



RIDGE

DESK TOP STUDY

SANDY BROW LANE, KNOWSLEY

BALANCE POWER

August 2023



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1. INTRODUCTION

1.1. Brief

Ridge and Partners LLP (Ridge) was commissioned by Balance Power (the Client) to undertake a Desk Top Study for land at Sandy Brow Lane, Knowsley centred on 344459, 398401 (hereafter referred to as 'the site'). A site location plan is included as Figure 1.

Ridge were briefed to use information provided to obtain an environmental database search relating to the site and carry out a walkover survey to assess and report on the findings with respect to potential ground contamination and potential associated future liabilities in accordance with the Preliminary Risk Assessment procedure outlined in LCRM (2020), published by the Environment Agency.

This report is prepared in line with the agreed brief and is subject to report conditions shown in Appendix 1.

1.2. Proposals

Initial development plans comprise a track off of Perimeter Road to the west which provides access to the main development in the eastern portion of the site.

The main development area comprises a 132kV substation area, transformer, control room, storage room, and many battery enclosures with associated inverter and transformer.

Proposed development plans are included as Figure 2.

1.3. Legal Context and Methodology

Part IIA of the Environmental Protection Act provides a risk-based approach to the identification and remediation of land where contamination poses an unacceptable risk to human health or the environment, but the regime does not take into account future uses. New developments are therefore controlled by the planning regime, with reference to the National Planning Policy Framework (NPPF, 2018), rather than directly by Part IIA of the Environmental Protection Act.

This report has been prepared in accordance with published Environment Agency guidance – Land Contamination Risk Management (LCRM, 2020), which supersedes CLR 11. CLR 11 adopted and refined the well-recognised methodology and terminology that has been used in contaminated land risk assessment for a number of years.

LCRM advocates a tiered approach to risk assessment, as necessary. This document constitutes a **Preliminary Risk Assessment**.

Further details regarding Legal Context and Methodology are included as Appendix 2.

1.4. End Use Classification

The site will be classified as commercial/ industrial for the Preliminary Risk Assessment.

A change in the site use from that currently proposed may result in the need for re-assessment of risk criteria and the conclusions and recommendations resulting from the risk assessment could therefore significantly change.

1.5. Report Scope and Limitation

This report is based upon a review of readily available historical and current information, a site walkover survey, geological and hydrogeological maps and information from an environmental database search. The assessment is based on the proposed use outlined in Section 1.2. The outcomes of this assessment could change if the end uses change.

The information contained in this report is intended for the use of **Balance Power**. Ridge can take no responsibility for the use of this information by any other party or for uses other than that described in this report.

2. SITE CONDITIONS

An engineer from Ridge visited on 18 July 2023 to conduct a walkover survey of the site and the surrounding areas for the purpose of identifying any potential contamination or evidence of previous contaminative processes. The descriptions below relate to site conditions at the time of the inspection only.

A photographic log is included as Appendix 3.

2.1. Site Description

The site is centred on easting 344279 and northing 398453, broadly in Knowsley.

The site is a rough rectangular shape with the longest axis east to west of 800m to 1,000m and approximately 350m to 400m north to south. The site has an area of approximately 32 hectares.

The site generally comprises rough open grass land with densely vegetated field boundaries around the north, south and eastern perimeter. The western edge of the site which runs parallel to Perimeter Road is lightly vegetated. Barbed wire fencing is also noted within the vegetation along field boundaries. The east and south of the site are relatively flat however a large uneven mound is present in the central north of the site.

A number of mounds of concrete and brick rubble as well as numerous other grassed mounds and embankments were noted across the west of the site. A small area of Himalayan Balsam was noted in the south-eastern corner of the site. The east of the site was generally noted to be much flatter. The near surface grassed soils (Made Ground) across the majority of the site were noted to contain occasional plastics, glass, metals, fabrics, brick and concrete.

2no. monitoring wells with locked upright covers were noted in the centre of the site, one of which was located within the raised area.

2.2. Current Site Use

The site currently comprises grassed farmland and is used for livestock grazing.

2.3. Access

A double vehicular gate and an adjacent pedestrian access point are present midway along the western site boundary along Perimeter Road. The double gate leads onto a single width gravel farm track which runs to the midpoint of the site before terminating.

2.4. Structures

No buildings are present on site however 2no. electricity pylons, and associated overhead cables, are situated in the west of the site.

2.5. Boundaries

The site boundaries are generally densely vegetated with a mixture of mature shrubs and trees combined with barbed wire fencing.

The northern, eastern and southern boundaries of the site are marked by surface water drainage ditches. Beyond these ditches is farmland.

2.6. Topography

The general elevation of farmland in the area is 45-50mAOD with a general fall towards the north-west.

A topographic survey for the site has been produced, extract below. Site levels vary between 48-54mAOD although in the north-west portion, where waste was deposited, ground levels are up to 59mAOD. In general there is a relatively steep peripheral slope to the northern, eastern and southern boundaries and thereafter gradients are quite shallow. There is a 2m deep valley feature trending south to north across the north-western part of the site.



Extract 2.1: Topographical Survey

2.7. Surroundings

The site is surrounded by agricultural land to the north, south and east with an industrial estate located to the west across Perimeter Road.

This large industrial estate comprises a variety of occupants from distribution warehouses to chemical manufacturers.

The closest properties to the site are summarised as follows –

- Industrial buildings some 90-150m to the west
- Top House Farm, approximately 310m to the north
- New Cut Farm, circa 670m south-east
- Sandy Brow 265m south

2.8. Utilities

Two sets of overhead powerlines cross the west of site from north to south. No other services were noted during the walkover.

2.9. Potential Sources of Contamination – Walkover Survey

Made ground which included occasional plastics, fabrics, metals, concrete, brick, and timber was recorded in various places at the site surface. No significant visual contamination was noted, no yellowing or vegetation die back was noted.

3. SITE HISTORY AND HISTORICAL CONTAMINATIVE SOURCES

3.1. Review of Historical Maps

Ordnance Survey Maps provided within a Groundsure Report package have been obtained to provide details of the history of the site and surrounding areas. We have also summarised map reviews in previously written reports. The descriptions focus on features which are considered to be relevant to the proposed development within 100m of the development site boundary. Note, potential contaminative sources and features more than 100m from the site have been discussed only where they are considered to be relevant. Copies of the maps are included as Appendix 4.

The earliest reviewed map from 1850 shows the entire site as farmland and woodland. Kirkby Moss Lane extended through the centre of the site orientated east to west and a second unnamed track through the centre of the site orientated north to south. The south-western portion of the site was part of Charley Wood and the remainder of the site was farmland sub-divided into a series of fields.

Kirkby Industrial Estate is first shown on the 1956 map, although it is understood that this area was developed during the war years for the manufacture of munitions. Two small 'marl pits' are shown to the north-east of the site.

Perimeter Road is first marked on the 1966 edition map. A small structure is shown in the central part of the site to the south-east of where the aforementioned tracks intersect. A series of drains are shown. A small pond is located on site close to the eastern boundary.

The Environment Agency reported that a portion of the site was operated as a landfill between 1965 and 1975 and included the filling of household and industrial wastes. More details are provided within subsequent sections of this report.

The 1990 map does not show any site features other than overhead cables, which were first shown on 1966 and 1978 maps.

KBC reports that 185,000m³ of topsoil, subsoil and builders waste was deposited on part of the site as an unauthorised operation circa 1989-1992. This material was never removed from the site.

The 2006 and 2013 maps show the site in its present day layout with a track extending from Perimeter Road to the centre of the site and area of enclosed woodland planting along the southern site boundary.

3.2. Potential Sources of Contamination – Historical Map Review

Contaminant sources considered to present a potential risk to the site are detailed in the table below.

POTENTIAL SOURCES OF CONTAMINATION CONSIDERED A RISK TO THE SITE		
FEATURE	DISTANCE, DIRECTION	APPROX. DATES PRESENT
Waste Materials/ Made Ground associated with historical landfilling and illegal landfilling of the site.	On site	Deposited 1965-1992
Landfill gas associated with landfill waste.	On site	1965 – present
Contamination from adjacent land uses.	Within 100m west	1956 – present

Table 3.1: Potential Sources following Historical Map Review

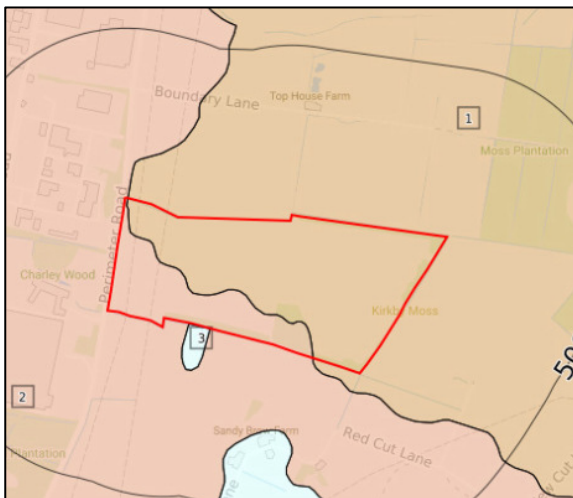
4. PHYSICAL SETTING

4.1. Geology and Hydrogeology

The following observations are taken from the British Geological Survey (BGS) GeoIndex (2023) and the Geo Insight Groundsure Report (Appendix 5).

4.1.1. Superficial Deposits

Superficial deposits comprise the following, as shown on Extract 4.1. Peat [1] and Shirdley Hill Sand Formation [2]. Devensian Till [3] is adjacent south. All deposits are considered to be unproductive (aquifers).

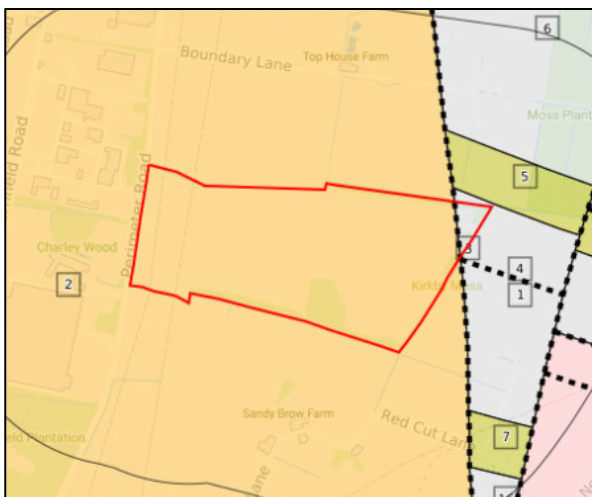


Extract 4.1: Superficial deposits

4.1.2. Bedrock Geology

Bedrock geology comprises the following, as shown on Extract 4.2. Chester Sandstone Formation [2] underlying the majority of the site and Pennine Lower Coal Measures [1].

Chester Sandstone Formation [2] is considered a Principal Aquifer while the [1] Pennine Lower Coal Measures [1] are categorized as a Secondary (A) aquifer.



Extract 4.2: Bedrock geology

A Principal aquifer is defined as layers of rock or drift deposits that have high intergranular and/ or fracture permeability meaning they usually have a high level of water storage. They may support water supply and/ or river base flow on a strategic scale.

A Secondary (A) aquifer is defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

4.1.3. Artificial Ground, Landslips and Faults

The entire site is classified as Made Ground owing to it's historical landfilling history.

An inferred fault [3] on Extract 4.2 above is situated on site. A fossil horizon/ marine band [4] is located adjacent east of the site.

4.1.4. Radon

Much of the site is classified as 'less than 1% of properties affected', but the extreme north-eastern corner is categorised as 'between 1% and 3% of properties affected'.

In consideration of the proposed end use of the site i.e. battery storage and absence of residential properties, this will not inhibit the development.

4.1.5. Ground Workings and Mining

The entire site is classified as a refuse heap, based on 1966 mapping. A pond has been identified in the extreme eastern portion of the site based on 1966 and 1976 mapping.

4.1.6. Natural Ground Subsidence

The BGS has provided the following on-site information as summarised in the table below.

PROCESS	RISK LEVEL	DETAILS
Compressible Deposits Majority of site	Very Low	Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.
Compressible Deposits North extreme of site	High	This is considered be associated with Peat potentially on site. Highly compressible strata. Significant constraint on land use depending on thickness.
Collapsible Deposits	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.
Landslides	Very Low	Slope instability problems are unlikely to be present. No special actions required.
Running Sands	Very Low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.
Shrink Swell Clay	Negligible	Ground conditions predominantly non-plastic.
Ground Dissolution of Soluble Rocks	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution.

Table 4.1: Ground Subsidence Records

4.1.7. BGS Estimated Background Soil Chemistry

Estimated background concentrations on site are as follows: arsenic 25-35mg/kg; cadmium 1.8mg/kg; chromium 90-120mg/kg; nickel 15-30mg/kg, lead 100-200mg/kg.

4.2. Hydrology

4.2.1. Surface Water Features

The Groundsure Report has identified on-site drainage ditches which surround the site. Kirkby Brook, which flows west, is located on the southern boundary orientated east and west.

4.2.2. Flooding

The site is situated with Environment Agency Flood Zone 1 (negligible risk).

4.3. Controlled Waters

4.3.1. Abstraction Licenses

The closes active groundwater abstraction is 305m north-west for general cooling. There are no other active groundwater abstractions within 500m of the site.

There are no records of surface water abstractions within 500m of the site.

An active potable groundwater abstraction is recorded 643m west for drinking, cooking, sanitary and washing. There are no further potable abstractions within 1km of the site.

4.3.2. Source Protection Zones

The site is situated within a SPZ3, defined as the area around a water source within which all groundwater recharge is presumed to be discharged at the (water) source. In confined aquifers, the source catchment may be displaced some distance from the source. For heavily exploited aquifers, the final Source Catchment Protection Zone can be defined as the whole aquifer recharge area where the ratio of groundwater abstraction to aquifer recharge is >0.75 .

4.4. Designated Environmentally Sensitive Sites

The site is situated within the Merseyside and Greater Manchester Green Belt.

5. ENVIRONMENTAL RECORDS REVIEW

The following information has been obtained from public archive via the data supplier Groundsure or by direct application. The full Enviro Insight Groundsure Report is included as Appendix 5. The subsequent review focusses on records within 100m of the outlined development site, or those which are considered relevant to the proposed development. Ridge have not included data from Groundsure's own review of historical maps.

5.1. Groundsure Record Search

The following observations are taken from the British Geological Survey (BGS) GeoIndex (2023) and the Enviro Insight Report (Appendix 5).

5.1.1. Historical Industrial Land Uses

On site refuse heaps are recorded circa 1966. Unspecified works are recorded on site 1966-1976. There are no other records within 100m of the site.

5.1.2. Historical Petrol Stations and Garages

There are no records within 500m of the site.

5.1.3. Historical Tank Database

There are no records within 100m of the site boundary.

5.1.4. Historical Energy Features

All records within 100m are in relation to electricity substations. There are no further pertinent records.

- 76m north-west

5.1.5. Historical Military Land

ROF Kirkby was located 20m north-west from September 1940 to March 1946. The operation produced approximately 10% of WWII ammunition, with 23000 employees.

5.1.6. Landfill

White Moss Peat Company Limited operated a landfill at the site from 1971. Waste deposited was inert, industrial and liquid sludge. No end date is supplied.

Merseyside County Council operated a landfill on the site from 1965 to 1975 depositing inert, industrial, commercial, household and liquid sludge.

Further details relating to land fill activities at the site are provided in Section 6 of this report.

5.1.7. Waste Exemptions

A number waste exemptions are associated with the site:

- Storage of sludge (on a farm)
- Depositing of waste from dredging of inland waters
- Deposit of agricultural waste consisting of plant tissue under a Plant Health notice
- Burning agricultural waste in the open

- Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
- Storage of sludge

All other records are more than 100m from the site.

5.1.8. Environmental Permits, Incidents, Registers and Consents

No pertinent records within proximity to the site.

5.1.9. Current Industrial Land Uses

There are no pertinent records in proximity to the site.

5.2. Local Authority Consultation

5.2.1. Planning History

Application 16/00342/FUL was submitted within appeal decision (refused) 8 September 2017 - Reclamation of tipped contaminated and derelict land through the importation of soils and soil forming materials; formation of new access; temporary construction of internal road, site offices and storage structures; car park and infrastructure compound with restoration to agriculture use and woodland.

Knowsley Borough Council (KBC) provided pre-application advice:

Knowsley Borough Council reported that the site was historically used for landfilling household and industrial wastes by Liverpool City Council and was restored for agricultural purposes after tipping ceased. It was further reported that the site was 'not properly treated when tripping ceased which resulted in undulating land with poor drainage and ponding consequential of this landform'.

KBC further reported that circa 185000 m³ of topsoil, subsoil and builders waste was deposited on part of the (middle-west of the) site as an unauthorised operation (circa 1989-1992). Despite taking enforcement action this material was never removed from the site.

It was reported within the Pre-Application Advice, that given the past use of the site as a landfill the Council would require site investigations, risk assessment a detailed assessment and methodology of the proposed restoration of the site. The standard contamination condition would state:

No development shall take place until an assessment of the risks posed by any contamination has been submitted to and approved in writing by the Local Planning Authority. Where land affected by contamination is found which poses unacceptable risks, no development shall take place until a detailed remediation scheme has been submitted to and approved in writing by the Local Planning Authority.

The EA reported that the landfill site was operated between 1965 and 1975 by Kirkby Urban District Council and Knowsley BC; that is prior to waste licensing (circa 1977). Waste types deposited included household and industrial wastes.

The EA stated that a Phase 1 and Phase 2 Site Investigation would be required to establish the current polluting potential of the already deposited materials, and continued monitoring to ensure that there is no increase in the polluting potential of the site.

Knowsley Borough Council and the Environment Agency (EA) provided feedback on the application proposals following the submission:

The intention of the proposals were to re-engineer and restore the site to the beneficial use of agricultural and woodland. The intent was also to improve the landscape by removing the mound of illegally tipped materials and to create a landform that is sympathetic to the local landscape character and to the green belt.

The site not classified as contaminated land under Part IIA.

The intent was not to remediate the land in the sense of removing any significant linkages, but to make it suitable for agricultural and woodland. Currently there are potential linkages to surface water and ground water, these could be exacerbated if the restoration work allows increased infiltration of rainwater or if the imported soils squeeze leachate from the site.

The EA commented that leakage from the proposed drainage lake should not percolate into the landfill. Storage of water above the old waste deposits represents a potential hazard with the likelihood of localised increase in infiltration. The EA commented it would be necessary to line the proposed pond with a layer of clay – 200mm thickness.

It was suggested that a 'watching brief' is maintained for any evidence of leachate seepage on the site surface and consideration is given to monitoring adjacent surface water quality during the restoration project.

It was acknowledged that on-site waste is covered with a soil layer which may prevent the uncontrolled venting of gas to atmosphere.

5.3. Potential Sources of Contamination – Records Review

Following the records review, potential source of contamination have been identified.

POTENTIAL SOURCES OF CONTAMINATION CONSIDERED A RISK TO THE SITE		
FEATURE	LOCATION	APPROX. DATES PRESENT
Records of on site refuse heaps, and on-site waste exemptions for sludge, water dredging, agricultural waste. Waste Materials/ Made Ground associated with historical landfilling and illegal landfilling of the site. Waste included inert, industrial, liquid sludge, household and commercial.	On site	Deposited 1965-1992
Landfill gas associated with landfill waste.	On site	1965 – present
Contamination from adjacent land uses, inclusive of ROF Kirkby located circa 20m north-west.	Within 100m west	1940 – present

Table 5.1: Potential Sources following records review

Potential contamination sources not considered to represent a significant risk to the site are detailed below. These features will not be considered further within the risk assessment.

POTENTIAL SOURCES NOT CONSIDERED FURTHER	
FEATURE	JUSTIFICATION
Substations more than 50m from site	Low contamination potential and distance from site.

Table 5.2: Potential Sources not considered further

6. PREVIOUS REPORTS

6.1. Site Investigation and Preliminary Risk Assessment (2014)

The Arley Consulting Company Limited (Arley) completed a Site Investigation and Preliminary Risk Assessment (Ref: 13673/1) in July 2014 for the site. Arley were commissioned by P Casey Enviro Limited (PCE) in relation to the proposed reclamation of the site, then known as Coopers Moss, Kirkby.

PCE's planning consultant was preparing an application for the reclamation and restoration of the site. Proposals were to re-grade illegally deposited wastes and to import further suitable soils to restore the site to beneficial agricultural use with shallow even gradients to promote passive site drainage through runoff.

The report contains the results of background searches, site inspection and investigations undertaken at the site by Arley and others.

6.1.1. Other Investigations

The Arley report summarises previous investigations carried out at the site.

In November 2013 PCE conducted a Trial Pit Investigation at the site which included the excavation of 18 trial pits using a mechanical excavator. 3 trial pits were excavated on the eastern low-lying section of the site and 15 were advanced on the western section. The trial pits were excavated to depths of between 0.90m and 4.10mbgl. Made Ground was encountered in all trial pits.

Eastern Field

Conditions comprised 0.50m thick brown sandy Clay with hardcore fines, shells and bricks overlying landfilled wastes. Waste comprised paper, wood, plastic, oil filters, oil, food waste, metal, hydraulic pipes and household waste. The engineer noted a strong smell of waste and oil.

At TP2 firm brown clay was encountered below the landfilled waste at 3.00m depth. The underlying natural soil was not identified at the other two trial pits which were abandoned in the waste at 3.30m and 3.00m depth. No groundwater or leachate was observed.

Area of Illegal Waste

The ground conditions in this area typically comprised sandy soils with occasional brick fragments and concrete or hardcore. Timber, metal and clay was also noted in some of the trial pits. A strong odour was recorded between 1.00m and 3.00m depth in TP10.

At TP13 and TP15 the soil and hardcore was underlined by landfilled waste including plastic, household waste, wood, rags, paper, metal, bottles, batteries and waste. Newspapers dated 1974 were observed in TP15. This stratum was similar to the waste encountered in the eastern field. The engineer noted a strong smell of waste associated with this stratum.

Landfilled waste was not identified at TP7 or TP12 – these trial pits were advanced to 3.80m depth.

None of the trial pits excavated in this area of the site identified natural soils beneath the waste.

Low lying area of Western Field

6 trial pits were excavated in the low-lying parts of the western field. Ground conditions comprised a layer of soil [clay or sand and topsoil] overlying landfilled waste. The soil layer varied in thickness from 0.50m to 2.30m.

The waste comprised a combination of paper, wood, plastic, metal, rags, bottles, household waste, disposable cups, pipes, oil, ash, burnt materials and tyres.

The engineer noted a strong smell of waste associated with the landfilled material. No groundwater or leachate was noted in the landfilled waste layer in this part of the site. None of the trial pits encountered natural soils.

Gas Monitoring

PCE carried out an initial gas survey of the site in September 2013, using a gas vent tube/ searcher bar. Gas concentrations were measured at 32 test locations all in the western part of the site. In summary gas concentrations measured were as follows:

- Methane 0 – 37.4%
- Carbon Dioxide 0.2 – 21.7%
- Oxygen 0.2 – 20.6%

It was noted that the Environment Agency does not generally accept searched bar spike testing as a precise investigation method and in any event the testing is limited to the western part of the site.

30 of the test locations were on the relatively low-lying part of the western half of the site. Test locations 31 and 32 were on the illegally deposited CDEW. Gas concentrations at these locations were very low, no methane was detected, and carbon dioxide concentrations measured were 0.2% and 1.6% and were thought to be in a typical background range.

Surface Water Sampling and Analysis

PCE collected surface water samples from the ditches around the site for chemical analysis. Four sample locations were taken from each corner of the site.

Samples were tested for a general suite of potential contaminants based on EA landfill monitoring guidance. Results showed that water quality in the ditches was highly variable.

Elevated concentrations of ammoniacal nitrogen were noted. It was considered likely that background concentrations in this agricultural setting are also elevated due to the use of fertilisers and other agricultural chemicals. All other results were below the corresponding freshwater EQS screening criteria.

Concentrations from some determinands were significantly higher in the sample from locations SW1 than the other locations in particular alkalinity, chromium, iron, manganese, nickel, potassium, sodium, ammoniacal nitrogen, total organic carbon and electrical conductivity.

6.1.2. Environmental Setting

A review of information from a Geology Report and an Envirocheck Report was performed. Ridge have carried out a separate review of latest environmental records in Section 5 of this report.

6.1.3. Preliminary Conceptual Model

A summary of the potential sources of contamination identified and the likelihood of them being present was provided.

6.1.3.1. Sources

Waste materials/ Made Ground

No soil samples have been chemically analysed as part of previous investigations, however these types of materials are known to be a source of potential contamination which is normally released through degradation and leachate generation.

Potential contaminants of concern were identified as heavy metals, sulphate, PAHs, petroleum hydrocarbons and asbestos.

Landfill Gas

It was considered that as the site contains a significant amount of potentially biodegradable matter there is a potential source of landfill gas. Although given the age of the wastes deposited, future gassing potential was considered to be low.

A strong smell of waste was identified by the engineer during previous investigations. Initial gas monitoring identified gas concentrations of up to 37.4% methane and 21.7% carbon dioxide.

Contamination from adjacent industrial uses

Various industrial activities are located in close proximity to the site. Kirkby Industrial Estate was first shown on 1956 mapping, although it is understood that the area was developed during the war years for the manufacture of munitions. Consequently the area has been used for potentially contaminative uses for in excess of 60 years.

Potential contaminants of concern were considered to be heavy metals, volatile and semi volatile organic compounds and asbestos.

6.1.3.2. Possible Significant Pollutant Linkages

A number of possible significant pollutant linkages were identified associated with the redevelopment of the site.

The report identified a potential risk of harm to the health of humans due to direct contact with contaminants in soil or water and ingestion of contaminated soil/ dust.

The report also states there is the possibility of windblown particulates being inhaled by people/ animals both on site and off site, particularly during any earthworks associated with the proposed site restoration. Human health was considered to be at risk by the inhalation of landfill gases/ vapours.

It was considered that the pollution of surface waters could occur through the lateral migration of leachable contaminants and pollution of the underlying Principal Aquifer could occur through the downward migration of contaminants.

6.1.4. Conclusions of PRA

It was recommended that further site investigation was required in order to quantify the potential environmental risks associated with the site and the proposed development works.

6.1.5. Site Investigation

Arley undertook a ground investigation at the site, the objectives of which were as follows:

- Determine the thickness and nature of the Made Ground and waste
- Determine the nature and thickness of the natural superficial soils between the waste and the underlying sandstone
- To install gas monitoring probes within the waste to facilitate gas and water monitoring
- To install groundwater monitoring boreholes in the Chester sandstone to facilitate groundwater monitoring within the principal aquifer

6.1.5.1. Conclusions

Investigations confirmed the landfilled waste did not contain significant quantities of potential biodegradable matter.

Landfill gas and leachate were found to be present within the local authority landfilled wastes. Gas concentrations were found to be high but flows suggested that there was no significant ongoing gas generation.

Arley considered that the potential for ground gas to impact off-site properties was low due to the distance to neighbouring farms and the industrial estate to the west.

Leachate was found to be present within the local authority waste, although it was identified as weak and therefore assessed to have a low polluting potential. Peat and boulder clay identified during the investigation was considered to have the potential to provide a natural barrier significantly reducing the potential for migration of contaminants from the waste to groundwater within the Chester Sandstone.

Groundwater and surface water quality appeared to be affected by some contamination which was thought to be from the local authority waste or off-site sources.

Arley considered that the proposed development (agricultural reclamation) did not represent a potential risk to the site or the general environment in terms of contamination. It was considered that the proposed site reclamation would reduce rainwater infiltration and thereby reduce the long-term risks associated with ongoing leachate generation.

6.1.5.2. Recommendations

On the basis of the risk assessment Arley did not consider any specific requirement to address existing or potential environmental issues at the site.

However, a series of recommendations were made:

- Local authority wastes should not be disturbed during development, the exiting soil cover should be retained

- Environmental monitoring should continue until the site works commence. Ongoing monitoring should include gas and water level monitoring
- Further groundwater samples should be collected for analysis
- A programme of surface water sampling and monitoring should be implemented to confirm that the site restoration works do not have an adverse impact on surface water quality

These recommendations are considered by Ridge in Section 9 of this report.

7. CONCEPTUAL SITE MODEL

The conceptual site model has been written in the knowledge of previous investigations carried out, and represents an assessment of the current status of the site, with the proposed development in mind.

7.1. Sources

It should be noted that additional sources of contamination may become apparent during any future investigation and development of the site.

7.1.1. On-Site

- Waste Materials/ Made Ground associated with historical landfilling and illegal landfilling of the site. Waste included inert, industrial, liquid sludge, household and commercial. Records of on-site refuse heaps, and on-site waste exemptions for sludge, water dredging, agricultural waste.
 - Contaminants of concern (CoC) include volatile organic acids in leachate, inorganic macro components (calcium, magnesium, sodium, potassium, ammonium, iron, chloride, sulphate and hydrogen carbonate), heavy metals (cadmium, chromium, copper, lead, nickel and zinc), and xenobiotic organic compounds (benzene, toluene, ethylbenzene, xylenes, tetrachloroethylene and trichloroethylene).
- Landfill gas associated with waste materials. A strong smell of waste was identified by the engineer during previous investigations. Initial gas monitoring identified gas concentrations of up to 37.4% methane and 21.7% carbon dioxide. Gas concentrations were found to be high but flows suggested that there was no significant ongoing gas generation.

7.1.2. Off-Site

- Contamination from adjacent industrial land uses within 100m of the site, inclusive of ROF Kirkby located circa 20m north-west. CoC could be wide and varied but are likely to include heavy metals, PAHs, petroleum hydrocarbons and solvents.

7.2. Pathways

The key environmental pathways and exposure routes by which potentially toxic substances can reach the identified potential receptors are considered to be:

7.2.1. Indirect

- Vertical and lateral migration of ground gas leading to accumulation in enclosed spaces.
- Vertical and lateral migration of organic and inorganic compounds through underlying geology.

7.2.2. Direct

- Inhalation of ground gases
- Inhalation of contaminated dust
- Ingestion
- Dermal contact

7.3. Receptors

Receptors that may be affected by the potential contamination are considered to be:

7.3.1. Human

- End users of the site (maintenance workers)
- Construction and Groundworkers during development of the site

7.3.2. Environmental

- Principal Aquifer – Chester Sandstone Formation
- Secondary (A) Aquifer – Pennine Lower Coal Measures
- Surface Water Features on site or in proximity – drainage ditches and Kirkby Brook

The site is situated within a Green Belt.

8. RISK ASSESSMENT

8.1. Risk Assessment Procedure

By considering the sources, pathways and receptors (pollutant linkages), an assessment of the human health/ environmental risks is made with reference to the significance and degree of the risk. This assessment is based on consideration of whether the contamination source can reach a receptor and hence whether it is of major or minor significance.

The risk assessment has been undertaken with reference to BS 10175:2011+A1:2013 and CIRIA Document C552: Contaminated Land Risk assessment 'A Guide to Good Practice'. The risk assessment has been carried out by assessing the severity of the potential consequence, considering both the potential magnitude of the hazard and the sensitivity of the target, based on the categories given below.

CATEGORY	EXAMPLES
High	Residential with gardens/Groundwater Source Protection Zone
Medium	Residential without gardens/Principal (Major) Aquifer/sensitive watercourse
Low	Commercial and industrial use/Secondary (Minor) Aquifer
Very Low	Construction and maintenance workers/non-sensitive watercourse

Table 8.1: Sensitivity of Receptor

CATEGORY	EXAMPLES
Gross Impact	Heavily contaminated gasworks or industrial site, hazardous waste landfill
Moderate Impact	Major leaks and spills from fuel infrastructure (e.g. petrol stations), domestic waste landfills
Slight Impact	Minor leaks and spills from fuel infrastructure, 'inert' waste landfills

Table 8.2: Magnitude of Impact

MAGNITUDE OF IMPACT	SENSITIVITY OF RECEPTOR			
	High	Medium	Low	Very Low
Gross Impact	Severe	Medium	Mild	Minor
Moderate Impact	Medium	Mild	Minor	Minor
Slight Impact	Mild	Minor	Minor	Minor

Table 8.3: Level of severity of potential hazard

The likelihood of an event (probability) takes into account both the presence of the hazard and target and the integrity of the pathway and has been assessed based on the categories given below.

CATEGORY	EXAMPLES
High likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor.
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term.
Low likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so.
Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable.

Table 8.4: Probability of risk definition

The potential severity of the risk and the probability of the risk occurring have been combined in accordance with the following matrix in order to give a level of risk for each potential hazard.

PROBABILITY OF RISK	SENSITIVITY OF RECEPTOR			
	Severe	Medium	Mild	Minor
High likelihood	Very High	High	Moderate	Low/Moderate
Likely	High	Moderate	Low/Moderate	Low
Low likelihood	Moderate	Low/Moderate	Low	Very Low
Unlikely	Low/Moderate	Low	Very Low	Very Low

Table 8.5: Level of risk for potential hazard definition

The assessment is discussed below in terms of plausible pollutant linkages. A complete assessment of the pollutant linkages is presented in Table 8.6.

A description of these risk classifications and likely action required are given in CIRIA 552 as:

Very high risk – High probability that severe harm could arise to a designated receptor from an identified hazard OR there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in substantial liability. Urgent investigation and remediation are likely to be required.

High risk – Harm is likely to arise to a designated receptor from an identified hazard. This risk, if realised, is likely to result in substantial liability. Urgent investigation is required, and remedial works may be necessary in the short term and are likely over the long term.

Moderate risk – It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation is normally required to clarify risks and to determine potential liability. Some remedial works may be required in the long term.

Low risk – It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.

Very low risk – It is a low possibility that harm could arise to a designated receptor. In the event of such harm being realised it is not likely to be severe.

8.2. Pollutant Linkage Assessment

Analysis of factors affecting source-pathway-receptor pollutant linkages is provided below, with a full assessment presented in Table 8.6.

8.2.1. Development Considerations

Initial development plans comprise a track from Perimeter Road to the west which provides access to the main development in the eastern portion of the site.

The main development area situated in the eastern portion of the site comprises a 132kV substation area, transformer, control room, storage room, and many battery enclosures with associated inverter and transformer.

Once the site has been constructed, there is not expected to be regular use of the site by people, bar site visits for maintenance. It is anticipated that much of the site will be surfaced with hardstanding, and therefore interaction with potentially contaminated shallow soils is unlikely.

With the proposed structure in mind, foundations are expected to be traditional i.e. penetration into potentially contaminated soil will be restricted. This will reduce any disturbance of soils and mobilisation of contaminants.

8.2.2. Contaminants in Soil

On-site landfilled waste represents the greatest risk.

Construction, demolition and excavation waste (CDEW) was identified in the north-western quadrant of the site (only) from surface. CDEW comprised dark brown and black clayey gravelly Sand which included bricks and concrete fragments. This waste represents a risk to end users of the site, but the temporary external setting of users reduces the risk level significantly.

The majority of the site contains a topsoil/ capping layer of circa 2.50m thickness. Below this, local authority waste of approximate thickness 4m, containing clay with concrete, bricks, clinker, ash and slag is present. This waste does not represent a significant risk to site end users due to its depths and capping later above.

Soil analysis has not been completed at the site, although leachate analysis was completed at three of the monitoring boreholes. Elevated concentrations of ammoniacal nitrogen were reported for each of the three samples tested. Concentrations of chromium, copper and zinc exceeded the lower EQS limit. Iron concentrations exceeded the EQS in each of the three samples tested. Some PAH species in the samples from BH4 and BH5 exceeded the corresponding EQS.

8.2.3. Controlled Waters

The site is underlain by a Principal Aquifer (Chester Sandstone) and is located within a SPZ3, although from investigation records peat and glacial Boulder Clay are present between the waste the underlying sandstone, and it is thought that these strata will provide a natural barrier significantly reducing the potential for migration of contaminants from the waste to the groundwater.

According to previous investigations there were exceedances of the applicable screening criteria for ammoniacal nitrogen, chromium, copper, zinc and iron. Some PAH species exceeded the EQS in BH4 and BH5.

Surface water sampling results during previous investigations was highly variable. There were exceedances of the applicable screening criteria for ammoniacal nitrogen and metals.

8.2.4. Ground Gas

Site users will work in a temporary and external setting thus reducing potential risks significantly.

According to previous investigations, landfill gases are present within the local authority landfilled wastes. The gas concentrations were high but low flows suggested that there is no significant ongoing gas generation. It was assessed that the potential for gas migration at concentrations and/ or flows which might affect neighbouring farms or the industrial estate to the west is low.

Consideration should be given to gas mitigation for proposed structures on site. Further assessment of the ground gas regime will allow us to evaluate the requirement for gas mitigation.

8.2.5. Assessment

The below assessment has been compiled based on the current site status.

SOURCE	PATHWAY	RECEPTOR	SEVERITY	LIKELIHOOD	RISK LEVEL
On-site waste materials/ Made Ground	Direct contact, ingestion and inhalation of impacted soils/ groundwater	Site end users	Minor	Low Likelihood	Very Low
		Construction and groundworkers	Minor	Likely	Low
	Vertical migration of contaminants through the underlying geology and/ or via overland flow	Principal and Secondary (A) Aquifer – bedrock	Medium	High Likelihood	High
		Surface water features	Minor	High Likelihood	Low/ Moderate
Landfill gas associated with waste materials	Migration of ground gas through the underlying geology	Site end users	Mild	Likely	Low/ Moderate
		Construction and groundworkers	Minor	Low Likelihood	Very Low
Off-site industrial land uses within 100m of the site	Direct contact, ingestion and inhalation of impacted soils/ groundwater	Site end users	Minor	Low Likelihood	Very Low
		Construction and groundworkers	Minor	Low Likelihood	Very Low

Table 8.6: Pollutant Linkage Assessment

9. CONCLUSIONS AND RECOMMENDATIONS

9.1. Contamination

Following site reconnaissance and a review of available records/ reports, the following contamination sources are considered to be potentially present:

- Waste Materials/ Made Ground associated with historical landfilling and illegal landfilling of the site. Waste included inert, industrial, liquid sludge, household and commercial. Records of on-site refuse heaps, and on-site waste exemptions for sludge, water dredging, agricultural waste.
- Landfill gas associated with waste materials.
- Contamination from adjacent industrial land uses within 100m of the site, inclusive of ROF Kirkby located circa 20m north-west. CoC could be wide and varied but are likely to include heavy metals, PAHs, petroleum hydrocarbons and solvents.

9.1.1. Risk Ratings

At present, highest risk ratings relate to groundwater resources and surface water in relation to on-site waste (**High-Moderate**), and site end-user exposure to ground gas (**Moderate**).

In light of these risk ratings, further assessment is required to either refine the risk levels or produce a remediation/ mitigation plan to ensure the site is suitable for it's intended use. Further details are provided in Section 9.3.

9.2. Geotechnical

A review of key geotechnical aspects is provided below.

9.2.1. Expected Ground Conditions

Previous investigations have confirmed that strata at the site can be summarised as follows:

- Construction, demolition and excavation waste (CDEW) – north-west portion of site only
- Topsoil/ capping layer
- Local authority waste
- Peat
- Glacial Clay
- Chester Sandstone

We do not anticipate that constructing directly onto CDEW, topsoil/ capping layer, local authority waste or peat will be possible due to its inherently weak and heterogenous nature.

The environmental records search highlighted peat as highly compressible and acting as a significant constraint on land use.

9.2.2. Foundations

With reference to the expected geology and the proposed development, we suspect that upper soils will need to be stripped back to identify suitable stratum to bear weight or a layered and compacted sub-grade will need to be constructed.

Soil compaction will be necessary to increase the bearing capacity and stiffness of the soils or engineered layer. Compaction will increase the shear strength of soils by adding friction from the interlocking of particles. Future settlement of soils is reduced by increasing the stiffness and eliminating voids creating a densified soil. The removal of voids reduces the chance of the soil settling or shrinking or expanding and it decreases water seepage that would lead to deleterious shrinking and swelling soil properties.

Consideration should be given to the use of a piled foundation solution. The requirement for this can be assessed during additional ground investigation.

9.2.3. Drainage

On site drainage is likely to be highly variable and therefore we recommend soakage testing is undertaken to inform the Drainage Strategy.

Soakaway water should be prevented from percolating into the landfill. Storage of water above the old waste deposits represents a potential hazard with the likelihood of localised increase in infiltration.

9.2.4. Floor Slabs

Given the suspected presence of Made Ground/ fill materials and cohesive strata at shallow depth it is expected that a suspended floor slab will be required, unless engineered granular fill is utilised.

9.2.5. Other Considerations

The site contains a number of trees and bushes. Furthermore, mature trees are situated along boundaries. If soils are shrinkable, foundations may need to be deepened adjacent to existing or proposed trees.

9.2.6. Earthworks / Site Levels

The general elevation of farmland in the area is 45-50mAOD with a general fall towards the north-west. Site levels vary between 48-54mAOD although in the north-west portion, where waste was deposited, ground levels are up to 59mAOD. In general there is a relatively steep peripheral slope to the northern, eastern and southern boundaries and thereafter gradients are quite shallow. There is a 2m deep valley feature trending south to north across the north-western part of the site.

Care should be taken when selecting the ground floor level of proposed structures to ensure that excessive earthworks are not required nor retaining situations created.

9.3. Additional Ground Investigation and Monitoring

We recommend the following further investigation to provide further geotechnical and contamination assessment. Recommendations within previous reports have been taken into consideration. A Site Investigation Scheme will be produced for Local Authority approval.

- Windowless sample boreholes (5x) within the development area
 - Assess geotechnical characteristics of soils in the development area
 - Assess contamination characteristics of soils in the development area
 - Allow installation of ground gas monitoring wells
- Windowless sample boreholes (3x) outside of the development area

- Assess contamination characteristics outside of the development area
- Allow installation of groundwater monitoring wells
- A series of Trial Pits across the site to efficiently assess geotechnical and contamination characteristics of soils
 - Carry out soakage testing within the development area in 3 x trial pits
- A series of TRL DCP tests in areas proposed as roads to allow CBR% conversion
- A programme of groundwater and surface water sampling to allow assessment of improvement/deterioration of the water environment through the lifecycle of the development
- A programme of ground gas monitoring in newly installed monitoring wells to assess the ground gas regime in the specific development area

9.4. Unexploded Ordnance

The site is not considered to be in an area at risk from UXO.

9.5. Radon

Much of the site is classified as 'less than 1% of properties affected', but the extreme north-eastern corner is categorised as 'between 1% and 3% of properties affected'.

In consideration of the proposed end use of the site i.e. battery storage and absence of residential properties, this will not inhibit the development.

FIGURE 1 – SITE LOCATION PLAN



© CROWN COPYRIGHT AND DATABASE RIGHTS (2022) ORDNANCE SURVEY (100031872)
APPLICATION SITE APPLICATION SITE BOUNDARY 1:1 ACROSS APPROX.



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DO NOT SCALE FOR CONSTRUCTION PURPOSES

NOTES
(1) N/A

EQUIPMENT LIST
(1) N/A

PROJECT NUMBER
PR871 - L33 3AP - 001

PROJECT TITLE
SANDYBROW LANE

PROJECT ADDRESS
SANDYBROW LANE - L33 3AP

DATE
03/08/2023

PROJECT TYPE
ENERGY DEVELOPMENT

DRAWING TYPE
LOCATION PLAN

DESIGNER
C. VICK

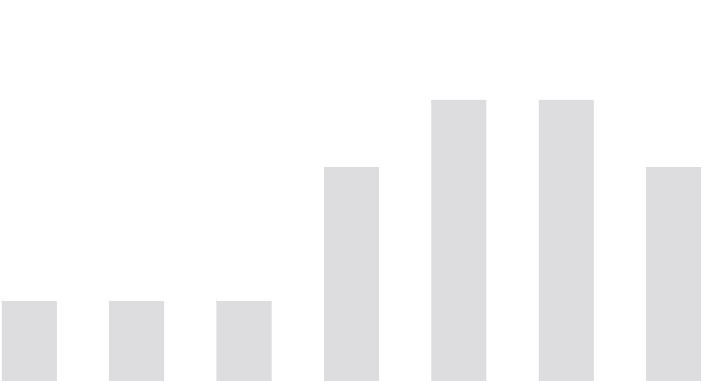
CHECKED BY
R. MACINDOE

APPROVED BY
I. WILLIAMS

SCALE
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REVISION
REV A

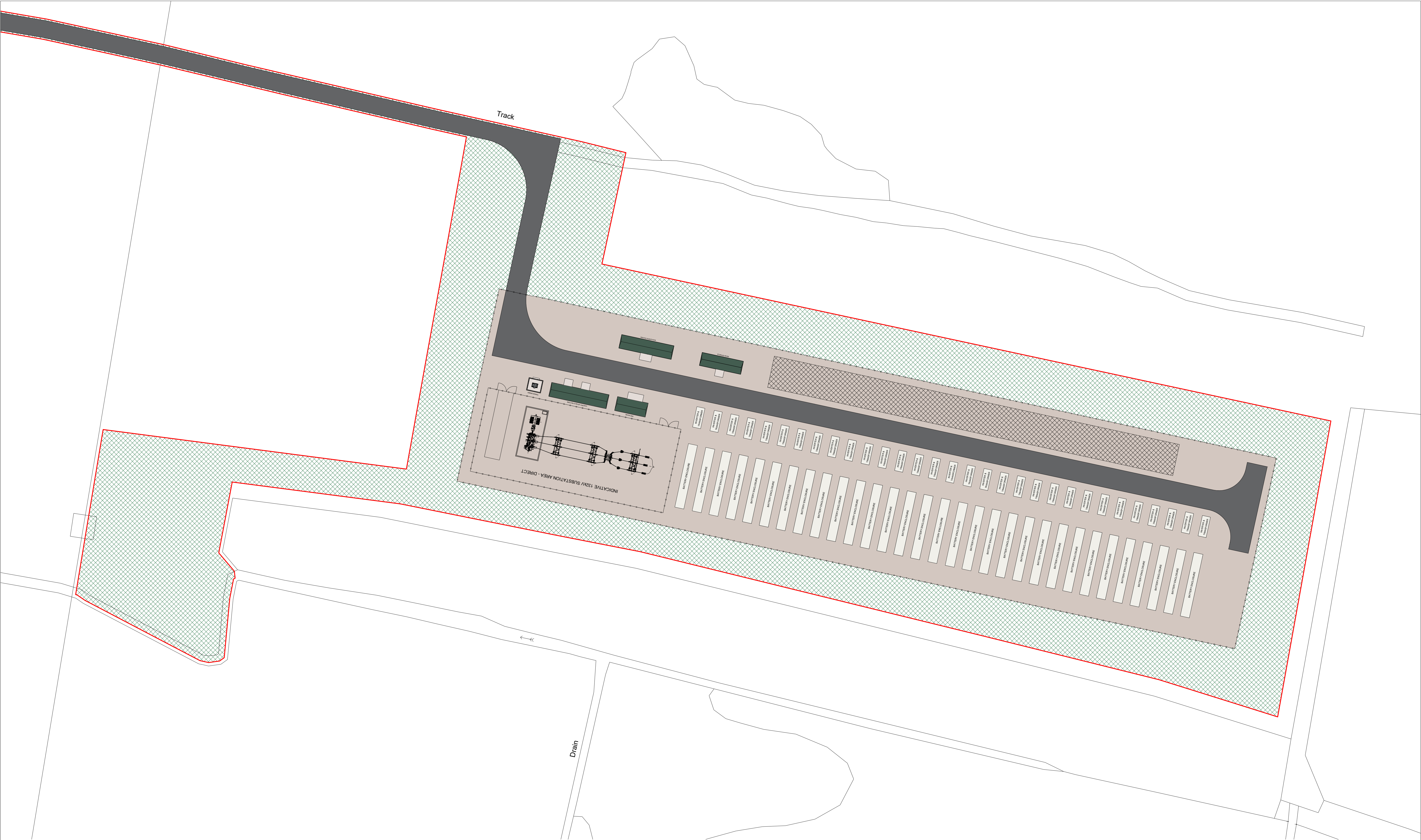
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A1



DRAWING PURPOSE

PLANNING

FIGURE 2 – DEVELOPMENT PLANS



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NOTES
 (1) N/A

EQUIPMENT LIST
 BATTERY CONTAINERS
 INVERTER & TRANSFORMER MODULES
 DNO ROOM
 TRANSFORMER
 PRIVATE SUBSTATION
 WELFARE & CONTROL ROOM
 STORAGE ROOM

PROJECT NUMBER
 PR871 - L33 3AP - 101

PROJECT TITLE
 SANDYBROW LANE

PROJECT ADDRESS
 SANDYBROW LANE - L33 3AP

DATE
 03/08/2023

PROJECT TYPE
 ENERGY DEVELOPMENT

DRAWING TYPE
 PROPOSED PLAN

DESIGNER
 C. VICK

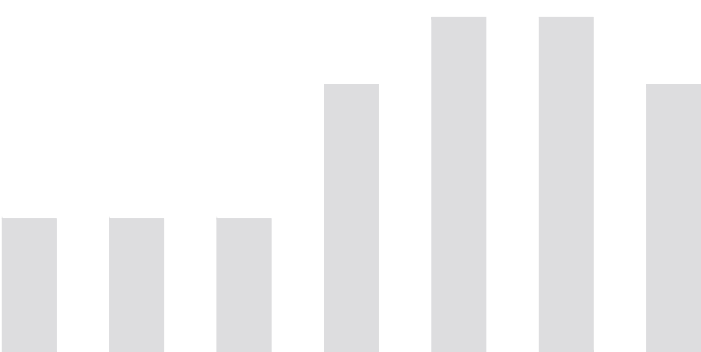
CHECKED BY
 R. MACINDOE

APPROVED BY
 I. WILLIAMS

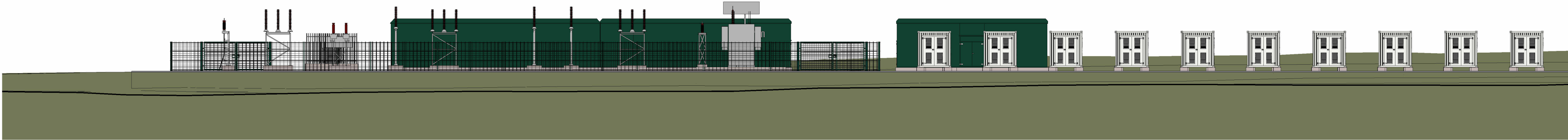
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REVISION
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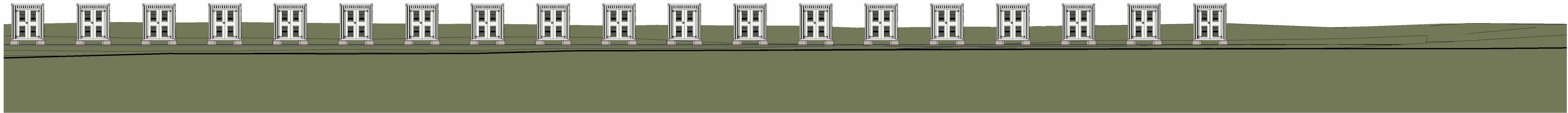
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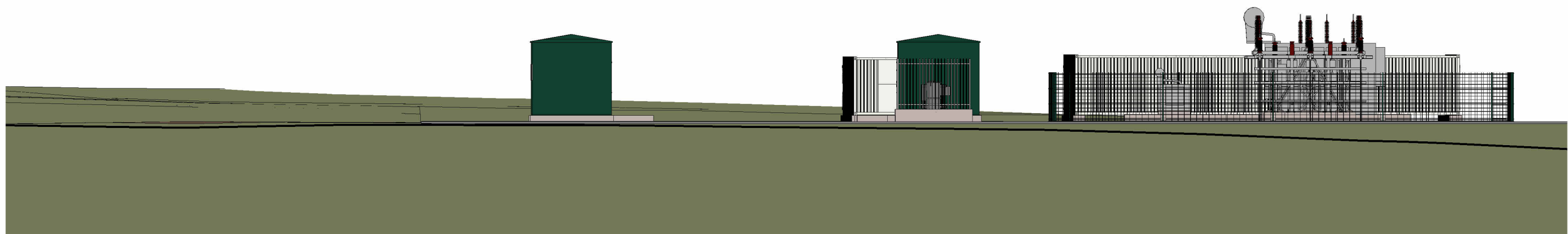
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PLANNING



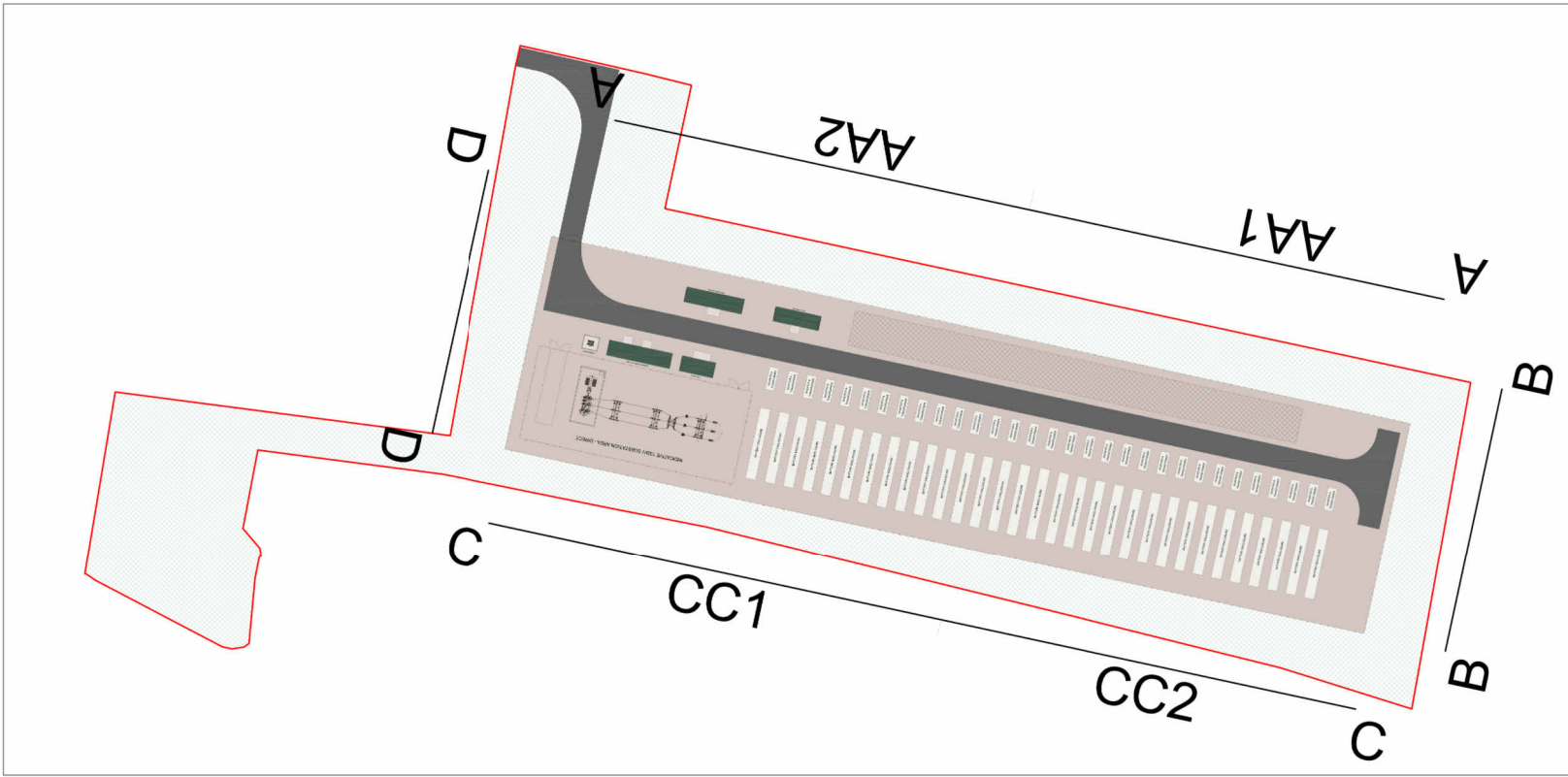
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DRAWING PURPOSE
PLANNING

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NOTES
ANCILLARY EQUIPMENT FOUNDATIONS STILL TO BE DECIDED

PROJECT NUMBER
PR871 - L33 3AP - 101

PROJECT TITLE
SANDYBROW LANE

PROJECT ADDRESS
SANDYBROW LANE - L33 3AP

PROJECT TYPE
ENERGY DEVELOPMENT

DRAWING TYPE
ELEVATIONS CC-DD

DATE
03/08/2023

REVISION
REV A

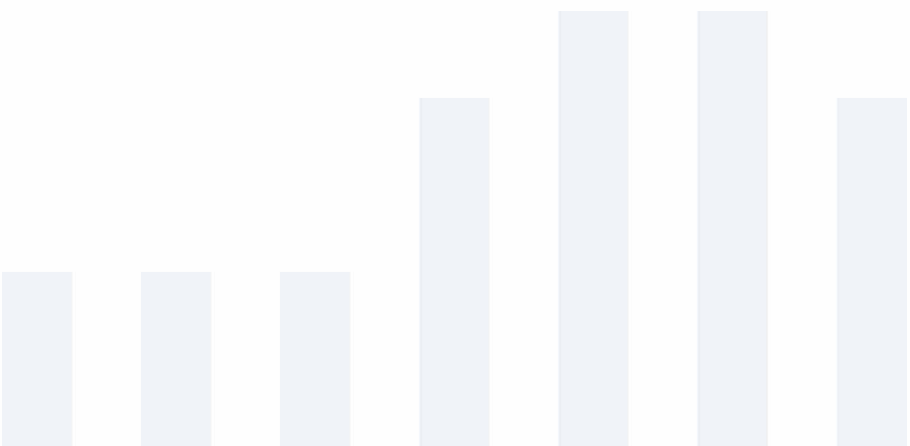
SCALE
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PAPER SIZE
A1

DESIGNER
C.VICK

CHECKED BY
R.MACINDOE

APPROVED BY
I.WILLIAMS



APPENDIX 1 – REPORT CONDITIONS

Report Conditions

This report is produced solely for the benefit of **Balance Power** and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the Site.

This report is based on a visual Site inspection, study of readily accessible referenced historical records, information supplied by those parties noted in the text and preliminary discussions with local and Statutory Authorities. Some of the opinions are based on unconfirmed data and information and are presented in good faith without exhaustive clarification. Where ground contamination is suspected but no physical Site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to detailed activities related to the Site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, not revealed by this research cannot be discounted.

Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categoric assurances that they will be accepted by Authorities or Funds etc. without question, as such bodies may have unpublished, often more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to Ridge and Partners LLP. In time improved practices or amended legislation may necessitate a re-assessment.

The report is necessarily limited to those aspects of land contamination specifically reported on and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents that may occur. The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous use and abuse of the Site and adjacent Sites. The report concentrates on the Site as defined in the report and provides an opinion on surrounding Sites. If migrating pollution or contamination (past or present) exists this can only practically be better assessed following extensive on and off Site intrusive investigations and monitoring.

APPENDIX 2 – LEGAL CONTEXT AND METHODOLOGY

Legal Context

Part IIA of the Environmental Protection Act 1990 (inserted by Section 57 of the Environment Act 1995) provides a regime for the control of specific threats to health or the environment from land contamination. In accordance with the Act and the statutory guidance document 'The Contaminated Land (England) Regulations 2000', the definition of contaminated land is intended to embody the concept of risk assessment. Within the meaning of the Act, land is only "contaminated land" where it appears to the Regulatory Authority, by reason of substances within or under the land, that:

"Significant harm is being caused, or there is a significant possibility of such harm being caused; or Pollution of controlled waters is being, or is likely to be, caused."

Inherent in this definition is the requirement for contamination risk assessment to be undertaken on a site-specific basis, as the potential for harm is determined by the Site's end use and its specific environmental setting. The guidance defines "risk" as the combination of:

- The probability, or frequency, of occurrence of a defined hazard (for example, exposure of a property to a substance with the potential to cause harm); and
- The magnitude (including the seriousness) of the consequences.

While Part IIA of the Environmental Protection Act provides a risk-based approach to the identification and remediation of land where contamination poses an unacceptable risk to human health or the environment, the regime does not take into account future uses. New developments are therefore controlled by the planning regime, with reference to the National Planning Policy Framework (NPPF, 2018), rather than directly by Part IIA of the Environmental Protection Act.

The NPPF is based on the principal that the site should be suitable for its new use, taking account of ground conditions, including from natural hazards or former activities and states that "Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner". The NPPF also links the planning and Part IIA regimes by stating that "after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990". Key components of the Part IIA regime, such as the definition of Contaminated Land and the associated risk-based assessment approach, are therefore considered to also be applicable to the planning regime.

Methodology

This report has been prepared in accordance with published Environment Agency guidance – Land Contamination Risk Management (LCRM, 2020), which supersedes CLR 11. CLR 11 adopted and refined the well-recognised methodology and terminology that has been used in contaminated land risk assessment for a number of years.

In the context of land contamination, there are three essential elements to any risk:

A **contaminant source** – a substance that is in, on or under the land and has the potential to cause harm or to cause pollution of controlled waters.

A **receptor** – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body.

A **pathway** – a route or means by which a receptor can be exposed to, or affected by, a contaminant.

Each of these elements can exist independently, but they create a risk only where they are linked together, so that a particular contaminant affects a particular receptor through a particular pathway. This kind of linked combination of contaminant–pathway–receptor is described as a pollutant linkage.

An important thread throughout the overall process of risk assessment is the need to formulate and develop a conceptual model for the site, which supports the identification and assessment of pollutant linkages. A conceptual model represents the characteristics of the site in diagrammatic or written form that shows the possible relationships between contaminants, pathways and receptors (pollutant linkages).

APPENDIX 3 – PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG

RIDGE

SITE: SANDY BROW LANE

PROJECT NUMBER: 5022617

Photo No.	Date	
1	18 July 2023	
View from the entrance of the site looking north along Perimeter Road.		

Photo No.	Date	
2	18 July 2023	
View into the site from Perimeter Road.		

PHOTOGRAPHIC LOG

RIDGE

SITE: SANDY BROW LANE

PROJECT NUMBER: 5022617

Photo No.	Date	
3	18 July 2023	
View looking east along the southern boundary.		

Photo No.	Date	
4	18 July 2023	
View of the southern site boundary.		

PHOTOGRAPHIC LOG

RIDGE

SITE: SANDY BROW LANE

PROJECT NUMBER: 5022617

Photo No.	Date	
5	18 July 2023	
View to the north from the southern site boundary.		

Photo No.	Date	
6	18 July 2023	
View looking northwest from the southern boundary.		

PHOTOGRAPHIC LOG

SITE: SANDY BROW LANE
PROJECT NUMBER: 5022617

RIDGE

Photo No.	Date	
7	18 July 2023	
View looking west.		

Photo No.	Date	
8	18 July 2023	
Evidence of historical on site structures.		

PHOTOGRAPHIC LOG

RIDGE

SITE: SANDY BROW LANE

PROJECT NUMBER: 5022617

Photo No.	Date	
9	18 July 2023	
On-site monitoring well.		

Photo No.	Date	
10	18 July 2023	
View looking west from the eastern portion of the site.		

PHOTOGRAPHIC LOG

RIDGE

SITE: SANDY BROW LANE

PROJECT NUMBER: 5022617

Photo No.	Date	
11	18 July 2023	
View from the north-east corner of the site looking north.		

Photo No.	Date	
12	18 July 2023	
View to the north-west.		

PHOTOGRAPHIC LOG

RIDGE

SITE: SANDY BROW LANE

PROJECT NUMBER: 5022617

Photo No.	Date	
13	18 July 2023	
View of the illegally deposited waste.		

Photo No.	Date	
14	18 July 2023	
View looking east along the site access track.		

APPENDIX 4 – HISTORICAL MAPS

Site Details:

SANDY BROW LANE, KIRKBY,
L33 3AE

Client Ref: 5022617-GEO-T815
Report Ref: GS-205-SPH-UW1-F1L
Grid Ref: 344485, 398348

Map Name: County Series

Map date: 1890-1892

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1890
Revised 1890
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1892
Revised 1892
Edition N/A
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Levelled N/A

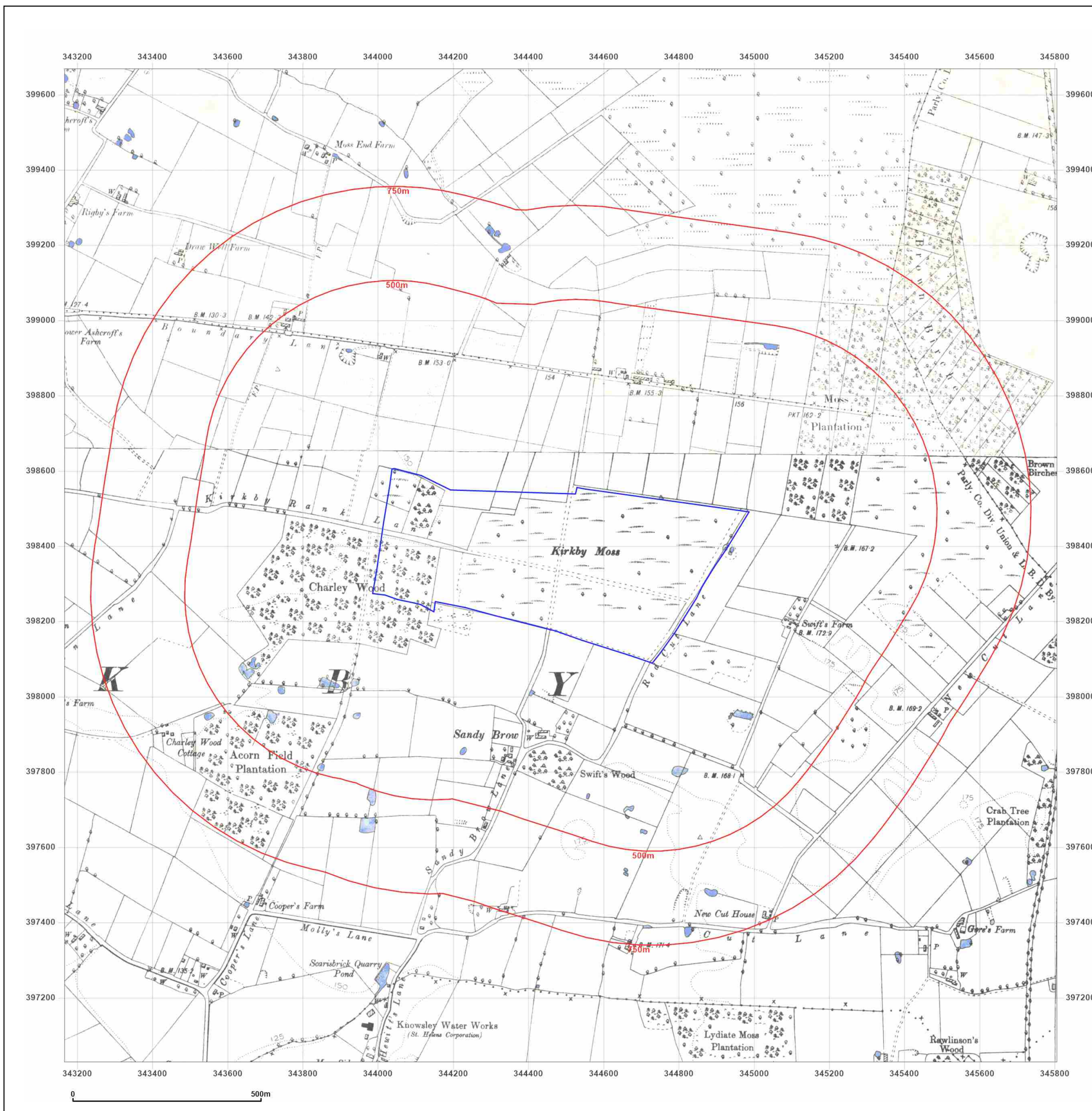


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Site Details:

SANDY BROW LANE, KIRKBY,
L33 3AE

Client Ref: 5022617-GEO-T815
Report Ref: GS-205-SPH-UW1-F1L
Grid Ref: 344485, 398348

Map Name: County Series

Map date: 1907

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1847
Revised 1907
Edition N/A
Copyright N/A
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Surveyed 1892
Revised 1907
Edition N/A
Copyright N/A
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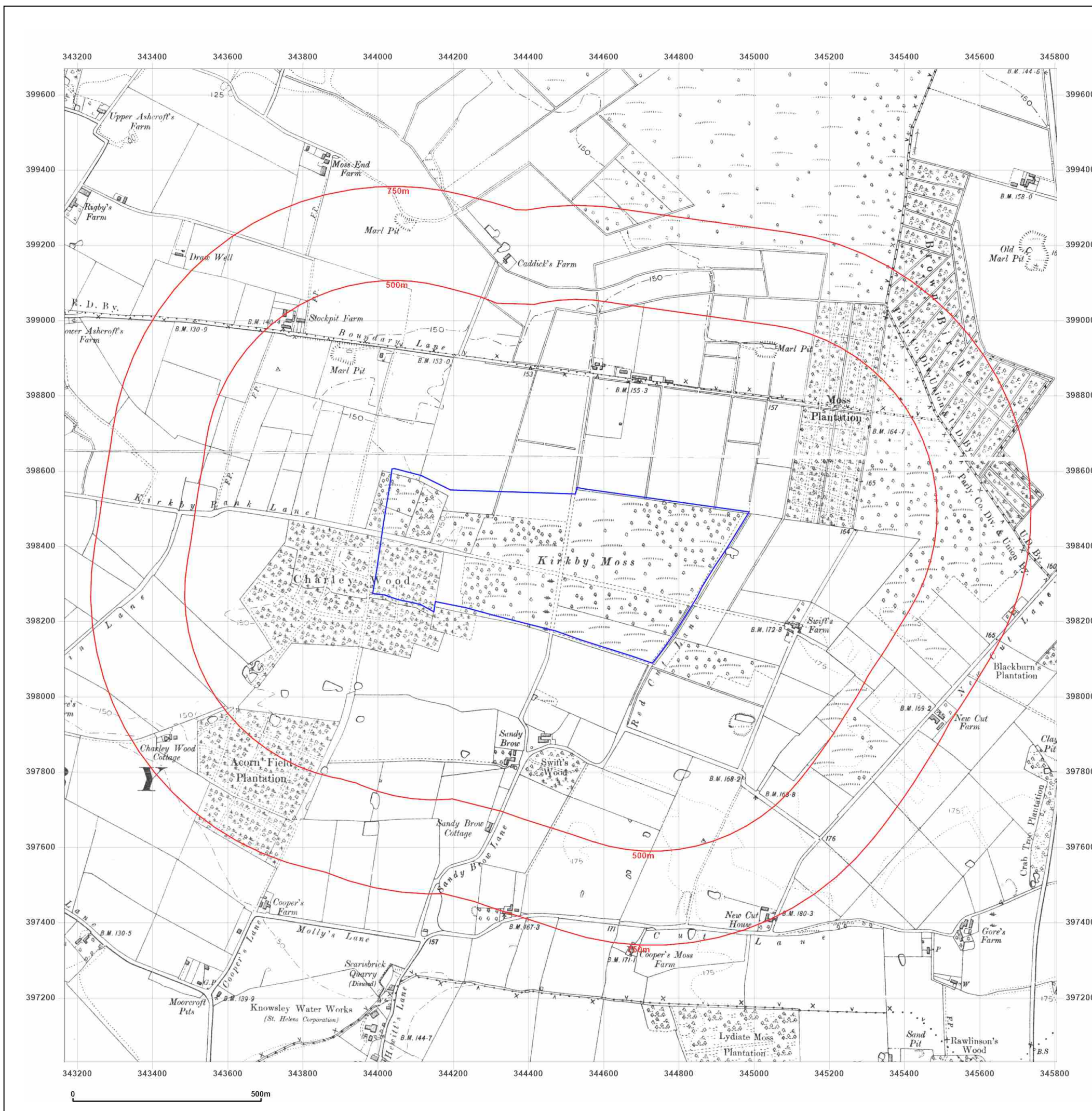


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L33 3AE

Client Ref: 5022617-GEO-T815
Report Ref: GS-205-SPH-UW1-F1L
Grid Ref: 344485, 398348

Map Name: County Series

Map date: 1925

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1847
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