

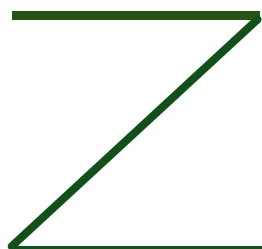


REPORT NO: ZZ25061-3
DATE: AUGUST 2025

KIRKBY VALLEY GOLF CLUB
INGOE LANE, LIVERPOOL

GROUND INVESTIGATION

PREPARED FOR
GREEN CIRCLE VENTURES LTD



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SITE/PROJECT	KIRKBY VALLEY GOLF CLUB, INGOE LANE, LIVERPOOL GROUND INVESTIGATION	
CLIENT	GREEN CIRCLE VENTURES LTD	
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REVISION HISTORY

REVISION REF	DATE	NATURE OF REVISION

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TABLE OF CONTENTS

1. INTRODUCTION.....	1
2. SITE DESCRIPTION	3
3. DESK STUDY FINDINGS	5
3.1 SITE HISTORY	5
3.2 GEOLOGY.....	6
3.3 MINING & GROUND STABILITY	6
3.4 HYDROGEOLOGY	7
3.5 HYDROLOGY	7
3.6 POTENTIAL SOURCES OF CONTAMINATION	8
3.7 RADON.....	9
3.8 SENSITIVE SITES	9
3.9 PRELIMINARY RISK ASSESSMENT CONCLUSIONS	10
4. INVESTIGATION	11
4.1 TRIAL PITS	11
4.2 GROUND CONDITIONS.....	11
5. CHEMICAL TESTING	12
6. UPDATED CONCEPTUAL MODEL	14
7. CONCLUSIONS & RECOMMENDATIONS	18

LIST OF APPENDICES

APPENDIX A - TRIAL PIT RECORDS
APPENDIX B - PHOTOGRAPHS
APPENDIX C - CHEMICAL TEST RESULTS
APPENDIX D - DRAWINGS

LIST OF DRAWINGS

INTERNATIONAL DESIGN GROUP
DRAWING NO G935 001 EXISTING SITE PLAN REV A
DRAWING NO G935 003 PROPOSED MASTERPLAN COLOUR REV A

ZZE DRAWING NO ZZ2506 1-1 TRIAL PIT LOCATIONS

1. INTRODUCTION

Zig Zag Environmental Ltd (ZZE) has been instructed by Green Circle Ventures Ltd to undertake a Phase 2 ground investigation at Kirkby Valley Golf Club.

The site is located approximately 9.1 km to the north-north-east of Liverpool city centre and occupies around 80 Ha. It currently comprises an 18-hole par 72 (6449 yard) public parkland golf course and some vacant land.

ZZE has produced a desk study report for the overall development site (Report No ZZ25061/1, dated June 2024) which has been submitted to the Local Planning Authority to satisfy Condition No 8A of the planning permission (Ref 21/00744/FUL).

ZZE concluded that *'the potential for significant contamination to be present at the site which may affect the development is generally low'*, based on the desk study findings. However, a number of old landfill sites have been identified, one on the development site itself, which was used for the disposal of inert uncontaminated soils and two off-site but within potential influencing distance of some of the proposed new buildings.

ZZE made recommendations for some further investigations but given the large and varied nature of the development these are phase specific as detailed below:

Phase	Description	Potential Hazards	Recommendation
1a & 1b	Road Junction	None	Watching Brief
2a	Existing Golf Course	Possible infilled ponds.	Watching Brief
2b	Par-3 Course	Old inert uncontaminated soil landfill & possible infilled ponds. Possible gas and ground contamination risks.	Trial pits to enable visual assessment of the disposed inert wastes within the identified landfill. Soil sampling & analysis if made ground or visual evidence of contamination is identified. Watching Brief for the rest of this phase – could include visual inspection on the subsoils exposed once the vegetation and topsoil layer has been stripped off.
2c	Pedestrian Bridge	None	Watching Brief

Phase	Description	Potential Hazards	Recommendation
3	Maintenance Area, Driving Range & Adventure Golf	Possible hazard, gas risks associated with the identified landfill sites.	Window sample boreholes and gas monitoring due to the proximity of identified landfills. This recommendation may be reviewed once the on-site landfill wastes have been inspected and assessed. Soil sampling & analysis if made ground or visual evidence of contamination is identified.
4	Car Park & Landscaping	None	Watching Brief Topsoil sampling & analysis if soils are to be re-used.
5	Clubhouse	Possible hazard, gas risks associated with the identified landfill sites.	Window sample boreholes and gas monitoring due to the proximity of identified landfills. Soil sampling & analysis if made ground or visual evidence of contamination is identified.
6	Academy Building	Possible hazard, gas risks associated with the identified landfill sites.	Window sample boreholes and gas monitoring due to the proximity of identified landfills. Soil sampling & analysis if made ground or visual evidence of contamination is identified.

Table 1 – PRA Recommendations

This investigation targeted Phase 2b – the par 3 academy course and driving range outfield, and comprised the following:

- 5 no trial pits excavated in the former landfill along the northern edge of Phase 2b, sampling & analysis
- 6 no trial pits across the remaining accessible area of Phase 2b, soil sampling & analysis. The eastern part of the site was not accessible due to the pending archaeological investigation.

Soil analyses have been assessed against appropriate assessment criteria published by DEFRA and/or LQM/CIEH.

In this report ZZE presents a summary of the PRA findings relating to Phase 2b and the results of the intrusive investigation, together with an assessment of the ground conditions with respect to the proposed development.

Greenfield conditions have been proved across most of Phase 2b, consistent with published geological records. In general, the old landfill consists of inert construction & demolition wastes but at the eastern end there is some refuse from the golf club.

As a result, limited remediation and or mitigation is required ie the excavation and removal of the golf club refuse.

The conclusions and recommendations presented in this report are the result of our professional interpretation of the information obtained. ZZE reserves the right to amend the conclusions and recommendations if further information becomes available.

2. SITE DESCRIPTION

The site is located approximately 9.1 km to the north-north-east of Liverpool city centre and occupies approximately 80 Ha. The existing site layout is shown on International Design Group Drawing No G935 001 Existing Site Plan, presented in Appendix D.

The approved development has been subdivided into a series of phases, as illustrated on Figure 1.

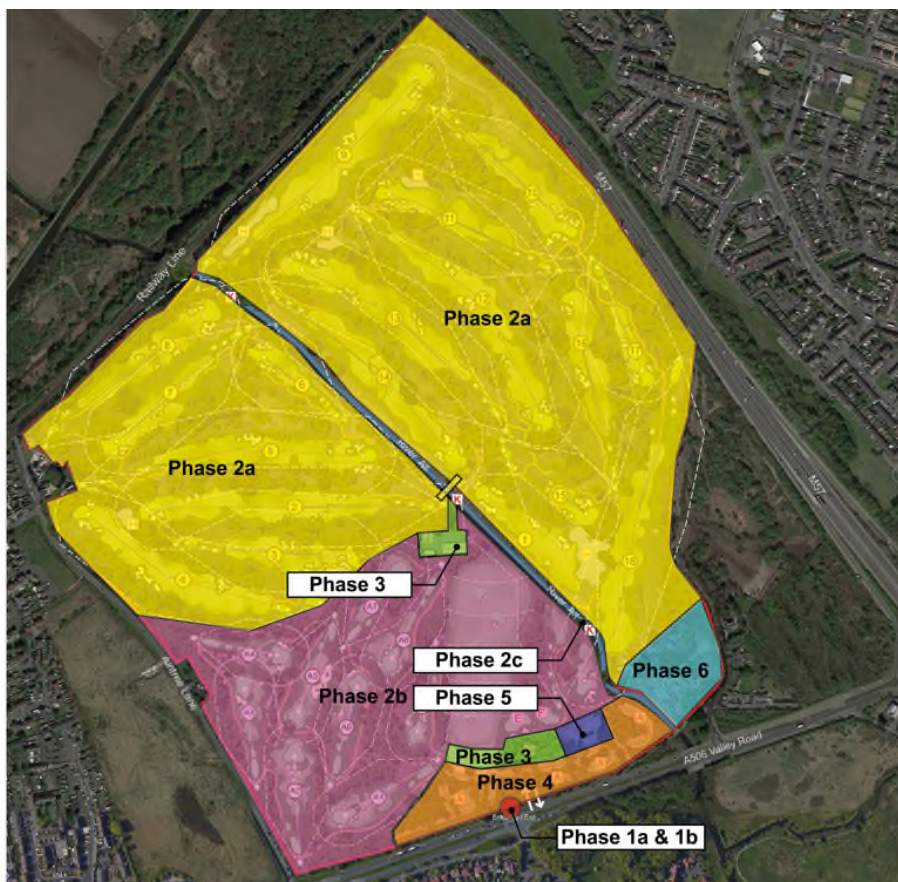


Figure 1 – Construction Phasing

The phases are described as follows:

Phases 1a & 1b	Road junction & traffic lights
Phase 2a	Existing golf course – winter works
Phase 2b	Par 3 academy golf course and driving range outfield
Phase 2c	New pedestrian bridge
Phase 3	Maintenance area, driving range building & adventure golf
Phase 4	Car park & associated landscaping
Phase 5	Clubhouse
Phase 6	Academy building

This report relates to Phase 2b, which is currently an area of vacant land which forms the south-western quadrant of the overall development site. It is bounded by the existing golf course, to the north, Aintree Lane to the west, Valley Road to the south and the River Alt to the east.

The approximate National Grid Reference for this part of the wider development site is 339505, 397727. This area of the site comprises three fields of unmanaged rough grassland with scattered trees, tall ruderal vegetation, wet grassland and hedgerows along the field boundaries. The site is relatively low-lying, flat and level.

The approved development layout is shown on International Design Group (IDG) Drawing No G935 003 presented at Appendix D & in schematic terms on Figure 2.



Figure 2 – Site Layout

3. DESK STUDY FINDINGS

3.1 SITE HISTORY

This part of the overall development site has been agricultural land since the earliest OS map from 1850.

The earliest OS maps show the river running roughly north-westerly through the main site at the eastern edge of Phase 2b.

A series of roads are also already present including Moor Lane to the south, Aintree Lane to the west and Ingoe Lane to the south-east, and a track cutting through the south-western section of the site connecting Aintree Lane and Moor Lane.

Hunters House is located to the north-west of the site and Nicholson House is present close to the river.

No significant changes to the site itself are evident on the 1894 & 1909 edition maps. Although the track connecting Aintree Lane and Moor Lane is no longer shown by 1894.

The land to the west of Aintree Lane has been developed by 1909, with Fazarkerley Sidings & Junction, a refuse destructor & filter beds and a hospital & cottage homes.

The 1928 & 1938 edition maps show little change to the site itself but during this period the River Alt is being re-aligned with a straight channel rather than the meandering one evident on the earlier maps. Also shown on the 1938 map is a large residential development to the south-west.

The 1954 map shows some residential development along Moor Lane to the south-west of the site and a Royal Air Force Reserve centre to the south beyond Moor Lane.

The 1967 edition map has the former Nicholson Cottage renamed Hospital Cottage with another small property to the west now called Nicholson Cottage. The land to the north-east of the site has been developed as a large residential housing estate.

The golf course (Liverpool Municipal Golf Course) is first evident on the 1974 edition map, occupying the land to the north and east of Phase 2b. A clubhouse is shown on the 1988 edition map, located to the east of Phase 2b, beyond the River Alt. Phase 2b remains undeveloped consisting of open land with some non coniferous trees.

Hospital Cottage is no longer shown on the 1974 map but the new Nicholson Cottage is still present. The M57 motorway is also present at this time with an electricity transmission line immediately to the south-west.

The former Fazakerley Sidings are progressively decommissioned and cleared between around 1974 & 1999.

The former hospital site to the west has been redeveloped for residential use by 1974.

ZZE is advised that the golf course was constructed in 1928 as an 18-hole par 72 (6449 yard) public parkland golf course. The golf club was managed for many years by Liverpool City Council, but it was taken over by Green Circle in 2014.

Google Earth aerial photographs show no changes to the site layout over the period 2000 to 2024. It is also evident from these photographs that there have been no significant changes to the surrounding land with the exception of the land immediately to the west. Earthworks are evident on the 2010, 2012 & 2013 aerial photographs but this area appears to have been restored, and a new pond created by 2015.

3.2 GEOLOGY

Review of the geological information indicates that:

- Phase 2b, the golf course to the north and east and some additional land to the north of the railway line is marked as made ground (undivided). This is almost certainly related to the formation of the golf course in the 1920's.
- Phase 2bThe site is underlain by Shirdley Hill Sand with a relatively narrow strip of alluvial soils along the route of the River Alt along the eastern edge of Phase 2b. These soils overly glacial till (Boulder Clay) which is present across the whole region.
- The north-north-westerly trending fault passes through Phase 2b with Chester Formation to the east and Wilmslow Sandstone Formation to the west.

Landmark reports that the anticipated soil chemistry for this site is as follows:

Arsenic	15 - 25 mg/kg
Cadmium	<1.8 mg/kg
Chromium	60 - 90 mg/kg
Lead	<100 mg/kg
Nickel	<15 - 30 mg/kg

These anticipated soil metal concentrations are all below the human health assessment criteria for public open space (park) land use and therefore would not represent a significant potential risk to the approved development.

3.3 MINING & GROUND STABILITY

The site is not in a coal mining reporting area.

There are no former or current recorded mineral sites in the vicinity of the development site.

The Envirocheck Report appended to the PRA also contains information on ground stability, as summarised below:

Collapsible Ground:	Very Low to No Hazard
Compressible Deposits:	Very Low Hazard
Ground Dissolution:	No Hazard
Landslide:	Very Low Hazard
Running Sand:	Very Low Hazard
Shrink Swell Clays:	Very Low to No Hazard

3.4 HYDROGEOLOGY

The Envirocheck Report contains information on the environmental setting of the site.

The superficial deposits at the site are classified as a Secondary A or Secondary (undifferentiated) Aquifer. The bedrock (Triassic sandstone) is classified as a Principal Aquifer.

The site is located within a defined Zone III (Total Catchment) source protection zone, due to the fact that the bedrock underlying the site is Triassic Sandstone. The closest areas of Zone I & Zone II relate to an abstraction borehole located some 1.6 km to the south-east of the site.

There are no groundwater abstractions within 1 km of the site.

Landmark reports that groundwater from the Lower Mersey Basin & North Merseyside Permo-Triassic sandstone aquifer has a poor chemical rating and poor overall rating.

According to Landmark there is a risk of groundwater flooding at the site, particularly close to the River Alt.

3.5 HYDROLOGY

The site is located in the catchment of the River Alt which flows in a north-westerly direction along the eastern side of Phase 2b. As stated in Section 3, the river's course was re-aligned in around 1928/38 from a meandering channel to the existing straight channel.

The Leeds & Liverpool Canal is located some 140 to 260 m to the wider development.

According to Landmark there are lakes to the south-west (100 m) and south of the site.

Phase 2b is within Flood Zone I where there is limited potential for flooding.

The closest consented discharges are located some 150 m to the west and close to the southern site boundary. Both allow United Utilities to discharge sewage to the River Alt, one upstream and one downstream of the development site.

Landmark has identified a number of pollution incidents to controlled waters at the wider site, but none within the Phase 2b area.

3.6 POTENTIAL SOURCES OF CONTAMINATION

An old landfill site is located along the northern edge of Phase 2b. There are 2 entries for this in the Envirocheck Report.

It is reported that Liverpool City Council deposited inert uncontaminated soil at the former Liverpool Municipal Golf Course. Records indicate the site was operated around 1993 and was exempt from licence.

A second landfill is located some 165 to 365 m to the east-north-east, beyond the River Alt, between Ingoe Lane and the M57 motorway. There are 3 entries for this landfill site in the Envirocheck Report, but limited information is known. It is suggested that the site was probably operated by the local authority, Knowsley Metropolitan Borough Council.

Two further landfills are indicated, some 165 & 260 m to the south-east of the development site, as follows:

- Historical landfill at Burtons Bridge, some 165 m from the site where the disposed wastes are reported to include household waste.
- Historical landfill site at the back of Gilmooss Lane, some 260 m from the site. Deposited wastes included industrial and household waste. It appears that this site has been redeveloped for commercial/industrial use as part of Gilmooss Industrial Estate.

It is also reported that UK Sports Parks Ltd operated a waste recovery activity at Fazakerley Playing Fields immediately to the west of the site, beyond Aintree Lane. The license was issued in 2012, but its current status is described as having been revoked.

In addition to the landfill/waste recovery sites, Landmark has also identified numerous areas of potentially infilled land, many of which relate to the former meandering route of the River Alt, which was backfilled when the river was re-aligned in the early part of the 20th Century.

There are 4 areas of potentially infilled land in or close to Phase 2b, these are described as follows:

- | | |
|---------|---|
| Ref 150 | Unknown Filled Ground (Pond, marsh, river, stream, dock etc) based on 1909 OS mapping. Located close to the River Alt and possibly part of the former river course. |
|---------|---|

- Ref 153 Unknown Filled Ground (Pond, marsh, river, stream, dock etc) based on 1850 OS mapping.
- Ref 155 Unknown Filled Ground (Pond, marsh, river, stream, dock etc) based on 1850 OS mapping. Located very close to Aintree Lane.
- Ref 159 Unknown Filled Ground (Pond, marsh, river, stream, dock etc) based on 1850 OS mapping.

Most of the features are likely to be old agricultural ponds, infilled more than 100 years ago. Consequently, any ongoing potential for hazardous gas and/or polluting leachate generation is likely to be very low.

Landmark has identified one substantiated pollution incident in the vicinity of the site. In September 2004 various waste materials were disposed at Aintree Lane, some 565 m to the north-west of the site. The items discarded included general biodegradable, natural organic material, inert construction/demolition material, household waste, tyres and vehicles/vehicle parts. The incident was classified as follows:

Water Impact Category 4 – No Impact

Air Impact Category 4 – No Impact

Land Impact Category 2 – Significant Impact

The nearest open petrol stations (Shell Fazarkerley & West Vale Service Station) are located at Longmoor Lane some 170 m to the south-west of the site and approximately 340 m to the north-east.

3.7 RADON

Landmark reports that the site *'is in a lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level' and consequently 'no radon protection measures are necessary in the construction of new dwellings or extensions'.*

3.8 SENSITIVE SITES

There are no potentially designated environmental sites in the immediate vicinity of the site.

The site is within an area of adopted green belt.

3.9 PRELIMINARY RISK ASSESSMENT CONCLUSIONS

The PRA findings in relation to Phase 2b are summarised at Table 2.

Receptor	Risk Rating	Notes
Human Health	Low	It is proposed to import and place suitable soil in this area to construct the par-3 course, thus capping any potential existing contamination, including the former Council inert, uncontaminated soil landfill.
Property (including Buildings, Crops, Livestock, Pets, Woodland)	Negligible	It is proposed to import and place suitable soil in this area to construct the par-3 course, thus capping any potential contamination, including the former Council inert, uncontaminated soil landfill. The anticipated ground conditions at this phase do not represent significant potential risk to off-site building.
Service Pipelines	Negligible	None known
Controlled Waters	Negligible to Low	The former inert uncontaminated soil landfill is located some 180 m to the west of the River Alt. There may be some local connectivity through permeable superficial soils. Risks to the sandstone aquifer are considered to be negligible because the natural low permeability glacial till (Boulder Clay) will act as a barrier severely restricting migration between near surface soils and made ground and the deep sandstone. A new large pond will be created as part of the development works.
Ecology	Very Low	Existing ground contamination will have a very low potential impact upon the existing and/or proposed ecological aspects of the scheme. A significant uplift in ecological habitat and biodiversity is built into the scheme.
Archaeological Sites & Ancient Monuments	Negligible	None known, although part of Area 2b will be the subject of an archaeological investigation required by planning condition

Table 2 - PRA Conclusions (Phase 2b)

4. INVESTIGATION

A Phase 2 intrusive investigation has been undertaken at Phase 2b, comprising the following:

- 5 no trial pits excavated in the former landfill along the northern edge of Phase 2b, sampling & analysis
- 6 no trial pits across the remaining accessible area of Phase 2b, soil sampling & analysis

4.1 TRIAL PITS

The trial holes were excavated on 3 July 2025, using a Komatsu PC 138us tracked excavator.

The holes were logged by an experienced engineer from ZZE.

Copies of the trial pit records are presented at Appendix A and the findings are discussed at Section 4.2. Photographs are provided at Appendix B.

4.2 GROUND CONDITIONS

(i) Former Landfill

The former landfill occupies a narrow strip of land along part of the northern boundary of Phase 2b. Trial pits were excavated at approximately 50 to 75 m centres along the length of the landfill.

A discrete topsoil layer was only encountered at Trial Pit 1 (0.2 m thick).

The made ground/waste stratum varied in thickness from 0.2 m (TP1) to 1.4 m (TPs 4 & 5). The waste generally consisted of soily sand and gravel with brick & concrete and occasional polythene, wood, pottery & metal rebar (TPs 1, 2, 3 & 5). This is consistent with pre-Landfill Directive inert waste.

Trial Pit 4 excavated towards the eastern end of the old landfill encountered similar material but also some polythene bags containing plastic bottles, tin cans, sweet wrappers and a golf trolley wheel.

The natural soils underlying the western section of the landfill comprised light brown/orange gravelly sand (TPs 1 & 2). The eastern section was underlain by firm to stiff brown slightly sandy silty clay with occasional gravel typical of glacial till (Boulder Clay).

The natural superficial soils were proved to a maximum depth of 1.7 m.

No groundwater was encountered any of the pits.

Sandstone bedrock was not encountered.

(ii) General Phase 2 Conditions

Six trial pits were excavated across the general Phase 2b area. There was no access to the south-eastern field where some archaeological investigation is yet to be undertaken.

Ground conditions encountered were quite consistent across the area, as follows:

Topsoil 0.30 to 0.35 m thick

Shirdley Hill Sand 0 to >1.25 m thick Light brown/orange sand with occasional gravel. Absent at Trial Pit 7.

Glacial Till To max depth of 1.6 m Firm to stiff brown slightly sandy silty clay with occasional gravel. Not encountered in Trial Pit 8.

Sandstone bedrock was not encountered.

No groundwater was encountered.

5. CHEMICAL TESTING

Samples were collected from selected pits for analysis.

Three waste/made ground samples have been analysed and 3 sand samples from the wider Phase 2b area to establish background conditions.

Lab testing has been carried out by Envirolab. The samples were analysed for a generic suite of potential contaminants comprising the following:

pH

Metals (arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium & zinc)

Cyanide

Speciated Polynuclear Aromatic Hydrocarbons

Phenols

Soil Organic Matter

Sulphate

Total TPH

The 3 made ground/waste samples have also been analysed for asbestos.

The chemical test results are presented at Appendix C and are summarised in Tables 3 & 4.

Analyte	Units	Range of Results		Assessment Criteria**
		Made Ground	Sand	
pH	-	7.87 – 8.28	5.87 – 6.21	n/a
Arsenic	mg/kg	4 – 16	<1 – 9	170*
Boron	mg/kg	<1.0	<1.0	46,000
Cadmium	mg/kg	<1.0	<1.0	880*
Copper	mg/kg	<1 – 76	<1 – 54	44,000
Chromium	mg/kg	3 – 12	<1 – 11	33,000
Chromium (vi)	mg/kg	<1	<1	250*
Lead	mg/kg	<1 – 224	<1 – 116	1300*
Mercury	mg/kg	<0.17 – 0.38	<0.017 – 0.22	30
Nickel	mg/kg	3 – 13	<1 – 14	3400
Selenium	mg/kg	<1	<1	1800
Zinc	mg/kg	3 – 106	<1 – 152	170,000
Sulphate (Total)	mg/kg	560 – 730	<200	n/a
Sulphate (2:1)	g/l	0.02 – 0.06	<0.01	n/a
Cyanide	mg/kg	<1	<1	n/a

Table 3 – Inorganic Soil Chemistry

Analyte	Units	Range of Results		Assessment Criteria *, **
		Made Ground	Sand	
Phenol	mg/kg	<0.2	<0.2	760
TPH Total	mg/kg	348 – 1080	<10 – 26	n/a
Organic Matter	%	4.32 – 5.44	<0.14 – 1.88	n/a
Acenaphthene	mg/kg	0.13 – 0.93	<0.01	29,000
Acenaphthylene	mg/kg	0.01 – 0.06	<0.01	29,000
Anthracene	mg/kg	0.14 – 0.61	<0.02	150,000
Benzo(a)anthracene	mg/kg	0.53 – 2.23	<0.04	49
Benzo(a)pyrene	mg/kg	0.50 – 2.07	<0.04	21*
Benzo(b)fluoranthene	mg/kg	0.56 – 2.23	<0.05	13
Benzo(ghi)perylene	mg/kg	0.33 – 1.18	<0.05	1400
Benzo(k)fluoranthene	mg/kg	0.18 – 0.78	<0.07	370
Chrysene	mg/kg	0.67 – 2.62	<0.06	93
Dibenzo(ah)anthracene	mg/kg	0.06 – 0.32	<0.04	1.1
Fluoranthene	mg/kg	1.19 – 4.39	<0.08	6300
Fluorene	mg/kg	0.07 – 0.48	<0.01	20,000
Indeno(123-cd)pyrene	mg/kg	0.35 – 1.46	<0.03	150
Naphthalene	mg/kg	<0.03 – 1.47	<0.03	1200
Phenanthrene	mg/kg	0.82 – 3.66	<0.03 – 0.07	6200
Pyrene	mg/kg	1.17 – 4.33	<0.07	15,000
Total PAH	mg/kg	6.75 – 28.2	<0.08	n/a

Table 4 – Organic Soil Chemistry

Notes to Tables 3 & 4:

n/a none available

* - DEFRA C4SLs for public open space (parks) land use, all other assessment criteria S4ULs (produced by LQM/CIEH) for the same land use,

** - Assessment criteria based on 1.0 % soil organic matter

No asbestos was encountered in the 3 no waste/made ground samples tested.

It can be seen, from the appended results that chemical contaminant concentrations are generally very low; well below the corresponding human health assessment criteria in both the made ground and natural sand soils. This indicates that the material is chemically uncontaminated with respect to the potential contaminants listed in the tables and the proposed land use, public open space.

6. UPDATED CONCEPTUAL MODEL

The Environment Act 1995 makes provision for a risk-based framework for the identification, assessment and management of potentially contaminated land through the assessment of risk.

The process of risk assessment is an evaluation of the probability of harm, and comprises the identification of sources of contamination, receptors that may be affected by the contamination and pathways by which the receptors may be harmed.

In this section of the report Zig Zag Environmental provides an updated qualitative assessment of risks at Phase 2b, based on potential contamination, plausible pathways and all significant receptors.

On-Site Potential Contaminative Sources

Phase 2b is predominantly undeveloped land comprising three fields of unmanaged rough grassland with scattered trees, tall ruderal vegetation, wet grassland and hedgerows along the field boundaries.

In around 1993, Liverpool City Council deposited inert uncontaminated soil in the north-western section of the undeveloped land immediately south of the western part of Liverpool Municipal Golf Course. This former landfill is located on the northern edge of Development Phase 2b.

The investigation proved made ground/waste from 0.2 m (TP1) to 1.4 m (TPs 4 & 5). The waste generally consisted of soily sand and gravel with brick & concrete and occasional polythene, wood, pottery & metal rebar (TPs 1, 2, 3 & 5). This is consistent with pre-Landfill Directive inert waste.

Trial Pit 4 excavated towards the eastern end of the old landfill encountered similar material but also some polythene bags containing plastic bottles, tin cans, sweet wrappers and a golf trolley wheel.

Analysis confirmed that the waste is uncontaminated with respect to the proposed development of this area of the site.

There are a number of areas of potentially filled ground which generally relate to the former meandering course of the River Alt before it was re-aligned in the late 1920's and 1930's or agricultural ponds, also from the late 19th or early 20th centuries. These are therefore likely to be low risk hazards.

Landmark reports a number of pollution incidents to controlled waters at the site, all of which occurred prior to Green Circle taking over the operation of the site in 2014. Most were classified as minor incidents but there were 3 incidents of sewage pollution which were classified as significant incidents.

Off-Site Potential Contaminative Sources

A railway line and the former Fazakerly Junction and Sidings were located to the north-west of Phase 2b, being shown on historic OS maps from between around 1909 & 1974.

There are two other former landfill sites within 250 m of the development site boundary, one located some 165 to 365 m to the east-north-east, beyond the River Alt which was probably operated by the local authority and one at Burtons Bridge, some 165 m to the south-east where the disposed wastes are reported to include household waste.

UK Sports Parks Ltd operated a waste recovery activity at Fazakerley Playing Fields to the west of the site, beyond Aintree Lane. The license was issued in 2012 and later revoked.

No other significant potentially contaminative land uses have been identified within the land immediately surrounding the site.

Conclusions

Based on the available information reviewed as part of this assessment, the potential for significant contamination to be present that may affect the development or surrounding receptors is considered to be Low.

Some refuse like materials including polythene bags containing plastic bottles, tin cans, sweet wrappers and a golf trolley wheel were encountered in one discrete location, although these items represent a relatively low risk of contamination.

Potential Contaminative Pathways

The approved scheme comprises various different elements, including significant areas of earthworks/landscaping, as well as some very limited areas of hard/built development.

The risks and hazards are slightly different for each phase of development. The following potential contamination pathways may exist:

- (i) Direct dermal contact

- (ii) Ingestion of contaminated soil
- (iii) Inhalation of contaminative dust/fibres/vapours
- (iv) Volatilisation and migration of volatile organic contaminants through the unsaturated zone of soil leading to inhalation
- (v) Breakdown of contaminants generating gaseous phase products (eg carbon dioxide, methane)
- (vi) Dissolution or suspension (leaching) of contaminants into groundwater
- (vii) Lateral migration of contaminants in shallow groundwater (dissolved and immiscible phases) providing base flow to surface waters
- (viii) Further downward migration of contaminants in shallow groundwater to the underlying aquifer
- (ix) Preferential flow pathways may be provided by:
 - more permeable layers within the made ground and/or natural strata
 - underground services
 - piles and foundations

The site is underlain by mixed superficial deposits consisting of a relatively narrow strip of alluvial soils along the route of the River Alt & Shirdley Hill Sand overlying glacial till (Boulder Clay) which is present across the whole region.

The natural glacial clay has a very low natural permeability which would severely restrict migration between near surface deposits and the underlying Triassic Sandstone Principal Aquifer. Also limiting migration between the site and any off-site potential pollution sources or receptors.

Potential Receptors

Condition No 8(ii) requires the assessment of the following potential receptors:

- human health
- property (existing or proposed) including buildings, crops, livestock, pets, woodland
- service lines and pipes
- adjoining land

- groundwaters and surface waters
- ecological systems
- archaeological sites and ancient monuments

Risk Assessment

The assessment of risk is based on the concept of the source – pathway - receptor linkage.

Risks posed to each of the identified potential receptors are discussed below in accordance with CIRIA Guidance Document: Contaminated Land Risk Assessment – A Guide to Good Practice.

An environmental risk rating of Negligible, Very Low, Low, Moderate or High has been assigned to each identified receptor. The risk assessment findings are summarised at Table 5.

Receptor	Risk Rating	Notes
Human Health	Low	No contamination has been identified within the existing soils or the former Council inert, uncontaminated soil landfill. Some largely non biodegradable refuse has been identified at one location (Trial Pit 4). It is proposed to import and place suitable soil in this area to construct the par-3 course, thus capping any potential existing contamination, including the former landfill.
Property (including Buildings, Crops, Livestock, Pets, Woodland)	Negligible	No buildings are proposed within Phase 2b. It is proposed to import and place suitable soil in this area to construct the par-3 course, thus capping the existing sand and clay soils & also the former Council inert landfill. Investigation proves that the majority of the material in the former landfill is uncontaminated however some largely non biodegradable refuse has been identified at one location (Trial Pit 4). The ground conditions at this phase, including the former landfill do not represent significant potential risk to off-site buildings.

Receptor	Risk Rating	Notes
Service Pipelines	Negligible	None known
Controlled Waters	Negligible to Very Low	The former soil landfill is located some 180 m to the west of the River Alt. The investigation has proved low levels of chemical contaminants, no polluting leachate and very low quantities of potentially biodegradable materials within the landfilled wastes. There may be some local connectivity through permeable superficial soils, consequently a very low risk of contamination is likely. Risks to the sandstone aquifer are considered to be negligible because the natural low permeability glacial till (Boulder Clay) will act as a barrier severely restricting migration between near surface soils and made ground and the deep sandstone. A new large pond will be created as part of the development works.
Ecology	Very Low	Existing ground contamination will have a very low potential impact upon the existing and/or proposed ecological aspects of the scheme. A significant uplift in ecological habitat and biodiversity is built into the scheme.
Archaeological Sites & Ancient Monuments	Negligible	None known, although part of Area 2b will be the subject of an archaeological investigation required by planning condition

Table 5 - Revised Risk Assessment Conclusions (Phase 2b)

7. CONCLUSIONS & RECOMMENDATIONS

Zig Zag Environmental has been instructed by Green Circle Ventures Ltd to carry out a Phase 2 investigation at Phase 2b of the at Kirkby Valley Golf Club.

The investigation consisted of a series of trial pits across the area, some targeting the former landfill site on the northern boundary. Samples have been recovered for chemical analysis.

The made ground/waste within the former landfill varied from 0.2 m thick at Trial Pit 1 to 1.4 m at Trial Pits 4 & 5. The waste generally consisted of soily sand and gravel with brick & concrete and occasional polythene, wood, pottery & metal rebar (TPs 1, 2, 3 & 5). This is consistent with pre-Landfill Directive inert waste.

Trial Pit 4 excavated towards the eastern end of the old landfill encountered similar material but also some polythene bags containing plastic bottles, tin cans, sweet wrappers and a golf trolley wheel.

The natural soils underlying the western section of the landfill comprised light brown/orange gravelly sand (TPs 1 & 2). The eastern section was underlain by firm to stiff brown slightly sandy silty clay with occasional gravel typical of glacial till (Boulder Clay).

The natural superficial soils were proved to a maximum depth of 1.7 m.

No groundwater was encountered in any of the pits.

Sandstone bedrock was not encountered.

No chemical contamination was identified, and all samples would be considered to be uncontaminated.

No specific remediation measures are required on the basis of the investigation findings, however as a precaution ZZE recommends that the following:

- (i) Refuse type materials are excavated and removed for off-site disposal.
- (ii) Following removal the area should be re-inspected by an independent consultant/engineer who should confirm the removal of the identified materials.
- (iii) Copies of the disposal records should be retained by the consultant/engineer.
- (iv) Imported soil shall be managed in accordance with the CL:AIRE Definition of Waste Code of Practise as specified in the planning permission.
- (v) Unrecorded Contamination

The developer and any appointed groundworks contractors should be aware that other previously unrecorded contamination might be encountered or identified during the redevelopment of the Phase 2b.

If, in the course of the ground works, any visual/olfactory signs of contamination are detected which had not previously been accounted for by the site investigation and assessment then works, in that area, should be suspended pending investigation and assessment.

Appropriate specialist advice should be sought and may result in further investigation and testing being carried out to determine the nature and extent of any such additional contamination. This information can be used to determine any further remedial measures required and the remediation statement can be updated or amended as necessary.

If the contamination identified is of limited extent it might be possible to remove it for temporary storage in a quarantine area pending further investigation and assessment.

This might allow development works to continue.

The local authority should be notified if such a situation arises.

A detailed record of any such occurrence should be maintained by the supervising engineer and this should be presented in the final completion report.

- (vi) A completion report should be produced on completion of the development and should be submitted to the LPA.



APPENDIX A

TRIAL PIT RECORDS

ZIG ZAG ENVIRONMENTAL SUITE 10 RAILWAY HOUSE RAILWAY ROAD CHORLEY PR6 0HW					Site Kirkby Valley Golf Club		Trial Pit Number TP3		
Excavation Method Komatsu PC 138 us tracked excavator		Dimensions 2.0 x 4.0 x 1.2 m		Ground Level (mOD)		Client Green Circle Ventures Ltd		Job Number ZZ25061	
		Location		Dates 03/07/2025		Engineer ML		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
						Soily sand and gravel with much brick gravel, some whole bricks and occasional polythene and concrete slab (MADE GROUND)			
						Firm to stiff brown slightly sandy silty CLAY with occasional fm gravel			
						Complete at 1.20m			
Plan					Remarks				
					Trial pit stable No groundwater encountered				
					Scale (approx)		Logged By		Figure No.
					1:25		DK		ZZ25061.TP3

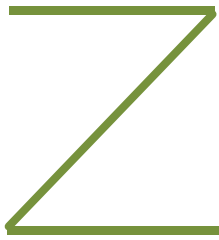
ZIG ZAG ENVIRONMENTAL SUITE 10 RAILWAY HOUSE RAILWAY ROAD CHORLEY PR6 0HW					Site Kirkby Valley Golf Club		Trial Pit Number TP6			
Excavation Method Komatsu PC 138 us tracked excavator		Dimensions 2.0 x 4.0 x 1.5 m		Ground Level (mOD)		Client Green Circle Ventures Ltd		Job Number ZZ25061		
		Location		Dates 03/07/2025		Engineer ML		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water	
0.50	D					Black TOPSOIL with grass and roots				
					(0.30)	Light brown orange SAND with occasional fm gravel				
					0.30					
					(0.70)	Soft to firm brown slightly sandy silty CLAY with occasional fm gravel				
					1.00					
(0.50)	Complete at 1.50m									
					1.50					
Plan					Remarks					
.					Trial pit stable					
.					No groundwater encountered					
.										
.										
.										
.										
					Scale (approx)		Logged By		Figure No.	
					1:25		DK		ZZ25061.TP6	

SUITE 10 RAILWAY HOUSE RAILWAY ROAD CHORLEY PR6 0HW					Site Kirkby Valley Golf Club		Trial Pit Number TP7		
Excavation Method Komatsu PC 138 us tracked excavator		Dimensions 2.0 x 4.0 x 1.5 m		Ground Level (mOD)		Client Green Circle Ventures Ltd		Job Number ZZ25061	
		Location		Dates 03/07/2025		Engineer ML		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
						Black TOPSOIL with grass and roots			
					0.30	Firm to stiff brown slightly sandy silty CLAY with occasional fm gravel			
					1.20				
					1.50	Complete at 1.50m			
Plan					Remarks				
					No groundwater encountered Trial pit stable				
					Scale (approx)		Logged By		Figure No.
					1:25		DK		ZZ25061.TP7

ZIG ZAG ENVIRONMENTAL SUITE 10 RAILWAY HOUSE RAILWAY ROAD CHORLEY PR6 0HW					Site Kirkby Valley Golf Club		Trial Pit Number TP8			
Excavation Method Komatsu PC138 us tracked excavator		Dimensions 2.0 x 4.0 x 1.6 m		Ground Level (mOD)		Client Green Circle Ventures Ltd		Job Number ZZ25061		
		Location		Dates 03/07/2025		Engineer ML		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
0.50	D					Black TOPSOIL with grass and roots				
					(0.35)					
					0.35	Light brown SAND with occasional fm gravel				
					(0.30)					
					0.65	Orange brown SAND with occasional fm gravel				
					(0.95)					
					1.60	Complete at 1.60m				
Plan					Remarks					
.					No groundwater encountered					
.					Trial pit stable					
.										
.										
.										
.										
.										
					Scale (approx)		Logged By		Figure No.	
					1:25		DK		ZZ25061.TP8	

ZIG ZAG ENVIRONMENTAL SUITE 10 RAILWAY HOUSE RAILWAY ROAD CHORLEY PR6 0HW					Site Kirkby Valley Golf Club		Trial Pit Number TP10		
Excavation Method Komatsu PC 138 us tracked excavator		Dimensions 2.0 x 4.0 x 1.5 m		Ground Level (mOD)		Client Green Circle Ventures Ltd		Job Number ZZ25061	
		Location		Dates 03/07/2025		Engineer ML		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
					0.30	Black TOPSOIL with grass and roots			
					0.30	Light brown SAND with occasional fm gravel			
					0.80				
					1.10	Soft to firm brown slightly sandy silty CLAY with occasional fm gravel			
					0.40				
					1.50	Complete at 1.50m			
Plan					Remarks				
					No groundwater encountered Trial pit stable				
					Scale (approx)	Logged By	Figure No.		
					1:25	DK	ZZ25061.TP10		

ZIG ZAG ENVIRONMENTAL SUITE 10 RAILWAY HOUSE RAILWAY ROAD CHORLEY PR6 0HW Site Kirkby Valley Golf Club Trial Pit Number TP11								
Excavation Method Komatsu PC 138 us tracked excavator		Dimensions 2.0 x 4.0 x 1.5 m		Ground Level (mOD)	Client Green Circle Ventures Ltd		Job Number ZZ25061	
		Location		Dates 03/07/2025	Engineer ML		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						Black TOPSOIL with grass and roots		
						Light brown SAND with occasional fm gravel		
						Orange SAND with occasional fm gravel		
						Complete at 1.50m		
Plan					Remarks No groundwater encountered Trial pit stable			
					Scale (approx) 1:25		Logged By DK	Figure No. ZZ25061.TP11



APPENDIX B

PHOTOGRAPHS

PHASE 2B – KIRKBY VALLEY GOLF CLUB
INVESTIGATION PHOTOGRAPHS – JULY 2025

TRIAL PIT 1



TRIAL PIT 2



PHASE 2B – KIRKBY VALLEY GOLF CLUB
INVESTIGATION PHOTOGRAPHS – JULY 2025

TRIAL PIT 3



TRIAL PIT 4



PHASE 2B – KIRKBY VALLEY GOLF CLUB
INVESTIGATION PHOTOGRAPHS – JULY 2025

TRIAL PIT 5



TRIAL PIT 6



PHASE 2B – KIRKBY VALLEY GOLF CLUB
INVESTIGATION PHOTOGRAPHS – JULY 2025

TRIAL PIT 7

NO IMAGE

TRIAL PIT 8



TRIAL PIT 9

NO IMAGE

PHASE 2B – KIRKBY VALLEY GOLF CLUB
INVESTIGATION PHOTOGRAPHS – JULY 2025

TRIAL PIT 10



TRIAL PIT 11





APPENDIX C

CHEMICAL TEST RESULTS

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 25/07274
Issue Number: 1

Date: 23 July, 2025

Client: Zig Zag Environmental Limited
Suite 10 Railway House
Railway Street
Chorley
Lancashire
PR6 0HW

Project Manager: Dave Killick/Martin Lovelock
Project Name: Kirby Valley GC GC
Project Ref: ZZ25061
Order No: 166/ZZ25061
Date Samples Received: 04/07/25
Date Instructions Received: 07/07/25
Date Analysis Completed: 18/07/25

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 25/07274

Client Project Name: Kirby Valley GC GC

Client Project Ref: ZZ25061

Lab Sample ID	25/07274/1	25/07274/2	25/07274/3	25/07274/4	25/07274/5	25/07274/6		Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP1	TP4	TP5	TP6	TP8	TP9				
Depth to Top	0.30	0.50	0.40	0.50	0.50	0.50				
Depth To Bottom										
Date Sampled	03-Jul-25	03-Jul-25	03-Jul-25	03-Jul-25	03-Jul-25	03-Jul-25				
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D				
Sample Matrix Code	4ABE	4ABE	4ABE	4A	4AE	1A				
% Stones >10mm _A	2.1	9.0	5.4	0.6	4.1	6.5		% w/w	0.1	A-T-044
pH _D ^{M#}	7.93	8.28	7.87	6.21	6.05	5.87		pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.05	0.02	0.06	<0.01	<0.01	<0.01		g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	660	730	560	<200	<200	<200		mg/kg	200	A-T-028s
Cyanide (total) _A ^{M#}	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		mg/kg	0.2	A-T-050s
Organic Matter _D ^{M#}	4.45	4.32	5.44	0.27	1.88	<0.14		% w/w	0.14	A-T-032s
Arsenic _D ^{M#}	9	16	4	9	<1	<1		mg/kg	1	A-T-024s
Boron (water soluble) _D ^{M#}	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		mg/kg	1	A-T-027s
Cadmium _D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		mg/kg	1	A-T-024s
Copper _D ^{M#}	44	76	<1	54	<1	<1		mg/kg	1	A-T-024s
Chromium _D ^{M#}	12	11	3	11	2	<1		mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-040s
Lead _D ^{M#}	99	224	<1	116	<1	<1		mg/kg	1	A-T-024s
Mercury _D	<0.17	0.38	<0.17	0.22	<0.17	<0.17		mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	12	13	3	14	<1	<1		mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-024s
Zinc _D ^{M#}	63	106	3	152	<1	<1		mg/kg	1	A-T-024s
TPH total (>C6-C40) _A ^{M#}	1080	559	348	<10	26	<10		mg/kg	10	A-T-007s

Envirolab Job Number: 25/07274

Client Project Name: Kirby Valley GC GC

Client Project Ref: ZZ25061

Lab Sample ID	25/07274/1	25/07274/2	25/07274/3	25/07274/4	25/07274/5	25/07274/6		Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP1	TP4	TP5	TP6	TP8	TP9				
Depth to Top	0.30	0.50	0.40	0.50	0.50	0.50				
Depth To Bottom										
Date Sampled	03-Jul-25	03-Jul-25	03-Jul-25	03-Jul-25	03-Jul-25	03-Jul-25				
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D				
Sample Matrix Code	4ABE	4ABE	4ABE	4A	4AE	1A				
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	-	-	-				A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-				A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-	-				A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	-	-	-				A-T-045

Envirolab Job Number: 25/07274

Client Project Name: Kirby Valley GC GC

Client Project Ref: ZZ25061

Lab Sample ID	25/07274/1	25/07274/2	25/07274/3	25/07274/4	25/07274/5	25/07274/6		Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP1	TP4	TP5	TP6	TP8	TP9				
Depth to Top	0.30	0.50	0.40	0.50	0.50	0.50				
Depth To Bottom										
Date Sampled	03-Jul-25	03-Jul-25	03-Jul-25	03-Jul-25	03-Jul-25	03-Jul-25				
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D				
Sample Matrix Code	4ABE	4ABE	4ABE	4A	4AE	1A				
PAH-16MS										
Acenaphthene _A ^{M#}	0.13	0.93	0.13	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.06	0.05	0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.54	0.61	0.14	<0.02	<0.02	<0.02		mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	2.23	2.08	0.53	<0.04	<0.04	<0.04		mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	2.07	2.00	0.50	<0.04	<0.04	<0.04		mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	2.12	2.23	0.56	<0.05	<0.05	<0.05		mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	1.18	1.11	0.33	<0.05	<0.05	<0.05		mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.78	0.67	0.18	<0.07	<0.07	<0.07		mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	2.36	2.62	0.67	<0.06	<0.06	<0.06		mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.29	0.32	0.06	<0.04	<0.04	<0.04		mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	4.39	4.37	1.19	<0.08	<0.08	<0.08		mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.11	0.48	0.07	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	1.46	1.25	0.35	<0.03	<0.03	<0.03		mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	1.47	0.04	<0.03	<0.03	<0.03		mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	1.84	3.66	0.82	<0.03	<0.03	0.07		mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	3.93	4.33	1.17	<0.07	<0.07	<0.07		mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	23.5	28.2	6.75	<0.08	<0.08	<0.08		mg/kg	0.01	A-T-019s

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs
Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.					

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as “% stones >10mm”.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.

Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

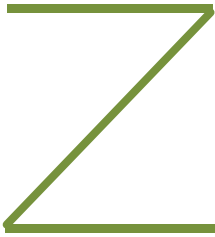
Please contact your client manager if you require any further information.

Envirolab Analysis Dates

Lab Sample ID	25/07274/1	25/07274/2	25/07274/3	25/07274/4	25/07274/5	25/07274/6
Client Sample No						
Client Sample ID/Depth	TP1 0.30m	TP4 0.50m	TP5 0.40m	TP6 0.50m	TP8 0.50m	TP9 0.50m
Date Sampled	03/07/25	03/07/25	03/07/25	03/07/25	03/07/25	03/07/25
A-T-007s	17/07/2025	17/07/2025	17/07/2025	17/07/2025	17/07/2025	17/07/2025
A-T-019s	17/07/2025	17/07/2025	17/07/2025	17/07/2025	17/07/2025	17/07/2025
A-T-024s	16/07/2025	16/07/2025	16/07/2025	16/07/2025	16/07/2025	16/07/2025
A-T-026s	16/07/2025	16/07/2025	16/07/2025	16/07/2025	16/07/2025	16/07/2025
A-T-027s	17/07/2025	17/07/2025	17/07/2025	17/07/2025	17/07/2025	17/07/2025
A-T-028s	16/07/2025	16/07/2025	16/07/2025	16/07/2025	16/07/2025	16/07/2025
A-T-031s	16/07/2025	16/07/2025	16/07/2025	16/07/2025	16/07/2025	16/07/2025
A-T-032s	17/07/2025	17/07/2025	17/07/2025	17/07/2025	17/07/2025	17/07/2025
A-T-040s	16/07/2025	16/07/2025	16/07/2025	16/07/2025	16/07/2025	16/07/2025
A-T-042sTCN	18/07/2025	18/07/2025	18/07/2025	18/07/2025	18/07/2025	18/07/2025
A-T-044	16/07/2025	16/07/2025	16/07/2025	16/07/2025	16/07/2025	16/07/2025
A-T-045	10/07/2025	10/07/2025	10/07/2025			
A-T-050s	18/07/2025	18/07/2025	18/07/2025	18/07/2025	18/07/2025	18/07/2025

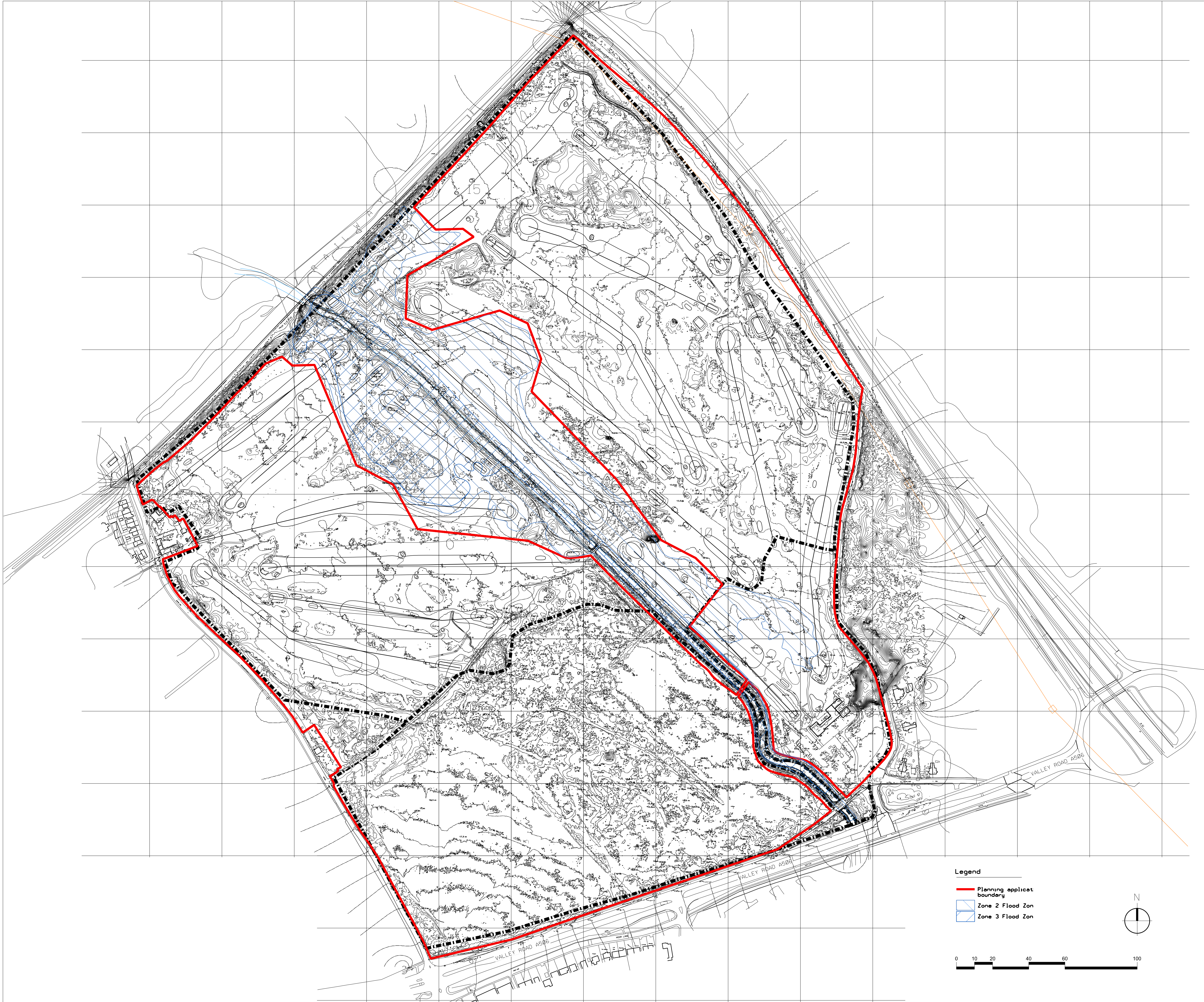
The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

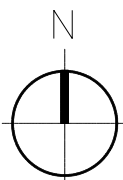


APPENDIX D

DRAWINGS



- Legend
- Planning applicat boundary
 - Zone 2 Flood Zon
 - Zone 3 Flood Zon



GENERAL NOTES

- 01.
- 02.
- 03.
- 04.
- 05.

REVISIONS

REV	DATE	DESCRIPTION	REV BY	CHK BY
A	10.11.23	Boundary line brought 10m back from top of river	ATC	ATC

KEY PLAN

CONSULTANT



LEAD CONSULTANT

CLIENT

Green Circle Estates

ISSUED FOR

Planning Application
100% submittal

PROJECT

Kirkby Valley Golf Club

DRAWING TITLE

001 Existing Site Plan

Drawn	PA	Checked	JH	Approved	AC
Date	13.02.23	Sheet Size	A1	Scale	1:2500
Drawing No.					Rev.
G935 001 EXISTING SITE PLAN					A

CAD File No.	Consultant Project No.
G935 001	

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Scorecard - 9 Hole Course Academy

Hole	Meters	Yards	Par
1	167	183	3
2	165	181	3
3	154	168	3
4	172	188	3
5	165	181	3
6	180	197	3
7	134	147	3
8	134	147	3
9	170	186	3
Total out	1441	1576	27

GENERAL NOTES

01.
02.
03.
04.
05.

REVISIONS

REV	DATE	DESCRIPTION	REV BY	CHK BY
A	09/03/20	Amendments to Driving Range	PA	AC

KEY PLAN

CONSULTANT



LEAD CONSULTANT

CLIENT

ISSUED FOR

Planning Application
(90% submittal)

PROJECT

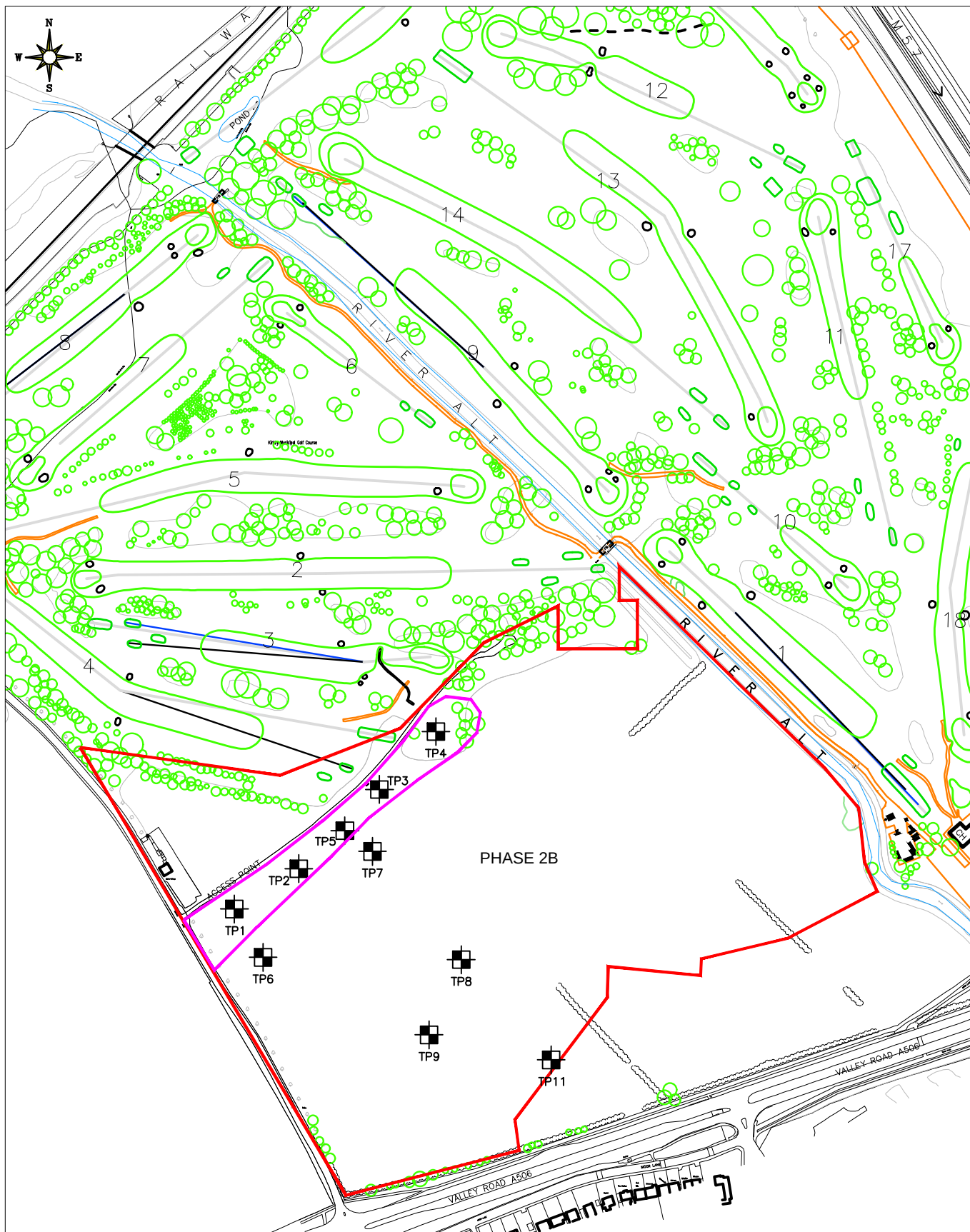
Kirkby Valley Golf Club

DRAWING TITLE

003 Proposed Masterplan - Colour

Drawn	ATC	Checked	ATC	Approved	ATC
Date	29.08.19	Sheet Size	A1	Scale	1:1250
Drawing No. G935 003 PROPOSED MASTERPLAN - COLOUR				Rev.	A
CAD File No.			Consultant Project No.		

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LEGEND — PHASE 2B BOUNDARY — LANDFILL BOUNDARY TP1 TRIAL PIT

ZIG ZAG
ENVIRONMENTAL

CLIENT
GREEN CIRCLE VENTURES LIMITED

JOB TITLE.
KIRKBY VALLEY GOLF CLUB

DRAWING TITLE.
TRIAL PIT LOCATIONS

DRAWN BY.
M.Y.B

DATE.
05/08/2025

SCALE © A4.
1:500

APPROVED BY.
M.L

DRAWING No.
ZZ25061-01