

GEO-ENVIRONMENTAL AUDIT

PHASE 1 Preliminary Risk Assessment

PHASE 2 Site Investigation

PHASE 3 Remediation Statement

Proposed Residential Development

Woodheys Road

Smithy Bridge

OL15 0BX

Author: Daniel Slattery
Client: Hoyle Developments Ltd
Reference: rep-tjba-hoyle-woodheys rd-phs1+2+3-060923.docx

Revision	Date	Reason
0	June 2023	Original to support planning application.

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Proposed Residential Development Woodheys Road Smithy Bridge OL15 0BX

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1. PHASE 1 - PRELIMINARY RISK ASSESSMENT

1.1. Introduction

T. J. Booth Associates have been appointed by Hoyle Developments Ltd to undertake a Phase 1, 2 & 3 Geo-environmental Audit & associated Site investigations to a Site in Smithy Bridge, Littleborough.

The Site is currently a plot of public open space within a residential housing estate.

The Site was granted planning permission in February 2023 under application No: 22/00742/FUL, for the: 'Erection of one pair of semi-detached dwellings including formation of new vehicular access from Woodheys Road'.

The purpose of this report is to discharge planning conditions attached to the planning permission, specifically condition No.12 which states:

- 12 Prior to commencement of the development a Phase I Report (Preliminary Risk Assessment) to assess the actual and/or potential contamination risks at the site shall be submitted to and approved in writing by the Local Planning Authority. For the avoidance of doubt, the Phase 1 Report shall include a desk top study, site walk over, conceptual model, basic hazard assessment and recommendation regarding the need or otherwise for further investigation and risk assessment. Where the Phase 1 Report has identified potential unacceptable risks, a suitable investigation, risk assessment and remedial action shall be carried out in accordance with details and within a timescale to have first been submitted to and approved in writing by the Local Planning Authority.

In the event that contamination is suspected or found at any time when carrying out the approved development that was not previously identified, or contamination is caused, the Local Planning Authority shall be notified immediately and development affected and potentially affected by the contamination must stop. An investigation and/or risk assessment and/or remediation shall be carried out in accordance with an agreed process and within agreed timescales to have first been submitted to and approved in writing by the Local Planning Authority. If contamination is not suspected, found or caused during development, this must be confirmed in a completion letter which shall be submitted to and approved in writing of the Local Planning Authority before first occupation.

This report provides a desk-based study & intrusive ground investigation based on current UK guidance for environmental investigation within the construction industry. Principal to the assessment is the potential for contamination pollutant linkages via the CLR-11 source-pathway-receptor methodology. Assessment of potential pollution linkages is primarily undertaken in strict accordance with BS 5930:2015, BS 10175:2011+A2:2017, CIRIA C665, and BS 8485:2015+A1:2019 et al.

1.2. Proposed Development

Planning drawings are for the erection of one pair of semidetached bungalows which will have a residential use.

The rear of the Site comprises a soft landscaped garden area made up of lawn and boundary hedging.

To the front of the Site will have driveways and soft landscaping with existing trees are to remain where possible.

1.3. Historic Maps

DATE	ON-SITE	OFF-SITE/SURROUNDING AREA
c1851	The Site is farmland within agricultural grazing fields.	The Site is approximately 50m from Cleggs Wood Heys farm. By this time, Hollingworth Lake exists approximately 175m east. Very little building structures in the wider area.
c1893	No change.	Lane now noted to the front of the Site (where Woodheys Road is now). Development along Smithy Bridge Road and Lake Bank.
c1910	No change.	Small pond noted approximately 75m northwest of the Site.

		Isolation hospital noted approximately 100m southwest.
c1930	An excavation is noted nominally encompassing the whole Site area.	Excavation noted approximately 80m southwest in the isolation hospital grounds.
c1938	Water/ponding noted to the east side of the excavation.	Lines on the plan suggest fencing around the excavation/pond area. Some further development to Milnrow Road, and along Smithy Bridge Road close to the Site.
c1955-60	Excavation remains but no water outline noted.	No overall change. The beginning of residential housing estates to the north of Smithy Bridge Road. Isolation Hospital now renamed Lakeview Childrens Hospital.
c1965-76	Site now noted as per the present-day layout – part of public open space within the residential development.	Residential housing estate surrounding the Site. Further housing estates to the northwest of the area.
c1977-88	No change.	Local and wider area now much as in the present-day layout.
c1992	No change.	No change.

1.4. Present Day Maps

Site Boundaries, Outlines of Structures and Buildings:	Current plans show the Site is landscaped area nominally comprising a grass surface with some juvenile/semi-mature trees along the frontage to Woodheys Road. There are no pertinent structures within the Site.
Ground Contours, Natural Drainage Features:	A topographic survey of the Site was undertaken in 2021. The survey indicates the highest point of the Site in the southwest corner at 178.00 falling to 177.50 at the southeast and northeast corners, with the northwest approximately 177.00maOD.
Water Courses:	No watercourses in the near vicinity.
Below Ground Obstructions:	None noted on current maps/plans.

1.5. Geology

Bedrock Geology:	The Site and wider local area are underlain by Milnrow Sandstone, a massive sandstone layer within the Lower Carboniferous Coal Measures. The dip of the local strata is estimated to be approximately 5deg southeast.
Superficial Geology:	The drift geology beneath the Site and wider local area comprises glacial boulder clays
Coal Seams.	The are no coal seams locally noted to underlie the Site at shallow depth.

1.6. Boreholes Records

There were no relevant boreholes noted locally.

1.7. Planning Data.

Past planning application for the land have been submitted but contained no data relevant to the environmental assessment.

1.8. Landmark Environmental Data

1.8.1. Agency & Hydrological

Discharge consents:	No records within a 250m radius.
Pollution incidents to controlled waters:	2 records within a 250m radius of the Site relating to a Hollingworth Lake pumping station approx 170m southeast.
River quality:	No records within a 250m radius.
Substantiated pollution incident register:	No records within a 250m radius.
Water abstractions:	No records within a 250m radius.
Bedrock aquifer:	Secondary A Aquifer.
Superficial aquifer:	Secondary Aquifer – undifferentiated.
Source protection zone:	Not within a Source Protection Zone. However, SPZ Zone 3 is approximately 45m southeast of the Site.

1.8.2. Waste

BGS recorded landfill sites:	None noted within a 250m radius.
Historic landfill sites:	None noted within a 250m radius.
Registered landfill sites:	None noted within a 250m radius.

1.8.3. Hazardous Substances

Planning hazardous substance consents:	No records within a 250m radius of the Site.
Planning hazardous substance enforcements:	No records within a 250m radius of the Site.

1.8.4. Geological

Mining Instability:	Within a coal mining area.
Potential for Collapsible Ground Stability Hazards:	Very low risk.
Potential for Compressible Ground Stability Hazards:	No hazard.
Potential for Ground Dissolution Stability Hazards:	No hazard.
Potential for Landslide Ground Stability Hazards:	Very low risk.
Potential for Running Sand Ground Stability Hazards:	Low to very low risk.

Potential for Shrinking or Swelling Clay Ground Stability Hazards:	Very low.
Radon Potential - Radon Affected Areas:	The property is within a Lower probability radon area (<1% of homes estimated to be at or above the action level).
Radon Potential - Radon Protection Measures:	No radon protection measures are required.

1.9. Coal Authority

Mine Shafts, Pits, Adits/Entries:	No coal entries within 20m of the site boundaries.
Past Recorded Underground Mining.	None noted beneath the Site or local area.
Present/Future Underground Mining.	Not known to be a risk.
Unrecorded Probable/Potential Shallow Underground Workings:	None noted beneath the Site or local area.
Past/Present/Future Surface Mining/Opencast:	None noted locally.
Mining Geology and Subsidence:	Not noted.
Hazards and Mine Gas:	Unknown.
Development High Risk Area:	The Site is NOT within a Development High Risk Area.
Abandonment Plan Data:	No data available.

1.10. Industry Profiles

N/A.

1.11. Site Reconnaissance

Details of Existing Structures:	The Site was accessed via Woodheys Road. The Site is nominally triangular in shape, and enclosed by concrete post and timber panel fences to the entire perimeter except that shared with Woodheys Road which is an open boundary. The only notable features on-site were some semi-mature trees along the front, notably ash & sycamore etc, and some other juvenile species including silver birch central to the Site. There were lamp posts at either end of the front boundary, and a manhole noted in the main road at the west side.
Adjacent Properties:	Surrounded by residential properties and gardens.
Water Levels, Directions of Flow and Rates in Rivers:	None noted.
Old Mine or Quarry Workings:	None noted.
Obvious/Immediate Hazards to Health/Safety:	None noted.

Areas of Discoloured Soil, Polluted Water, Vegetation, and Significant Odours:	None noted.
Relevant Ground Levels, Ground Water Levels, Positions of Wells and Springs:	Site appeared relatively level with a slight fall to the northwest corner. The Site was boggy to the rear suggesting waterlogged clay ground.

1.12. Identification of Source-Pathway-Receptor.

1.12.1. Summary & Discussion.

Prior to the construction of the residential housing estate, the previous use of the Site and local area was as agricultural land.

The only pertinent environmental feature noted on the historic mapping database was the excavation noted on-site, which encompassed almost the entire boundary, and was noted c1930-60. In the 1938 map, the excavation had a waterline noted to the east side. Given the size of the Site and excavation profile, the excavation doesn't appear to be deep, and is likely to have been backfilled with clay fill.

The excavation remained until the current housing estate was erected. As the pond would have had to be infilled to create the level ground noted today, the Site will be filled with an unknown depth & type of made ground which may be a source material for contaminative materials.

Externally there are no landfill Sites. The Site has not been subject to coal mining and radon is not an issue in the local area.

Due to the above reasoning, the existing on-site historic made ground will have to be assessed in accordance with the risks identified, and with the associated contaminants of concern.

1.12.2. Potential Contaminants.

CURRENT SOURCE/S	ORIGINAL ASSOCIATED SOURCE	CONTAMINANT/S
Existing historic made ground – is thought to exist across the Site.	Mill & demolition materials, mortars & plasters, cladding, heat resistant fixings/fittings/insulation, other material such as hardcore & planings etc.	Metals, PAHs, sulphates, asbestos (CH ₄ , CO ₂ if any putrescible materials noted).

1.12.3. Potential Pathways.

The potential pathways to/from the Development Site include (not an exhaustive list but a summary of the main points):

PATHWAY	MEDIA
Soil and dust ingestion	Soil and indoor dust
Consumption of home-grown fruit and vegetables	Produce
Skin contact (indoors)	Indoor dust
Skin contact (outdoors)	Soil
Inhalation of dust (indoors)	Air
Inhalation of dust (outdoors)	Air
Vapours (indoors)	Air
Vapours (outdoors)	Air

1.12.4. Potential Receptors.

Receptors mainly comprise workers in the construction phase, and workforce for the proposed end use.

Controlled waters: no receptors.

1.13. Preliminary Conceptual Model.

CURRENT SOURCE/S		ORIGINAL ASSOCIATED USAGE / LOCATION	CONTAMINANT TYPE	PATHWAY	RECEPTOR	POLLUTION LINKAGE	CONSEQUENCE	PROBABILITY	RISK
CHEMICAL (SOLID)	Existing made ground - surface/sub-soil.	Former excavation on site has been infilled as part of the estate construction. Fill materials are unknown.	Metals, PAHs, sulphates, asbestos.	Direct ingestion, aerial ingestion, dermal contact, drinking water.	Site construction operatives & future occupants. Site buildings.	Historical made ground will have to be investigated but may comprise common contaminants above threshold values allowed for a residential usage.	Medium.	High likelihood.	High risk.
	Geological ground gas.	Radon sources in Namurian deposits underlying the Site.	Rn.	Diffusion through soil, substructure s, aerial inhalation.	Future occupants. Explosion, suffocation.	The Site is within a Class 1 radon area. No protective measures are required.	Medium.	Unlikely.	Low risk.
GROUND GAS RISK (VAPOURS)	Anthropogenic ground gas sources.	Former excavation on site has been infilled as part of the estate construction but appears to be shallow. Fill materials are unknown but likely to be clay backfill with little putrescible material.	CH ₄ , CO ₂ , other trace gases.			The pollutant linkage will only be viable if there is putrescible material in the ground.	Medium.	Unlikely.	Low risk.
		Historic landfill sites in the wider area.				None in the local area.	Medium.	Unlikely.	Low risk.
CHEMICAL (LIQUID)	Existing made ground - surface/sub-soil.	Former tanks.	Metals, PAHs, sulphates.	Permeation through soil into ground water, local watercourse s, or aquatic habitats.	Contaminated ground / surface water. Controlled Waters such as watercourses, canal, aquatic habitats & associated wildlife.	Unlikely to pose a significant. Metal & PAH contamination is expected to be minor, and these contaminants of concern are not as mobile as others. Made ground deposits are limited in area. There are also no groundwater extractions or source control areas locally.	Medium.	Unlikely.	Low risk.

1.14. Site Investigations.

1.14.1. Site Investigations (Trial Holes) 11.10.2023.

Site Investigations were undertaken by T J Booth Associates and comprised 4No. shallow hand excavated trial pits (THs 1-4).

The trial pits were located nominally in a grid format at equidistant points around the Site to gain an understanding of the geo-environmental characteristics of the upper soil for assessment.

Historically, the full Site area had a former use as an agricultural pond. The trial pit locations (TPs1, 2 & 4) were designed to encounter this area & were expected to find fill. The exception to this was TP3, located nominally on the edge of the former pond, and so would be the only trial pit likely to encounter virgin ground.

The trial pits comprised the following findings:

- TP1. GL: 177.76
0-400 Soft dark brown very slightly sandy, slightly gravelly clay topsoil MADE GROUND (damp). Gravel is stone & rare brick. (S1)
- TP2. GL: 177.63
0-400 Soft dark brown slightly sandy, gravelly clay topsoil MADE GROUND (waterlogged). Gravel is shale, stone & rare brick. (S2)
- TP3. GL: 177.75
0-300 Dark brown slightly sandy, slightly gravelly silty TOPSOIL (dry). Gravel is stone & rare brick. (S1)
300-350 Stiff orange/brown grey mottled CLAY
- TP4. GL: 177.15
0-400 Soft dark brown slightly gravelly clay topsoil MADE GROUND (damp). Gravel is stone & rare brick. (S1)

The trial pit excavations albeit shallow, confirmed clayey fill in TP1, 2 & 4; and found what appeared to be topsoil over stiff clay (both suspected as virgin ground).

4No. soil samples (S1-4) were also taken in each of the trial pits, and are representative of the upper topsoil/made ground horizon as encountered. Samples were taken to assess the potential general background contamination levels across the Site.

Soil samples were sealed in 1kg white plastic snap top containers & amber jars & vials and sent to Envirolab Ltd to be tested for a range of common contaminants.

Samples were tested for metals, speciated PAH, inorganics & sulphates, SOM, & asbestos screening in accordance with the conceptual model.

No visual or olfactory evidence of hydrocarbon contamination was suspected on site or in the risk assessment.

1.15. Risk Assessments.

1.15.1. Human Health Risk.

On return the samples were assessed by TJ Booth Associates to common threshold comparison data, specifically the Defra Category 4 Screening Levels (C4SLs), then to LQM/CIEH (S4ULs).

Testing of made ground revealed all contaminants of concern at levels below threshold trigger values for a residential end use, (refer to testing certificates, and full analysis spreadsheets in the Appendix):

The existing soils are considered to be suitable for reuse with regard to human receptors.

1.15.2. Controlled Waters Risk.

Groundwater samples against the EQS & also drinking water standards (UK DWI 2016 & WHO 2022), and surface water/river sampling results are generally compared against the Environment Quality Standards for Freshwater (EQS).

1.15.2.1. Groundwater.

Risks to groundwater are considered low for the following reasons:

- The Site has had no former industrial or contaminative usage.
- Was formerly agricultural land prior to becoming open land as part of the current housing estate.
- Was excavated and used as a pond area, prior to being infilled with inert clay fill.
- The Site is underlain by a low vulnerability, secondary aquifer.
- Not in a source protection zone.
- No water abstractions in the local area.

1.15.2.2. Surface water/watercourses.

Risks to surface water is considered low for the following reasons:

- No watercourses adjacent or close to the Site.
- Low ground water risk at the Site (no watercourse baseflow issues etc).
- Nearest surface water feature (Hollingworth Lake) is over 175m distant.

1.15.3. Ground Gas Risk.

1.15.3.1. Historic landfill sites.

There are no current or historic landfill sites within a 250m radius of the Site boundaries.

1.15.3.2. On-site refuse tips/infilled ponds.

There was a small former agricultural excavation/pond on Site which appeared to have been in use c1930s until the housing estate was built and the pond was infilled. Orange/brown clay was noted in one of the shallow trial holes below the topsoil.

No credible risk is attributed to this source.

1.15.3.3. Radon.

The Site is in a lower radon probability area (<1% above the action level), and as such, radon protective measures are not required in new development.

1.15.3.4. Alluvium.

No alluvium or peat deposits noted in the local area.

1.16. Final Conceptual Model.

CURRENT SOURCE/S		ORIGINAL ASSOCIATED USAGE / LOCATION	CONTAMINANT TYPE	PATHWAY	RECEPTOR	POLLUTION LINKAGE	CONSEQUENCE	PROBABILITY	RISK	MITIGATION PROPOSED
CHEMICAL (SOLID)	Existing made ground - surface/sub-soil.	Former excavation on site has been infilled as part of the estate construction. Fill materials are unknown.	Metals, PAHs, sulphates, asbestos.	Direct ingestion, aerial ingestion, dermal contact, drinking water.	Site construction operatives & future occupants. Site buildings.	No contaminants above residential threshold levels were noted in the sample analysis.	Medium.	Unlikely.	Very low risk.	No mitigation required. Source-pathway-receptor pollutant linkage broken.
GROUND GAS RISK (VAPOURS)	Anthropogenic ground gas sources.	Former excavation on site has been infilled as part of the estate construction. Inert clay fill was used to infill the pond.	CH ₄ , CO ₂ , other trace gases.	Diffusion through soil, substructures, aerial inhalation.	Future occupants. Explosion, suffocation.	To date, limited investigations have revealed the fill material beneath the Site is inert clay infill. Without a source, the pollutant linkage is broken.	Medium.	Unlikely.	Very low risk.	No mitigation required. Source-pathway-receptor pollutant linkage broken.

2. PHASE 3 - REMEDIATION STATEMENT

2.1. Basic Site Details

Full details included in the Phase 2 Site Investigation Introduction & subsequent sections.

2.2. Site & Remedial Objectives

Site investigations undertaken as part of the Phase 2, comprised shallow trial holes & soil sampling methods.

No remedial objectives were concluded.

2.3. Conceptual Model (Final) & Relevant Pollution Linkages

Refer to Phase 2 Site Investigation and Assessment section of the report for Final Conceptual Model.

All pollutant linkages have been broken.

2.4. Recommended Remediation:

No remediation required.

2.5. Verification (Phase 4 requirements)

Verification of the imported soil may be required for Planning or Building Control/Building Regulations submission. Should this be required, it will need to be undertaken by suitably qualified consultants and comprise the following:

- Import source material.
- Characterisation & suitability of material.
- Soil sampling should be undertaken as per YALPAG Guidelines as per the following ratios:

Virgin quarried materials, 1-2 samples to confirm inert nature.

Crushed hardcore, stone, brick, min 1 sample per 500cum.

Greenfield/manufactured, generally 1 sample per 250cum (min 3 samples).

Brownfield, generally 1 sample per 50cum (min 6 samples).

Samples should be tested for the following contamination suites: metals, inorganics, PAH USEPA16 speciated, and asbestos screening. Results will be analysed against Defra Category 4 Screening Levels (C4SLs) where available, and then to the LQM/CIEH (S4ULs), for use in a residential end use setting.

- Verification depth NOT required.
- Reporting (including photographic evidence).

2.6. Additional Notes

Before any further work is undertaken, this report should be submitted to and agreed by the Local Planning Authority Contaminated Land Department/Building Control Department as necessary.

We trust that the above clear, but should you require further advice please contact the undersigned.

Signed.....



D.S. Slattery BSc (Hons).

T J Booth Associates.

Authorised...

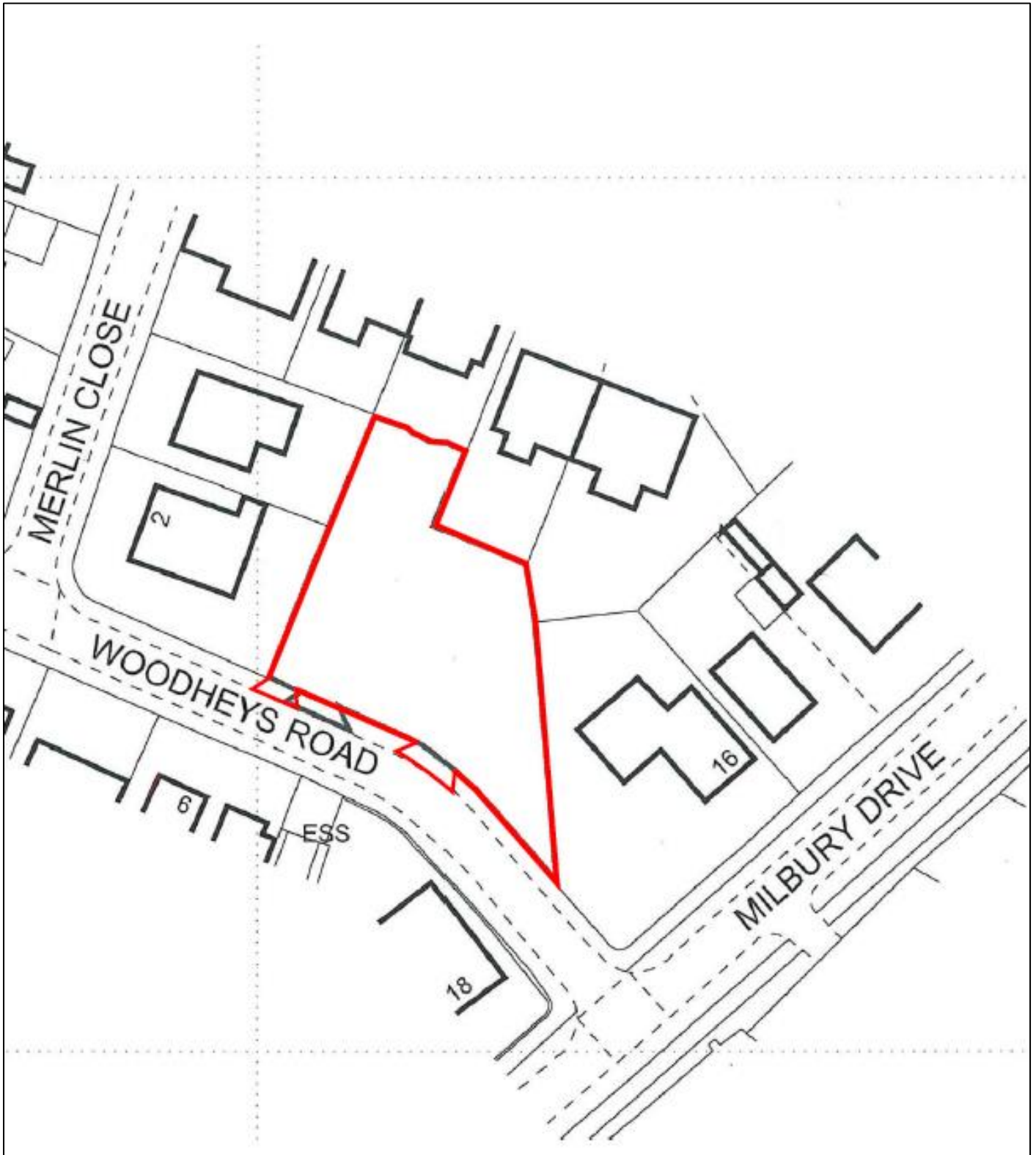


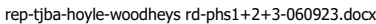
T J Booth BSc (Hons), C. Eng. C. Env. MICE.

T J Booth Associates.

4. APPENDIX A: FIGURES

4.1. Location Plan





4.5. TJBA Soil Analysis

Client / Site:		Hoyle - Woodheys Rd, Smithy Bridge.						
Sample Type:		Soil Samples						
Sampling Date:		10.10.2023						
Contaminant		No	Max	Mean	t 95	RESIDENTIAL (with or without plant uptake)		
						Pass/Fail	Comment	
METALS	Arsenic as As, dry weight	4	12	8.75	11.55	37	PASS	
	Boron as B, hot water sol dw	4	1	1	1	290	PASS	
	Cadmium as Cd, dry weight	4	0.5	0.5	0.5	22	PASS	
	chromium as Cr(III) dry weight	4	27	22.25	26.40	910	PASS	
	Chromium as Cr(VI), dry weight	4	1	1	1	21	PASS	
	Copper, as Dry Weight	4	39	35.75	39	2400	PASS	
	Lead, as Dry Weight	4	68	55.5	66.05	200	PASS	
	Mercury as Hg, dry weight	4	0.17	0.17	0.17	1.2	PASS	
	Nickel as Ni, dry weight	4	24	21	23.7	130	PASS	
	Selenium as Se, dry weight	4	1	1	1	250	PASS	
	Zinc as Zn, dry weight	4	80	67.75	78.8	3700	PASS	
INORGANIC	Cyanide (Total)	4	1	1	1	2.5	PASS	
	Sulphate (Total) as SO ₄	4	0.072	0.0558	0.071	0.24	PASS	
	Sulphide	4	5	5	5	250	PASS	
	pH	4	6.68	6.1625	6.643	6 to 8	NORMAL	
	Sulphur (Elemental)	4	41	19.75	37.1	100	PASS	
	Asbestos Identification	4	0	0	0	0	PASS	
ORGANIC	SOM	4	6	6	6			
	PAH acenaphthene	4	0.04	0.0225	0.039	1100	PASS	
	PAH acenaphthylene	4	0.03	0.0175	0.029	920	PASS	
	PAH anthracene	4	0.15	0.0775	0.143	11000	PASS	
	PAH benzo[a]anthracene	4	0.68	0.325	0.632	13	PASS	
	PAH benzo[a]pyrene	4	0.5	0.2725	0.475	5	PASS	
	PAH benzo[b]fluoranthene	4	0.71	0.385	0.671	3.7	PASS	
	PAH benzo[g,h,i]perylene	4	0.25	0.1625	0.244	350	PASS	
	PAH benzo[k]fluoranthene	4	0.31	0.185	0.295	100	PASS	
	PAH chrysene	4	0.65	0.35	0.613	27	PASS	
	PAH dibenz[ah]anthracene	4	0.06	0.045	0.057	0.3	PASS	
	PAH fluoranthene	4	1.4	0.6925	1.306	890	PASS	
	PAH fluorene	4	0.03	0.0175	0.029	860	PASS	
	PAH indeno[123-cd]pyrene	4	0.33	0.185	0.315	41	PASS	
	PAH naphthalene	4	0.03	0.03	0.03	13	PASS	
	PAH phenanthrene	4	0.49	0.2625	0.471	440	PASS	
	PAH pyrene	4	1.25	0.62	1.166	2000	PASS	
	PAH PAH (Total - SUM EPA16)	4	6.85	3.46	6.454	1	comment	
	SVOC phenol	4	0.2	0.2	0.2	380	PASS	

4.6. Envirolab Ltd Certificates

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/10064
Issue Number: 1
Date: 31 October, 2023

Client: T J Booth Associates
20a East Gate Street
Rochdale
Rochdale
Greater Manchester
UK
OL16 1DH

Project Manager: Daniel Slattery
Project Name: Hoyle Devs, Woodheys Road
Project Ref: Not specified
Order No: N/A
Date Samples Received: 11/10/23
Date Instructions Received: 12/10/23
Date Analysis Completed: 31/10/23

Approved by:



Gemma Berrisford
Deputy Client Services Supervisor

Envirolab Job Number: 23/10064

Client Project Name: Hoyle Devs, Woodheys Road

Client Project Ref: Not specified

Lab Sample ID	23/10064/1	23/10064/2	23/10064/3	23/10064/4						
Client Sample No	S1	S2	S3	S4						
Client Sample ID	TP1	TP2	TP3	TP4						
Depth to Top	0.00	0.00	0.00	0.00						
Depth To Bottom	0.40	0.40	0.30	0.40						
Date Sampled	10-Oct-23	10-Oct-23	10-Oct-23	10-Oct-23						
Sample Type	SOIL	SOIL	SOIL	SOIL						
Sample Matrix Code	8A	8AE	8E	8E						
								Units	Limit of Detection	Method ref
% Stones >10mm _s	8.4	2.6	<0.1	<0.1				% w/w	0.1	A-1-044
pH ₂₅ TM	8.43	8.88	6.88	6.88				pH	0.01	A-1-021a
Sulphate (acid soluble) _s TM	370	470	720	870				mg/kg	200	A-1-028a
Cyanide (total) _s TM	<1	<1	<1	<1				mg/kg	1	A-1-026/128
Phenols - Total by HPLC _s	<0.2	<0.2	<0.2	<0.2				mg/kg	0.2	A-1-088a
Sulphide _s	<5	<5	<5	<5				mg/kg	5	A-1-043-a
Sulphur (elemental) _s TM	41	16	16	8				mg/kg	5	A-1-028a
Organic Matter _s TM	6.3	6.7	8.7	7.0				% w/w	0.1	A-1-022a
Arsenic _s TM	9	8	12	8				mg/kg	1	A-1-024a
Boron (water soluble) _s TM	<1.0	<1.0	<1.0	<1.0				mg/kg	1	A-1-027a
Cadmium _s TM	<0.5	<0.5	0.5	<0.5				mg/kg	0.5	A-1-024a
Copper _s TM	38	38	38	29				mg/kg	1	A-1-024a
Chromium _s TM	23	21	27	18				mg/kg	1	A-1-024a
Chromium (hexavalent) _s	<1	<1	<1	<1				mg/kg	1	A-1-040a
Lead _s TM	66	64	88	46				mg/kg	1	A-1-024a
Mercury _s	<0.17	<0.17	<0.17	<0.17				mg/kg	0.17	A-1-028a
Nickel _s TM	24	21	22	17				mg/kg	1	A-1-024a
Selenium _s TM	<1	<1	<1	<1				mg/kg	1	A-1-024a
Zinc _s TM	83	72	80	68				mg/kg	5	A-1-024a

Envirolab Job Number: 23/10064

Client Project Name: Hoyle Devs, Woodheys Road

Client Project Ref: Not specified

Lab Sample ID	23/10064/1	23/10064/2	23/10064/3	23/10064/4						
Client Sample No	S1	S2	S3	S4						
Client Sample ID	TP1	TP2	TP3	TP4						
Depth to Top	0.00	0.00	0.00	0.00						
Depth To Bottom	0.40	0.40	0.30	0.40						
Date Sampled	10-Oct-23	10-Oct-23	10-Oct-23	10-Oct-23						
Sample Type	SOIL	SOIL	SOIL	SOIL						
Sample Matrix Code	SA	SAE	SE	SE						
Asbestos In Soil (inc. matrix)										
Asbestos In soil _g ^g	NAD	NAD	NAD	NAD						A-1065
Asbestos Matrix (visual) _g	-	-	-	-						A-1065
Asbestos Matrix (microscope) _g	-	-	-	-						A-1065
Asbestos ACM - Suitable for Water Absorption Test? _g	N/A	N/A	N/A	N/A						A-1065

Envirolab Job Number: 23/10064

Client Project Name: Hoyle Devs, Woodheys Road

Client Project Ref: Not specified

Lab Sample ID	23/10064/1	23/10064/2	23/10064/3	23/10064/4						
Client Sample No	S1	S2	S3	S4						
Client Sample ID	TP1	TP2	TP3	TP4						
Depth to Top	0.00	0.00	0.00	0.00						
Depth To Bottom	0.40	0.40	0.30	0.40						
Date Sampled	10-Oct-23	10-Oct-23	10-Oct-23	10-Oct-23						
Sample Type	SOIL	SOIL	SOIL	SOIL						
Sample Matrix Code	6A	6AE	6E	6E						
PAH-16MS										
Acenaphthene ₁₆	0.03	<0.01	0.04	<0.01				mg/kg	0.01	A-1-03a
Acenaphthylene ₁₆	0.02	<0.01	0.03	<0.01				mg/kg	0.01	A-1-03a
Anthracene ₁₆	0.15	0.04	0.10	<0.02				mg/kg	0.02	A-1-03a
Benzo(a)anthracene ₁₆	0.88	0.22	0.38	<0.04				mg/kg	0.04	A-1-03a
Benzo(a)pyrene ₁₆	0.60	0.22	0.33	<0.04				mg/kg	0.04	A-1-03a
Benzo(b)fluoranthene ₁₆	0.71	0.33	0.45	<0.05				mg/kg	0.05	A-1-03a
Benzo(ghi)perylene ₁₆	0.25	0.14	0.21	<0.05				mg/kg	0.05	A-1-03a
Benzo(k)fluoranthene ₁₆	0.31	0.15	0.21	<0.07				mg/kg	0.07	A-1-03a
Chrysene ₁₆	0.85	0.29	0.40	<0.06				mg/kg	0.06	A-1-03a
Dibenzo(ah)anthracene ₁₆	0.08	<0.04	<0.04	<0.04				mg/kg	0.04	A-1-03a
Fluoranthene ₁₆	1.40	0.52	0.77	<0.08				mg/kg	0.08	A-1-03a
Fluorene ₁₆	0.02	<0.01	0.03	<0.01				mg/kg	0.01	A-1-03a
Indeno(123-cd)pyrene ₁₆	0.33	0.15	0.23	<0.03				mg/kg	0.03	A-1-03a
Naphthalene ₁₆	<0.03 ^U	<0.03 ^U	<0.03 ^U	<0.03 ^U				mg/kg	0.03	A-1-03a
Phenanthrene ₁₆	0.48	0.17	0.38	<0.03				mg/kg	0.03	A-1-03a
Pyrene ₁₆	1.25	0.47	0.88	<0.07				mg/kg	0.07	A-1-03a
Total PAH-16MS ₁₆	8.85	2.70	4.21	<0.08				mg/kg	0.01	A-1-03a

Report Notes

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

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 six 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.

The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client.

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.

Key

Superscript "H"	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 "M"	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
NOP	No Determination Possible
NAD	No Asbestos Detected
N/A	Not applicable

Asbestos

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

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing, and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

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 accreditation range and as such are unaccredited.

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

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envirolab.co.uk

Client: T J Booth Associates, 20a East Gate Street, Rochdale, Rochdale, Greater Manchester, UK, OL16 1DH

Project: Hoyle Devs, Woodheys Road

Clients Project No:

Project No: 23/10064

Date Received: 12/10/2023 (am)

Cool Box Temperatures (°C): 6.8

Lab Sample ID	23/10064/1	23/10064/2	23/10064/3	23/10064/4
Client Sample No	S1	S2	S3	S4
Client Sample ID/Depth	TP1 0.00-0.40m	TP2 0.00-0.40m	TP3 0.00-0.30m	TP4 0.00-0.40m
Date Sampled	10/10/23	10/10/23	10/10/23	10/10/23
Deviation Code	F			

Key

F

Maximum holding time exceeded between sampling date and analysis for analytes listed below

HOLDING TIME EXCEEDANCES

Lab Sample ID	23/10064/1	23/10064/2	23/10064/3	23/10064/4
Client Sample No	S1	S2	S3	S4
Client Sample ID/Depth	TP1 0.00-0.40m	TP2 0.00-0.40m	TP3 0.00-0.30m	TP4 0.00-0.40m
Date Sampled	10/10/23	10/10/23	10/10/23	10/10/23
Sulphide	✓	✓	✓	✓
Cyanide (total)	✓	✓	✓	✓

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples $5 \pm 3^{\circ}\text{C}$), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

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Envirolab Analysis Dates

Lab Sample ID	23/10064/1	23/10064/2	23/10064/3	23/10064/4
Client Sample No	S1	S2	S3	S4
Client Sample ID/Depth	TP1 0.00-0.40m	TP2 0.00-0.40m	TP3 0.00-0.30m	TP4 0.00-0.40m
Date Sampled	10/10/23	10/10/23	10/10/23	10/10/23
A-T-019s	23/10/2023	23/10/2023	23/10/2023	23/10/2023
A-T-024s	24/10/2023	24/10/2023	24/10/2023	24/10/2023
A-T-027s	20/10/2023	20/10/2023	20/10/2023	20/10/2023
A-T-028s	20/10/2023	20/10/2023	20/10/2023	20/10/2023
A-T-029s	27/10/2023	27/10/2023	27/10/2023	27/10/2023
A-T-031s	24/10/2023	24/10/2023	24/10/2023	24/10/2023
A-T-032s	31/10/2023	31/10/2023	31/10/2023	31/10/2023
A-T-040s	20/10/2023	20/10/2023	20/10/2023	20/10/2023
A-T-042sTCN	30/10/2023	30/10/2023	30/10/2023	30/10/2023
A-T-043-s	31/10/2023	31/10/2023	31/10/2023	31/10/2023
A-T-044	25/10/2023	25/10/2023	25/10/2023	25/10/2023
A-T-045	13/10/2023	13/10/2023	13/10/2023	13/10/2023
A-T-050s	16/10/2023	16/10/2023	16/10/2023	16/10/2023

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

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5. APPENDIX B: PHOTOS



Site view from Woodheys Rd.



TP1/S1 location.



TP2/S2 location.

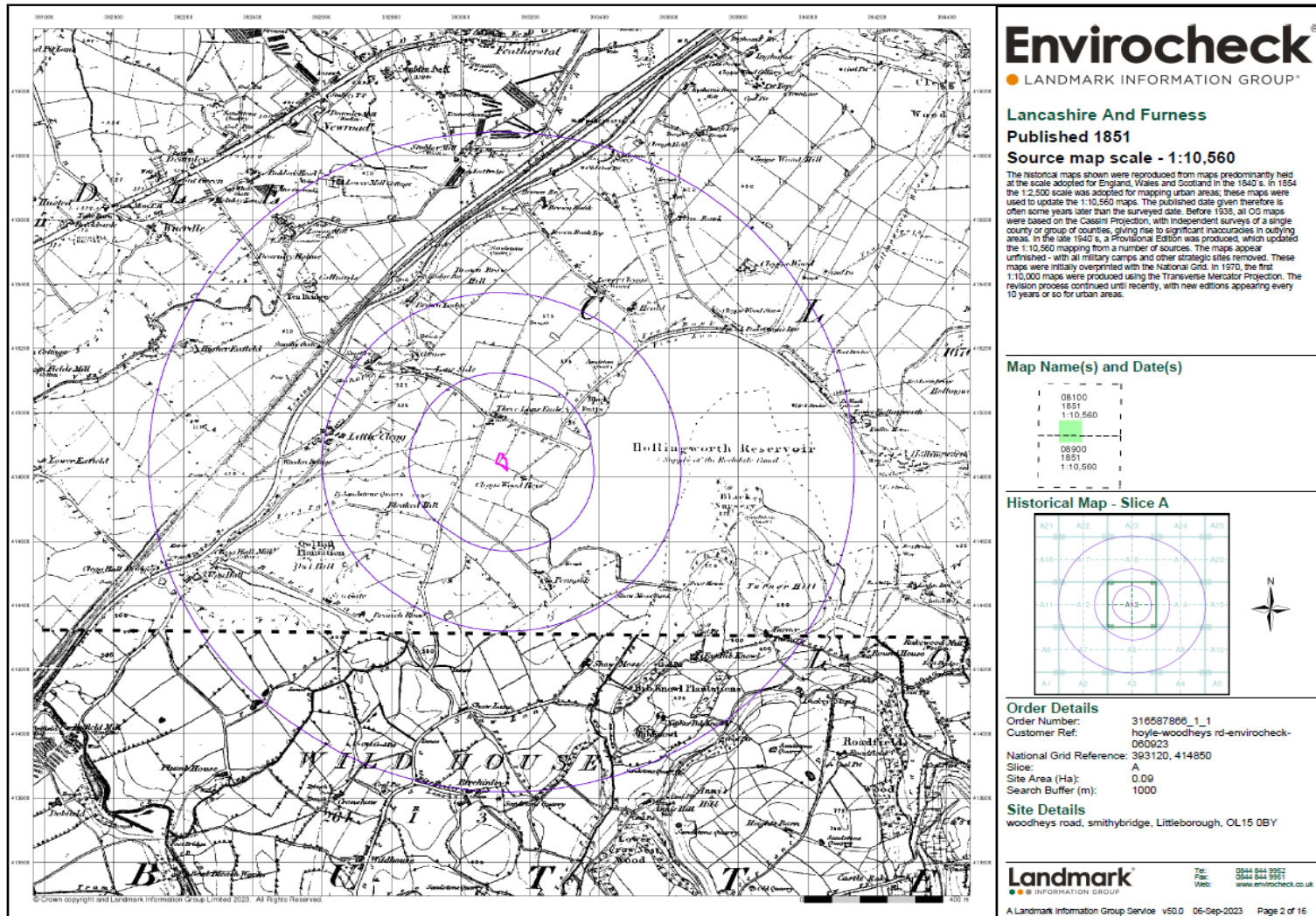


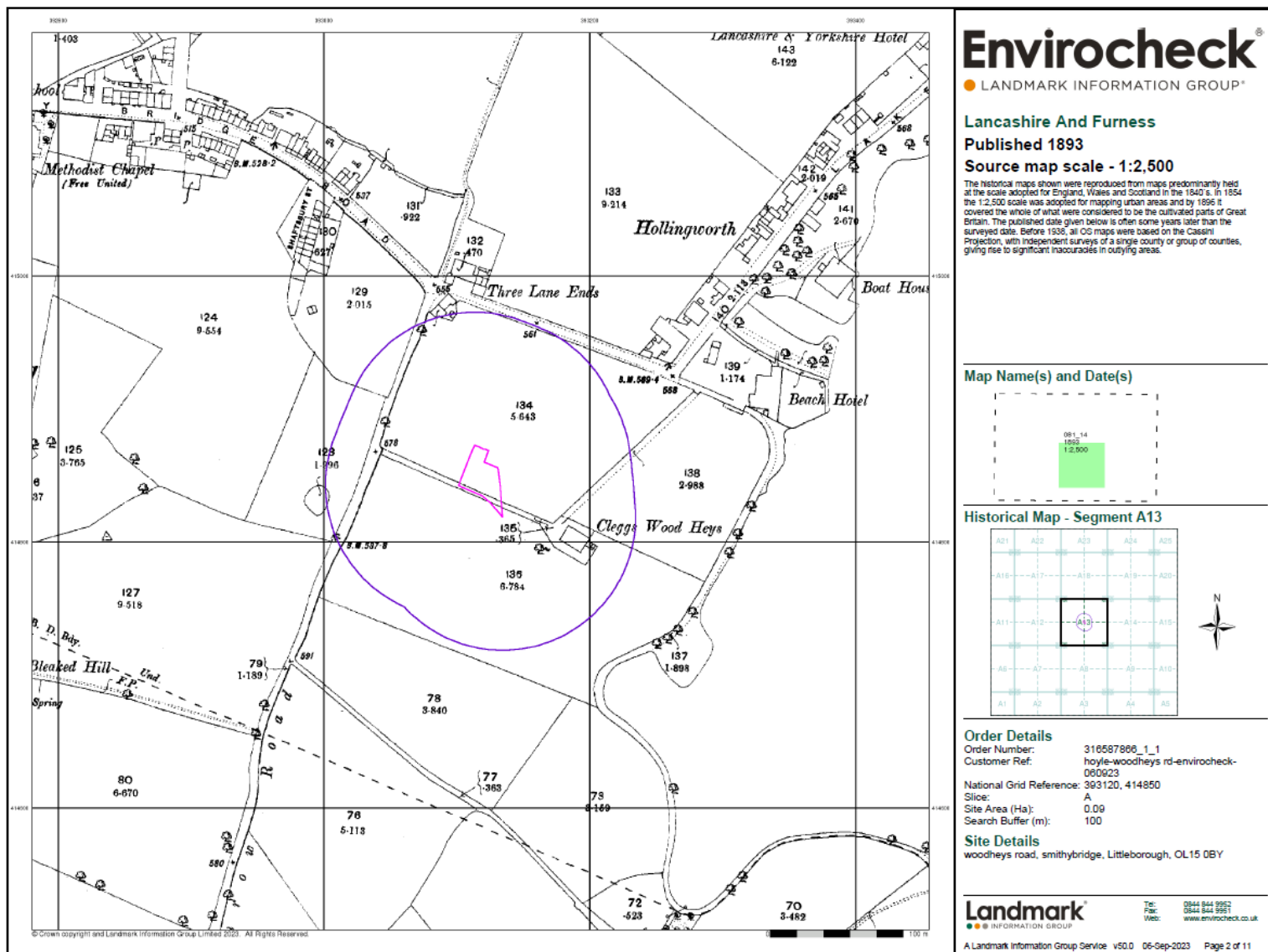
TP3/S3 location.

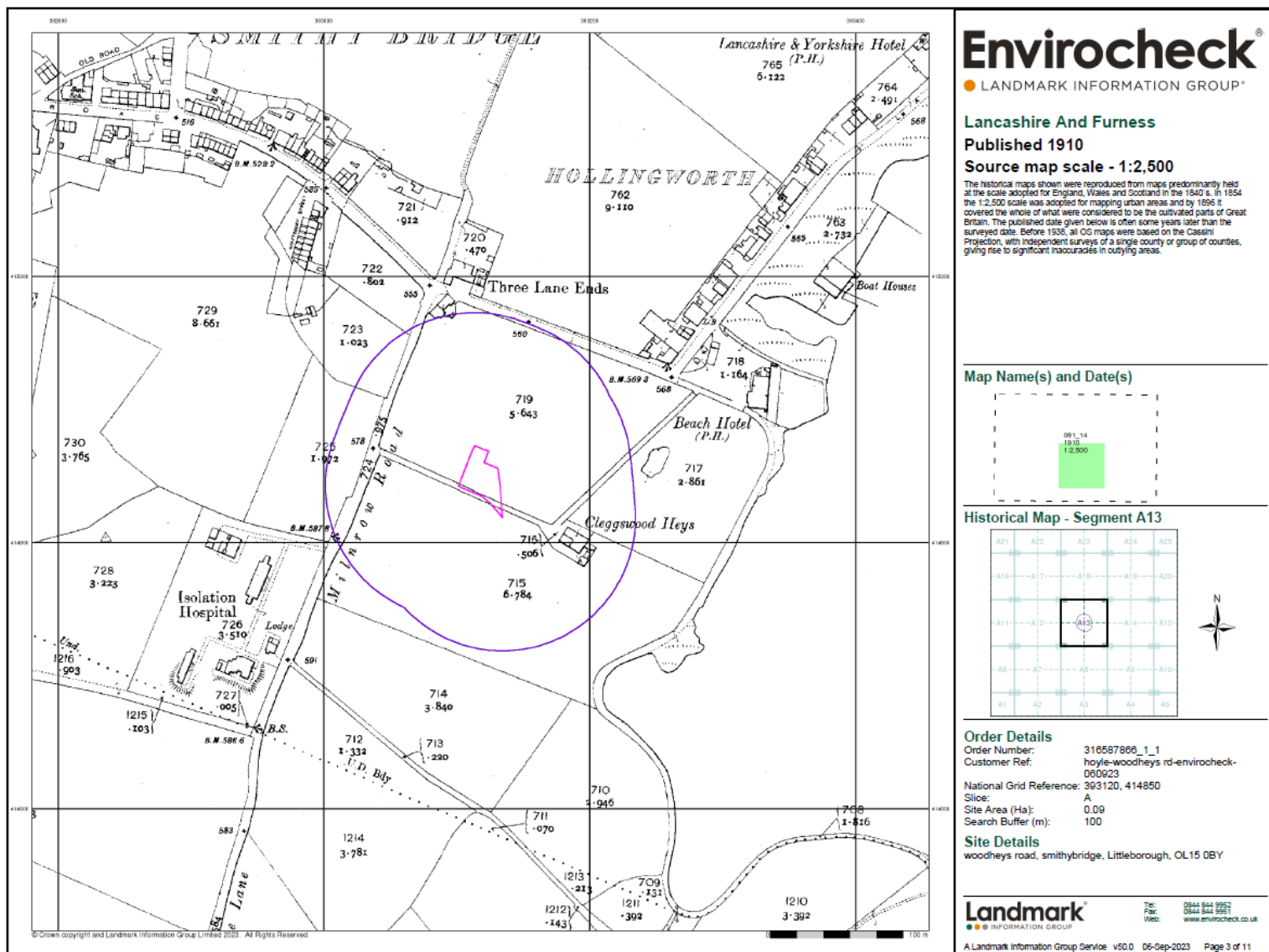


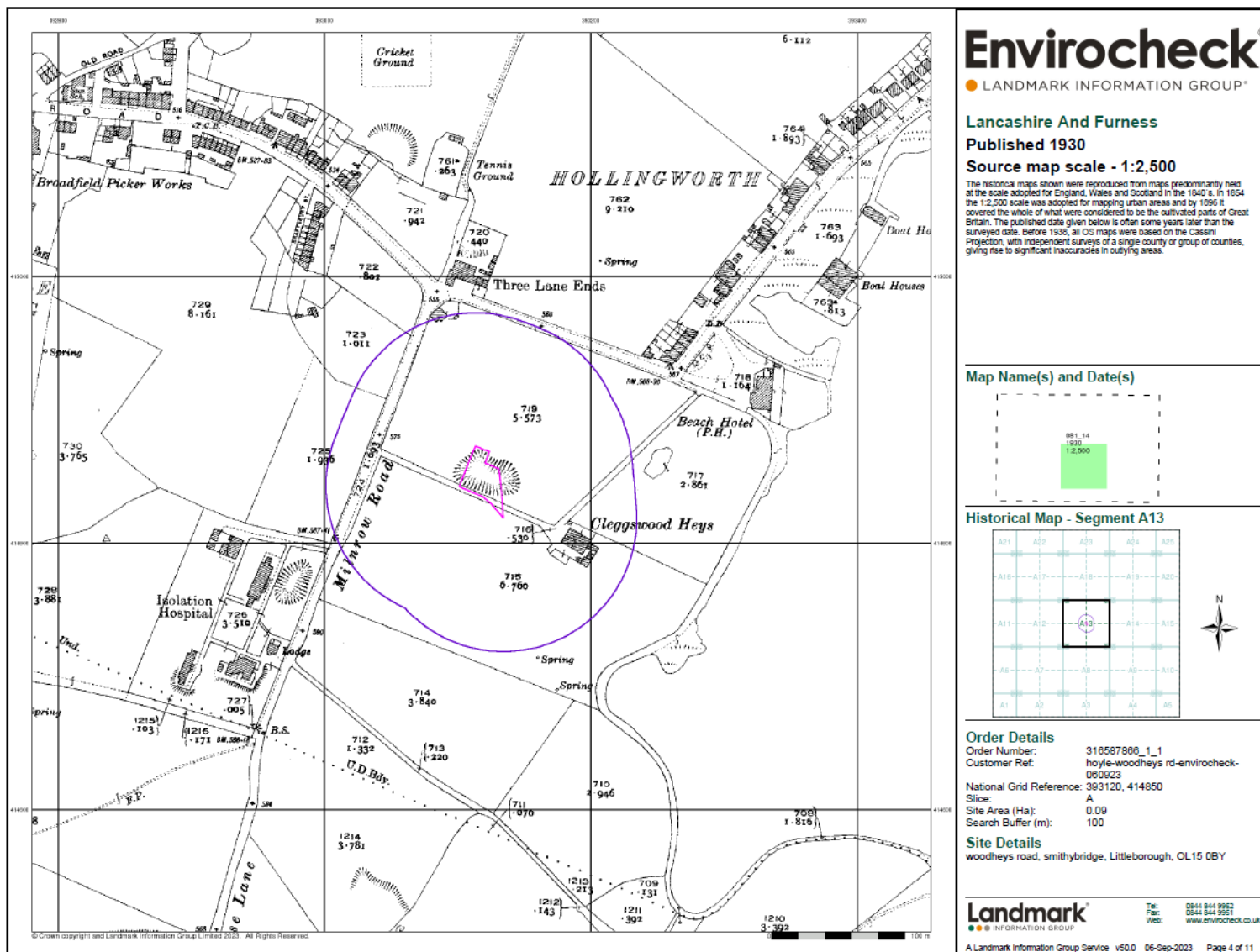
TP4/S4 location.

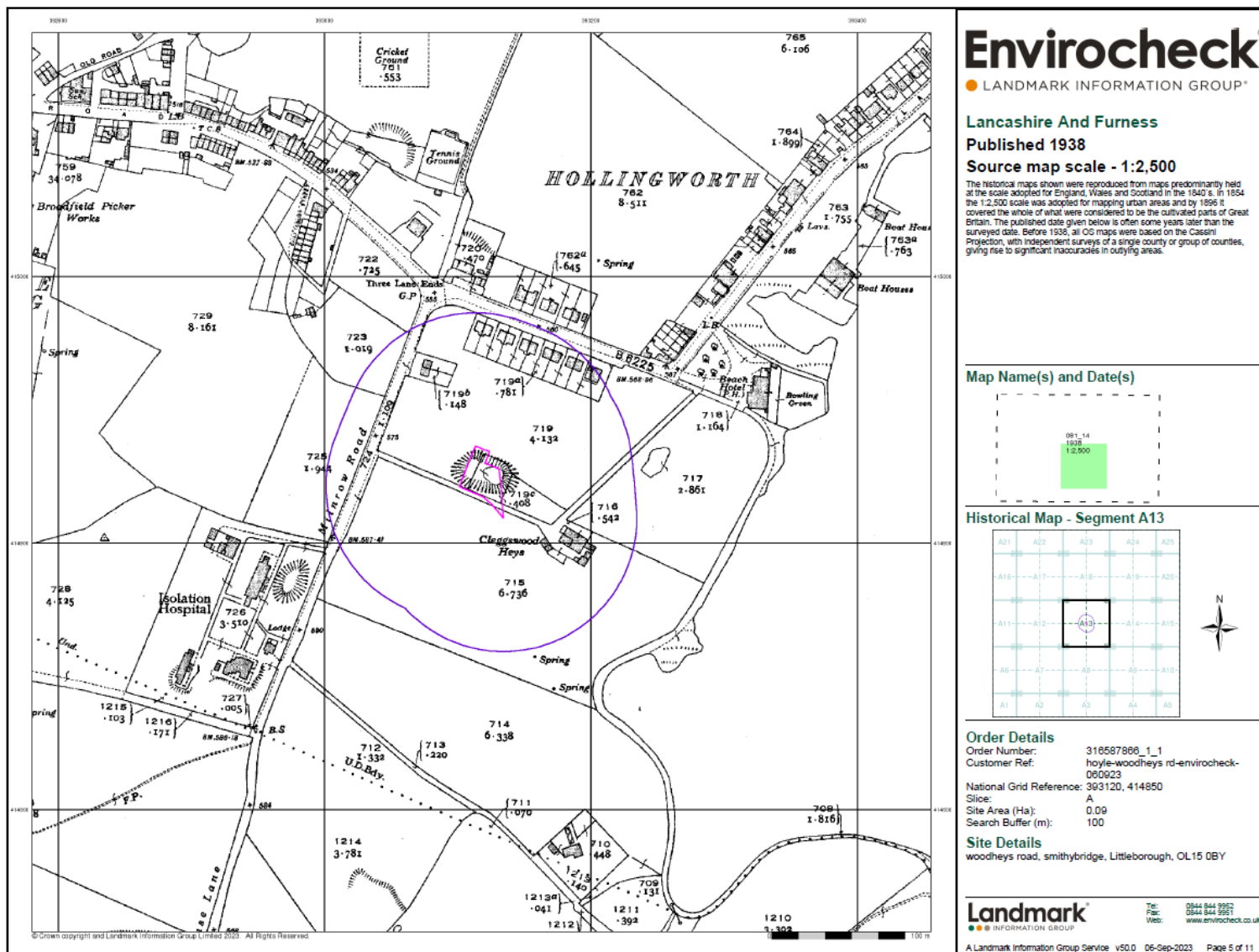
6. APPENDIX C: LANDMARK ENVIROCHECK

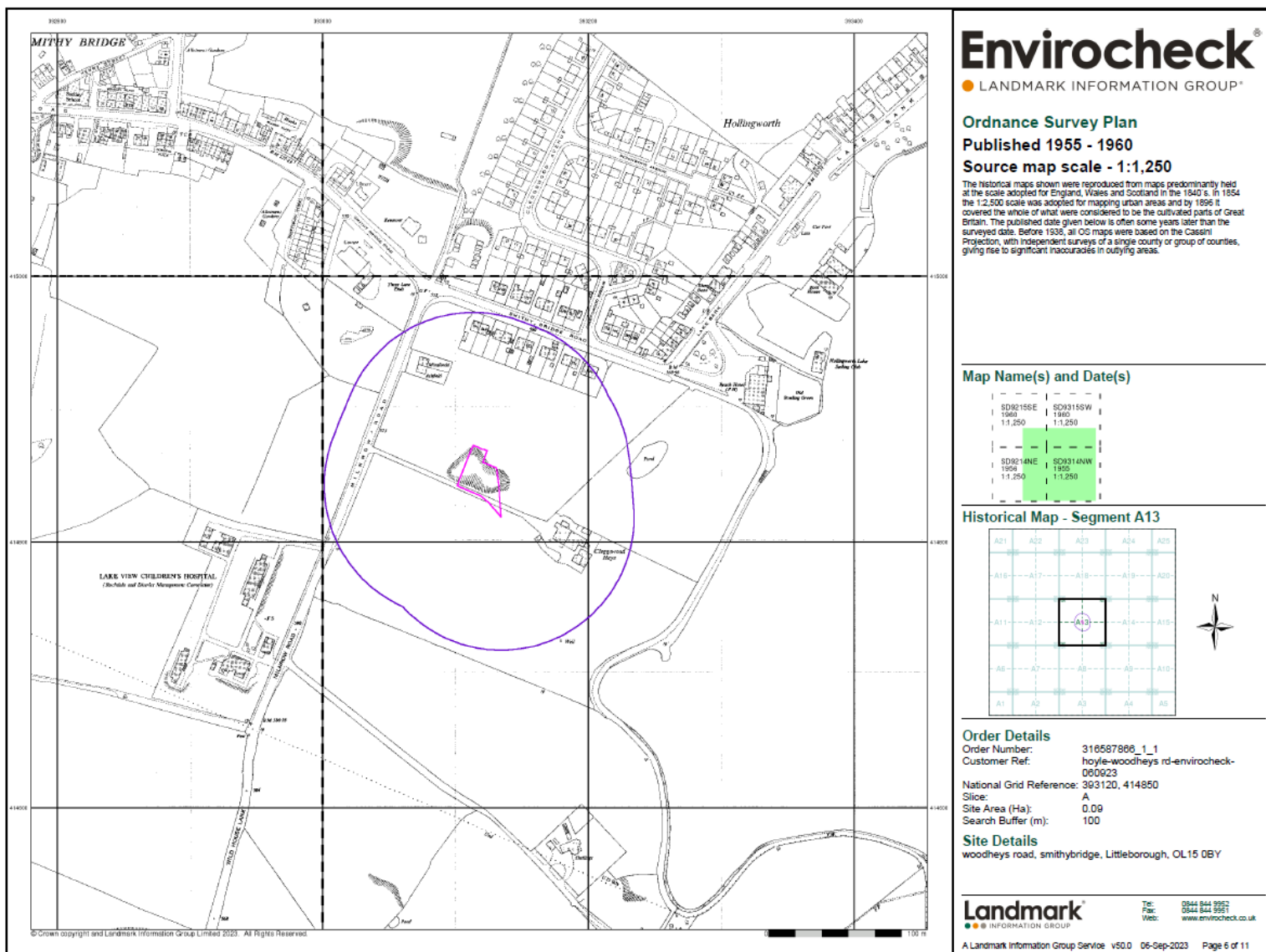


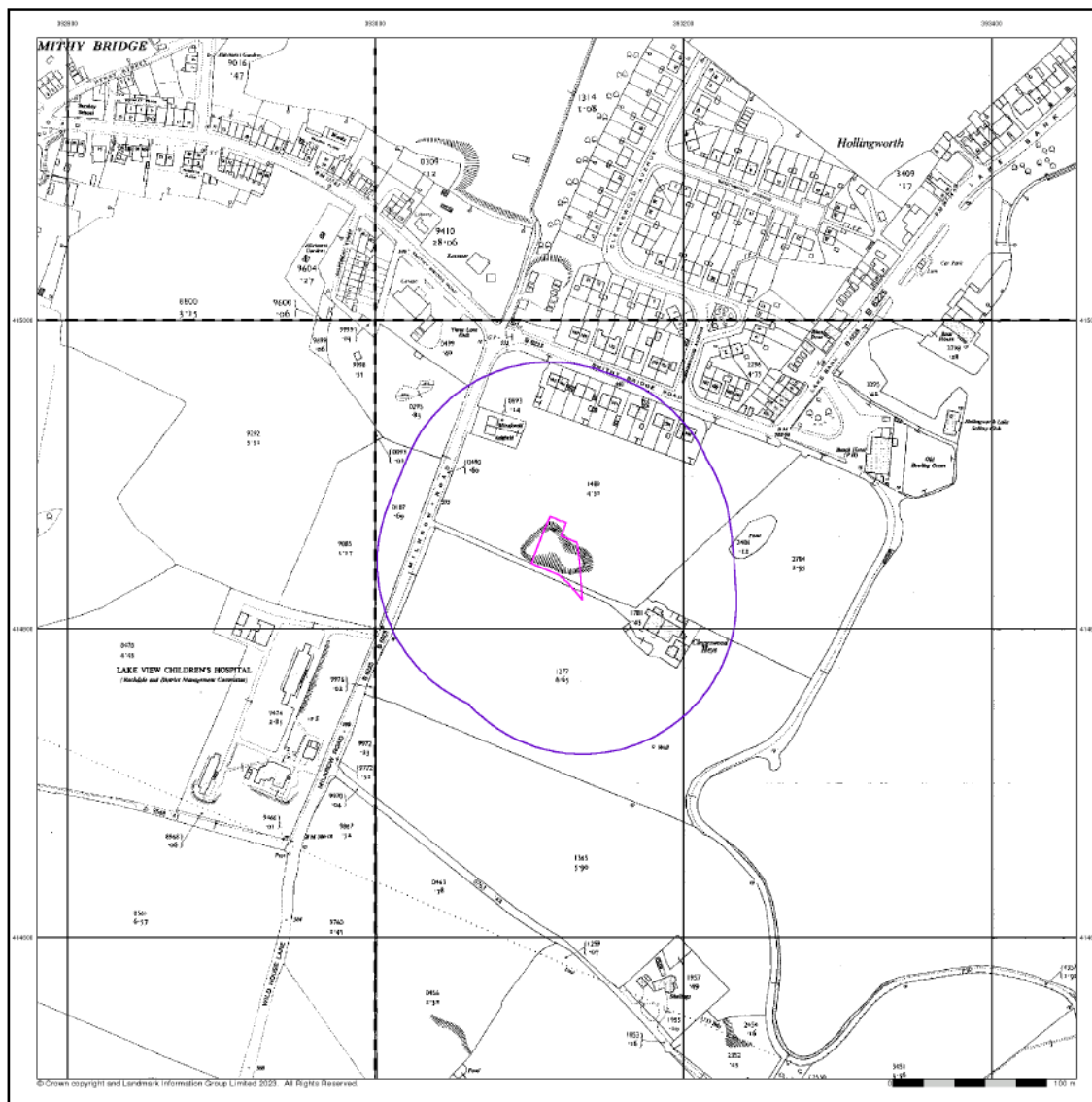












Envirocheck®
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Ordnance Survey Plan

Published 1956 - 1961

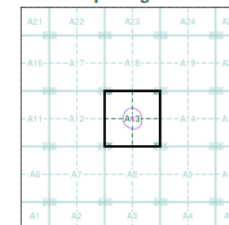
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1940 s. In 1954 the 1:2,500 scale was adopted for mapping urban areas and by 1956 it covered the whole of what were considered to be the outvoted parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

SD2615	SD2615
1961	1961
12,500	12,500
SD2614	SD2614
1959	1959
12,500	12,500

Historical Map - Segment A13



Order Details

Order Number: 316587886_1_1
 Customer Ref: hoyle-woodheys rd-envirocheck-060923
 National Grid Reference: 393120, 414850
 Slice: A
 Site Area (Ha): 0.09
 Search Buffer (m): 100

Site Details

woodheys road, smithybridge, Littleborough, OL15 0BY

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 Web: www.envirocheck.co.uk

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