



Mark Jowitt
Wrexham County Borough Council
Housing and Economy Department
Ruthin Road
Wrexham
LL13 7TH

Our Ref: 70099705 / 11901(1)

8 December 2021

PUBLIC

Dear Mark,

Re: Remediation Strategy for Land off Heol Offa, Johnstown, Wrexham, LL14 2BD

1. INTRODUCTION

PREAMBLE

Wrexham County Borough Council (the Client) commissioned WSP UK Limited (WSP) to produce a remediation strategy for the remediation of asbestos on land at 83/85 Heol Offa, Johnstown, Wrexham (nearby postcode LL14 2BD), henceforth referred to as the site. A site location plan is included as Figure 1, Appendix A.

This document comprises a combined Remediation Options Appraisal (ROA) and Remediation Strategy (RS), providing an appraisal of the available options for remediation of the soil. This letter report follows current guidance for contamination land assessment and management. The ROA and RS are required to discharge planning conditions, under planning application P/2021/1018.

BACKGROUND

WSP have previously produced the following report for the site:

- WSP (2021) Land at Heol Offa, Johnstown, Wrexham, dated: February 2021, ref: 70079705-11723(1) (WSP Phase II).

This letter report should be read in conjunction with the above report. The WSP Phase II identified the presence of asbestos fibres within one sample of Made Ground (out of five submitted) which laboratory analysis identified as Chrysotile at a recorded volume of <0.001%. The report concluded that given the generic nature of Made Ground additional asbestos at potentially greater volumes could not be ruled out. A potentially viable pollutant linkage was therefore identified, and remedial works considered necessary.

Following submission of the report, WSP undertook hand pitting works to determine the extent of Made Ground type and its chemical/asbestos characteristics. Information from the original WSP works and this additional hand pitting were used to inform this ROA / RS.

LIMITATIONS & RELIANCE

Appendix B presents WSP Standard Terms and Conditions and the assumptions and limitations for works of this type.

2. SITE INFORMATION

The site is approximately 0.09 hectares (ha) in size and located in the suburb of Johnstown, approximately 5km southwest of Wrexham. The site is situated in a defined residential area and is primarily surrounded by bungalow and semi-detached traditional housing, with the exception of allotments bordering the site to the northeast.

It is understood the site is proposed for redevelopment into a residential end use comprising 6no. flats over 2-storeys with car parking and landscaped areas. The proposed site plan (ref: HOJ-AW-X-X-DR-A-069001-Option 01-Proposed Site Plan) is included in Appendix A.

FIELDWORKS

Site works have been completed in general accordance with BS5930:2015 'Code of Practice for Site Investigation' and BS10175:2011 'Investigation of Potentially Contaminated Sites – Code of Practice'. All fieldworks were completed under the fulltime supervision of a WSP engineer.

A summary of the fieldworks is provided in Table 1 and an exploratory hole location plan is included as Figure 2, in Appendix A. Exploratory hole logs are included in Appendix C and a hand pit photolog is presented in Appendix D.

Table 1: Summary of Fieldworks

Task	Date	Details
Service Clearance	08 January 2021	A full set of service plans were procured prior to the site works. A third-party subcontractor completed service tracing across the site prior to positioning the boreholes and soakaway pits in suitable locations.
Window Sample Drilling (WS101 to WS104)	08 January 2021	All positions were hand dug to 1.5m bgl and then drilled using a windowless sampling technique with standard penetration tests at 1.0m intervals. All four boreholes were installed within groundwater / ground gas monitoring wells.
Soakaway testing (SA101)	25 January 2021	A trial pit was excavated using a JCB 3CX with a toothless bucket. Upon reaching 2.0m in depth a standpipe was placed in the pit and it was backfilled with gravel to prevent collapse when filled with water. The BRE 365 methodology states that the trial pit should be filled with a volume of water and the water level monitored until the water had 'soaked away' to level a specific water level. The volume of water used to infill and the water level at the end of the test were calculated using BRE 365 guidance. The trial pit was filled with water, however the water did not soakaway as required for the test to completed and after a period of monitoring the trial pit was backfilled.
Monitoring	January 2021	Groundwater level gauging and ground gas monitoring were completed on three occasions to provide preliminary ground gas information. Groundwater volumes were not sufficient to allow for sample collection.
Service Clearance	09 November 2021	A full set of service plans were procured prior to the site works. A third-party subcontractor completed service tracing across the site prior to positioning the hand pits in suitable locations.

Task	Date	Details
Excavation of hand pits	09 November 2021	Excavation of 20 hand pits to up to 0.60m bgl (or the base of Made Ground whichever comes first). All hand pits were backfilled with arisings following logging (according to Eurocode 7 – BS 5930) and sampling by WSP.

LABORATORY ANALYSIS

Selected soil samples were submitted for analysis at ALS laboratories which uses United Kingdom Accreditation Service (UKAS) and Environment Agency Monitoring Certification Scheme (MCERTS) accredited method, where applicable.

The soil chemical testing and leachate analysis is listed in Table 2 (insufficient groundwater volumes preventing groundwater sampling). Analytical results are included in Appendix E.

Table 2: Soil Analytical Suite

Phase of Fieldwork	Chemical Analyte	No. of soil Samples Analysed	No. of leachate Samples Analysed
January 2021	Metals suite (including arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc)	6	2
	Polyaromatic hydrocarbons (PAH) Speciated 16	6	2
	Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG)	2	-
	Asbestos Identification	5	-
November 2021	Asbestos Identification	30	-
	Asbestos Quantification	1	-

GROUND CONDITIONS AND ASBESTOS DISTRIBUTION

The strata sequence is summarised in Table 3. Exploratory hole logs are included as Appendix C and further detail on the strata is given below.

Table 3: Summary of Strata Encountered

Strata Name	Window Sample & Soakaway Excavation		Hand Pit Excavation	
	Depth to Base (m bgl) *	Thickness (m)	Depth to Base (m bgl) *	Thickness (m)
Made Ground	0.17 – 0.60	0.17 – 0.60	0.20 – 0.70	0.20 – 0.70
Glaciofluvial Deposits	1.40 - >5.00	1.00 – 4.83	0.40 – >1.02	0.05 – 0.42

*Metres Below Ground Level (m bgl)

Made Ground was recorded at the surface in all locations and predominantly comprises grass over sandy clay over clayey gravelly sandy Made Ground.

Hand pits to the west of the site (Area A in Insert 1) recorded shallow Made Ground (excluding HP20 which identified 550mm of Made Ground) which contained sandstone, concrete and coal gravel to 350mm bgl (HP18 and HP19). Hand pits to the east of the site (Area B in Insert 1), recorded the deepest Made Ground (700mm bgl at HP03) and contained a significantly higher volume of anthropogenic material including brick, plastic, metal, tile, and glass. Groundwater was not recorded in any of the hand pits. Superficial deposits were recorded underlying the Made Ground.

FIELD OBSERVATIONS OF ASBESTOS

One possible Asbestos Containing Material (ACM) observation was noted during the supplementary hand pit works at HP05 in Made Ground <0.6m bgl. Following laboratory testing on the suspected ACM and surrounding Made Ground soil, it was confirmed by ALS laboratories that the sample was not ACM and the soils at this location did not contain asbestos fibres.

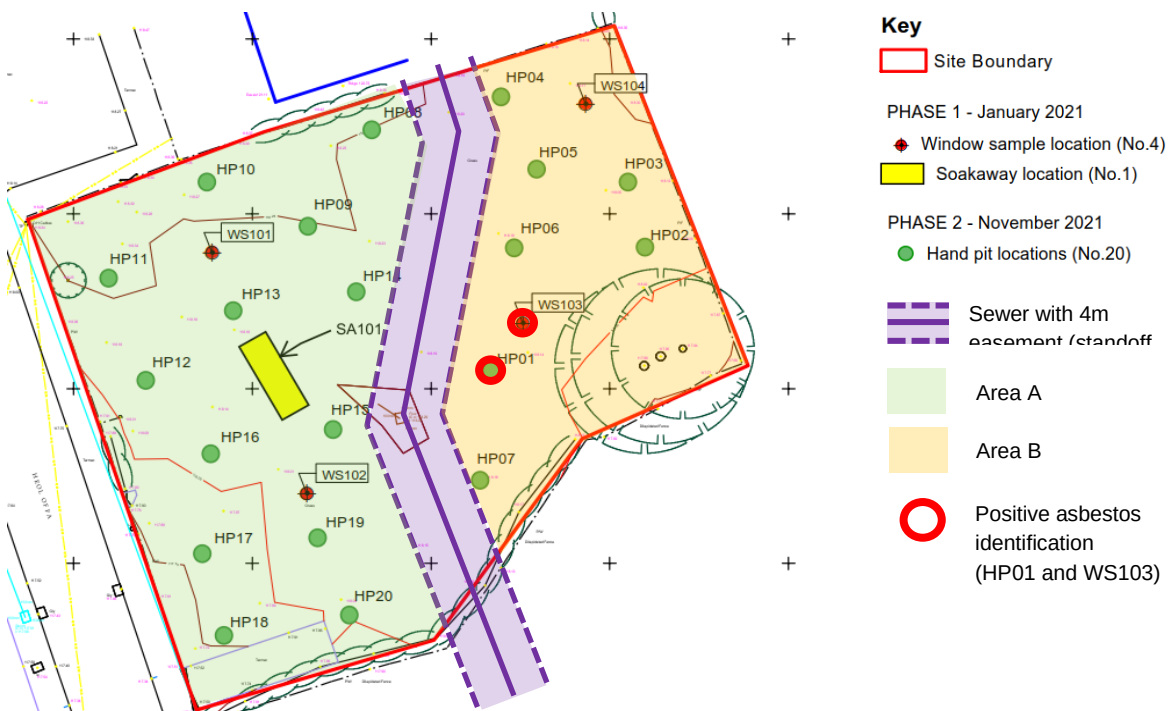
ALS LABORATORIES - ASBESTOS IDENTIFICATION AND QUANTIFICATION

Asbestos has been detected in 2no. of 34no. soil samples scheduled for asbestos identification;

- ACM debris consisting of Chrysotile was identified in Made Ground soils at WS103 between 0.3 – 0.55m bgl in January 2021. This was quantified to <0.001% (Phase Contrast Microscopy, abbreviated to PCOM) and <0.001% (Gravimetric).
- ACM fragment of Chrysotile was identified in Made Ground soils at HP01 between 0.4 – 0.5m bgl in November 2021. This was quantified to <0.001% (PCOM) and 0.0048% (Gravimetric).

Both positive asbestos identifications were identified in Made Ground soils excavated to the east of the site, within Area B where the proposed shared garden is to be located. This is demonstrated on Insert 1.

Insert 1: Extent of Ground Conditions and Asbestos Delineation



3. REMEDIATION APPROACH

SUMMARY OF INVESTIGATION DATA

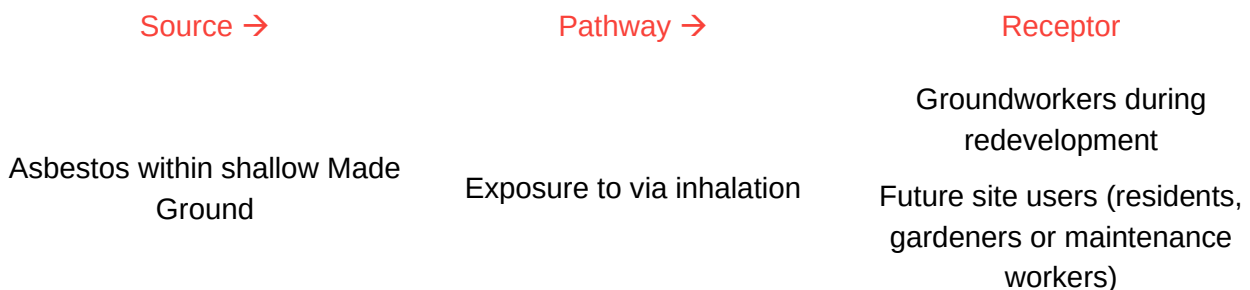
With respect to asbestos recorded at the site the following aspects are considered pertinent to the consideration of the remediation options:

- Made Ground was visually very different in both depth and description between the east and west of the site (roughly divided by the sewer main with 4m easement).
- Made Ground within the west of the site contain little or no anthropogenic material and was generally shallower.
- Made Ground in the east of the site contained notable volumes of anthropogenic material and was deeper (up to 700mm bgl).
- Asbestos was only recorded in Made Ground samples collected from the east of the site.

CONCEPTUAL SITE MODEL – POLLUTANT LINKAGE

The site will be redeveloped into a residential end use with landscaped/ shared garden areas located in Area B.

In the context of the redevelopment the conceptual site model following the WSP Phase 2 and additional delineation hand pitting has identified the following potentially viable pollutant linkage:



REMEDIATION OBJECTIVE

To address the asbestos recorded in the Made Ground the remediation objective is to break contaminant linkages identified.

REMEDIATION OPTIONS APPRAISAL(ROA)

The following two options are considered to be reasonably practicable within the confines of the site:

- **OPTION 1) REMOVAL TOP 300MMM OF SOIL, INSTALLATION OF A MEMBRANE AND INFILL WITH CLEAN IMPORTED MATERIAL**

Removal of Made Ground soils to at least 300mm bgl in Area B for offsite disposal, followed by installation of a no-dig membrane and replacement by clean imported (or site-won, if available from Area A and suitable) sub-soil and topsoil. The WSP Phase II indicated the asbestos has been quantified as <0.1% w/w and below the threshold for hazardous waste (for landfilling purposes). The imported soil would need to comprise 100mm topsoil and 200mm of subsoil.

➤ **OPTION 2) INSTALLATION OF MEMBRANE & COVER LAYER**

If Made Ground soils are left in situ, Area B would require the installation of an asbestos demarcation no dig membrane and provision of a clean imported (or site-won, if available and suitable) soil material (cover layer) to break the exposure pathway. A 300mm thickness (100mm topsoil and 200mm subsoil) is considered appropriate for areas of planting and grass verges.

RECOMMENDED APPROACH

For final design and practicalities of site levels option 1 is likely to be the preferred option.

It is important to note that for either strategies, if site-won soils are considered suitable for on-site re-use then a Materials Management Plan will be required, together with supporting documents, in line with the CL:AIRE document Definition of Waste: Development Industry Code of Practice (DoWCoP).

The potential risks of exposure of groundworkers during the remediation should be managed under an asbestos management strategy as should all acute risks. The remediation strategy only addresses the chronic risks and therefore addresses the potential risk to future site users.

REMEDATION STRATEGY

The following general approach to remediation is recommended regarding the commission of Option 1 Removal and Provision of Cover Layer, as detailed above;

- Removal of Made Ground soils in the to the east of the site, within Area B, to at least 0.3m bgl. This work should be undertaken under a watching brief.
- Validation of materials along the excavation edge and base at the site boundaries to ascertain the absence of asbestos (achieved visually and through sampling for laboratory analysis).
- Infilling the excavated area with clean imported (or site-won, if available and suitable) sub-soil and topsoil, to a minimum thickness of 300mm.
- Following placement of cover system, an appropriate number of hand-dug verification pits are to be excavated within landscaped areas and extended through the placed topsoil and sub-soil. Observation of the pits and confirmation of the material type and thickness should be made by an external consultant. This will be achieved using a measuring tape or staff, with a comprehensive and clear photographic record of the measurements for each landscaped area. Confirmatory sample collection and analysis for the following suite of contaminants should be undertaken at a rate of 1 per 50m³.
 - Asbestos, metals (arsenic, cadmium, chromium, lead, mercury, nickel, selenium and zinc, polyaromatic hydrocarbons (speciated 16) and total petroleum hydrocarbon criteria working group (TPH CWG).

The soil assessment criteria for the suitability for usage is presented in Appendix F.

- A validation report detailing the materials used, laboratory analysis results compared to the suitability criteria and assessment of the material depth should be produced and forwarded to the local authority for approval.



CLOSE

We trust this ROA and RS meet your requirements. Any queries please direct them to emily.morgan@wsp.com.

Yours Sincerely

**Morgan,
Emily
(UKEEM001)**

Digitally signed by Morgan,
Emily (UKEEM001)
DN: cn=Morgan, Emily
(UKEEM001), ou=Active,
email=Emily.Morgan@wsp.com
Date: 2021.12.08 13:36:33 Z

**Emily Lyons
Assistant Consultant
WSP**

**Emily Morgan
Principal Consultant
WSP**

App A : Figures
App B : Standard Terms and Conditions
App C : Exploratory Logs
App D: Photographic Log
App E: Laboratory Analytical Data
App F: Soil Suitability Criteria

Appendix A

Figures

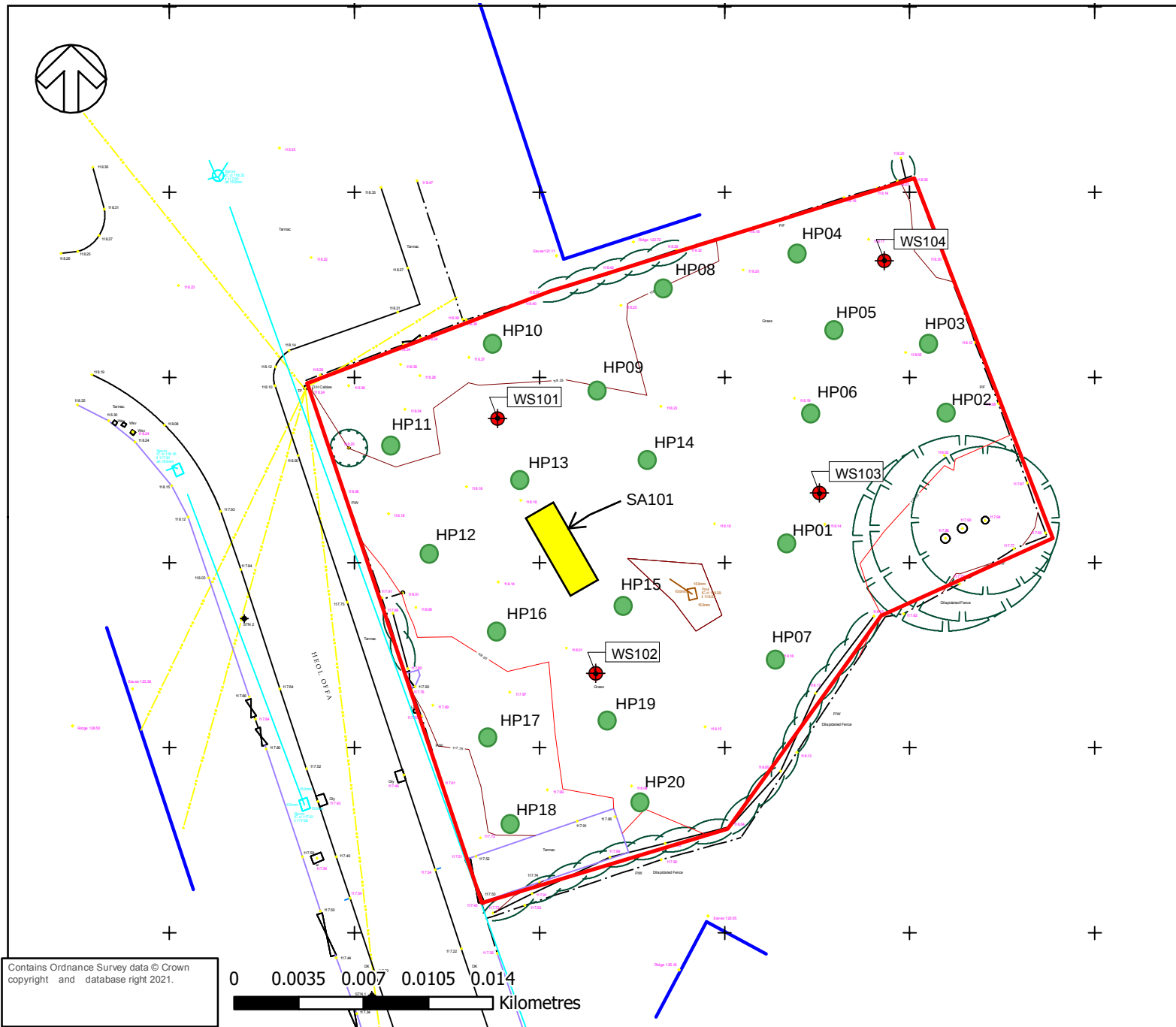




Date Modified:

Drawn By:

File:



Key

Site Boundary

PHASE 1 - January 2021

Window sample location (No.4)

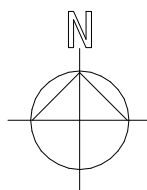
Soakaway location (No.1)

PHASE 2 - November 2021

Hand pit locations (No.20)

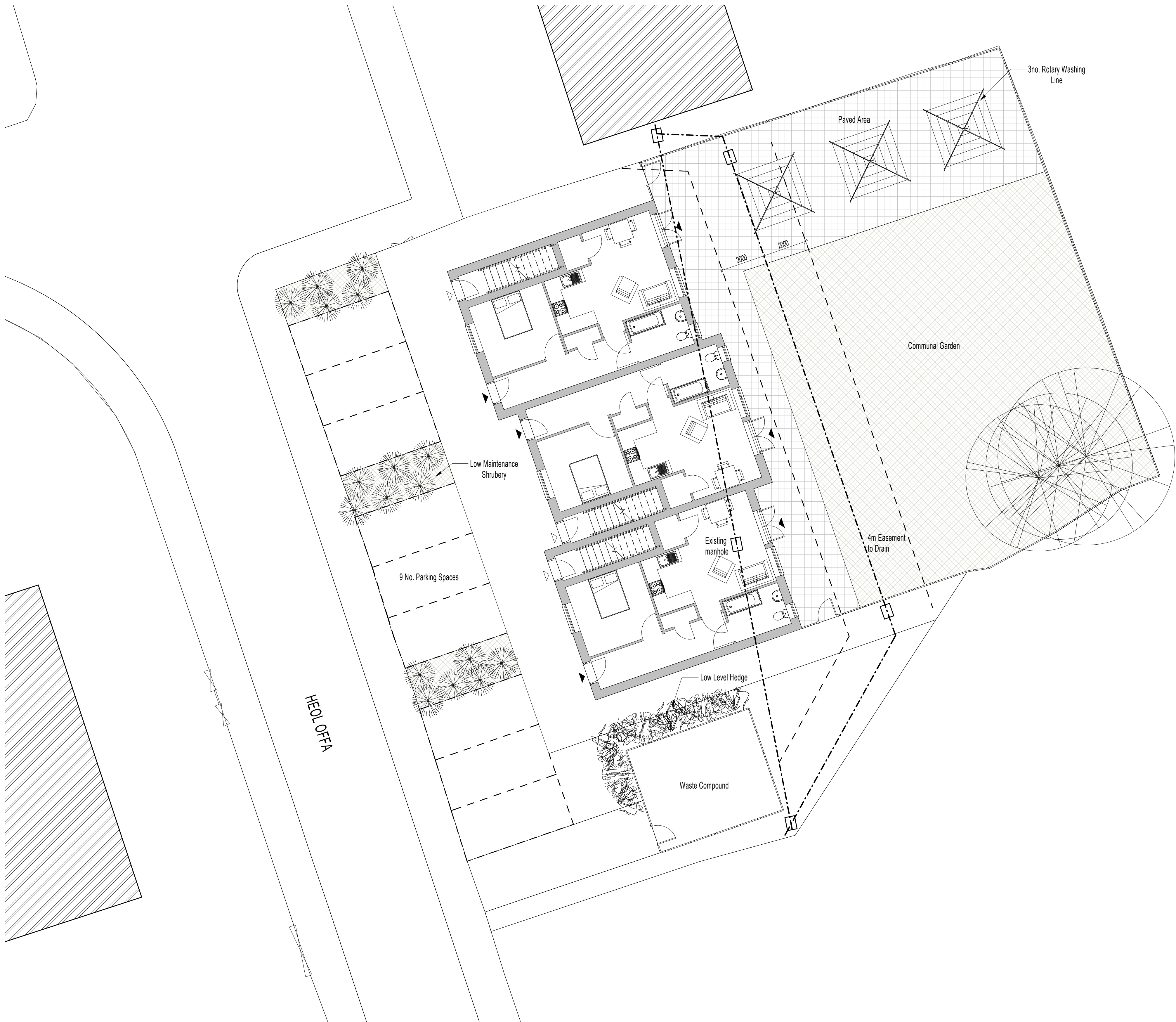
TITLE:
70079705 HEOL OFFA

FIGURE No:
FIGURE 2
EXPLORATORY HOLE
LOCATION PLAN



Construction (Design and Management) Regulations
Design risk assessments are carried out throughout the design stage of this project in accordance with company procedures and manuals. Where reasonably possible all areas of risk applicable to design and end use of the construction have been identified and then eliminated, mitigated or recorded as a residual risk. Note that general risks of which a competent designer or contractor should be aware are not included. This drawing is to be read in conjunction with the Pre-construction Information and all related documents prepared in accordance with the current Construction (Design and Management) Regulations 2015 and all applicable Health and Safety legislation as currently amended.

- ▲ GROUND FLOOR ENTRANCE
△ FIRST FLOOR ENTRANCE



P05	Bathroom Layout Updated AJ KOH	22/12/2020
P04	Revised Layout AJ KOH	22/12/2020
P03	Communal Garden Added AJ DH	15/12/2020
P02	Revised Layout AJ DH	11/12/2020
P01	Initial Issue AJ DH	02/12/2020
REV.	DESCRIPTION DRAWN BY CHECKED BY APPROVED BY	DATE
RIBA PLAN OF WORK 2013 WORKSTAGE	LEVEL OF MODEL DEFINITION (LoD)	
Stage 3 - Developed Design	LoD 3 - Approximate Model	
PURPOSE OF ISSUE - SUITABLE FOR ...	BS1192 STATUS	
Planning Submission	Status A - Approved	



CARDIFF 029 2052 8140
LONDON 0207 138 3560
WREXHAM 01978 357 887

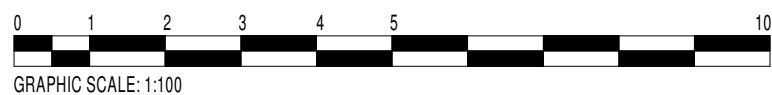
www.lawray.co.uk

CLIENT
WREXHAM COUNTY BOROUGH COUNCIL

PROJECT TITLE
HEOL OFFA JOHNSTOWN

DRAWING TITLE
PROPOSED SITE PLAN

PROPOSED SITE PLAN 1:100



GRAPHIC SCALE: 1:100

PROJECT No 19427 SCALE @ A1
As indicated

DRAWING No	PROJECT	ORIGINATOR	VOLUME	LEVEL	TYPE	ROLE	NUMBER	REVISION
19427/01	HOJ-LAW-X-X-DR-	A-069001	P05					

DO NOT SCALE
Any discrepancy or query concerning this drawing should be referred to the Architect
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Appendix B

Terms and Conditions



REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

GENERAL

1. WSP UK Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed and outlined in the body of the report.
2. Unless explicitly agreed otherwise, in writing, this report has been prepared under WSP UK Limited standard Terms and Conditions as included within our proposal to the Client.
3. Project specific appointment documents may be agreed at our discretion and a charge may be levied for both the time to review and finalise appointments documents and also for associated changes to the appointment terms. WSP UK Limited reserves the right to amend the fee should any changes to the appointment terms create an increase risk to WSP UK Limited.
4. The report needs to be considered in the light of the WSP UK Limited proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

PHASE 1 GEO ENVIRONMENTAL AND PRELIMINARY RISK ASSESSMENTS

Coverage: *This section covers reports with the following titles or combination of titles: phase 1; desk top study; geo environmental assessment; development appraisal; preliminary environmental risk assessment; constraints report; due diligence report; geotechnical development review; environmental statement; environmental chapter; project scope summary report (PSSR), program environmental impact report (PEIR), geotechnical development risk register; and, baseline environmental assessment.*

5. The works undertaken to prepare this report comprised a study of available and easily documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the Site and correspondence with relevant authorities and other interested parties. Due to the short timescales associated with these projects responses may not have been received from all parties. WSP UK Limited cannot be held responsible for any disclosures that are provided post production of our report and will not automatically update our report.
6. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, WSP UK Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.
7. It should be noted that any risks identified in this report are perceived risks based on the information reviewed. Actual risks can only be assessed following intrusive investigations of the site.
8. WSP UK Limited does not warrant work / data undertaken / provided by others.

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

INTRUSIVE INVESTIGATION REPORTS

Coverage: *The following report titles (or combination) may cover this category of work: geo environmental site investigation; geotechnical assessment; GIR (Ground Investigation reports); preliminary environmental and geotechnical risk assessment; and, geotechnical risk register.*

9. The investigation has been undertaken to provide information concerning either:
 - i. The type and degree of contamination present at the site in order to allow a generic quantitative risk assessment to be undertaken; or
 - ii. Information on the soil properties present at the site to allow for geotechnical development constraints to be considered.
10. The scope of the investigation was selected on the basis of the specific development and land use scenario proposed by the Client and may be inappropriate to another form of development or scheme. If the development layout was not known at the time of the investigation the report findings may need revisiting once the development layout is confirmed.
11. For contamination purposes, the objectives of the investigation are limited to establishing the risks associated with potential contamination sources with the potential to cause harm to human health, building materials, the environment (including adjacent land), or controlled waters.
12. For geotechnical investigations the purpose is to broadly consider potential development constraints associated with the physical property of the soils underlying the site within the context of the proposed future or continued use of the site, as stated within the report.
13. The amount of exploratory work, soil property testing and chemical testing undertaken has necessarily been restricted by various factors which may include accessibility, the presence of services; existing buildings; current site usage or short timescales. The exploratory holes completed assess only a small percentage of the area in relation to the overall size of the Site, and as such can only provide a general indication of conditions.
14. The number of sampling points and the methods of sampling and testing do not preclude the possible existence of contamination where concentrations may be significantly higher than those actually encountered or ground conditions that vary from those identified. In addition, there may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.
15. The inspection, testing and monitoring records relate specifically to the investigation points and the timeframe that the works were undertaken. They will also be limited by the techniques employed. As part of this assessment, WSP UK Limited has used reasonable skill and care to extrapolate conditions between these points based upon assumptions to develop our interpretation and conclusions. The assumption made in forming our conclusions is that the ground and groundwater conditions (both chemically and physically) are the same as have been encountered during the works undertaken at the specific points of investigation. Conditions can change between investigation points and these interpretations should be considered indicative.
16. The risk assessment and opinions provided are based on currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values. Specific assumptions associated

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

with the WSP UK Limited risk assessment process have been outlined within the body or associated appendix of the report.

17. Additional investigations may be required in order to satisfy relevant planning conditions or to resolve any engineering and environmental issues.
18. Where soil contamination concentrations recorded as part of this investigation are used for commentary on potential waste classification of soils for disposal purposes, these should be classed as indicative only. Due consideration should be given to the variability of contaminant concentrations taken from targeted samples versus bulk excavated soils and the potential variability of contaminant concentrations between sampling locations. Where major waste disposal operations are considered, targeted waste classification investigations should be designed.
19. The results of the asbestos testing are factually reported and interpretation given as to how this relates to the previous use of the site, the types of ground encountered and site conceptualisation. This does not however constitute a formal asbestos assessment. These results should be treated cautiously and should not be relied upon to provide detailed and representative information on the delineation, type and extent of bulk ACMs and / or trace loose asbestos fibres within the soil matrix at the site.
20. If costs have been included in relation to additional site works, and / or site remediation works these must be considered as indicative only and must be confirmed by a qualified quantity surveyor.

EUROCODE 7: GEOTECHNICAL DESIGN

21. On 1st April 2010, BS EN 1997-1:2004 (Eurocode 7: Geotechnical Design – Part 1) became the mandatory baseline standard for geotechnical ground investigations.
22. In terms of geotechnical design for foundations, slopes, retaining walls and earthworks, EC7 sets guidance on design procedures including specific guidance on the numbers and spacings of boreholes for geotechnical design, there are limits to methods of ground investigation and the quality of data obtained and there are also prescriptive methods of assessing soil strengths and methods of design. Unless otherwise explicitly stated, the work has not been undertaken in accordance with EC7. A standard geotechnical interpretative report will not meet the requirements of the Geotechnical Design Report (GDR) under Eurocode 7. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. The report is likely to represent a Ground Investigation Report (GIR) under the Eurocode 7 guidance.

DETAILED QUANTITATIVE RISK ASSESSMENTS AND REMEDIAL STRATEGY REPORTS

23. These reports build upon previous report versions and associated notes. The scope of the investigation, further testing and monitoring and associated risk assessments were selected on the basis of the specific development and land use scenario proposed by the Client and may not be appropriate to another form of development or scheme layout. The risk assessment and opinions provided are based on currently available approaches in the generation of Site Specific Assessment Criteria relating to contamination concentrations and are not considered to represent a risk in a specific land use scenario to a specific receptor. No liability can be accepted for the retrospective effects of any future changes or amendments to these values, associated models or associated guidance.



REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

- 24. The outputs of the Detailed Quantitative Risk Assessments are based upon WSP UK Limited manipulation of standard risk assessment models. These are our interpretation of the risk assessment criteria.
- 25. Prior to adoption on site they will need discussing and agreeing with the Regulatory Authorities prior to adoption on site. The regulatory discussion and engagement process may result in an alternative interpretation being determined and agreed. The process and timescales associated with the Regulatory Authority engagement are not within the control of WSP UK Limited. All costs and programmes presented as a result of this process should be validated by a quantity surveyor and should be presumed to be indicative.

GEOTECHNICAL DESIGN REPORT (GDR)

- 26. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. All the relevant information needs to be provided to allow for a GDR to be produced.

MONITORING (INCLUDING REMEDIATION MONITORING REPORTS)

- 27. These reports are factual in nature and comprise monitoring, normally groundwater and ground gas and data provided by contractors as part of an earthworks or remedial works.
- 28. The data is presented and will be compared with assessment criteria.

Appendix C

Exploratory Logs



WSP The Victoria, 150-182 The Quays Salford Quays, M50 3SP Telephone: +44 (0)161 886 2400		WINDOW SAMPLE LOG				Hole No. WS102						
Project Heol Offa, Johnstown		Sheet 1 of 1										
Job No 70069705		Client Wrexham County Borough Council										
Date 08-01-21 08-01-21												
Contractor / Driller RP Drilling		Method/Plant Used Window Sample Rig		Logged By EL		Co-Ordinates (NGR) E 330353.05 N 345914.01		Ground Level (m AOD) 117.96				
SAMPLES & TESTS							STRATA					Install / Backfill
Depth	Type	Test Result	PID (ppmV)	HSV (kNm ²)	P Pen (kNm ²)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. 50 mm
							117.56	0.40	Grass over, dark brown, slightly clayey, silty fine SAND. Rare concrete cobble. (MADE GROUND - topsoil)		MG	
1.00-1.30	ES	.						(1.00)	Loose (inferred) orangish light brown, slightly clayey, slightly gravelly, silty fine to medium SAND. Gravel is fine to coarse, subangular to subrounded of natural lithologies including sandstone and mudstone. Frequent cobbles of natural lithologies and pockets of firm clay. (GLACIOFLUVIAL DEPOSITS)		GFDU	
1.25-1.40	D	.		35			116.56	1.40	1.35 - 1.40 m bgl Fine gravel of coal.			
2.00	(C)	2,1,2 1,2,3 N=8.							Soft reddish brown, slightly silty, slightly sandy CLAY. (GLACIOFLUVIAL DEPOSITS)			
2.50-2.60	ES	.		14					2.50 m bgl Fine gravel of coal. 2.50 - 5.00 m bgl Becomes silty.			
3.00	(C)	1,1,1 1,2,2 N=6.						(3.60)			GT	
3.50-4.00	D	.										
4.00	(C)	2,1,0 1,2,3 N=6.							4.30 - 4.60 m bgl Becoming slightly gravelly. Gravel is fine to medium, subangular to subrounded of natural lithologies.			
5.00	(C)	8,12,26 24 N=50/ 135mm.					112.96	5.00	Drill rig refused at 5m bgl. Location terminated at 5m bgl and installed.		END	
Hole Diameter			Recovery			Water Strikes						
Depth	Diameter (mm)	Remarks	Core Top (m)	Core Base (m)	% Recovery	Date	Time	Strike	Minutes	Standing	Casing	
						08-01-21		3.00				
						General Remarks Inspection pit excavated to a depth of 1.5m bgl. Windowless sampling commenced from base of pit to 5m bgl. Terminated in Glacial Till Deposits. No visual or olfactory evidence of contamination. Groundwater encountered at 3.0m bgl. Borehole installed with monitoring well upon completion (response zone 1m - 3m bgl).						
Scale 1:34.375			Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

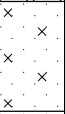
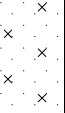
17 WSP WINDOW SAMPLE LOG WS LOGS_V1.GPJ WSPTEMPLATE7.00.GDT 4/2/21

 WSP The Victoria, 150-182 The Quays Salford Quays, M50 3SP Telephone: +44 (0)161 886 2400		WINDOW SAMPLE LOG		Hole No. WS103	
Project Heol Offa, Johnstown		Sheet 1 of 1			
Job No 70069705		Client Wrexham County Borough Council		Date 08-01-21 08-01-21	
Contractor / Driller RP Drilling		Method/Plant Used Window Sample Rig		Logged By EL	
		Co-Ordinates (NGR) E 330365.14 N 345923.77		Ground Level (m AOD) 118.08	

SAMPLES & TESTS							STRATA					Install / Backfill
Depth	Type	Test Result	PID (ppmV)	HSV (kNm2)	P Pen (kNm2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. 50 mm
0.30-0.55	ES	.		29			117.53	0.55	Grass over, dark brown, slightly clayey, silty fine SAND. (MADE GROUND - topsoil) 0.20 m bgl Dense rootlets.		MG	
1.00-1.30	ES	.					116.68	1.40	0.50 - 0.55 m bgl Becoming medium sand with occasional sandstone cobbles. Dark brown - orangish, slightly clayey, slightly gravelly, silty medium SAND with pockets of soft clay. Gravel is fine to coarse, subangular to subrounded of natural lithologies. (GLACIOFLUVIAL DEPOSITS)		GFDU	
2.00	(C)	1,2,2 2,2,1 N=7.					116.23	1.85	Dark grey - brown, slightly clayey, slightly gravelly, silty fine to medium SAND. Gravel is fine to medium, subangular to subrounded of natural lithologies including sandstone. (GLACIOFLUVIAL DEPOSITS) 1.70 m bgl Sandstone cobble.		GFDU	
							115.68	2.40	Loose black fine SAND and fine to medium GRAVEL of coal. Potentially a Coal band. (GLACIOFLUVIAL DEPOSITS)		GFDU	
							115.08	3.00	Medium dense orangish (golden) light brown, slightly clayey, slightly gravelly, silty fine SAND. Gravel is fine of coal. (GLACIOFLUVIAL DEPOSITS)		GFDU	
3.00	(C)	2,2,3 2,2,3 N=10.							Terminated at 3m bgl and installed.		END	

Hole Diameter			Recovery			Water Strikes					
Depth	Diameter (mm)	Remarks	Core Top (m)	Core Base (m)	% Recovery	Date	Time	Strike	Minutes	Standing	Casing
						General Remarks Inspection pit excavated to a depth of 1.5m bgl. Windowless sampling commenced from base of pit to 3m bgl. Terminated in Glaciofluvial Deposits. No visual or olfactory evidence of contamination. No groundwater encountered. Borehole installed with monitoring well upon completion (response zone 1m - 3m bgl), base of well collapsed preventing deeper installation.					
Scale 1:34.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP The Victoria, 150-182 The Quays Salford Quays, M50 3SP Telephone: +44 (0)161 886 2400		WINDOW SAMPLE LOG		Hole No. WS104	
Project Heol Offa, Johnstown		Sheet 1 of 1			
Job No 70069705		Client Wrexham County Borough Council		Date 08-01-21 08-01-21	
Contractor / Driller RP Drilling		Method/Plant Used Window Sample Rig		Logged By EL	
		Co-Ordinates (NGR) E 330368.64 N 345936.30		Ground Level (m AOD) 118.19	

SAMPLES & TESTS							STRATA					Install / Backfill
Depth	Type	Test Result	PID (ppmV)	HSV (kNm2)	P Pen (kNm2)	Water	Elev. (mAOD)	Depth (Thick-ness)	Description	Legend	Geology	Dia. 50 mm
0.30-0.40	ES	.		26				(0.60)	Grass over, dark brown, slightly clayey, silty fine SAND with rare plastic, metal and glass fragments. (MADE GROUND - topsoil)		MG	
0.70-1.00	ES	.					117.59	0.60	0.45 - 0.60 m bgl Becoming medium sand with occasional sandstone cobbles.		GFDU	
								(0.50)	Dark brown - orangish, slightly clayey, slightly gravelly, silty medium SAND with pockets of soft clay. Gravel is fine to medium, subangular to subrounded of natural lithologies. (GLACIOFLUVIAL DEPOSITS)			
							117.09	1.10				
1.30-1.50	ES	.							Loose to medium dense orangish (golden) light brown, slightly clayey, silty fine SAND with rare fine to medium gravel of sandstone. (GLACIOFLUVIAL DEPOSITS)			
												
2.00	(C)	2,2,3 2,2,2 N=9.						(1.90)			GFDU	
												
				16					2.40 - 2.70 m bgl Soft clay band with fine to coarse gravel of coal. 2.40 - 2.80 m bgl Black vertical staining. No odour, likely organic.			
												
							115.19	3.00				
3.00	(C)	2,2,2 3,3,3 N=11.							Terminated at 3m bgl and installed.		END	
												
												
												
												
												
												

Hole Diameter			Recovery			Water Strikes					
Depth	Diameter (mm)	Remarks	Core Top (m)	Core Base (m)	% Recovery	Date	Time	Strike	Minutes	Standing	Casing
						General Remarks Inspection pit excavated to a depth of 1.5m bgl. Windowless sampling commenced from base of pit to 3m bgl. Terminated in Glaciofluvial Deposits. No visual or olfactory evidence of contamination. No groundwater encountered. Borehole installed with monitoring well upon completion (response zone 1m - 3m bgl).					
Scale 1:34.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

17 WSP WINDOW SAMPLE LOG WS LOGS_V1.GPJ WSPTEMPLATE7.00.GDT 4/2/21

 WSP Telephone:	BOREHOLE LOG		Hole No. HP01	
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1	
Job No 70079705	Client Wrexham County Borough Council		Date 09-11-21 09-11-21	
Contractor / Driller RP Drilling Ltd.	Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR)	Ground Level (m AOD)

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.15-0.25	ES							0.05	Very soft dark brown slightly sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND)		CMG	
								(0.45)	Dark greyish brown slightly silty clayey gravelly fine and medium SAND. Gravel is fine and medium angular to subangular of various lithologies sandstone, mudstone, coal, plastic, foil and fine rootlets. (MADE GROUND) 0.05 - 0.1 Large boulder of concrete.			
0.40-0.50	ES							0.50	Light orangish brown clayey slightly gravelly fine and medium SAND. Gravel is medium and coarse angular to subrounded of various lithologies quartz and mudstone. (GLACIAL DEPOSITS) End of hand pit.		GFDU	
								0.55				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.55mbgl. No V/O. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP Telephone:	BOREHOLE LOG		Hole No. HP02	
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1	
Job No 70079705	Client Wrexham County Borough Council		Date 09-11-21 09-11-21	
Contractor / Driller RP Drilling Ltd.	Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR)	Ground Level (m AOD)

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P. Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.20-0.30	ES							(0.10) 0.10	Very soft dark brown slightly sandy CLAY with grass over and roots (TOPSOIL). (MADE GROUND)		CMG	
								Dark greyish brown slightly silty clayey gravelly fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone, concrete, glass, quartz, plastic. (MADE GROUND)		GMG		
0.40-0.50	ES											(0.50) 0.60
								0.65	Light orangish brown clayey slightly gravelly fine and medium SAND. Gravel is fine and medium subrounded of various lithologies quartz, mudstone and sandstone. (GLACIAL DEPOSITS)		GFDU	
									End of hand pit.		END	
												
												
												
												
												
												
												

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.65mbgl. No V/O. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP Telephone:	BOREHOLE LOG		Hole No. HP03	
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1	
Job No 70079705		Client Wrexham County Borough Council		Date 09-11-21 09-11-21
Contractor / Driller RP Drilling Ltd.		Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR)
		Ground Level (m AOD)		

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P. Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.05-0.10	ES							0.05	Very soft dark brown slightly sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND)		CMG	
0.20-0.30	ES							(0.65)	Dark reddish brown very gravelly slightly silty clayey fine and medium SAND with rare cobbles of concrete. Gravel is fine to coarse angular to subrounded of various lithologies sandstone, mudstone, limestone, brick, concrete, glass and plastic. (MADE GROUND) 0.05 - 0.10 Reinforced glass 0.10 - 0.25 Plastic sheeting		GMG	
								(0.10) 0.80	Light orangish brown clayey slightly gravelly fine and medium SAND. Gravel is fine subangular to subrounded of various lithologies quartz and mudstone. (GLACIAL DEPOSIT)		GFDU	
									End of hand pit.		END	

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.8mbgl. No V/O No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP Telephone:	BOREHOLE LOG		Hole No. HP05	
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1	
Job No 70079705	Client Wrexham County Borough Council		Date 09-11-21 09-11-21	
Contractor / Driller RP Drilling Ltd.	Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR)	Ground Level (m AOD)

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.10-0.20	ES							0.05	Very soft dark brown sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND)		CMG	
0.30-0.50	ES							(0.55)	Dark greyish brown gravelly slightly clayey fine and medium SAND with rare cobbles of sandstone and , rare metal bar (0.13m long). Gravel is fine to coarse angular to subrounded of various lithologies sandstone, mudstone, limestone, brick, tile and mortar. (MADE GROUND) 0.05 - 0.6 Possible acm-white and fibrous		GMG	
								0.60				
								(0.15)	Light orangish brown slightly clayey slightly gravelly fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone and mudstone. (GLACIAL DEPOSIT)		GFDU	
								0.75	End of hand pit.		END	

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.75mbgl. No odour. Potential acm in made ground. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP Telephone:	BOREHOLE LOG		Hole No. HP07
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1
Job No 70079705	Client Wrexham County Borough Council		Date 09-11-21 09-11-21
Contractor / Driller RP Drilling Ltd.	Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR) Ground Level (m AOD)

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P.Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.20-0.30	ES							(0.10) 0.10	Very soft dark reddish brown slightly sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND)		CMG	
								(0.20) 0.30	Dark brown slightly gravelly clayey slightly silty fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, quartz and terracotta pot fragment. (MADE GROUND)		GMG	
								(0.10) 0.40	Light orangish brown clayey gravelly fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone and mudstone. (GLACIAL DEPOSIT)		GFDU	
									End of hand pit.		END	
					</							

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.4mbgl. No V/O. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP Telephone:	BOREHOLE LOG		Hole No. HP08	
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1	
Job No 70079705		Client Wrexham County Borough Council		Date 09-11-21 09-11-21
Contractor / Driller RP Drilling Ltd.		Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR)
Ground Level (m AOD)				

SAMPLES & TESTS							STRATA						
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P. Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm	
0.10-0.20	ES							0.07	Very soft dark brown sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND) 0.05 - 0.05 5mm diameter plastic tube		CMG		
								(0.33)	Dark greyish brown gravelly clayey slightly silty fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, concrete, mudstone, quartz, coal, metal, brick, plastic and fabric. (MADE GROUND)		GMG		
0.30-0.40	ES							0.40	Light orangish brown slightly clayey very gravelly fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone. (GLACIAL DEPOSIT)		GFDU		
								(0.23)					
								0.63	End of hand pit.		END		

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.63mbgl. No V/O. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

17 WSP BH LOG HAND PIT LOGS - EL.GPJ WSPTEMPLATE7.00.GDT 12/11/21

 WSP Telephone:	BOREHOLE LOG		Hole No. HP09
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1
Job No 70079705	Client Wrexham County Borough Council		Date 09-11-21 09-11-21
Contractor / Driller RP Drilling Ltd.	Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR) Ground Level (m AOD)

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P. Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.10-0.20	ES							(0.09) 0.09	Very soft dark brown sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND)		CMG	
								(0.11) 0.20	Dark greyish brown gravelly clayey slightly silty fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, concrete and coal. (MADE GROUND)		GMG	
								(0.33) <				

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.53mbgl. No V/O. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP Telephone:	BOREHOLE LOG		Hole No. HP10
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1
Job No 70079705	Client Wrexham County Borough Council		Date 09-11-21 09-11-21
Contractor / Driller RP Drilling Ltd.	Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR) Ground Level (m AOD)

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P. Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.10-0.25	ES							(0.08) 0.08	Very soft dark brown slightly sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND)		CMG	
								(0.17) 0.25	Dark reddish brown gravelly clayey slightly silty fine and medium SAND with rare cobbles of brick. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone, quartz, glass and brick. (MADE GROUND)		GMG	
								(0.25) 0.50	Light orangish brown very clayey gravelly fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone and coal. (GLACIAL DEPOSIT)		GFDU	
									End of hand pit.		END	
						</						

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.5mbgl. No V/O. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP Telephone:	BOREHOLE LOG		Hole No. HP12
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1
Job No 70079705	Client Wrexham County Borough Council		Date 09-11-21 09-11-21
Contractor / Driller RP Drilling Ltd.	Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR) Ground Level (m AOD)

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P. Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.10-0.20	ES							(0.08) 0.08	Very soft dark brown slightly sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND)		CMG	
								(0.22) 0.30	Dark greyish brown gravelly clayey slightly silty fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, plastic fragment, coal, concrete and quartz. (MADE GROUND)		GMG	
								(0.10) 0.40	Light orangish brown clayey gravelly fine and medium SAND with rare cobbles of sandstone. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone and coal. (GLACIAL DEPOSIT)		GFDU	
									End of hand pit.		END	

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.4mbgl. No V/O. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP Telephone:	BOREHOLE LOG		Hole No. HP15
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1
Job No 70079705	Client Wrexham County Borough Council		Date 09-11-21 09-11-21
Contractor / Driller RP Drilling Ltd.	Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR) Ground Level (m AOD)

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thick-ness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.20-0.30	ES							(0.09) 0.09	Very soft dark brown slightly sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND)		CMG	
								(0.21) 0.30	Dark greyish brown gravelly clayey slightly silty fine and medium SAND with rare cobbles concrete. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone, ash, coal, black combustible ashy product, concrete and brick. (MADE GROUND) 0.20 - 0.25 Greyish black ashy horizon		GMG	
								(0.30) 0.60	Light orangish brown clayey gravelly fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone and coal. (GLACIAL DEPOSIT)		GFDU	
									End of hand pit.		END	

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.6mbgl. No V/O. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

 WSP Telephone:	BOREHOLE LOG		Hole No. HP16
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1
Job No 70079705	Client Wrexham County Borough Council		Date 09-11-21 09-11-21
Contractor / Driller RP Drilling Ltd.	Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR) Ground Level (m AOD)

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.10-0.25	ES							(0.08) 0.08	Very soft dark brown slightly sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND)		CMG	
								(0.22) 0.30	Dark reddish brown gravelly clayey slightly silty fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone, brick, plastic pen end and concrete. (MADE GROUND)		GMG	
								(0.17) 0.47	Light orangish brown clayey gravelly fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone, coal and quartz. (GLACIAL DEPOSIT)		GFDU	
									End of hand pit.		END	

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.47mbgl. No V/O. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

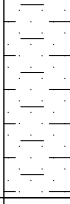
 WSP Telephone:	BOREHOLE LOG		Hole No. HP17	
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1	
Job No 70079705	Client Wrexham County Borough Council		Date 09-11-21 09-11-21	
Contractor / Driller RP Drilling Ltd.	Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR)	Ground Level (m AOD)

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P. Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.10-0.20	ES							0.05	Very soft dark brown slightly sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND)		CMG	
								(0.15)	Dark reddish brown gravelly clayey slightly silty fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone, quartz and concrete. (MADE GROUND)		GMG	
								0.20	Light orangish brown clayey gravelly fine and medium SAND with rare cobbles of quartz. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone, coal and quartz. (GLACIAL DEPOSIT)		GFDU	
								(0.40)				
								0.60	End of hand pit.		END	

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.6mbgl. No V/O. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

17 WSP BH LOG HAND PIT LOGS - EL.GPJ WSPTEMPLATE7.00.GDT 12/11/21

 WSP Telephone:	BOREHOLE LOG		Hole No. HP18
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1
Job No 70079705	Client Wrexham County Borough Council		Date 09-11-21 09-11-21
Contractor / Driller RP Drilling Ltd.	Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR) Ground Level (m AOD)

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P. Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.10-0.20	ES							(0.08) 0.08	Very soft dark brown slightly sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND)		CMG	
0.20-0.30	ES							(0.27) 0.35	Dark reddish brown gravelly clayey slightly silty fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone, coal, roof tile and quartz. (MADE GROUND)		GMG	
								(0.25) 0.60	Light orangish brown clayey gravelly fine and medium SAND with rare cobbles of sandstone. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone, coal and quartz. (GLACIAL DEPOSIT)		GFDU	
									End of hand pit.		END	

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.6mbgl. No V/O. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

17 WSP BH LOG HAND PIT LOGS - EL.GPJ WSPTEMPLATE7.00.GDT 12/11/21

 WSP Telephone:	BOREHOLE LOG		Hole No. HP20
	Project Heol Offa GRR Asbestos Delineation		Sheet 1 of 1
Job No 70079705	Client Wrexham County Borough Council		Date 09-11-21 09-11-21
Contractor / Driller RP Drilling Ltd.	Method/Plant Used Insulated hand tools	Logged By E. Hale	Co-Ordinates (NGR) Ground Level (m AOD)

SAMPLES & TESTS							STRATA					
Depth	Type	Test Result	PID (ppmV)	HSV (kN/m2)	P. Pen (kN/m2)	Water	Elev. (mAOD)	Depth (Thickness)	Description	Legend	Geology	Dia. Install / Backfill mm
0.10-0.20	ES							0.06	Very soft dark reddish brown slightly sandy CLAY with grass over and rootlets (TOPSOIL). (MADE GROUND)		CMG	
								(0.49)	Dark reddish brown gravelly clayey slightly silty fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone, coal, concrete and quartz. (MADE GROUND)		GMG	
0.40-0.50	ES							0.55	Orangish brown clayey gravelly fine and medium SAND. Gravel is fine to coarse subangular to subrounded of various lithologies sandstone, mudstone, coal and quartz. (GLACIAL DEPOSIT)		GFDU	
								(0.15)				
								0.70	End of hand pit.		END	
												
												
												
												
												
												
												
												
												
												
												
												

Boring Progress						Water Strikes					
Date	Time	Depth	Casing Depth	Dia. (mm)	Water Depth	Date	Time	Strike	Minutes	Standing	Casing
Chiselling				Water Added		General Remarks Inspection pit terminated at 0.7mbgl. No V/O. No Groundwater.					
From	To	Hours	Tool	From	To						
Scale 1:9.375		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									