

LAND OFF HOLT ROAD, WREXHAM

**STAGE 1
CONTAMINATION ASSESSMENT**

For: Barratt Manchester

November 2014

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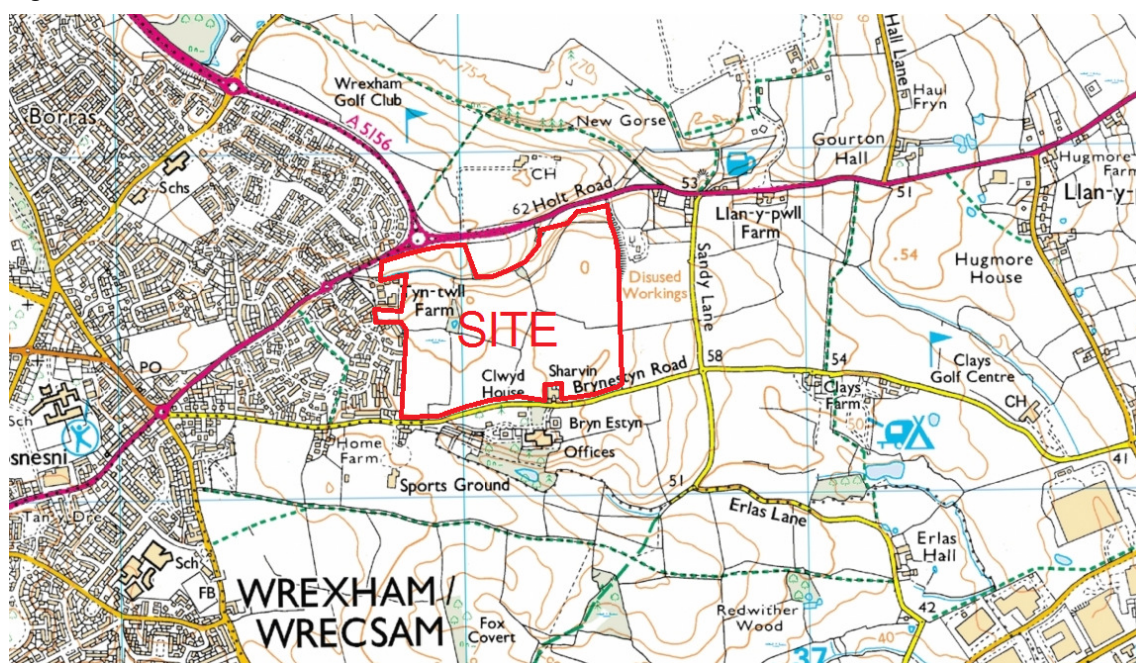
1. Introduction

1.1. Smith Grant LLP (SGP) were instructed by Barratt Manchester to undertake a Stage 1 Contamination Assessment of a parcel of land adjacent to Holt Road, Wrexham. A site location plan is provided below in Figure 1. Site details are:

Table 1.1: Site details

Address	Land between Holt Road and Bryn Estyn Road, Wrexham, LL13 9SJ (nearest)
National Grid Reference	336181, 351500
Local Authority	Wrexham County Borough Council
Site Area	Approximately 29 Ha
Current Nature of Site	Open fields
Site Access	Off Holt Road
Proposed use	Residential development

Figure 1.1: Site Location



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- 1.2. The site presently consists of areas of open farmland comprising several fields with fencing and hedgerows, areas of scrub and a small area of woodland.
- 1.3. This report has been produced to identify potential constraints to redevelopment associated with ground conditions at the site and within the surrounding environs. The report describes the findings of Stage 1 Ground Contamination Assessment (desk study) and limited site inspection (from external vantage points only) undertaken by SGP to identify the previous and current uses of the site and surrounding area and the potential contaminants that may be present. The

report methodology follows the framework described in the EA / DEFRA Contaminated Land Report 11: 'Model Procedures for the Management of Land Contamination 2004'. This report also considers potential constraints to redevelopment resulting from physical ground conditions and stability.

- 1.4. The assessment comprised a review of readily available information on the environmental setting and the historical development of the site and surrounding land, along with a limited site inspection. SGP has contacted the Local Authority regarding the use of reporting held for an adjacent site and received permission to refer to the content of a number of reports, however has not carried out any consultation with the site owners. There have also been constraints on access to the site; therefore information relating to its current condition has been gathered remotely from external viewing or contemporaneous satellite photographs.
- 1.5. This report contains a qualitative risk assessment and where appropriate makes recommendations for further investigations appropriate to the current and future development.

2. Information Sources

2.1. The principle sources of information consulted in the preparation of this report include:

reference and date	author and source	purpose and information content
Topography, geology, hydrogeology and hydrology		
Explorer Sheet 256: Wrexham 2000	Ordnance Survey (OS), Explorer Map, 1:25,000	general mapping information including topography, ground features, rights of way, communications, water features, etc
http://mapapps.bgs.ac.uk/geologyofbritain/home.html 2014	British Geological Survey (BGS)	distribution of geological units at surface and depth and borehole database records
http://mapapps.bgs.ac.uk/geologyofbritain/home.html?mode=boreholes 2014	British Geological Survey (BGS)	Scanned borehole logs
61961705_1_1 2014	Landmark Information Group	Information relevant to ground stability hazards including mining and natural cavities data, historical land use, ground stability data and ground movement
51000690912001	The Coal Authority	Information and past and present underground, shallow, and open cast mining, the locations of mine entries, coal mining subsidence claims, and mine gas emissions, and brine compensation district
http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=en 2014	Environment Agency/Natural Resources Wales	Aquifer designations, groundwater Source Protection Zones and details of abstractions
Soils and their use in Midland and Western England 1984	Soil Survey of England and Wales	Information of soil classification and drainage
HPA-RPD-033: Indicative Radon Atlas of England and Wales 2007	Health Protection Agency	mapping defining radon affected areas in England & Wales
Historical data		
Various County series maps at 1:10,560, 1:2,500 and 1:10,000 scales	Ordnance Survey	historical mapping from 1879 to 1992

reference and date	author and source	purpose and information content
Aerial/satellite photography 2000-2013	Various sources	Historical images of site from 2003 & 2006
http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=e 2014	Environment Agency/Natural Resources Wales	Historical landfills
Environmental Sensitivity		
61961705_1_1 2014	Landmark Information Group	Information on Environment Agency and hydrogeological records, waste, hazardous substances, geology, industrial land use and sensitive land uses
http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=e 2014	Environment Agency/Natural Resources Wales	general information on watercourses, groundwater source protection zones and vulnerability, pollution and landfills
www.magic.gov.uk 2014	DEFRA	web-based interactive map containing information on nature conservation areas

2.2. Previous Site Investigations and Consultations

2.2.1. SGP are unaware of any site investigations having been undertaken at the site with the exception of the two central boreholes identified in BGS records, which were reportedly for the purposes of a sand and gravel resource survey.

2.2.2. Numerous reports exist relating to the adjacent historical landfill within a former sand pit known as Llan-y-Pwll Landfill. In particular one report prepared by SGP is referred to; a Stage 2 Contamination Assessment from 2007 (Ref: R786-R47 Final Rev1 (Llan-y-Pwll S2) as this comprises a review of previously held information from a variety of other sources.

2.2.3. SGP has contacted WCBC Trading Standards and The Animal Health and Veterinary Laboratories Agency to confirm whether any notifiable disease or other animal burial sites are recorded on the site. Wrexham Trading Standards have responded but SGP have not received a response from The Animal Health and Veterinary Laboratories Agency at the time of writing.

2.3. Site Inspection

2.3.1. A preliminary site inspection of the site was carried out by Ben Thomas (Partner) of SGP on the 14th October 2014. Permission to enter the site had not been obtained and the inspection was limited to areas visible from viewpoints around the site boundary.

3. Development History and Current Status

3.1. Historical Uses

3.1.1. A summary of significant historical features, developments, and land uses identified is provided in Table 1 below.

Table 1: Summary of Relevant Development History

Map	Site	Surrounds
1879 1:10,560	The site is subdivided into several fields. Two features in the centre of the site may be small ponds.	Tyn Twll, a farm or large dwelling is present adjacent to the northwest part of the site; Bryn Estyn Hall and grounds are to the south over Bryn Estyn lane which marks the site's southern boundary. A road also runs parallel but slightly away from the site's northern boundary The remaining surrounding land use is as fields.
1881 1:10,560	No significant changes.	No significant changes.
1881 1:2,500	The central ponds are clearly indicated. No significant changes.	A small sandpit is indicated 100m to the east of the site.
1899 1:2,500	A very small pond is indicated in the south of the site.	No significant changes.
1899-1900 1:10,560	No significant changes.	A well is indicated in the shallow valley to the north of the northeast corner of the site.
1911 1:2,500	No significant changes.	A building has been constructed immediately to the south of the site mid way along its boundary off Bryn Estyn Lane.
1914, 1: 10,560	The larger of the central ponds has changed shape, extending slightly to the south.	No significant changes.
1914-1915 1:10,560	No significant changes.	No significant changes.
1938-1954 1:10,560	No significant changes.	A sand pit is present to the northeast of the site within 20m of the site boundary. To the north an airfield is present, some additional buildings around the settlement of Rhosnesni to the east have been constructed
1960-1962 1:2,500	No significant changes.	The sand pit to the northeast of the site has been extended southwards and now runs along the sites eastern boundary for a distance of 200m

Map	Site	Surrounds
1964 1:10,560	The smaller of the two central ponds, and the pond in the south of the site is no longer indicated	The land to the north of the site between the lane and airfield (which is now indicated as disused) is marked as a golf course.
1968 1:10,560	No significant changes.	A smaller sand pit is indicated in the centre of Llan-y-Pwll 300m away from the site.
1974-1983 1:10,000	No significant changes.	The road to the north-west of the site has been widened and a new roundabout constructed. The urban area of Wrexham to the west has undergone significant expansion mainly for residential use and associated services such as schools and parks, playing fields are present to the south of the site beyond Bryn Estyn hall. The former airfield to the north is now indicated as containing a sand and gravel pit
1992 1:10,000 1:2,500	A drain is indicated in the northwest part of the site	The central and southern parts of the sand pit to the east of the site are now indicated to be a tip. An unspecified works is marked in the north part of the former extraction area.
2006-2009 Satellite imagery (Various)	The site does not show significant changes other than an area of rough ground present to the south of Tyn Twll Farm contained various materials which cannot be identified from the resolution of the available imagery.	Housing has been constructed on former fields immediately to the west of the site around Tyn Twll farm; a tank or silo is also present within the farm which is not indicated on the historical maps. The former tip to the east is vegetated with the works to the north of this shown as containing a number of structures associated with an existing concrete batching plant, although these cannot be identified from the resolution of the available imagery.

3.1.2. Whilst there are some gaps in the historical map coverage it is considered that the available information provides adequate coverage of the development history of the site and its' immediate surroundings. Historical features within the site and in the immediate surrounds which are considered relevant to risks from ground contamination or stability hazards are summarised in Drawing 001.

3.2. Current land condition

3.2.1. A summary of existing significant features noted during SGP's inspection and examination of contemporary records is presented below.

Table 3.2: Present Land Condition

Site Description	The site currently comprises several open fields, which appear to be in mixed use as arable and grazing.
Access	Access to the site appears to be from the farm buildings to the immediate west of the site, or through one of a number of field gates in the south.
Boundaries	North: fences and hedgerows onto several parcels of open ground and a cycle/footpath along the former route of Holt Road. East: fencing and hedgerows onto a concrete batching plant (north) and the former Llan-y-Pwll Landfill (centre) or open fields (south). South: fences and hedgerows onto Bryn Estyn Lane West: garden fences onto adjoining residential properties (where these could be viewed).
Drainage	The parts of the site surface visible from the adjacent land appeared dry and free draining after an period of wet weather. Two surface watercourses or drains are indicted within the site both in the northern areas, the central watercourse is within a valley deeper than the surrounding land and appears to enter into a culvert or sink beyond the site boundary. A large pond is indicated in the centre of the site.
Rights of Way	SGP did not identify any public right of way crossing the site.
Structures	No above ground structures apart from a number of overhead power lines are visible or identifiable from contemporary satellite imagery or viewing from external locations.
Services and Utilities	No service plans have been obtained as part of this report and SGP have not carried out a comprehensive search for services and utilities. SGP has not been able to identify any pipelines or major infrastructure routes crossing the site, however several overhead power lines cross the site and SGP noted the presence of a gas governor in the vicinity.
Industrial Land Use	There are no contemporary trade directory entries within the site itself; the adjacent farm was formerly may contain a fuel store or stores of chemicals for agricultural use. Other recorded industrial activities are of low potential to cause significant pollution. A concrete batching plant and sand and gravel quarry are present nearby.
Surfaces / Vegetation	The large fields which make up the majority of the site areas appear to be grassed or have been harvested for arable with stubble remaining. Most of the peripheral areas of the site consist of dense hedgerows and woodland; a wooded area is present in the central part of the site. No invasive species were recorded during the limited site inspection.

3.2.2. Drawing 001 includes some photographs of the parts of the site visible during the site walkover inspection carried out on the 03rd October 2014. Due to access restrictions an inspection within the site boundary could not be carried out and only limited parts of the site could be viewed from external locations.

4. Site Characterisation

4.1. Present land condition

Table 4.1: Environmental Setting

Surrounding Landuse	The site is located south of the A534 and north of Bryn Estyn Lane. The land-use to the west is dominated by residential development, to the north and south are sports/recreational facilities (a golf course and rugby playing fields respectively). The land immediately to the east is occupied by fields in the south and rough ground over a former landfill in the north. More generally the surrounding land use to the north, east and south is agricultural, although a large sand and gravel quarry is present to the north beyond the golf course.
Topography	The site occupies an elevated position on a broad ridge of high ground extending from west to east. The site is undulating and appears to contain a central low lying area and a valley mid way along the northern boundary; either side of this a slope down towards the old route of the A534 is present immediately to the north of the site.
Natural Conditions / Geology	The soils on the site are mapped as the Newport 1 Association, consisting mainly of well drained medium sandy soils derived from the underlying glacial fluvial deposits. These form part of a large sheet underlying much of the land to the west, north and south, although glacial till comprising boulder clay underlies this at depth and outcrops to the east of the site. Two publicly accessible borehole records from the site centre (BGS Reference SJ 35SE26 & 35SE202) part of a sand and gravel survey carried out in 1976/77 indicate sand with some gravel to depths in excess of 25m below ground level. Bedrock underlying the site comprises the Halesowen Formation of interbedded mudstone, siltstone and sandstone. Immediately to the east the Kinnerton Sandstone subcrops beneath the superficial deposits.
Natural Ground Stability Hazards	The site has been assessed as at very low risk, or that there is no hazard, for collapsible ground, landslide, running sand, shrinking or swelling clay, compressible or dissolution ground hazards.
Hydrogeology / Groundwater	Soils on the site are of high leaching potential and likely to be free draining. The underlying superficial deposits are of high leaching potential reflecting the dominant granular matrix which may be anticipated. The superficial deposits over all of the site and bedrock underlying the western parts of the site are classed as a Secondary A Aquifer, of variable permeability; however the bedrock immediately to the east of the site forms a Principal Aquifer and is within the catchment of a Groundwater Source Protection Zone. Three groundwater abstractions 500m to the northeast of the site have been authorised by the Environment Agency (Now Natural Resource Wales); these are for mineral washing operations in the nearby quarries.
Hydrology / Drainage	The soils on the site are classed as highly permeable and are unlikely to be seasonally waterlogged. The site contains two tertiary surface watercourses which drain to the west and northeast of the northern boundary before possibly entering drains accosted with the new road construction to the north or the urban surface water drainage system to the west. A pollution incident to controlled waters is recorded at the south of the site; however details of the receiving water are not available.

Flood Risk	The EA flood risk map shows most parts of the site to be at very low risk (less than 1 in 1,000 annually) from flooding events; land within the settlement of Llan-y-Pwll, 100m to the northeast of the site, appears within Zone 2 or 3 flood areas.
Radon	The radon atlas indicates the site is in an area where 1%-3% of dwellings may be at or above the action level. No radon protection measures are necessary in the construction of new dwellings or residences.
Mining	The site is in an area subject to historical abstraction of sands and gravels; however there is no evidence to suggest that such activities have been carried out within the site boundary. A large sand pit was present immediately to the east of the site. The site is in an area which may be impacted by coal mining activity, however the Coal Authority Report obtained for the site indicates that the only worked seam of coal underlying the site is at 710m-810m depth and any movement associated with these workings should have ceased. The site is also not in the likely zone of influence of current workings or an area where a licence has been granted for deep or opencast mining and there are no indications of mine entries, faults or other weaknesses which have been impacted by mining. The site is not in the Cheshire Brine Compensation district.
Excavation and Land filling	The development history of the site does not indicate that substantial land filling or raising activities have taken place, although small ponds appear to have been infilled at some point in the period covered by the available historical mapping and a small heap is noted within the site. The sand pit immediately to the east of the site was utilised as a landfill, accepting inert, industrial, commercial household and special wastes between 1984 and 1988. The total length of the landfill site running along the east boundary is approximately 325m, longer than the maximum extent of the sand pit indicated on the historical maps. The site is subject to active landfill gas and leachate measures. It is understood that the gas extraction system utilises a flare operated on a timer basis as there is insufficient gas generation to allow full time operation. Gas monitoring data indicates that elevated concentrations of landfill gas have been detected on the landfill/site boundary since installation of the gas extraction system, and although concentrations have shown an overall decrease over time that the system may not be functioning at maximum efficiency.
Ecology and Conservation	No statutory nature conservation sites, such as SSSIs, SPAs etc have been identified within 250m of the site. SGP has not undertaken a detailed ecological survey.
Animal/Notifiable Diseases burial	Wrexham County Borough Council Trading Standards have indicated that they are unaware of any animal burial sites within the site; SGP has contacted The Animal Health and Veterinary Laboratories Agency but not received a response at the time of writing.

4.2. Development Proposals

4.2.1. The site is being considered for residential development. For the purposes of defining future receptors with the potential to be impacted by land contamination it is assumed that most parts of the site could contain residential properties with private gardens, or amenity land with landscaping, public open space and infrastructure to support any of these uses.

4.2.2. It must therefore be assumed that, in addition to the environmentally sensitive receptors already existing on the site and the surrounds, that development, construction and maintenance workers, and future occupants will be introduced to the site, resulting in the creation of exposure

pathways which do not currently exist. It is also assumed that disturbance of the site necessary to prepare the land for redevelopment could result in the temporary creation of new exposure pathways.

- 4.2.3. The use of the site for residential use necessitates the construction of numerous new buildings, which are assumed to be of low-rise, traditional construction, and supporting infrastructure including roads, drains sewers and utility services. The potential for damage to these structures caused by ground movement, or attack of vulnerable materials by aggressive ground conditions is also considered.

5. Preliminary Conceptual Model and Risk Assessment

5.1. Methodology

- 5.1.1. Information from the desk study has been used to identify the likely source-pathway-target relationships that may exist at the site during and following the proposed development. Principal factors that may determine potential sources of contaminants at the site, receptor vulnerability and potential pathways have been identified and each assessed in turn to derive a Conceptual Site Model (CSM).

5.2. Site Source Risk Assessment

- 5.2.1. Natural sources of ground contamination appear to be limited, based on the available evidence; the potential for organic soils and peat appears to be limited and the site is an area where less than 3% of residential dwellings can be anticipated to be impacted by radon gas. Estimated soil chemistry parameters for selected metals and metalloids provided by the BGS do not indicate significantly naturally elevated concentrations in the area.
- 5.2.2. The historical mapping indicates that the site was open fields, although there is evidence to suggest that a number of small ponds within the site have been infilled; these possibly may also contain waste materials including hazardous materials such as asbestos or chemical wastes, or readily degradable materials which can produce hazardous ground gasses, SGP are awaiting confirmation of the absence of animal burial pits on the site. There is a minor possibility that polluting substances in liquid wastes deposited in drums or discharged directly within these areas has taken place. Apart from these identified potential source areas, no constraint to the proposed development associated with ground contamination within the site has been identified.

5.3. Off-Site Sources

- 5.3.1. Several minor areas of infilled land in the immediate surrounds may similarly contain degradable materials with the potential to produce hazardous gas, however only one is considered a source with the potential to constrain the planned redevelopment of the site. The

former sand pit to the immediate east of the northern half of the eastern site boundary accepted mixed wastes 26 years ago.

5.3.2. The landfill site is engineered in that it has been provided with a liner, however historical monitoring data indicates that very high methane and carbon dioxide concentration concentrations were present at the site perimeter indicate limited functionality. Concentrations have decreased over time and this may be due to stabilisation of the waste materials, however a landfill gas extraction system has been established on the site and continues to function.

5.3.3. Risk assessments relating to landfill gas emissions have concentrated on receptors to the north of the landfill and concluded that it is unlikely that a possibility of significant harm exists, although the potential for such circumstances in the event of a failure of the extraction systems is considered reasonably possible or likely.

5.4. Potential Receptors

5.4.1. The site is in an area of high environmental sensitivity as far as groundwater is concerned; the underlying bedrock immediately adjacent to the site supports a Principal Aquifer and a Source Protection Zone is associated with this. Local abstractions for industrial use are recorded. The overlying superficial deposits, probably readily allow infiltration and migration, and are may also support matrix base flow to nearby watercourses. The surface watercourses or drains on the site are likely to receive surface water or field drainage and are therefore sensitive to potential site sources of pollution, if present.

5.4.2. The surrounding area mainly consists of agricultural, residential and amenity land use with some commercial properties nearby but no significant industrial development is present apart from a concrete batching plant to the east. The site does not appear to be used for amenity purposes, and is probably of limited ecological value but constitutes productive farmland.

5.4.3. Apart from farm workers, there is probably minimal potential for exposure of people to soils on the site under existing conditions, however redevelopment of the site will introduce new receptors, comprising a construction workforce, maintenance workers, visitors and residents, the latter being the most sensitive due to the presence of children resident on the site for long periods of time.

5.4.4. The principal vulnerable receptors for the existing and proposed uses will be:

- The two unnamed tertiary watercourses or drains on the site;
- construction workers who may be exposed to contaminants during preparatory and construction works;
- future site users and building occupants, primarily assumed to be residents including

infants and children, and;

- future maintenance workers.

5.5. Controlled Waters Risk Assessment

5.5.1. Perched water is unlikely to be present on the site. Based on the existing information, there is likely to be mobile groundwater present within the underlying natural superficial deposits. Groundwater flows within the underlying bedrock are likely to be less significant.

5.5.2. The potential for diffuse sources within the site which could cause pollution of controlled waters is considered minimal. Flow to the watercourses is probably primarily via infiltration and base flow within the underlying aquifer but some land drains or ditches may carry flow. Where such pathways exist these could form routes for migration of pollutants released from discrete sources (such as spills and leaks of fuel from storage facilities, or releases of other chemicals such as fertilisers or pesticides), however there is no evidence that such sources exist.

5.6. Human Health Risk Assessment

5.6.1. A development layout has not been produced for the site; for the purposes of human health risk assessment it is assumed that most parts of the site are intended to contain dwellings or areas of publicly accessible land.

5.6.2. The potential for significant contamination to be present that may pose an acute risk to construction workers during the development is low. Similarly future maintenance workers are unlikely to be exposed to materials with the potential to cause short-term impacts.

5.6.3. The contents of the infilled ponds should be confirmed: unless any waste deposits associated with contaminated materials are encountered there is minimal potential for constraints to redevelopment posed by ground contamination within the site. If any such risks are identified these are likely to be dominated by long term exposure of future residents, particularly children.

5.6.4. Gas generation rates within the natural soils are probably very low; however significant thicknesses of degradable wastes are present immediately to the east of the site. Under certain circumstances these can pose a high risk of generating significant flows of ground gas with the potential to cause fire, explosion, asphyxia or poisoning. Highly elevated concentrations of landfill gas have been historically reported at the site boundary with the adjacent landfill indicating that containment by the liner system is not complete.

5.6.5. Gas concentrations appear to have reduced over time and this may be a result of construction of, and improvements to a landfill gas extraction system operated within the former landfill which is believed to operate either intermittently or with variable efficiency. The most recent data reviewed by SGP (from 2011) indicates that methane in excess of 1% and carbon dioxide in

excess of 5% by volume sporadically occurs at the landfill's boundary with the site, which would necessitate protection measures even if considered to be representative of the "worst-case" conditions within the site.

5.6.6. The presence of such a system introduces additional uncertainty as to how the ground gas regime in the landfill interacts with the site under consideration. Recorded conditions at the site boundary may be subject to large variations in the event that the system fails, or is decommissioned. A high degree of uncertainty would be attached to any ground gas risk assessment carried out unless the operation of the system during monitoring can be confirmed.

5.6.7. Risk assessments relating to landfill gas emissions have concentrated on receptors to the north of the landfill and concluded that it is unlikely that a possibility of significant harm exists, although the potential for such circumstances in the event of a failure of the extraction systems is considered reasonably possible or likely. Extrapolation of this conclusion to future dwellings within the parts of the site adjacent to the landfill is considered reasonable, although there is greater potential for risk mitigation within new development as discussed below.

5.7. Site Conceptual Model

5.7.1. Potential pollution linkages between the identified contamination sources and existing and future receptors are summarised in Table 5.1 below:

Table 5.1: Conceptual Site Model

Hazardous Source		Receptor	Pathway	Risk Assessment			Notes
Origin	Contaminant			Consequence	Probability	Risk	
Hazardous substances present as discrete deposits within made ground as a result of uncontrolled waste disposal	metals, PAHs, fuels, oils, organic pesticides and asbestos present as discrete deposits within made ground as a result of uncontrolled waste disposal	current / future site users including residents construction workers / future maintenance workers	direct contact / dust & soil ingestion and inhalation	severe	unlikely	low	The potential for significant sources is difficult to quantify but likely to be highly localised and restricted to in filled ponds or other small pits, risks are likely to be dominated by long term exposure of future residents rather than transient and short term exposure of construction or maintenance workers confirm through intrusive site investigation.
		Controlled water receptors, mainly the site surface watercourses/drains and the aquifer in the sand and gravel deposits	leaching and infiltration through unsaturated zone, pollution of groundwater and discharge into the site watercourses or nearby principal aquifer	severe	unlikely	low	The potential for significant sources is difficult to quantify but likely to be highly localised and restricted to in filled ponds or other small pits, risks are likely to be dominated by leaching into the sand and gravel aquifer or flow into the surface watercourses/drains within the site or to the nearby principal aquifer/Source Protection Zone confirm through intrusive site investigation
Hazardous ground gas from sources within adjacent landfill	Methane, carbon dioxide, potentially VOCs, and depressed oxygen conditions	Site workers: construction stage or future maintenance workers	Accumulation of toxic or flammable gasses to harmful or explosive concentrations	severe	possible	moderate	The potential for sources within discrete areas of made ground and fill both externally and internally to the site is recognised, however the only source with a high potential is the adjacent historical Llan-y-Pwll Landfill. Elevated landfill gasses have been recorded at the site boundary with the facility and an active gas extraction system is in use, the natural soils which extend to depths over 20m BGL are likely to offer minimal protection in the event of failure of control measures Full assessment of risks from ground gas is required. Mitigation may be required in the form of gas protection measures including in-ground barriers, however development in the north eastern parts of the site may be constrained
		future site users / unventilated voids in future buildings	Accumulation of toxic or flammable gasses to harmful or explosive concentrations	severe	possible	moderate	
		Buildings and structures	Accumulation of flammable gasses to explosive concentrations	severe	possible	moderate	

Note: Risk Assessment based on guidance provided in CIRIA 552, 2001, 'Contaminated Land Risk Assessment: Guide to Good Practice'

5.8. Property Risk Assessment

5.8.1. The underlying natural strata are classed by the BGS as being at very low risk of collapsible ground, landslide, running sand and shrinking or swelling clay, and with no compressible or dissolution ground hazards.

5.8.2. The site appears to have remained undeveloped and in continuous use as farmland over its recorded history and does not appear to have has been subject to extensive land raising. The only potential areas identified as containing fill materials are a small number of former ponds which are indicated have having been partially or fully infilled.

5.8.3. If the methane migration from on, or off, site sources is identified as a significant risk of entry to and accumulation within poorly ventilated voids to flammable or explosive concentrations could exist.

5.9. Drainage

5.9.1. The site is likely to be free draining and suitable for surface water soakaways.

5.10. Other Environmental Issues

5.10.1. An operational concrete batching plant is present immediately adjacent to the site boundary and is operated under a Local Authority Environmental Permit; SGP are not aware of any pollution issues associated with this facility.

5.10.2. A large sand quarry is present to the north of the site; SGP are unaware of any fugitive dust issues which could impact the site.

5.10.3. No other local potential pollution sources have been identified; the nearest other area of major industrial development, Wrexham Industrial Estate is over 1km to the southeast of the site.

6. Conclusions and Recommendations

6.1. Conclusions

6.1.1. The available evidence indicates that the site has not been subject to previous activities which could result in land contamination that would impose significant constraints on redevelopment for residential use. A small number of partially or completely infilled ponds within the site may have resulted in localised heterogeneous ground conditions and there is a small possibility that this could include hazardous or polluting wastes, although given the size of the site these are likely to be of relatively low significance provided they are appropriately remediated.

6.1.2. Minor off site sources may exist within the surrounding area, however the only potential pollution source of significance identified is the adjacent Llan-y-Pwll Landfill; this has been confirmed as historically producing significant concentrations of landfill gas at its boundary with the site. More recent monitoring data indicates that gas concentrations have decreased, but are still at a level where mitigation in the form of gas protection measures would be required. However, a high degree of uncertainty concerning the gas regime within the site remains as the effects of the active gas extraction system within the former tip are uncertain and gas concentrations and the potential for migration into the site may increase substantially if the system fails or is shut down.

6.1.3. The site is therefore currently assessed as posing generally low risks to redevelopment associated with land contamination or ground stability, with the exception of the migration of landfill gas from the adjacent tip which must be considered a moderate risk to the eastern parts of the site in the absence of detailed assessment of the gassing potential of the site and the long-term performance of the gas management system. The Local Planning Authority may object to proposed redevelopment, particularly of the eastern parts of the site near the former tip as this would introduce new receptors and increase the likelihood that the adjacent tip could be designated as Contaminated Land under the statutory definition of the term.

6.2. Recommendations

6.2.1. An intrusive site investigation to characterise the geotechnical properties of the ground and confirm the contamination status of the site is required; the design of this must be informed by a complete site inspection carried out by an appropriately qualified and experienced person and should preferably be carried out over multiple phases allowing an iterative approach to assessing risks on the site to be adopted.

6.2.2. A preliminary intrusive investigation is likely to include drilling of percussion type boreholes, on a large grid over all parts of the site, supplemented by trial pits at closer intervals within suspected areas of made ground (the infilled ponds).

6.2.3. A comprehensive ground gas risk assessment to assess risks to development of the eastern parts of the site will be required; this is likely to involve the drilling of a series of boreholes in the eastern part of the site and construction of monitoring wells to enable gas and groundwater monitoring to be carried out. The use of continuous gas monitoring techniques is considered an appropriate means of assessing conditions under a range of conditions will need to be established. However, in order to demonstrate the true “worst-case” conditions for migration into the site, the operational parameters of the landfill gas extraction system must be taken into account, and if possible, monitoring during shut down periods coinciding with other conditions conducive to gas migration completed; such an exercise may present considerable logistical challenges.

6.2.4. The use of in ground barriers and/or venting along the boundary with the landfill could provide a higher degree of confidence that future risks will not impact the site, although the likely significant depths of gas-permeable soils beneath the site could present significant impediments to the design and construction of such a structure. Verification of construction and validation of its performance will be required.

6.2.5. It is therefore recommended that consultation with the Local Planning Authority regarding the status of the adjacent historical landfill be carried out in advance of scheduling further site investigation; the Local Authority should also be given the opportunity to comment on any schedule for intrusive assessment.

6.2.6. The Local Planning Authority may also recommend that the Natural Resources Wales be consulted although they are unlikely to raise specific concerns other than the adjacent landfill given the low pollution potential associated with the site.

6.3. Limitations

6.3.1. The scope of assessment was selected on the basis of the available development proposals by the client, and may be inappropriate to another form of development or scheme. SGP reserves the right to alter any of the foregoing information in the event of new information being disclosed or provided and in the light of changes to legislation, guidelines and responses by the statutory and regulatory authorities.

6.3.2. This report partially reviews and relies upon information provided by others. Smith Grant LLP accepts no responsibility for advice given on the basis of incorrect factual information provided to it. It was not possible to carry out an inspection of the internal parts of the site; therefore conclusions drawn from observations of the current status of the site should be treated with caution.

6.3.3. This report has been prepared by Smith Grant LLP, for the sole and exclusive use of Barratt Manchester (Barratt Developments PLC). The benefit of this report may not be assigned to any other party without the prior agreement in writing of Smith Grant LLP. Reasonable skill, care and diligence have been exercised within the timescale and budget available, and in accordance with the technical requirements of the brief.

6.3.4. Notwithstanding the efforts made by the professional team in undertaking the assessment and preparing this report, it is possible that other ground conditions and contamination as yet undetected may exist. Reliance on the findings of this report must therefore be limited accordingly. Such reliance must be based on the whole report and not on extracts which may lead to incomplete or incorrect conclusions when taken out of context.

DRAWING

APPENDIX A

Envirocheck Report

APPENDIX B

Ground Stability Report

APPENDIX C

Coal Authority Report

Envirocheck[®] Report:

Datasheet

Order Details:

Order Number:

61961705_1_1

Customer Reference:

R2062

National Grid Reference:

336130, 351500

Slice:

A

Site Area (Ha):

28.92

Search Buffer (m):

500

Site Details:

Site at 336180, 351500

Client Details:

MR B Thomas
Smith Grant Partnership
Station House
Station Road
Ruabon
Wrexham
LL14 6DL

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	4
Hazardous Substances	-
Geological	6
Industrial Land Use	11
Sensitive Land Use	-
Data Currency	12
Data Suppliers	16
Useful Contacts	17

Introduction

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

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

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Report Version v49.0

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

Data Type	Page Number	On Site	0 to 250m	251 to 500m (*up to 1000m)
Waste				
BGS Recorded Landfill Sites				
Historical Landfill Sites	pg 4		1	
Integrated Pollution Control Registered Waste Sites				
Licensed Waste Management Facilities (Landfill Boundaries)				
Licensed Waste Management Facilities (Locations)	pg 4			1
Local Authority Recorded Landfill Sites				
Registered Landfill Sites	pg 4		1	
Registered Waste Transfer Sites				
Registered Waste Treatment or Disposal Sites	pg 5		1	
Hazardous Substances				
Control of Major Accident Hazards Sites (COMAH)				
Explosive Sites				
Notification of Installations Handling Hazardous Substances (NIHHS)				
Planning Hazardous Substance Consents				
Planning Hazardous Substance Enforcements				
Geological				
BGS 1:625,000 Solid Geology	pg 6	Yes	n/a	n/a
BGS Estimated Soil Chemistry	pg 6	Yes	Yes	Yes
BGS Recorded Mineral Sites				
BGS Urban Soil Chemistry				
BGS Urban Soil Chemistry Averages				
Brine Compensation Area			n/a	n/a
Coal Mining Affected Areas	pg 9	Yes	n/a	n/a
Mining Instability	pg 9	Yes	n/a	n/a
Man-Made Mining Cavities				
Natural Cavities				
Non Coal Mining Areas of Great Britain				n/a
Potential for Collapsible Ground Stability Hazards	pg 9	Yes		n/a
Potential for Compressible Ground Stability Hazards				n/a
Potential for Ground Dissolution Stability Hazards				n/a
Potential for Landslide Ground Stability Hazards	pg 10	Yes		n/a
Potential for Running Sand Ground Stability Hazards	pg 10	Yes		n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 10		Yes	n/a
Radon Potential - Radon Affected Areas	pg 10	Yes	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a

Data Type	Page Number	On Site	0 to 250m	251 to 500m (*up to 1000m)
Industrial Land Use				
Contemporary Trade Directory Entries	pg 11		6	1
Fuel Station Entries				
Sensitive Land Use				
Areas of Adopted Green Belt				
Areas of Unadopted Green Belt				
Areas of Outstanding Natural Beauty				
Environmentally Sensitive Areas				
Forest Parks				
Local Nature Reserves				
Marine Nature Reserves				
National Nature Reserves				
National Parks				
Nitrate Sensitive Areas				
Nitrate Vulnerable Zones				
Ramsar Sites				
Sites of Special Scientific Interest				
Special Areas of Conservation				
Special Protection Areas				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	Local Authority Pollution Prevention and Controls Name: Hanson Quarry Products Ltd Location: Llan-y-Pwll Quarry, Holy Road, WREXHAM, Clwyd, LL11 1AY Authority: Wrexham County Borough Council, Environmental Health Department Permit Reference: WCBC/PG/3/1/HP(v5) Dated: 27th March 1996 Process Type: Local Authority Air Pollution Control Description: PG3/1Blending, packing, loading and use of bulk cement Status: Authorised Positional Accuracy: Manually positioned to the address or location	A11SE (NE)	58	2	336524 351718
	Nearest Surface Water Feature	A10SE (NW)	0	-	335987 351642
2	Pollution Incidents to Controlled Waters Property Type: Water Company Sewage: Surface Water Outfall Location: Brynestyn Lane, WREXHAM Authority: Environment Agency, Welsh Region Pollutant: Miscellaneous - Fire water / Foam Note: Not Supplied Incident Date: 20th November 1995 Incident Reference: 26726 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Runoff Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A6NE (SW)	0	3	336000 351250
	Water Abstractions Operator: Lafarge Tarmac Trading Limited Licence Number: 24/67/7/0197 Permit Version: 103 Location: Borehole Authority: Natural Resources Wales Abstraction: Mineral Products: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 27th March 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12NW (NE)	508	4	336870 352070
	Water Abstractions Operator: Tarmac Limited Licence Number: 24/67/7/0197 Permit Version: 102 Location: Borehole Authority: Environment Agency, Welsh Region Abstraction: Mineral Products: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 15th February 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12NW (NE)	508	3	336870 352070
	Water Abstractions Operator: Tarmac Central Ltd Licence Number: 24/67/7/0197 Permit Version: 101 Location: Borehole Authority: Environment Agency, Welsh Region Abstraction: Mineral Products: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 7th March 2001 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12NW (NE)	508	3	336870 352070

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Tarmac Quarry Products (North West) Ltd Licence Number: 24/67/7/0197 Permit Version: 100 Location: Borehole Authority: Environment Agency, Welsh Region Abstraction: Mineral Products: Mineral Washing Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 1996 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12NW (NE)	508	3	336870 352070
	Groundwater Vulnerability Soil Classification: Soils of High Leaching Potential (H2) - Deep, permeable, coarse textured soils which readily transmit a wide range of pollutants because of their rapid drainage and low attenuation potential Map Sheet: Sheet 16 West Cheshire Scale: 1:100,000	A7NW (S)	0	3	336132 351504
	Groundwater Vulnerability Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise Map Sheet: Sheet 16 West Cheshire Scale: 1:100,000	A10SE (N)	0	3	336103 351741
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A7NW (S)	0	5	336132 351504
	Bedrock Aquifer Designations Aquifer Designation: Principal Aquifer	A7NE (E)	0	5	336477 351482
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A7NW (S)	0	5	336132 351504
3	Source Protection Zones Name: Various Source: Natural Resources Wales Reference: Not Supplied Type: Zone III (Total Catchment): The total area needed to support the discharge from the protected groundwater source.	A7NE (E)	73	4	336560 351506
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A11NE (NE)	94	4	336490 351875
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A11NE (NE)	94	4	336490 351875
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
	Detailed River Network Lines None				
4	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D010	A10SE (NW)	0	3	335987 351642
5	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D010	A11SW (N)	0	3	336180 351669

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
6	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D010	A11SW (NE)	3	3	336237 351738
7	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D010	A7SW (SE)	264	3	336433 351015
8	Detailed River Network Offline Drainage River Type: Tertiary River Hydrographic Area: D010	A7SE (SE)	347	3	336594 350977

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	Historical Landfill Sites Licence Holder: Wrexham Maelor Borough Council Location: Llan-Y-Pwll, Wrexham Name: Land of West Lane Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHL14758 First Input Date: 1st July 1984 Last Input Date: 31st August 1988 Specified Waste: Deposited Waste included Inert, Industrial, Commercial, Household and Type: Special Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 6955/0035 BGS Ref: Not Supplied Other Ref: WMBC	A7NE (E)	1	4	336464 351501
10	Licensed Waste Management Facilities (Locations) Licence Number: 102745 Location: Holt Road, Borrass, Wrexham, LL13 9SE Operator Name: Tarmac Ltd Operator Location: Not Supplied Authority: Natural Resources Wales Site Category: Management of inert or extractive waste at mine Licence Status: Issued Issued: 24th May 2011 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12NW (NE)	464	4	336906 351887
	Local Authority Landfill Coverage Name: Wrexham County Borough Council - Has supplied landfill data		0	8	336132 351504
11	Registered Landfill Sites Licence Holder: Wrexham Maelor B.C. Licence Reference: R Site Location: Llanypwll, Holt Road, Wrexham, Clwyd Licence Easting: 336550 Licence Northing: 351650 Operator Location: The Depot, Mold Road, Gwersyllt, WREXHAM, Clwyd, LL11 4AF Authority: Environment Agency Wales, North Area Site Category: Landfill Max Input Rate: Undefined Waste Source: No known restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st December 1983 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the road within the address or location Boundary Accuracy: Not Applicable Authorised Waste: Non-Toxic Waste	A11SE (E)	85	3	336550 351650

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
12	Registered Waste Treatment or Disposal Sites Licence Holder: Alan Jones t/a Andy Used Car Spares Licence Reference: L79 Site Location: Home Farm, Bryn Estyn Lane, Wrexham, Clwyd Operator Location: 9 Tower View, Wrexham, Clwyd Authority: Environment Agency Wales, North Area Site Category: Scrapyard Max Input Rate: Undefined Waste Source: No known restriction on source of waste Restrictions: Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st April 1994 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Approximate location provided by supplier Boundary Quality: Not Supplied Authorised Waste: Scrap Cars Prohibited Waste: Cadmium Compounds Drums Elemental Sodium/Potassium Liquified Gas / Gas Under Pressure Mercury Compounds Powder / Powdered Waste Special Wastes Sub'S Control. Radioactive Subs Act'60 Waste N.O.S. Water Soluble Waste	A6NW (SW)	230	3	335600 351200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Permian and Triassic sandstones, undifferentiated, including Bunter and Keuper	A7NW (E)	0	5	336360 351502
	BGS 1:625,000 Solid Geology Description: Westphalian and Stephanian, undivided, of Barren Red lithology	A7NW (S)	0	5	336132 351504
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A6NE (W)	0	6	336000 351504
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A7NW (S)	0	6	336132 351504
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: 15 - 30 mg/kg	A7NE (E)	0	6	336477 351482
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: <15 mg/kg	A7NE (E)	0	6	336462 351496
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <150 mg/kg Nickel Concentration: <15 mg/kg	A7NE (E)	16	6	336477 351493

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A7SW (S)	163	6	336243 351087
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A7SW (SE)	168	6	336439 351118
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A11NW (N)	207	6	336132 352000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A11NE (NE)	209	6	336471 352000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A7NE (E)	225	6	336741 351438
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A6SE (S)	225	6	336000 351000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A7SW (S)	234	6	336132 351000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A7SW (S)	268	6	336328 351000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A7SW (SE)	276	6	336420 351000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A10NE (N)	282	6	336000 352000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A7SE (SE)	303	6	336512 351000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A7SW (SE)	323	6	336411 350950

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 40 - 60 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel <15 mg/kg Concentration:	A11NE (NE)	328	6	336670 352032
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A5SE (SW)	469	6	335425 350989
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 60 - 90 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel 15 - 30 mg/kg Concentration:	A5SE (SW)	478	6	335408 351000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: RuSoilExAs Arsenic <15 mg/kg Concentration: Cadmium <1.8 mg/kg Concentration: Chromium 40 - 60 mg/kg Concentration: Lead Concentration: <150 mg/kg Nickel <15 mg/kg Concentration:	A15SW (N)	495	6	336144 352289
	BGS Measured Urban Soil Chemistry No data available				
	BGS Urban Soil Chemistry Averages No data available				
	Coal Mining Affected Areas Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	A7NW (S)	0	7	336132 351504
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A7NW (S)	0	-	336132 351504
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	5	336132 351504
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	5	336132 351504
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	5	336132 351504

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	5	336132 351504
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	5	336132 351504
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A7NE (E)	0	5	336462 351496
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	5	336132 351504
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11SE (NE)	4	5	336481 351745
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11SE (E)	10	5	336473 351525
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A7SW (S)	163	5	336243 351087
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	5	336132 351504
	Radon Potential - Radon Affected Areas Affected Area: The property is in an intermediate probability radon area, as between 1 and 3% of homes are above the action level Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	5	336132 351504

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
13	Contemporary Trade Directory Entries Name: Nightingale-Eos Location: Unit 2, Bryn Estyn Rd, Wrexham, Clwyd, LL13 9TY Classification: Medical Equipment Manufacturers Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location	A6NE (SW)	8	-	335862 351220
14	Contemporary Trade Directory Entries Name: Old Bungalow Garage Location: Bryn Estyn Rd, Wrexham, Clwyd, LL13 9TY Classification: Car Body Repairs Status: Active Positional Accuracy: Manually positioned to the road within the address or location	A6NE (SW)	35	-	335793 351222
15	Contemporary Trade Directory Entries Name: Hanson Aggregates Location: Holt Road, Llan-y-Pwll, Wrexham, Clwyd, LL13 9SA Classification: Concrete Products Status: Active Positional Accuracy: Automatically positioned to the address	A11SE (NE)	60	-	336526 351717
16	Contemporary Trade Directory Entries Name: Jsm Location: 11, Muirfield Close, Wrexham, Clwyd, LL13 9FX Classification: Carpet, Curtain & Upholstery Cleaners Status: Inactive Positional Accuracy: Automatically positioned to the address	A6NW (SW)	148	-	335680 351235
17	Contemporary Trade Directory Entries Name: Selclene Location: Gredington Clo, Wrexham, Clwyd, LL13 9DQ Classification: Cleaning Services - Domestic Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location	A10SW (NW)	161	-	335715 351833
18	Contemporary Trade Directory Entries Name: H H D Technical Services Location: Bryn Estyn Business Centre, Bryn Estyn Road, Wrexham, Clwyd, LL13 9TY Classification: Corrosion Prevention & Control Status: Active Positional Accuracy: Automatically positioned to the address	A6SE (SW)	184	-	335801 351047
19	Contemporary Trade Directory Entries Name: Scorpio Blinds Location: 7, Hinsley Drive, Wrexham, Clwyd, LL13 9QH Classification: Blinds, Awnings & Canopies Status: Inactive Positional Accuracy: Automatically positioned to the address	A9SE (W)	422	-	335367 351779

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices Wrexham County Borough Council - Public Protection Department	December 2013	Annually
Discharge Consents Environment Agency - Welsh Region	August 2014	Quarterly
Enforcement and Prohibition Notices Environment Agency - Welsh Region	March 2013	As notified
Integrated Pollution Controls Environment Agency - Welsh Region	October 2008	Not Applicable
Integrated Pollution Prevention And Control Environment Agency - Welsh Region	August 2014	Quarterly
Local Authority Integrated Pollution Prevention And Control Wrexham County Borough Council - Environmental Health Department	April 2014	Annual Rolling Update
Local Authority Pollution Prevention and Controls Wrexham County Borough Council - Environmental Health Department	April 2014	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements Wrexham County Borough Council - Environmental Health Department	April 2014	Annual Rolling Update
Nearest Surface Water Feature Ordnance Survey	July 2012	Quarterly
Pollution Incidents to Controlled Waters Environment Agency - Welsh Region	December 1998	Not Applicable
Prosecutions Relating to Authorised Processes Environment Agency - Welsh Region	March 2013	As notified
Prosecutions Relating to Controlled Waters Environment Agency - Welsh Region	March 2013	As notified
Registered Radioactive Substances Environment Agency - Welsh Region	August 2014	Quarterly
River Quality Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points Environment Agency - Head Office	July 2012	Annually
River Quality Chemistry Sampling Points Environment Agency - Head Office	July 2012	Annually
Substantiated Pollution Incident Register Environment Agency Wales - North Area	August 2014	Quarterly
Water Abstractions Environment Agency - Welsh Region Natural Resources Wales	July 2014 July 2014	Quarterly Quarterly
Water Industry Act Referrals Environment Agency - Welsh Region	August 2014	Quarterly
Groundwater Vulnerability Environment Agency - Head Office	January 2011	Not Applicable
Drift Deposits Environment Agency - Head Office	January 1999	Not Applicable
Bedrock Aquifer Designations British Geological Survey - National Geoscience Information Service	October 2012	Annually
Superficial Aquifer Designations British Geological Survey - National Geoscience Information Service	October 2012	Annually
Source Protection Zones Environment Agency - Head Office Natural Resources Wales	August 2014 August 2014	Quarterly Quarterly

Agency & Hydrological	Version	Update Cycle
Extreme Flooding from Rivers or Sea without Defences Environment Agency - Head Office Natural Resources Wales	August 2014 May 2014	Quarterly Quarterly
Flooding from Rivers or Sea without Defences Environment Agency - Head Office Natural Resources Wales	August 2014 May 2014	Quarterly Quarterly
Areas Benefiting from Flood Defences Environment Agency - Head Office	August 2014	Quarterly
Flood Water Storage Areas Environment Agency - Head Office	August 2014	Quarterly
Flood Defences Environment Agency - Head Office	August 2014	Quarterly
Detailed River Network Lines Environment Agency - Head Office	March 2012	Annually
Detailed River Network Offline Drainage Environment Agency - Head Office	March 2012	Annually
Waste	Version	Update Cycle
BGS Recorded Landfill Sites British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Historical Landfill Sites Environment Agency Wales - North Area Natural Resources Wales	August 2014 May 2014	Quarterly Quarterly
Integrated Pollution Control Registered Waste Sites Environment Agency - Welsh Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency Wales - North Area	August 2014	Quarterly
Licensed Waste Management Facilities (Locations) Environment Agency Wales - North Area Natural Resources Wales	August 2014 May 2014	Quarterly Quarterly
Local Authority Landfill Coverage Wrexham County Borough Council	May 2000	Not Applicable
Local Authority Recorded Landfill Sites Wrexham County Borough Council	June 2003	Not Applicable
Registered Landfill Sites Environment Agency Wales - North Area	March 2003	Not Applicable
Registered Waste Transfer Sites Environment Agency Wales - North Area	March 2003	Not Applicable
Registered Waste Treatment or Disposal Sites Environment Agency Wales - North Area	March 2003	Not Applicable

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	August 2014	Bi-Annually
Explosive Sites Health and Safety Executive	October 2014	Bi-Annually
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements Wrexham County Borough Council - Planning Department	April 2014	Annual Rolling Update
Planning Hazardous Substance Consents Wrexham County Borough Council - Planning Department	April 2014	Annual Rolling Update
Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	August 1996	Not Applicable
BGS Estimated Soil Chemistry British Geological Survey - National Geoscience Information Service	January 2010	Annually
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	October 2014	Bi-Annually
Coal Mining Affected Areas The Coal Authority - Mining Report Service	December 2013	As notified
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	July 2014	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	Annually
Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	August 2014	Quarterly
Fuel Station Entries Catalist Ltd - Experian	November 2014	Quarterly

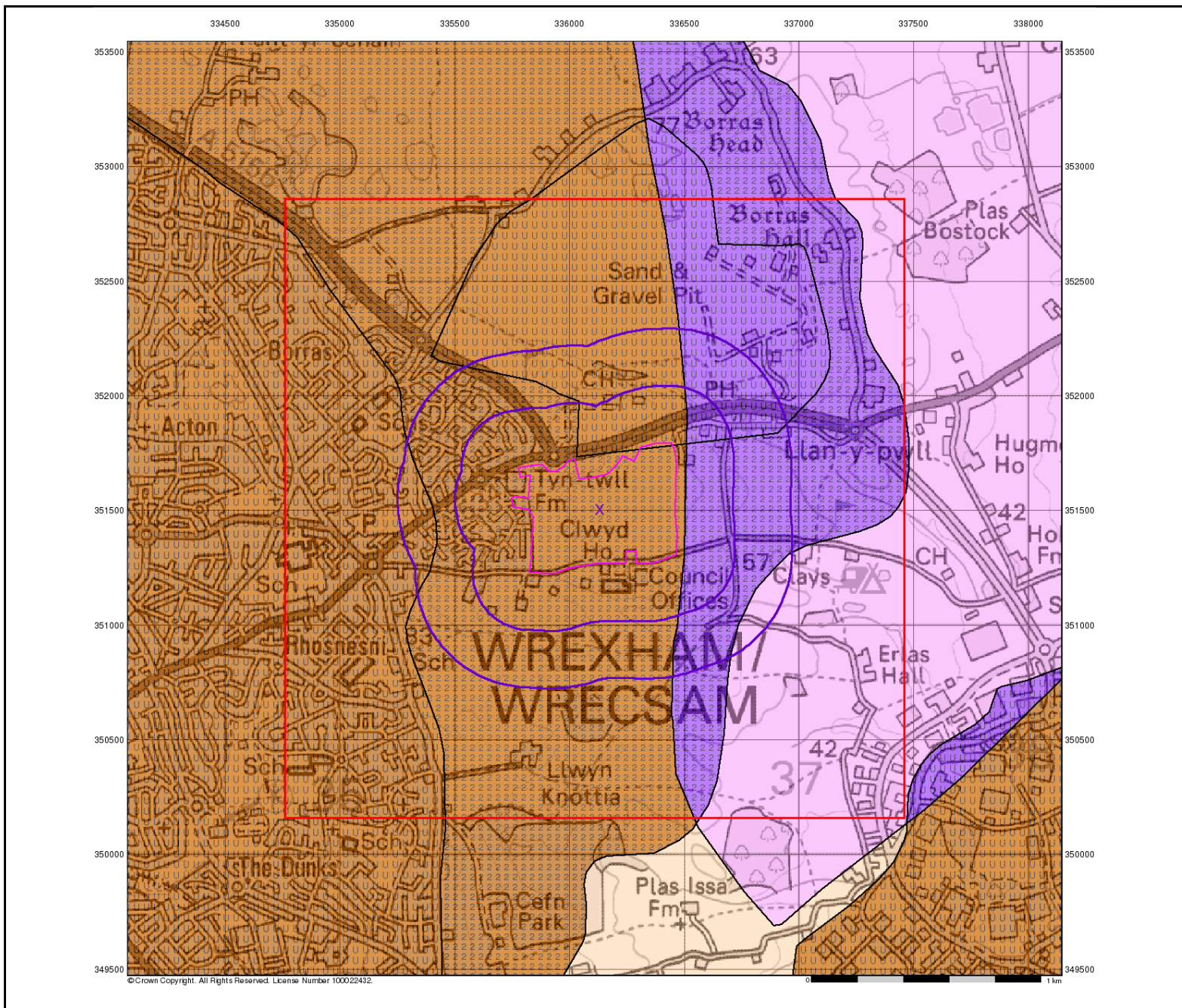
Sensitive Land Use	Version	Update Cycle
Areas of Outstanding Natural Beauty Natural Resources Wales	October 2014	Bi-Annually
Environmentally Sensitive Areas The National Assembly for Wales - GI Services (Department of Planning & Countryside)	August 2008	Annually
Forest Parks Forestry Commission	April 1997	Not Applicable
Local Nature Reserves Wrexham County Borough Council	October 2014	Bi-Annually
Marine Nature Reserves Natural Resources Wales	September 2014	Bi-Annually
National Nature Reserves Natural Resources Wales	October 2014	Bi-Annually
Nitrate Sensitive Areas Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	February 2012	Not Applicable
Nitrate Vulnerable Zones The National Assembly for Wales - GI Services (Department of Planning & Countryside)	October 2005	Annually
Ramsar Sites Natural Resources Wales	October 2014	Bi-Annually
Sites of Special Scientific Interest Natural Resources Wales	March 2014	Bi-Annually
Special Areas of Conservation Natural Resources Wales	March 2014	Bi-Annually
Special Protection Areas Natural Resources Wales	March 2014	Bi-Annually

A selection of organisations who provide data within this report

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

Contact	Name and Address	Contact Details
2	Wrexham County Borough Council - Environmental Health Department Crown Buildings, P O Box 1297, Wrexham, Clwyd, LL13 8ZE	Telephone: 01978 297038 Fax: 01978 292502 Website: www.wrexham.gov.uk
3	Environment Agency - National Customer Contact Centre (NCCC) PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 08708 506 506 Email: enquiries@environment-agency.gov.uk
4	Natural Resources Wales Ty Cambria, 29 Newport Road, Cardiff, CF24 0TP	Telephone: 0300 065 3000 Email: enquiries@naturalresourceswales.gov.uk
5	British Geological Survey - Enquiry Service British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
6	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmark.co.uk Website: www.landmarkinfo.co.uk
7	The Coal Authority - Mining Report Service 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG	Telephone: 0845 7626848 Email: thecoalauthority@coal.gov.uk
8	Wrexham County Borough Council Lampet Street, Guildhall, Wrexham, Clwyd, LL11 1WL	Telephone: 01978 292000 Fax: 01978 292502 Website: www.wrexham.gov.uk
-	Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

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



Envirocheck®

Groundwater Vulnerability

General

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

Agency and Hydrological

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

Site Sensitivity Context Map - Slice A

Order Details

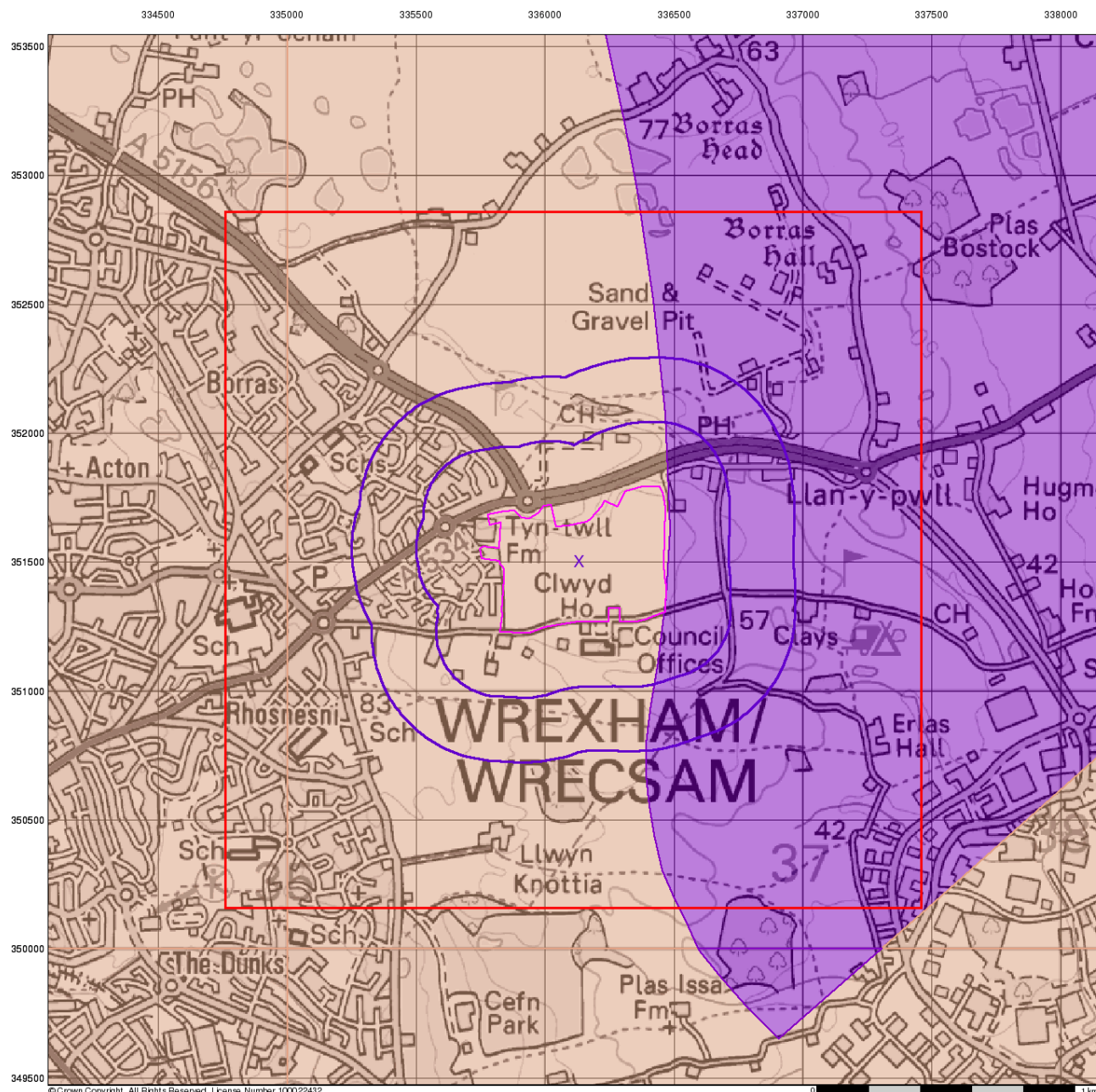
Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500

Landmark®
Information Group

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0 1 km



Bedrock Aquifer Designation

General

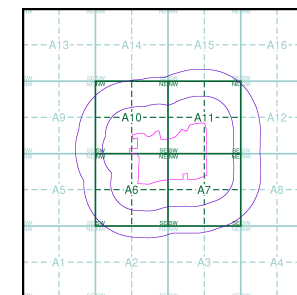
- Specified Site
- Specified Buffer(s)
- x Bearing Reference Point
- Slice
- B Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

Site Sensitivity Context Map - Slice A



Order Details

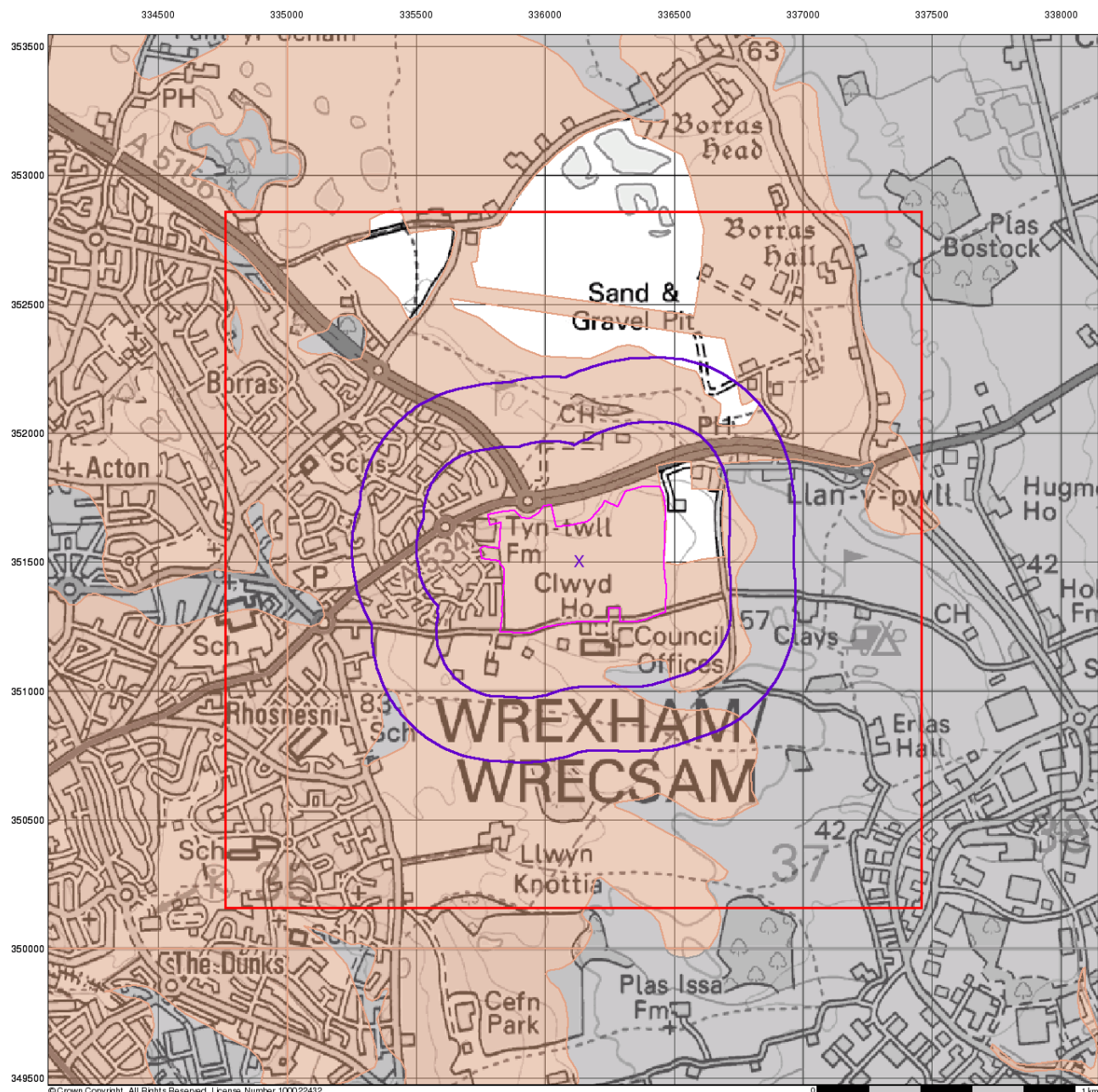
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 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500



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Superficial Aquifer Designation

General

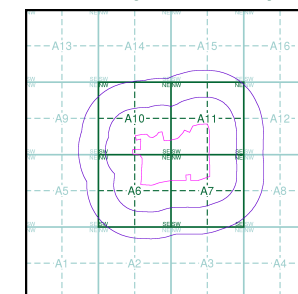
- Specified Site
- Specified Buffer(s)
- x Bearing Reference Point
- Slice
- B Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

Site Sensitivity Context Map - Slice A



Order Details

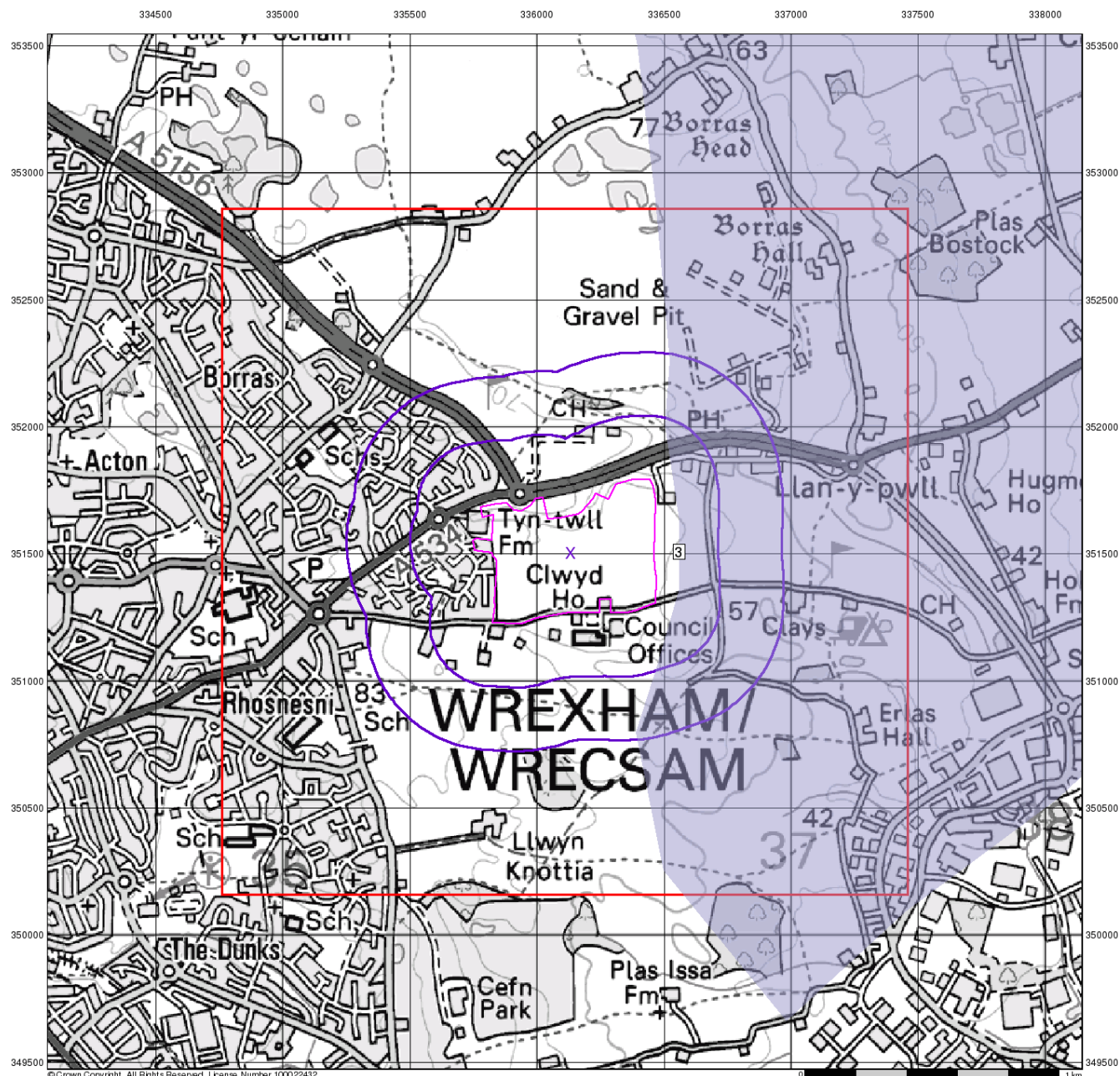
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 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500



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Source Protection Zones

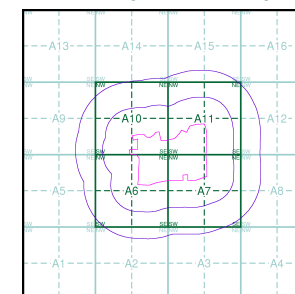
General

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

Agency and Hydrological

- Source Protection Zone I
- Source Protection Zone II
- Source Protection Zone III
- Zone of Special Interest
- Source Protection Zone Borehole

Site Sensitivity Context Map - Slice A



Order Details

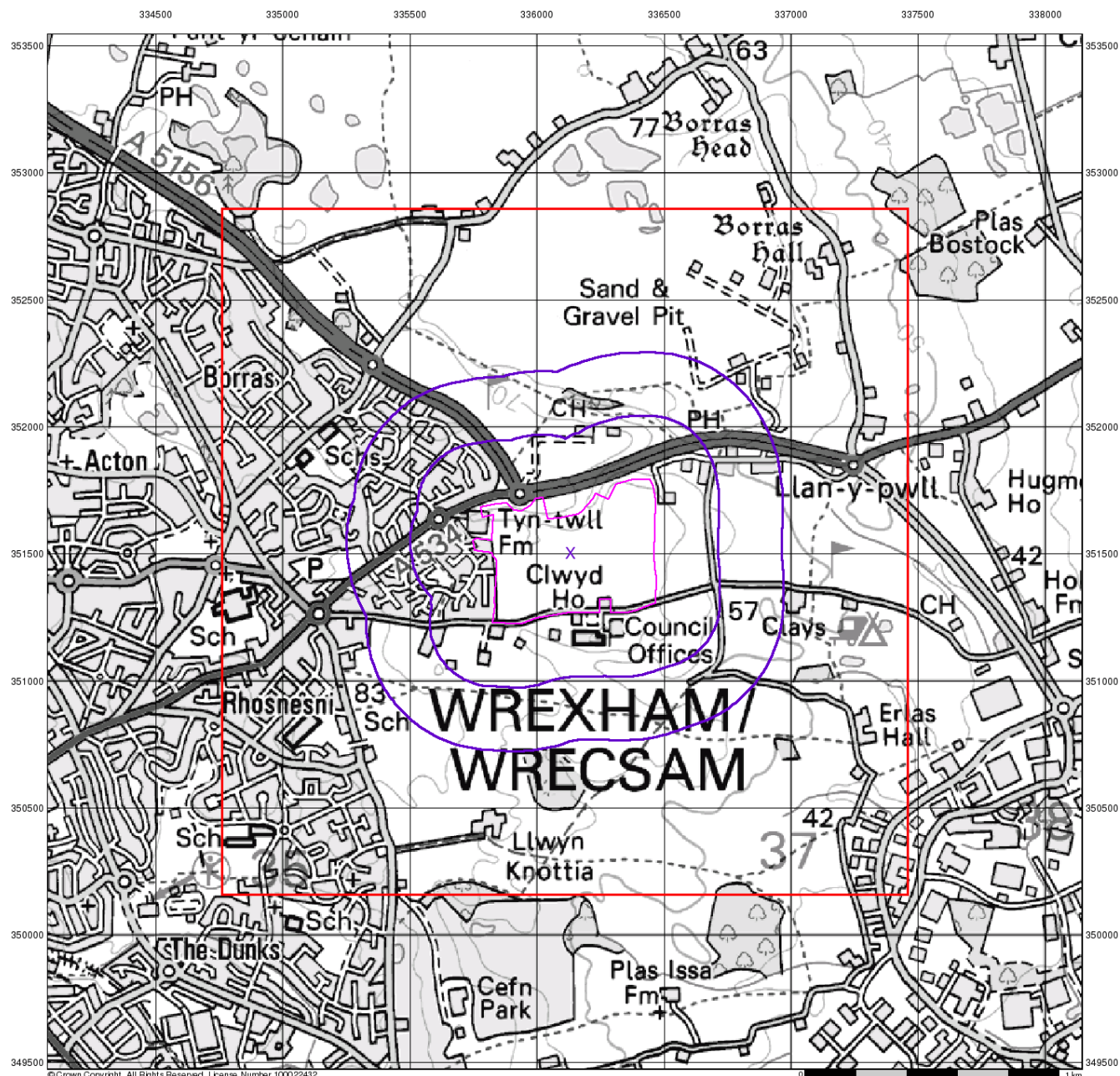
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 Customer Ref: R2062
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 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

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Sensitive Land Uses

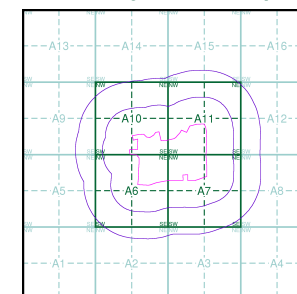
General

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

Sensitive Land Uses

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

Site Sensitivity Context Map - Slice A



Order Details

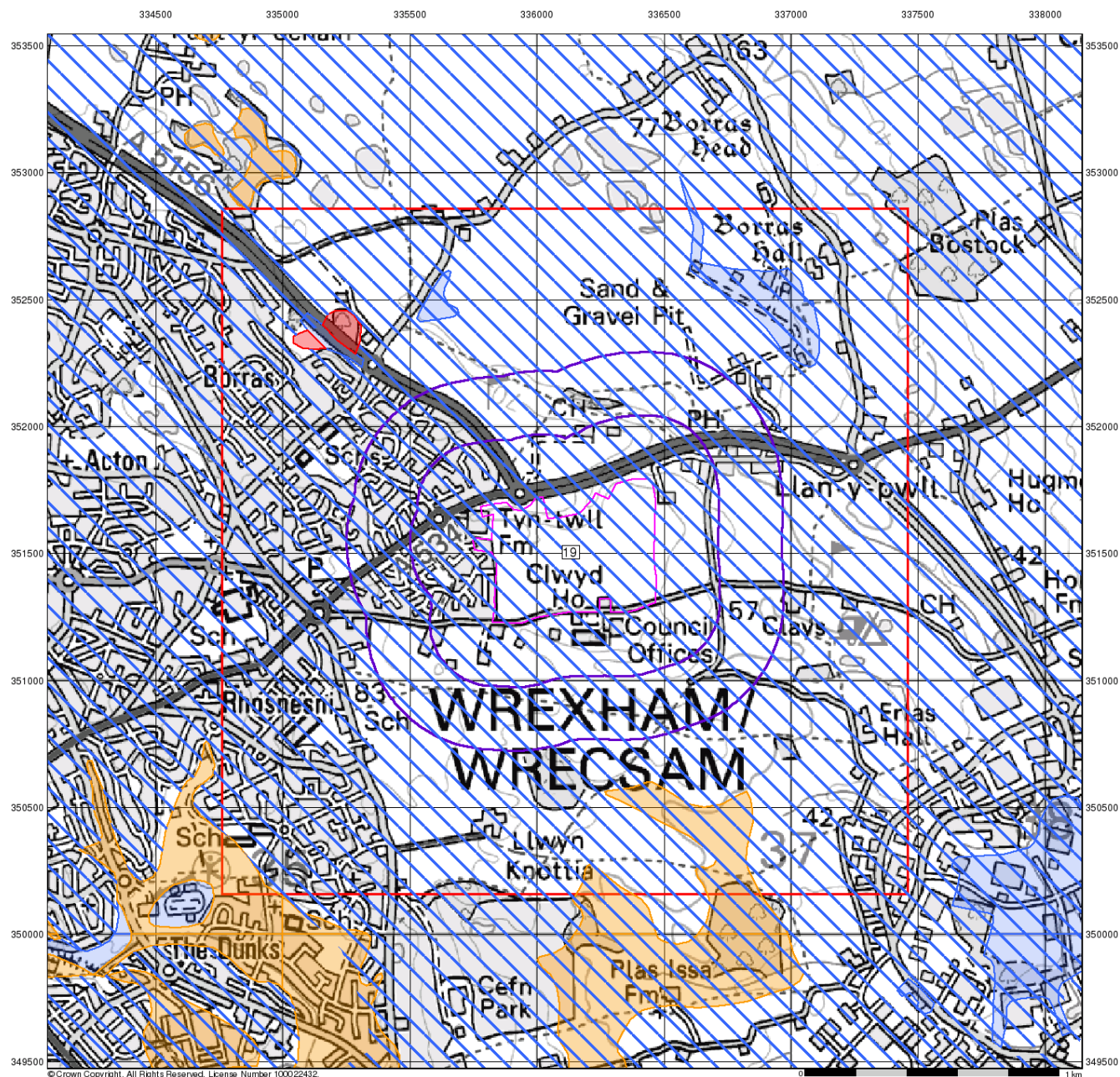
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 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

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Ground Stability Data (1:50,000)

General

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

Potential for Compressible Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

Potential for Collapsible Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

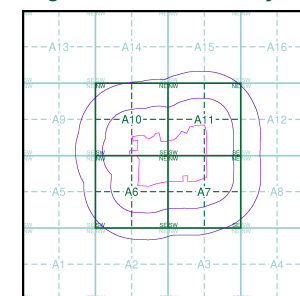
Brine Pumping and Salt Mining

Brine Pumping Related Feature

Salt Mining Related Feature

- | Point | Polygon |
|-------|---------|
| | |
| | |

Mining and Ground Stability - Slice A



Order Details

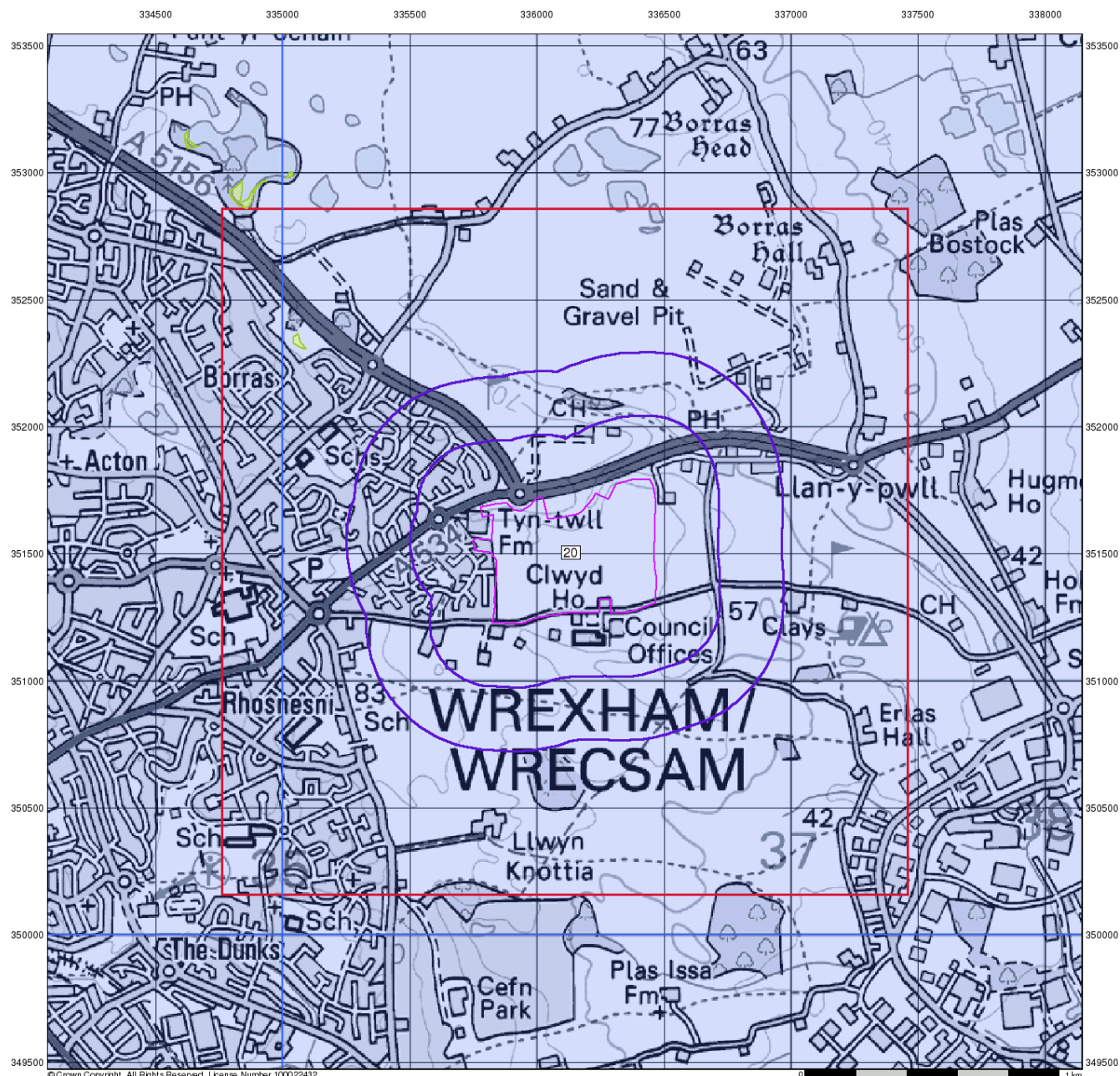
Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500



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Ground Stability Data (1:50,000)

General

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

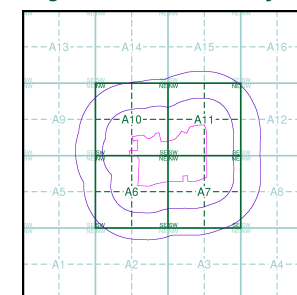
Potential for Landslide Ground Stability Hazards

- High
- Low
- Moderate
- Very Low

Potential for Ground Dissolution Stability Hazards

- High
- Low
- Moderate
- Very Low

Mining and Ground Stability - Slice A



Order Details

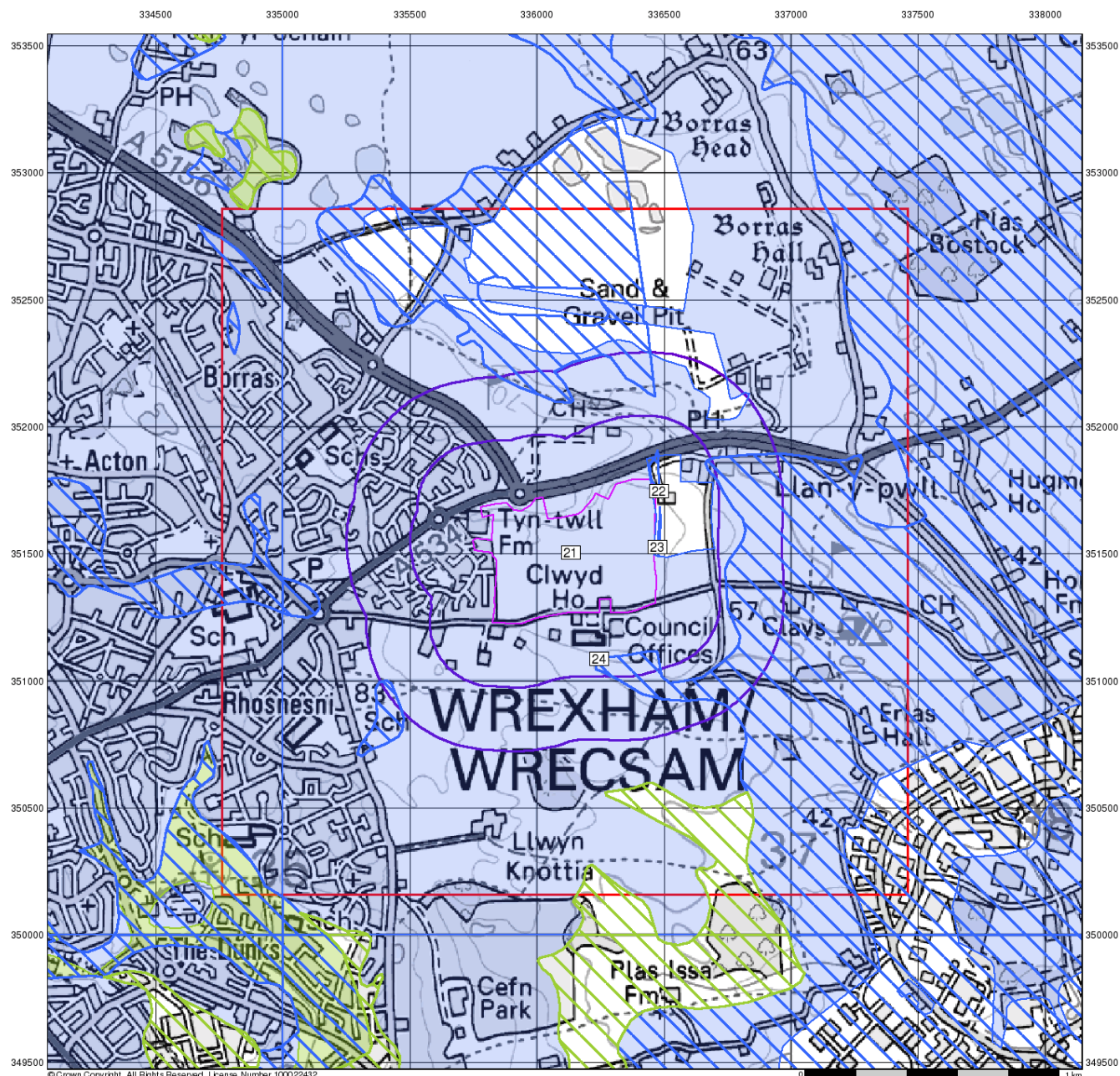
Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500



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Ground Stability Data (1:50,000)

General

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

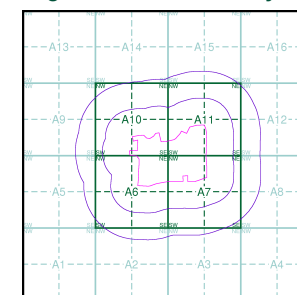
Potential for Running Sand Ground Stability Hazards

- High
- Moderate
- Low
- Very Low

Potential for Shrinking or Swelling Clay Ground Stability Hazards

- High
- Moderate
- Low
- Very Low

Mining and Ground Stability - Slice A



Order Details

Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500



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

Envirocheck[®] Report:

Mining and Ground Stability Datasheet

Order Details:

Order Number:

61961705_1_1

Customer Reference:

R2062

National Grid Reference:

336130, 351500

Slice:

A

Site Area (Ha):

28.92

Search Buffer (m):

500

Site Details:

Site at 336180, 351500

Client Details:

MR B Thomas
Smith Grant Partnership
Station House
Station Road
Ruabon
Wrexham
LL14 6DL

Report Section and Details	Page Number
Summary	-
The Summary section provides an overview of the data contained within the report, detailing the number of data set features or the existence of a data set in relation to the buffer selected. For ease of reference, the report is broken down into 4 sections of data; Mining and Natural Cavities Data, Historical Land Use Information (1:2,500), Historical Land Use Information (1:10,000) and Ground Stability Data (1:50,000).	
Mining and Natural Cavities Data	1
The Mining and Natural Cavities Data section features data sets related to the existence of mining areas and their potential hazards; and details of naturally formed cavities. Data sets within this section are not plotted, with the exception of BGS Recorded Mineral Sites and Potential Mining Areas which feature on the Historical Land Use Information (1:10,000) map.	
Historical Land Use Information (1:2,500)	2
The Historical Land Use Information (1:2,500) section contains data captured from analysis carried out by Landmark of 1:1,250 and 1:2,500 scale historical Ordnance Survey mapping, identifying areas where, historically, the land uses were potentially contaminative. For the purpose of this Envirocheck module, only historical data relating to mining and ground stability has been included and plotted on the corresponding Historical Land Use Information (1:2,500) map. This section also includes the Subterranean Features data set, which details various man-made and man-used underground spaces obtained from the Subterranea Britannica society.	
Historical Land Use Information (1:10,000)	3
The Historical Land Use (1:10,000) section covers data captured from the systematic analysis carried out by Landmark of 1:10, 560 and 1:10,000 scale historical Ordnance Survey mapping dating back to the mid-19th century, identifying potentially contaminative past industrial land uses. For the purpose of this Envirocheck module, only data relating to mining and ground stability has been included and plotted on the accompanying Historical Land Use Information (1:10,000) map.	
Ground Stability Data (1:50,000)	4
The Ground Stability (1:50,000) section includes the BGS Geosure data suite, reporting features to 250m and plotted onto 3 separate maps. Also reported is brine subsidence, brine mining and salt mining data sets, of which Brine Pumping and Salt Mining Related Features are plotted, and subsidence insurance claims and insurance investigations data, which is not plotted.	
Motion Map Data (1:2,500)	5
The Motion Map Data (1:2,500) section contains data which is plotted to indicate long-term stability trends from analysis of satellite radar data.	
Historical Map List	7
The Historical Map List section details the historical mapping that has been analysed for your site, in relation to the Historical Land Use Information sections.	
Data Currency	9
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Useful Contacts	12

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The brine subsidence data relating to the Driotwich area as provided in this report is derived from JPB studies and physical monitoring undertaken annually over more than 35 years. For more detailed interpretation contact enquiries@jpb.co.uk. JPB retain the copyright and intellectual rights to this data and accept no liability for any loss or damage, including in direct or consequential loss, arising from the use of this data.

Data Type	Page Number	On Site	0 to 250m	251 to 500m
Mining and Natural Cavities Data				
BGS Recorded Mineral Sites				
Coal Mining Affected Areas	pg 1	Yes	n/a	n/a
Man Made Mining Cavities				
Mining Instability	pg 1	Yes	n/a	n/a
Natural Cavities				
Non Coal Mining Areas of Great Britain				n/a
Potential Mining Areas				
Historical Land Use Information (1:2,500)				
Extractive Industries or Potential Excavations from 1855-1909 (100m)	pg 2		1	n/a
Extractive Industries or Potential Excavations from 1893-1915 (100m)	pg 2		1	n/a
Extractive Industries or Potential Excavations from 1906-1937 (100m)	pg 2		2	n/a
Extractive Industries or Potential Excavations from 1924-1949 (100m)				n/a
Extractive Industries or Potential Excavations from 1950-1980 (100m)	pg 2	2	2	n/a
Subterranean Features (100m)				n/a
Historical Land Use Information (1:10,000)				
Air Shafts				
Disturbed Ground				
General Quarrying				
Heap, unknown constituents	pg 3	1		
Mineral Railway				
Mining & quarrying general				
Mining of coal & lignite				
Quarrying of sand & clay, operation of sand & gravel pits	pg 3		1	
Former Marshes				
Potentially Infilled Land (Non-Water)	pg 3		1	
Potentially Infilled Land (Water)	pg 3		2	5

Data Type	Page Number	On Site	0 to 250m	251 to 500m
Ground Stability Data (1:50,000)				
Brine Compensation Area			n/a	n/a
Brine Pumping Related Features				
Brine Subsidence Solution Area				
Potential for Collapsible Ground Stability Hazards	pg 4	Yes		n/a
Potential for Compressible Ground Stability Hazards	pg 4	Yes		n/a
Potential for Ground Dissolution Stability Hazards	pg 4	Yes		n/a
Potential for Landslide Ground Stability Hazards	pg 4	Yes		n/a
Potential for Running Sand Ground Stability Hazards	pg 4	Yes		n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 4	Yes	Yes	n/a
Salt Mining Related Features				
Subsidence Insurance Claims				n/a
Subsidence Investigations				n/a
Motion Map Data (1:2,500)				
Motion Map (100m)	pg 5	1	31	n/a

Report Version v49.0

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Coal Mining Affected Areas Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	A7NW (S)	0	1	336132 351504
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A7NW (S)	0	2	336132 351504
	Non Coal Mining Areas of Great Britain No Hazard				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	Extractive Industries or Potential Excavations from 1855-1909 Use: Well First Map Published 1881 Date: Last Map Published Not Applicable Date:	A11SW (NE)	41	-	336290 351809
2	Extractive Industries or Potential Excavations from 1893-1915 Use: Well First Map Published 1899 Date: Last Map Published Not Applicable Date:	A11SW (NE)	41	-	336287 351806
3	Extractive Industries or Potential Excavations from 1906-1937 Use: Well First Map Published 1911 Date: Last Map Published Not Applicable Date:	A11SW (NE)	42	-	336289 351809
4	Extractive Industries or Potential Excavations from 1906-1937 Use: W First Map Published 1911 Date: Last Map Published Not Applicable Date:	A6NE (S)	89	-	336106 351177
5	Extractive Industries or Potential Excavations from 1950-1980 Use: Pond First Map Published 1962 Date: Last Map Published N/A Date:	A7NW (SE)	0	-	336226 351321
6	Extractive Industries or Potential Excavations from 1950-1980 Use: Pond First Map Published 1959 Date: Last Map Published 1959 Date:	A10SE (W)	0	-	336000 351512
7	Extractive Industries or Potential Excavations from 1950-1980 Use: Sand Pit First Map Published 1962 Date: Last Map Published N/A Date:	A11SE (E)	1	-	336467 351595
8	Extractive Industries or Potential Excavations from 1950-1980 Use: Pond First Map Published 1962 Date: Last Map Published N/A Date:	A11SW (NE)	40	-	336295 351813

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	Heap, unknown constituents Use: Not Supplied Date of Mapping: 1964 - 1992	A11SE (E)	0	-	336461 351590
10	Quarrying of sand & clay, operation of sand & gravel pits Use: Not Supplied Date of Mapping: 1954	A11SE (NE)	17	-	336478 351748
11	Potentially Infilled Land (Non-Water) Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1992	A11SE (NE)	17	-	336478 351748
12	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1954	A10NE (N)	180	-	335980 351896
13	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1900	A10NW (NW)	241	-	335697 351911
14	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1900	A10NE (NW)	295	-	335812 351990
15	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1964	A6SW (SW)	383	-	335544 350971
16	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1954	A10NW (NW)	406	-	335464 351942
17	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1964	A9SE (W)	433	-	335339 351689
18	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1964	A9SE (NW)	449	-	335353 351828

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Brine Compensation Area The site does not fall within the brine compensation area.				
	Brine Subsidence Solution Area The site does not fall within the brine subsidence solution area.				
19	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	3	336132 351504
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	3	336132 351504
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	3	336132 351504
20	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	3	336132 351504
21	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	3	336132 351504
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A7NE (E)	0	3	336462 351496
22	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11SE (NE)	4	3	336481 351745
23	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11SE (E)	10	3	336473 351525
24	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A7SW (S)	163	3	336243 351087
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A7NW (S)	0	3	336132 351504

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
25	Motion Map Average Velocity -0.8 Gradient (mmyear):	A10SE (W)	0	-	335774 351557
25	Motion Map Average Velocity -0.6 Gradient (mmyear):	A10SW (W)	1	-	335769 351558
25	Motion Map Average Velocity -0.3 Gradient (mmyear):	A10SW (W)	4	-	335771 351562
26	Motion Map Average Velocity -0.4 Gradient (mmyear):	A10SE (W)	3	-	335777 351561
26	Motion Map Average Velocity 0.0 Gradient (mmyear):	A10SE (W)	11	-	335779 351568
27	Motion Map Average Velocity -0.8 Gradient (mmyear):	A10SE (W)	9	-	335798 351637
28	Motion Map Average Velocity -1.3 Gradient (mmyear):	A10SE (W)	10	-	335817 351587
28	Motion Map Average Velocity -1.2 Gradient (mmyear):	A10SE (W)	11	-	335815 351583
29	Motion Map Average Velocity 0.3 Gradient (mmyear):	A10SE (W)	12	-	335814 351576
29	Motion Map Average Velocity -0.7 Gradient (mmyear):	A10SE (W)	12	-	335814 351572
29	Motion Map Average Velocity -0.9 Gradient (mmyear):	A10SE (W)	13	-	335812 351568
29	Motion Map Average Velocity -0.9 Gradient (mmyear):	A10SE (W)	14	-	335810 351569
29	Motion Map Average Velocity -0.7 Gradient (mmyear):	A10SE (W)	16	-	335810 351573
30	Motion Map Average Velocity -0.2 Gradient (mmyear):	A10SE (W)	17	-	335795 351572
31	Motion Map Average Velocity -0.7 Gradient (mmyear):	A10SE (NW)	29	-	335809 351720
32	Motion Map Average Velocity -1.4 Gradient (mmyear):	A6NE (SW)	30	-	335855 351198
33	Motion Map Average Velocity -0.7 Gradient (mmyear):	A10SW (NW)	34	-	335754 351709
33	Motion Map Average Velocity -0.6 Gradient (mmyear):	A10SW (NW)	37	-	335755 351713
34	Motion Map Average Velocity 0.2 Gradient (mmyear):	A10SW (W)	49	-	335750 351612
34	Motion Map Average Velocity -0.1 Gradient (mmyear):	A10SW (W)	52	-	335748 351608

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
35	Motion Map Average Velocity -1.1 Gradient (mmyear):	A10SE (NW)	55	-	335825 351749
35	Motion Map Average Velocity -0.9 Gradient (mmyear):	A10SE (NW)	59	-	335824 351753
35	Motion Map Average Velocity -0.6 Gradient (mmyear):	A10SE (NW)	62	-	335818 351754
36	Motion Map Average Velocity 1.0 Gradient (mmyear):	A11SE (NE)	65	-	336531 351707
36	Motion Map Average Velocity 0.2 Gradient (mmyear):	A11SE (NE)	66	-	336532 351703
36	Motion Map Average Velocity 0.7 Gradient (mmyear):	A11SE (NE)	69	-	336535 351706
37	Motion Map Average Velocity -0.3 Gradient (mmyear):	A11SE (NE)	68	-	336533 351723
37	Motion Map Average Velocity -0.1 Gradient (mmyear):	A11SE (NE)	70	-	336536 351722
37	Motion Map Average Velocity -0.4 Gradient (mmyear):	A11SE (NE)	73	-	336537 351726
38	Motion Map Average Velocity -1.2 Gradient (mmyear):	A7NW (S)	89	-	336247 351180
39	Motion Map Average Velocity -0.8 Gradient (mmyear):	A7NW (S)	95	-	336237 351174
40	Motion Map Average Velocity -0.5 Gradient (mmyear):	A10SW (W)	100	-	335679 351682

The following mapping has been analysed for Historical Land Use Information (1:2,500):

1:2,500	Mapsheet	Published Date
Denbighshire	029_05	1881
Denbighshire	029_05	1881
Denbighshire	029_05	1881
Denbighshire	029_05	1881
Denbighshire	029_05	1899
Denbighshire	029_05	1899
Denbighshire	029_05	1899
Denbighshire	029_05	1899
Denbighshire	029_05	1911
Denbighshire	029_05	1911
Denbighshire	029_05	1911
Denbighshire	029_05	1911
Ordnance Survey Plan	SJ3650	1961
Ordnance Survey Plan	SJ3650	1961
Ordnance Survey Plan	SJ3552	1962
Ordnance Survey Plan	SJ3651	1962
Ordnance Survey Plan	SJ3651	1962
Ordnance Survey Plan	SJ3651	1962
Ordnance Survey Plan	SJ3651	1962
Ordnance Survey Plan	SJ3651	1962
Ordnance Survey Plan	SJ3652	1962
Ordnance Survey Plan	SJ3652	1962

The following mapping has been analysed for Historical Land Use Information (1:10,000):

1:10,560	Mapsheet	Published Date
Denbighshire	028_00	1879
Denbighshire	029_00	1881
Cheshire	053_00	1881
Cheshire	059_00	1881
Denbighshire	029_SW	1899
Denbighshire	028_NE	1900
Denbighshire	028_SE	1900
Denbighshire	029_NW	1900
Flintshire	020_NW	1914
Denbighshire	028_SE	1914
Denbighshire	029_NW	1914
Denbighshire	029_SW	1914
Denbighshire	028_NE	1915
Denbighshire	028_NE	1938
Denbighshire	028_SE	1938
Denbighshire	029_SW	1938
Denbighshire	029_NW	1954
Ordnance Survey Plan	SJ35SE	1964
Ordnance Survey Plan	SJ35SW	1964
1:10,000	Mapsheet	Published Date
Ordnance Survey Plan	SJ35SE	1992
Ordnance Survey Plan	SJ35SW	1992

Mining and Cavities Data	Version	Update Cycle
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	October 2014	Bi-Annually
Coal Mining Affected Areas The Coal Authority - Mining Report Service	December 2013	As notified
Man Made Mining Cavities Peter Brett Associates	August 2014	Bi-Annually
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Natural Cavities Peter Brett Associates	August 2014	Bi-Annually
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	July 2014	Not Applicable
Historical Land Use Information (1:2,500)	Version	Update Cycle
Subterranean Features Landmark Information Group Limited	September 2014	Bi-Annually
Ground Stability Data (1:50,000)	Version	Update Cycle
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2014	Annually
Subsidence Insurance Claims SP Property Services	November 2014	Quarterly
Subsidence Investigations CET Structures Ltd	November 2014	Quarterly

Motion Map Data (1:2,500)	Version	Update Cycle
Motion Map		
Nigel Press Associates - Hampshire	February 2011	As notified
Nigel Press Associates - Cambridge	January 2011	As notified
Nigel Press Associates - Ipswich	January 2011	As notified
Nigel Press Associates - Norwich	January 2011	As notified
Nigel Press Associates - Peterborough	January 2011	As notified
Nigel Press Associates - Barnstaple	July 2010	As notified
Nigel Press Associates - Derbyshire	July 2010	As notified
Nigel Press Associates - Humberside	July 2010	As notified
Nigel Press Associates - Kent	July 2010	As notified
Nigel Press Associates - Lincolnshire	July 2010	As notified
Nigel Press Associates - Nottinghamshire	July 2010	As notified
Nigel Press Associates - Birmingham	May 2009	As notified
Nigel Press Associates - Bournemouth	May 2009	As notified
Nigel Press Associates - Brighton	May 2009	As notified
Nigel Press Associates - Bristol	May 2009	As notified
Nigel Press Associates - Cardiff	May 2009	As notified
Nigel Press Associates - Central London	May 2009	As notified
Nigel Press Associates - Cheltenham	May 2009	As notified
Nigel Press Associates - Coventry	May 2009	As notified
Nigel Press Associates - Crawley	May 2009	As notified
Nigel Press Associates - Edinburgh	May 2009	As notified
Nigel Press Associates - Exeter	May 2009	As notified
Nigel Press Associates - Glasgow	May 2009	As notified
Nigel Press Associates - Isle of Wight	May 2009	As notified
Nigel Press Associates - Leeds	May 2009	As notified
Nigel Press Associates - Leicester	May 2009	As notified
Nigel Press Associates - Liverpool	May 2009	As notified
Nigel Press Associates - Manchester	May 2009	As notified
Nigel Press Associates - Milton Keynes	May 2009	As notified
Nigel Press Associates - Newcastle	May 2009	As notified
Nigel Press Associates - Northwich	May 2009	As notified
Nigel Press Associates - Nottingham	May 2009	As notified
Nigel Press Associates - Oxford	May 2009	As notified
Nigel Press Associates - Plymouth	May 2009	As notified
Nigel Press Associates - Portsmouth	May 2009	As notified
Nigel Press Associates - Preston	May 2009	As notified
Nigel Press Associates - Reading	May 2009	As notified
Nigel Press Associates - Sheffield	May 2009	As notified
Nigel Press Associates - Stoke	May 2009	As notified
Nigel Press Associates - Swindon	May 2009	As notified
Nigel Press Associates - Tonbridge	May 2009	As notified
Nigel Press Associates - North London	November 2008	As notified
Nigel Press Associates - Head Office	September 2008	As notified

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
British Geological Survey	 British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL
The Coal Authority	THE COAL AUTHORITY
Ove Arup	ARUP
Peter Brett Associates	
Wardell Armstrong	
Johnson Poole & Bloomer	

Contact	Name and Address	Contact Details
1	The Coal Authority - Mining Report Service 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG	Telephone: 0845 7626848 Email: thecoalauthority@coal.gov.uk
2	Ove Arup & Partners Central Square, Forth Street, Newcastle upon Tyne, Tyne and Wear, NE1 3PL	Telephone: 0191 261 6080 Fax: 0191 261 7879
3	British Geological Survey - Enquiry Service British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
-	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Historical Land Use Information (1:2,500)

General

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

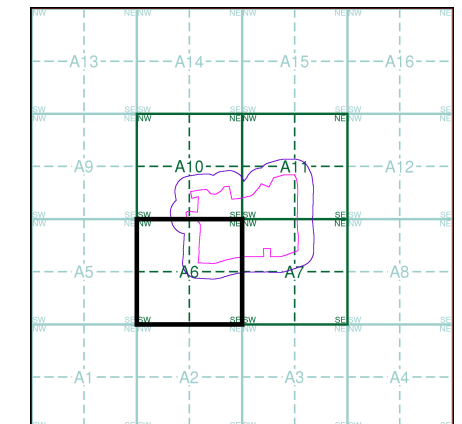
Potentially Contaminative Industrial Uses (Extractive Industries Activity)

	Point	Line	Polygon
Extractive Industries Activity from 1855 - 1909	▲	—	■
Extractive Industries Activity from 1893 - 1915	▲	—	■
Extractive Industries Activity from 1906 - 1937	▲	—	■
Extractive Industries Activity from 1924 - 1949	▲	—	■
Extractive Industries Activity from 1950 - 1980	▲	—	■

Subterranean Features

	Point	Line	Polygon
Subterranean Features	▼	---	■

Mining and Ground Stability - Segment A6

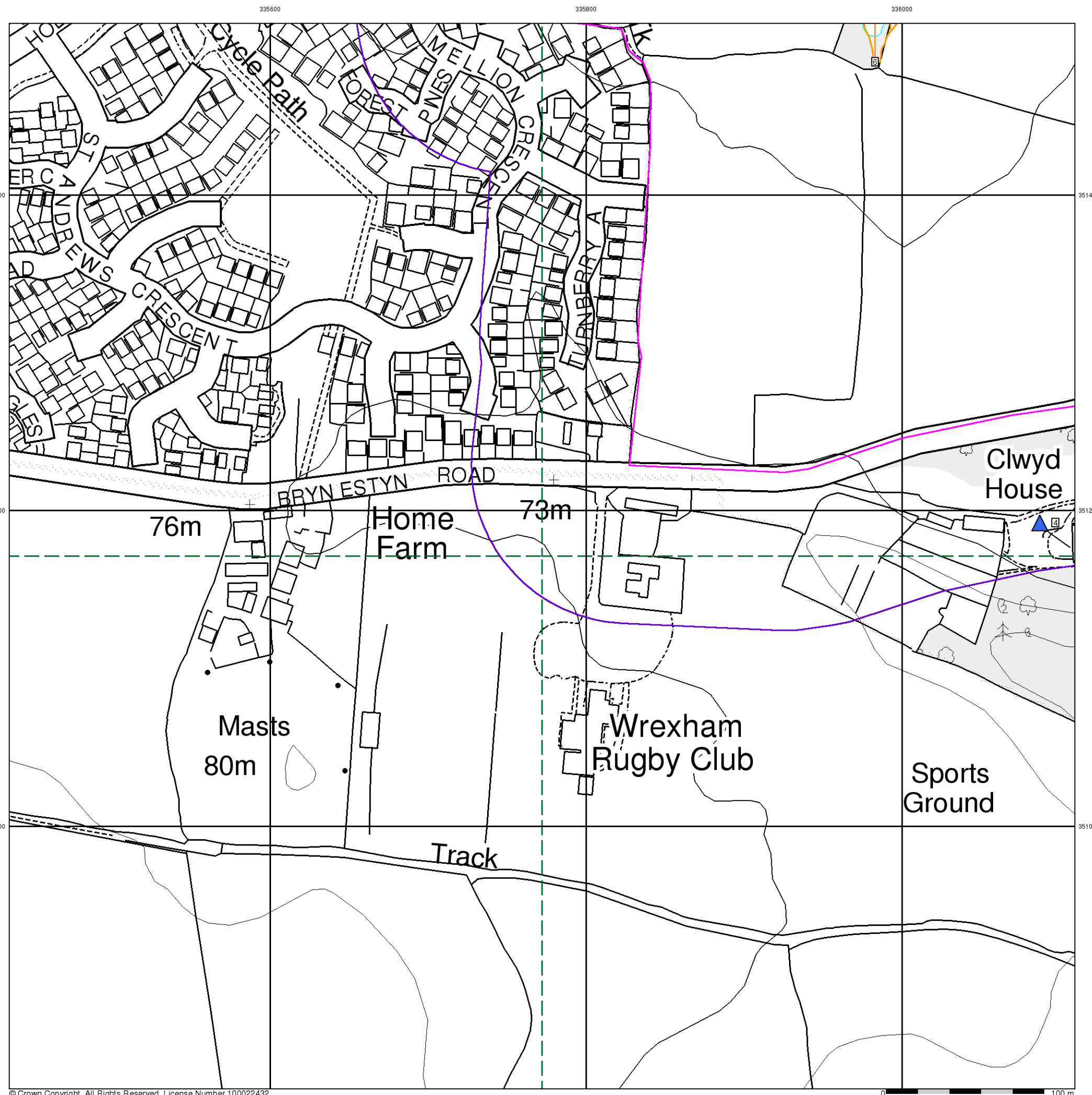


Order Details

Order Number: 61961705_1_1
Customer Ref: R2062
National Grid Reference: 336130, 351500
Slice: A
Site Area (Ha): 28.92
Plot Buffer (m): 100

Site Details

Site at 336180, 351500



Historical Land Use Information (1:2,500)

General

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

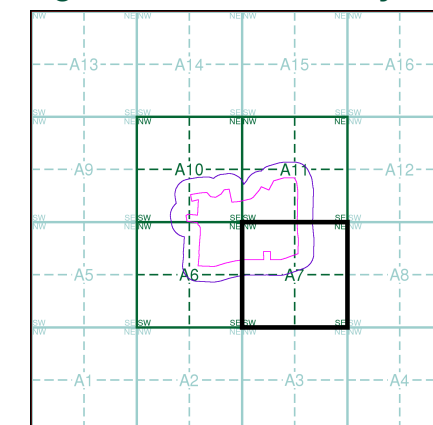
Potentially Contaminative Industrial Uses (Extractive Industries Activity)

	Point	Line	Polygon
Extractive Industries Activity from 1855 - 1909	▲	—	■
Extractive Industries Activity from 1893 - 1915	▲	—	■
Extractive Industries Activity from 1906 - 1937	▲	—	■
Extractive Industries Activity from 1924 - 1949	▲	—	■
Extractive Industries Activity from 1950 - 1980	▲	—	■

Subterranean Features

	Point	Line	Polygon
Subterranean Features	▼	---	■

Mining and Ground Stability - Segment A7

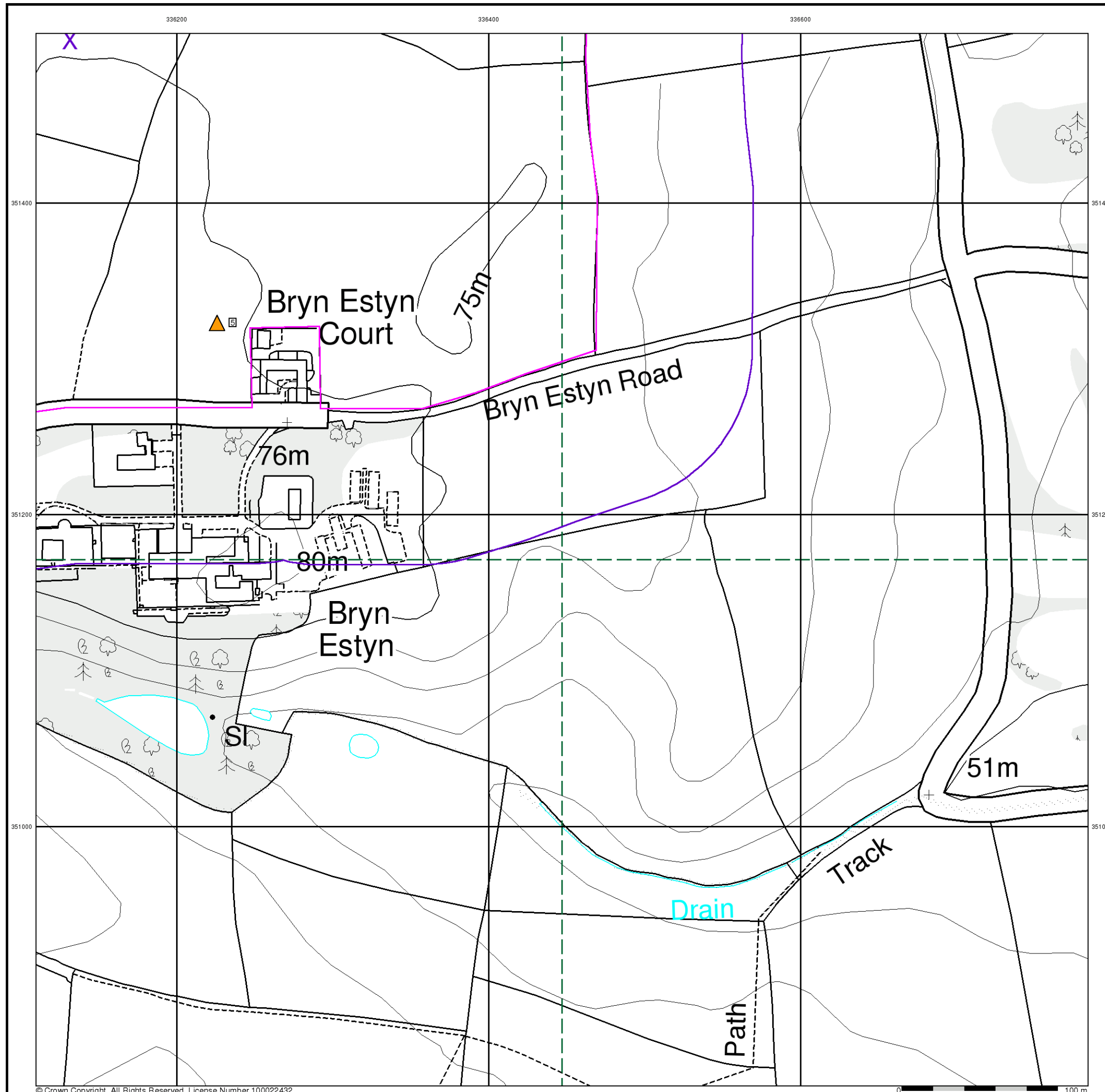


Order Details

Order Number: 61961705_1_1
Customer Ref: R2062
National Grid Reference: 336130, 351500
Slice: A
Site Area (Ha): 28.92
Plot Buffer (m): 100

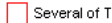
Site Details

Site at 336180, 351500



Historical Land Use Information (1:2,500)

General

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

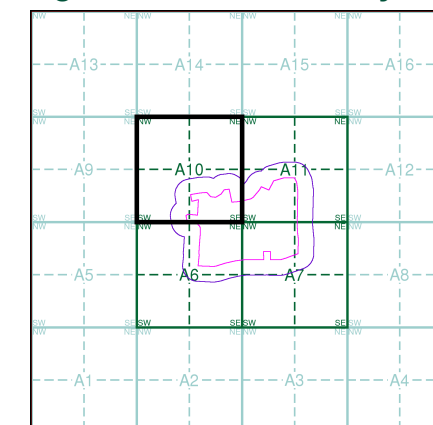
Potentially Contaminative Industrial Uses (Extractive Industries Activity)

	Point	Line	Polygon
Extractive Industries Activity from 1855 - 1909			
Extractive Industries Activity from 1893 - 1915			
Extractive Industries Activity from 1906 - 1937			
Extractive Industries Activity from 1924 - 1949			
Extractive Industries Activity from 1950 - 1980			

Subterranean Features

	Point	Line	Polygon
Subterranean Features			

Mining and Ground Stability - Segment A10

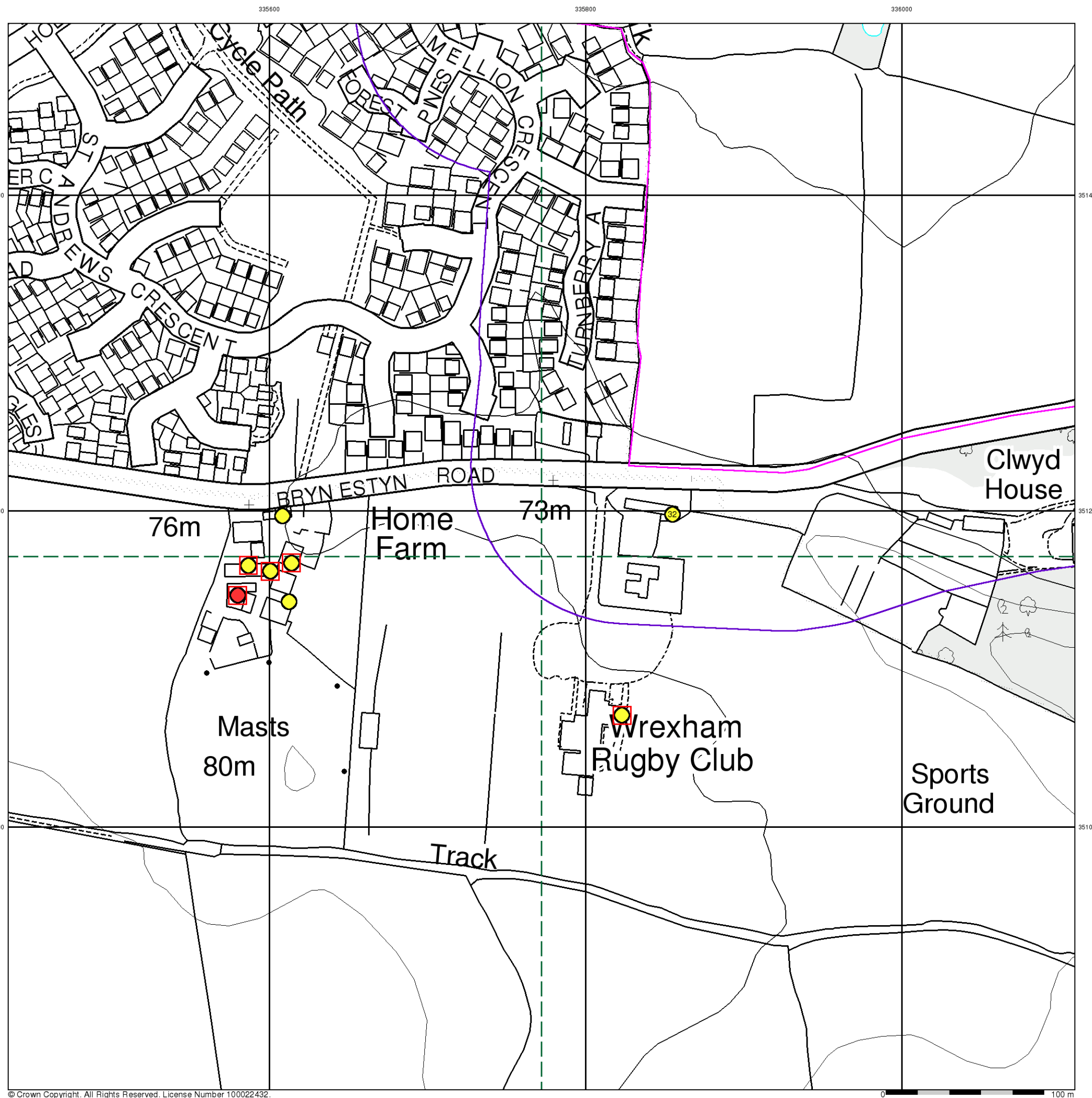


Order Details

Order Number: 61961705_1_1
Customer Ref: R2062
National Grid Reference: 336130, 351500
Slice: A
Site Area (Ha): 28.92
Plot Buffer (m): 100

Site Details

Site at 336180, 351500



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Motion Map Data (1:2,500)

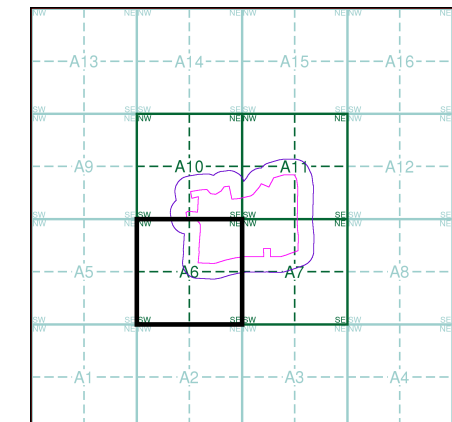
General

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

Average Velocity Gradient

- Upward Movement > 3.5mm per year
- Upward Movement 1.5mm to 3.5mm per year
- Stable 1.5mm to -1.5mm per year
- Downward Movement -1.5mm to -3.5mm per year
- Downward Movement > -3.5mm per year

Mining and Ground Stability - Segment A6



Order Details

Order Number: 61961705_1_1
Customer Ref: R2062
National Grid Reference: 336130, 351500
Slice: A
Site Area (Ha): 28.92
Plot Buffer (m): 100

Site Details

Site at 336180, 351500

Motion Map Data (1:2,500)

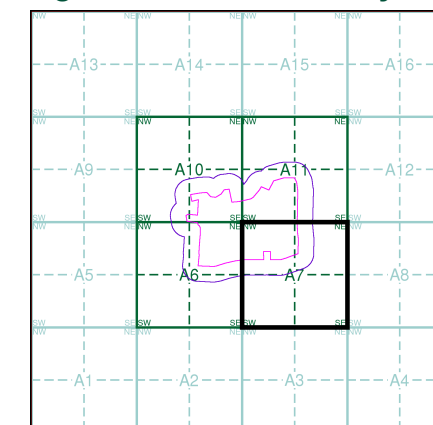
General

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

Average Velocity Gradient

- Upward Movement > 3.5mm per year ●
- Upward Movement 1.5mm to 3.5mm per year ●
- Stable 1.5mm to -1.5mm per year ●
- Downward Movement -1.5mm to -3.5mm per year ●
- Downward Movement > -3.5mm per year ●

Mining and Ground Stability - Segment A7

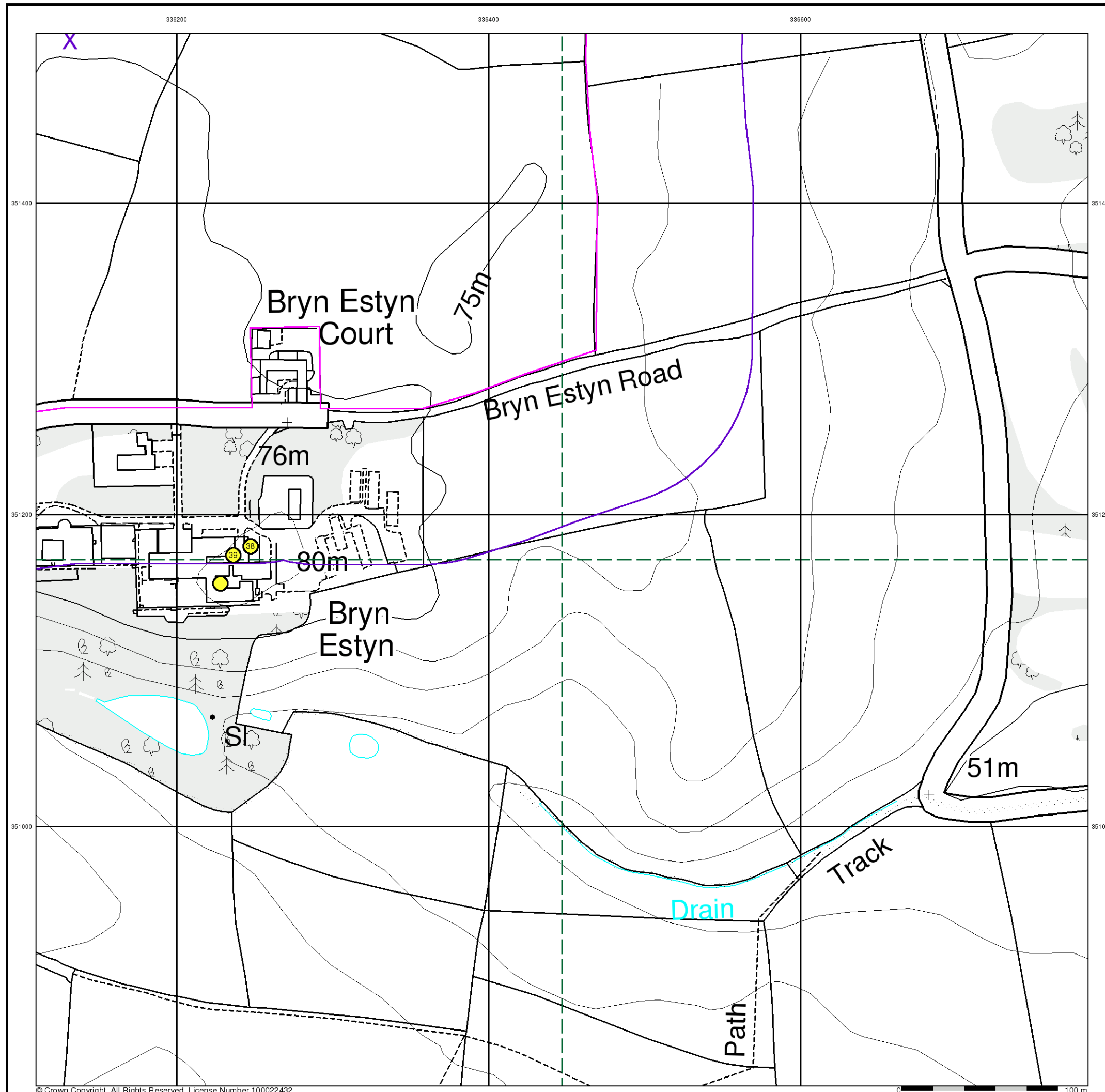


Order Details

Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Plot Buffer (m): 100

Site Details

Site at 336180, 351500



Motion Map Data (1:2,500)

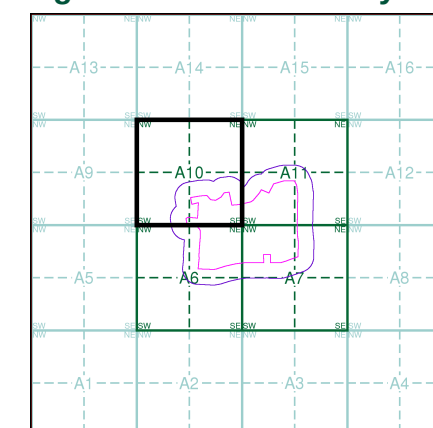
General

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

Average Velocity Gradient

- Upward Movement > 3.5mm per year ●
- Upward Movement 1.5mm to 3.5mm per year ●
- Stable 1.5mm to -1.5mm per year ●
- Downward Movement -1.5mm to -3.5mm per year ●
- Downward Movement > -3.5mm per year ●

Mining and Ground Stability - Segment A10

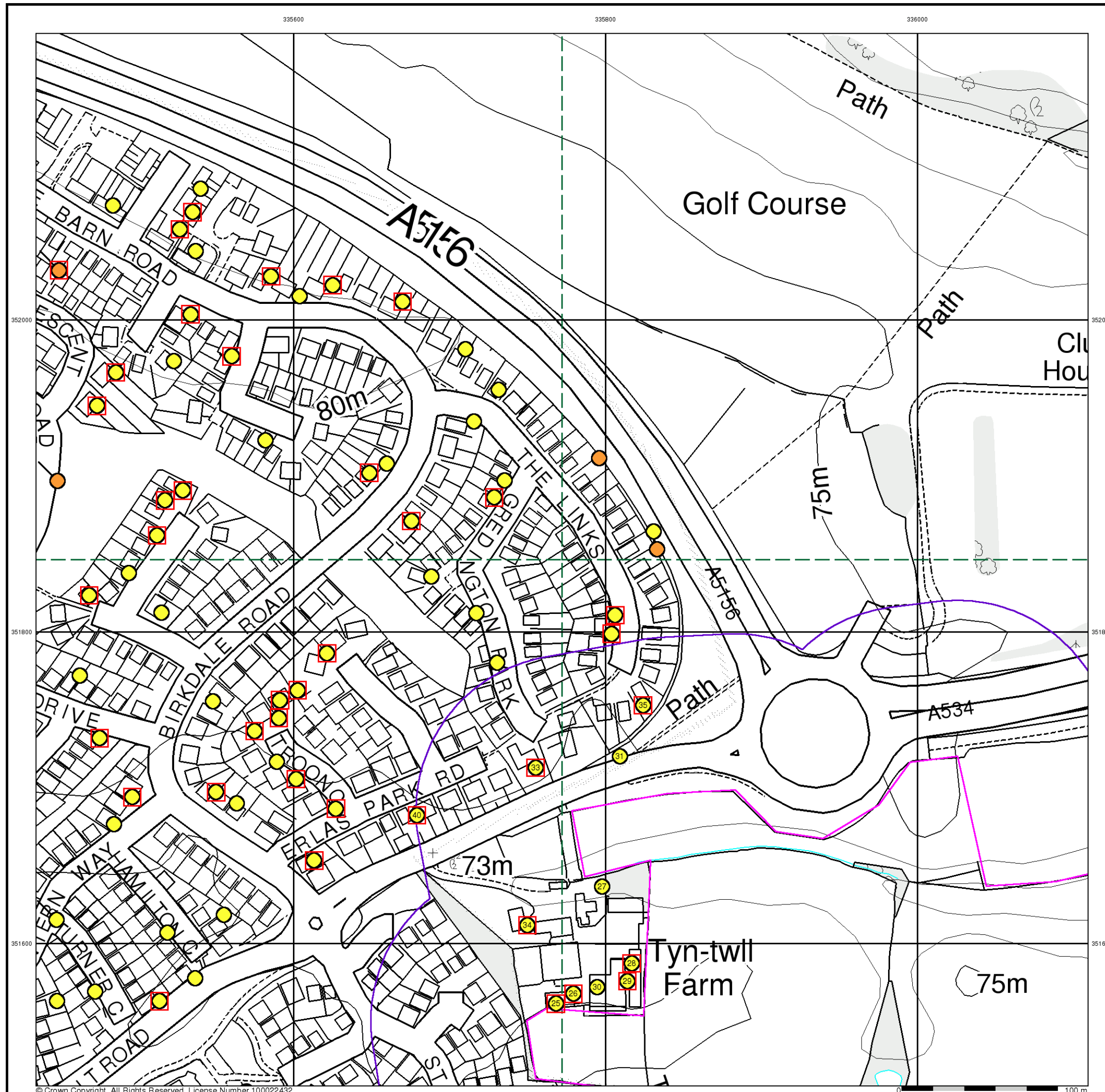


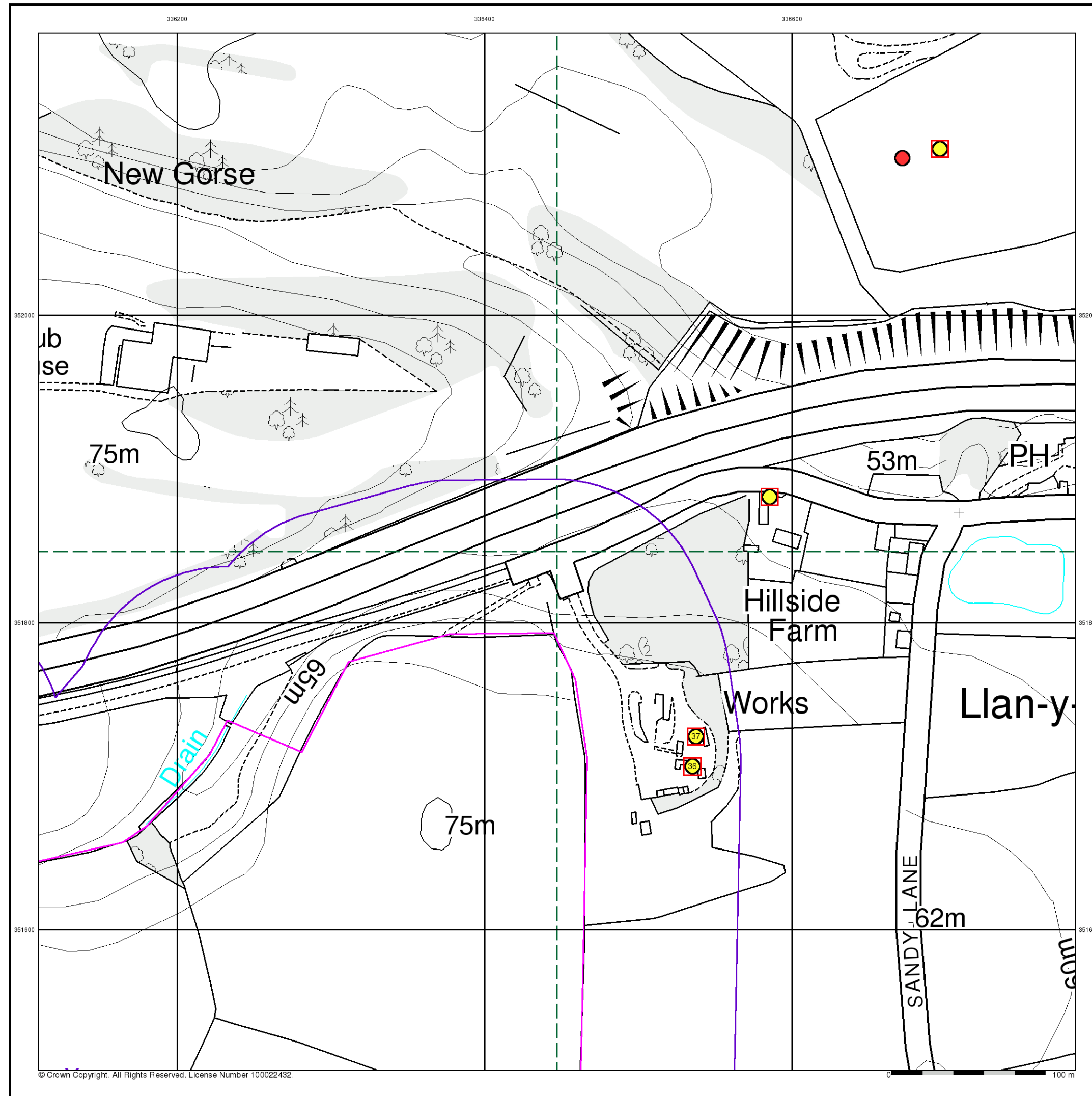
Order Details

Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Plot Buffer (m): 100

Site Details

Site at 336180, 351500





Motion Map Data (1:2,500)

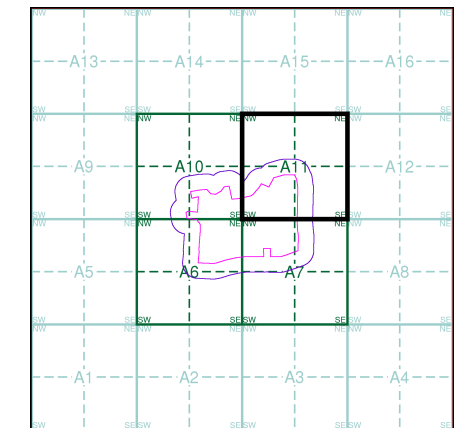
General

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

Average Velocity Gradient

- Upward Movement > 3.5mm per year
- Upward Movement 1.5mm to 3.5mm per year
- Stable 1.5mm to -1.5mm per year
- Downward Movement -1.5mm to -3.5mm per year
- Downward Movement > -3.5mm per year

Mining and Ground Stability - Segment A11



Order Details

Order Number: 61961705_1_1
Customer Ref: R2062
National Grid Reference: 336130, 351500
Slice: A
Site Area (Ha): 28.92
Plot Buffer (m): 100

Site Details

Site at 336180, 351500

General

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

Agency and Hydrological

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

Waste

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

Hazardous Substances

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

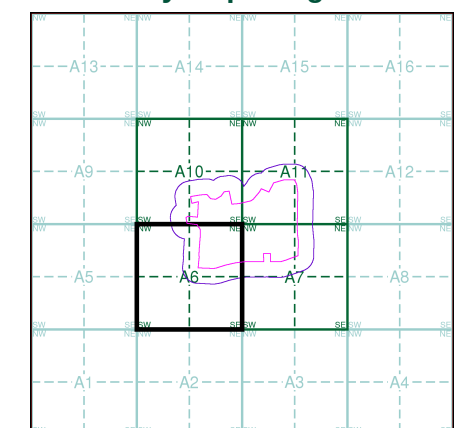
Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

Site Sensitivity Map - Segment A6

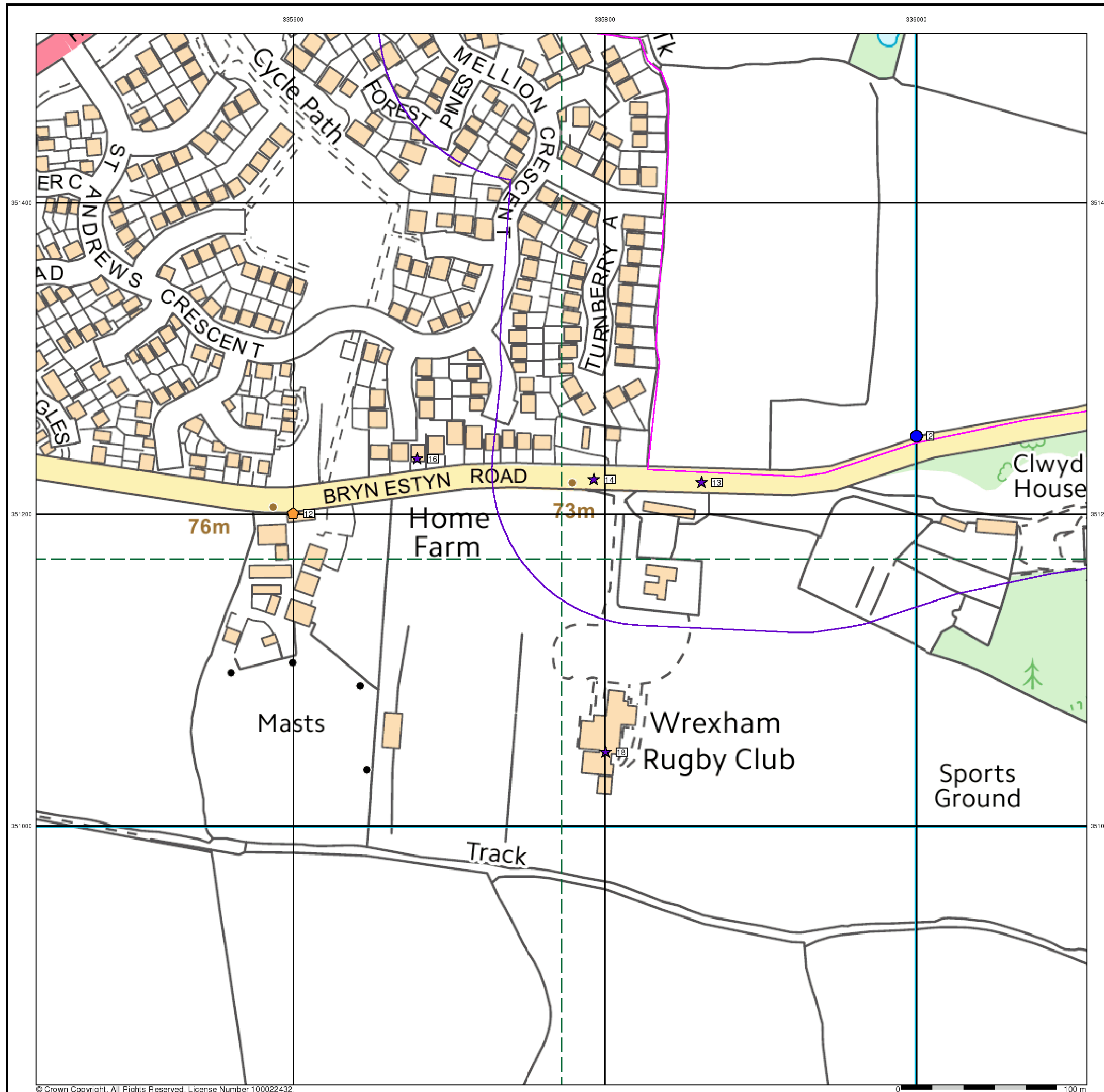


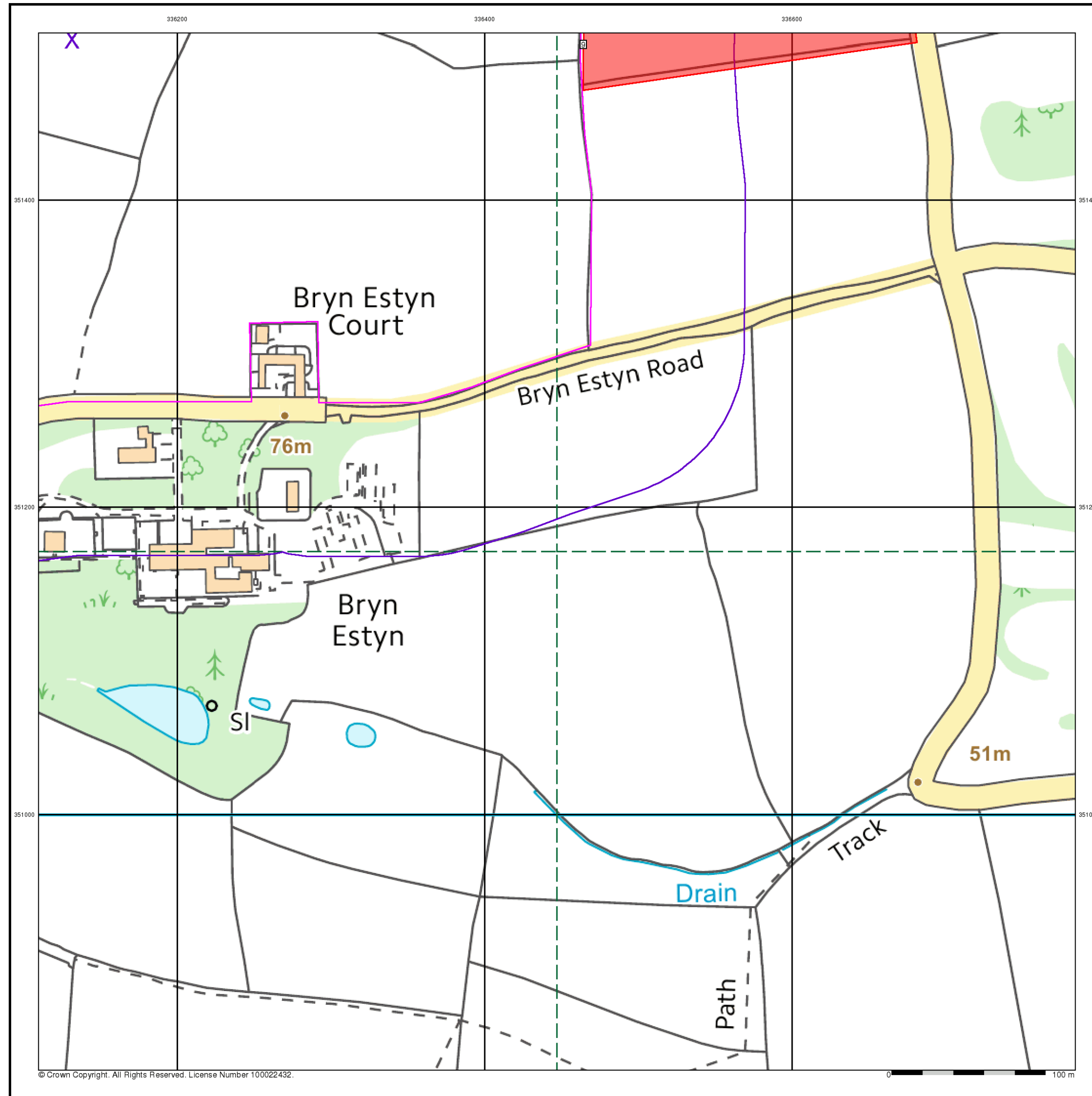
Order Details

Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92

Site Details

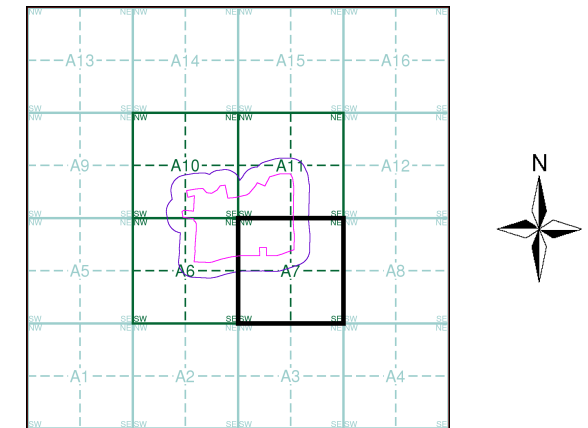
Site at 336180, 351500





- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Map ID
 - Several of Type at Location
- Agency and Hydrological**
- Contaminated Land Register Entry or Notice (Location)
 - Contaminated Land Register Entry or Notice
 - Discharge Consent
 - Enforcement or Prohibition Notice
 - Integrated Pollution Control
 - Integrated Pollution Prevention Control
 - Local Authority Integrated Pollution Prevention and Control
 - Local Authority Pollution Prevention and Control Enforcement
 - Pollution Incident to Controlled Waters
 - Prosecution Relating to Authorised Processes
 - Prosecution Relating to Controlled Waters
 - Registered Radioactive Substance
 - River Network or Water Feature
 - River Quality Sampling Point
 - Substantiated Pollution Incident Register
 - Water Abstraction
 - Water Industry Act Referral
- Waste**
- BGS Recorded Landfill Site (Location)
 - BGS Recorded Landfill Site
 - EA Historic Landfill (Buffered Point)
 - EA Historic Landfill (Polygon)
 - Integrated Pollution Control Registered Waste Site
 - Licensed Waste Management Facility (Landfill Boundary)
 - Licensed Waste Management Facility (Location)
 - Local Authority Recorded Landfill Site (Location)
 - Local Authority Recorded Landfill Site
 - Registered Landfill Site
 - Registered Landfill Site (Location)
 - Registered Landfill Site (Point Buffered to 100m)
 - Registered Landfill Site (Point Buffered to 250m)
 - Registered Waste Transfer Site (Location)
 - Registered Waste Transfer Site
 - Registered Waste Treatment or Disposal Site (Location)
 - Registered Waste Treatment or Disposal Site
- Hazardous Substances**
- COMAH Site
 - Explosive Site
 - NIHHS Site
 - Planning Hazardous Substance Consent
 - Planning Hazardous Substance Enforcement
- Geological**
- BGS Recorded Mineral Site
- Industrial Land Use**
- Contemporary Trade Directory Entry
 - Fuel Station Entry

Site Sensitivity Map - Segment A7



Order Details

Order Number: 61961705_1_1
Customer Ref: R2062
National Grid Reference: 336130, 351500
Slice: A
Site Area (Ha): 28.92

Site Details

Site at 336180, 351500

General

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

Agency and Hydrological

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

Waste

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

Hazardous Substances

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

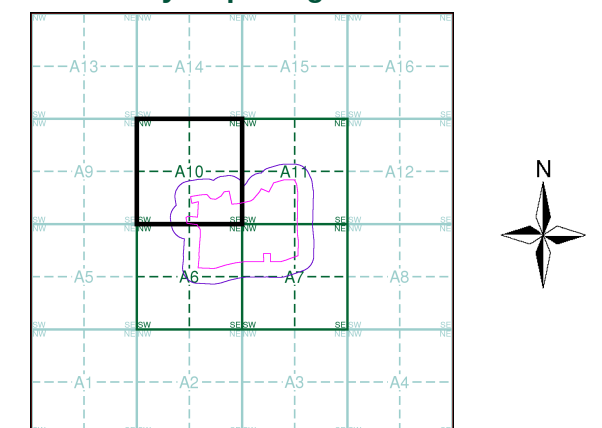
Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

Site Sensitivity Map - Segment A10

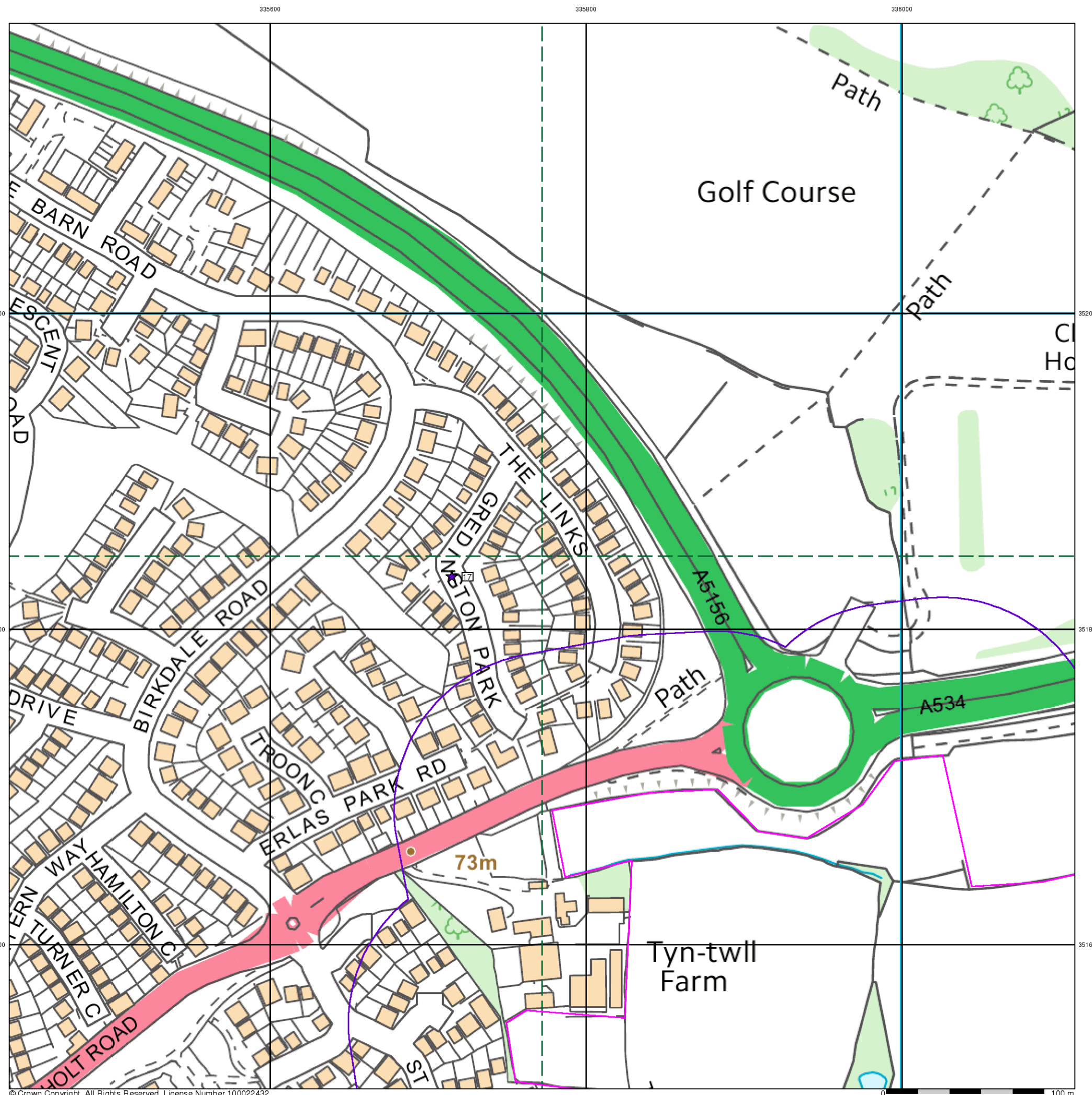


Order Details

Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92

Site Details

Site at 336180, 351500



General

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

Agency and Hydrological

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

Waste

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

Hazardous Substances

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

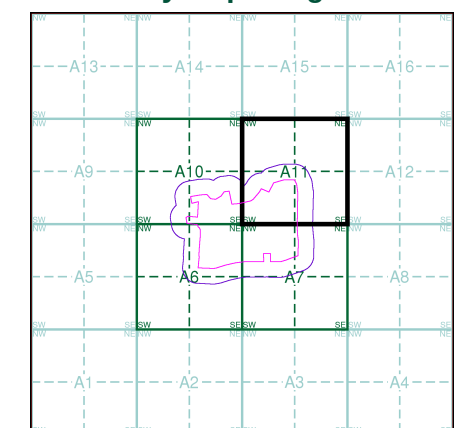
Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

Site Sensitivity Map - Segment A11

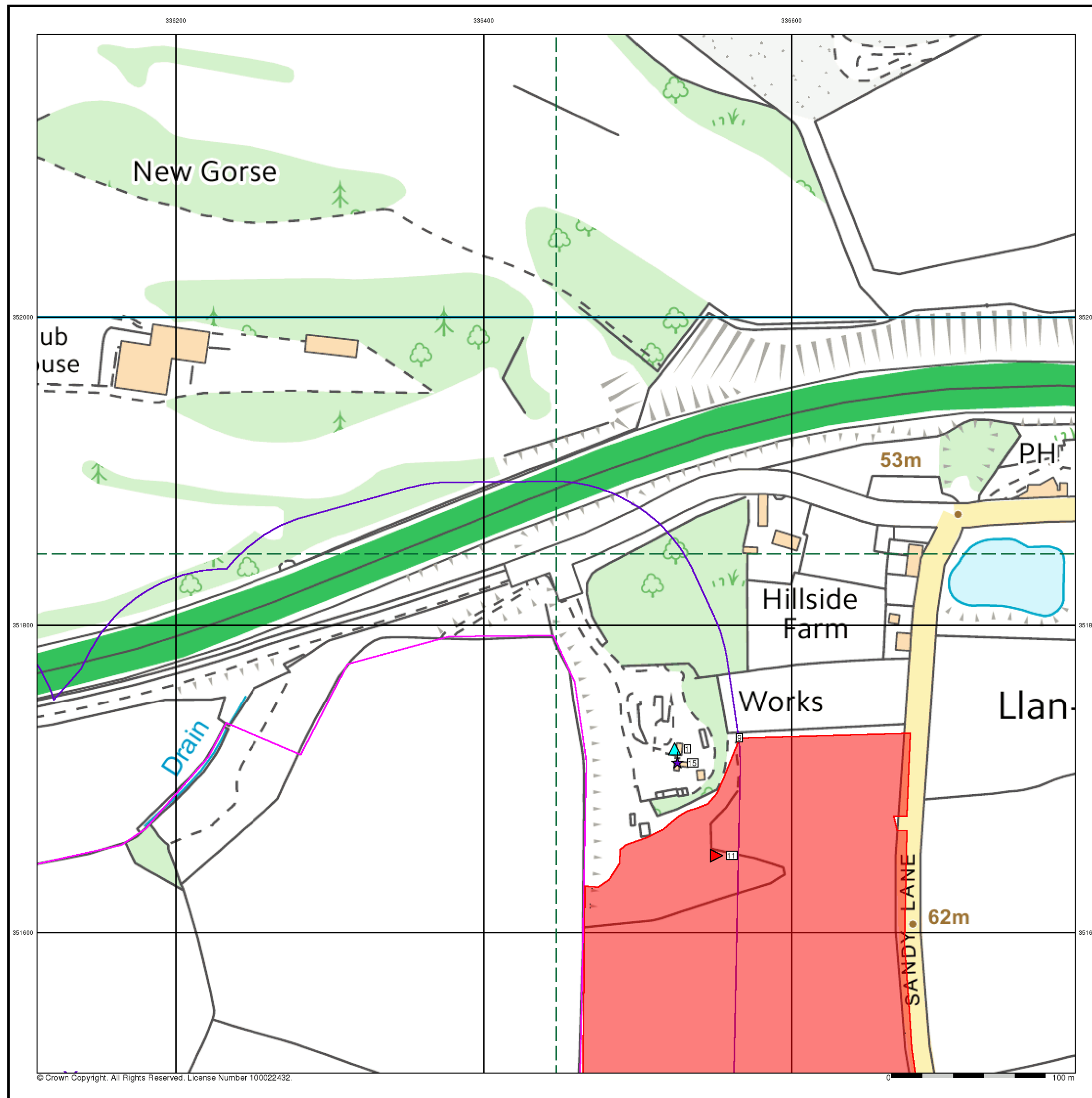


Order Details

Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92

Site Details

Site at 336180, 351500



General

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

Agency and Hydrological

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

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
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- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
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- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Hazardous Substances

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

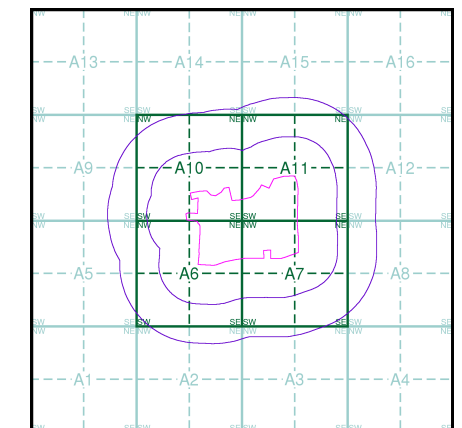
Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

Site Sensitivity Map - Slice A

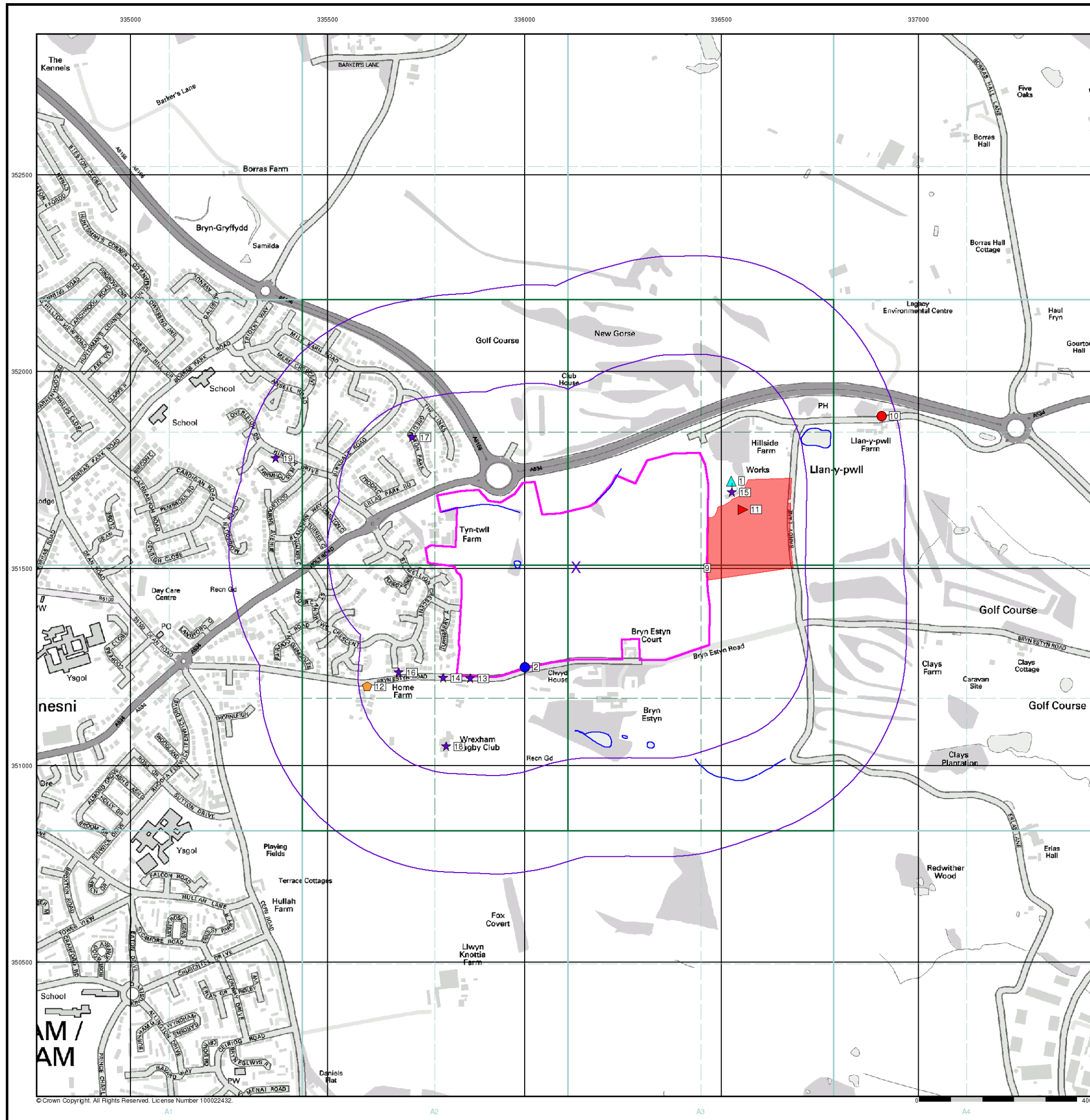


Order Details

Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500



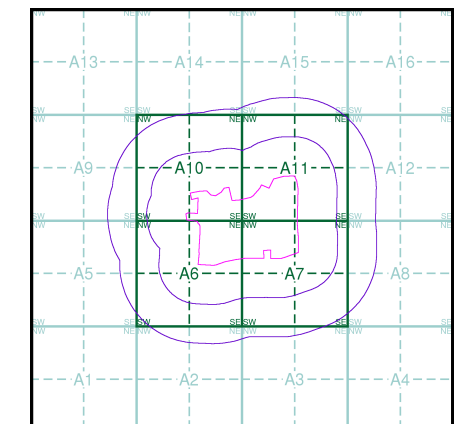
General

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

Agency and Hydrological (Flood)

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

Flood Map - Slice A

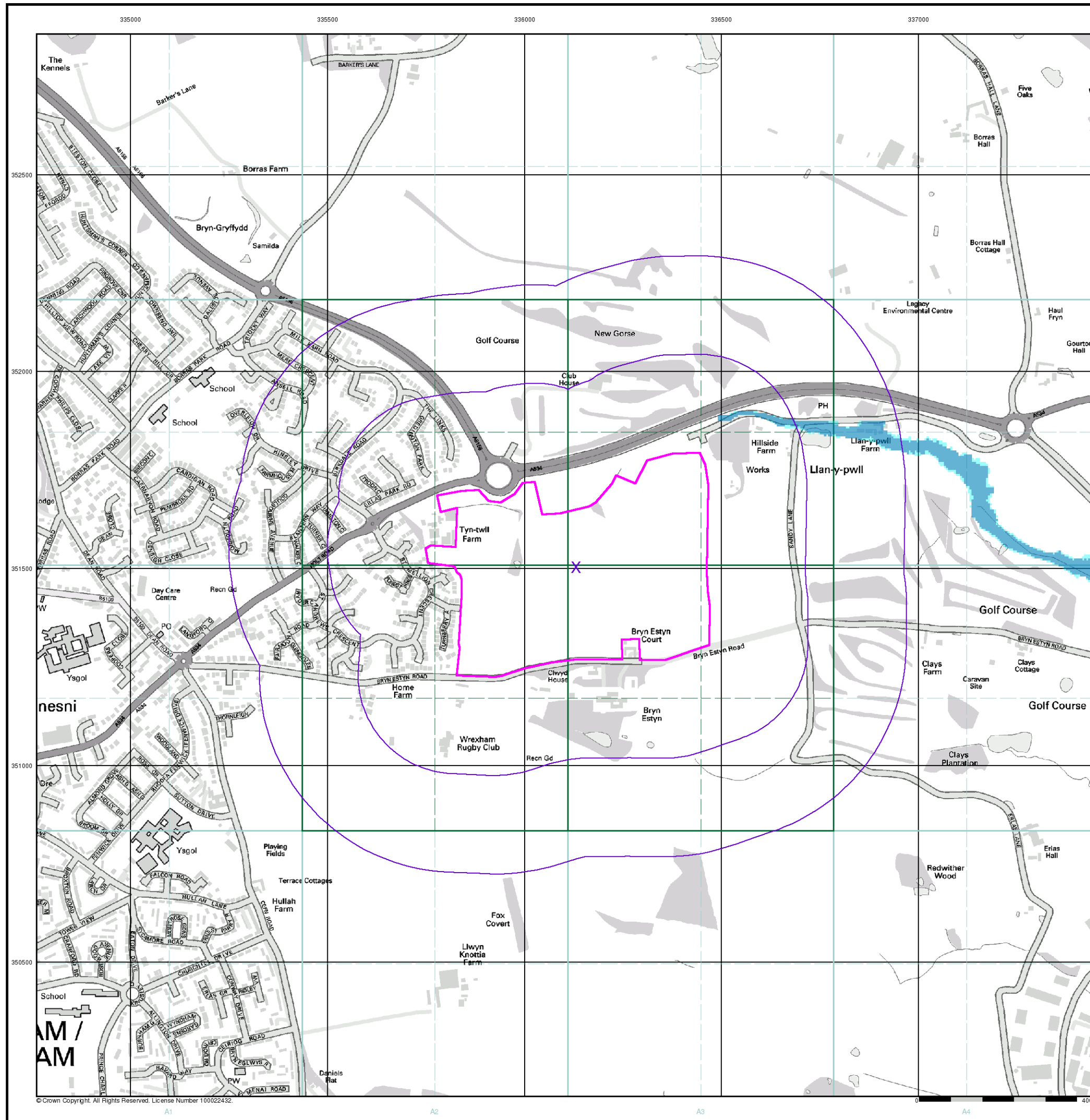


Order Details

Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500



General

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

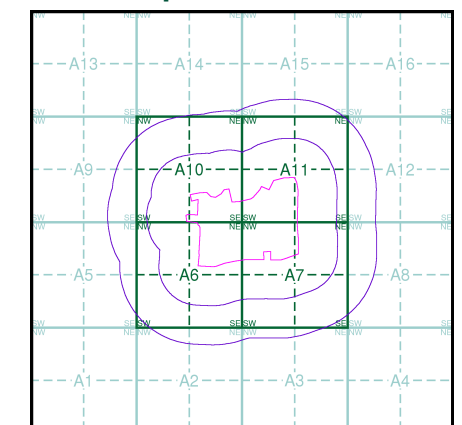
Agency and Hydrological (Boreholes)

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

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

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

Borehole Map - Slice A

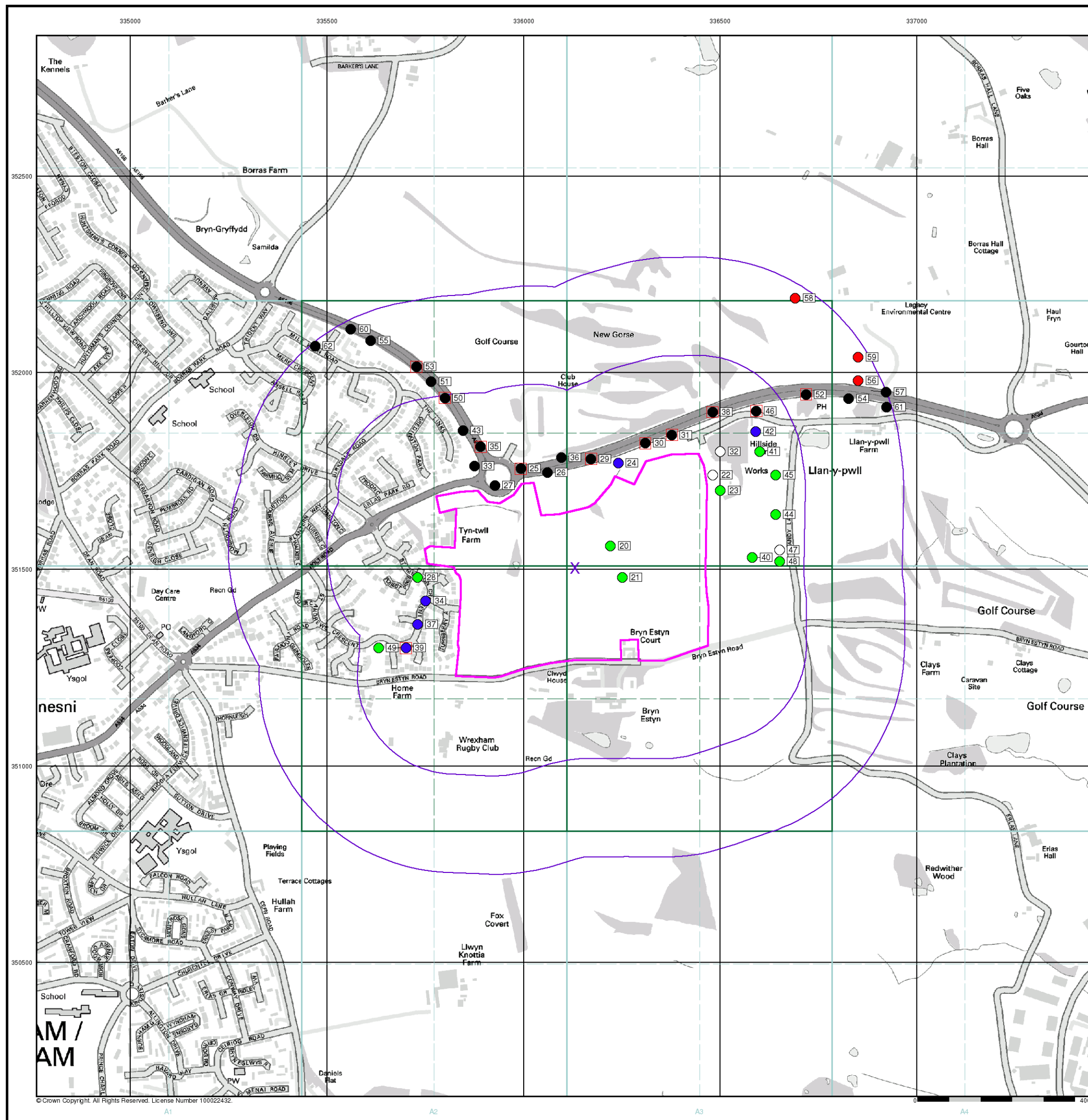


Order Details

Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500



General

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

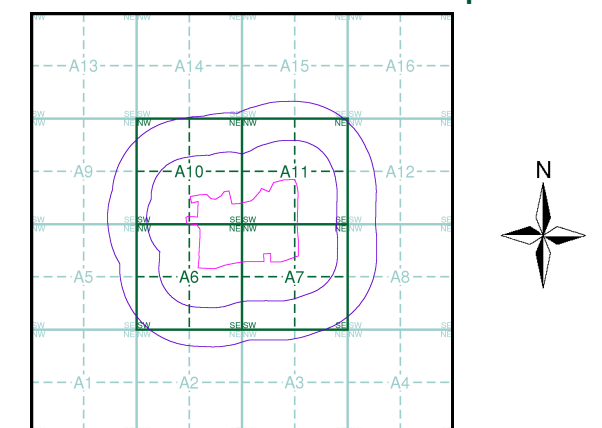
Detailed River Network Data

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

Contours (height in metres)

- Standard Contour  105  Mean Low Water
- Master Contour  100  Mean High Water
- Spot Height  167.3

EAN/RW Detailed River Network Map - Slice A

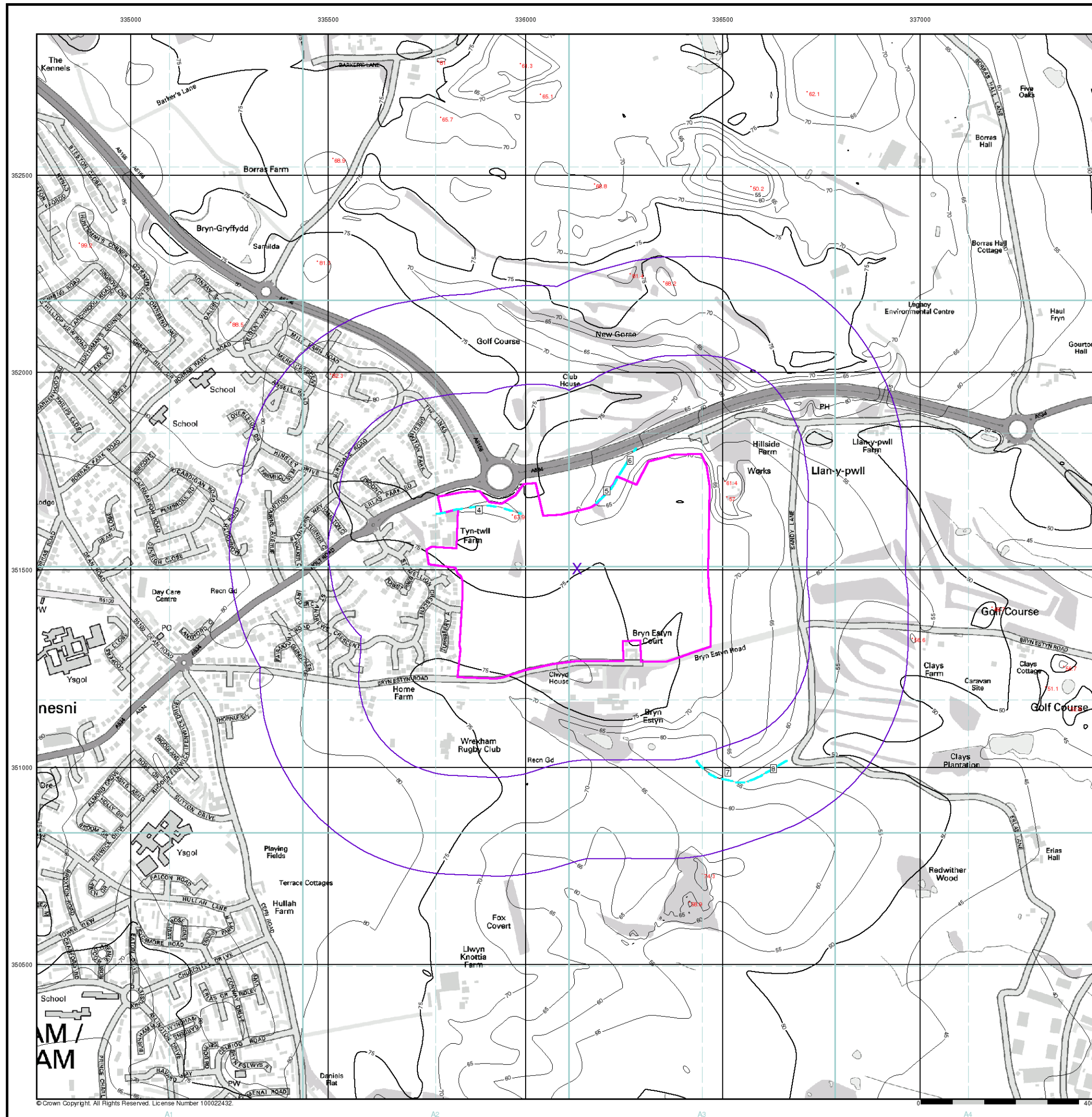


Order Details

Order Number: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500

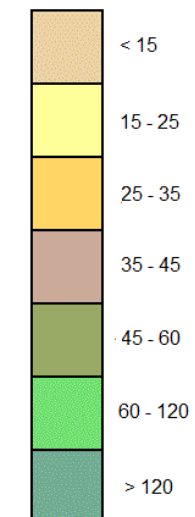


General

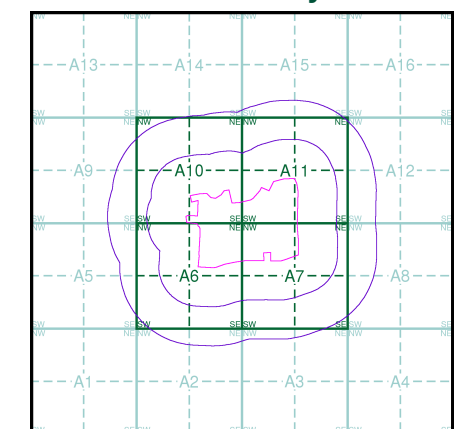
 Specified Site  Specified Buffer(s)  Bearing Reference Point

Estimated Soil Chemistry Arsenic

Arsenic Concentrations mg/kg



Estimated Soil Chemistry Arsenic - Slice A



Order Details

Order Details: 61961705_1_1
Customer Ref: R2062
National Grid Reference: 336130, 351500
Slice: A
Site Area (Ha): 28.92
Search Buffer (m): 500

Site Details

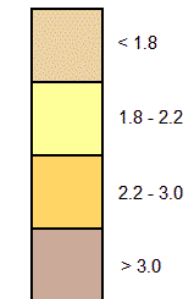
Site at 336180, 351500

General

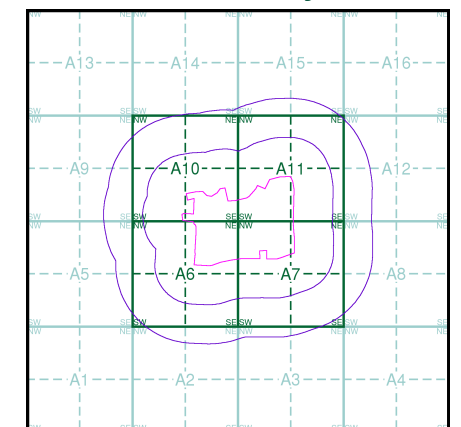
 Specified Site  Specified Buffer(s)  Bearing Reference Point

Estimated Soil Chemistry Cadmium

Cadmium Concentrations mg/kg



Estimated Soil Chemistry Cadmium - Slice A



Order Details

Order Details: 61961705_1_1
Customer Ref: R2062
National Grid Reference: 336130, 351500
Slice: A
Site Area (Ha): 28.92
Search Buffer (m): 500

Site Details

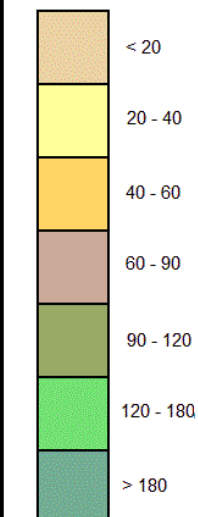
Site at 336180, 351500

General

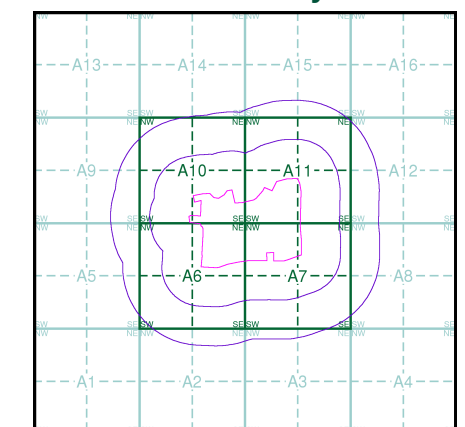
 Specified Site
  Specified Buffer(s)
  Bearing Reference Point

Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg



Estimated Soil Chemistry Chromium - Slice A

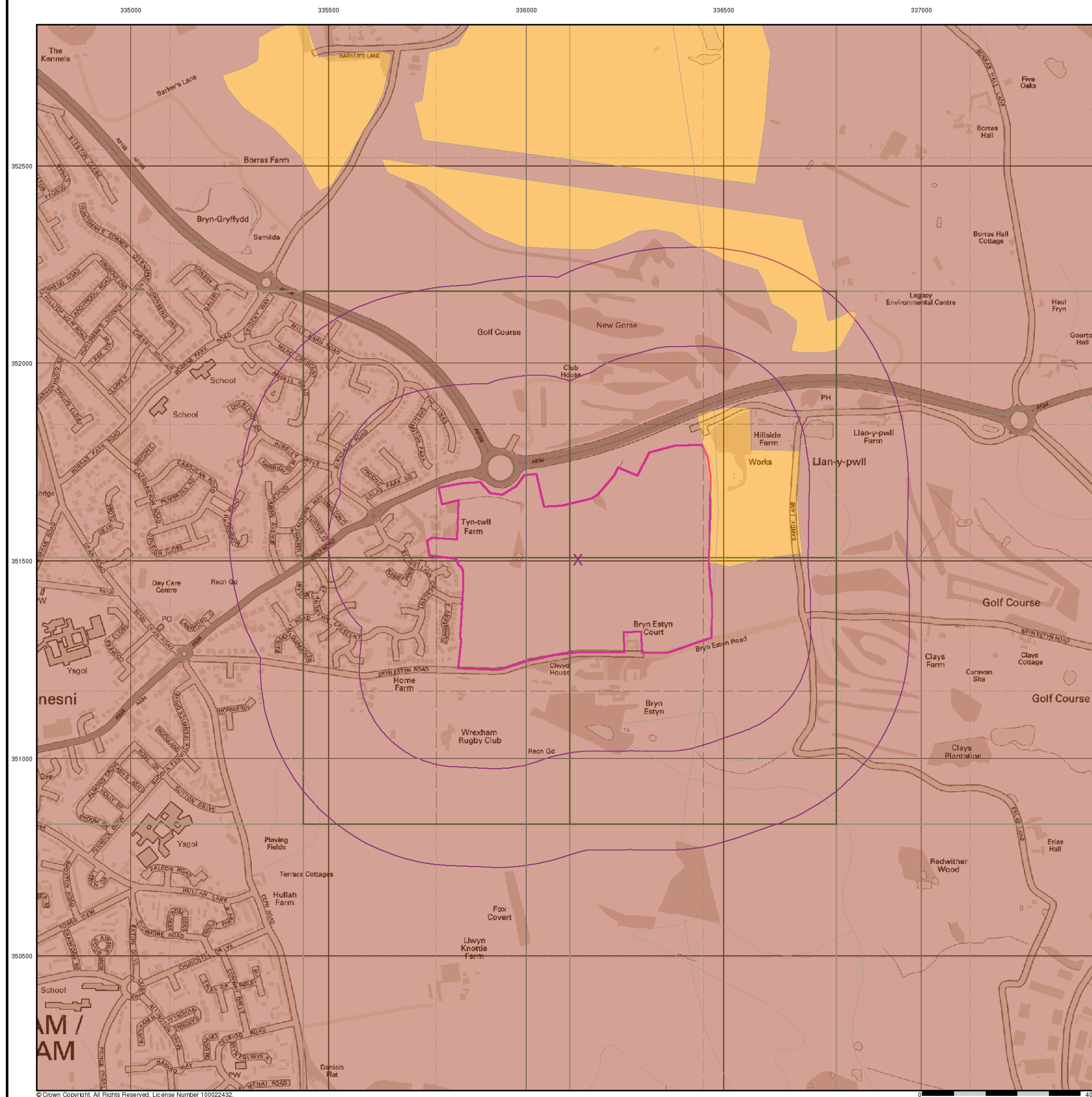


Order Details

Order Details: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500

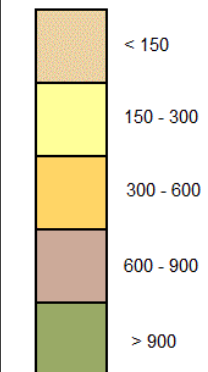


General

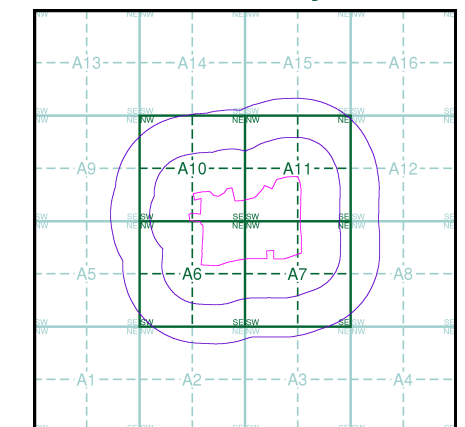
 Specified Site
  Specified Buffer(s)
  Bearing Reference Point

Estimated Soil Chemistry Lead

Lead Concentrations mg/kg



Estimated Soil Chemistry Lead - Slice A

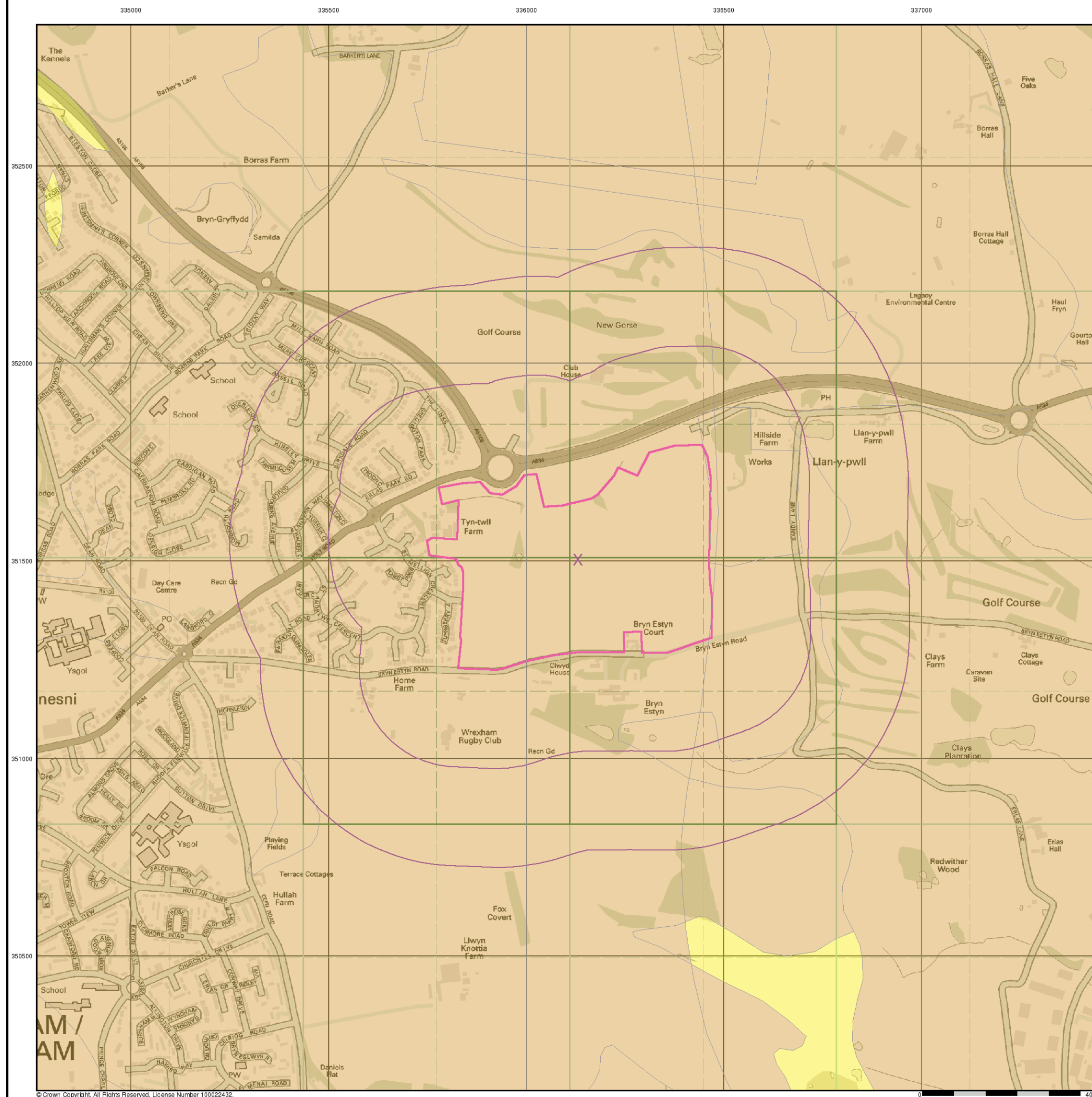


Order Details

Order Details: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500

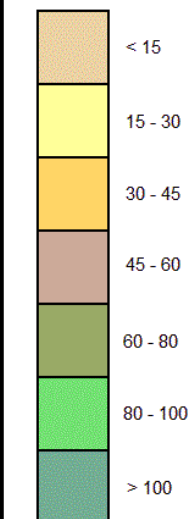


General

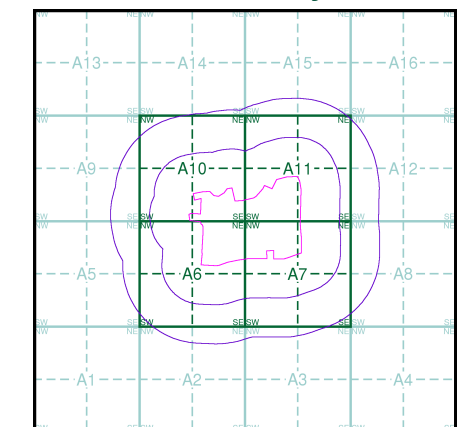
 Specified Site
  Specified Buffer(s)
  Bearing Reference Point

Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg



Estimated Soil Chemistry Nickel - Slice A



Order Details

Order Details: 61961705_1_1
 Customer Ref: R2062
 National Grid Reference: 336130, 351500
 Slice: A
 Site Area (Ha): 28.92
 Search Buffer (m): 500

Site Details

Site at 336180, 351500

