recorded quarries at the site. Therefore, the proposed development should not be constrained by ground stability issues relating to mining or quarrying activities.

9. GEOTECHNICAL ASSESSMENT

9.1 Assessment of Foundation Solutions

The proposed development comprises the construction of a single structure that is of two-storey equivalent height. It is assumed that the structure is to be of steel frame with cladding construction. No structural loads/column loads have currently been provided.

Ground conditions at the site comprise a thickness of Made Ground to between 0.8 m and 1.5 m depth. Beneath the Made Ground, typically firm to stiff consistency, medium to high strength, silty clay (Tidal Flat Deposits) was encountered to around 2 m depth. It is considered that the upper horizon of those superficial deposits represents a higher strength 'crust'. Below approximately 2.0 m depth, lower strength, soft and firm consistency clays are present, with significant horizons of peat, up to 0.6 m thick, recorded from 2.5 m depth. Groundwater has been monitored at depths of between 0.89 m and 1.21 m (levels of 5.61 m OD and 5.39 m OD respectively).

The Made Ground includes variable materials and include gravel, cobbles and boulders. Whilst the materials may have been placed and compacted in the past as part of development within the overall Retail Park, it is considered unlikely that materials with particle size ranges as recorded would have been placed and compacted in accordance with an earthworks specification to form an engineered fill. No information is currently available to suggest any specification or compaction controls and subsequent verification testing. On this basis, it is considered that the construction of pad, strip or trench fill foundations within the Made Ground may be associated with adverse total or differential settlements and, therefore, such a foundation solution is considered not to be appropriate.

A higher strength 'crust' is identified below the Made Ground and at the top of the Tidal Flat Deposits. However, that 'crust' is then underlain by low strength materials and horizons of peat of significant thickness. Therefore, structural loads transferred to the ground from pad or trench fill foundations taken into the Tidal Flat Deposits 'crust' or a reinforced shallow foundation (reinforced grillage connecting columns or raft) constructed in Made Ground, may induce adverse total and differential settlements in the low strength and/or peat materials.

Due to the organic materials, including peat, identified beneath the site (together with the potential depth to the base of the Tidal Flat Deposits), it is considered that a vibro-replacement ground treatment solution would not be feasible for the proposed development. Therefore, it would be prudent to allow for a piled foundation solution with piles extending down to Mercia Mudstone Group strata. Continuous flight auger (CFA) or displacement auger piles may be suitable. Consideration could also be given to driven piles (including driven steel piles), but segmented driven piles would need an appropriate joint detail due to the change in strength between the Tidal Flat Deposits and the Mercia Mudstone Group strata.

It is assumed that floor slab loadings in the new building are not significantly high and that there would not be significantly restrictive tolerance requirements to differential settlements/deflections. Therefore, it may be feasible to use ground bearing floor slabs for the new building. It would be prudent to proof roll the building formation level and to remove soft spots, if identified, and to then replace soft spot materials with suitable

coarse-grained materials before undertaking further proof rolling. If high floor loadings are anticipated, then it may be prudent to consider also piling the floor slab.

External areas appear likely to essentially comprise vehicle parking areas. Therefore, significant differential settlements between a piled building and the external areas are considered unlikely. Notwithstanding this, it may be prudent to consider the use of flexible surfacing materials. It may also be prudent to consider the use of flexible service connections and/or oversize pipes. Depending on the depth of manholes in relation to low strength clays/peat, support to manholes may need to be considered and consideration could be given to piling deep manholes, if applicable.

It should be noted that the above assessment is provided on the assumption that development ground levels would be kept similar to existing levels. If there are proposals to increase ground levels then the above assessment may need to be reappraised as the weight of fill may have potential to induce adverse settlements in the soft clay/peat materials identified beneath the site.

Prior to the commencement of piling operations, it will be necessary to provide a working platform in accordance with the requirements of the Federation of Piling Specialists as outlined in Section 10.

Laboratory testing results indicate that clay soils beneath the site are classified as 'high' volume change potential soils, as defined in NHBC Standards (2024) and referenced by the Building Regulations Approved Document C. Within the influence zones of existing or proposed trees, suitable foundation precautions should be adopted, as outlined in NHBC Standards (2024). However, the depth to groundwater should be noted when determining requirements for precautions as soils below groundwater should be moisture stable.

Based on guidance published within BRE Special Digest 1 (2005), the specified DC Class of concrete for buried structures and foundations placed within the existing Made Ground should be suitable for an ACEC site classification of AC-2.

9.2 General Construction Advice

All formations should be cleaned, and subsequently inspected by a suitably qualified engineer prior to placing concrete. Should any soft, compressible or otherwise unsuitable materials be encountered they should be removed and replaced by blinding concrete.

Foundation concrete, or alternatively, a blinding layer of concrete, should be placed immediately after excavation and inspection in order to protect the formation against softening and disturbance.

Generally, all formations should be placed wholly within the same material type, unless specific geotechnical inspection and assessment have been undertaken.

Care should be taken to ensure that any existing services encountered are carefully and satisfactorily blocked to prevent water seeping through the drains and into any excavations.

The locations of any trial pits undertaken as part of this investigation should be accurately surveyed in order that their precise locations are known and that appropriate precautions can be taken when building over or near to these locations.

10. TEMPORARY WORKS

Conventional plant is considered appropriate for excavation works at this site, with an allowance for hydraulic breakers to break out dense and thinly cemented Made Ground.

Excavations are expected to remain stable in the short term, although some spalling should be anticipated if the excavations are left open for extended periods of time and particularly during inclement weather. Support should be provided, or the sides battered back, in any excavation in excess of 1.2 m depth requiring man entry in compliance with the relevant risk assessment.

Perched groundwater seepages were locally encountered during the ground investigation. Groundwater monitoring indicates a groundwater depth around 1 m below ground level. Excavations for service installations should be kept above the level of the groundwater if possible. Trench support and pumping from sumps is likely to be required where excavations below the groundwater are required.

Where large plant is proposed (piling equipment) then a temporary working platform should be provided for the specific plant to be used, in compliance with the requirements of FPS (2002) and BRE BR470 (2004). The working platform can be designed to be placed on existing ground and then removed following the works or ground levels can be reduced and the working platform can be incorporated into final site levels.

11. ASSESSMENT OF SOAKAWAY DRAINAGE

In-situ percolation tests were undertaken within two trial pits, TP1 and TP2, at the site. One test was undertaken to assess the feasibility of a conventional soakaway drainage system for the proposed development within the Tidal Flat Deposits and the other test was undertaken at shallow depth within the Made Ground materials for the potential use of permeable paving, or similar shallow solution. Water was pumped into the pits until it reached a suitable depth below ground level. The fall in water level was then monitored over time. The test was repeated a second time in the shallow trial pit (TP2). The results of the testing are presented in Appendix III.

The in-situ percolation test in TP1 undertaken within the silty clay Tidal Flat Deposits recorded no significant fall in water level throughout the test such that an infiltration rate is unable to be calculated, and the strata are indicated to have insufficient infiltration characteristics to support a soakaway drainage solution. Therefore, it is considered that a conventional soakaway drainage system will not be feasible for the proposed development.

The in-situ percolation tests undertaken within the shallow Made Ground strata in TP2 indicated soil infiltration rates of 7.2×10^{-5} m/s and 9.7×10^{-5} m/s. It is generally recommended that soakaways should not be constructed to discharge water within Made Ground materials due to potentially adverse settlements within those materials being impossible to predict if large quantities of water are introduced to Made Ground (and the potential for significant inundation settlements if concentrated volumes of water are discharged to Made Ground). It is therefore recommended that an alternative drainage system be adopted, such that potential future deleterious settlements beneath proposed hardstanding are avoided. However, if a soakaway drainage system based on permeable paving is to be progressed then, due to potential future settlements, it should be appreciated that future and/or ongoing maintenance may be required to hard surfacing if adverse settlements occur. Soakaways associated with permeable paving should be located an appropriate distance from existing/new structures (both on and off site) so that water discharging to Made Ground does not have an adverse effect on foundations. Conventional chamber type soakaways discharging to Made Ground should not be used for the proposed development due to the concentrated volume of water that may be discharged to the ground from such a system.

It should be noted that groundwater is indicated to be at relatively shallow depth below the site and would need to be considered if a shallow, permeable pavement or similar, infiltration drainage system is proposed as there would typically need to be a suitable attenuation distance between groundwater and the base of any infiltration drainage system.

12. ROAD PAVEMENTS

Based on the nature of the shallow soils beneath the site a preliminary design equilibrium CBR of 3% may be considered for the design of road pavements. The materials at shallow depth may be regarded as frost susceptible.

13. ASSESSMENT OF MATERIALS FOR WASTE DISPOSAL

There is no requirement, from an environmental perspective, to remove soils from site and, therefore, development levels should be set such that soils can be retained and reused on site where possible. Providing development levels are set to accommodate soil arisings (for example, from foundation excavations), such materials would not be classified as waste if retained and re-used on site. However, if materials are excess to requirements (as may be the case for the majority of the existing stockpile/bund materials), they should be taken to an appropriately permitted waste facility.

If material is identified for removal to a waste facility, it will be necessary to provide a description of the material and laboratory test data to the receiving facility. This information is included in Appendix III. It should be noted that additional testing, either for classification purposes or for waste acceptance criteria (WAC) testing to confirm acceptability of the waste may be required (as noted below).

The available analytical laboratory test data has been used to provide preliminary waste disposal advice. It should be noted that these test results may not specifically relate to materials that are, or will be, scheduled for removal from site. However, the results are appropriate for preliminary guidance and costing purposes.

A preliminary assessment of potential waste classification for materials on site has been undertaken in accordance with the Natural Resources Wales's document Guidance on the Classification and Assessment of Waste WM3 (2021). The assessment indicates that the following preliminary waste classification advice would be appropriate.

- Topsoil, where present, is likely to be classified as 'non-hazardous' waste if taken to a landfill due to the organic content of such materials. Alternatively, these materials could be taken to a recycling facility.
- Based on the analytical laboratory test results, the Made Ground materials encountered beneath the site and within the perimeter bunds and stockpile SK1 (southeast of the gravel surfaced area) are likely to be classified as 'non-hazardous' waste for disposal off site. Based on the WAC testing undertaken, these materials may be suitable for acceptance at an 'inert' landfill facility as they are indicated to comply with the inert WAC limiting values.
- Based on the petroleum hydrocarbon concentrations, the Made Ground materials encountered within stockpile SK2 may be classified as 'hazardous' waste for disposal off site. The materials comply with the hazardous WAC limiting values and, therefore, should be accepted for disposal at a 'hazardous' landfill.
- Natural strata, providing they have not been impacted by potential contaminants, would generally be classified as 'inert' waste without any requirement for laboratory testing. However, horizons within the Tidal Flat Deposits include visible organic material and peat layers and such materials may require disposal at a 'non-hazardous' landfill due to the organic content. Therefore, it would be prudent to make allowance for some natural strata to require removal to a 'non-hazardous' landfill.

Waste requires pre-treatment prior to disposal at landfill and this may take the form of physical or chemical treatment to reduce hazards and/or waste volumes. The segregation and screening of waste soils into separate, and appropriately classified, waste streams would satisfy the pre-treatment criteria by ensuring that volumes of each waste category are minimised. Segregation of waste streams is also important to prevent materials being classified within a worse-case category and, therefore, incurring higher disposal costs. Mixing of different waste streams to dilute hazardous properties is not permitted.

It should be noted that the above assessment is provided in accordance with current waste disposal and environmental permitting legislation and guidance documents. However, individual landfills and other waste disposal facilities may have variances in their permit that differs from standard guidance. Waste facilities may also make decisions with respect to accepting waste on a commercial basis. Therefore, landfills or other waste facilities should be approached to confirm that they will accept waste materials prior to finalising waste disposal proposals.

14. RECOMMENDATIONS FOR FURTHER GROUND INVESTIGATIONS

Based on the recorded ground conditions, it is indicated that a conventional shallow foundation solution is unlikely to be feasible for the proposed development due to the recorded variable Made Ground and underlying variable Tidal Flat Deposits, including low strength and compressible material with peat horizons. Therefore, supplementary ground investigation works, utilising deep boreholes, are recommended to confirm the depth to competent underlying Mercia Mudstone strata and obtain suitable data for pile foundation design.

15. RECOMMENDED SUPERVISION AND MONITORING

In compliance with the requirements in BS EN 1997-1:2004 and BE EN 1997-2:2007, construction and workmanship of the engineering solutions recommended in this report shall be supervised. In particular, issues listed in Section 9.2 General Construction Advice shall be considered in the implementation of the works and design of any necessary temporary works set out in Section 10.

In relation to the foundation solution(s) and ground floor slab recommendations in Section 9, the following supervision and monitoring is recommended

- Verification testing will be required (in situ testing following pile installation) to demonstrate satisfactory installation and performance in compliance with the specification and design criteria applicable to the piles.

16. SUMMARY

A commercial development is proposed at land off Seven Stiles Avenue, Newport Retail Park, Newport. The site is currently occupied by a vacant development plot comprising an area of gravel surfacing within the northern part of the site and overgrown shrub vegetation elsewhere. The proposed development comprises a van rental premises to include a van workshop and wash bays with an office/reception area together with car/van parking and limited areas of managed soft landscaping.

Ground conditions at the site comprise a thickness of Made Ground to between 0.8 m and 1.5 m depth. Beneath the Made Ground, typically firm to stiff consistency, medium to high strength, silty clay (Tidal Flat Deposits) was encountered to around 2 m depth. It is considered that the upper horizon of those superficial deposits

represents a higher strength 'crust'. Below approximately 2.0 m depth, lower strength, soft and firm consistency clays are present, with significant horizons of peat, up to 0.6 m thick, recorded from 2.5 m depth. Mercia Mudstone Group strata are indicated below the Tidal Flat Deposits and may be present from depth below about 8.5 m to 9.0 m (although such an assessment is based on dynamic probing profiling rather than visual inspection). Groundwater has been monitored at depths of between 0.89 m and 1.21 m (levels of 5.61 m OD and 5.39 m OD respectively).

Based on available desk study and historical map information, a conceptual site model has been developed that identified a number of potential contaminant linkages in relation to the proposed development. A ground investigation was then designed to provide assessment of these contaminant linkages. In respect of human health, no elevated concentrations of potential contaminants have been identified within the soils beneath the site. No mobile contaminants have been identified within the shallow soils beneath the site such that risks to controlled waters are considered to be negligible. Appropriate buried concrete design is likely to be required for buried concrete placed within the existing Made Ground. The ground gas monitoring undertaken indicates that gas protection measures are not required for the proposed building.

Based on the recorded ground conditions, it is indicated that a conventional shallow foundation solution for the proposed development is unlikely to be feasible due to the recorded variable Made Ground and underlying variable Tidal Flat Deposits, which include low strength and compressible material with peat horizons. The recorded thickness of the Tidal Flat Deposits and organic horizons are also not compatible with a ground treatment (vibro-replacement) foundation solution. Therefore, allowance should be made for a piled foundation solution with piles taken into Mercia Mudstone Group strata. Ground bearing floor slabs may be suitable if floor slab loads are not particularly high (and there are no restrictive settlement/deflection tolerance). It would be prudent to proof roll the formation level before constructing the floor slab and to remove and replace soft spots, if identified. If high floor slab loads are indicated then it would be prudent to make allowance to pile the floor slabs. It may be appropriate to allow for flexible surfacing materials in external areas together with flexible services/drainage connections.

It should be noted that if there are proposals to significantly increase ground levels at the site as part of the development then the foundation and other engineering solutions may need to be appraised as the weight of fill materials may induce adverse settlements in the low strength clays/peats identified below the site.

Based on the ground conditions encountered and soakaway testing that has been undertaken, it is considered that conventional soakaway drainage discharging to natural strata will not be feasible for the development (low permeability natural strata and shallow groundwater). Testing has indicated that permeable pavement type infiltration drainage may be suitable (although is typically recommended not to be used in Made Ground). It should be noted that discharge of water to Made Ground may induce adverse settlements in Made Ground such that ongoing maintenance may be required. The depth to groundwater would also need to be noted so that there is appropriate attenuation between groundwater and the base of any infiltration drainage system.

A supplementary ground investigation is recommended and should utilise deep boreholes to confirm the depth to Mercia Mudstone Group strata and obtain suitable data for pile foundation design.

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GENERAL NOTES

1. The report is limited to the site boundaries and is specific to the development proposals as identified by the Client (or Client's advisor) and confirmed within this report. The report should not be used in a different context. Where the report is identified as a site appraisal, further geoenvironmental assessment, and detailed investigations, will be required prior to finalisation of ground related assessment and designs. Other reports may recommend additional investigation or other works that would be considered essential prior to the preparation of final assessments and associated designs.
2. This report has been prepared by Crossfield Consulting Limited with all reasonable skill, care and diligence within the terms of the Appointment/Proposal Terms and Conditions (as applicable) and with the resources agreed with the Client. Responsibility for any matters outside the agreed scope is not accepted.
3. Where any data supplied by the Client or by other external sources, including previous site investigation data, have been used it has been assumed that the information is correct unless otherwise stated. No responsibility can be accepted by Crossfield Consulting Limited for inaccuracies within the data supplied by others.
4. Any borehole data from the British Geological Survey sources are included on the following basis: "The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation.
5. Any assessments made in this report are based on the ground conditions indicated by the factual records included and/or referenced in the report, namely, trial pits and/or boreholes, together with the results of any field or laboratory testing undertaken and, where appropriate, other relevant site data/desk study information which may have been obtained for the site. Variations in ground conditions may occur between exploratory hole locations and there may be special conditions appertaining to the site that have not been revealed by the investigation and that have not been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available.
6. Exploratory hole locations provided in the report are generally established by tape measurement (or similar measurement) from existing features or boundaries. Ground levels stated in the report are based on site survey plans as provided. Hole locations are not accurately surveyed and ground levels at these locations are not obtained unless specifically included in the agreed scope of services.
7. Unless stated otherwise, no consultations with regulatory authorities, funders or other third parties have been carried out; hence, definitive assurance that such third parties will accept the findings of this report cannot be provided.
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11. New information, improved methods, changes in published guidance, codes of practice, policies and legislation can occur at any time and may necessitate an alteration to the report in whole, or in part, after its submission. Therefore, with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to Crossfield Consulting Limited for re-assessment and, if necessary, re-appraisal.

TABLES

TABLE 1

CONCEPTUAL SITE MODEL

	Potential Contaminant Source	Potential Contaminants	Potential Pathway	Receptors and Assessed Contaminant Linkage
On-Site Solid	Import of Made Ground, which may include demolition rubble and/or ashy materials. Excess material stockpiles and site perimeter bunds	Toxic metals Phytotoxic metals Polyaromatic hydrocarbons Asbestos fibres/ACM	Dermal and oral exposure pathways (including air-borne migration) are present during construction phase but will generally not be present following development due to building and hardstanding effective barriers. Limited landscaping areas after development represent possible dust exposure pathways.	Human Health <i>End Users:</i> Possible contaminant linkage <i>Groundworkers:</i> Possible contaminant linkage <i>Neighbouring Properties/General Public:</i> Possible contaminant linkage Buried Structures & Services <i>Buried concrete:</i> Possible contaminant linkage <i>Potable water pipes:</i> No contaminant linkage <i>Other buried structures:</i> No contaminant linkage Landscape Areas Possible contaminant linkage
	Natural strata/Made Ground	Sulphates	Adverse chemical reactions due to sulphates can deteriorate concrete quality	
Off-Site Solid	Similar ground conditions expected in surrounding areas and unlikely to be associated with mobile contaminant sources	n/a	Release into Liquid Phase Metals and PAHs have generally low solubility. Potential for plant uptake of metals. Negligible potential for release to the water environment Release into Vapour Phase n/a (no source)	
On-Site Liquid	No evidence of potential source	n/a	n/a (no source)	
Off-Site Liquid	Petrol filling station approximately 220 m to the west is a modern facility likely to have appropriate controls against fuel losses and potential for significant impaction of the ground. Site unlikely to be within influencing distance of contaminant migration if significant loss of fuels to the ground did occur. No realistic potential significant source	n/a		
On Site Liquid	No evidence of potential liquid source. Leached source from solids unlikely to represent a significant potential source.	n/a	n/a (no source)	Controlled Waters <i>Groundwater:</i> Unproductive superfcials and Secondary B bedrock aquifer strata and no groundwater source protection zone: No contaminant linkage <i>Surface Water:</i> Drainage channel 10 m east: No contaminant linkage
Ground Gases	No landfills within vicinity of site	n/a	n/a (no source)	Human Health <i>End users;</i> No contaminant linkage (but review of ground conditions recommended during a ground investigation and, if applicable, subsequent reappraisal of ground gas risks)
	Not in a radon affected area (no source)	n/a	n/a (no source)	
	Made Ground of unknown thickness and provenance indicated across the Newport Retail Park area of unknown thickness and provenance, Materials used for such a purpose are usually not associated with putrescible – potential source unlikely	Methane (limited potential source) Carbon dioxide (limited potential source)	Unlikely to be sufficient gas volumes for flow and emission at the surface (and subsequent entry to building due to pressure differential)	
	Tidal Flat Deposits and peat horizons may be a potential source of ground gases but are typically associated with very low volumes of gas	Methane (limited potential source) Carbon dioxide (limited potential source)	Very low volumes of gas are associated with negligible gas flow rates with negligible potential for migration and emission at the surface (not a valid pathway)	

NOTES

1. The above conceptual model is based on CIRIA C552 (2001) and BS 10175:2011+A2:2017, BS EN ISO 21365:2020 and Environment Agency Land Contamination Risk Management (LCRM) (2023).
2. The Conceptual Site Model is prepared from available desk study information. Where a site walkover or ground investigation identifies information that was not known at the desk study stage, such information is used to modify the Model.
3. Where a contaminant linkage is identified, any subsequent ground investigation is designed to obtain relevant information to assess the contaminant linkage. See Table 5 for a summary of contaminant linkage assessments.

TABLE 2
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SUMMARY OF ANALYTICAL TEST DATA: SOILS
RISKS TO HUMAN HEALTH

Determinand	Units	No of Tests	Concentration (mg/kg)		Generic Assessment Criteria (mg/kg) Commercial		Category 4 Screening Level (mg/kg) Commercial	
			Min	Max	Value	No>GAC	Value	No>C4SL
Arsenic	mg/kg	8	2.6	11	640 ¹	0	640 ³	0
Cadmium	mg/kg	8	<0.2	0.7	190 ¹	0	410 ³	0
Chromium (Total) ⁴	mg/kg	8	6.4	100	8600 ¹	0	-	-
Chromium (VI)	mg/kg	8	<1.8	<1.8	33 ¹	0	49 ³	0
Lead	mg/kg	8	6	46	-	-	2330 ³	0
Inorganic Mercury	mg/kg	8	<0.3	<0.3	1100 ¹	0	-	-
Nickel	mg/kg	8	1.1	21	980 ¹	0	-	-
Selenium	mg/kg	8	2.2	5.6	12,000 ¹	0	-	-
Copper	mg/kg	8	3.4	21	68,000 ¹	0	-	-
Zinc	mg/kg	8	32	140	730,000 ¹	0	-	-
Phenols	mg/kg	8	<1.0	<1.0	440 ¹	0	-	-
Petroleum Hydrocarbons								
Aliphatics C ₅ – C ₆	mg/kg	8	<0.010	<0.010	3200 ¹	0	-	-
Aliphatics C ₆ – C ₈	mg/kg	8	<0.010	<0.010	7800 ¹	0	-	-
Aliphatics C ₈ – C ₁₀	mg/kg	8	<0.010	<0.010	2000 ¹	0	-	-
Aliphatics C ₁₀ – C ₁₂	mg/kg	8	<1.0	<1.0	9700 ¹	0	-	-
Aliphatics C ₁₂ – C ₁₆	mg/kg	8	<2.0	7.7	59,000 ¹	0	-	-
Aliphatics C ₁₆ – C ₃₅	mg/kg	8	<8.0	1626	1,000,000 ¹	0	-	-
Aromatics C ₆ – C ₇	mg/kg	8	<0.010	<0.010	26,000 ¹	0	-	-
Aromatics C ₇ – C ₈	mg/kg	8	<0.010	<0.010	56,000 ¹	0	-	-
Aromatics C ₈ – C ₁₀	mg/kg	8	<0.020	<0.020	3500 ¹	0	-	-
Aromatics C ₁₀ – C ₁₂	mg/kg	8	<1.0	<1.0	16,000 ¹	0	-	-
Aromatics C ₁₂ – C ₁₆	mg/kg	8	<2.0	<2.0	36,000 ¹	0	-	-
Aromatics C ₁₆ – C ₂₁	mg/kg	8	<10	12	28,000 ¹	0	-	-
Aromatics C ₂₁ – C ₃₅	mg/kg	8	<10	2900	28,000 ¹	0	-	-
VOCs								
Benzene	mg/kg	8	<0.005	<0.005	27 ¹	0	27 ³	0
Toluene	mg/kg	8	<0.005	<0.005	56,000 ¹	0	-	-
Ethylbenzene	mg/kg	8	<0.005	<0.005	5700 ¹	0	-	-
Xylene	mg/kg	8	<0.005	<0.005	5900 ¹	0	-	-
MTBE	mg/kg	8	<0.005	<0.005	7900 ²	0	-	-

TABLE 2
(Page 2 of 2)

Determinand	Units	No of Tests	Concentration (mg/kg)		Generic Assessment Criteria (mg/kg) Commercial		Category 4 Screening Level (mg/kg) Commercial	
			Min	Max	Value	No>GAC	Value	No>C4SL
PAHs								
Naphthalene	mg/kg	8	<0.05	<0.05	190 ¹	0	-	-
Acenaphthylene	mg/kg	8	<0.05	<0.05	83,000 ¹	0	-	-
Acenaphthene	mg/kg	8	<0.05	<0.05	84,000 ¹	0	-	-
Fluorene	mg/kg	8	<0.05	<0.05	63,000 ¹	0	-	-
Phenanthrene	mg/kg	8	<0.05	0.18	22,000 ¹	0	-	-
Anthracene	mg/kg	8	<0.05	<0.05	520,000 ¹	0	-	-
Fluoranthene	mg/kg	8	<0.05	0.44	23,000 ¹	0	-	-
Pyrene	mg/kg	8	<0.05	0.39	54,000 ¹	0	-	-
Benz(a)anthracene	mg/kg	8	<0.05	0.34	170 ¹	0	-	-
Chrysene	mg/kg	8	<0.05	0.39	350 ¹	0	-	-
Benzo(b)fluoranthene	mg/kg	8	<0.05	0.7	44 ¹	0	-	-
Benzo(k)fluoranthene	mg/kg	8	<0.05	0.21	1200 ¹	0	-	-
Benzo(a)pyrene	mg/kg	8	<0.05	0.42	35 ¹	0	76 ³	0
Indeno(123cd)pyrene	mg/kg	8	<0.05	0.25	500 ¹	0	-	-
Dibenzo(ah)anthracene	mg/kg	8	<0.05	0.05	3.5 ¹	0	-	-
Benzo(ghi)perylene	mg/kg	8	<0.05	0.28	3900 ¹	0	-	-

NOTES

1. Suitable for Use Level (S4UL) published by LQM/CIEH, 2015 – Commercial landuse. S4UL assumptions comprise 1% soil organic matter, soil pH of 7 and sandy loam soil type. Where S4UL presented by LQM is greater than 100%, the S4UL for this assessment has been capped at 1,000,000 mg/kg. S4ULs are copyright © Land Quality Management Limited reproduced with permission; Publication Number S4UL3133.
2. Soil GAC for Human Health Risk Assessment produced by CL:AIRE (2010) – Commercial. Assumption of 1% soil organic matter.
3. Category 4 Screening Level (C4SL), Department for Environment Food and Rural Affairs (March 2014) – calculated for 1% SOM using the CLEA Model v1.071
4. In the absence of desk study or historical map evidence indicating a potential source of chromium (VI) usage at or in the near vicinity of the site, total chromium concentrations have been compared to the GAC for chromium (III).
5. This Table summarises data from 4 No. samples recovered and tested from exploratory holes during the ground investigation. The Table also includes testing from 4 No. samples recovered from stockpiles in the site and bunds around the site. Whilst those features will be removed as part of the development, the test data has been included and assessed in case material reuse to form required ground levels for the proposed development.

TABLE 3

SUMMARY OF GROUND GAS CONDITIONS

Date	Standpipe Ref	Methane $C_{hg} CH_4$ (%)	Carbon Dioxide $C_{hg} CO_2$ (%)	Oxygen (%)	Trace Gases		Atm ¹ (mb)	Standpipe Pressure ² (mb)	Ground Gas ^{2,3} Flow Rate (litre/hr)	Characteristic Hazardous gas	Characteristic Hazardous gas
					H ₂ S (ppm)	CO (ppm)				Flow Rate Methane $Q_{hgs} CH_4$ ⁴ (litre/hr)	Flow Rate Carbon Dioxide $Q_{hgs} CO_2$ ⁴ (litre/hr)
4.10.24	DS3	<0.1	3.1	17.5	<1	<1	1019 F	0.02	<0.1	0.0001	0.0031
	DS4	<0.1	0.6	20.0	<1	<1	1019 F	0.23	0.2	0.0002	0.0012
	DS5	<0.1	0.2	20.5	<1	<1	1019 F	0.02	<0.1	0.0001	0.0002
9.10.24	DS3	<0.1	3.7	15.5	<1	<1	986 R	0.02	<0.1	0.0001	0.0037
	DS4	<0.1	1.5	18.5	<1	<1	986 R	0.02	<0.1	0.0001	0.0015
	DS5	<0.1	0.1	20.4	<1	<1	986 R	0.01	<0.1	0.0001	0.0001
16.10.24	DS3	<0.1	3.9	15.1	<1	<1	999 F	0.02	<0.1	0.0001	0.0039
	DS4	<0.1	1.7	18.0	<1	<1	999 F	0.12	0.1	0.0001	0.0017
	DS5	<0.1	0.2	20.1	<1	<1	999 F	0.01	<0.1	0.0001	0.0002
23.10.24	DS3	<0.1	1.7	18.1	<1	<1	1026 F	0.02	<0.1	0.0001	0.0017
	DS4	<0.1	1.6	18.0	<1	<1	1026 F	0.10	0.1	0.0001	0.0016
	DS5	<0.1	0.1	20.4	<1	<1	1026 F	0.01	<0.1	0.0001	0.0001

NOTES:

1. Atm denotes atmospheric pressure. R: rising F: falling S: static (pressure trend is over day of measurement, as indicated on the record sheets).
2. Negative recorded flow/pressure values are indicative of flow from the atmosphere into the standpipe and are associated with negligible ground gas emissions to atmosphere.
3. Ground Gas Flow Rate (q) measured at the gas tap on monitoring standpipe.
4. Characteristic Hazardous Gas Flow Rate (Q_{hgs}) = $(C_{hg} / 100) \times q$ (from BS 8485:2015+A1:2019). This value has been calculated for each gas under highest recorded flow conditions. This parameter is similar to the "Gas Screening Value" (GSV) in CIRIA C665 (2007).
5. Ground Gas monitoring equipment: Gas Data GFM436
6. Groundwater data is presented on Table III-4

TABLE 4

GROUND GAS DATA SUFFICIENCY ASSESSMENT

The following assessment is based on Table F1: BS8576:2013.

Action	Result
Recorded Ground Gas Regime	Characteristic Hazardous Gas Flow Rate ¹ : Methane 0.0001 litre/hr Characteristic Methane Concentration: < 0.1% Characteristic Hazardous Gas Flow Rate ¹ : Carbon dioxide 0.0039 litre/hr Characteristic Carbon dioxide Concentration: 3.9 % Other gases of concern: None Characteristic Situation (CS) ² CS 1
Increase in Ground Gas Concentration required increase level of risk/gas protection requirements.	Based on the highest recorded ground gas flow rate recorded to date, methane or carbon dioxide concentrations would require to increase to 70%.
Increase in Ground Gas Flow rate required increase level of risk/gas protection requirements.	Based on the highest recorded concentration of carbon dioxide recorded to date, an increased ground gas flow rate of 1.8 litre/hr would be required.
Likelihood of increase in Ground Gas Concentration required increase level of risk/gas protection requirements.	} There is no valid mechanism for a future increase in gas generation and associated flow rates.
Likelihood of increase in Ground Gas Flow Rate required increase level of risk/gas protection requirements.	
Conclusion: Requirement for Additional Ground Gas Monitoring	No – Based on the above assessment, additional ground gas monitoring is not required to support an assessment compliant with BS8485:2015+A1:2019 and BS8576:2013.

NOTES:

1. Characteristic Hazardous Gas Flow Rate as defined in BS8485:2015+A1:2019. This parameter is synonymous with the “Gas Screening Value” (GSV) in CIRIA C665 (2007).
2. Reference should also be made to the accompanying detailed assessment presented in Section 7 of the report.

TABLE 5

ASSESSMENT OF CONTAMINANT LINKAGES

NOTES:

- 1. Contaminant linkage validity assessed following qualitative or semi-quantitative risk assessment.
- 2. Contaminant linkage assessed following detailed quantitative risk assessment or assuming the recommended remediation or mitigation measures are in place.

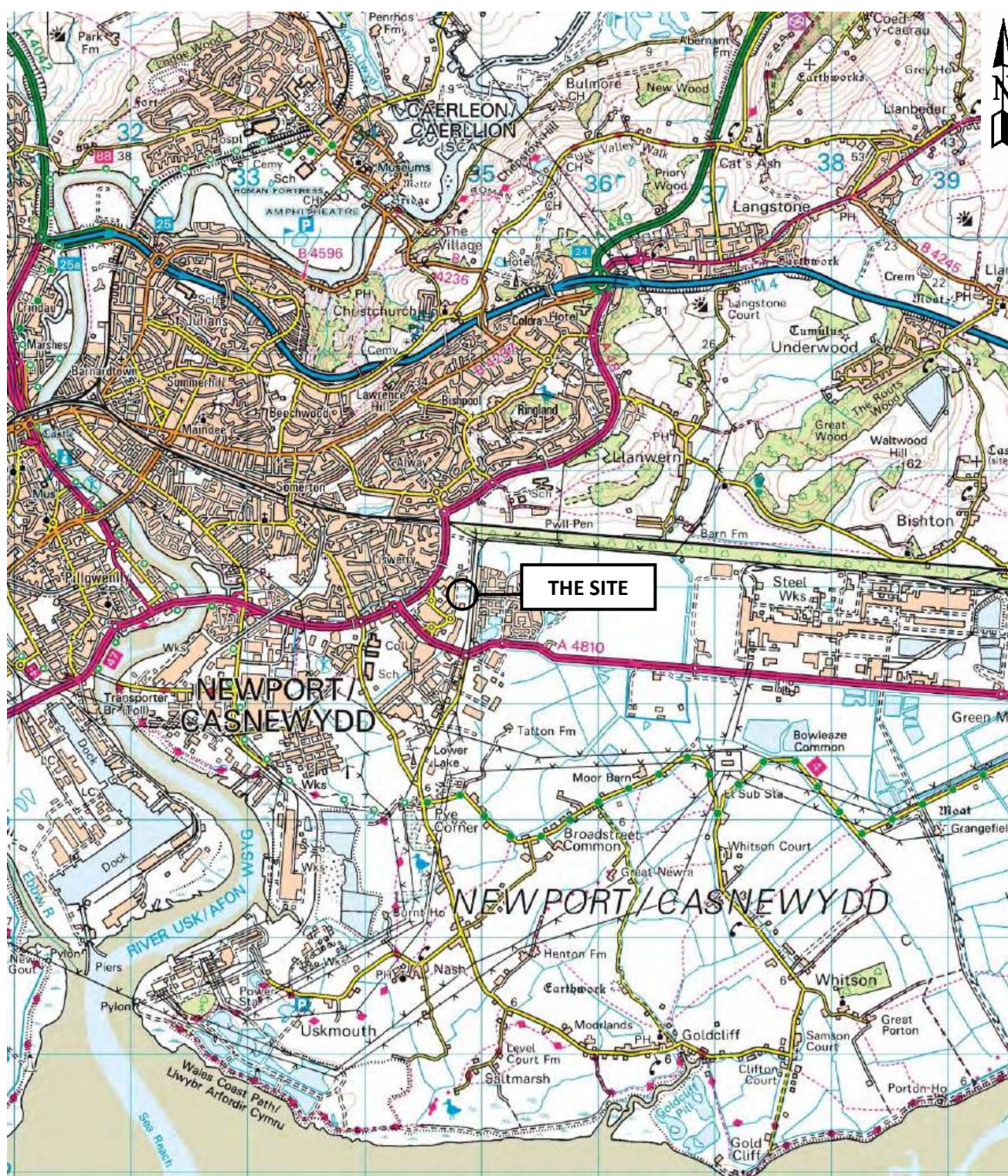
		Consequence ©			
		Severe	Medium	Mild	Minor
Probability (P)	High likelihood (HL)	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely (L)	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low likelihood (LL)	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely (UL)	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

All terminology in accordance with the definitions provided in CIRIA C552 (2001)

Contaminant Linkage			Assessment of Contaminant Linkage following Ground Investigation	Contaminant Linkage Valid? ¹	Risk Rating			Quantitative Risk Assessment	Recommended Remediation/Mitigation (See Section 7 for further details)	Recommended Work Verified?	Contaminant Linkage Valid? ²
Source	Pathway	Receptor			C	P	Risk				
Toxic metals Petroleum hydrocarbons PAHs Asbestos fibres/ACM	Inhalation (dust), Ingestion (dust), Dermal contact (dust)	End users	All concentrations of potential contaminants recorded below the GAC and C4SL No asbestos detected	No No	n/a n/a	n/a n/a	n/a n/a	Not applicable	None required	Not applicable	No
Toxic metals Petroleum hydrocarbons PAHs Asbestos fibres/ACM	Dermal contact (dust), Ingestion (dust), Inhalation (dust)	Neighbours/general public	All concentrations of potential contaminants recorded below the GAC and C4SL No asbestos detected	No No	Med n/a	UL n/a	Low n/a	Not applicable	It is recommended that soil dampening equipment be used to minimise potential for airborne migration of fugitive dust from site.	To be confirmed during construction phase.	No
Toxic metals Petroleum hydrocarbons PAHs Asbestos fibres/ACM	Dermal contact, ingestion and inhalation	Construction workers	All tests below concentrations considered to be a short term (acute) risk. No further assessment required. No asbestos detected	No No	n/a n/a	n/a n/a	n/a n/a	Not applicable	Not required but standard personal protective equipment is recommended as good practice and dust suppression measures should be adopted when undertaking groundworks.	Not applicable	No
Organic compounds	Direct contact	Potable water supply	Site has not been associated with fuel/chemical storage, therefore, considered not to be ‘brownfield’ (UKWIR)	No	n/a	n/a	n/a	Not applicable	None required. However, requirements of water company should be confirmed.	To be confirmed during construction phase.	No
Sulphates Sulphides (potential sulphates)	Contact/reaction with buried concrete	Deleterious to certain type of buried concrete	Sulphates recorded at levels where precautions are indicated to be necessary for buried concrete	Yes	Med	L	Mod	Not applicable	Buried structures to include a suitable concrete design/mix	To be confirmed during construction	No
Phytotoxic metals	Plant uptake	Landscape plantings	No elevated concentrations of phytotoxic metals have been recorded above guideline values given for healthy plant growth, based on BS 3882:2015.	No	n/a	n/a	n/a	Not applicable	None required. However, site predominantly devoid of topsoil such that a suitable thickness of topsoil is likely to be required to provide a growing medium in proposed soft landscaping areas.	Not applicable	No
Ground gases	Migration through Made Ground	End users	Ground gas conditions recorded and assessed compatible with a Characteristic Gas Situation 1 (CS1) such that no ground gas precautions are indicated necessary.	No	n/a	n/a	n/a	Not applicable	None required.	Not applicable	No

FIGURES

FIGURE 1



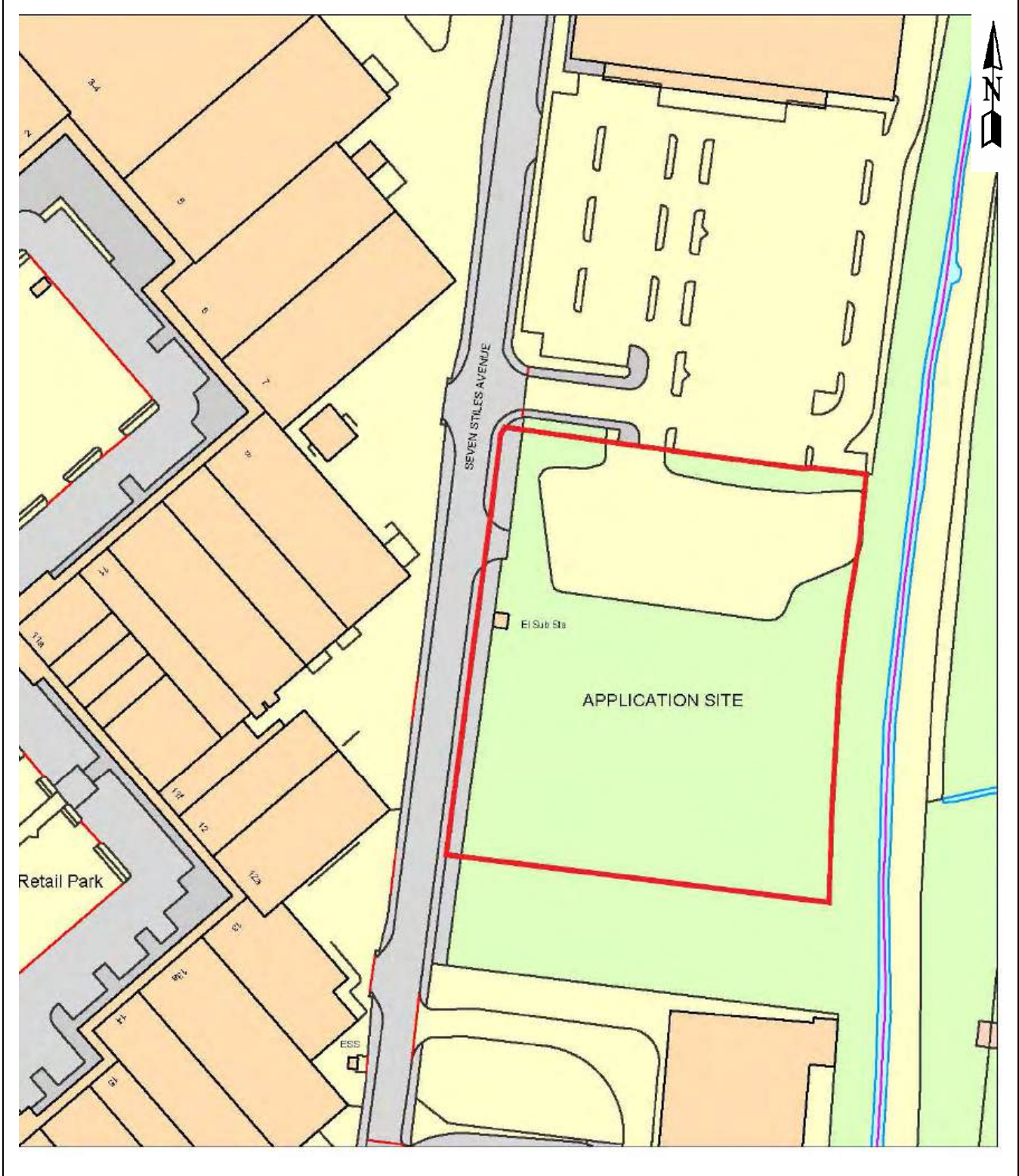
SITE LOCATION PLAN

Scale 1: 50,000

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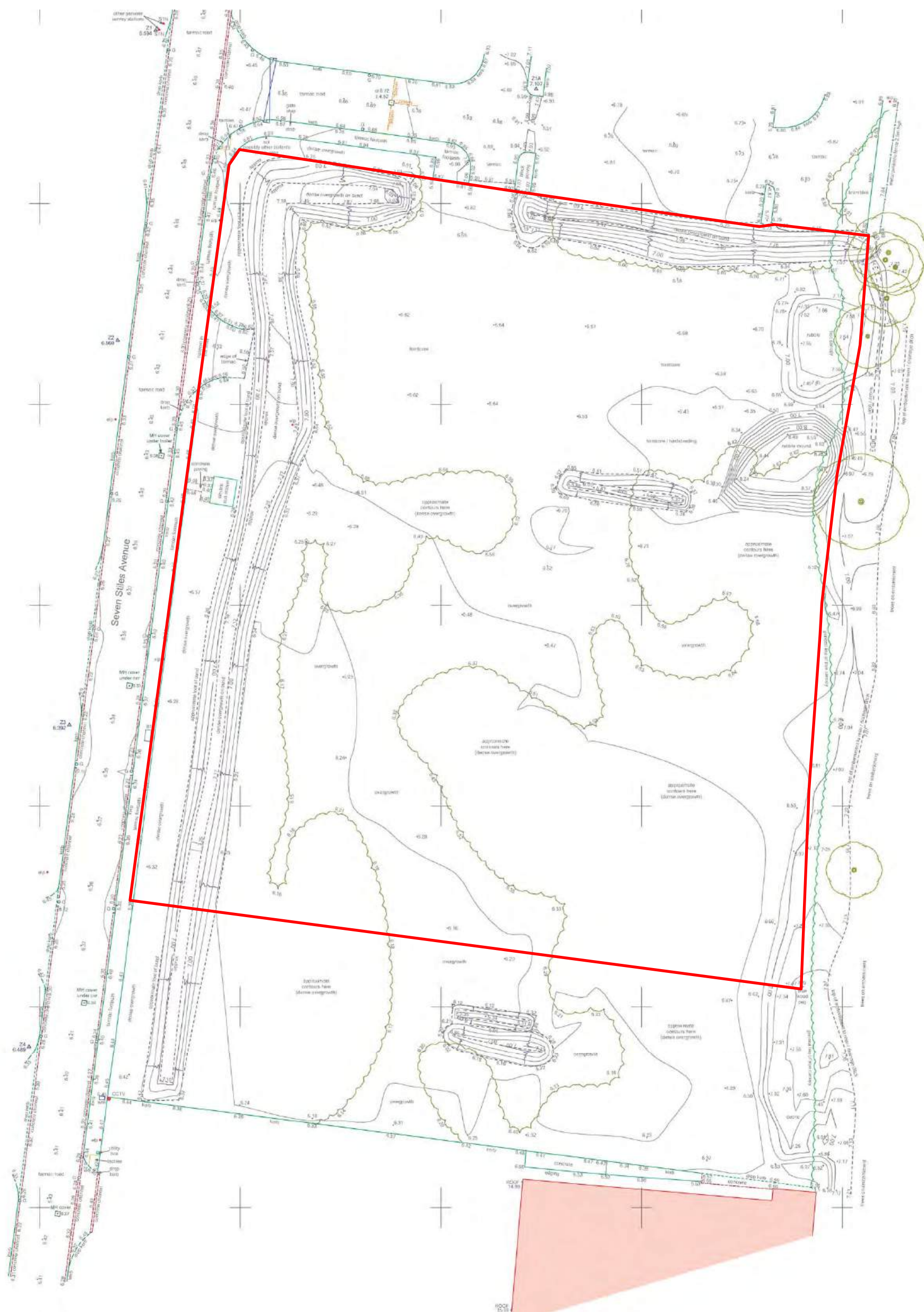
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FIGURE 2



SITE LOCATION PLAN
Scale 1: 1250

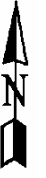
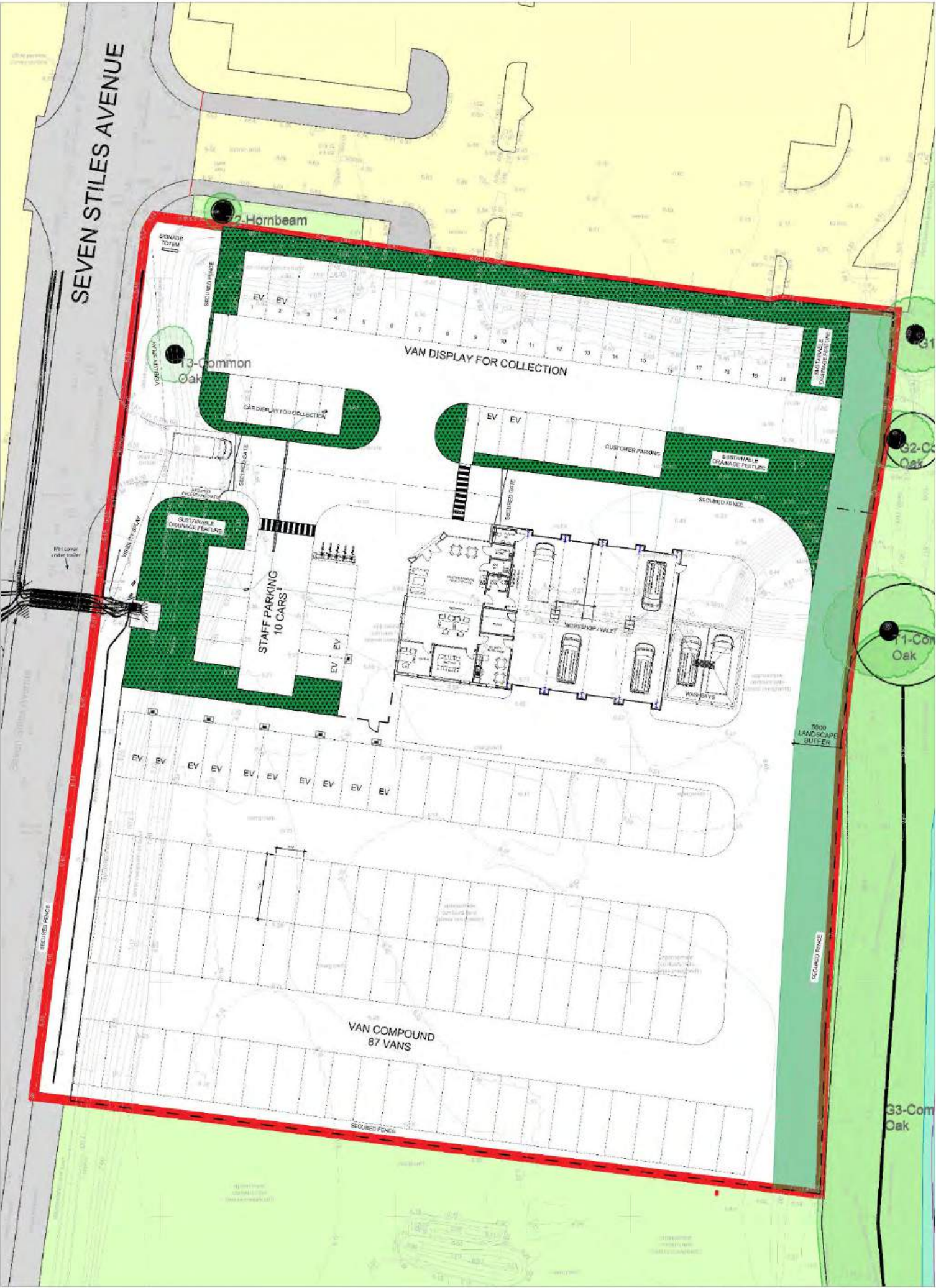
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Scale 1:500

Land off Seven Stiles Avenue, Newport Retail Park
CCL03796.CU99
October 2024

FIGURE 4



PROPOSED DEVELOPMENT PLAN
Scale 1:500

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APPENDIX I

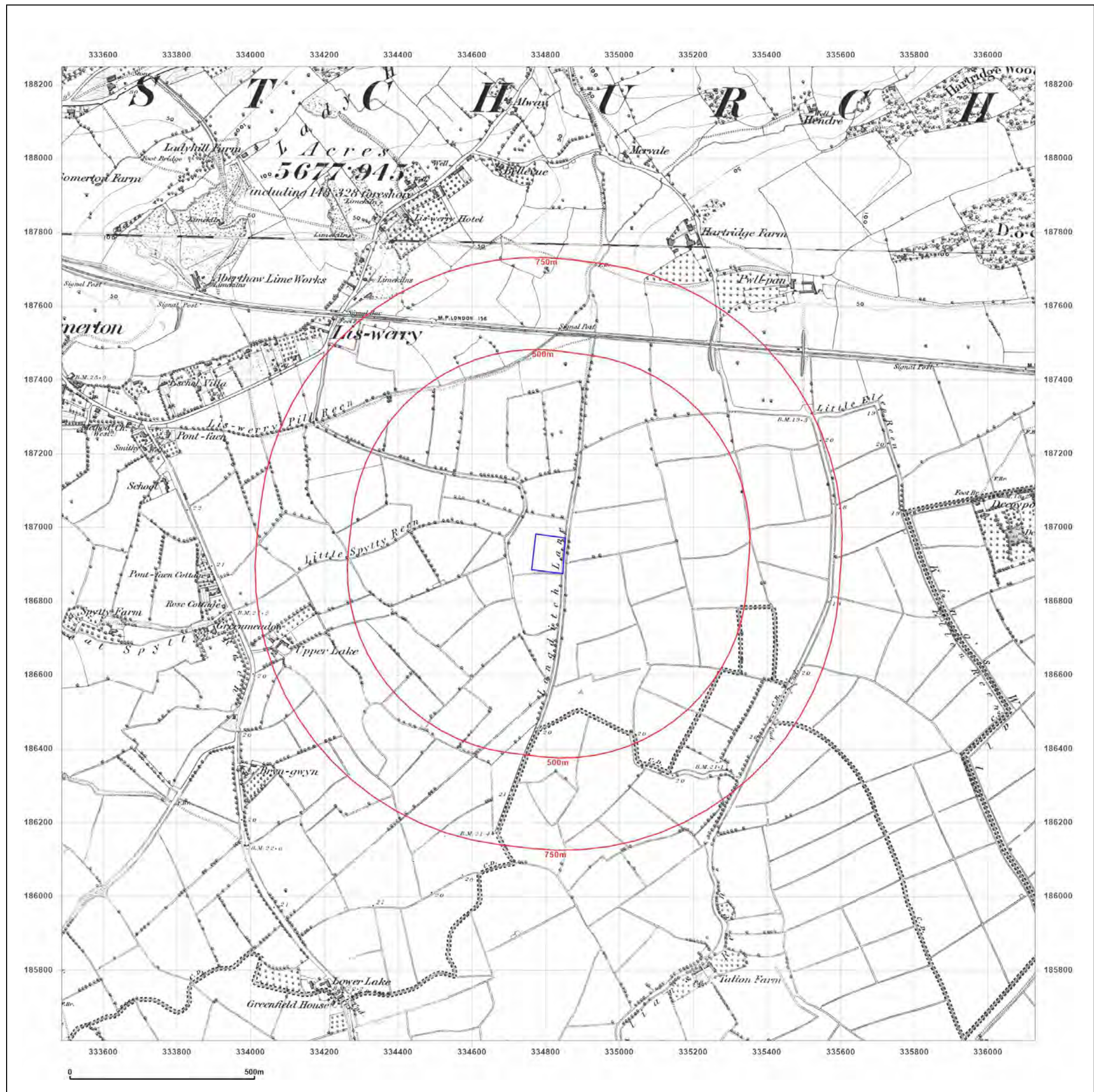
APPENDIX I – HISTORICAL INFORMATION

GroundSure MapInsight

Historical Ordnance Survey County Series and National Grid maps, as part of Groundsure's MapInsight package, have been obtained from Emapsite. Only map extracts that indicate relevant changes to the site and surrounding area are presented in this Appendix and discussed further in Section 2.3 of the report. A complete list of the maps received in the MapInsight package is given below in Table I-1. A full copy of the MapInsight package can be provided on request.

TABLE I-1

Large Scale Maps 25" County Series/1:2500 National Grid Series/1:1250 LandLine	Small Scale Maps 6" County Series/1:10,000 National Grid Series
1883-1884	1882
1901	1900
1921	1920-1922
1956	1922
1957	1938
1967	1949
1967-1968	1963-1965
1974-1978	1973
1988	1981
1986-1990	1985-1988
1987-1992	1988
1995	2001
1990-1995	2010
1993-1995	2024
1995	
2003	



Site Details:

Seven Stiles Avenue, Newport
retail park, Newport, NP19 4TX

Client Ref: EMS_968493_1203545
Report Ref: EMS-968493_1229095
Grid Ref: 334807, 186928

Map Name: County Series

Map date: 1882

Scale: 1:10,560

Printed at: 1:10,560



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Edition N/A
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Surveyed 1882
Revised 1882
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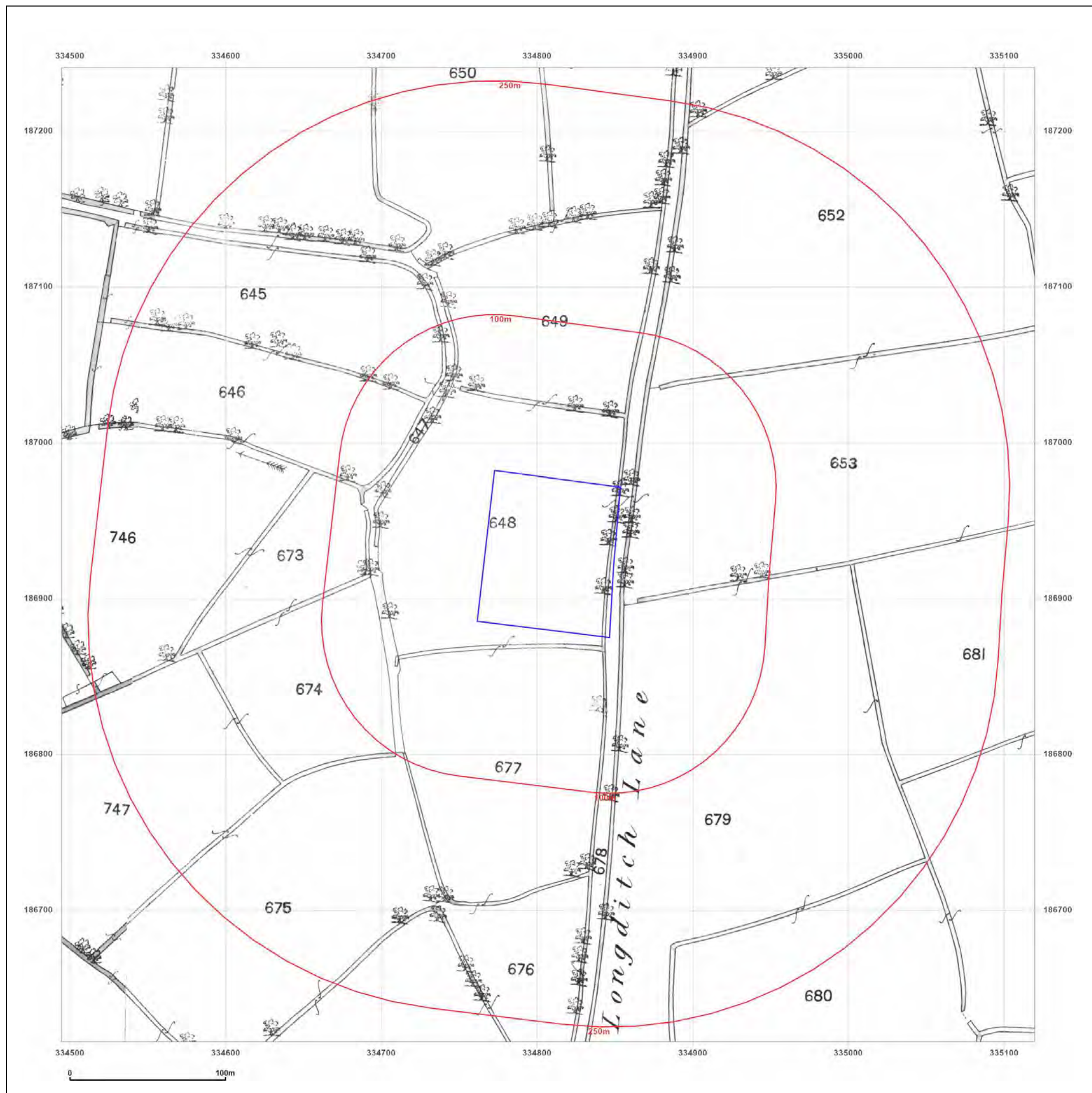


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Site Details:

Seven Stiles Avenue, Newport
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Client Ref: EMS_968493_1203545
Report Ref: EMS-968493_1229095
Grid Ref: 334807, 186928

Map Name: County Series

Map date: 1883-1884

Scale: 1:2,500

Printed at: 1:2,500



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Surveyed 1883
Revised 1883
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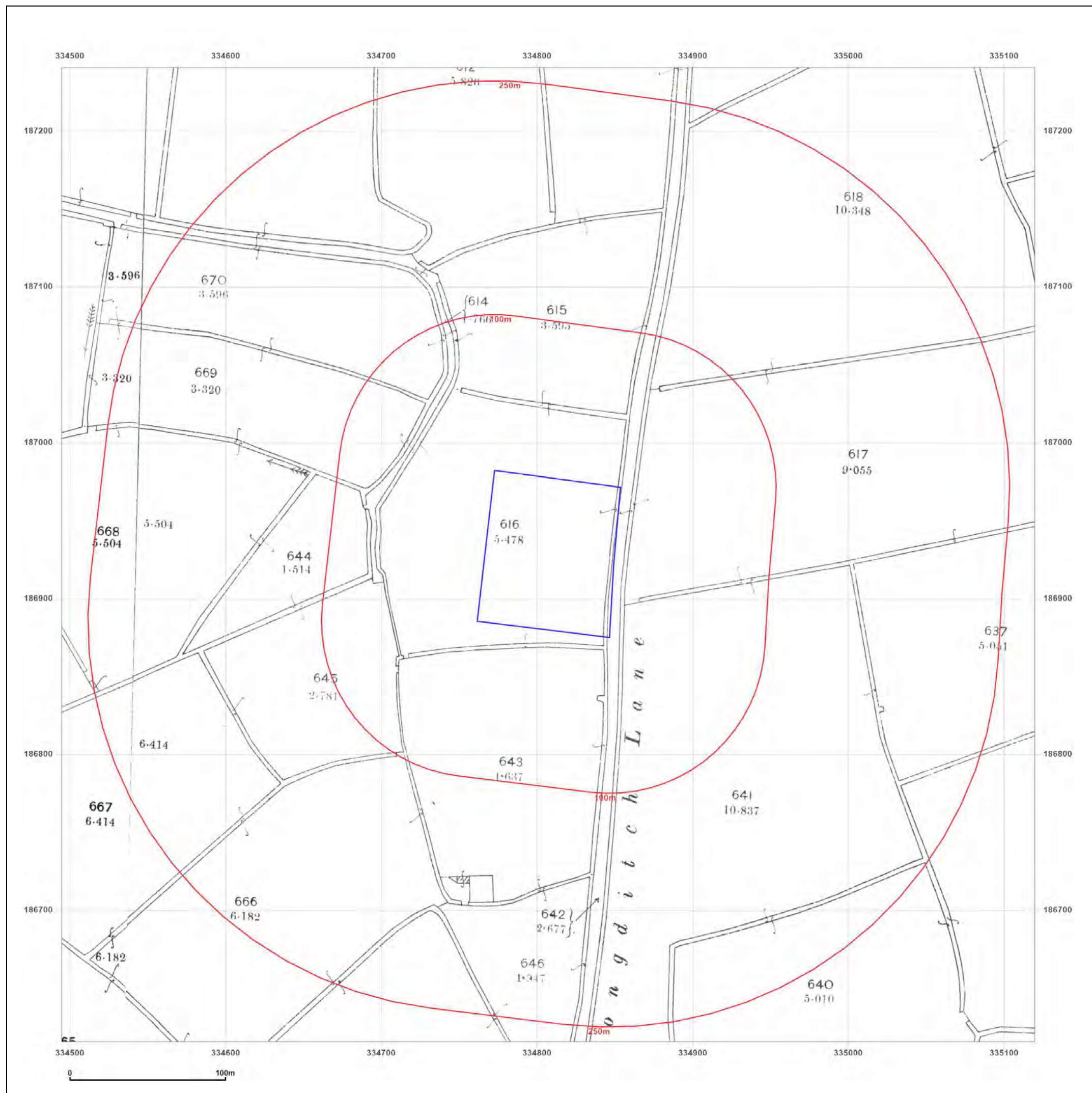


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Report Ref: EMS-968493_1229095
Grid Ref: 334807, 186928

Map Name: County Series

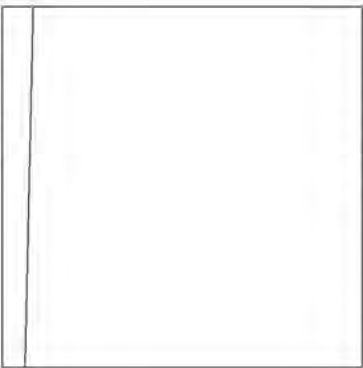
Map date: 1901

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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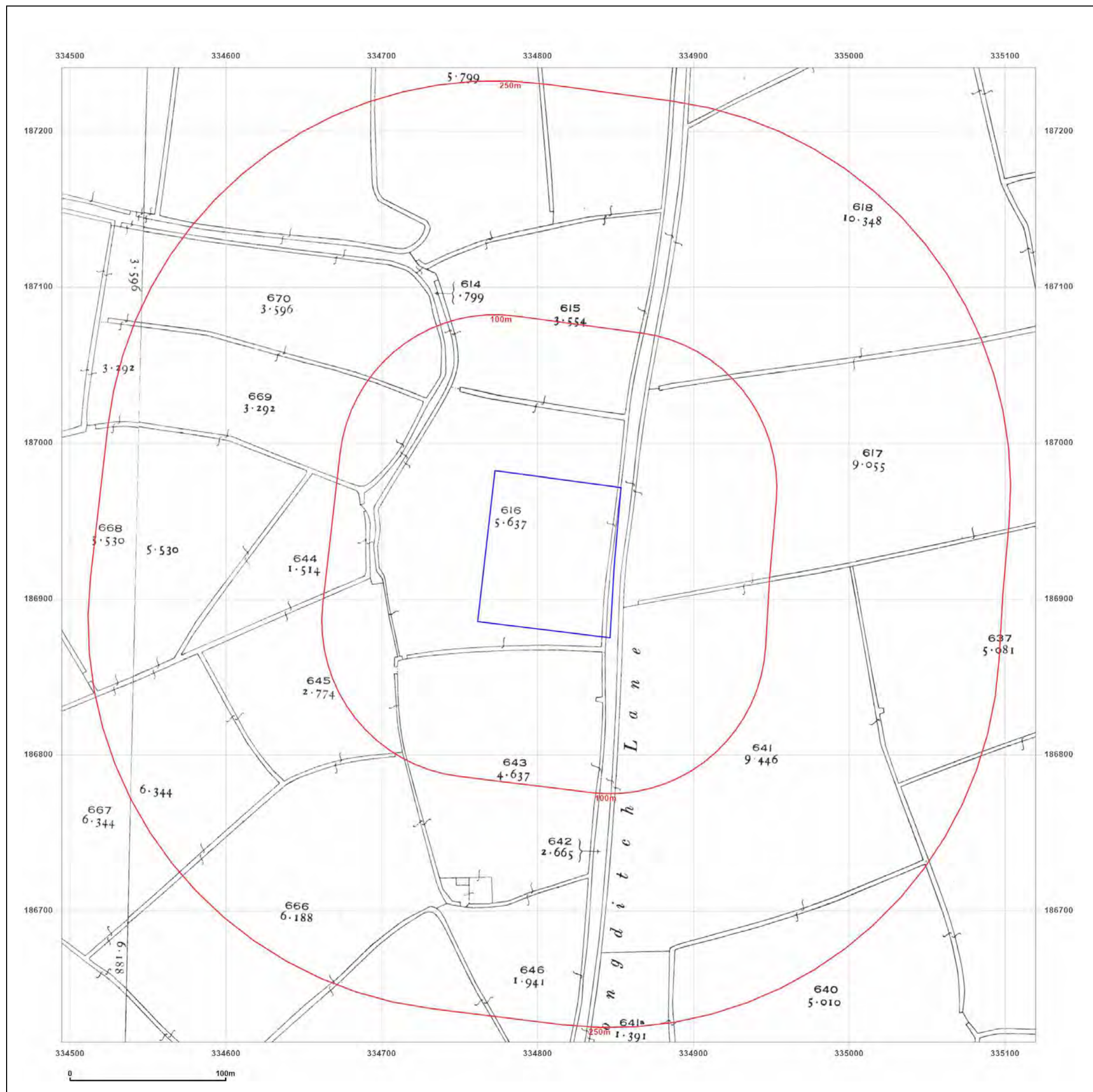


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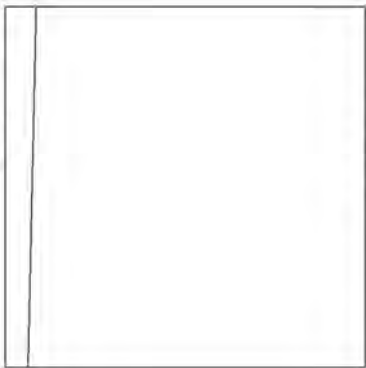
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Report Ref: EMS-968493_1229095
Grid Ref: 334807, 186928

Map Name: County Series
Map date: 1921
Scale: 1:2,500
Printed at: 1:2,500



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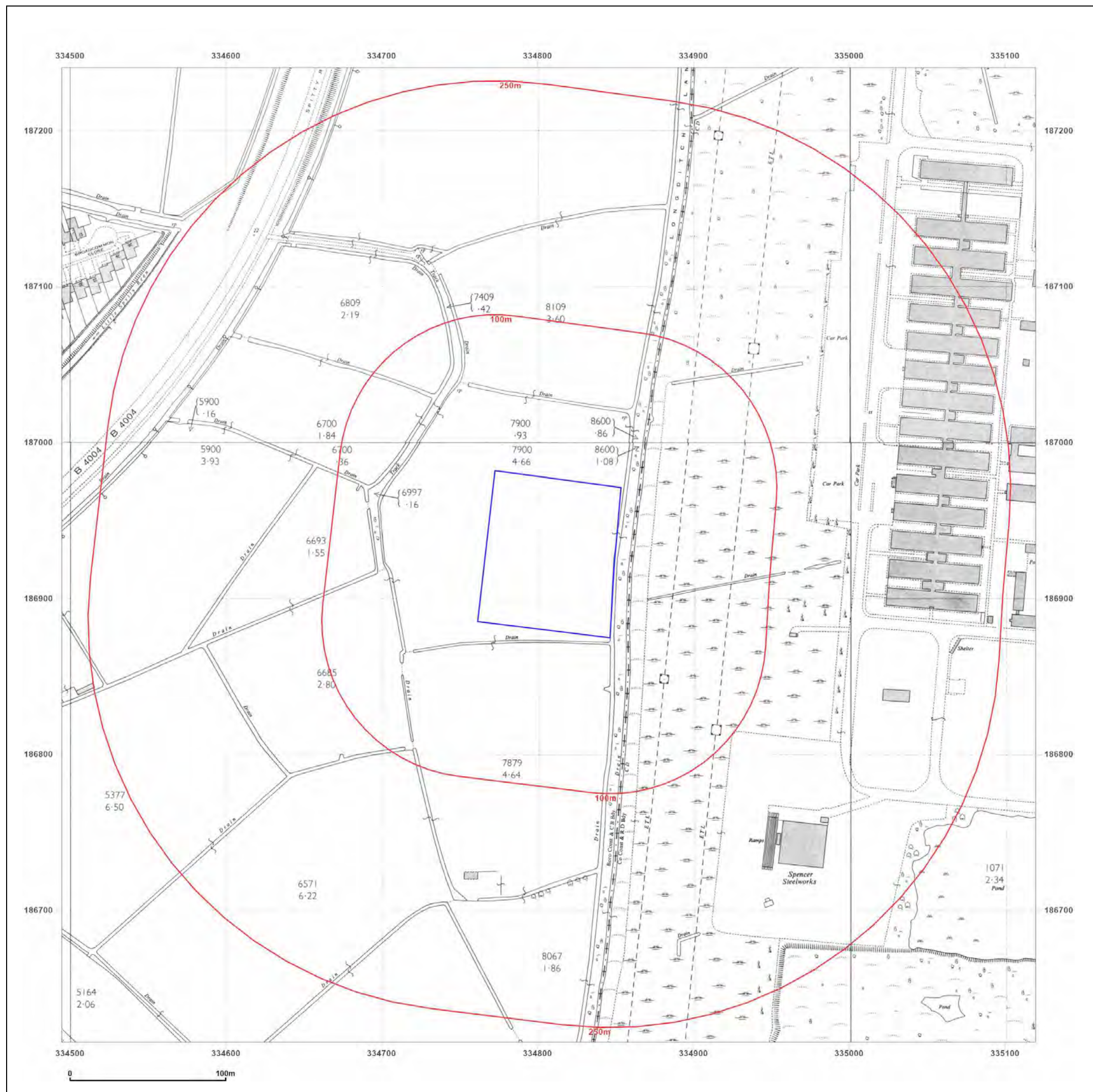


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Report Ref: EMS-968493_1229095
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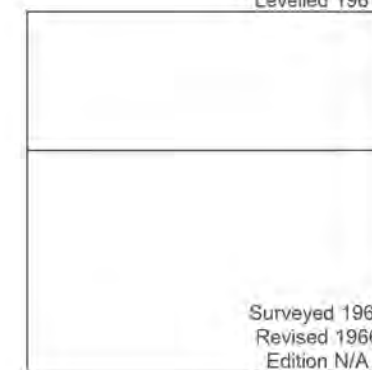
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Scale: 1:2,500

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Client Ref: EMS_968493_1203545
Report Ref: EMS-968493_1229095
Grid Ref: 334807, 186928

Map Name: National Grid

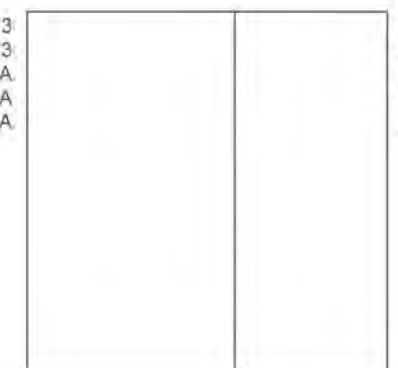
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Scale: 1:10,000

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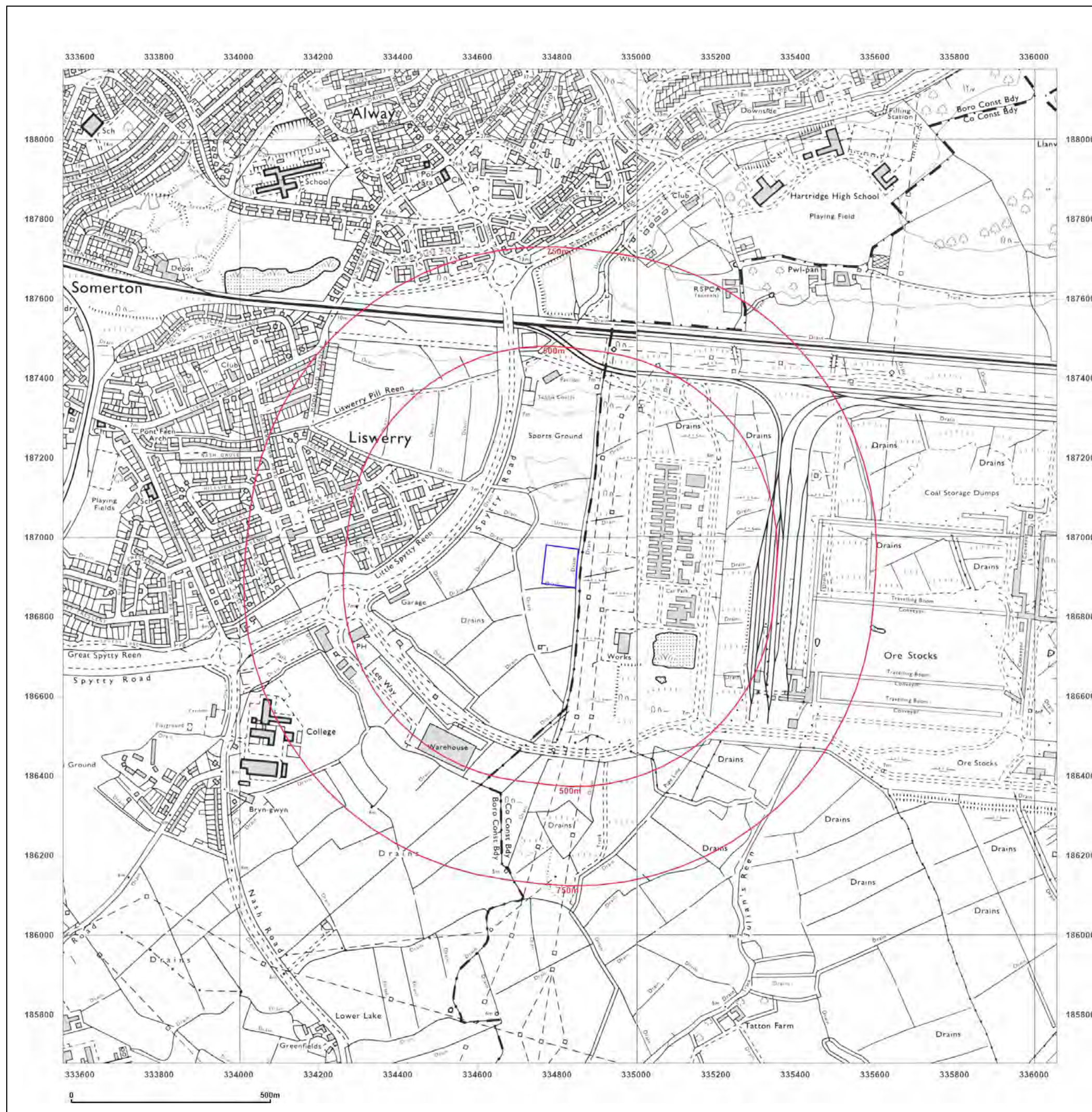


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Client Ref: EMS_968493_1203545
Report Ref: EMS-968493_1229095
Grid Ref: 334807, 186928

Map Name: National Grid

Map date: 1986-1990

Scale: 1:1,250

Printed at: 1:2,000



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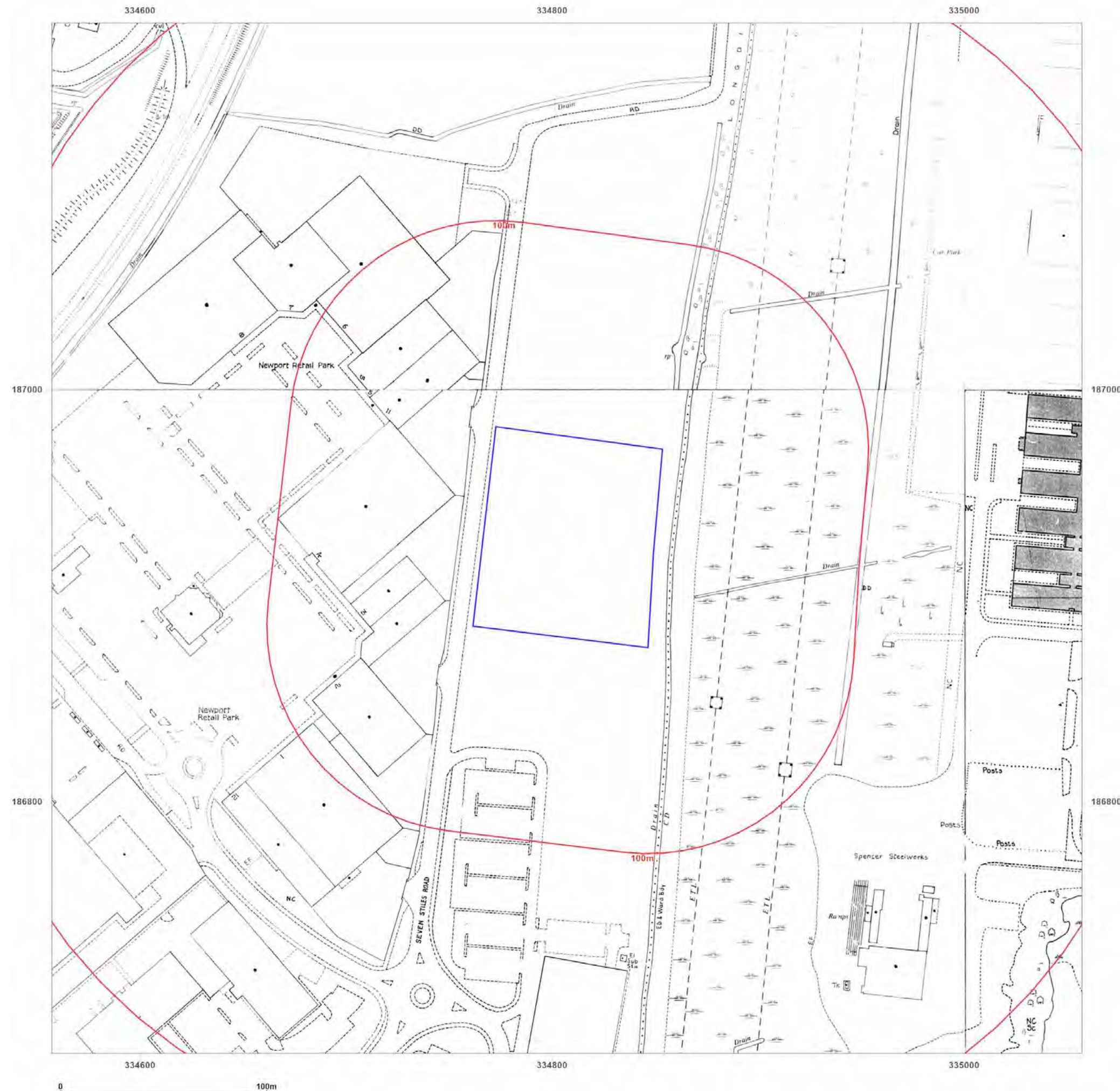


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Site Details:

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Client Ref: EMS_968493_1203545
Report Ref: EMS-968493_1229095
Grid Ref: 334807, 186928

Map Name: National Grid

Map date: 1995

Scale: 1:1,250

Printed at: 1:2,000



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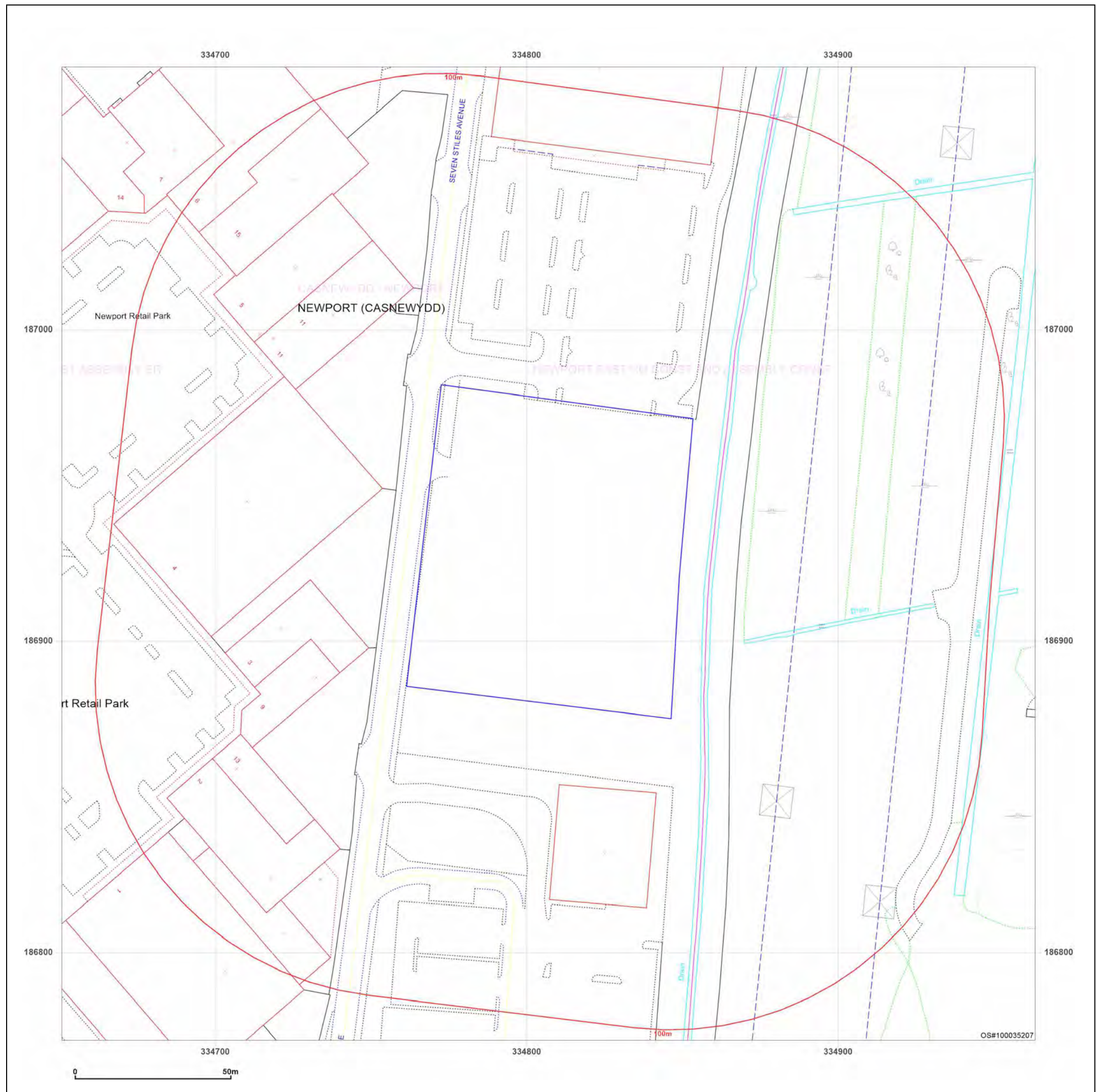
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Site Details:

Seven Stiles Avenue, Newport
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Client Ref: EMS_968493_1203545
Report Ref: EMS-968493_1229095
Grid Ref: 334807, 186928

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



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Site Details:

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Client Ref: EMS_968493_1203545
Report Ref: EMS-968493_1229095
Grid Ref: 334807, 186928

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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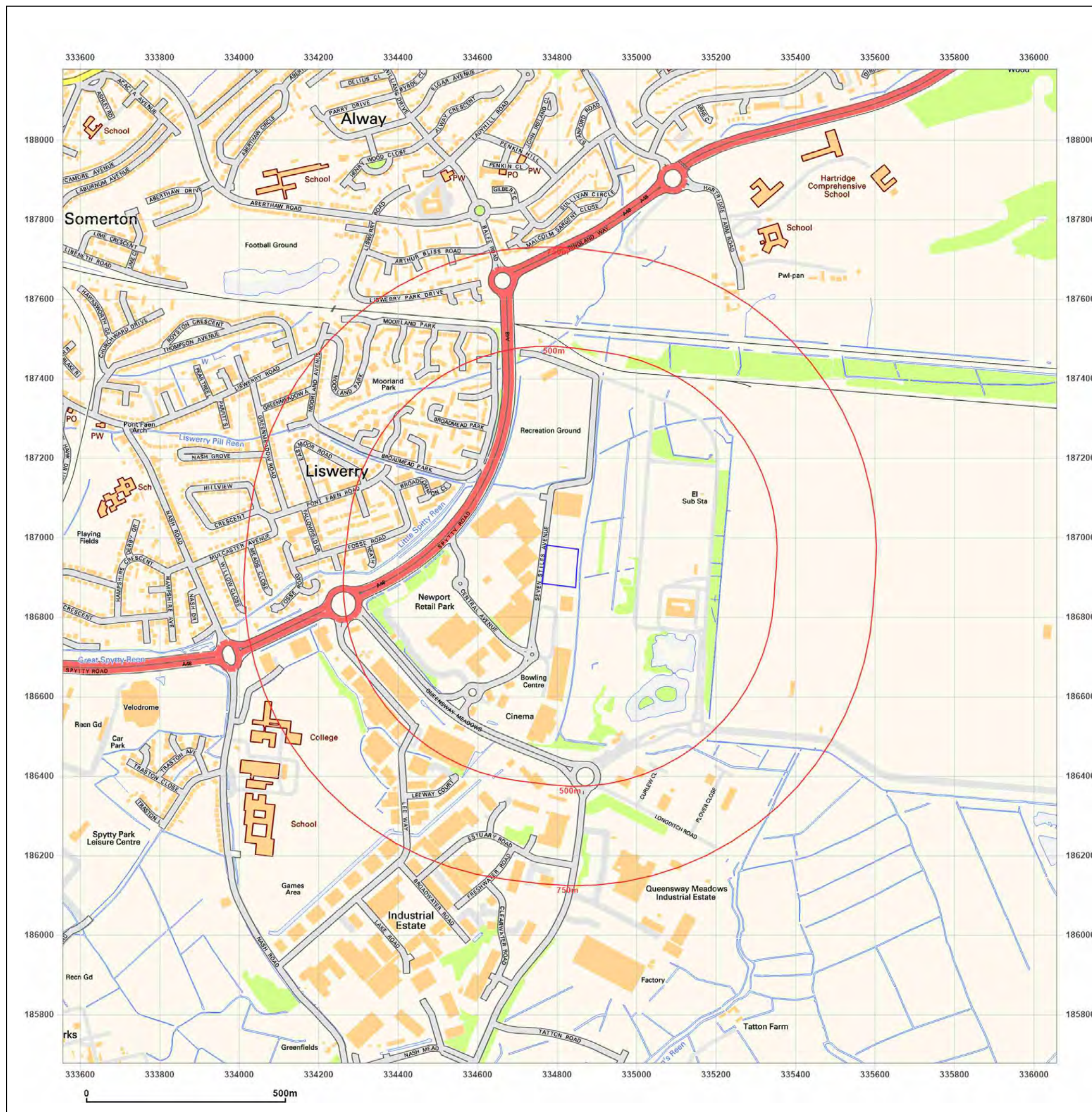


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APPENDIX II

APPENDIX II – DESK STUDY INFORMATION

Groundsure Enviro+Geo Insight Databases

A Groundsure Enviro+Geo Insight Report has been obtained from Emapsite for the site and surrounding area. The databases compile information from a variety of sources and includes entries that cover Natural Resources Wales permits, waste sites, hazardous substances, geological data, industrial landuse, groundwater vulnerability, source protection zones and floodplains.

Also included is reference to databases that cover geological data, including information regarding mining/mineral extraction, natural cavities, landslips and other geohazards.

A report is included in this Appendix for a search radius of up to 1 km around the site and that report includes a summary table of the search results. Detailed information contained in the report has been included only if it is relevant to the geotechnical and environmental assessment. All other pages have been omitted. A full copy of the GroundSure Report can be provided on request.

Seven Stiles Avenue, Newport retail park, Newport, NP19 4TX

Order Details

Date: 02/09/2024
Your ref: EMS_968493_1203545
Our Ref: EMS-968493_1229096

Site Details

Location: 334808 186928
Area: 0.81 ha
Authority: [Casnewydd - Newport City Council](#) ↗



[Summary of findings](#)

[p. 2 >](#) [Aerial image](#)

[p. 9 >](#)

[OS MasterMap site plan](#)

[p.14 >](#) [Insight User Guide](#) ↗

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
15 >	1.1 >	Historical industrial land uses >	0	0	5	7	-
16 >	1.2 >	Historical tanks >	0	0	1	10	-
17 >	1.3 >	Historical energy features >	0	0	5	14	-
18	1.4	Historical petrol stations	0	0	0	0	-
18 >	1.5 >	Historical garages >	0	0	0	3	-
19	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped >	On site	0-50m	50-250m	250-500m	500-2000m
20 >	2.1 >	Historical industrial land uses >	0	0	9	15	-
21 >	2.2 >	Historical tanks >	0	0	4	25	-
23 >	2.3 >	Historical energy features >	0	0	8	29	-
24	2.4	Historical petrol stations	0	0	0	0	-
25 >	2.5 >	Historical garages >	0	0	0	4	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
26	3.1	Active or recent landfill	0	0	0	0	-
26	3.2	Historical landfill (BGS records)	0	0	0	0	-
27	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
27	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
27 >	3.5 >	Historical waste sites >	0	0	1	0	-
27	3.6	Licensed waste sites	0	0	0	0	-
28 >	3.7 >	Waste exemptions >	0	0	1	0	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
29 >	4.1 >	Recent industrial land uses >	1	2	17	-	-
31 >	4.2 >	Current or recent petrol stations >	0	0	0	1	-
31	4.3	Electricity cables	0	0	0	0	-
31	4.4	Gas pipelines	0	0	0	0	-
32	4.5	Sites determined as Contaminated Land	0	0	0	0	-



32 >	4.6 >	Control of Major Accident Hazards (COMAH) >	0	0	0	3	-
32	4.7	Regulated explosive sites	0	0	0	0	-
33	4.8	Hazardous substance storage/usage	0	0	0	0	-
33 >	4.9 >	Historical licensed industrial activities (IPC) >	0	0	0	33	-
36 >	4.10 >	Licensed industrial activities (Part A(1)) >	0	0	0	29	-
41 >	4.11 >	Licensed pollutant release (Part A(2)/B) >	0	0	1	0	-
41 >	4.12 >	Radioactive Substance Authorisations >	0	0	0	1	-
42	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
42	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
42 >	4.15 >	Pollutant release to public sewer >	0	0	0	1	-
43	4.16	List 1 Dangerous Substances	0	0	0	0	-
43	4.17	List 2 Dangerous Substances	0	0	0	0	-
43 >	4.18 >	Pollution Incidents (EA/NRW) >	1	0	0	3	-
44	4.19	Pollution inventory substances	0	0	0	0	-
44	4.20	Pollution inventory waste transfers	0	0	0	0	-
44	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology >	On site	0-50m	50-250m	250-500m	500-2000m
45 >	5.1 >	Superficial aquifer >	Identified (within 500m)				
46 >	5.2 >	Bedrock aquifer >	Identified (within 500m)				
48 >	5.3 >	Groundwater vulnerability >	Identified (within 50m)				
49	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
49	5.5	Groundwater vulnerability- local information	None (within 0m)				
50	5.6	Groundwater abstractions	0	0	0	0	0
50	5.7	Surface water abstractions	0	0	0	0	0
50	5.8	Potable abstractions	0	0	0	0	0
50	5.9	Source Protection Zones	0	0	0	0	-
51	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology >	On site	0-50m	50-250m	250-500m	500-2000m
52 >	6.1 >	Water Network (OS MasterMap) >	0	2	16	-	-



54 >	6.2 >	Surface water features >	0	1	8	-	-
54 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
55	6.4	WFD Surface water bodies	0	0	0	-	-
55 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding >	On site	0-50m	50-250m	250-500m	500-2000m
56 >	7.1 >	Risk of flooding from rivers and the sea >	Medium (within 50m)				
57	7.2	Historical Flood Events	0	0	0	-	-
57	7.3	Flood Defences	0	0	0	-	-
57 >	7.4 >	Areas Benefiting from Flood Defences >	1	0	0	-	-
58	7.5	Flood Storage Areas	0	0	0	-	-
59 >	7.6 >	Flood Zone 2 >	Identified (within 50m)				
60 >	7.7 >	Flood Zone 3 >	Identified (within 50m)				
Page	Section	Surface water flooding >					
61 >	8.1 >	Surface water flooding >	1 in 30 year, 0.1m - 0.3m (within 50m)				
Page	Section	Groundwater flooding >					
63 >	9.1 >	Groundwater flooding >	Negligible (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
64 >	10.1 >	Sites of Special Scientific Interest (SSSI) >	0	0	0	1	1
65	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
65 >	10.3 >	Special Areas of Conservation (SAC) >	0	0	0	0	1
66	10.4	Special Protection Areas (SPA)	0	0	0	0	0
66	10.5	National Nature Reserves (NNR)	0	0	0	0	0
66	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
66 >	10.7 >	Designated Ancient Woodland >	0	0	0	0	20
67	10.8	Biosphere Reserves	0	0	0	0	0
68	10.9	Forest Parks	0	0	0	0	0
68	10.10	Marine Conservation Zones	0	0	0	0	0
68	10.11	Green Belt	0	0	0	0	0
68	10.12	Proposed Ramsar sites	0	0	0	0	0

68	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
69	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
69	10.15	Nitrate Sensitive Areas	0	0	0	0	0
69	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
70	10.17	SSSI Impact Risk Zones	0	-	-	-	-
70	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
71	11.1	World Heritage Sites	0	0	0	-	-
71	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
71	11.3	National Parks	0	0	0	-	-
71	11.4	Listed Buildings	0	0	0	-	-
72	11.5	Conservation Areas	0	0	0	-	-
72	11.6	Scheduled Ancient Monuments	0	0	0	-	-
72	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
73 >	12.1 >	Agricultural Land Classification >	Grade 4 (within 250m)				
74	12.2	Open Access Land	0	0	0	-	-
74	12.3	Tree Felling Licences	0	0	0	-	-
74	12.4	Environmental Stewardship Schemes	0	0	0	-	-
74	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
75	13.1	Priority Habitat Inventory	0	0	0	-	-
75	13.2	Habitat Networks	0	0	0	-	-
75	13.3	Open Mosaic Habitat	0	0	0	-	-
75	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
76 >	14.1 >	10k Availability >	Identified (within 500m)				
77	14.2	Artificial and made ground (10k)	0	0	0	0	-
78 >	14.3 >	Superficial geology (10k) >	1	0	1	0	-



79	14.4	Landslip (10k)	0	0	0	0	-
80 >	14.5 >	Bedrock geology (10k) >	1	0	1	3	-
81	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
82 >	15.1 >	50k Availability >	Identified (within 500m)				
83	15.2	Artificial and made ground (50k)	0	0	0	0	-
83	15.3	Artificial ground permeability (50k)	0	0	-	-	-
84 >	15.4 >	Superficial geology (50k) >	1	0	0	0	-
85 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
85	15.6	Landslip (50k)	0	0	0	0	-
85	15.7	Landslip permeability (50k)	None (within 50m)				
86 >	15.8 >	Bedrock geology (50k) >	1	0	0	2	-
87 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
87	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
88	16.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence >					
89 >	17.1 >	Shrink swell clays >	Low (within 50m)				
90 >	17.2 >	Running sands >	Moderate (within 50m)				
91 >	17.3 >	Compressible deposits >	Moderate (within 50m)				
92 >	17.4 >	Collapsible deposits >	Negligible (within 50m)				
93 >	17.5 >	Landslides >	Very low (within 50m)				
94 >	17.6 >	Ground dissolution of soluble rocks >	Negligible (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
96	18.1	BritPits	0	0	0	0	-
97 >	18.2 >	Surface ground workings >	0	0	5	-	-
97	18.3	Underground workings	0	0	0	0	0
97	18.4	Underground mining extents	0	0	0	0	-
97	18.5	Historical Mineral Planning Areas	0	0	0	0	-



98	18.6	Non-coal mining	0	0	0	0	0
98	18.7	JPB mining areas	None (within 0m)				
98	18.8	The Coal Authority non-coal mining	0	0	0	0	-
98	18.9	Researched mining	0	0	0	0	-
99	18.10	Mining record office plans	0	0	0	0	-
99	18.11	BGS mine plans	0	0	0	0	-
99	18.12	Coal mining	None (within 0m)				
99	18.13	Brine areas	None (within 0m)				
99	18.14	Gypsum areas	None (within 0m)				
100	18.15	Tin mining	None (within 0m)				
100	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
101	19.1	Natural cavities	0	0	0	0	-
101	19.2	Mining cavities	0	0	0	0	0
101	19.3	Reported recent incidents	0	0	0	0	-
101	19.4	Historical incidents	0	0	0	0	-
102	19.5	National karst database	0	0	0	0	-
Page	Section	Radon >					
103 >	20.1 >	Radon >	Less than 1% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
105 >	21.1 >	BGS Estimated Background Soil Chemistry >	1	1	-	-	-
105	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
105	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
106	22.1	Underground railways (London)	0	0	0	-	-
106	22.2	Underground railways (Non-London)	0	0	0	-	-
106	22.3	Railway tunnels	0	0	0	-	-
106	22.4	Historical railway and tunnel features	0	0	0	-	-
106	22.5	Royal Mail tunnels	0	0	0	-	-



107	22.6	Historical railways	0	0	0	-	-
107	22.7	Railways	0	0	0	-	-
107	22.8	Crossrail 1	0	0	0	0	-
107	22.9	Crossrail 2	0	0	0	0	-
107	22.10	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 14/04/2020

Site Area: 0.81ha



Recent site history - 2017 aerial photograph



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Capture Date: 25/05/2017

Site Area: 0.81ha



Recent site history - 2009 aerial photograph



Capture Date: 12/10/2009

Site Area: 0.81ha



Recent site history - 2001 aerial photograph



Capture Date: 27/08/2001

Site Area: 0.81ha



Recent site history - 2000 aerial photograph

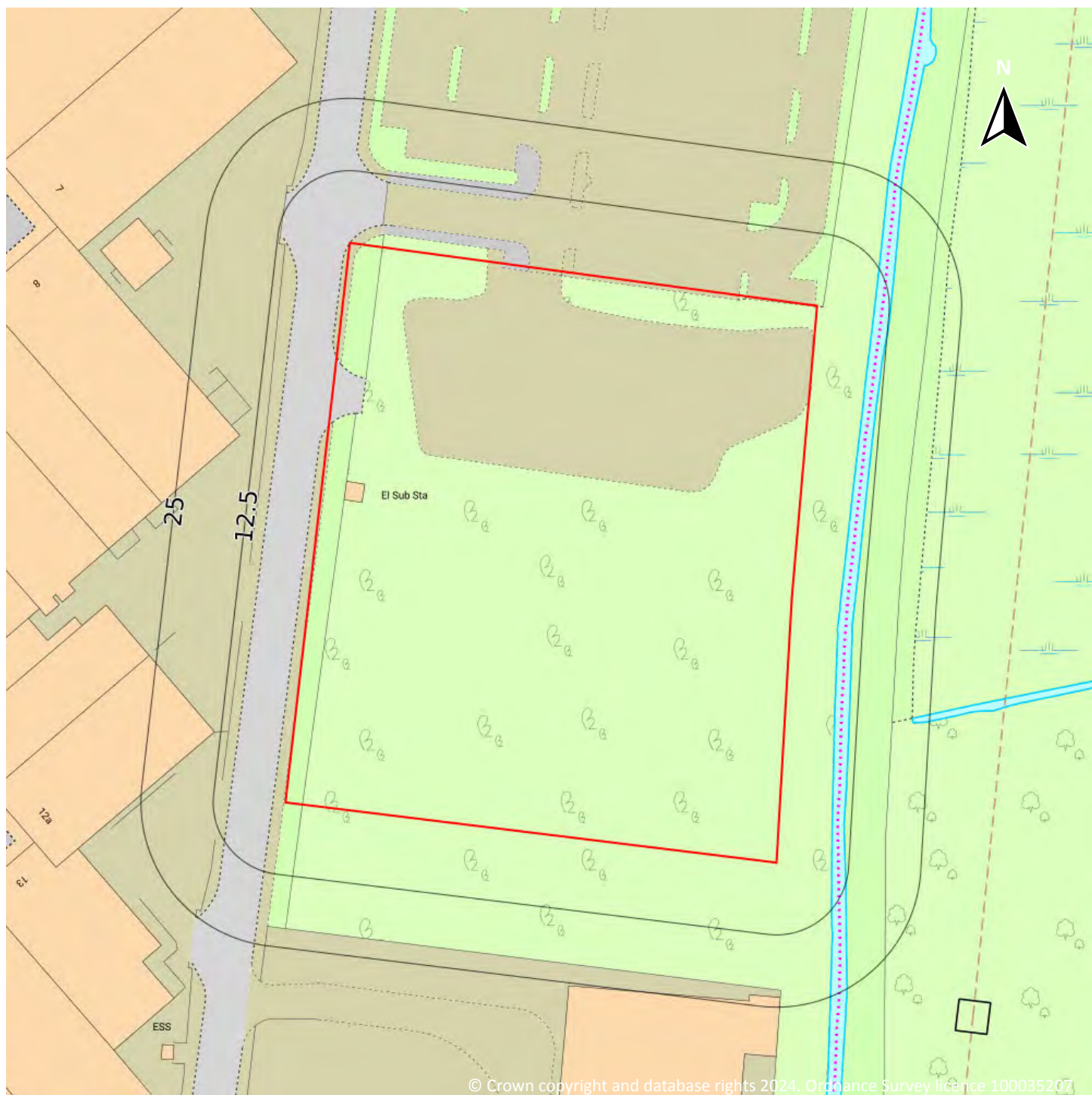


Capture Date: 06/10/2000

Site Area: 0.81ha



OS MasterMap site plan



Site Area: 0.81ha



3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Historical waste sites
- Waste exemptions

3.1 Active or recent landfill

Records within 500m

0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m

0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.



3.3 Historical landfill (LA/mapping records)

Records within 500m**0**

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m**0**

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m**1**

Waste site records derived from Local Authority planning records and high detail historical mapping.

Features are displayed on the Waste and landfill map on [page 26 >](#)

ID	Location	Address	Further Details	Date
2	235m SW	Site Address: Tesco Newport Retail Park, Seven Stiles Avenue, NEWPORT, Gwent, NP19 4TX	Type of Site: Recycling Unit Planning application reference: 09/0019 Description: Scheme comprises provision of free standing automated recycling unit. An application (ref: 09/0019) for detailed planning permission was submitted to Newport B.C. Data source: Historic Planning Application Data Type: Point	-

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m**0**

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.



3.7 Waste exemptions

Records within 500m

1

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

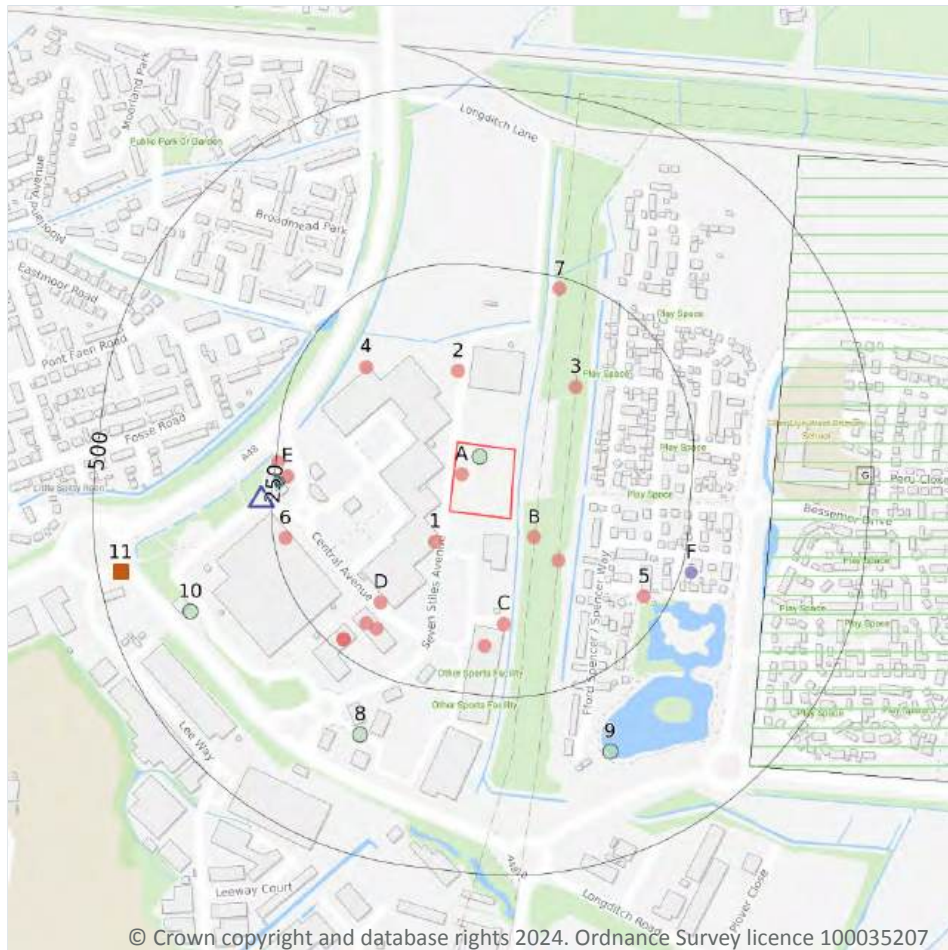
Features are displayed on the Waste and landfill map on [page 26 >](#)

ID	Location	Site	Reference	Category	Sub-Category	Description
1	58m W	Cineworld Newport, Seven Styles Avenue, Spytt Road, Newport, Np19 4qq	WEX110723	Storing waste exemption	Not on a farm	Storage of waste in a secure place

This data is sourced from the Environment Agency and Natural Resources Wales.



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- ▲ Current or recent petrol stations
- Control of Major Accident Hazards
- Historical licensed industrial activities
- ◊ Part A(1) industrial activities
- Licensed pollutant release (Part A(2)/B)
- Radioactive Substance Authorisations
- Pollutant release to public sewer
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

20

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 29](#) >

ID	Location	Company	Address	Activity	Category
A	On site	Electricity Sub Station	Gwent, NP19	Electrical Features	Infrastructure and Facilities
B	43m SE	Pylon	Gwent, NP19	Electrical Features	Infrastructure and Facilities
1	47m SW	Electricity Sub Station	Gwent, NP19	Electrical Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
B	90m SE	Pylon	Gwent, NP19	Electrical Features	Infrastructure and Facilities
2	100m N	Electricity Sub Station	Gwent, NP19	Electrical Features	Infrastructure and Facilities
3	123m NE	Pylon	Gwent, NP19	Electrical Features	Infrastructure and Facilities
C	147m S	Electricity Sub Station	Gwent, NP19	Electrical Features	Infrastructure and Facilities
D	160m SW	Electricity Sub Stations	Gwent, NP19	Electrical Features	Infrastructure and Facilities
4	166m NW	Electricity Sub Station	Gwent, NP19	Electrical Features	Infrastructure and Facilities
C	181m S	Stellantis & You Citron Newport	Seven Stiles Avenue Newport Retail Park, Newport, Gwent, NP19 4QR	New Vehicles	Motoring
D	194m SW	Leasing Centre Dacia	Seven Stiles Avenue, Newport Retail Park, Newport, Gwent, NP19 4QR	New Vehicles	Motoring
D	196m SW	Business Centre Renault - Newport	Newport Retail Park, Seven Stiles Avenue, Newport, Gwent, NP19 4QR	New Vehicles	Motoring
5	217m SE	Electricity Sub Station	Gwent, NP19	Electrical Features	Infrastructure and Facilities
E	232m W	Tesco Petrol Filling Station	Spytty Road, Newport, Gwent, NP19 4TX	Petrol and Fuel Stations	Road and Rail
6	233m W	Bush Healthcare	G, Newport Retail Park, Tesco Extra, Spytty Road, Town Centre, Newport, Gwent, NP19 4TX	Disability and Mobility Equipment	Consumer Products
D	233m SW	Wessex Garages Hyundai Newport	Wessex Garages Newport Retail Park, Spytty Road, Newport, Gwent, NP19 4QR	New Vehicles	Motoring
D	233m SW	Motability Wessex Garages Dacia - Newport	Wessex Garages Newport Retail Park, Spytty Road, Newport, Gwent, NP19 4QR	New Vehicles	Motoring



ID	Location	Company	Address	Activity	Category
D	234m SW	Wessex Nissan	Newport Retail Park, Newport, Gwent, NP19 4QR	New Vehicles	Motoring
7	234m N	Pylon	Gwent, NP19	Electrical Features	Infrastructure and Facilities
E	247m W	Tesco Newport Spytty	Spytty Road, Newport, Gwent, NP19 4QQ	Vehicle Cleaning Services	Personal, Consumer and Other Services

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	1
----------------------------	----------

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on [page 29 >](#)

ID	Location	Company	Address	LPG	Status
E	265m W	TESCO	Spytty Road, Newport, Newport, NP19 4TX	No	Open

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0
----------------------------	----------

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	0
----------------------------	----------

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m**0**

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m**3**

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

Features are displayed on the Current industrial land use map on [page 29 >](#)

ID	Location	Company	Address	Operational status	Tier
G	364m E	Bsc	Bsc, Llanwern Works, Newport	Historical NIHHS Site	-
G	364m E	Air Products (BR) Limited	Air Products (BR) Limited, Llanwern, Spencer Works, Queensway, Newport, Gwent, Monmouthshire, NP19 4QX	Current COMAH Site	COMAH Lower Tier Operator
G	364m E	Air Products (BR) Limited	Air Products (BR) Limited, Llanwern, Spencer Works, Queensway, Newport, Gwent, Monmouthshire, NP19 4QX	Current COMAH Site	COMAH Lower Tier Operator

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m**0**

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.



ID	Location	Details	
F	265m SE	Operator: TATA STEEL UK LIMITED Installation Name: LLANWERN STEELWORKS EPR/BS3905IP Process: PROCESSING FERROUS METALS AND THEIR ALLOYS BY USING HOT-ROLLING MILLS WITH A PRO... Permit Number: BS3905IP Original Permit Number: TP3931ZP	EPR Reference: - Issue Date: 13/05/2013 Effective Date: 13/05/2013 Last date noted as effective: 01/04/2018 Status: EFFECTIVE
F	265m SE	Operator: TATA STEEL UK LIMITED Installation Name: LLANWERN STEELWORKS EPR/BS3905IP Process: PROCESSING FERROUS METALS AND THEIR ALLOYS BY USING HOT-ROLLING MILLS WITH A PRO... Permit Number: BS3905IP Original Permit Number: TP3931ZP	EPR Reference: - Issue Date: 13/05/2013 Effective Date: 13/05/2013 Last date noted as effective: 01/04/2018 Status: EFFECTIVE

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m	1
----------------------------	----------

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on [page 29 >](#)

ID	Location	Address	Details	
E	242m W	Tesco Stores Ltd Filling Station, Newport Retail Park, Spyttty Road, Newport, South Wales, NP19 4TX	Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	1
----------------------------	----------

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

Features are displayed on the Current industrial land use map on [page 29 >](#)



4.16 List 1 Dangerous Substances

Records within 500m

0

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m

0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m

4

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

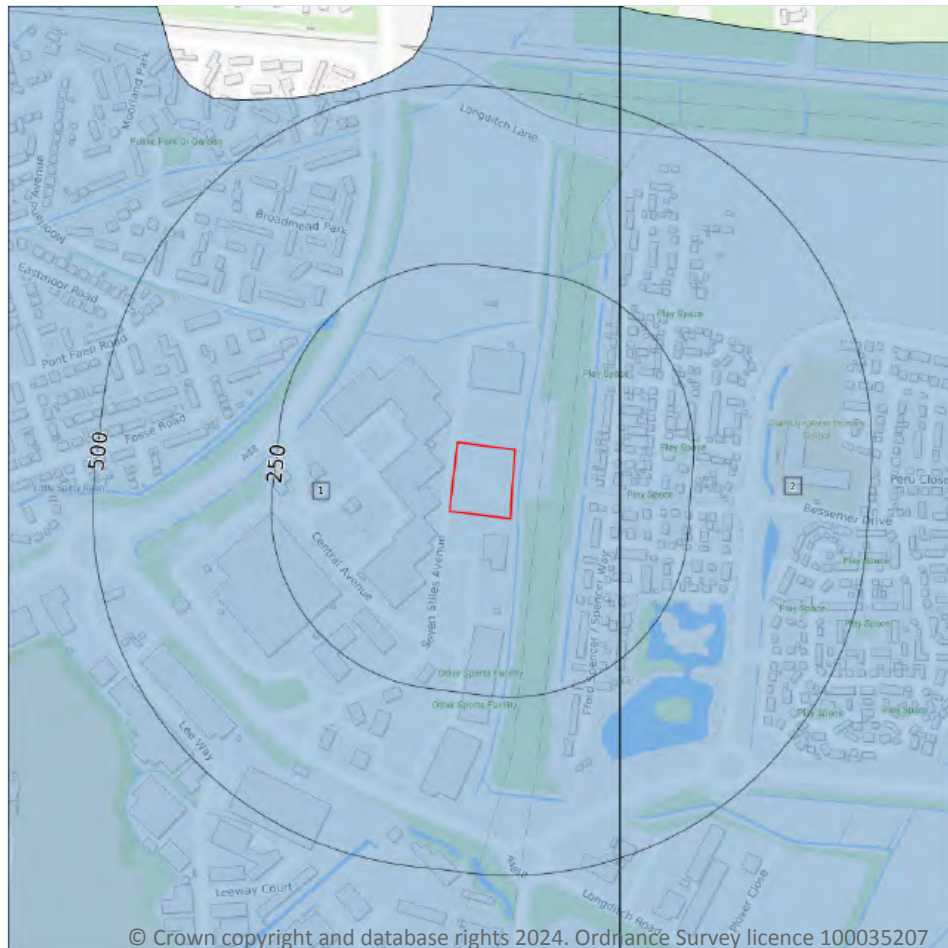
Features are displayed on the Current industrial land use map on [page 29](#) >

ID	Location	Details	
A	On site	Incident Date: 01/08/2013 Incident Identification: 1142481 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
8	337m SW	Incident Date: 13/06/2015 Incident Identification: 1344973 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
9	355m SE	Incident Date: 13/06/2013 Incident Identification: 1121873 Pollutant: Contaminated Water Pollutant Description: Other Contaminated Water	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 3 (Minor)
10	390m SW	Incident Date: 04/03/2019 Incident Identification: 1901382 Pollutant: Contaminated Water Pollutant Description: Vehicle and Plant Washings	Water Impact: Category 2 (Significant) Land Impact: No Details Air Impact: No Details

This data is sourced from the Environment Agency and Natural Resources Wales.



5 Hydrogeology - Superficial aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive
 - Unknown

5.1 Superficial aquifer

Records within 500m

2

Aquifer status of groundwater held within superficial geology.

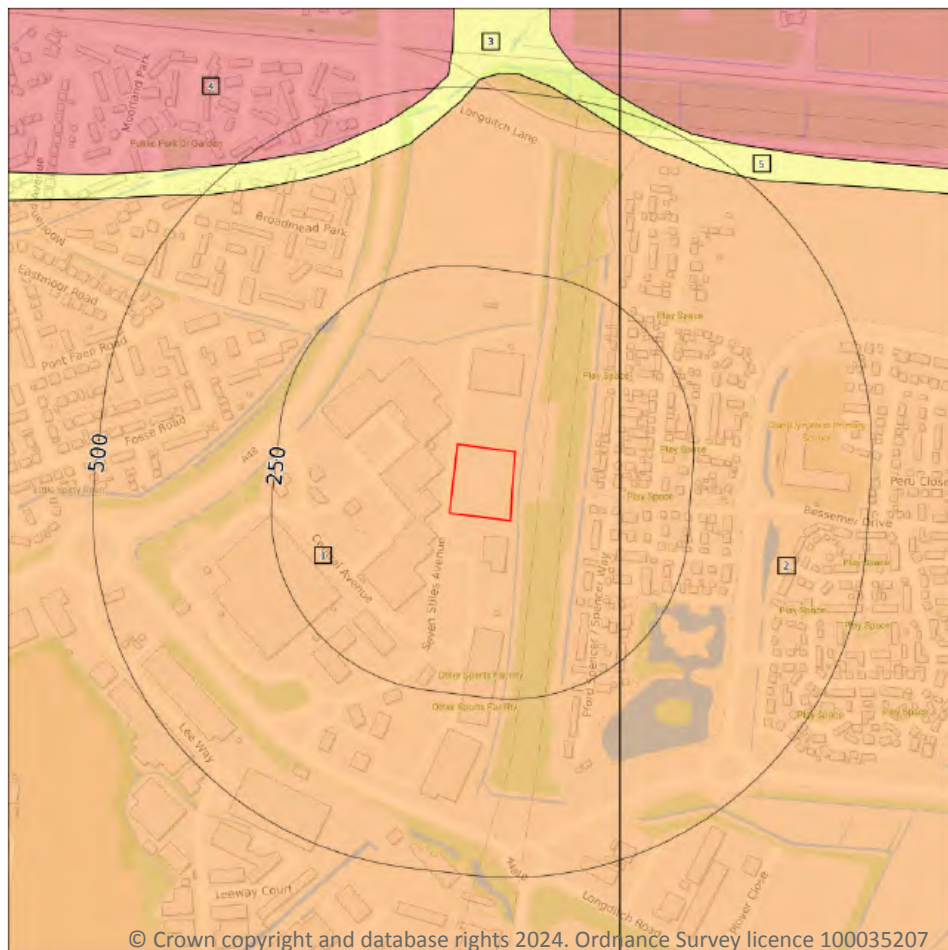
Features are displayed on the Hydrogeology map on [page 45](#) >

ID	Location	Designation	Description
1	On site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
2	147m E	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

5.2 Bedrock aquifer

Records within 500m

5

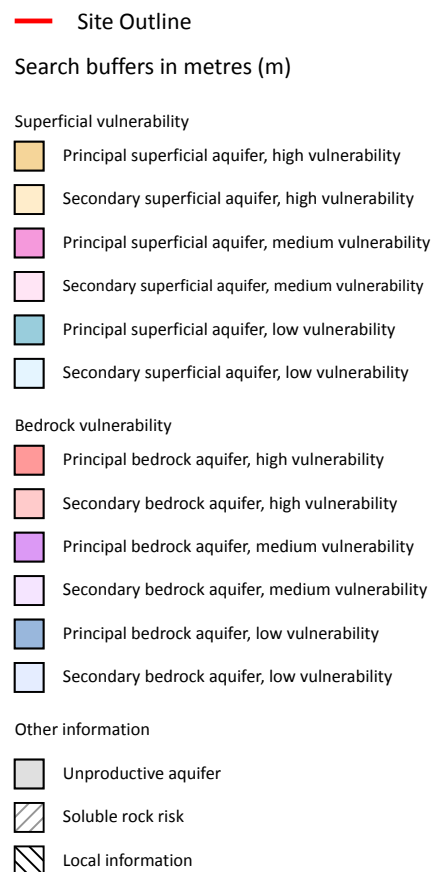
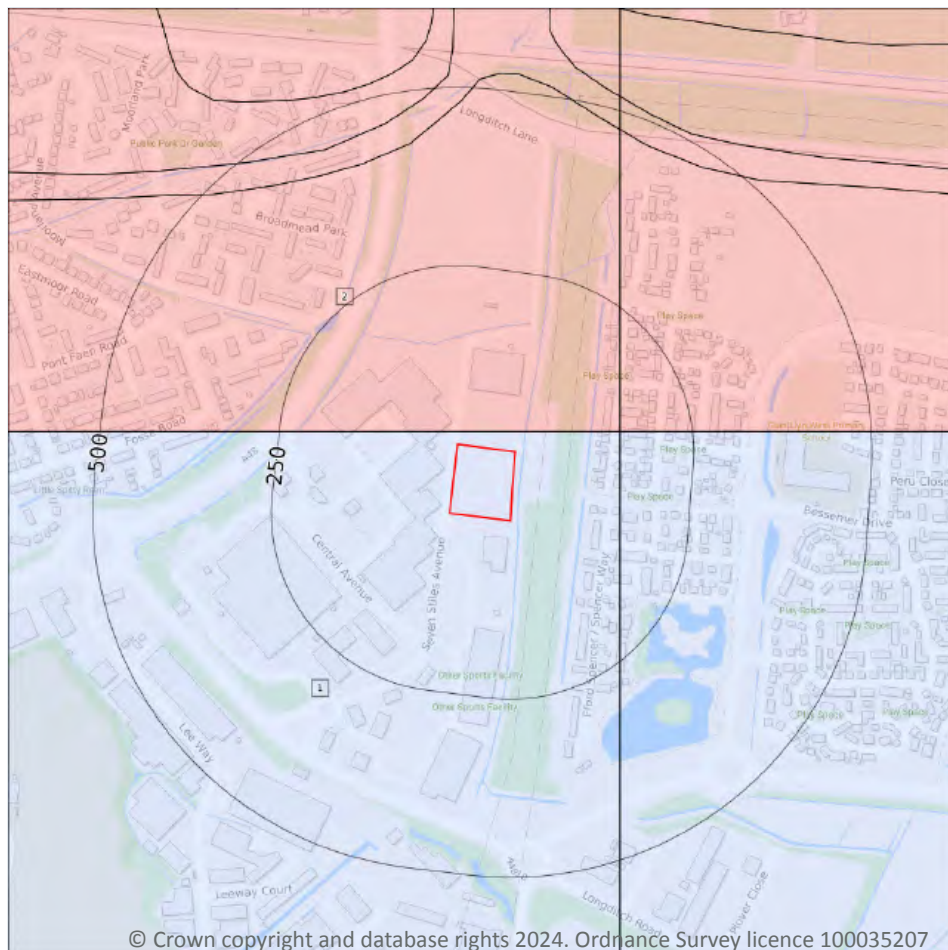
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on [page 46 >](#)

ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	147m E	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

2

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on [page 48](#) >



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary bedrock aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Unproductive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: Unproductive Aquifer type: Unproductive Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
2	18m NW	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Unproductive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: >550mm/year	Vulnerability: Unproductive Aquifer type: Unproductive Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site

0

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

Records on site

0

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk ↗.

This data is sourced from the British Geological Survey and the Environment Agency.



6 Hydrology



- Site Outline
- Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- ⋯ WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

18

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on [page 52](#) >

ID	Location	Type of water feature	Ground level	Permanence	Name
4	10m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
5	22m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
6	74m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
A	99m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
7	101m E	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
B	101m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
9	144m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
10	192m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
11	198m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	203m NW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
D	203m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	204m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	224m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	240m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
D	244m W	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
H	244m NE	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
G	245m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
H	246m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	9
----------------------------	----------

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on [page 52 >](#)

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1
------------------------	----------

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on [page 52 >](#)

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	On site	Coastal catchment	Not part of a river WB catchment	156	Usk below Abergavenny	Usk

This data is sourced from the Environment Agency and Natural Resources Wales.



6.4 WFD Surface water bodies

Records identified

0

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site.

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site

1

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place.

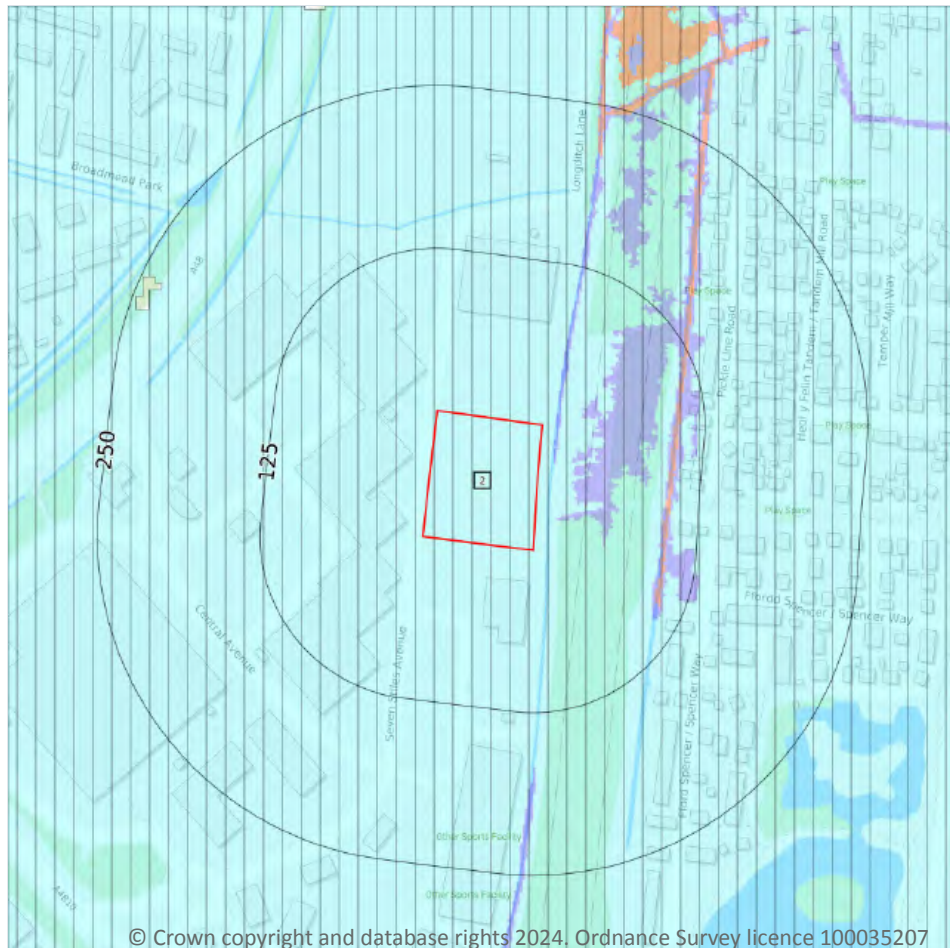
Features are displayed on the Hydrology map on [page 52 >](#)

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
2	On site	Usk Devonian Old Red Sandstone	GB40902G201700	Good	Good	Good	2017

This data is sourced from the Environment Agency and Natural Resources Wales.



7 River and coastal flooding



— Site Outline
Search buffers in metres (m)

River and coastal flooding:

- High
- Medium
- Low
- Very Low
- Historical Flood Events
- Areas Used for Flood Storage
- Areas Benefiting from Flood Defences
- Flood Defences

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7.1 Risk of flooding from rivers and the sea

Records within 50m

24

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

Features are displayed on the River and coastal flooding map on [page 56 >](#)

Distance	Flood risk category
On site	Low
0 - 50m	Medium

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	0
----------------------------	----------

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	0
----------------------------	----------

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m	1
----------------------------	----------

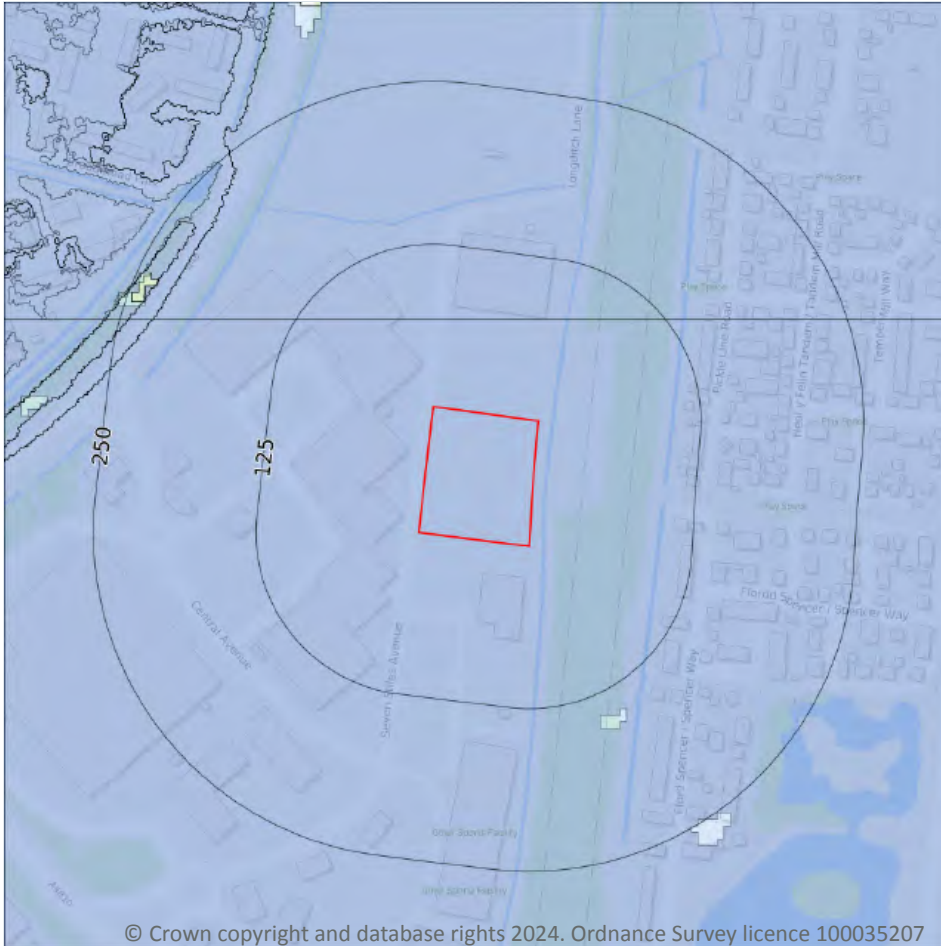
Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

Features are displayed on the River and coastal flooding map on [page 56 >](#)

ID	Location	
2	On site	Area benefiting from flood defences

This data is sourced from the Environment Agency and Natural Resources Wales.

River and coastal flooding - Flood Zones



- Site Outline
- Search buffers in metres (m)
- Flood zone 2
- Flood zone 3

7.6 Flood Zone 2

Records within 50m

1

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on [page 56 >](#)

Location	Type
On site	Zone 2 - (Fluvial /Tidal Models)

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m

1

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

Features are displayed on the River and coastal flooding map on [page 56](#) >

Location	Type
On site	Zone 3 - (Fluvial /Tidal Models)

This data is sourced from the Environment Agency and Natural Resources Wales.



8 Surface water flooding



— Site Outline

Search buffers in metres (m)

1 in 1000 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site

1 in 30 year, 0.1m - 0.3m

Highest risk within 50m

1 in 30 year, 0.1m - 0.3m

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on [page 61](#) >

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

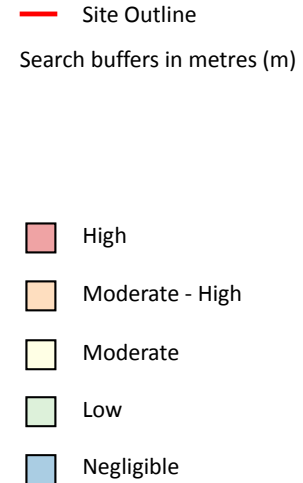
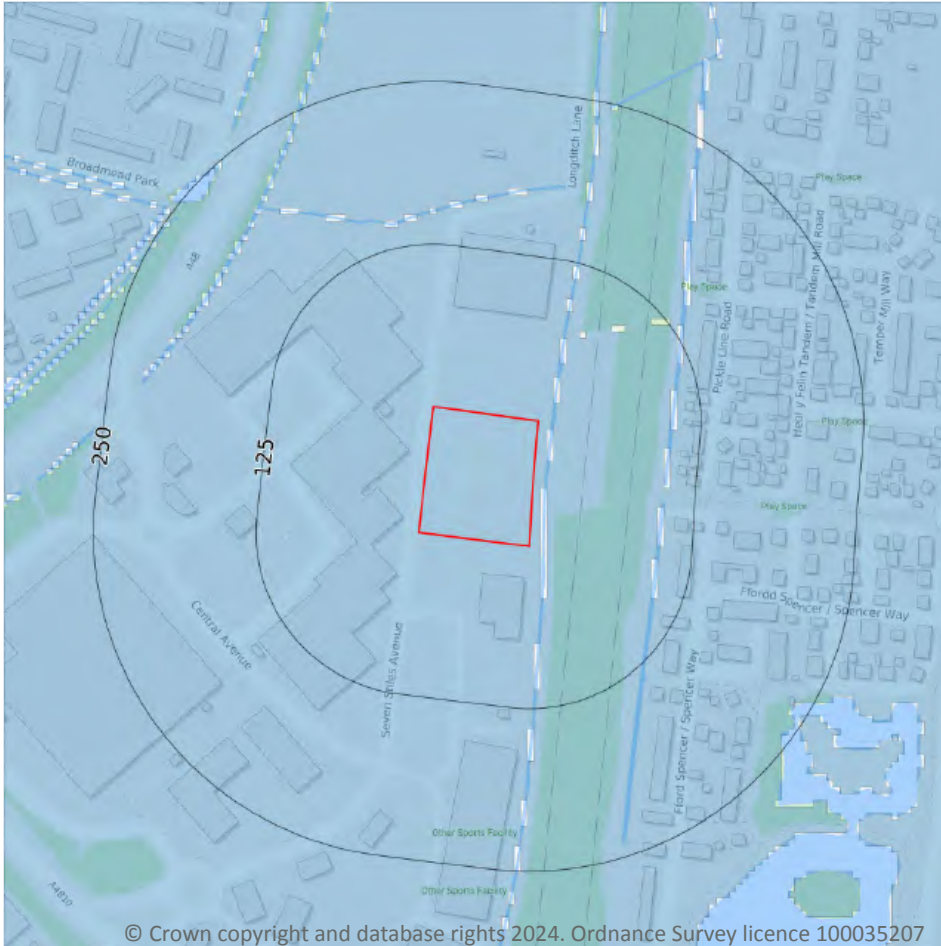
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.3m and 1.0m
1 in 250 year	Between 0.1m and 0.3m
1 in 100 year	Between 0.1m and 0.3m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

Negligible

Highest risk within 50m

Negligible

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on [page 63](#) >

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Sites of Special Scientific Interest (SSSI)
- + Special Areas of Conservation (SAC)
- Designated Ancient Woodland

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

2

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on [page 64](#) >

ID	Location	Name	Data source
1	447m SE	Gwent Levels - Nash and Goldcliff	Natural Resources Wales



14 Geology 1:10,000 scale - Availability



— Site Outline
Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m

2

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

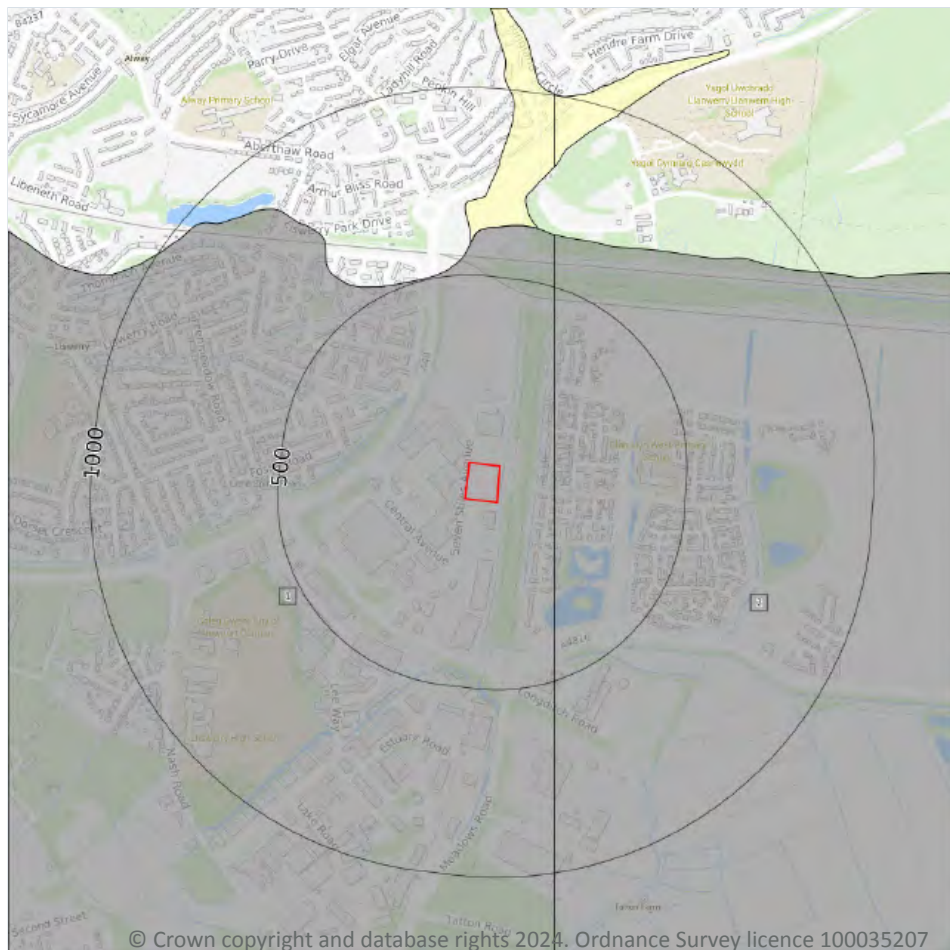
Features are displayed on the Geology 1:10,000 scale - Availability map on [page 76 >](#)

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	ST38NW
2	147m E	No coverage	Full	Full	No coverage	ST38NE

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (10k)
- Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m

2

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on [page 78](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	TFD-CZ	Tidal Flat Deposits - Clay, Silty (unlithified Deposits Coding Scheme)	Clay, Silty
2	147m E	TFD-CZ	Tidal Flat Deposits - Clay, Silty (unlithified Deposits Coding Scheme)	Clay, Silty

This data is sourced from the British Geological Survey.



14.4 Landslip (10k)

Records within 500m

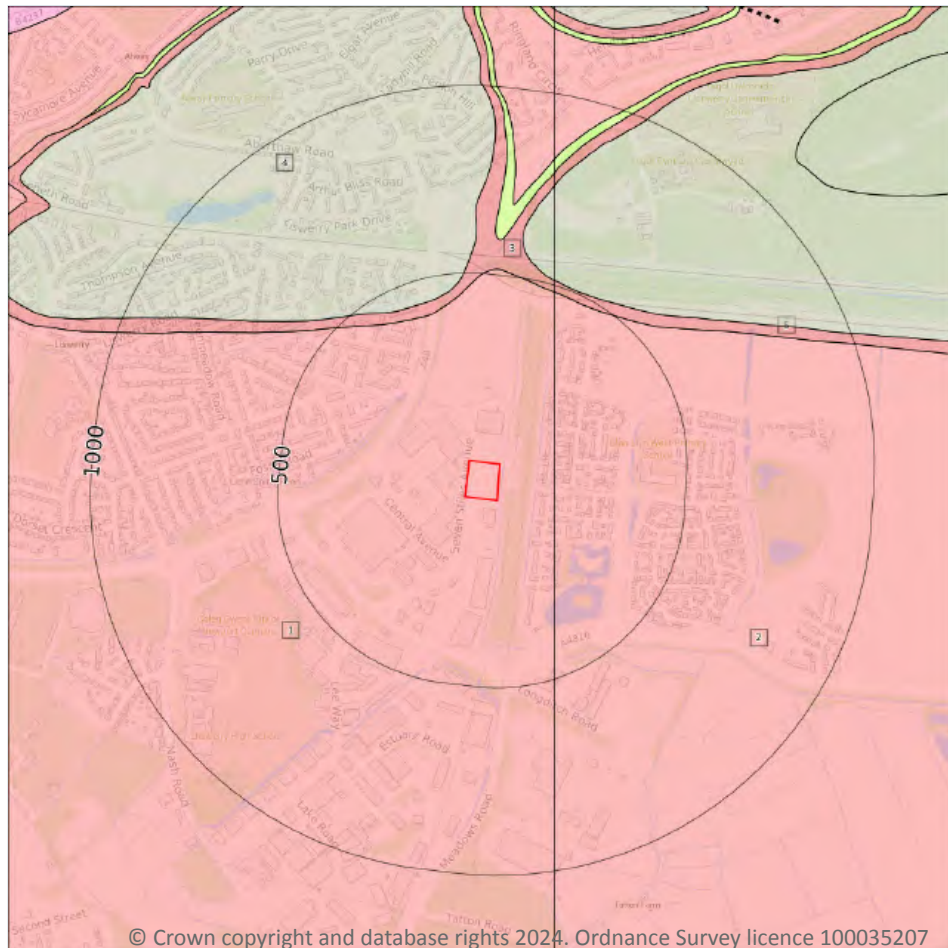
0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m

5

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on [page 80 >](#)

ID	Location	LEX Code	Description	Rock age
1	On site	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch
2	147m E	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch
3	401m N	PNG-MDST	Penarth Group - Mudstone	Rhaetian Age



ID	Location	LEX Code	Description	Rock age
4	436m N	BLI-LSMD	Blue Lias Formation - Interbedded Limestone And Mudstone	Sinemurian Age - Rhaetian Age
5	479m NE	PNG-MDST	Penarth Group - Mudstone	Rhaetian Age

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m

0

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



— Site Outline

Search buffers in metres (m)

□ Geological map tile

15.1 50k Availability

Records within 500m

1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme. Where 50k data is not available, this area has been filled in with 625k scale data.

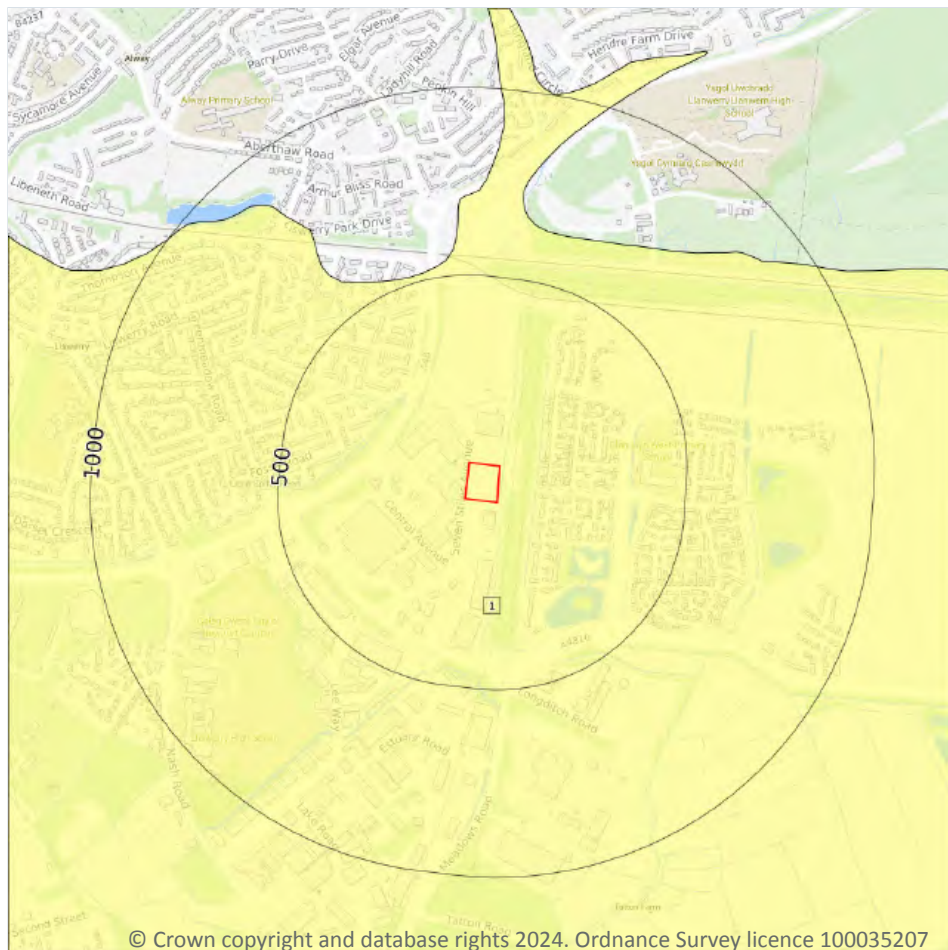
Features are displayed on the Geology 1:50,000 scale - Availability map on [page 82](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW249_newport_v4

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (50k)
- Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m

1

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on [page 84](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	TFD-XCZ	TIDAL FLAT DEPOSITS	CLAY AND SILT

This data is sourced from the British Geological Survey.



15.5 Superficial permeability (50k)

Records within 50m**1**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Intergranular	Low	Very Low

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m**0**

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

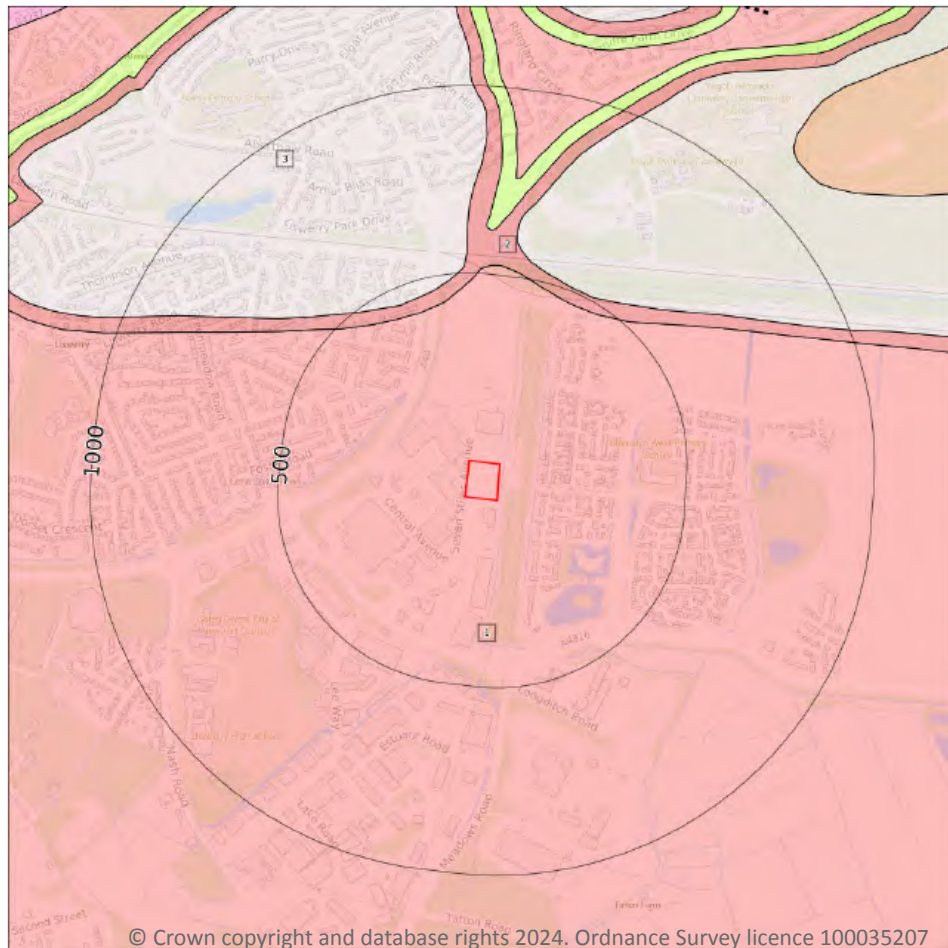
Records within 50m**0**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m

3

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on [page 86](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	MMG-MDST	MERCIA MUDSTONE GROUP - MUDSTONE	-
2	415m N	PNG-MDST	PENARTH GROUP - MUDSTONE	RHAETIAN
3	452m NW	STM-LSMD	ST MARY'S WELL BAY MEMBER - LIMESTONE AND MUDSTONE, INTERBEDDED	RHAETIAN



This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m

1

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	Low	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

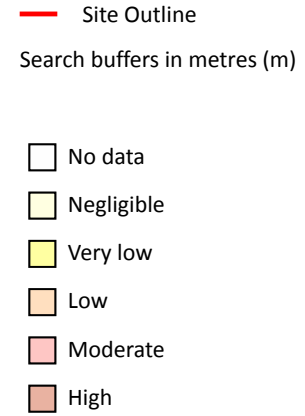
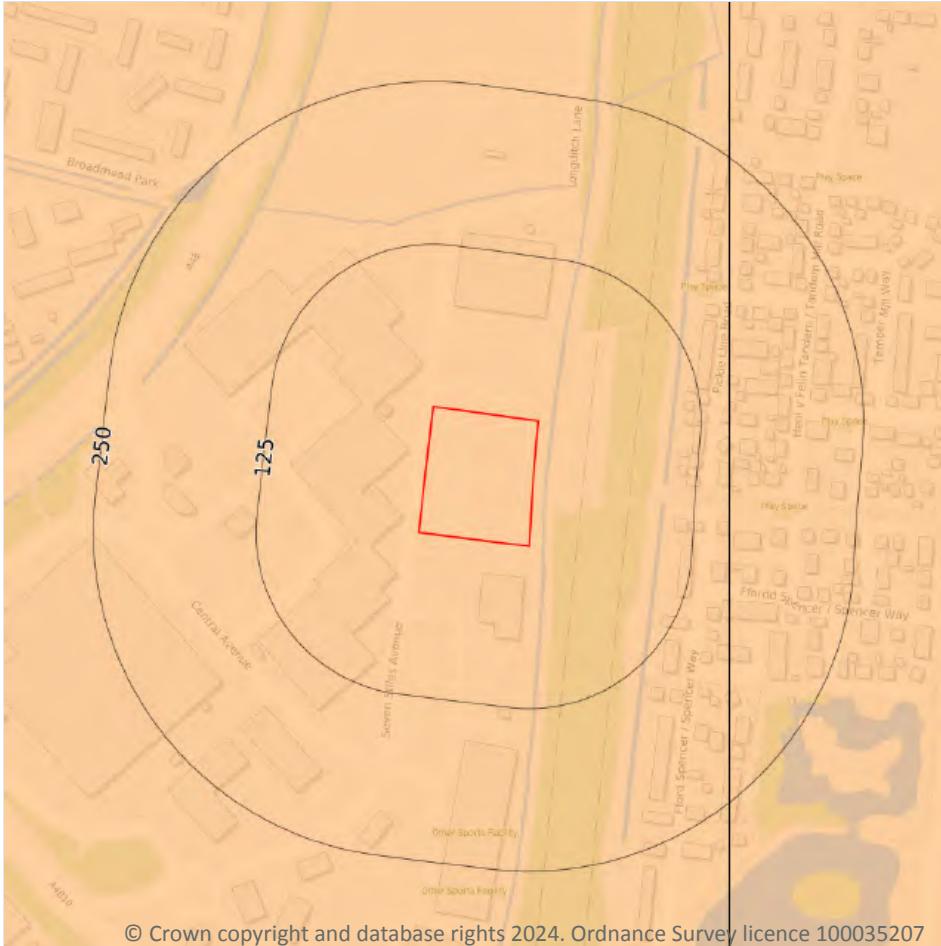
0

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



17.1 Shrink swell clays

Records within 50m

1

The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

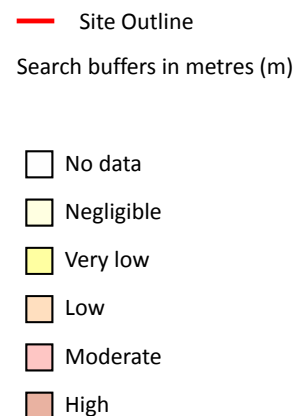
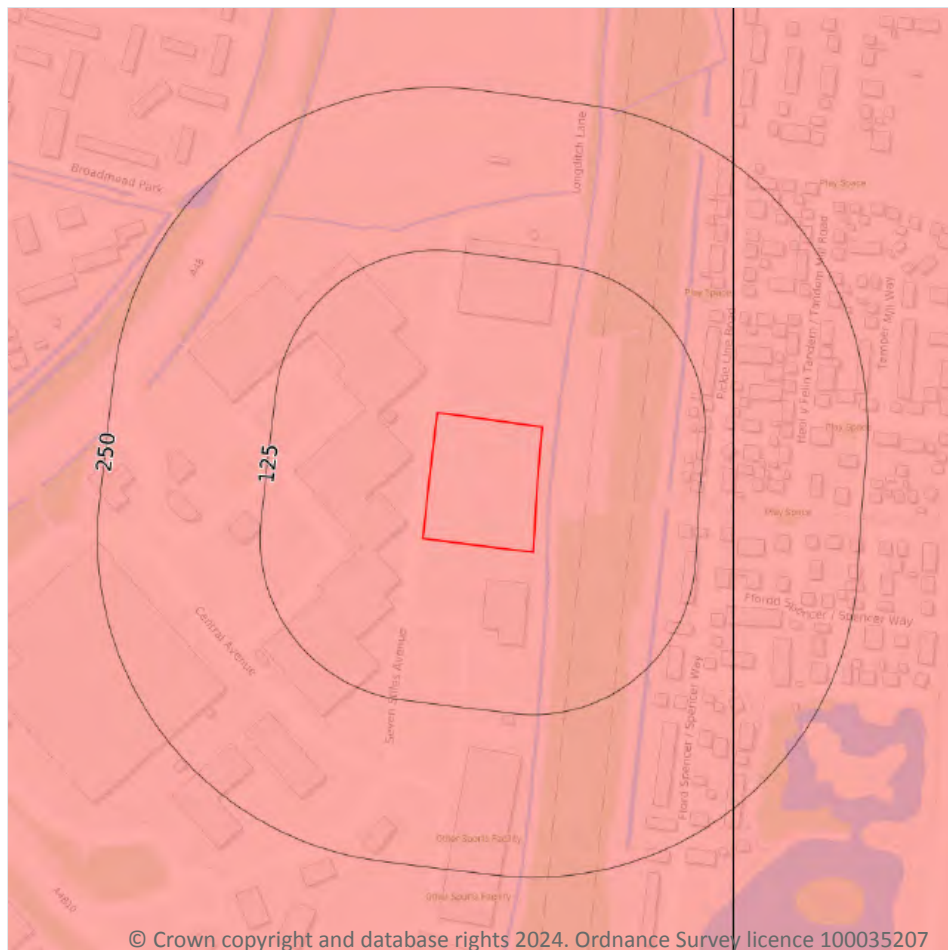
Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 89](#) >

Location	Hazard rating	Details
On site	Low	Ground conditions predominantly medium plasticity.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



17.2 Running sands

Records within 50m

1

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

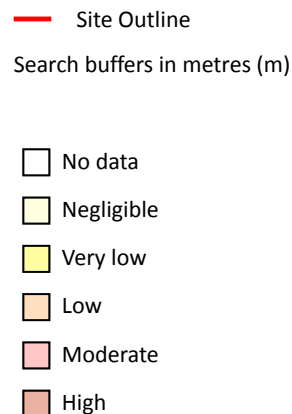
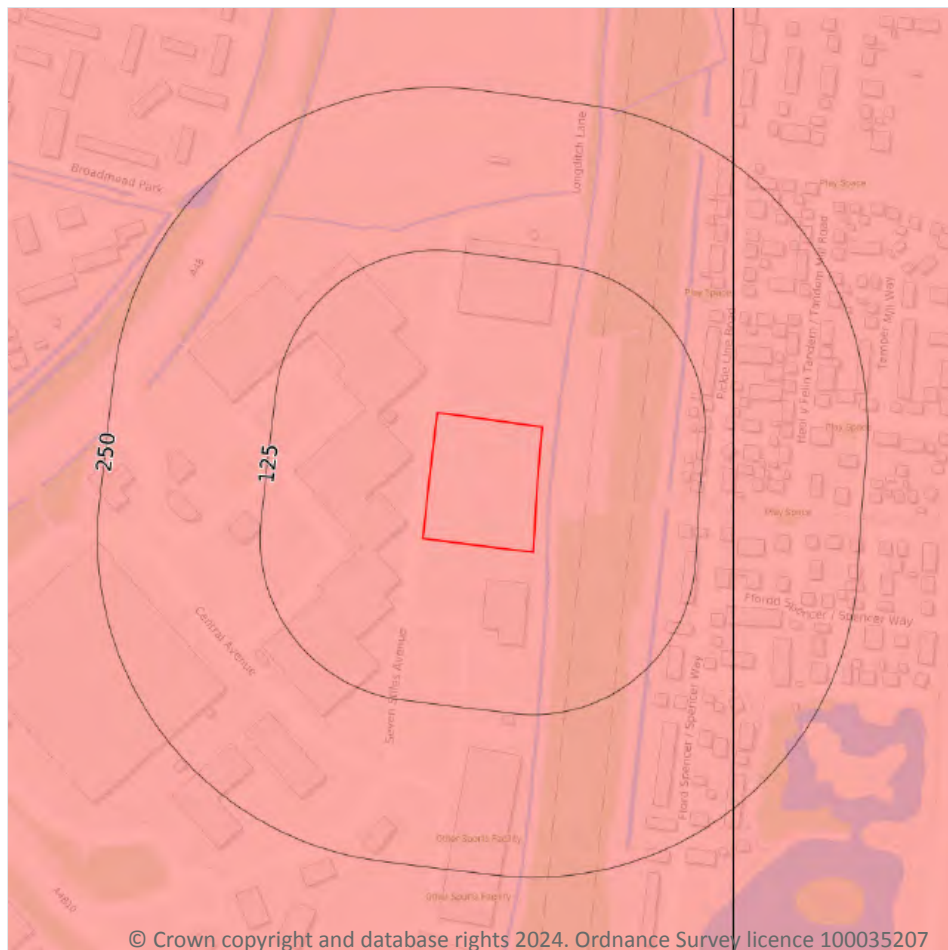
Features are displayed on the Natural ground subsidence - Running sands map on [page 90](#) >

Location	Hazard rating	Details
On site	Moderate	Running sand conditions are probably present. Constraints may apply to land uses involving excavation or the addition or removal of water.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m

1

The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

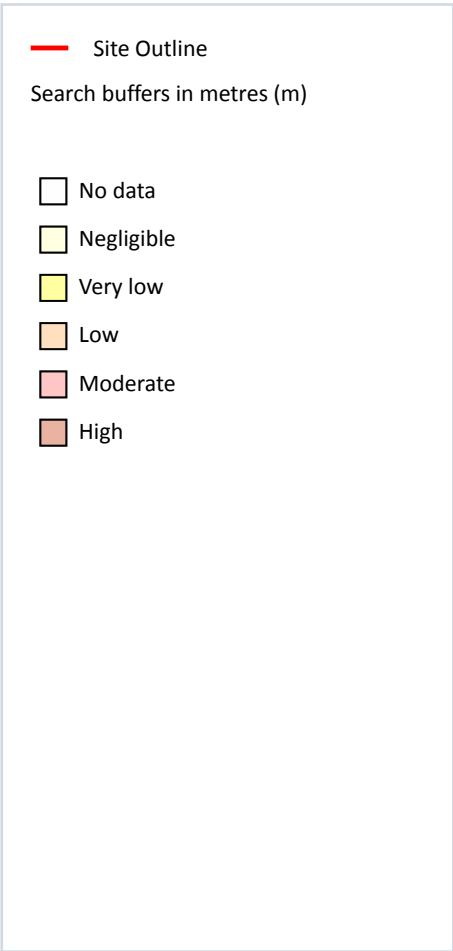
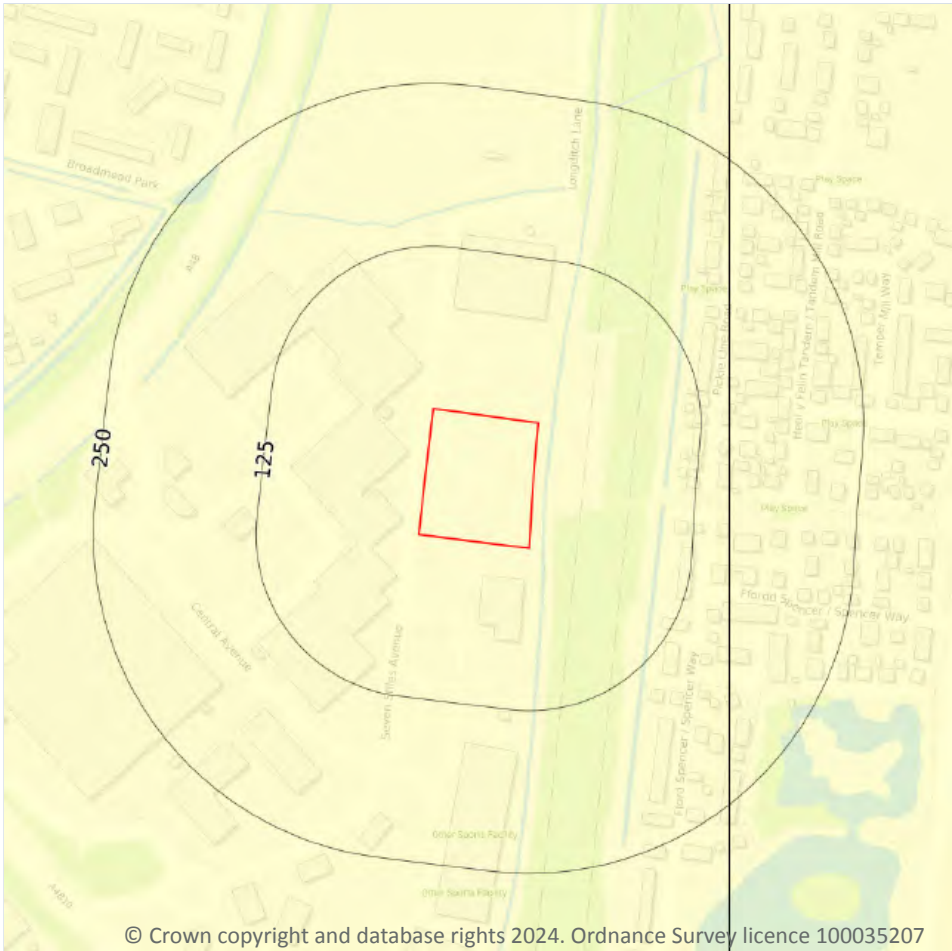
Features are displayed on the Natural ground subsidence - Compressible deposits map on [page 91](#) >

Location	Hazard rating	Details
On site	Moderate	Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



17.4 Collapsible deposits

Records within 50m

1

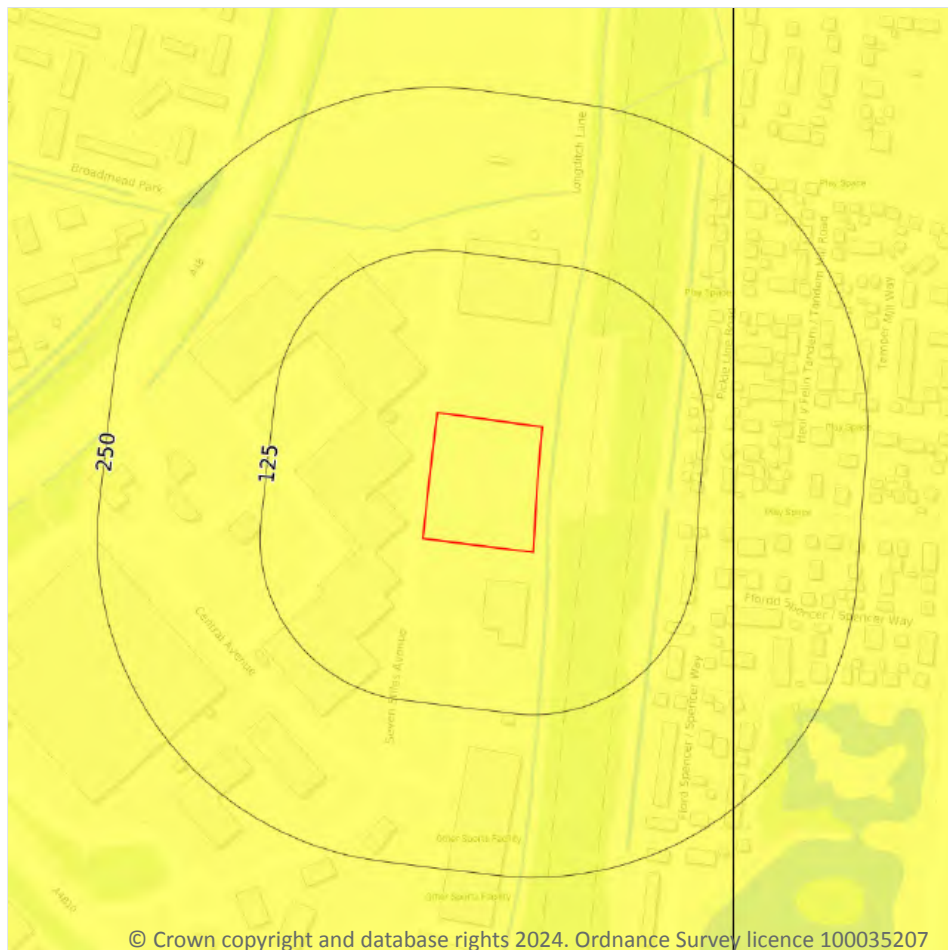
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 92](#) >

Location	Hazard rating	Details
On site	Negligible	Deposits with potential to collapse when loaded and saturated are believed not to be present.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☒ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.5 Landslides

Records within 50m

1

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

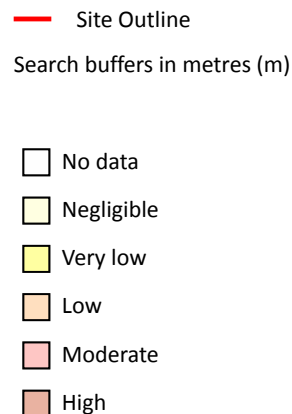
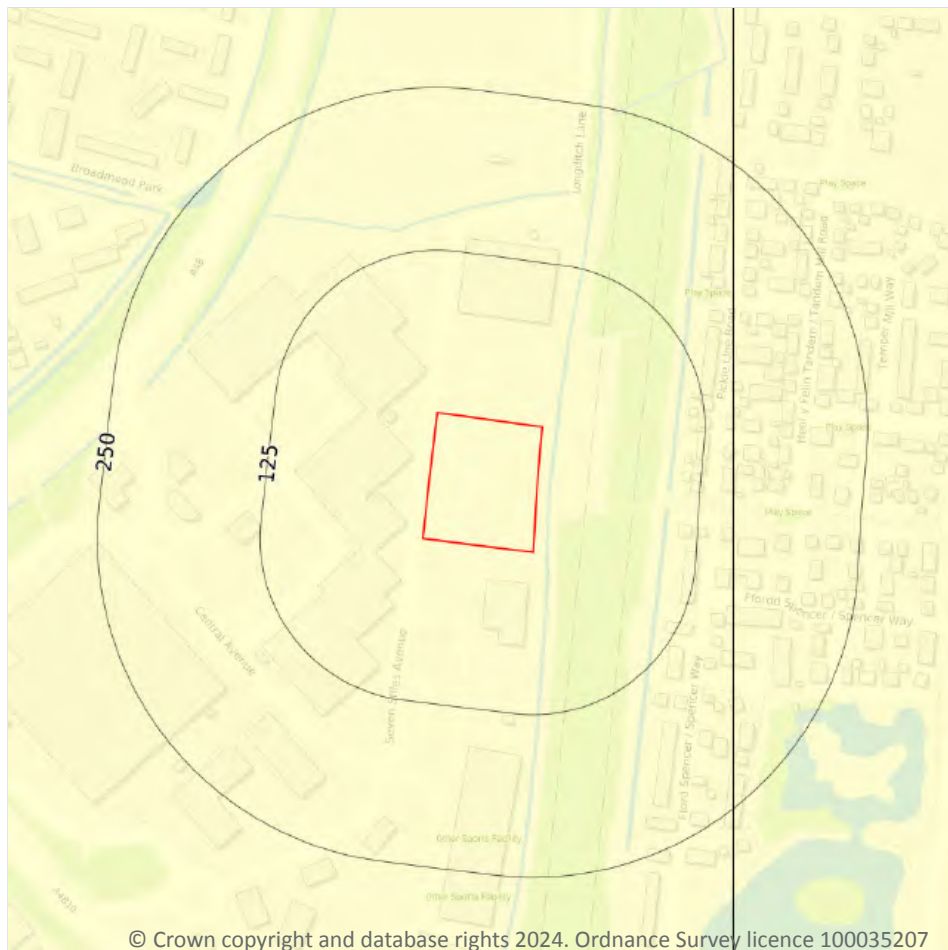
Features are displayed on the Natural ground subsidence - Landslides map on [page 93](#) >

Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m

1

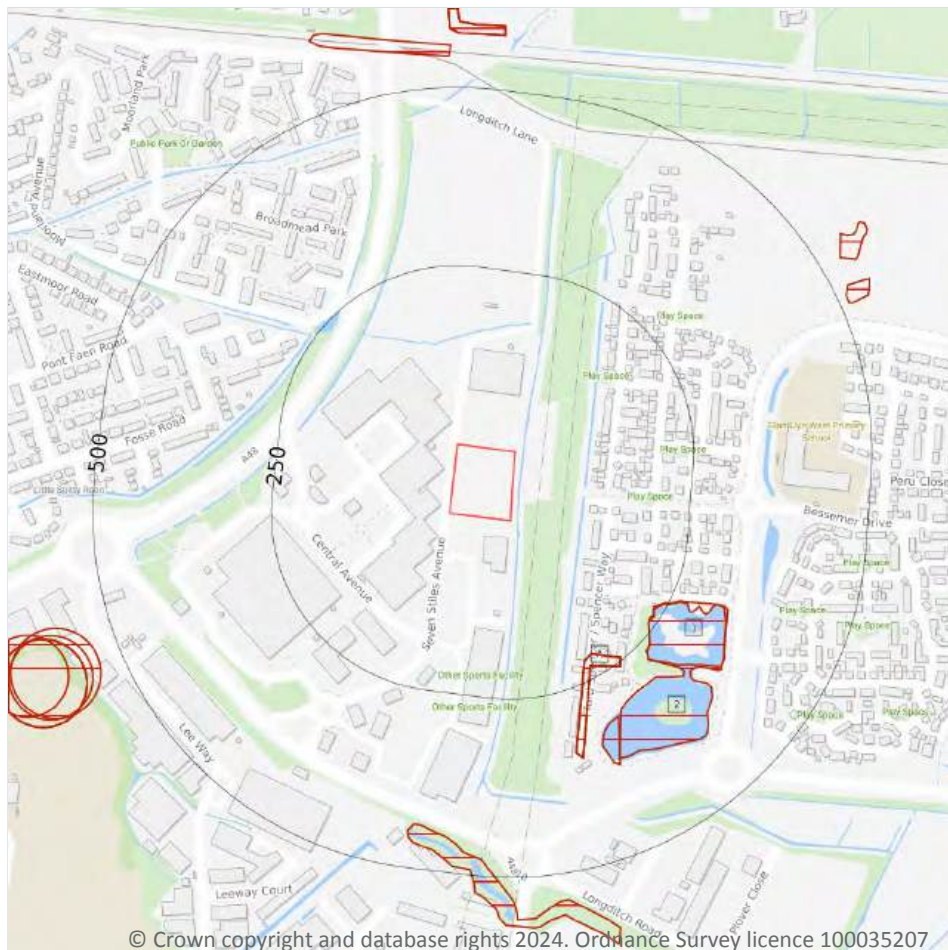
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on [page 94](#)

Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.



18 Mining and ground workings



- Site Outline
- Search buffers in metres (m)
- BritPits
- Surface ground workings
- Underground workings
- Underground mining extents
- Historical mineral planning areas
- TCA non-coal mining
- Non Coal Mining
- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

18.1 BritPits

Records within 500m

0

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

This data is sourced from the British Geological Survey.

18.2 Surface ground workings

Records within 250m**5**

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining and ground workings map on [page 96 >](#)

ID	Location	Land Use	Year of mapping	Mapping scale
A	219m SE	Unspecified Ground Workings	1985	1:10000
A	219m SE	Unspecified Ground Workings	1981	1:10000
A	219m SE	Unspecified Ground Workings	1973	1:10000
1	235m SE	Pond	1973	1:10000
2	237m SE	Ponds	1988	1:10000

This is data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m**0**

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground mining extents

Records within 500m**0**

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

This data is sourced from Groundsure.

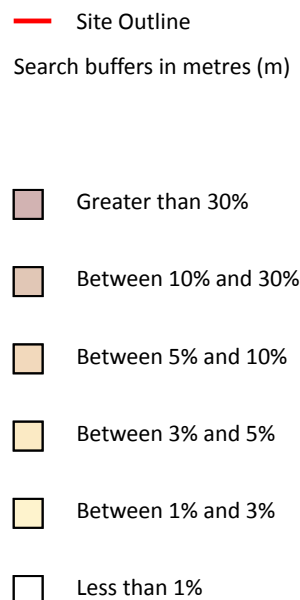
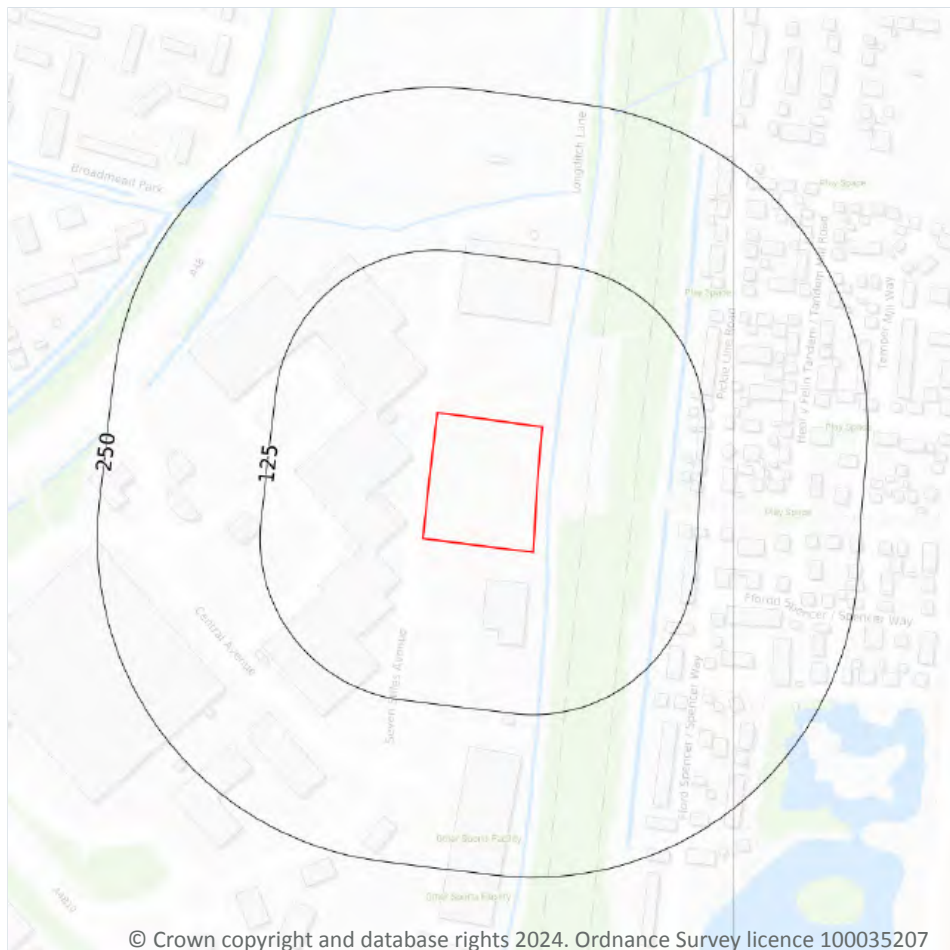
18.5 Historical Mineral Planning Areas

Records within 500m**0**

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.



20 Radon



20.1 Radon

Records on site

1

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on [page 103](#) >

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None



APPENDIX III

APPENDIX III – GROUND INVESTIGATION

Introduction

This Appendix, together with Sections 2 to 5 of the report forms the Ground Investigation Report for the development described in the report, in compliance with the requirements of BS 5930:2015+A1:2020, BS EN1997-1:2004(2007) and BS EN1997-2:2007(2007).

The site operations were carried out between 18th September and 23th October 2024 under the supervision of a geotechnical/geoenvironmental engineer from Crossfield Consulting Limited. The scope and rationale for the design of the investigation is presented in Table III-1.

The ground investigation was designed and supervised by qualified and experienced geotechnical/geoenvironmental specialists from Crossfield Consulting Limited. Where appropriate, and as outlined below, specialist drilling/sampling equipment was procured together with trained and experienced operators. Unless otherwise indicated, sampling and logging remained the responsibility of trained staff from Crossfield Consulting Limited and field records were prepared on site, during or immediately following drilling/sampling or in situ measurements/tests. The results of in situ tests are presented on the relevant record sheets in this Appendix and the data are summarised on Figures III-1 to 2.

An exploratory hole location plan is presented as Figure III-3.

Trial Pits

Five trial pits, denoted as TP1 to TP5, were excavated by a JCB 3CX excavator on 18th September 2024. The trial pit records from the investigation are presented in this Appendix and these records include the descriptions and depths of the strata encountered, together with sample depths, groundwater observations and other pertinent comments.

In situ hand vane tests were carried out on fine-grained soils, where appropriate, to provide undrained shear strength data representative of the tested horizon. The tests were carried out using Pilcon-Edeco hand vane tester, with extension rods in accordance with the site health and safety method statement. With reference to the guidance published in Serota & Jangle (1972), it is noted that this instrument is calibrated and scaled to provide a direct reading of undrained shear strength, such that application of additional correction factors on the recorded measurements is not necessary. Published correlations with undrained shear strength, as measured by immediate undrained triaxial tests, indicate this hand vane tester provides measurements with a significantly lower scatter in comparison to triaxial tests, with fewer anomalous results. Specific test measurements are listed on the exploratory hole records and a summary of the test data and instrument details are presented in this Appendix.

Four shallow trial pits, denoted as SK1 to SK4, were excavated by a JCB 3CX on 18th and 19th September 2024, to obtain representative soil samples from two stockpiles and the perimeter bund on site. The soil sample descriptions are presented in this Appendix.

In Situ Soakaway Tests

In situ soakaway tests were performed in Trial Pits 1 and 2 generally in accordance with the requirements of BRE DG365 (2016) except that TP1 was filled only once and TP2 was filled twice. Trial Pits were filled with clean water and the fall in water level measured with time. The results of the in situ testing are presented in this Appendix.

Dynamic Sampling

Five dynamic sampling boreholes, denoted as DS1 to DS5, were sunk by LTS Drilling Limited, on 19th September 2024 to between 4 m and 5 m depth. Dynamic/driven open-tube soil sampling/boring was undertaken using

an Archway Dart Competitor rig. Using a 1.0 m long thick-walled open-tube sampler (with plastic liner), Category A and B samples were recovered (sample disturbance being influenced by the specific soils encountered). Where appropriate, small disturbed sub-samples were recovered from the materials recovered in the open-tube sampler.

Standard Penetration Tests (SPT) were carried out at regular intervals to provide data on the in situ density of coarse-grained strata and an indication of strength within fine-grained strata. A summary of SPT/depth data is presented in this Appendix. The SPTs were carried out in accordance with BS EN ISO 22476-3:2005(2007).

The records from the investigation are presented in this Appendix. These records include the descriptions and depths of the strata encountered, together with sample depths, in situ test results (uncorrected values), groundwater observations, details of installations/backfill within exploratory holes and other pertinent comments.

Dynamic Probing

Two continuous dynamic probing holes, denoted as DP1 to DP2, were sunk by LTS Drilling Limited on 19th September 2024, to 10 m depth. The probes were progressed from the base of DS1 & DS2 respectively.

The probing equipment comprised an Archway Dart Competitor rig and complies with the 'super heavy' specification (DPSH), as defined in BS EN ISO 22476-2:2005. On completion, the sides of the small diameter exploratory holes (less than 30 mm diameter) collapsed, effectively infilling the hole. The probing records are presented in this Appendix and include a graphical summary of the test data.

Soil Samples

All samples for analytical testing were collected in appropriate containers, stored in cool boxes (where appropriate) and sent to the testing laboratory overnight. The sample containers, storage and handling procedures were all compatible with the relevant recommendations of the UKAS accredited testing laboratory for the specific testing proposed.

Samples designated for geotechnical testing were collected, stored and transported in accordance with the published requirements for the specific tests scheduled, such that moisture content and soil structure integrity was maintained, as necessary for the test requirements.

Ground Gas and Groundwater Monitoring

Standpipes installed in Borehole Nos DS3, DS4 and DS5 were monitored for ground gases and groundwater on four occasions during the period 4th October to 23rd October using a Gas Data GFM436 gas analyser and the following parameters recorded:

- Ground gas pressure and flow (from standpipe and relative to atmospheric conditions)
- Atmospheric pressure and temperature on site during monitoring site visit
- Atmospheric pressure trend (From MET Office data for the site area over the 24 hours that included site measurements)
- Concentration (%v/v) of methane, carbon dioxide and oxygen
- Concentration (ppm v/v) of hydrogen sulphide and carbon monoxide
- Groundwater level in monitoring standpipe

The sampling was undertaken by experienced geoenvironmental specialists from Environmental Site Sampling.

Standpipe gas taps remained closed between each monitoring visit. The results of gas and groundwater monitoring are presented in this Appendix.

Analytical Laboratory Testing

The rationale for the analytical testing is set out in Table III-2.

Selected samples of the soils encountered were submitted for screening analysis of the following determinands:

- Arsenic (Total)
- Chromium (Total and Hexavalent)
- Lead (Total)
- Nickel (Total)
- Selenium (Total)
- Cyanide (Total)
- Sulphate (Water soluble)
- pH
- Asbestos (Fibre & ACM Screen)
- Cadmium (Total)
- Copper (Total)
- Mercury (Total)
- Zinc (Total)
- Boron (Water soluble)
- Sulphide (Total)
- Phenols (Total-monohydric)
- Total Organic Carbon
- Asbestos (Quantification)

Note: Total determinands are based on an aqua-regia extract.

Selected samples of the soils encountered were submitted for analysis of the following determinands:

- Total Petroleum Hydrocarbons – aromatic/aliphatic split and carbon number banding, using GC-FID techniques
- Polyaromatic Hydrocarbons – using GC-MS techniques

Selected samples were submitted for Waste Acceptance Criteria Tests (WAC) to BS EN 12457-3:

Solid Tests

Total Organic Carbon (TOC)	PCB [#] – Total (7 Congeners)
Loss on Ignition @ 450°C	PAH ^Δ – (Total WAC 17)
Mineral Oil (C ₁₀ -C ₄₀)	Acid Neutralisation Capacity
BTEX * – Total	pH

* BTEX: Total of Benzene, Toluene, Ethylbenzene, Xylenes

[#] PCB: Polychlorinated biphenyl (Total of congener Nos. 28, 52, 101, 118, 138, 153, 180)

^Δ PAH: Polyaromatic Hydrocarbons (Total of 17No. compounds from WAC)

Eluate Tests

Arsenic (dissolved)	Molybdenum (dissolved)	Chloride
Barium (dissolved)	Nickel (dissolved)	Fluoride
Cadmium (dissolved)	Lead (dissolved)	Sulphate as SO ₄
Chromium (dissolved)	Antimony (dissolved)	Dissolved Solids
Copper (dissolved)	Selenium (dissolved)	Phenols - Total (monohydric)
Mercury (dissolved)	Zinc (dissolved)	Dissolved Organic Carbon (DOC)

The analyses were carried out by i2 Analytical, a UKAS accredited laboratory, and the results are presented in this Appendix. Soil testing was undertaken in accordance with the Environment Agency's Monitoring Certification Scheme (MCERTS).

Geotechnical Laboratory Testing

The rationale for the geotechnical laboratory testing is set out in the Table III-3.

Selected samples of the soils encountered were submitted for analysis for the following tests:

- pH value
- Water soluble sulphate
- Moisture content
- Atterberg Limits

The analyses were carried out by i2 Analytical and GEO Site & Testing Services Limited, both UKAS accredited laboratories, and the results are presented in this Appendix.

RATIONALE FOR THE DESIGN OF THE GROUND INVESTIGATION

The scope of the ground investigation was designed with reference to the published geology and ground conditions indicated in the desk study information.

In compliance with the guidance published in BS EN 1997-2:2007, the ground investigation was designed to verify the preliminary ground model, established from the desk study information and to characterise the ground conditions within influencing distance of the proposed structures. In this regard, the exploratory holes were targeted within relevant areas of the site to provide information on the strata profile down to competent materials.

In compliance with the guidance published in BS 10175:2011+A2:2017, BS 5930:2015+A1:2020 and Environment Agency LCRM (2023), the layout of the exploratory holes and sampling regime also considers the Conceptual Site Model and potential contaminant linkages, such that the spatial arrangement of the investigation provides the necessary information to support a risk assessment of the identified potential contaminant linkages.

Exploratory Hole and Technique	Rationale for Hole Location	Depth (m)	Sampling/In Situ Testing and Monitoring
TP5 TP4 DS2 DS3 DS4 DS5	Exploratory holes were located within accessible areas within the vicinity of the proposed building footprint to confirm the shallow ground conditions and obtain suitable soil samples and data for environmental and geotechnical assessments	3.0 3.0 5.0 5.0 4.0 5.0	Representative samples of Made Ground recovered for analytical laboratory testing. Representative samples of natural strata recovered for geotechnical laboratory testing. In trial pits, in situ hand vane tests were carried out on fine-grained soils, where appropriate, to provide undrained shear strength data representative of the tested horizon. In dynamic sample boreholes, Standard Penetration Tests (SPT) were carried out at regular intervals to provide data on the in situ density of coarse-grained strata and an indication of strength within fine-grained strata. Groundwater/ground gas monitoring standpipes were installed within DS3, DS4 & DS5. Ground gas monitoring was carried out over a period of 4 weeks and included 4 site visits and measurements.

TABLE III-1
(Page 2 of 2)

Exploratory Hole and Technique	Rationale for Hole Location	Depth (m)	Sampling/In Situ Testing and Monitoring
TP1 TP2	Exploratory holes were located within accessible areas of the proposed car parking areas of the site to assess soakaway feasibility	2.8 1.0	Representative samples of Made Ground recovered for analytical laboratory testing. Representative samples of natural strata recovered for geotechnical laboratory testing. In situ hand vane tests were carried out on fine-grained soils, where appropriate, to provide undrained shear strength data representative of the tested horizon. In situ soakaway test undertaken in pits.
TP3 DS1	Exploratory holes were located within accessible areas of the proposed car parking areas of the site to provide additional site coverage	3.0 5.0	Representative samples of Made Ground recovered for analytical laboratory testing. Representative samples of natural strata recovered for geotechnical laboratory testing. In trial pits, in situ hand vane tests were carried out on fine-grained soils, where appropriate, to provide undrained shear strength data representative of the tested horizon. In dynamic sample boreholes, Standard Penetration Tests (SPT) were carried out at regular intervals to provide data on the in situ density of coarse-grained strata and an indication of strength within fine-grained strata.
DP1 (DS1) DP2 (DS2)	Exploratory holes were progressed from the base of DS1 & DS2 to provide an indication of the ground profile and strength/density to greater depth	10.0 10.0	Continuous dynamic probing undertaken from base of dynamic sampling holes.
SK1 SK2 SK3 SK4	Shallow exploratory holes were undertaken within existing stockpiles and the perimeter bund to confirm materials and obtain representative samples		Representative samples of Made Ground recovered for analytical laboratory testing.

Key

TP X	Machine dug trial pit	SK X	Stockpile/Bund Sampling Location
DS X	Dynamic Sample Borehole	DP X	Dynamic Probe

TABLE III-2

RATIONALE FOR THE ANALYTICAL TESTING SUITE

Exploratory Hole and Samples	Selection Criteria	Analytical Tests
TP2 0.5 m TP3 0.3 m TP4 0.4 m TP5 0.5 m SK1 Stockpile SK2 Stockpile SK3 Bund SK4 Bund	Representative Made Ground samples recovered and tested to assess the presence and concentration of potential contaminants identified as relevant to the site risk assessment based on the conceptual site model.	Metals and metalloids, cyanide (total), pH, phenol, sulphate (water and acid soluble), sulphide, sulphur (total) and TOC Petroleum Hydrocarbons (aliphatic and aromatic split with CWG carbon number banding including BTEX and MTBE) Polyaromatic Hydrocarbons Asbestos (identification and, if applicable, quantification)
TP1 2.55 m TP4 2.9 m	Representative peat samples recovered and tested to give an indication of organic content	Total Organic Carbon
TP4 0.4 m TP5 0.5 m SK2 Stockpile SK4 Bund	Representative Made Ground samples recovered and tested to aid waste classification	WAC Total Waste Solid Suite WAC Leachate Suite In accordance with BS EN 12457-3

TABLE III-3

RATIONALE FOR THE GEOTECHNICAL TESTING SUITE

Exploratory Hole and Sample	Selection Criteria	Geotechnical Tests
TP4 2.3 m TP5 1.3 m DS2 1.5 m DS4 1.5 m DS5 2.2 m	Representative samples of potential founding strata to undertake testing to aid concrete design	pH Water soluble sulphate
TP1 1.2 m TP4 1.5 m DS3 2.1 m DS5 1.1 m	Representative samples to undertake classification testing	Moisture content Atterberg Limits

TRIAL PIT RECORDS

KEY

	J	Disturbed Jar Sample	}	Category B Samples
	G	Soil Sample in Glass Container		
	g	Soil Sample in Glass Vial		
	B	Disturbed Bulk Sample		
	C	"Undisturbed" CBR Mould Sample (denoted Category A: OS-TK/W in BS EN 22475-1:2006)		
	W	Water Sample		
FVT	{	c_{fv}	Undrained Shear Strength (from hand vane shear vane test)	
		c_{rv}	Undrained Remoulded Shear Strength (from hand vane shear vane test)	
		c_{fv}^*	Undrained Shear Strength from Hand Vane Shear Strength Test on block sample dug from pit by excavator	

Notes:

1. All measurement values on record sheets are uncorrected, unless otherwise indicated.
2. For corrected test values, refer to report.
3. Identification and classification of strata is based on the guidance published in the current edition of BS5930 together with BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2004, BS EN ISO 14689-1:2003
4. Consistency (soft, firm, stiff etc.) relates to a manual test/inspection on site (in compliance with BS EN ISO 14688-1:2002 Section 5.14)
5. Undrained shear strength (low, medium, high etc.) relates to in situ or laboratory test data and the associated assessed strength of a stratum (in compliance with BS EN ISO 14688-2:2004 Section 5.3 and Table 5).
6. The density of coarse-grained soils is based on SPT N values (or equivalent Dynamic Probe test or CPT data) as outlined in BS5930 and BS EN ISO 14688-2:2004.
7. Rock strength (weak, strong etc.) is based on field identification (and/or strength test data), as outlined in BS EN ISO 14689-1:2003 Table 5.

Crossfield CONSULTING GEOTECHNICAL ENVIRONMENTAL			Trial Pit Record Sheet			Hole Ref. TP 1			
			Project Land off Seven Stiles Avenue, Newport			Sheet 1 of 1			
			Date 18/09/2024			Job No. CCL03796			
Bearing: West			Shoring None used			Ground Level 6.65 m OD*			
Plant JCB 3CX			Stability Sides vertical and stable throughout excavation			Co-ordinates			
Trial Pit Plan A → B C			Water Water at base of Made Ground at 1.15 m			Logged by LG Logged on site during excavation			
Checked by									
Depth		Face A		Face B		Face C		Depth	
1.15				(1)				1.15	
2.50				(2)				2.50	
2.60				(3)				2.60	
2.80				(4)				2.80	
				Base of Pit					
Sampling			Strata						
Sample/Test Depth	Type	Strength (kN/m²)	Ref. No.	Strata Depth	Description				
0.40	JGg		1	0.00-1.15	Very dense greyish brown and grey sandy fine to coarse angular gravel with occasional cobbles and thin cemented layers. Gravel includes rare possible crushed slag materials (MADE GROUND)				
1.20	c _{fv} *	78,100,92	2	1.15-2.50	Firm to stiff consistency dark grey mottled orange silty CLAY (TIDAL FLAT DEPOSITS)				
1.20	J								
2.55	J		3	2.50-2.60	Dark brown spongy pseudo-fibrous PEAT (TIDAL FLAT DEPOSITS)				
2.80	c _{fv} *	40,40,40	4	2.60-2.80	Soft to firm consistency dark bluish grey silty CLAY (TIDAL FLAT DEPOSITS)				
Remarks					Notes				
* Ground level estimated from topographical survey by Zenith Land Surveys Limited, Dwg No. 22022_A					1. All logging and sampling in accordance with BS 5930:2015+A1:2020 2. Symbols and abbreviations are explained on the accompanying key 3. All linear dimensions are in metres unless otherwise stated				

Ground Level	6.25 m OD*
--------------	------------

Co-ordinates

Logged by	LG	Logged on
Checked by		site during excavation

Depth		Face A	Face B	Face C	Depth	
0.25			(1)		0.25	
			(2)			
0.80					0.80	
1.00			(3)		1.00	
			Base of Pit			

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m ²)	Ref. No.	Strata Depth	Description
0.50	JGg		1	0.00-0.25	Brown slightly humic slightly sandy slightly gravelly clayey silt with rootlets. Gravel is fine to coarse angular (TOPSOIL)
			2	0.25-0.80	Dark grey and brown sandy fine to coarse angular gravel and cobbles including rare possible crushed slag materials (MADE GROUND)
1.00	c _{fv}	110, 110, 100	3	0.80-1.00	Stiff consistency bluish grey mottled brown silty CLAY (TIDAL FLAT DEPOSITS)

Notes
1. All logging and sampling in accordance with BS 5930:2015+A1:2020
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING GEOTECHNICAL ENVIRONMENTAL			Trial Pit Record Sheet			Hole Ref. TP 3			
			Project Land off Seven Stiles Avenue, Newport			Sheet 1 of 1			
			Date 18/09/2024			Job No. CCL03796			
Bearing: Northwest			Shoring None used			Ground Level 6.35 m OD*			
Plant JCB 3CX			Stability Sides vertical and stable throughout excavation			Co-ordinates			
Trial Pit Plan A → B C			Water No water encountered			Logged by LG Logged on site during excavation			
Checked by									
Depth		Face A		Face B		Face C		Depth	
0.10				(1)				0.10	
0.90				(2)				0.90	
2.90				(3)				2.90	
				Base of Pit					
Sampling			Strata						
Sample/Test Depth	Type	Strength (kN/m²)	Ref. No.	Strata Depth	Description				
0.30	JGg		1	0.00-0.10	Brown slightly humic slightly gravelly sandy clayey silt with rootlets. Gravel is fine to coarse angular (TOPSOIL)				
0.50	c _{fv}	125, 140,95	2	0.10-0.90	Dark greyish brown sandy fine to coarse angular gravel and cobbles with dark bluish grey clay lenses (MADE GROUND)				
1.10	c _{fv}	90, 100, 100	3	0.90-2.90	Firm to stiff consistency dark bluish grey silty CLAY (TIDAL FLAT DEPOSITS)				
1.10	J				...becoming soft to firm consistency and bluish grey below 2 m				
2.20	J								
2.30	c _{fv} *	40, 30, 35							
Remarks					Notes				
* Ground level estimated from topographical survey by Zenith Land Surveys Limited, Dwg No. 22022_A					1. All logging and sampling in accordance with BS 5930:2015+A1:2020 2. Symbols and abbreviations are explained on the accompanying key 3. All linear dimensions are in metres unless otherwise stated				

Crossfield CONSULTING GEOTECHNICAL ENVIRONMENTAL			Trial Pit Record Sheet			Hole Ref. TP 4			
			Project Land off Seven Stiles Avenue, Newport			Sheet 1 of 1			
			Date 18/09/2024			Job No. CCL03796			
Bearing: West			Shoring None used			Ground Level 6.60 m OD*			
Plant JCB 3CX			Stability Slight instability in Made Ground			Co-ordinates			
Trial Pit Plan A → B C			Water No water encountered			Logged by LG Logged on site during excavation			
Checked by									
Depth		Face A		Face B		Face C		Depth	
0.10				(1)				0.10	
1.25				(2)				1.25	
2.80				(3)				2.80	
3.00				(4)				3.00	
				Base pf Pit					
Sampling			Strata						
Sample/Test Depth	Type	Strength (kN/m²)	Ref. No.	Strata Depth	Description				
0.40	JGg		1	0.00-0.10	Brown slightly humic slightly gravelly sandy clayey silt with rootlets. Gravel is fine to coarse angular (TOPSOIL)				
			2	0.10-1.25	Greyish brown sandy fine to coarse angular gravel with medium cobbles and boulders content including brick, concrete, plastic pipe fragments and rare possible crushed slag materials (MADE GROUND)				
1.30	c _{fv}	75, 75, 85	3	1.25-2.80	Firm to stiff consistency bluish grey mottled brown silty CLAY (TIDAL FLAT DEPOSITS)				
1.50	J								
2.30	c _{fv} *	40, 35, 45			...becoming soft to firm consistency below 2.3 m				
2.30	J				...becoming dark bluish grey below 2.5 m				
2.90	J		4	2.80-3.00	Dark brown spongy pseudo-fibrous PEAT (TIDAL FLAT DEPOSITS)				
Remarks					Notes				
* Ground level estimated from topographical survey by Zenith Land Surveys Limited, Dwg No. 22022_A					1. All logging and sampling in accordance with BS 5930:2015+A1:2020 2. Symbols and abbreviations are explained on the accompanying key 3. All linear dimensions are in metres unless otherwise stated				

Crossfield CONSULTING GEOTECHNICAL ENVIRONMENTAL		Trial Pit Record Sheet			Hole Ref. TP 5	
		Project Land off Seven Stiles Avenue, Newport			Sheet 1 of 1	
		Date 18/09/2024			Job No. CCL03796	
Bearing: West		Shoring None used			Ground Level 6.45 m OD*	
Plant JCB 3CX		Stability Sides vertical and stable throughout excavation			Co-ordinates	
Trial Pit Plan A B C		Water No water encountered			Logged by LG Logged on site during excavation	
Checked by						
Depth	Face A		Face B		Face C	
0.10			(1)		0.10	
1.10			(2)		1.10	
			(3)			
2.50			(4)		2.50	
2.70			(5)		2.70	
3.00			Base of Pit		3.00	
Sampling			Strata			
Sample/Test Depth	Type	Strength (kN/m²)	Ref. No.	Strata Depth	Description	
0.50	JGg	70, 80, 64	1	0.00-0.10	Brown gravelly sand with some rootlets. Gravel is fine to coarse angular (MADE GROUND)	
			2	0.10-1.10	Very dense grey sandy fine to coarse angular gravel including cemented layers and rare possible crushed slag materials (MADE GROUND)	
			3	1.10-2.50	Firm to stiff consistency dark bluish grey mottled brown silty CLAY (TIDAL FLAT DEPOSITS)	
			4	2.50-2.70	Dark brown spongy pseudo-fiborous PEAT (TIDAL FLAT DEPOSITS)	
			5	2.70-3.00	Soft consistency dark grey organic silty CLAY with plant remains (TIDAL FLAT DEPOSITS)	
1.20	c _{fv}	70, 80, 64	3	1.10-2.50	Firm to stiff consistency dark bluish grey mottled brown silty CLAY (TIDAL FLAT DEPOSITS)	
1.30	J				...becoming bluish grey mottled brown below 1.5 m	
2.00	J					
2.20	c _{fv} *	78, 85, 75				
Remarks					Notes	
* Ground level estimated from topographical survey by Zenith Land Surveys Limited, Dwg No. 22022_A					1. All logging and sampling in accordance with BS 5930:2015+A1:2020 2. Symbols and abbreviations are explained on the accompanying key 3. All linear dimensions are in metres unless otherwise stated	

Crossfield CONSULTING GEOTECHNICAL ENVIRONMENTAL		Sample Description Record		Job No.	CCL03796
		Project: Land off Seven Stiles Avenue, Newport		Logged by: LG	
		Date: 18/09/2024 - 19/09/2024		Checked by: 	
Notes:	Samples were taken from two existing stockpiles on the site (SK1 and SK2) and from the perimeter bund along the northern and northwestern site boundaries (SK3 and SK4). The perimeter bund comprised a thin cover of topsoil materials underlain by the sampled materials.				Sheet 1 of 1
Sample Ref.	Sample Description		Sample Containers	Sample Depth	
SK1	Brown gravelly sand with cobbles and concrete boulders with rebar. Gravel is fine to coarse angular		JGg		
SK2	Brownish grey sandy fine to coarse angular gravel including brick fragments and rare possible crushed slag material		JGg		
SK3	Grey gravelly sand with brick and plastic pipe fragments. Gravel is fine to coarse angular		JGg		
SK4	Brown gravelly sand with brick and concrete block fragments. Gravel is fine to coarse angular		JGg		

In Situ Percolation Test

Hole Ref. **TP 1**

Project: Land off Seven Stiles Avenue, Newport

Sheet 1 of 1

Job No. CCL03796

Date: 18/09/2024

Test by: LG

Checked by: 

Trial Pit 1

Test 1

Depth 2.80 m
Length 2.30 m
Width 0.60 m

Depth to water at start of test 1.85 m
Max Effective Depth 0.95 m
75% Effective Depth 0.71 m
25% Effective Depth 0.24 m

Water Level Measurements

Time at Start of Test	Time (Minutes)	Depth to Water (metres)	Effective Depth (m)
10.25	0	1.85	0.95
	1	1.85	0.95
	5	1.85	0.95
	10	1.85	0.95
	159	1.83	0.97
	223	1.83	0.97
	289	1.83	0.97
	345	1.83	0.97

75% Effective Depth - N/A - 0.71
25% Effective Depth - N/A - 0.24

Outflow Volume

Volume outflowing between 75% & 25% effective depth:

$$V_{p75} = 0.66 \text{ m}^3$$

The mean surface area through which the outflow occurs, taken to be the pit sides to 50% effective depth and the base.

$$a_{p50} = 4.14 \text{ m}^2$$

Time for outflow

$$t_p = \text{mins} \quad (\text{Outflow time cannot be measured})$$

Soil Infiltration Rate

as defined in

BRE DG365 (2016)

$$f = V_{p75} / a_{p50} * t_p$$

$$f = <1 \times 10^{-6} \text{ m/sec}$$

In Situ Percolation Test

Hole Ref. **TP 2**

Project: Land off Seven Stiles Avenue, Newport

Sheet 1 of 2

Job No. CCL03796

Date: 18/09/2024

Test by: LG

Checked by: 

Trial Pit 2

Test 1

Depth 1.00 m
Length 2.90 m
Width 0.60 m

Depth to water at start of test 0.56 m
Max Effective Depth 0.44 m
75% Effective Depth 0.33 m
25% Effective Depth 0.11 m

Water Level Measurements

Time at Start of Test	Time (Minutes)	Depth to Water (metres)	Effective Depth (m)
11.36	0	0.56	0.44
	1	0.63	0.37
	5	0.74	0.26
	9	0.75	0.25
	16	0.80	0.20
	25	0.80	0.20

75% Effective Depth - 3 - 0.33
25% Effective Depth - 30 - 0.11

Outflow Volume

Volume outflowing between 75% & 25% effective depth:

$$V_{p75} = 0.38 \text{ m}^3$$

The mean surface area through which the outflow occurs, taken to be the pit sides to 50% effective depth and the base.

$$a_{p50} = 3.28 \text{ m}^2$$

Time for outflow

$$t_p = 27 \text{ mins}$$

Soil Infiltration Rate

as defined in

BRE DG365 (2016)

$$f = V_{p75} / a_{p50} * t_p$$

$$f = 7.2E-05 \text{ m/sec}$$

Data has been assessed to reflect Made Ground materials.

In Situ Percolation Test

Project: Land off Seven Stiles Avenue, Newport

Date: 18/09/2024

Hole Ref. TP 2

Sheet 2 of 2

Job No. CCL03796

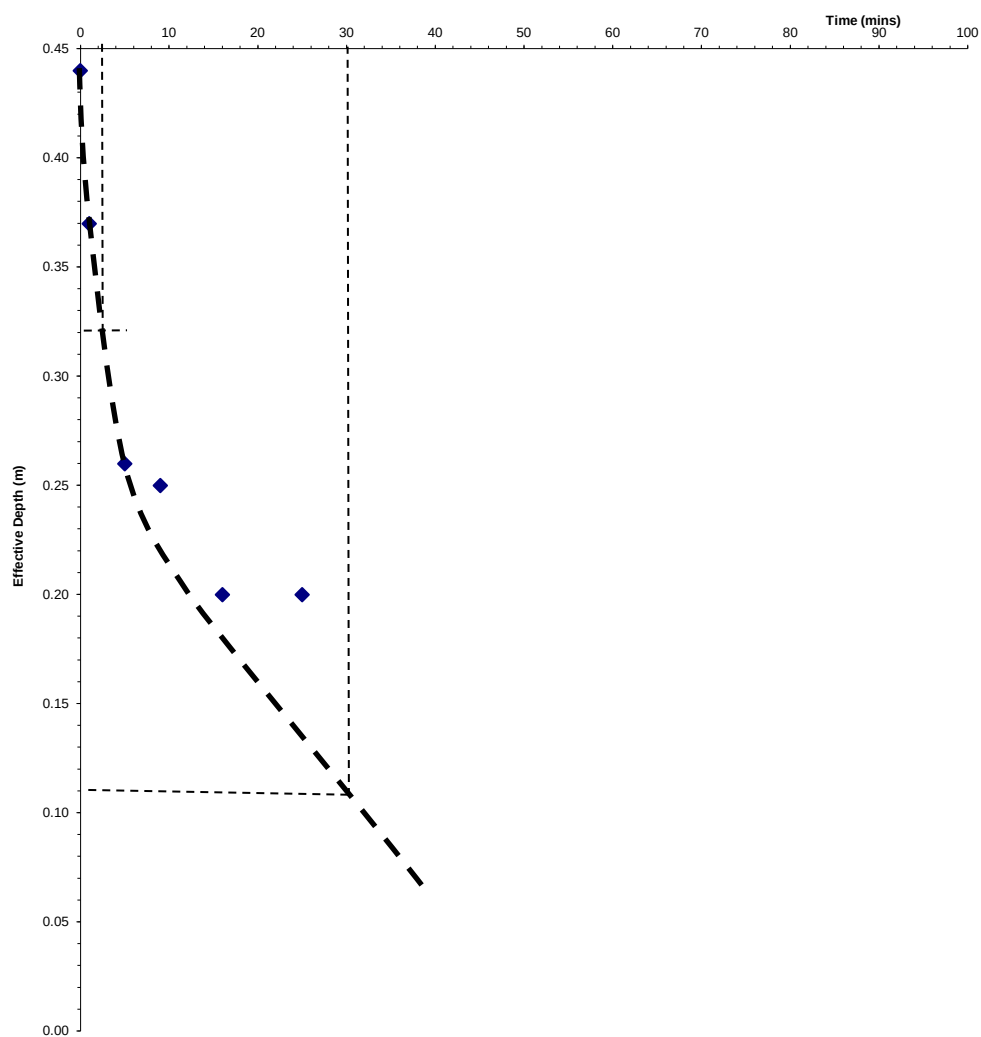
Test by: LG

Checked by: 

Trial Pit 2

Test 1

Infiltration Rate



In Situ Percolation Test

Hole Ref. **TP 2**

Project: Land off Seven Stiles Avenue, Newport

Sheet 1 of 2

Date: 18/09/2024

Job No. CCL03796

Test by: LG

Checked by: 

Trial Pit 2

Test 2

Depth 1.00 m
Length 2.90 m
Width 0.60 m

Depth to water at start of test 0.50 m
Max Effective Depth 0.50 m
75% Effective Depth 0.38 m
25% Effective Depth 0.13 m

Water Level Measurements

Time at Start of Test	Time (Minutes)	Depth to Water (metres)	Effective Depth (m)
12.03	0	0.50	0.50
	2	0.63	0.37
	4	0.70	0.30
	8	0.73	0.27
	14	0.80	0.20
	17	0.80	0.20

75% Effective Depth - 2.5 - 0.38
25% Effective Depth - 24 - 0.13

Outflow Volume

Volume outflowing between 75% & 25% effective depth:

$$V_{p75} = 0.44 \text{ m}^3$$

The mean surface area through which the outflow occurs, taken to be the pit sides to 50% effective depth and the base.

$$a_{p50} = 3.49 \text{ m}^2$$

Time for outflow

$$t_p = 22 \text{ mins}$$

Soil Infiltration Rate

$$f = V_{p75} / a_{p50} * t_p$$

as defined in

BRE DG365 (2016)

$$f = 9.7E-05 \text{ m/sec}$$

Data has been assessed to reflect Made Ground materials.

In Situ Percolation Test

Project: Land off Seven Stiles Avenue, Newport

Date: 18/09/2024

Hole Ref. TP 2

Sheet 2 of 2

Job No. CCL03796

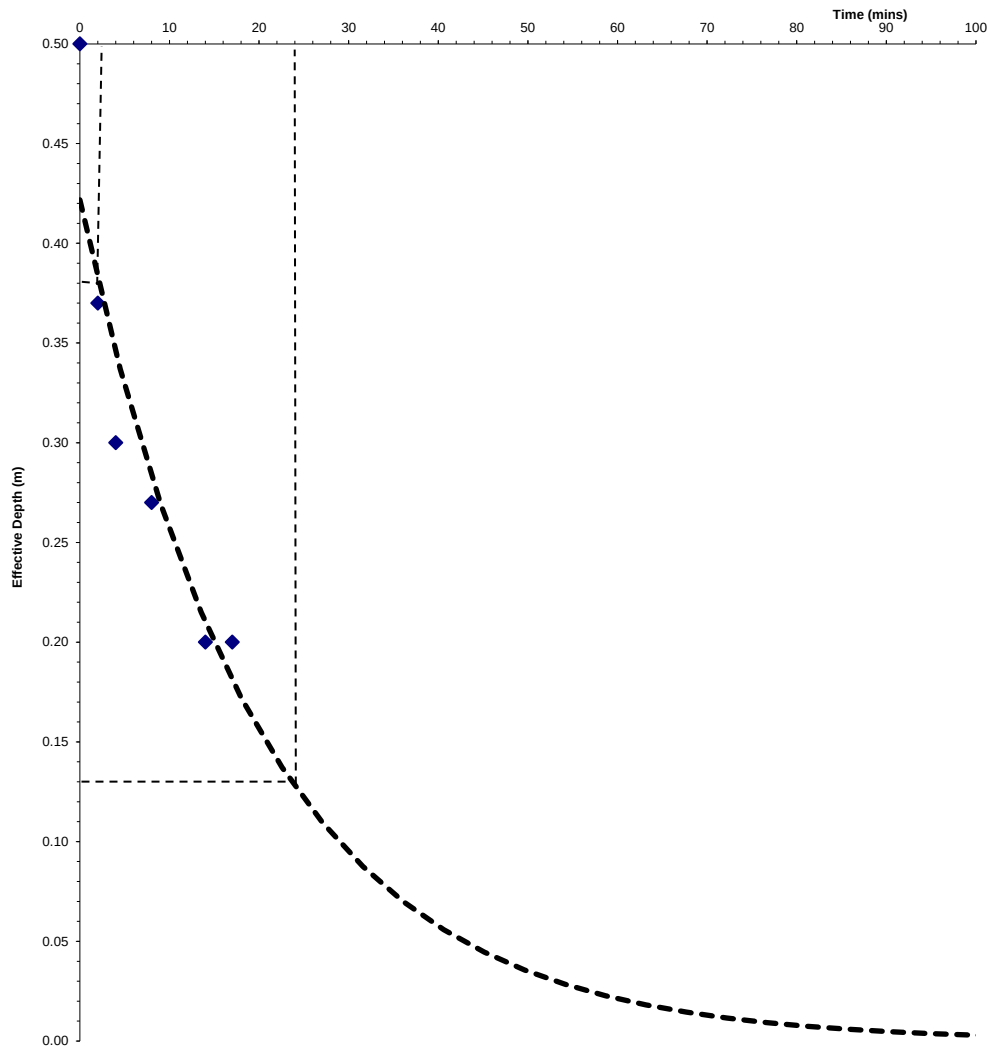
Test by: LG

Checked by: 97

Trial Pit 2

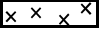
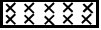
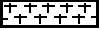
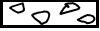
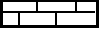
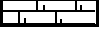
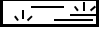
Test 2

Infiltration Rate

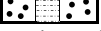
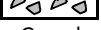


BOREHOLE & DRILLHOLE RECORDS - LEGENDS KEY SHEET

Legend - Strata Encountered in Exploratory Hole

Soil	Rock		
	Sedimentary	Igneous	Metamorphic
 Made Ground	 Mudstone	 Fine-grained	 Fine-grained
 Clay	 Shale	 Medium-grained	 Medium-grained
 Silt	 Siltstone	 Coarse-grained	 Coarse-grained
 Sand	 Sandstone		
 Gravel	 Limestone		
 Peat/Topsoil	 Chalk		
 Organic Sand	 Coal		
 Organic Clay	 Conglomerate		

Legend - Backfill to Borehole and Standpipe Installations

Backfill	Installations
 Soil arisings	 Concrete Cover Over Standpipe
 Bentonite	 Plain Standpipe - Bentonite Surround
 Cement-based Grout	 Perforated Standpipe - Geotextile and Granular Filter Surround
 Gravel	 Perforated Standpipe End Geotextile and Granular Filter Surround

Notes:

1. A combination of the strata symbols are indicative of mixed soil types.
2. The response zone of a standpipe refers to the section of perforated pipe within a granular surround, where substances may freely enter the standpipe from the surrounding strata.

DYNAMIC SAMPLE RECORDS

KEY

Sampling

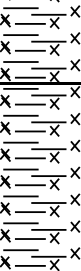
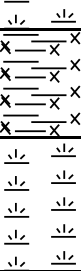
J	Disturbed Jar Sample
G	Jar Sample in Glass Container
g	Soil Sample in Glass Vial
W	Water Sample
IC	Nett sample recovery ratio (ratio of length of recovered sample to length of sample run)

In Situ Measurements

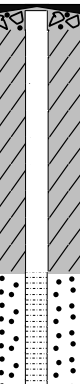
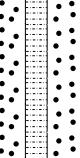
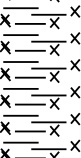
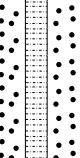
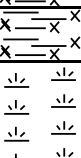
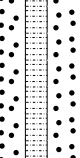
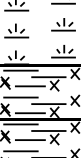
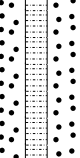
FVT	{	C _{fv}	Undrained Shear Strength (from hand vane shear vane test)
		C _{rv}	Undrained Remoulded Shear Strength (from hand vane shear vane test)
		C _{fv} *	Hand Vane Shear Strength Test (on Category A: OS-TK/W soil sample recovered in window sampler)
		S	Standard Penetration Test (SPT: split spoon sampler)
		SPT(C)	SPT carried out with a 60° cone
		'N'	'N' Value from SPT test
		N ₁₀	Dynamic Probe Test: Number of blows to drive 100 mm
DPH		N _{H10}	Dynamic Probe Test: Heavy (30 kg mass & 500 mm fall)
DPSH-A		N _{SHA10}	Dynamic Probe Test: Super-Heavy A (63.5 kg mass & 500 mm fall)
DPSH-B		N _{SHB10}	Dynamic Probe Test: Super-Heavy B (63.5 kg mass & 750 mm fall)
		<u>x</u>	x Blows per y Driving Distance (for non-standard SPT or DP driving distance)
		y mm	
		T	Torque (max) required to turn rods (unit: Nm, unless otherwise shown)

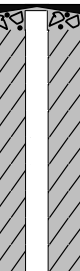
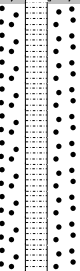
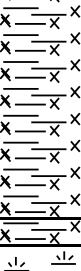
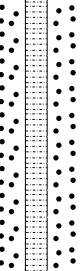
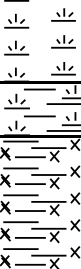
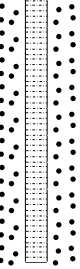
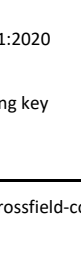
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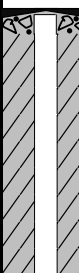
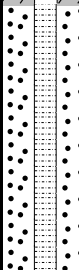
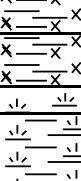
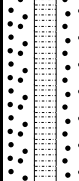
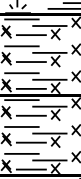
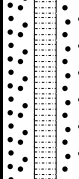
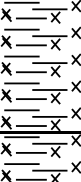
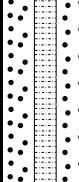
1. All measurement values on record sheets are uncorrected, unless otherwise indicated.
2. For corrected test values, refer to report.
3. Identification and classification of strata is based on the guidance published in the current edition of BS5930 together with BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2004 and BS EN ISO 14689-1:2003
4. Consistency (soft, firm, stiff etc) relates to a manual test/inspection on site (in compliance with BS EN ISO 14688-1:2002 Section 5.14).
5. Undrained shear strength (low, medium, high etc) relates to in situ or laboratory test data and the associated assessed strength of a stratum (in compliance with BS EN ISO 14688-2:2004 Section 5.3 and Table 5).
6. The density of coarse-grained soils is based on SPT N values (or equivalent Dynamic Probe test or CPT data) as outlined in BS5930 and BS EN ISO 14688-2:2004.
7. Rock strength (weak, strong etc) is based on field identification (and/or strength test data), as outlined in BS EN ISO 14689-1:2003 Table 5.

					Dynamic Sample Record Sheet					Hole Ref. DS 1	
					Project: Land off Seven Stiles Avenue, Newport					Sheet 1 of 1	
					Date: 19/09/2024					Job No. CCL03796	
Contractor LTS Drilling Ltd					Equipment Archway Dart Competitor					Ground Level. 6.30 m OD*	
Method 0.0 m to 1.0 m machine excavated trial pit. 1.0 m to 5.0 m dynamic sampling										Co-ordinates	
Boring Diameter 100 mm										Logged by: LG Logged on site during drilling operations Checked by: 	
Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.		
1.00-1.45 1.20	SPT (C) J	1.00	-	N=11	Brown slightly gravelly silty sand with rootlets. Gravel is fine to coarse angular (MADE GROUND)	0.10			6.20		
					Dense grey sandy fine to coarse angular gravel with low cobble content. Includes rare possible crushed slag materials (MADE GROUND)	1.00			5.30		
2.00-2.45 2.30	SPT (C) J	1.00	-	N=7	Firm to stiff consistency light bluish grey mottled brown silty CLAY (TIDAL FLAT DEPOSITS)	2.30			4.00		
					...becoming firm consistency below 1.6 m	3.00			3.30		
3.00-3.45 3.10	SPT (C) J	1.00	-	N=7	Firm consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)	3.60			2.70		
					Dark brown spongy pseudo-fibrous PEAT (TIDAL FLAT DEPOSITS)	3.95			2.35		
4.00-4.45 4.05	SPT (C) J	1.00	-	N=4	Firm consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)	4.50			1.80		
					Dark brown spongy pseudo-fibrous PEAT (TIDAL FLAT DEPOSITS)	5.00			1.30		
5.00-5.45	SPT (C)	1.00	-	N=5	End of Hole						
Core Recovery					Groundwater					Additional Tests	
Depth	Recovery	Hole Depth	Strike Depth	Water Depth	Observations	Test type	Test Depth	Test Value			
0.00-1.00	Excavated				No water encountered						
1.00-2.00	100%										
2.00-3.00	60%										
3.00-4.00	85%										
4.00-5.00	75%										
Remarks					Notes						
* Ground level estimated from topographic survey by Zenith Land Surveys Limited, Dwg No. 22022_A					1. All logging and sampling in accordance with BS 5930:2015+A1:2020						
Dynamic probing undertaken from base of hole, see DP1 log.					2. The depths to strata change are approximate only						
					3. Symbols and abbreviations are explained on the accompanying key						
					4. All linear dimensions are in metres unless otherwise stated						
					5. Undrained shear strength test value given in kN/m ²						

Crossfield CONSULTING GEOTECHNICAL ENVIRONMENTAL					Dynamic Sample Record Sheet					Hole Ref. DS 2		
					Project: Land off Seven Stiles Avenue, Newport					Sheet 1 of 1		
					Date: 19/09/2024					Job No. CCL03796		
Contractor LTS Drilling Ltd					Equipment Archway Dart Competitor					Ground Level. 6.55 m OD*		
Method 0.0 m to 1.0 m machine excavated trial pit. 1.0 m to 5.0 m dynamic sampling										Co-ordinates		
Boring Diameter 100 mm										Logged by: LG Logged on site during drilling operations		
										Checked by:		
Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.			
1.00-1.45	SPT (C)	1.00	-	N=3	Brown slightly gravelly silty sand with rootlets. Gravel is fine to coarse angular (MADE GROUND)	0.10			6.45			
					Dense grey sandy fine to coarse angular gravel with occasional cobbles and thin cemented layers. Includes rare possible crushed slag materials (MADE GROUND)	1.00			5.55			
1.50	J				Firm to stiff consistency bluish grey mottled brown silty CLAY (TIDAL FLAT DEPOSITS)							
2.00-2.45	SPT (C)	1.00	-	N=3		2.10			4.45			
					Soft to firm consistency bluish grey mottled brown silty CLAY (TIDAL FLAT DEPOSITS)	2.50			4.05			
3.00-3.45	SPT (C)	1.00	-	N=10	Dark brown spongy pseudo-fibrous PEAT (TIDAL FLAT DEPOSITS)							
						3.00			3.55			
					Soft consistency greyish brown silty CLAY with relic plant material (TIDAL FLAT DEPOSITS)	3.30			3.25			
3.80	J				Soft to firm consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)	3.80			2.75			
4.00-4.45	SPT (C)	1.00	-	N=2	Firm to stiff consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)							
5.00-5.45	SPT (C)	1.00	-	N=3	End of Hole	5.00			1.55			
Core Recovery					Groundwater					Additional Tests		
Depth		Recovery		Hole Depth		Strike Depth	Water Depth	Observations		Test type	Test Depth	Test Value
0.00-1.00		Excavated						No water encountered				
1.00-2.00		75%										
2.00-3.00		60%										
3.00-4.00		85%										
4.00-5.00		60%										
Remarks						Notes						
* Ground level estimated from topographic survey by Zenith Land Surveys Limited, Dwg No. 22022_A Dynamic probing undertaken from base of hole, see DP2 log.						1. All logging and sampling in accordance with BS 5930:2015+A1:2020						
						2. The depths to strata change are approximate only						
						3. Symbols and abbreviations are explained on the accompanying key						
						4. All linear dimensions are in metres unless otherwise stated						
						5. Undrained shear strength test value given in kN/m ²						

					Dynamic Sample Record Sheet					Hole Ref. DS 3	
					Project: Land off Seven Stiles Avenue, Newport					Sheet 1 of 1	
					Date: 19/09/2024					Job No. CCL03796	
Contractor LTS Drilling Ltd					Equipment Archway Dart Competitor					Ground Level. 6.60 m OD*	
Method 0.0 m to 2.0 m machine excavated trial pit. 2.0 m to 5.0 m dynamic sampling										Co-ordinates	
Boring Diameter 100 mm										Logged by: LG Logged on site during drilling operations Checked by: 	
Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.		
					Brown slightly gravelly silty sand with rootlets. Gravel is fine to coarse angular (MADE GROUND)	0.10			6.50		
					Dense grey sandy fine to coarse angular gravel with high cobble and boulder content of concrete (MADE GROUND)						
2.00-2.45 2.10	SPT (C) J	2.00	-	N=7	Firm to stiff consistency light bluish grey mottled brown silty CLAY (TIDAL FLAT DEPOSITS)	1.50			5.10		
					Firm to stiff consistency light bluish grey mottled brown silty CLAY. (TIDAL FLAT DEPOSITS)	2.00			4.60		
					Soft to firm consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)	2.60			4.00		
					Dark brown spongy pseudo-fibrous PEAT (TIDAL FLAT DEPOSITS)	2.80			3.80		
3.00-3.45	SPT (C)	2.00	-	N=6	Dark brown spongy pseudo-fibrous PEAT (TIDAL FLAT DEPOSITS)						
					Soft consistency brown silty CLAY with abundant plant remains (TIDAL FLAT DEPOSITS)	3.40			3.20		
4.00-4.45	SPT (C)	2.00	-	N=7	Firm to stiff consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)	3.60			3.00		
					Dark brown spongy pseudo-fibrous PEAT (TIDAL FLAT DEPOSITS)	4.00			2.60		
					Soft to firm consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)	4.30			2.30		
					Firm to stiff consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)	4.50			2.10		
5.00-5.45	SPT (C)	2.00	-	N=6	Dark brown spongy pseudo-fibrous PEAT (TIDAL FLAT DEPOSITS)	4.90			1.70		
					End of Hole	5.00			1.60		
Core Recovery					Groundwater					Additional Tests	
Depth		Recovery			Hole Depth	Strike Depth	Water Depth	Observations	Test type	Test Depth	Test Value
0.00-1.00		Excavated						No water encountered			
1.00-2.00		Excavated									
2.00-3.00		98%									
3.00-4.00		80%									
4.00-5.00		75%									
Remarks					Notes						
* Ground level estimated from topographic survey by Zenith Land Surveys Limited, Dwg No. 22022_A					1. All logging and sampling in accordance with BS 5930:2015+A1:2020						
					2. The depths to strata change are approximate only						
					3. Symbols and abbreviations are explained on the accompanying key						
					4. All linear dimensions are in metres unless otherwise stated						
					5. Undrained shear strength test value given in kN/m ²						

Crossfield CONSULTING GEOTECHNICAL ENVIRONMENTAL					Dynamic Sample Record Sheet					Hole Ref. DS 4	
Project: Land off Seven Stiles Avenue, Newport					Sheet 1 of 1					Job No. CCL03796	
Date: 19/09/2024					Ground Level. 6.50 m OD*					Co-ordinates	
Contractor LTS Drilling Ltd					Equipment Archway Dart Competitor					Logged by: LG Logged on site during drilling operations	
Method 0.0 m to 1.0 m machine excavated trial pit. 1.0 m to 4.0 m dynamic sampling					Checked by: 						
Boring Diameter 100 mm											
Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.		
0.40	JGg				Brown slightly humic slightly gravelly sandy clayey silt and rootlets Gravel is fine to coarse angular (MADE GROUND)	0.10			6.40		
1.00-1.45	SPT (C)	1.00	-	N=7	Dense grey sandy fine to coarse angular gravel and cobbles with thin cemented layers and rare possible crushed slag material. (MADE GROUND)	1.00			5.50		
1.50	J				Firm to stiff consistency light bluish grey mottled brown silty CLAY (TIDAL FLAT DEPOSITS)						
2.00-2.45	SPT (C)	1.00	-	N=6							
3.00-3.45	SPT (C)	1.00	-	N=5	Firm consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)	2.80			3.70		
3.20	J				Dark brown spongy pseudo-fibrous PEAT (TIDAL FLAT DEPOSITS)	2.95			3.55		
											
Core Recovery					Groundwater					Additional Tests	
Depth	Recovery	Hole Depth		Strike Depth	Water Depth	Observations	Test type	Test Depth	Test Value		
0.00-1.00	Excavated					No water encountered					
1.00-2.00	60%										
2.00-3.00	85%										
3.00-4.00	95%										
Remarks * Ground level estimated from topographic survey by Zenith Land Surveys Limited, Dwg No. 22022_A Further progression below 4 m prevented by repeat hole collapse.					Notes 1. All logging and sampling in accordance with BS 5930:2015+A1:2020 2. The depths to strata change are approximate only 3. Symbols and abbreviations are explained on the accompanying key 4. All linear dimensions are in metres unless otherwise stated 5. Undrained shear strength test value given in kN/m²						

Crossfield CONSULTING GEOTECHNICAL ENVIRONMENTAL					Dynamic Sample Record Sheet				Hole Ref. DS 5					
					Project:		Land off Seven Stiles Avenue, Newport			Sheet 1 of 1				
					Date:		19/09/2024			Job No. CCL03796				
Contractor		LTS Drilling Ltd		Equipment		Archway Dart Competitor			Ground Level. 6.60 m OD*					
Method		0.0 m to 1.0 m machine excavated trial pit. 1.0 m to 5.0 m dynamic sampling							Co-ordinates					
Boring Diameter		100 mm							Logged by: LG Logged on site during drilling operations					
									Checked by: 					
Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description				Depth	Legend	Backfill	Level O.D.		
1.00-1.45 1.10	SPT (C) J	1.00	-	N=8	Brown sandy fine to coarse angular gravel (MADE GROUND) Very dense grey sandy fine to coarse angular gravel with low cobble content, thin cemented layer and rare possible crushed slag material (MADE GROUND)				0.10			6.50		
2.00-2.45 2.20	SPT (C) J	1.00	-	N=3	Firm to stiff consistency light bluish grey mottled brown silty CLAY (TIDAL FLAT DEPOSITS)				1.00			5.60		
3.00-3.45	SPT (C)	1.00	-	N=8	Firm to stiff consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)				2.10			4.50		
					Dark brown spongy pseudo-fibrous PEAT (TIDAL FLAT DEPOSITS)				2.30			4.30		
					Soft consistency greyish brown silty organic CLAY with abundant relic plant material (TIDAL FLAT DEPOSITS)				2.40			4.20		
					Firm to stiff consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)				2.75			3.85		
					Soft consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)				3.00			3.60		
					Soft to firm consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)				4.30			2.30		
4.00-4.45	SPT (C)	1.00	-	N=6	Firm to stiff consistency bluish grey silty CLAY (TIDAL FLAT DEPOSITS)				4.85			1.75		
5.00-4.45	SPT (C)	1.00	-	N=5	End of Hole				5.00			1.60		
Core Recovery				Groundwater						Additional Tests				
Depth		Recovery		Hole Depth		Strike Depth		Water Depth		Observations		Test type	Test Depth	Test Value
0.00-1.00		Excavated								No water encountered				
1.00-2.00		80%												
2.00-3.00		100%												
3.00-4.00		10%												
4.00-5.00		85%												
Remarks						Notes								
* Ground level estimated from topographic survey by Zenith Land Surveys Limited, Dwg No. 22022_A						1. All logging and sampling in accordance with BS 5930:2015+A1:2020								
						2. The depths to strata change are approximate only								
						3. Symbols and abbreviations are explained on the accompanying key								
						4. All linear dimensions are in metres unless otherwise stated								
						5. Undrained shear strength test value given in kN/m ²								

SPT Hammer Energy Test Report

In accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING (UK) LTD
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP

SPT Hammer Ref: AF01
Test Date: 18/01/2024
Report Date: 18/01/2024
File Name: AF01.spt
Test Operator: JL

Instrumented Rod Data

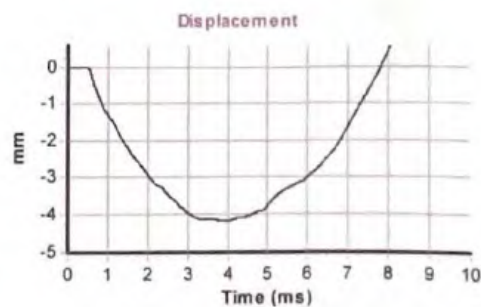
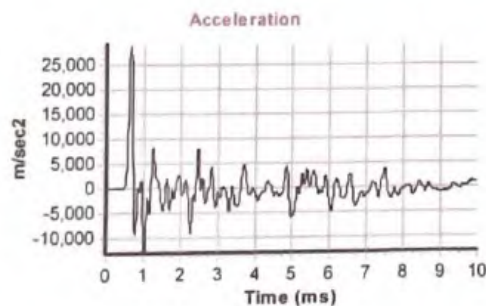
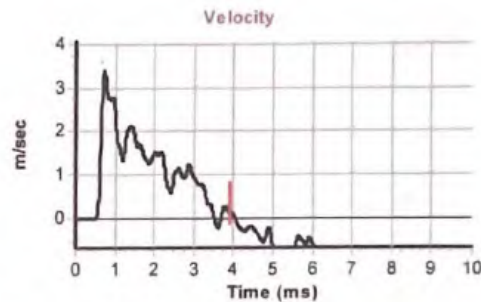
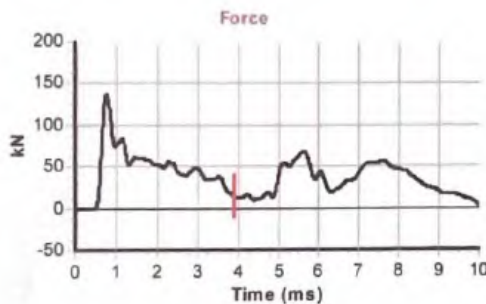
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.6
Assumed Modulus E_a (GPa): 200
Accelerometer No.1: 7080
Accelerometer No.2: 11609

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location

LTS DRILLING LTD - 88000



Calculations

Area of Rod A (mm^2): 983
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 283

Energy Ratio E_r (%): **60**

Signed: J.LOCK

Title: FITTER

The recommended calibration interval is 12 months

BOREHOLE & PROBING RECORDS

KEY

Sampling

J	Soil Sample: Plastic Jar	}	Category B Samples
G	Soil Sample: Glass Jar		
g	Soil Sample: Glass Vial		
D	Soil Sample: Small Bag Sample		
B	Disturbed Bulk Soil Sample		
W	Water Sample – recovered during boring operations		
U	"Undisturbed" 100 mm Diameter Soil Sample (denoted Category A OS-TK/W in BS EN 22475-1:2006)		
P	"Undisturbed" Piston Soil Sample (denoted PS-T/W in BS EN 22475-1:2006)		
NR	Sample not recovered		
S	Standard Penetration Test (SPT: split spoon sampler)		
SPT(C)	SPT carried out with a 60° cone		
IC	Nett sample recovery ratio (ratio of length of recovered sample to length of sample run)		

In Situ Measurements

FVT	{	C_{fv}	Undrained Shear Strength (from hand vane shear vane test)
		C_{rv}	Undrained Remoulded Shear Strength (from hand vane shear vane test)
		C_{fv}^*	Hand Vane Shear Strength Test (on Category A: OS-TK/W soil sample "U" type, as outlined above)
SPT N		100	'N' Value from SPT test
		(10)	Number of blows to drive U100
		N_{10}	Dynamic Probe Test: Number of blows to drive 100 mm
DPH		N_{H10}	Dynamic Probe Test: Heavy (30 kg mass & 500 mm fall)
DPSH-A		N_{SHA10}	Dynamic Probe Test: Super-Heavy A (63.5 kg mass & 500 mm fall)
DPSH-B		N_{SHB10}	Dynamic Probe Test: Super-Heavy B (63.5 kg mass & 750 mm fall)
		$\frac{x}{y}$	x Blows per y Driving Distance (for non-standard driving distance)
		y mm	
T			Torque (max) required to turn rods (unit: Nm, unless otherwise shown)

Notes:

1. All measurement values on record sheets are uncorrected.
2. For corrected test values, refer to report.
3. Identification and classification of strata is based on the guidance published in the current edition of BS5930 together with BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2004, BS EN ISO 14689-1:2003
4. Consistency (soft, firm, stiff etc) relates to a manual test/inspection on site (in compliance with BS EN ISO 14688-1:2002 Section 5.14)
5. Undrained shear strength (low, medium, high etc) relates to in situ or laboratory test data and the associated assessed strength of a stratum (in compliance with BS EN ISO 14688-2:2004 Section 5.3 and Table 5).
6. The density of coarse-grained soils is based on SPT N values (or equivalent Dynamic Probe test or CPT data) as outlined in BS5930 and BS EN ISO 14688-2:2004.
7. Rock strength (weak, strong etc) is based on field identification (and/or strength test data), as outlined in BS EN ISO 14689-1:2003 Table 5.

Dynamic Probe Record Sheet

Hole Ref. **DP1 (DS1)**

Project: Land off Seven Stiles Avenue, Newport

Sheet: 1 of 1

Date: 19/09/2024

Job No. CCL03796

Contractor: LTS Drilling Ltd

Equipment: Archway Dart Competitor

Ground Level: 6.30 m OD

Method: Dynamic Probing

Co-ordinates:

Probing Specification: DPSH

Plotted by: LG

Checked by: 

Depth (m)	Blow Count	Blow Count Plot	Depth	Legend	Level O.D.
5.0-5.1		For strata GL to 5.5 m Refer to DS1			
5.1-5.2					
5.2-5.3					
5.3-5.4					
5.4-5.5					
5.5-5.6	SW				
5.6-5.7	SW				
5.7-5.8	SW				
5.8-5.9	SW				
5.9-6.0	1				0.30
6.0-6.1	1				
6.1-6.2	0				
6.2-6.3	1				
6.3-6.4	0				
6.4-6.5	1				
6.5-6.6	0				
6.6-6.7	1				
6.7-6.8	1				
6.8-6.9	1				
6.9-7.0	0				-0.70
7.0-7.1	1				
7.1-7.2	1				
7.2-7.3	1				
7.3-7.4	0				
7.4-7.5	1				
7.5-7.6	0				
7.6-7.7	1				
7.7-7.8	0				
7.8-7.9	1				
7.9-8.0	0				-1.70
8.0-8.1	1				
8.1-8.2	1				
8.2-8.3	1				
8.3-8.4	2				
8.4-8.5	2				
8.5-8.6	3				
8.6-8.7	3				
8.7-8.8	2				
8.8-8.9	3				
8.9-9.0	4				-2.70
9.0-9.1	13				
9.1-9.2	10				
9.2-9.3	9				
9.3-9.4	10				
9.4-9.5	10				
9.5-9.6	8				
9.6-9.7	7				
9.7-9.8	8				
9.8-9.9	8				
9.9-10.0	7				-3.70

Remarks

Notes

1. Strata interpretations and depths to strata change are approximate only and are based on correlation with borehole records for the site
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated
4. Dynamic probing undertaken in accordance with BS EN 22476-2:2005

Dynamic Probe Record Sheet

Hole Ref. **DP2 (DS2)**

Project: Land off Seven Stiles Avenue, Newport

Sheet: 1 of 1

Date: 19/09/2024

Job No. CCL03796

Contractor: LTS Drilling Ltd

Equipment: Archway Dart Competitor

Ground Level: 6.55 m OD

Method: Dynamic Probing

Co-ordinates:

Probing Specification: DPSH

Plotted by: LG

Checked by: 

Depth (m)	Blow Count	Blow Count Plot					Depth	Legend	Level O.D.
5.0-5.1		For strata GL to 5.5 m Refer to DS2							
5.1-5.2									
5.2-5.3									
5.3-5.4									
5.4-5.5									
5.5-5.6	sw								
5.6-5.7	sw								
5.7-5.8	sw								0.75
5.8-5.9	1								
5.9-6.0	0								0.55
6.0-6.1	1								
6.1-6.2	0								
6.2-6.3	1								
6.3-6.4	0								
6.4-6.5	1								
6.5-6.6	1								
6.6-6.7	1								
6.7-6.8	1								
6.8-6.9	0								
6.9-7.0	1								-0.45
7.0-7.1	1								
7.1-7.2	1								
7.2-7.3	0								
7.3-7.4	1								
7.4-7.5	0								
7.5-7.6	1								
7.6-7.7	0								
7.7-7.8	1								
7.8-7.9	1								-1.45
7.9-8.0	0								
8.0-8.1	1								
8.1-8.2	1								
8.2-8.3	2								
8.3-8.4	1								
8.4-8.5	2								
8.5-8.6	2								
8.6-8.7	2								
8.7-8.8	2								
8.8-8.9	2								
8.9-9.0	3								-2.45
9.0-9.1	6								
9.1-9.2	7								
9.2-9.3	6								
9.3-9.4	6								
9.4-9.5	5								
9.5-9.6	5								
9.6-9.7	5								
9.7-9.8	5								
9.8-9.9	5								
9.9-10.0	6								-3.45

Remarks

Notes

1. Strata interpretations and depths to strata change are approximate only and are based on correlation with borehole records for the site
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated
4. Dynamic probing undertaken in accordance with BS EN 22476-2:2005

TABLE III-4

GROUNDWATER MONITORING DATA

Borehole	Ground Ground Ground	Date: 4.10.24		Date: 9.10.24		Date: 16.10.24		Date: 23.10.24	
		Depth to Groundwater (m)	Groundwater Level (mOD)	Depth to Groundwater (m)	Groundwater Level (mOD)	Depth to Groundwater (m)	Groundwater Level (mOD)	Depth to Groundwater (m)	Groundwater Level (mOD)
DS3	6.60	1.17	5.43	1.15	5.45	1.12	5.48	1.16	5.44
DS4	6.50	0.94	5.56	0.91	5.59	0.89	5.61	0.92	5.58
DS5	6.60	1.21	5.39	1.14	5.46	1.09	5.51	1.12	5.48

Notes:

1. Ground levels from Drawing No. 22022_A by Zenith Land Surveys Limited

ESS**Environmental Site Sampling Ltd**

4th October 2024

Ms L Gilfillan
Crossfield Consulting Ltd
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Environmental Site Sampling Ltd
94 Dillotford Avenue
Styvechale
Coventry
CV3 5DU

Tel: (024) 7669 0514
Mobile: 07971 664 118

e.mail: cosgrove_patrick@hotmail.com

Page 1 of 2

In-situ Analysis Report: CCL/6843

Dear Ms Gilfillan,

Please find enclosed a copy of the in-situ ground gas analysis undertaken at Land off Seven Stiles Avenue, Newport Retail Park, Newport, on 4th October 2024.

I trust you find these satisfactory. Should you have any queries please contact us.

Yours Sincerely,

Patrick Cosgrove

P V Cosgrove BSc MSc
Environmental Site Sampling Ltd



Environmental Site Sampling Ltd Registered in England & Wales No. 4431348
Registered Office: 94 Dillotford Avenue Coventry CV3 5DU

In-situ Analysis: CCL/6843

Client: Crossfield Consulting Ltd

Project: CCL03796, Land off Seven Stiles Avenue, Newport Retail Park, Newport

04/10/24

Sample Location	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%vol)		Methane (%LEL)		Carbon Dioxide (%vol)		Oxygen (%vol)		Other Gases (ppm)		Water Level (Meters)
			Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	H ₂ S	CO	
DS 3	<0.1	2	<0.1	<0.1	<2	<2	3.1	3.1	17.5	17.5	<1	<1	1.17m
DS 4	0.2	23	<0.1	<0.1	<2	<2	0.6	0.6	20.0	20.0	<1	<1	0.94m
DS 5	<0.1	3	<0.1	<0.1	<2	<2	0.2	0.2	20.5	20.5	<1	<1	1.21m

Notes:

Monitoring order is from left to right.

Steady concentrations are measured up to 3 minutes.

Additional Information	
Date Monitoring Undertaken:	4 th October 2024
Monitoring Undertaken By:	P Cosgrove
Equipment Used:	GFM436 S/N 13985
Atmospheric Pressure Newport a.m. (mb) :	1021mb
Atmospheric Pressure On-site (mb) :	1019mb
Atmospheric Pressure Newport p.m. (mb) :	1019mb
Weather During Visit:	Sunny, Dry, Wind S, 2m/s, 11°C
Comments:	

ESS**Environmental Site Sampling Ltd**

9th October 2024

Ms L Gilfillan
Crossfield Consulting Ltd
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Environmental Site Sampling Ltd
94 Dillotford Avenue
Styvechale
Coventry
CV3 5DU

Tel: (024) 7669 0514
Mobile: 07971 664 118

e.mail: cosgrove_patrick@hotmail.com

Page 1 of 2

In-situ Analysis Report: CCL/6847

Dear Ms Gilfillan,

Please find enclosed a copy of the in-situ ground gas analysis undertaken at Land off Seven Stiles Avenue, Newport Retail Park, Newport, on 9th October 2024.

I trust you find these satisfactory. Should you have any queries please contact us.

Yours Sincerely,

Patrick Cosgrove

P V Cosgrove BSc MSc
Environmental Site Sampling Ltd



Environmental Site Sampling Ltd Registered in England & Wales No. 4431348
Registered Office: 94 Dillotford Avenue Coventry CV3 5DU

In-situ Analysis: CCL/6847

Client: Crossfield Consulting Ltd

Project: CCL03796, Land off Seven Stiles Avenue, Newport Retail Park, Newport

09/10/24

Sample Location	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%vol)		Methane (%LEL)		Carbon Dioxide (%vol)		Oxygen (%vol)		Other Gases (ppm)		Water Level (Meters)
			Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	H ₂ S	CO	
DS 3	<0.1	2	<0.1	<0.1	<2	<2	3.7	3.7	15.5	15.5	<1	<1	1.15m
DS 4	<0.1	2	<0.1	<0.1	<2	<2	1.5	1.5	18.5	18.5	<1	<1	0.91m
DS 5	<0.1	1	<0.1	<0.1	<2	<2	0.1	0.1	20.1	20.4	<1	<1	1.14m

Notes:

Monitoring order is from left to right.

Steady concentrations are measured up to 3 minutes.

Additional Information	
Date Monitoring Undertaken:	9 th October 2024
Monitoring Undertaken By:	P Cosgrove
Equipment Used:	GFM436 S/N 13985
Atmospheric Pressure Newport a.m. (mb) :	0984mb
Atmospheric Pressure On-site (mb) :	0986mb
Atmospheric Pressure Newport p.m. (mb) :	0999mb
Weather During Visit:	Sunny, Dry, Wind N, 2m/s, 14°C
Comments:	

ESS**Environmental Site Sampling Ltd**

16th October 2024

Ms L Gilfillan
Crossfield Consulting Ltd
The Granary
White Hall Farm
Long Itchington
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CV47 9PU

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Page 1 of 2

In-situ Analysis Report: CCL/6851

Dear Ms Gilfillan,

Please find enclosed a copy of the in-situ ground gas analysis undertaken at Land off Seven Stiles Avenue, Newport Retail Park, Newport, on 16th October 2024.

I trust you find these satisfactory. Should you have any queries please contact us.

Yours Sincerely,

Patrick Cosgrove

P V Cosgrove BSc MSc
Environmental Site Sampling Ltd



Environmental Site Sampling Ltd Registered in England & Wales No. 4431348
Registered Office: 94 Dillotford Avenue Coventry CV3 5DU

In-situ Analysis: CCL/6851

Client: Crossfield Consulting Ltd
Project: CCL03796, Land off Seven Stiles Avenue, Newport Retail Park, Newport

16/10/24

Sample Location	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%vol)		Methane (%LEL)		Carbon Dioxide (%vol)		Oxygen (%vol)		Other Gases (ppm)		Water Level (Meters)
			Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	H ₂ S	CO	
DS 3	<0.1	2	<0.1	<0.1	<2	<2	3.9	3.9	15.1	15.1	<1	<1	1.12m
DS 4	0.1	12	<0.1	<0.1	<2	<2	1.7	1.7	18.0	18.0	<1	<1	0.89m
DS 5	<0.1	1	<0.1	<0.1	<2	<2	0.2	0.2	20.1	20.1	<1	<1	1.09m
Notes: Monitoring order is from left to right. Steady concentrations are measured up to 3 minutes.													

Additional Information	
Date Monitoring Undertaken:	16 th October 2024
Monitoring Undertaken By:	P Cosgrove
Equipment Used:	GFM436 S/N 13985
Atmospheric Pressure Newport a.m. (mb) :	1000mb
Atmospheric Pressure On-site (mb) :	0999mb
Atmospheric Pressure Newport p.m. (mb) :	0998mb
Weather During Visit:	Overcast, Raining, Wind S, 4m/s, 17°C
Comments:	

ESS**Environmental Site Sampling Ltd**

23rd October 2024

Ms L Gilfillan
Crossfield Consulting Ltd
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Environmental Site Sampling Ltd
94 Dillotford Avenue
Styvechale
Coventry
CV3 5DU

Tel: (024) 7669 0514

Mobile: 07971 664 118

e.mail: cosgrove_patrick@hotmail.com

Page 1 of 2

In-situ Analysis Report: CCL/6858

Dear Ms Gilfillan,

Please find enclosed a copy of the in-situ ground gas analysis undertaken at Land off Seven Stiles Avenue, Newport Retail Park, Newport, on 23rd October 2024.

I trust you find these satisfactory. Should you have any queries please contact us.

Yours Sincerely,

Patrick Cosgrove

P V Cosgrove BSc MSc
Environmental Site Sampling Ltd



Environmental Site Sampling Ltd Registered in England & Wales No. 4431348
Registered Office: 94 Dillotford Avenue Coventry CV3 5DU

In-situ Analysis: CCL/6858

Client: Crossfield Consulting Ltd

Project: CCL03796, Land off Seven Stiles Avenue, Newport Retail Park, Newport

23/10/24

Sample Location	Gas Flow (l/hr)	Borehole Pressure (Pa)	Methane (%vol)		Methane (%LEL)		Carbon Dioxide (%vol)		Oxygen (%vol)		Other Gases (ppm)		Water Level (Meters)
			Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	H ₂ S	CO	
DS 3	<0.1	2	<0.1	<0.1	<2	<2	1.7	1.7	18.1	18.1	<1	<1	1.16m
DS 4	0.1	10	<0.1	<0.1	<2	<2	1.6	1.6	18.0	18.0	<1	<1	0.92m
DS 5	<0.1	1	<0.1	<0.1	<2	<2	0.1	0.1	20.4	20.4	<1	<1	1.12m

Notes:

Monitoring order is from left to right.

Steady concentrations are measured up to 3 minutes.

Additional Information	
Date Monitoring Undertaken:	23 rd October 2024
Monitoring Undertaken By:	P Cosgrove
Equipment Used:	GFM436 S/N 13985
Atmospheric Pressure Newport a.m. (mb) :	1028mb
Atmospheric Pressure On-site (mb) :	1026mb
Atmospheric Pressure Newport p.m. (mb) :	1022mb
Weather During Visit:	Sunny, Dry, Wind S, 3m/s, 14°C
Comments:	



Crossfield Consulting Ltd
The Granary
White Hall Farm
Leamington Road
Long Itchington
Warwickshire

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
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e: mail@crossfield-consulting.co.uk

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e: reception@i2analytical.com

Analytical Report Number : 24-043423

Project / Site name:	Land off Seven Stiles Avenue, Newport Retail Park, Newport	Samples received on:	20/09/2024
Your job number:	CCL03796	Samples instructed on/ Analysis started on:	20/09/2024
Your order number:	PO13507	Analysis completed by:	01/10/2024
Report Issue Number:	1	Report issued on:	01/10/2024
Samples Analysed:	15 soil samples		

Signed:

Joanna Wawrzeczko
Senior Reporting Specialist
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.

Analytical Report Number: 24-043423

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

Your Order No: PO13507

Lab Sample Number				323799	323800	323801	323802	323803
Sample Reference				TP2	TP3	TP4	SK1	SK2
Sample Number				None Supplied	None Supplied	None Supplied	Stockpile	Stockpile
Depth (m)				0.50	0.30	0.40	None Supplied	None Supplied
Date Sampled				18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

Stone Content	%	0.1	NONE	62.3	44.6	37.7	28.7	55.6
Moisture Content	%	0.01	NONE	6.8	9.2	9.1	7.9	11
Total mass of sample received	kg	0.1	NONE	1.1	1.1	1	1.1	1.1

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	EWS	EWS	EWS	EWS	EWS

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	9.4	9.3	9.2	9.3	10.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	3200	2500	2200	2600	4500
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1800	1200	720	480	2200
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.888	0.613	0.359	0.242	1.09
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	888	613	359	242	1090
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	-	-	-	-	-
Sulphide	mg/kg	1	MCERTS	1200	1100	69	67	53
Total Sulphur	mg/kg	50	MCERTS	4000	2200	1800	1500	3700
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.7	1	1.8	1.8	6.2
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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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	0.06	< 0.05	< 0.05	0.07
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.11	0.22	0.3	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.08	0.16	0.25	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.06	0.14	0.26	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.06	0.19	0.32	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.09	0.26	0.44	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	0.09	0.21	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.05	0.14	0.36	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.05	< 0.05	0.2	< 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	0.09	0.14	0.24	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	1.34	2.59	< 0.80
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Analytical Report Number: 24-043423

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

Your Order No: PO13507

Lab Sample Number	323799	323800	323801	323802	323803
Sample Reference	TP2	TP3	TP4	SK1	SK2
Sample Number	None Supplied	None Supplied	None Supplied	Stockpile	Stockpile
Depth (m)	0.50	0.30	0.40	None Supplied	None Supplied
Date Sampled	18/09/2024	18/09/2024	18/09/2024	18/09/2024	18/09/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.9	7	7.6	6.4	2.6
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	0.8	0.8	0.9	3.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.5	0.7	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	20	20	14	100
Copper (aqua regia extractable)	mg/kg	1	MCERTS	4.2	7	9.1	9.8	3.4
Lead (aqua regia extractable)	mg/kg	1	MCERTS	8.3	13	19	21	6
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	5.4	11	9.7	8	3.1
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	4.6	4	3.4	2.9	4.8
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40	74	78	86	65

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	4.5	7.7
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	26
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	53	70	1600
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	< 10	< 10	53	75	1600

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	12
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	25	97	120	2900
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	< 10	25	97	120	2900

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-043423

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

Your Order No: PO13507

Lab Sample Number				323804	323805	323806	323807	323808
Sample Reference				SK3	SK4	TP1	TP4	TP4
Sample Number				Bund	Bund	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	2.55	2.90	2.30
Date Sampled				18/09/2024	19/09/2024	19/09/2024	19/09/2024	19/09/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

Stone Content	%	0.1	NONE	24	22.4	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	9.2	10	60	69	22
Total mass of sample received	kg	0.1	NONE	1	1.2	1.3	1.1	1.2

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	EWS	EWS	-	-	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	9.4	9.1	-	-	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1500	1700	-	-	-
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	350	350	-	-	50
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.176	0.174	-	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	176	174	-	-	-
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	-	-	-	-	24.9
Sulphide	mg/kg	1	MCERTS	48	< 1.0	-	-	-
Total Sulphur	mg/kg	50	MCERTS	1100	1400	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.7	3.2	-	-	-
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	19	18	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	0.18	0.12	-	-	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	0.44	0.26	-	-	-
Pyrene	mg/kg	0.05	MCERTS	0.39	0.23	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.34	0.19	-	-	-
Chrysene	mg/kg	0.05	MCERTS	0.39	0.2	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.7	0.31	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.18	0.12	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.42	0.24	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.25	0.14	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.05	< 0.05	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.28	0.21	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	3.61	2.02	-	-	-
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Analytical Report Number: 24-043423

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

Your Order No: PO13507

Lab Sample Number				323804	323805	323806	323807	323808
Sample Reference				SK3	SK4	TP1	TP4	TP4
Sample Number				Bund	Bund	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	2.55	2.90	2.30
Date Sampled				18/09/2024	19/09/2024	19/09/2024	19/09/2024	19/09/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	9.6	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	3.2	3.3	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	0.4	-	-	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	49	38	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	16	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	46	32	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21	18	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.2	2.4	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	130	-	-	-

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	-	-
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	-	-
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	-	-
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	-	-	-
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	-	-	-
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	22	28	-	-	-
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	22	28	-	-	-

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	-	-
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	-	-
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	< 0.020	< 0.020	-	-	-
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	-	-	-
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	-	-	-
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	34	-	-	-
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	< 10	34	-	-	-

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	-	-	-
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	-	-
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	-	-
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	-	-
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-043423

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

Your Order No: PO13507

Lab Sample Number				323809	323810	323811	323812	324835
Sample Reference				TP5	DS2	DS4	DSS	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.30	1.50	1.50	2.20	0.50
Date Sampled				19/09/2024	19/09/2024	19/09/2024	19/09/2024	18/09/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	48.8
Moisture Content	%	0.01	NONE	27	18	19	26	7.4
Total mass of sample received	kg	0.1	NONE	1.2	1.1	1.2	1.1	0.9

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	-	-	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	-	-	-	-	EWS

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7.5	8	8.1	8	11
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-	-	-	-	4400
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	440	40	37	91	1100
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	0.543
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	-	543
Water Soluble SO ₄ 16hr extraction (2:1)	mg/l	1.25	MCERTS	220	20.1	18.4	45.6	-
Sulphide	mg/kg	1	MCERTS	-	-	-	-	75
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	2800
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	-	-	0.3
Total Organic Carbon (TOC) - Manual	%	0.1	MCERTS	-	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	0.2
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	0.11
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	0.15
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	0.22
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	-	-	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	0.13
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	0.07
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	0.1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	-	-	-	0.97
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Analytical Report Number: 24-043423

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

Your Order No: PO13507

Lab Sample Number	323809	323810	323811	323812	324835
Sample Reference	TP5	DS2	DS4	DSS	TP5
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	1.30	1.50	1.50	2.20	0.50
Date Sampled	19/09/2024	19/09/2024	19/09/2024	19/09/2024	18/09/2024
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	2.8
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	4.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	-	-	-	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	6.4
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	4.5
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	6.2
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	1.1
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	5.6
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	32

Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	-	-	< 0.010
TPHCWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	-	-	< 0.010
TPHCWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.01	MCERTS	-	-	-	-	< 0.010
TPHCWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPHCWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPHCWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPHCWG - Aliphatic >EC5 - EC35 _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	-	-	-	-	< 10

TPHCWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	-	-	-	< 0.010
TPHCWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	MCERTS	-	-	-	-	< 0.010
TPHCWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.02	MCERTS	-	-	-	-	< 0.020
TPHCWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPHCWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPHCWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-	-	-	< 10
TPHCWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-	-	-	< 10
TPHCWG - Aromatic >EC5 - EC35 _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	-	-	-	-	< 10

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	< 5.0
Benzene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
Toluene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	-	-	-	-	< 5.0
o-Xylene	µg/kg	5	MCERTS	-	-	-	-	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number : 24-043423

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

* 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 *
323799	TP2	None Supplied	0.5	Brown loam with vegetation and stones
323800	TP3	None Supplied	0.3	Brown loam with vegetation and stones
323801	TP4	None Supplied	0.4	Brown loam and sand with stones and vegetation
323802	SK1	Stockpile	None Supplied	Brown loam and sand with stones and vegetation
323803	SK2	Stockpile	None Supplied	Brown sand with gravel and stones
323804	SK3	Bund	None Supplied	Brown loam with stones and vegetation
323805	SK4	Bund	None Supplied	Brown loam with stones and vegetation
323806	TP1	None Supplied	2.55	Black clay and loam with peat and vegetation
323807	TP4	None Supplied	2.9	Black clay and loam with peat and vegetation
323808	TP4	None Supplied	2.3	Grey clay with gravel
323809	TP5	None Supplied	1.3	Grey clay with gravel and vegetation
323810	DS2	None Supplied	1.5	Brown clay
323811	DS4	None Supplied	1.5	Grey clay
323812	DSS	None Supplied	2.2	Grey clay
324835	TP5	None Supplied	0.5	Brown loam and gravel with stones

Analytical Report Number : 24-043423

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	In-house method	L010-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L023B	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS

Analytical Report Number : 24-043423

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' 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 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution



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Analytical Report Number : 24-045327

Project / Site name:	Land off Seven Stiles Avenue, Newport Retail Park, Newport	Samples received on:	20/09/2024
Your job number:	CCL03796	Samples instructed on/ Analysis started on:	02/10/2024
Your order number:	PO13520	Analysis completed by:	09/10/2024
Report Issue Number:	1	Report issued on:	10/10/2024
Samples Analysed:	4 10:1 WAC samples		

Signed:

Trevor Hill
Customer Service Advisor
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.

Analytical Report Number: 24-045327

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

Your Order No: PO13520

Lab Sample Number				335397	335398	335399	335400
Sample Reference				TP4	SK2	SK4	TP5
Sample Number				None Supplied	Stockpile	Bund	None Supplied
Depth (m)				0.40	None Supplied	None Supplied	0.50
Date Sampled				18/09/2024	18/09/2024	19/09/2024	18/09/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status				

Stone Content	%	0.1	NONE	37.7	55.6	22.4	48.8
Moisture Content	%	0.01	NONE	9.1	11	10	7.4
Total mass of sample received	kg	0.1	NONE	0.8	0.8	0.8	0.5

General Inorganics

pH (L005B)	pH Units	N/A	MCERTS	8.3	8.3	8.1	10.7
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.1	3.5	2.3	< 0.1
Loss on Ignition @ 450°C	%	0.2	MCERTS	2.8	9.7	5.5	0.7
Acid Neutralisation Capacity	mmol/kg	-9999	NONE	18	3	7.1	36

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	0.06	< 0.05	0.08	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.18	0.18
Pyrene	mg/kg	0.05	MCERTS	0.12	< 0.05	0.17	0.16
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.09	< 0.05	0.12	0.14
Chrysene	mg/kg	0.05	MCERTS	0.13	< 0.05	0.15	0.16
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	0.17	0.22
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.39	0.07	0.06
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.15	0.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.09	0.1
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	0.16	< 0.05
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	< 0.80	-	-
Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.85	< 0.85	1.34	1.22

Petroleum Hydrocarbons

Mineral Oil (EC10 - EC40) EH_CU_1D_AL	mg/kg	10	NONE	120	1800	56	19
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VOCs

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0

Total BTEX	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
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Analytical Report Number: 24-045327

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

Your Order No: PO13520

Lab Sample Number				335397	335398	335399	335400
Sample Reference				TP4	SK2	SK4	TP5
Sample Number				None Supplied	Stockpile	Bund	None Supplied
Depth (m)				0.40	None Supplied	None Supplied	0.50
Date Sampled				18/09/2024	18/09/2024	19/09/2024	18/09/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status	

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
Total PCBs				mg/kg	0.007	MCERTS	< 0.007

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Waste Acceptance Criteria Analytical Results

Waste Acceptance Criteria Analytical Results							
Report No:	24-045327						
					Client: CROSSFCLTD		
Location	Land off Seven Stiles Avenue, Newport Retail Park, Newport						
Lab Reference (Sample Number)	335397				Landfill Waste Acceptance Criteria		
Sampling Date	18/09/2024				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	TP4						
Depth (m)	0.40						
Solid Waste Analysis							
TOC (%)**	1.1				3%	5%	6%
Loss on Ignition (%) **	2.8				--	--	10%
BTEX (µg/kg) **	< 5.0				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg) EH, ID, CU, AL	120				500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.85				100	--	--
pH (units)**	8.3				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	18				--	To be evaluated	To be evaluated
Eluate Analysis							
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1			10:1	Limit values for compliance leaching test		
	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.00413			0.0413	0.5	2	25
Barium *	0.141			1.41	20	100	300
Cadmium *	< 0.000100			< 0.00100	0.04	1	5
Chromium *	0.0014			0.014	0.5	10	70
Copper *	0.010			0.10	2	50	100
Mercury *	< 0.000500			< 0.00500	0.01	0.2	2
Molybdenum *	0.000668			0.00668	0.5	10	30
Nickel *	0.0012			0.012	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0046			0.046	4	50	200
Chloride *	0.55			5.5	800	15000	25000
Fluoride*	0.72			7.2	10	150	500
Sulphate *	13			130	1000	20000	50000
TDS*	63			630	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	6.16			61.6	500	800	1000
Leach Test Information							
Stone Content (%)	37.7						
Sample Mass (kg)	0.8						
Dry Matter (%)							
Moisture (%)	9.1						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.					* = UKAS accredited (liquid eluate analysis only)		
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation					** = MCERTS accredited		

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
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Waste Acceptance Criteria Analytical Results

Waste Acceptance Criteria Analytical Results							
Report No:	24-045327						
				Client: CROSSFCLTD			
Location	Land off Seven Stiles Avenue, Newport Retail Park, Newport						
Lab Reference (Sample Number)	335398			Landfill Waste Acceptance Criteria			
				Limits			
Sampling Date	18/09/2024			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID	SK2 Stockpile						
Depth (m)							
Solid Waste Analysis							
TOC (%)**	3.5			3%	5%	6%	
Loss on Ignition (%) **	9.7			--	--	10%	
BTEX (µg/kg) **	< 5.0			6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007			1	--	--	
Mineral Oil (mg/kg) EH, ID, CU, AL	1800			500	--	--	
Total PAH (WAC-17) (mg/kg)	< 0.85			100	--	--	
pH (units)**	8.3			--	>6	--	
Acid Neutralisation Capacity (mmol / kg)	3.0			--	To be evaluated	To be evaluated	
Eluate Analysis	10:1		10:1	Limit values for compliance leaching test			
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic *	0.00181		0.0181	0.5	2	25	
Barium *	0.317		3.17	20	100	300	
Cadmium *	< 0.000100		< 0.00100	0.04	1	5	
Chromium *	< 0.00040		< 0.0040	0.5	10	70	
Copper *	0.0073		0.073	2	50	100	
Mercury *	< 0.000500		< 0.00500	0.01	0.2	2	
Molybdenum *	< 0.000400		< 0.00400	0.5	10	30	
Nickel *	0.00056		0.0056	0.4	10	40	
Lead *	< 0.0010		< 0.010	0.5	10	50	
Antimony *	< 0.0017		< 0.017	0.06	0.7	5	
Selenium *	< 0.0040		< 0.040	0.1	0.5	7	
Zinc *	0.016		0.16	4	50	200	
Chloride *	1.5		15	800	15000	25000	
Fluoride*	0.64		6.4	10	150	500	
Sulphate *	61		610	1000	20000	50000	
TDS*	88		880	4000	60000	100000	
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-	
DOC	7.19		71.9	500	800	1000	
Leach Test Information							
Stone Content (%)	55.6						
Sample Mass (kg)	0.8						
Dry Matter (%)							
Moisture (%)	11						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.				* = UKAS accredited (liquid eluate analysis only)			
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation				** = MCERTS accredited			

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
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Waste Acceptance Criteria Analytical Results								
Report No:	24-045327							
					Client: CROSSFCLTD			
Location	Land off Seven Stiles Avenue, Newport Retail Park, Newport							
Lab Reference (Sample Number)	335399				Landfill Waste Acceptance Criteria			
					Limits			
Sampling Date	19/09/2024				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID	SK4 Bund							
Depth (m)								
Solid Waste Analysis								
TOC (%)**	2.3				3%	5%	6%	
Loss on Ignition (%) **	5.5				--	--	10%	
BTEX (µg/kg) **	< 5.0				6000	--	--	
Sum of PCBs (mg/kg) **	< 0.007				1	--	--	
Mineral Oil (mg/kg) EH,1D,CU,AL	56				500	--	--	
Total PAH (WAC-17) (mg/kg)	1.34				100	--	--	
pH (units)**	8.1				--	>6	--	
Acid Neutralisation Capacity (mmol / kg)	7.1				--	To be evaluated	To be evaluated	
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test			
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic *	0.00739			0.0739	0.5	2	25	
Barium *	0.0490			0.490	20	100	300	
Cadmium *	< 0.000100			< 0.00100	0.04	1	5	
Chromium *	0.0029			0.029	0.5	10	70	
Copper *	0.022			0.22	2	50	100	
Mercury *	< 0.000500			< 0.00500	0.01	0.2	2	
Molybdenum *	0.000949			0.00949	0.5	10	30	
Nickel *	0.0027			0.027	0.4	10	40	
Lead *	0.0017			0.017	0.5	10	50	
Antimony *	< 0.0017			< 0.017	0.06	0.7	5	
Selenium *	< 0.0040			< 0.040	0.1	0.5	7	
Zinc *	0.011			0.11	4	50	200	
Chloride *	0.47			4.7	800	15000	25000	
Fluoride*	0.58			5.8	10	150	500	
Sulphate *	5.3			53	1000	20000	50000	
TDS*	69			690	4000	60000	100000	
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-	
DOC	10.0			100	500	800	1000	
Leach Test Information								
Stone Content (%)	22.4							
Sample Mass (kg)	0.8							
Dry Matter (%)								
Moisture (%)	10							
Results are expressed on a dry weight basis, after correction for moisture content where applicable.					* = UKAS accredited (liquid eluate analysis only)			
Stated limits are for guidance only and I2 cannot be held responsible for any discrepancies with current legislation					** = MCERTS accredited			

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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Waste Acceptance Criteria Analytical Results

Waste Acceptance Criteria Analytical Results							
Report No:	24-045327						
				Client: CROSSFCLTD			
Location	Land off Seven Stiles Avenue, Newport Retail Park, Newport						
Lab Reference (Sample Number)	335400			Landfill Waste Acceptance Criteria			
Sampling Date	18/09/2024			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID	TP5						
Depth (m)	0.50						
Solid Waste Analysis							
TOC (%)**	< 0.1				3%	5%	6%
Loss on Ignition (%) **	0.7				--	--	10%
BTEX (µg/kg) **	< 5.0				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg) EH, ID, CU, AL	19				500	--	--
Total PAH (WAC-17) (mg/kg)	1.22				100	--	--
pH (units)**	10.7				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	36				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.00140			0.0140	0.5	2	25
Barium *	0.252			2.52	20	100	300
Cadmium *	< 0.000100			< 0.00100	0.04	1	5
Chromium *	< 0.00040			< 0.0040	0.5	10	70
Copper *	0.0049			0.049	2	50	100
Mercury *	< 0.000500			< 0.00500	0.01	0.2	2
Molybdenum *	< 0.000400			< 0.00400	0.5	10	30
Nickel *	< 0.00030			< 0.0030	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0040			0.040	4	50	200
Chloride *	1.6			16	800	15000	25000
Fluoride*	0.26			2.6	10	150	500
Sulphate *	65			650	1000	20000	50000
TDS*	130			1300	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	2.70			27.0	500	800	1000
Leach Test Information							
Stone Content (%)	48.8						
Sample Mass (kg)	0.5						
Dry Matter (%)							
Moisture (%)	7.4						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.				* = UKAS accredited (liquid eluate analysis only)			
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation				** = MCERTS accredited			

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Analytical Report Number : 24-045327

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

* 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 *
335397	TP4	None Supplied	0.4	Brown loam and sand with stones and vegetation
335398	SK2	Stockpile	None Supplied	Brown sand with gravel and stones
335399	SK4	Bund	None Supplied	Brown loam with stones and vegetation
335400	TP5	None Supplied	0.5	Brown loam and gravel with stones

Analytical Report Number : 24-045327

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH at 20°C in soil	Determination of pH in soil by addition of water followed by electrometric measurement	In-house method	L005B	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with hexane followed by GC-MS	In-house method based on USEPA 8082	L027B	D	MCERTS
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	NONE
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Sample Preparation		In-house method	L043B	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe	In-house method based on Guidance on Sampling and Testing of Wastes to Meet Landfill Waste Acceptance	L046B	W	NONE
Loss on ignition of soil @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	In-house method	L047-PL	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088-PL	D/W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025

Analytical Report Number : 24-045327

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' 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.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

Analytical Report Number : 24-045327

Project / Site name: Land off Seven Stiles Avenue, Newport Retail Park, Newport

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP5	N/A	S	335400	b	BTEX and/or Volatile organic compounds in soil	L073B	b
TP5	N/A	S	335400	b	PCB's By GC-MS in soil	L027B	b
TP5	N/A	S	335400	b	Speciated PAHs and/or Semi-volatile organic compounds in soil	L064B	b
TP5	N/A	S	335400	b	Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	L076B/L088-PL	b



Laboratory Report



Contract Number: 74940

Client Ref: **CCL03796**

Client PO: **13508**

Date Received: **27-09-2024**

Date Completed: **07-10-2024**

Report Date: **07-10-2024**

Client: **Crossfield Consulting**

This report has been checked and approved by:

Contract Title: **Land off Seven Sites Avenue, Newport Retail Park, Newport**

For the attention of: **Laura Gilfillan**

Brendan Evans
Office Administrator

Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	4
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	4
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:

Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)

Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)

Wayne Honey (HR & HSE Manager)



**NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)**

Contract Number	74940	
Project Name	Land off Seven Sites Avenue, Newport Retail Park, Newport	
Date Tested	06/10/2024	
	DESCRIPTIONS	

[illegible]

Operator

Clayton Jenkins

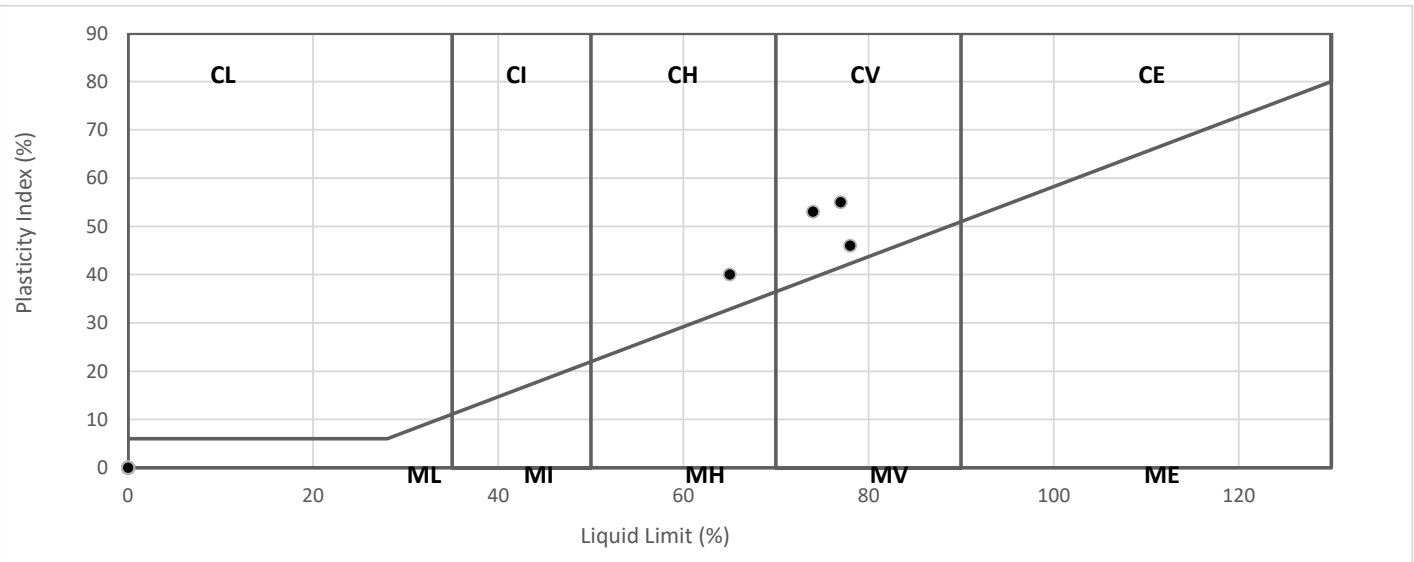
**NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND
PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)**

Contract Number	74940	
Project Name	Land off Seven Sites Avenue, Newport Retail Park, Newport	
Date Tested	06/10/2024	

[illegible]

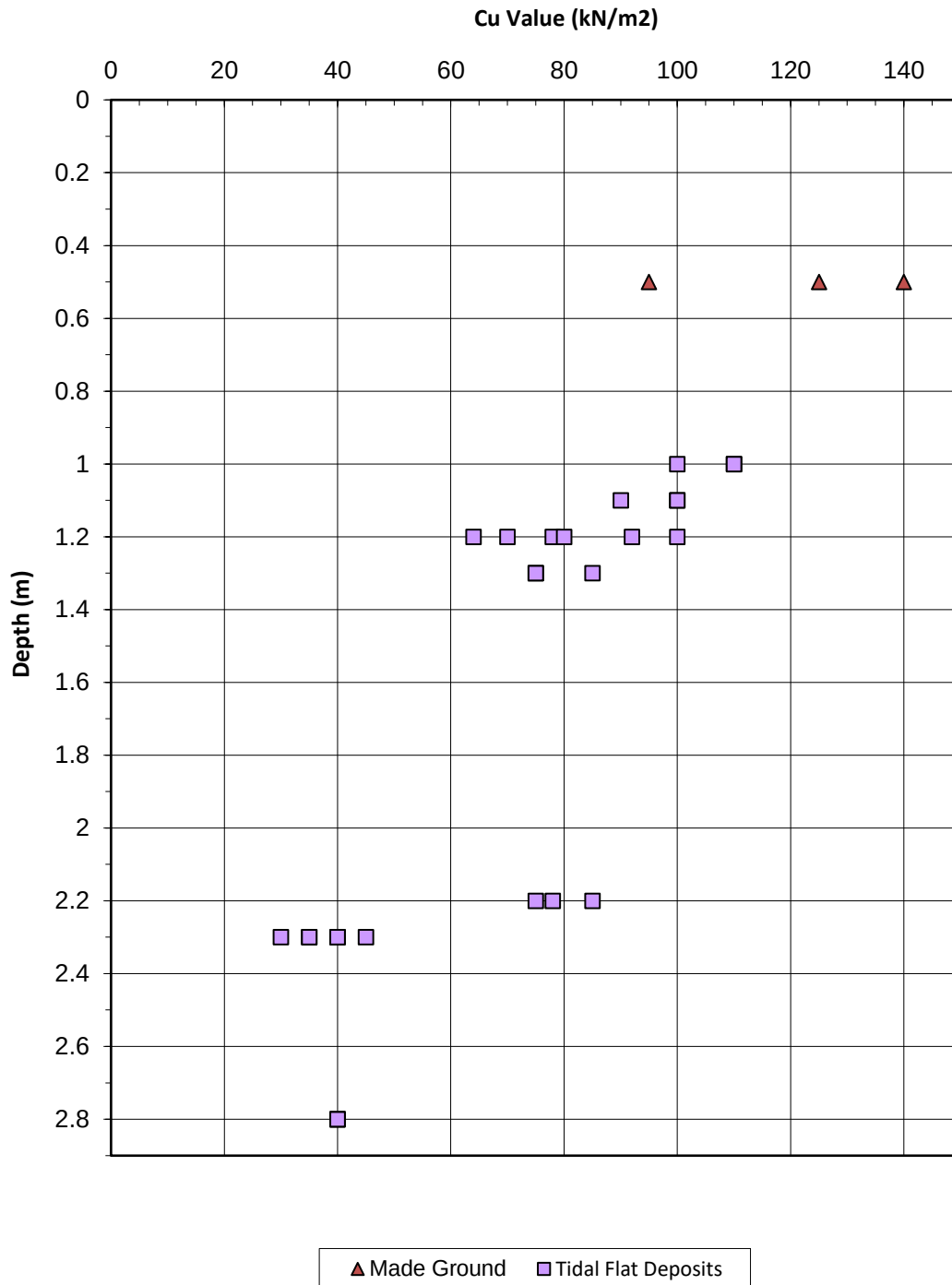
Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION



Operator
Clayton Jenkins

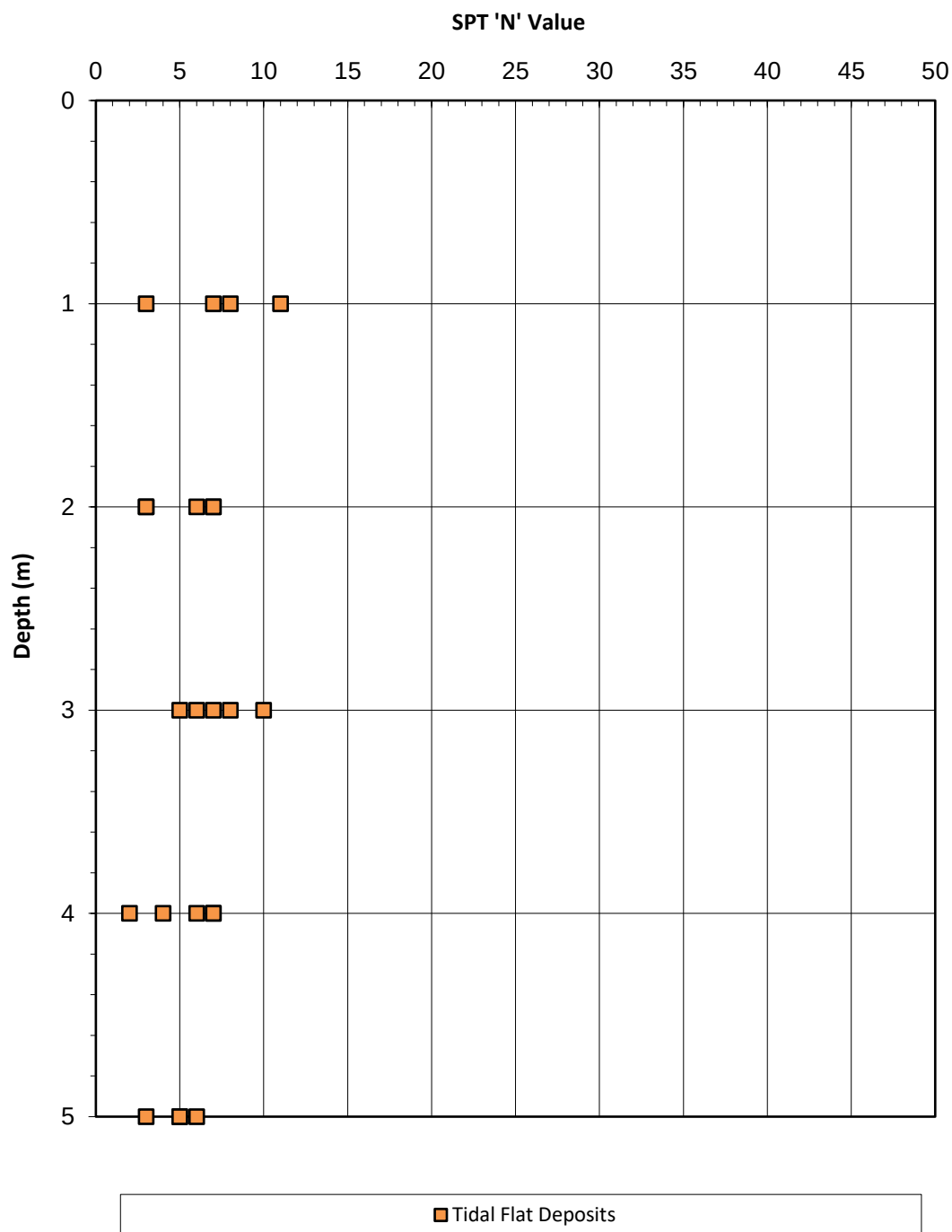
FIGURE III-1



Values based on field hand vane test results

UNDRAINED SHEAR STRENGTH (c_u) PROFILE

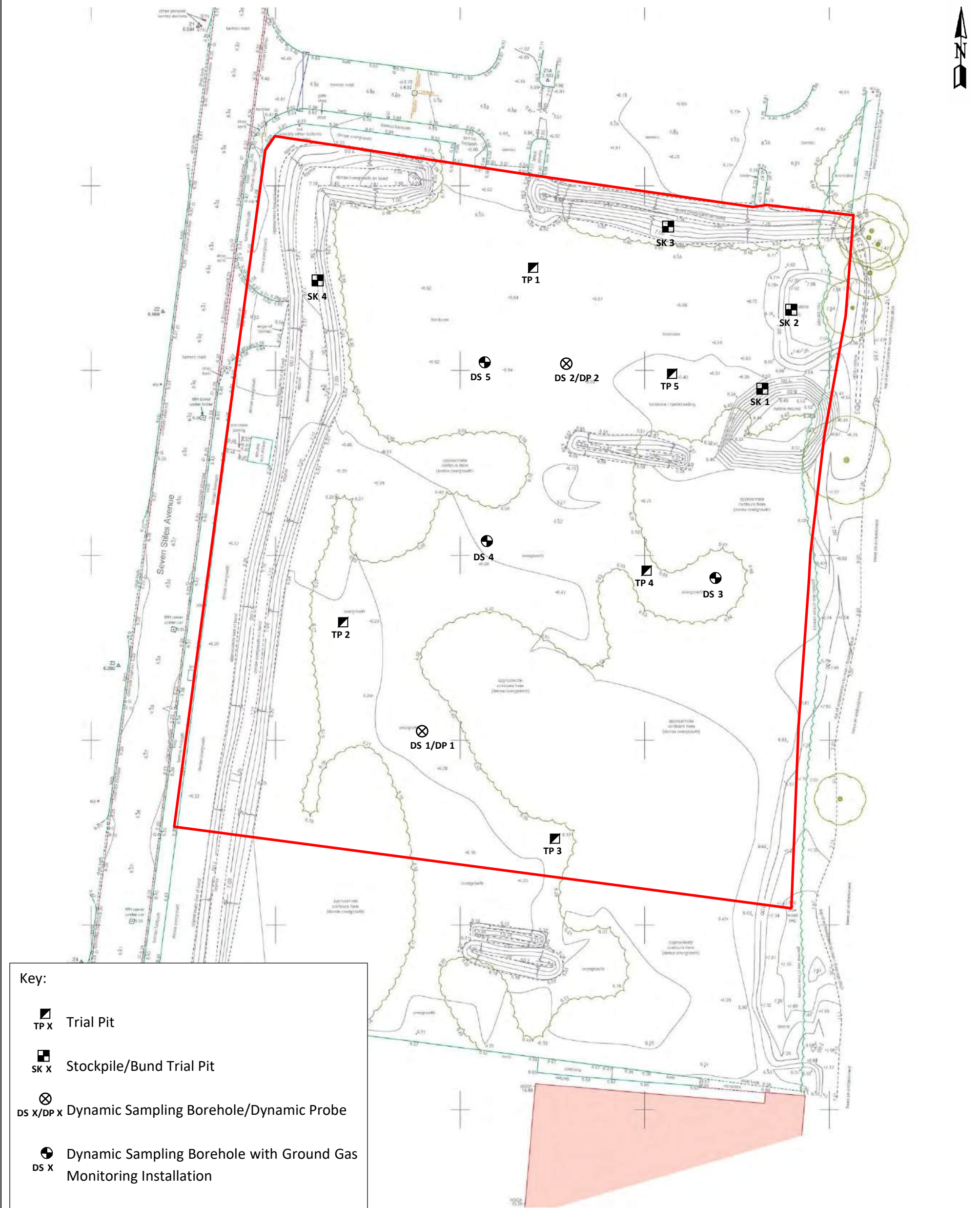
FIGURE III-2



'N' values are uncorrected

SPT 'N' VALUE PROFILE

FIGURE III-3



Reproduced from a Topographical Survey, dated August 2024, by Zenith Land Surveys Limited, Dwg No. 22022_A