



RHONDDA
GEOTECHNICAL
SERVICES

PHASE 2
CONTAMINATED LAND ASSESSMENT
REVISION 1
N.P.T. FULL PLANNING REF. P2021/1086
EXTENSION TO EXISTING INDUSTRIAL UNIT
UNIT 21 MARDON PARK
BAGLAN
PORT TALBOT
SA12 7AX
27/04/2024

EXECUTIVE SUMMARY

Planning application P2021/1086 to Neath Port Talbot L.P.A. is for an extension to an existing industrial unit at Mardon Park, Baglan. Contaminated Land Planning Conditions were attached to the decision to grant full planning.

Rhondda Geotechnical Services were commissioned to carry out the work. A Phase 1 Report on the land had already been carried out in 2018 by Ian Farmer Associates. This has previously been accepted by N.P.T. on an adjacent site. The I.F.A. report was reviewed by R.G.S. and used to inform the design of the Phase 2. The Phase 2 consisted of the excavation of two trial pits. The soil was sampled and sent for laboratory testing. The testing showed the site was uncontaminated and required no remedial treatment. Ground Gas risk assessment and Radon monitoring showed no requirement for gas protection measures. Therefore, there should be no reason for N.P.T. not to discharge all contamination conditions.

PLEASE NOTE THIS REPORT AND ITS CONCLUSIONS SUPERCEDES THE PHASE 2 RISK ASSESSMENT PREVIOUSLY PRODUCED FOR N.P.T. AND DATED 3.10.2022

INTRODUCTION PURPOSES AND AIMS

G.B.V. Properties Ltd have been granted planning permission ref P2021/1086 for an extension to an existing detached industrial building at Mardon Park, Baglan. Neath Port Talbot L.P.A. have granted the permission with multiple conditions. Amongst these are contaminated land conditions. The exact wording is as follows:-

9. No development shall commence on site until an assessment of the nature and extent of contamination affecting the application site area has been submitted to and approved in writing by the Local Planning Authority. This assessment must be carried out by or under the direction of a suitably qualified competent person in accordance with BS10175 (2011) 'Investigation of Potentially Contaminated Sites Code of Practice' and shall assess any contamination on the site, whether or not it originates on the site. The report of the findings shall include:

(i) a desk top study to identify all previous uses at the site and potential contaminants associated with those uses and the impacts from those contaminants on land and controlled waters. The desk study shall establish a 'conceptual site model' (CSM) which identifies and assesses all identified potential source, pathway, and receptor linkages;

(ii) an intrusive investigation to assess the extent, scale and nature of contamination which may be present, if identified as required by the desk top study;

(iii) an assessment of the potential risks to: - human health, - groundwater and surface waters - adjoining land, - property (existing or proposed) including buildings, crops, livestock, pets, woodland and service lines and pipes,- ecological systems, - archaeological sites and ancient monuments; and - any other receptors identified at (i)

(iv) an appraisal of remedial options, and justification for the preferred remedial option(s)

10. No development shall commence on site until a remediation scheme to bring the site to a condition suitable for the intended use by removing any unacceptable risks to human health, buildings, other property and the natural and historic environment shall be prepared and submitted to and agreed in writing with the Local Planning Authority. The scheme shall include all works to be undertaken, proposed remediation objectives, remediation criteria and site management procedures. The measures proposed within the remediation scheme shall be implemented in accordance with an agreed programme of works.

12. Prior to beneficial use of the proposed development commencing, a verification report which demonstrates the effectiveness of the agreed remediation works carried out in accordance with condition 10 shall have been submitted to and agreed in writing by the Local Planning Authority. Reason: To ensure that risks from land contamination to the future users of the land and neighbouring land are minimised, together with those to controlled waters, property and ecological systems, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors and to ensure compliance with Policies SP16 and EN8 of the Neath Port Talbot Local Development Plan (2011-2026). 13 In the event that contamination is found at any time when carrying out the approved development that was not previously identified, work on site shall cease immediately and shall be reported in writing to the Local Planning Authority. A Desk Study, Site Investigation, Risk Assessment and where necessary a Remediation Strategy must be undertaken in accordance with the following document:- Land Contamination: A Guide for Developers (WLGA, WAG & EAW, July 2006). This document shall be submitted to and agreed in writing with the Local Planning Authority. Prior to occupation of the development, a verification report which demonstrates the effectiveness of the agreed remediation, shall be submitted to and agreed in writing with the Local Planning Authority.

It should be noted that Conditions 9iv, 10 and 12 are entirely dependent on the site investigation requested in condition 9ii-9iii revealing contamination at the site. From previous work carried out nearby this may not be the case.

1. AUTHOR CREDENTIALS

The author of this report is Richard Davies. He graduated with a Batchelor of Science honours degree in Geology from Liverpool University in 1979. After starting his career as an engineer in the coal industry, he moved into site investigation in the 1980's and has many years experience working on contaminated land. He is a Fellow of The Geological Society and holds a Master's Degree in Applied Environmental Geology from Cardiff University. He is also a Supporter Member of CL: AIRE (Contaminated Land: Applications in Real Environments)

2. THE SITE

The site is situated on Baglan Energy Park, Port Talbot. The site is rectangular, measuring approximately 50m x 45m (0.23 Ha). Centred on grid reference 273960,192590 the site is a featureless expanse of flat land adjacent to the existing Unit 21. There are no surface

watercourses. The site location is shown in Figure 1, with an aerial photo from Google Earth Pro showing the site boundary in Figure 2.

3. PHASE 1 SUMMARY

A Phase 1 Desk Study by Ian Farmer Associates dating from September 2018 covers the site. The site currently under discussion sits within a larger land parcel which has been subject to previous planning applications. The original I.F.A. report gives a comprehensive review of historical land use at the site and is done within the template framework recommended in “Land Contamination: A guide for Developers (WLGA, 2017). The I.A.F. report has previously been accepted by N.P.T. for an adjacent site. It is the author’s opinion that the I.F.A. Report is sufficient to discharge Condition 12.1 a-d above. The site boundary for the I.F.A. Phase 1 report is shown in red in Figure 2 and quite clearly includes the site that is subject to the current planning application. The I.F.A. Phase 1 (with an R.G.S. cover page to avoid confusion) and the R.G.S. Phase 2 will be submitted together as two separate but complementary reports.

Page 18 of the I.F.A. Phase 1 Report (points 7.1.1 and 7.1.2) recommended an intrusive investigation. Intrusive works in the form of two trial pits were carried out by R.G.S. in 2021 at the request of G.B.V Developments during an intrusive investigation on an adjacent site. Soil samples were taken for laboratory analysis. The results of this analysis, and the implications of these results form the basis of this Phase 2 report. The Conceptual Site Model from the I.F.A. report is summarised in Table 1 on page 8. The preliminary risk from Ground Gas is summarised in Table 2 on page 9.

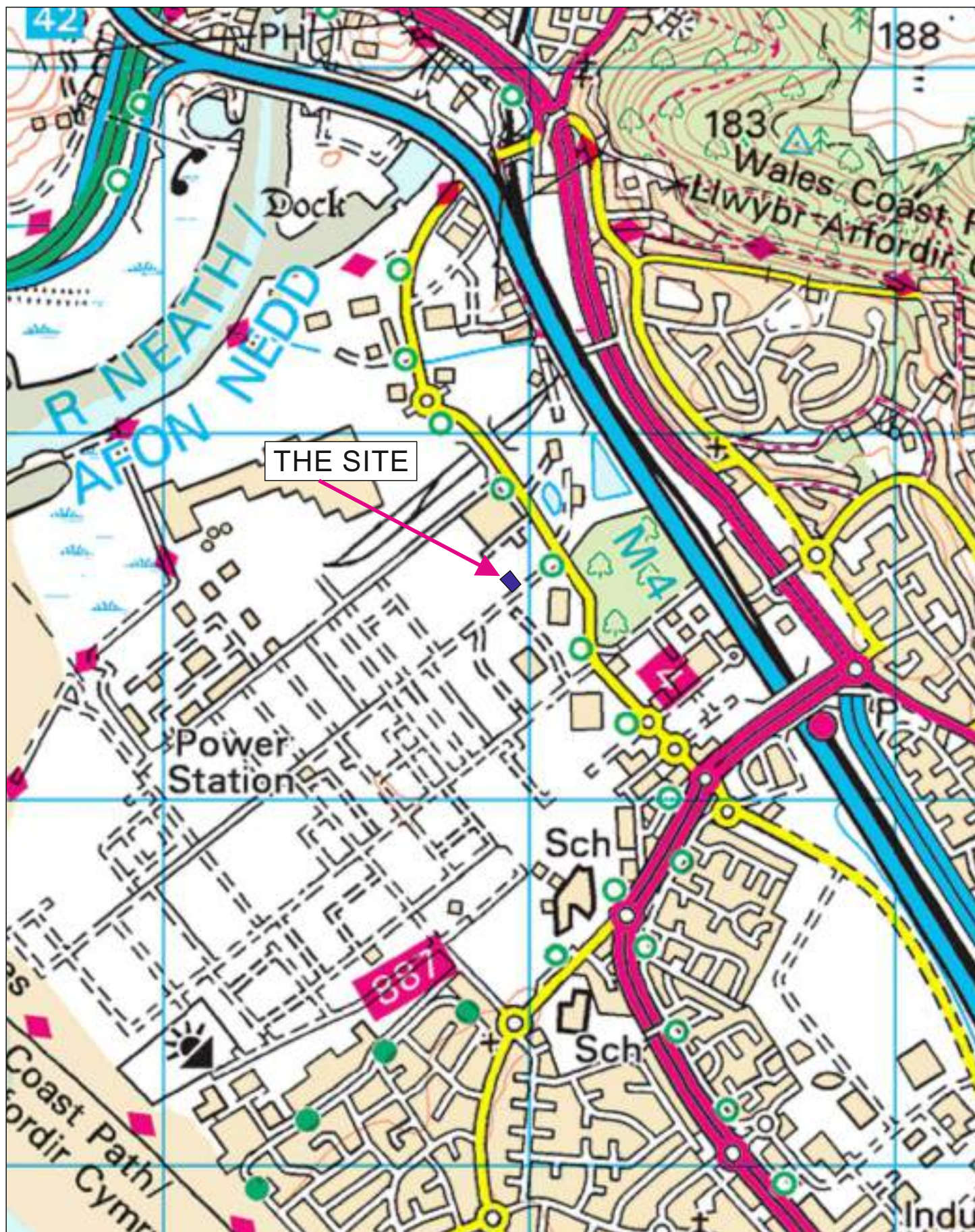


FIGURE 1
SITE LOCATION

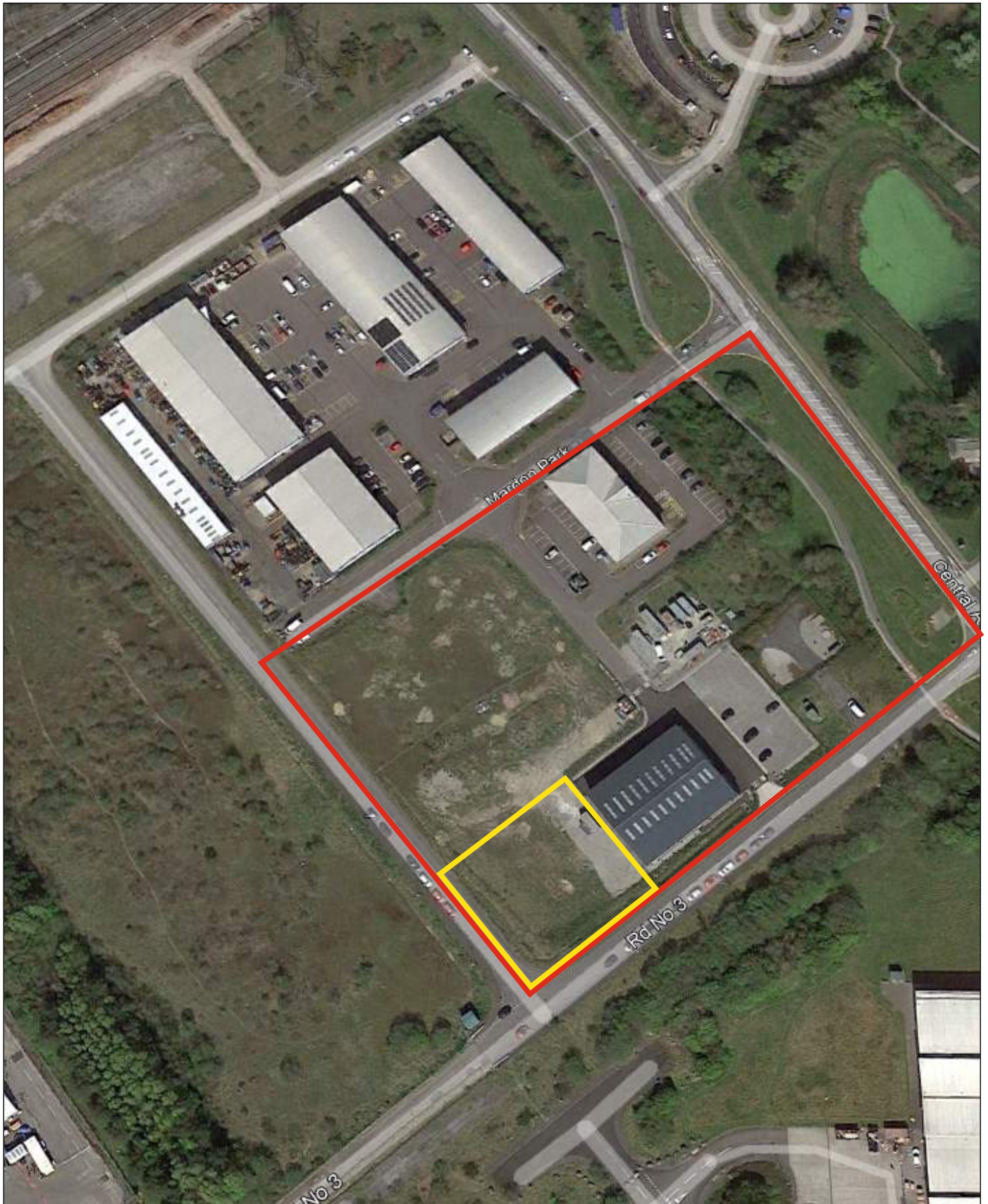


FIGURE 2

AERIAL VIEW FROM GOOGLE EARTH PRO. THE RED BOUNDARY DELINEATES THE AREA COVERED BY THE IAN FARMER ASSOC. DESK STUDY (PHASE 1). THE YELLOW BOUNDARY DELINEATES THE AREA COVERED BY THE RHONDDA GEOTECHNICAL SERVICES INTRUSIVE INVESTIGATION (PHASE 2).

TABLE 1						
QUALITATIVE HUMAN HEALTH RISK ASSESSMENT AND ENVIRONMENTAL RISK ASSESSMENT AT MARDON PARK, BAGLAN.						
CONTAMINANT SOURCE	PATHWAYS	RECEPTORS	POTENTIAL SEVERITY	PROBABILITY OF RISK	LEVEL OF RISK	FURTHER ACTION REQUIRED
ON SITE: POTENTIAL CONTAMINATION IN SOILS/MADE GROUND. POSSIBLY ELEVATED LEVELS OF METALS HYDROCARBONS AND PAH	INGESTION, DERMAL CONTACT, INHALATION	FUTURE END USERS, VISITORS	MEDIUM	MEDIUM	MEDIUM	SLIGHT POSSIBILITY OF MADE GROUND BEING A SOURCE OF CONTAMINATION ON SITE. FURTHER QUANTIFICATION REQUIRED VIA AN INTRUSIVE INVESTIGATION
	CONTACT WITH CONTAMINATED GROUNDWATER	FUTURE END USERS, VISITORS AND CONSTRUCTION WORKERS	MEDIUM			
	PERMEATION OF WATER PIPES	FUTURE END USERS AND SITE VISITORS	MEDIUM			
	INGESTION OF HOME GROWN PRODUCE	FUTURE END USERS	N/A			
ON SITE: ASBESTOS AT OR NEAR GROUND SURFACE IN SOILS/MADE GROUND	INHALATION OF FIBRES IN AIRBORNE DUST	FUTURE END USERS AND SITE VISITORS	HIGH	MEDIUM	MEDIUM	POSSIBLE SOURCE OF ASBESTOS ON SITE. FURTHER QUANTIFICATION REQUIRED. INTRUSIVE INVESTIGATION WILL INCLUDE AN ASBESTOS SCREEN
		CONSTRUCTION WORKERS	HIGH	MEDIUM	MEDIUM	
ON SITE: POTENTIAL CONTAMINATION IN SOILS/MADE GROUND. POSSIBLY ELEVATED LEVELS OF CONTAMINANTS	RUN OFF	SURFACE DRAINAGE	MEDIUM	MEDIUM	MEDIUM	SLIGHT POSIBILITY OF CONTAMINATION IN MADE GROUND ON SITE MEANS FURTHER QUANTIFICATION OF THE THREAT TO CONTROLLED WATERS/ ENVIRONMENTAL RECEPTORS MAY BE NECESSARY
	MIGRATION THROUGH SOIL VIA LEACHING	SHALLOW GROUNDWATER				
	ONWARD MIGRATION OF GROUNDWATER	BEDROCK AQUIFER				

TABLE 2 INITIAL GROUND GAS RISK ASSESSMENT MARDON PARK, BAGLAN					
SOURCE	PATHWAY	RECEPTOR	CONSEQUENCE CLASSIFICATION	RISK	FURTHER ACTION
HAZARDOUS GROUND GAS FROM OFF SITE SOURCE	INHALATION, INJURY FROM EXPLOSION	SITE USERS, VISITORS, CONSTRUCTION WORKERS	SEVERE	MEDIUM. SLIGHT POSSIBILITY OF OFF SITE GENERATION OF MINE GASES MIGRATING ONTO SITE.	THE RISK REQUIRES FURTHER QUANTIFICATION FROM THE NEW C.M.R.A.
HAZARDOUS GROUND GAS FROM OFF SITE SOURCE	DAMAGE FROM EXPLOSION	BUILDINGS	SEVERE		
HAZARDOUS GROUND GAS FROM ON SITE SOURCE	INHALATION, INJURY FROM EXPLOSION	SITE USERS, VISITORS, CONSTRUCTION WORKERS	SEVERE	MEDIUM. SLIGHT POSSIBILITY OF ON SITE GENERATION FROM MADE GROUND.	THE RISK REQUIRES QUANTIFICATION DURING THE INTRUSIVE INVESTIGATION
HAZARDOUS GROUND GAS FROM ON SITE SOURCE	DAMAGE FROM EXPLOSION	BUILDINGS	SEVERE		
RADON GAS	LONG TERM HAZARD FROM INHALATION	SITE USERS	SEVERE	MEDIUM. 3%-5% LOCAL PROPERTIES ABOVE RADON ACTION LEVEL	BASIC RADON PROTECTION MEASURES REQUIRED

4. SITE INVESTIGATION AND SAMPLING METHODOLOGY

Intrusive site investigations were carried out on 16/03/2021 under the supervision of Richard Davies. This was done at the same time as a larger intrusive investigation into an adjacent site. Works consisted of the digging of two trial pits with a tracked excavator. The trial pit locations are shown in Figure 3 together with the depth of the samples taken. The site was flat and featureless. Previous desk studies had suggested no specific areas of contamination. Most of the site will be occupied by the new building. The two trial pit locations were situated outside the building footprint. Two soil samples were taken, one from each trial pit. This was considered reasonable and proportionate for an initial investigation of a site of this size. The trial pits were excavated through the slag forming the Made Ground into the underlying natural ground. This was sand. The ground conditions were very similar to the other ten trial pits on adjacent land. There was no sensory field evidence of contamination detected anywhere on site. Groundwater was encountered in both trial pits. Groundwater samples had been taken and tested on the larger adjacent site on the same day. Since the groundwater was clearly in hydraulic connectivity across the larger adjacent site, the results from the groundwater analysis for that site were considered suitably representative of the site now under discussion.

The soil samples were collected, placed in British Standard sealed containers and immediately labelled with depth, location and sample number. Each soil sampling location had four samples taken. These comprised two one litre plastic tubs, one 60ml. amber glass jar and one 120ml. amber glass jar. This is the recommended quantity required for a broad general suite of testing. In the case of the groundwater samples on the adjacent site a litre amber glass bottle and a litre plastic bottle were collected. The soil samples were taken with a stainless steel trowel, cleaned between samples to avoid cross contamination. The samples were stored in cool boxes and dispatched by courier to the laboratory the following morning. This meant that the lab was in receipt of the samples within 48 hours of them being taken, and they were kept under correct conditions throughout. This is important to ensure the samples are “non-deviating” particularly in the case of testing for organic contaminants.

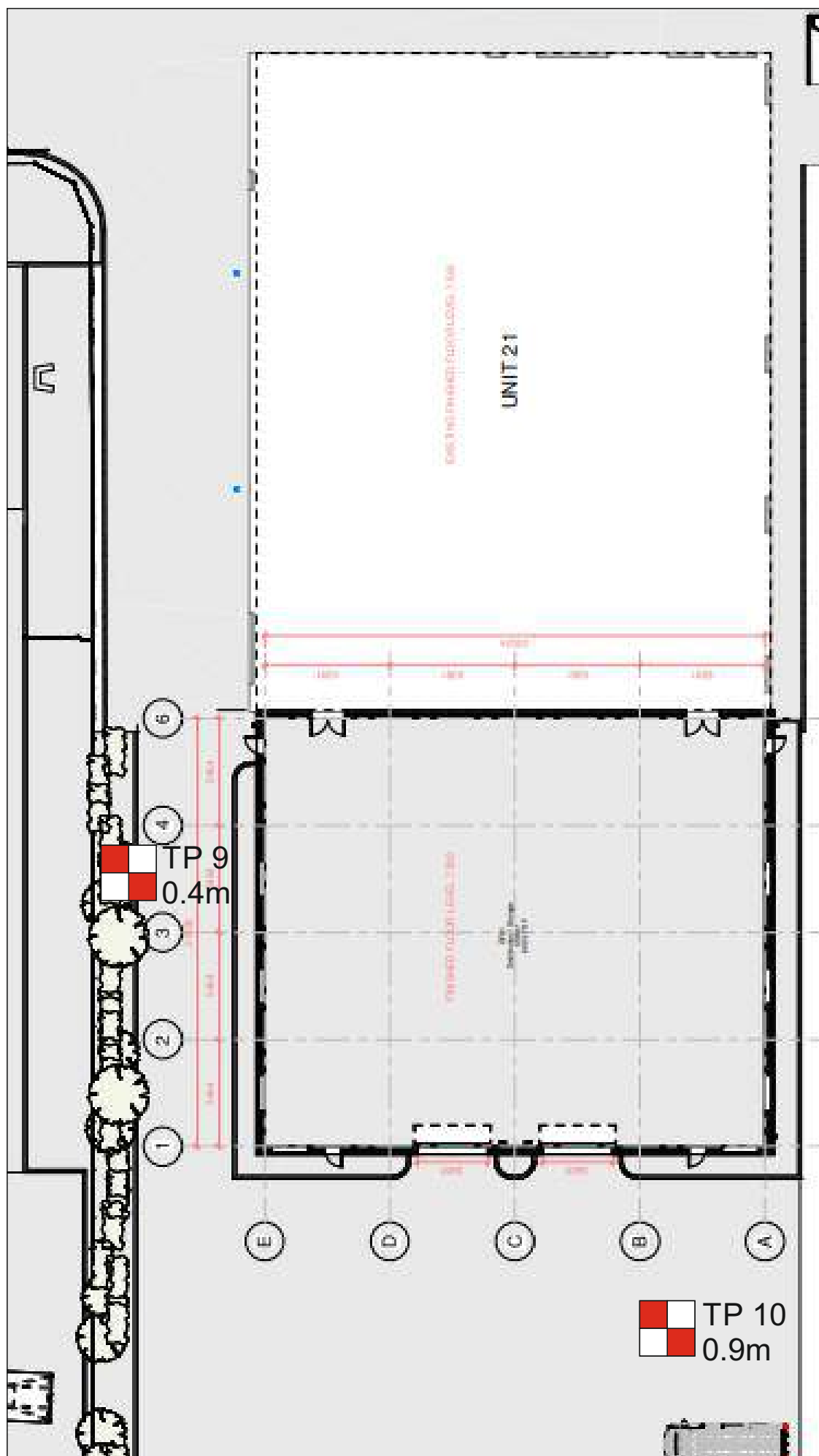


FIGURE 3 TRIAL PIT POSITIONS AT MARDON PARK

5. TESTING STRATEGY

All the samples were tested by The Environmental Laboratory Ltd (reg. 3882193) at their laboratory in East Sussex. They hold both MCERTS and UKAS accreditation (UKAS lab no.2683). Their full details can be seen on the laboratory report 21-32708-01b. The complete report is included as Appendix B.

The Phase 1 report and Conceptual Site Model did not identify any specific range of potential contaminants of concern. Testing of soil samples from an adjacent site showed no contamination. Because of this a wide range of contaminants was tested for. This is the CLEA 2.1 Suite plus asbestos screen. The substances tested for could be described as a broad general suite in common use in British contaminated land studies. The substances can be split into two main categories. Organic and Inorganic compounds.

The inorganic contaminants tested for were metals:-

Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium and Zinc.

In addition, Free Cyanide was measured, and all samples were screened for Asbestos.

Total Organic Carbon and moisture were both measured. From this a calculation is used to derive Soil Organic Matter. This is needed to risk assess levels of P.A.H.'s, TPH's and Phenols which differ with varying S.O.M. values. A wide range of organic contaminants were tested for.

All samples were tested for P.A.H.s (Polycyclic Aromatic Hydrocarbons). Sixteen different compounds were measured. These are the USEPA16. Originating from the U.S.A. they are an internationally recognised, representative indicative group amongst the huge number of these compounds.

T.P.H. (total petroleum hydrocarbons) analysis was split up by Carbon Banding, along conventionally normal lines (Texas Banding). An aromatic/aliphatic split analysis was also carried out to allow further speciation of any hydrocarbon contamination detected.

The analysis for Organic contaminants also included a Phenol Suite. This contained a range of six Monohydric Phenols commonly found on contaminated sites.

6. CHOICE OF SUITABLE FOR USE VALUES (S4ULs) USED IN PHASE 2

Much work has been done in recent years on human health risk assessment for exposure to contaminated land. Originally the E.A. produced figures known as Soil Guidance Values (SGVs). These were later withdrawn, and this has resulted in the production of Generic Assessment Criteria (GACs). These are figures produced for individual substances. If the concentration of a contaminant is above its GAC, there is a potential for harm to human health (or controlled waters). Each contaminant has different levels for different exposure scenarios. For example, for any given contaminant, its GAC is far higher for a commercial development than it would be for Residential Use with consumption of homegrown produce. Many GACs have been published by Contaminated Land: Applications in real environments (CL:AIRE), Land Quality Management Ltd. (LQM) and the Environmental Industries Commission (EIC).

Due to different bodies producing GACS over the years since they were introduced, LQM have produced a complete revision of their figures and renamed them Suitable for Use Levels (S4ULs). The values used in this report are S4ULs with the exception of Lead which has a Category 4 Screening Levels (C4SL). Cyanide is not assessed in this way, instead it has an acute GAC, rather than one modelled on long term exposure. Asbestos also has its own safety levels governing land use.

The LQM S4ULs have been derived in accordance with the changes in exposure modelling presented within the C4SL framework, whilst still using a set of toxicological criteria that are set within the “minimal risk” range. The LQM/CIEH S4ULs were published to offer a set of collated information on the toxicity and transport properties for a number of common contaminants. They are widely considered to be suitable for use in planning assessments such as this. The most recent update was published in 2017 and reflects changes in UK human health risk assessment since the previous figures were published in 2009. All the data inputs used in the derivation of the S4ULs are presented in full in the publication LQM/CIEH Suitable 4 Use Levels and there is no intention to provide them here. These values are intended for use by professionals who have purchased them. To authenticate this the purchaser is supplied with an individual number to validate the report writer’s entitlement to use the LQM/CIEH S4ULs. This number can be seen on the result summary sheet. The author has the right to

reproduce these values here, but they remain copyright of LQM, a specialist environmental consultancy based in Nottingham.

The proposed development is a commercial unit. Given the nature of the proposed development, the Commercial Land Use S4ULs are appropriate, and these have been used when analysing the results for the risk assessment of the site.

7. SUMMARY OF GROUND CONDITIONS AND TEST RESULTS

The full trial pit logs to BS5930:2015 together with photographs of the pits can be found in Appendix A. In summary, all trial pits encountered a thin (0.25m-0.7m) layer of poor Topsoil/Made Ground or fused slag. The thin Made Ground lay directly on top of sand. The sand contained some large fragments of slag at deeper levels indicating some degree of disturbance. It is likely this occurred during the reclamation of Baglan Moors approximately 70 years ago.

A summary of the laboratory report in Appendix B has been produced overleaf in Tables 3-7. These compare the test results for each substance with its relevant Commercial Land Use S4UL value. TP9 and TP10 outlined in red in the tables are the two samples from this site.

With the organic contaminants, the samples are normally subdivided based on their Soil Organic Matter (S.O.M.) as the S4UL value for each organic contaminant is controlled by the S.O.M. value. All of the samples tested fell in the S.O.M. band >1% <2.5%. Because of this there are no different S4UL values for all the organic contaminants in Tables 3-5.

There were minute quantities of some of the 16 P.A.H. range of substances in one of the samples tested. In the other samples P.A.H. levels were below the L.O.D.

In Table 4, every one of the T.P.H. range tested for was either below the level of detection in the sample from TP10. The sample from TP9 had minute trace quantities of aromatic band C21-C35.

Because all the six speciated Phenols were below the level of detection in all samples, only the Phenol Index is shown, without speciation.

With the inorganic substances in Table 6, there are no exceedances of any of the S4UL/C4SL levels any of the metals tested for.

Cyanide was below the Limit of Detection (L.O.D.) in all the samples. There was no Asbestos detected in any of the samples.

To summarise, levels of all contaminants present in the soils at the site are very low. None remotely approach the S4UL/C4SL values appropriate for the Commercial Land use scenario. In fact, contaminant levels are so low there are no exceedances of the S4UL/C4SL values for residential use with homegrown produce. This is the most conservative of all and is set at approximately 10% of the commercial threshold values.

Two groundwater samples from the adjacent site were also tested. These are in the report in Appendix B but are not tabulated here. The reason for this is that there are many different standards for water depending on the situation. The Environmental Quality Standard (E.Q.S.) for freshwater could be considered an appropriate yardstick for the groundwater below the site. These values are from an E.U. directive and are primarily aimed at river basins and lakes. The reason for picking freshwater values is because of the coastal position and the large (>20m) thickness of permeable superficial deposits. In these circumstances a freshwater wedge will form and float on top of more saline water at depth.

The groundwater analyses are on page 7 of the ELAB report. Arsenic appears slightly elevated at 29 µg/l and 30 µg/l. This is a normal phenomenon in the South Wales Coalfield because of naturally occurring Arsenic in the bedrock. The E.Q.S. is 50 µg/l. Traces of P.A.H. were also found in both samples. There are no E.Q.S. values for ten of the USEPA16 substances. Some authorities suggest using Benzo[a]Pyrene as a marker. This was formerly the approach for P.A.H. in soils before speciation was widely available. The levels of BaP are 0.42 µg/l and 0.33 µg/l respectively. Whilst these concentrations are minute, they are much larger than the E.Q.S. of 0.00017 µg/l. the implications of this will be discussed in the risk assessment in Section 9.

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ALL VALUES ARE IN mg/kg

ALL S4ULs REFER TO A COMMERCIAL DEVELOPMENT SCENARIO

SOIL ORGANIC MATTER(S.O.M.)					> 1%<2.5%	
CONTAMINANT	TP9 0.4m	TP10 0.9m	TP11 0.6m	TP12 0.55		S4UL
NAPHTHALENE	<0.1	<0.1	<0.1	<0.1		190
ACENAPHTHYLENE	<0.1	<0.1	<0.1	<0.1		83000
ACENAPHTHENE	<0.1	<0.1	<0.1	<0.1		84000
FLOURENE	<0.1	<0.1	<0.1	<0.1		63000
PHENANTHRENE	<0.1	<0.1	<0.1	<0.1		22000
ANTHRACENE	<0.1	<0.1	<0.1	<0.1		520000
FLOURANTHENE	0.2	<0.1	0.5	0.7		23000
PYRENE	0.1	<0.1	0.6	0.8		54000
BENZO[a]ANTHRACENE	0.1	<0.1	0.7	0.8		170
CHRYSENE	0.1	<0.1	1	1.3		350
BENZO[b]FLOURANTHENE	0.1	<0.1	1	1.3		44
BENZO[k]FLOURANTHENE	<0.1	<0.1	1.1	1.4		1200
BENZO[a]PYRENE	0.1	<0.1	1	1.4		35
INDENO[1,2,3-cd]PYRENE	0.1	<0.1	1	1.5		500
DIBENZO[a,h]ANTHRACENE	<0.1	<0.1	0.3	0.4		3.5
BENZO[g,h,i]PERYLINE	0.1	<0.1	0.9	1.2		3900
TOTAL(USEPA 16) PAHs	1.3	0.4	8.5	10.8		N/A
TABLE 3 POLYCYCLIC AROMATIC HYDROCARBONS (USEPA16)						

SUMMARY OF TEST RESULTS MARDON PARK, BAGLAN

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ALL S4ULs REFER TO A COMMERCIAL DEVELOPMENT SCENARIO

SOIL ORGANIC MATTER(S.O.M.)						> 1%<2.5%
CARBON BANDING	TP9 0.4m	TP10 0.9m	TP11 0.6m	TP12 0.55		S4UL
>C5-C6 ALI	<0.01	<0.01	<0.01	<0.1		3200
>C6-C8 ALI	<0.01	<0.01	<0.01	<0.1		7800
>C8-C10 ALI	<1	<1	<1	<1		2000
>C10-C12 ALI	<1	<1	<1	<1		9700
>C12-C16 ALI	<1	<1	<1	<1		59000
>C16-C21 ALI	<1	<1	<1	<1		1600000
>C21-C35 ALI	<1	<1	<1	<1		1600000
>C35-C40 ALI	<1	<1	<1	<1		1600000
TOTAL ALI C5-C40	<1	<1	<1	1.4		N/A
>C5-C7 ARO	<0.01	<0.01	<0.01	<0.1		26000
>C7-C8 ARO	<0.01	<0.01	<0.01	<0.1		56000
>C8-C10 ARO	<1	<1	<1	<1		3500
>C10-C12 ARO	<1	<1	<1	<1		16000
>C12-C16 ARO	<1	<1	<1	<1		36000
>C16-C21 ARO	<1	<1	<1	<1		28000
>C21-C35 ARO	1.5	1.2	1.2	5.3		28000
>C35-C40 ARO	<1	<1	7.2	1.1		28000
TOTAL ARO C5-C40	1.7	<1	23.5	6.8		N/A
TPH C5-C40	2.2	1.1	31.8	7.1		N/A
TABLE 4 TOTAL PETROLEUM HYDROCARBONS W1.2ITH CARBON BANDING AND ALIPHATIC/AROMATIC SPLIT						

SUMMARY OF TEST RESULTS MARDON PARK, BAGLAN

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SOIL ORGANIC MATTER(S.O.M.)						> 1%<2.5%
	TP9 0.4m	TP10 0.9m	TP11 0.6m	TP12 0.55		S4UL
PHENOL	<5	<5	<5	<5		760
TABLE 5 TOTAL MONOHYDRIC PHENOLS						

CONTAMINANT	TP9 0.4m	TP10 0.9m	TP11 0.6m	TP12 0.55	S4UL	
ARSENIC	15.2	12.7	18.9	16.8	640	
CADMIUM	<0.5	<0.5	0.6	0.8	190	
CHROMIUM	32.7	18.3	500	504	8600	
COPPER	15.5	13.6	43.8	56.5	68000	
LEAD	24.9	24.6	106	144	2300	(C4SL)
MERCURY	<0.5	<0.5	<0.5	<0.5	58	
NICKEL	9.4	8.4	47.9	23.7	980	
SELENIUM	<1	<1	<1	1.3	12000	
ZINC	87.5	78.4	289	362	730000	
CYANIDE	<1.0	<1.0	<1.0	<1.0	22	GACacute
TABLE 6 TOXIC/HEAVY METALS AND CYANIDE						

TRIAL PIT	TP9	TP10	TP11	TP12		
DEPTH (m.)	0.4m	0.9m	0.6m	0.55		
WEIGHT (g)	0	0	0	0		
% DRY WEIGHT OF SAMPLE	0	0	0	0		
TABLE 7 ASBESTOS ANALYSIS						

SUMMARY OF TEST RESULTS MARDON PARK, BAGLAN
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8. REVISED RISK ASSESSMENT FOR GROUND GAS

The review of the earlier desk studies established there was minimal risk from ground gas migration from off-site sources. There are no landfill records within 500m of the site. The C.M.R.A. produced by R.G.S. to validate this application established the fact that the closest underground mining is 270m away. These workings are at depth and undoubtedly flooded. There are no viable pathways to the site and the risk from off-site migration can be completely discounted.

The risk from on-site gas generation was considered unlikely but required quantification. The trial pitting established that the site has a thin (<0.5m) veneer of Made Ground with no visible biodegradable material. This means there is no potential for gas generation. The Made Ground is underlain at very shallow depth by sand. The nearest available borehole records established that there was gravel at greater (17m-20m) depth. Both strata contain very low levels of organic material and have no potential for gas generation. The author has very extensive experience of drilling boreholes in the Baglan Energy Park, both before and after the removal of the former B.P. plant. There are thin laterally discontinuous layers of Peat in the area, and it is possible the site is underlain at depth by Peat. The peat dates from the immediate post-glacial period after the last (Devensian) glaciation. Rising sea levels then buried the Peat, and it is highly compacted. The compaction of the peat beneath permeable sand means very little finite gas remains. Piling for the building will produce a preferential pathway. Any remaining gas will completely discharge during the construction phase and will pose no further risk. All risks from ground gas from off-site and on-site sources have been removed from the final Ground Gas Risk Assessment in Table 8.

Lastly the risk from Radon needs to be considered. Because of the size of the building P.H.E. reports are deemed inadequate. Instead, a site-specific report from the B.G.S. is the requirement for a desk study. A report was purchased and is attached as Appendix C. The conclusions of the B.G.S. Report are that no Radon Protective Measures are required for the extension. The author has been carrying out remote Radon monitoring within the existing building. The monitoring has been running for two weeks at the time of writing and is currently ongoing. The monitoring intervals are hourly and the results to date are attached as an EXCEL spreadsheet in Appendix D. The average Radon level to date is 39.5 Bq/m³. To put this in perspective, 200 Bq/m³ is the action level

for Radon where consideration should be given to lowering levels. 100 Bq/m³ is the target level post-remediation in an existing building or achieved by protective measures in a new build. The Radon Risk has been removed from Table 8.

9. REVISED RISK ASSESSMENT FOR SOILS

There were no contaminants present in the soils at the site above acceptable levels. The contaminants tested for in the soil samples, were at very low levels, well below the appropriate S4UL/C4SL levels. There was no Asbestos present. Organic contaminants were either below L.O.D. or present in minute traces. All contaminant levels were so low that they were below residential S4UL/C4SL levels. Without a source there can be no pathway to above ground receptors. For this reason, the potential risks from soils at the site can be removed from Table 9 at this stage.

10. RISK ASSESSMENT FOR CONTROLLED WATERS

The contaminants tested for in the soil samples, were at very low levels well below the appropriate S4UL/C4SL levels. The natural ground has a high permeability, and the water table was encountered at shallow depth. Testing of the groundwater showed Arsenic levels were slightly elevated, but not above recommended levels (E.Q.S.) for freshwater. As explained in Section 6 this is a natural phenomenon in the South Wales Coalfield. Traces of P.A.H. were also present in the groundwater but not in the soils. This means the soil cannot be the source of the contamination in the groundwater. It could be speculated that the source of these contaminants would be the former B.P. Plant.

- The plant was in very close proximity to the site and produced plastics using Hydrocarbon compounds from refined crude oil.
- The groundwater below the plant was previously heavily contaminated (Author's personal experience). Whilst extensive remediation was carried out this would have been unlikely to lower contaminant levels to E.Q.S. levels.
- The groundwater beneath the site will be in lateral hydraulic connectivity with the groundwater directly beneath the process areas of the former plant.

The soil at the site does not form a threat to controlled waters or onward transport to the wider environment. The potential source has been removed

from the revised risk assessment in Table 9 overleaf. The groundwater beneath the site may be classed as slightly contaminated but the comparison values are idealised standards and have no Generic Assessment Criteria related directly to human health. The site is not the source of the contamination. There is no pathway to above ground receptors. Therefore, no further action is required in the revised risk assessment in Table 9. The site investigation and results detailed above should be sufficient for N.P.T. to discharge Conditions 9i-9iii.

10. SUMMARY OF REMEDIATION OBJECTIVES, CRITERIA AND OPTIONS

The objective of any remediation strategy is to make the land suitable for its intended use. In this case a commercial property. The levels of contamination are so low that the site would be suitable for residential use with no remediation necessary. The soil beneath the site poses no risk to human, animal or environmental receptors. Because of this no remediation strategy needs to be presented in accordance with the requirements of Conditions 9iv and 10. Because remediation will not be required, no verification report for remediation in accordance with Condition 12 will be required. Condition 13 in not pre-commencement and will remain in place throughout any groundworks in the construction phase.

The slight contamination of the groundwater beneath the site does not originate on the site and neither is it the responsibility of the site owners. Tens of millions of pounds have already been spent on groundwater remediation and it is unrealistic to imagine the situation can be improved further.

As the risk from both ground gases and Radon is considered negligible no gas proof membrane will need to be installed in the proposed extension and therefore no verification will be required.

Richard Davies BSc.(Hons.), MSc., F.G.S.

27/04/2024

TABLE 8 FINAL GROUND GAS RISK ASSESSMENT MARDON PARK, BAGLAN					
SOURCE	PATHWAY	RECEPTOR	CONSEQUENCE CLASSIFICATION	RISK	FURTHER ACTION
HAZARDOUS GROUND GAS FROM OFF SITE SOURCE	INHALATION, INJURY FROM EXPLOSION	SITE USERS, VISITORS, CONSTRUCTION WORKERS	SEVERE	LOW. C.M.R.A. ESTABLISHED THERE WAS NO RISK FROM MINE GASES.	NO FURTHER ACTION REQUIRED
HAZARDOUS GROUND GAS FROM OFF SITE SOURCE	DAMAGE FROM EXPLOSION	BUILDINGS	SEVERE		
HAZARDOUS GROUND GAS FROM ON SITE SOURCE	INHALATION, INJURY FROM EXPLOSION	SITE USERS, VISITORS, CONSTRUCTION WORKERS	SEVERE	LOW. NO POSSIBILITY OF ON SITE GENERATION FROM MADE GROUND. NO POSSIBILITY OF GAS MIGRATION FROM ORGANIC SOILS POST CONSTRUCTION.	NO FURTHER ACTION REQUIRED
HAZARDOUS GROUND GAS FROM ON SITE SOURCE	DAMAGE FROM EXPLOSION	BUILDINGS	SEVERE		
RADON GAS	LONG TERM HAZARD FROM INHALATION	SITE USERS	SEVERE	LOW . NO RISK FROM RADON QUANTIFIED BY MONITORING	NO RADON PROTECTION MEASURES REQUIRED

TABLE 9						
QUANTITATIVE HUMAN HEALTH RISK ASSESSMENT AND ENVIRONMENTAL RISK ASSESSMENT AT MARDON PARK, BAGLAN.						
CONTAMINANT SOURCE	PATHWAYS	RECEPTORS	POTENTIAL SEVERITY	PROBABILITY OF RISK	LEVEL OF RISK	FURTHER ACTION REQUIRED
ON SITE: POTENTIAL CONTAMINATION IN SOILS/MADE GROUND. POSSIBLY ELEVATED LEVELS OF METALS HYDROCARBONS AND PAH	INGESTION, DERMAL CONTACT, INHALATION	FUTURE END USERS, VISITORS	MEDIUM	LOW	LOW	CONTAMINANT LEVELS AT SHALLOW DEPTH WERE WELL BELOW ACCEPTABLE LEVELS FOR A COMMERCIAL PROPERTY. THERE IS NO RISK TO END USERS. THE PROPOSED DEVELOPMENT WILL CUT ALL PATHWAYS AND REMOVE ALL RISKS. NO FURTHER ACTION REQUIRED.
	CONTACT WITH CONTAMINATED GROUNDWATER	FUTURE END USERS, VISITORS AND CONSTRUCTION WORKERS	MEDIUM			
	PERMEATION OF WATER PIPES	FUTURE END USERS AND SITE VISITORS	MEDIUM			
	INGESTION OF HOME GROWN PRODUCE	FUTURE END USERS	MEDIUM			
ON SITE: ASBESTOS AT OR NEAR GROUND SURFACE IN SOILS/MADE GROUND	INHALATION OF FIBRES IN AIRBORNE DUST	FUTURE END USERS AND SITE VISITORS	HIGH	LOW	LOW	NO ASBESTOS WAS FOUND DURING THE LABORATORY TESTING. NO FURTHER ACTION REQUIRED.
		CONSTRUCTION WORKERS	HIGH	LOW	LOW	
ON SITE: POTENTIAL CONTAMINATION IN SOILS/MADE GROUND. POSSIBLY ELEVATED LEVELS OF CONTAMINANTS	RUN OFF	SURFACE DRAINAGE	MEDIUM	LOW	LOW	TRACE LEVELS OF PAH WERE DETECTED IN THE GROUNDWATER ON THE ADJACENT SITE. ARSENIC LEVELS WERE ALSO SLIGHTLY ELEVATED, BUT BELOW THE EQS FOR FRESHWATER. SIMILAR VALUES ARE ANTICIPATED BELOW THE SITE. THERE IS NO PATHWAY TO ABOVE GROUND RECEPTORS. NO FURTHER ACTION REQUIRED.
	MIGRATION THROUGH SOIL VIA LEACHING	SHALLOW GROUNDWATER				
	ONWARD MIGRATION OF GROUNDWATER	BEDROCK AQUIFER				

APPENDIX A
TRIAL PIT LOGS TO BS5930:2015
WITH PHOTOGRAPHS
MARDON PARK
BAGLAN

Project: MARDON PARK	Project No: MP15
Described By: R.DAVIES	Trial Pit No. TP9
Date: 16/03/2021	Sheet: 1 of 1
Method / Plant TRACKED EXCAVATOR	Groundwater Observations: STANDING AT 0.85
Stability GOOD	Strike of Face A:
Shoring NONE	Loggers Signature

FACE SKETCHES - INCLUDING ANY SIGNIFICANT FINDINGS WITHIN TRIAL PIT

Samples and Tests		Strata	
Depth (m)	Type (B,D,ES)	Depth (m)	Strata Description
		G.L.	Dense dark grey gravel of metallic slag (MADE GROUND)
0.4	ES1	0.45	Medium dense, brown gravelly SAND. Gravel is angular, fine to coarse of slag.
		1.0	

Notes: ES-Environmental Soil
 EW - Environmental Water
 B - Bulk Disturbed
 D - Small Disturbed

TRIAL PIT NUMBER
TP9



FIGURE 4 TP 9

Project: MARDON PARK	Project No: MP15
Described By: R.DAVIES	Trial Pit No. TP10
Date: 16/03/2021	Sheet: 1 of 1
Method / Plant TRACKED EXCAVATOR	Groundwater Observations: standing at 1.05m
Stability GOOD	Strike of Face A:
Shoring NONE	Loggers Signature

FACE SKETCHES - INCLUDING ANY SIGNIFICANT FINDINGS WITHIN TRIAL PIT

Samples and Tests		Strata	
Depth (m)	Type (B,D,ES)	Depth (m)	Strata Description
		G.L.	Dense dark grey metallic slag (MADE GROUND)
		0.4	Medium dense, brown gravelly SAND. Gravel is angular, fine to coarse of slag.
0.9	ES1		
		1.3	

Notes: ES-Environmental Soil
 EW - Environmental Water
 B - Bulk Disturbed
 D - Small Disturbed

TRIAL PIT NUMBER
TP10



FIGURE 5 TP 10

APPENDIX B
ENVIRONMENTAL LABORATORIES
REPORT 21-32708-1 (ALL SAMPLES)
AND
21-32708-1b (SITE SPECIFIC)
MARDON PARK
BAGLAN



2683



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info@elab-uk.co.uk

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 21-32708

Issue: 1

Date of Issue: 25/03/2021

Contact: Lisa Williams

Customer Details: GBV Properties Ltd
19 Mardon Park
Baglan Energy Park
Port Talbot
SA12 7AX

Quotation No: Q21-02092

Order No: Not Supplied

Customer Reference: MP15

Date Received: 18/03/2021

Date Approved: 25/03/2021

Details: Mardon Park

Approved by: 

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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Sample Summary

Report No.: 21-32708, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
230845	TP1 ES1 0.30	16/03/2021	18/03/2021	Sand	
230846	TP2 ES1 0.40	16/03/2021	18/03/2021	Sand	
230847	TP3 ES1 1.20	16/03/2021	18/03/2021	Sand	
230848	TP4 ES1 0.30	16/03/2021	18/03/2021	Sand	
230849	TP4 WS1 1.00	16/03/2021	18/03/2021		c
230850	TP5 ES1 0.40	16/03/2021	18/03/2021	Sand	
230851	TP6 ES1 1.20	16/03/2021	18/03/2021	Sand	
230852	TP6 WS2 1.00	16/03/2021	18/03/2021		c
230853	TP7 ES1 0.70	16/03/2021	18/03/2021	Sand	
230854	TP8 ES1 1.20	16/03/2021	18/03/2021	Sand	
230855	TP9 ES1 0.40	16/03/2021	18/03/2021	Sand	
230856	TP10 ES1 0.90	16/03/2021	18/03/2021	Sand	
230857	TP11 ES1 0.60	16/03/2021	18/03/2021	Sandy silty loam	
230858	TP12 ES1 0.55	16/03/2021	18/03/2021	Sandy silty loam	

Results Summary

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Report No.: 21-32708, issue number 1

ELAB Reference	230845	230846	230847	230848	230850
Customer Reference	ES1	ES1	ES1	ES1	ES1
Sample ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP1	TP2	TP3	TP4	TP5
Sample Depth (m)	0.30	0.40	1.20	0.30	0.40
Sampling Date	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021

Determinand	Codes	Units	LOD					
Soil sample preparation parameters								
Moisture Content	N	%	0.1	8.5	9.7	23.5	10.1	8.5
Material removed	N	%	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	None	None	None	None	None
Metals								
Arsenic	M	mg/kg	1	14.9	16.2	26.9	15.8	16.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	0.7	< 0.5	0.6
Chromium	M	mg/kg	5	62.9	24.6	30.8	33.5	60.9
Copper	M	mg/kg	5	16.3	7.3	38.3	10.6	23.6
Lead	M	mg/kg	5	31.3	17.1	49.3	20.1	67.2
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	9.5	8.0	15.0	9.3	13.5
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	5	88.2	54.7	128	66.5	240
Inorganics								
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Miscellaneous								
pH	M	pH units	0.1	9.2	9.4	8.9	9.2	8.8
Soil Organic Matter	U	%	0.1	0.1	0.2	0.1	0.1	0.2
Total Organic Carbon	N	%	0.01	0.14	0.08	0.27	0.09	0.58
Phenols								
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5	< 5
Polyaromatic hydrocarbons								
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	0.5	< 0.4	< 0.4	< 0.4	< 0.4



Results Summary

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Report No.: 21-32708, issue number 1

ELAB Reference	230845	230846	230847	230848	230850
Customer Reference	ES1	ES1	ES1	ES1	ES1
Sample ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP1	TP2	TP3	TP4	TP5
Sample Depth (m)	0.30	0.40	1.20	0.30	0.40
Sampling Date	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021

Determinand	Codes	Units	LOD					
TPH CWG								
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	2.2
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	< 1.0	1.4	< 1.0	< 1.0	1.6
>C35-C40 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	1.5	< 1.0	1.1	2.3
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	1.7	< 1.0	1.5	4.5

Results Summary

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Report No.: 21-32708, issue number 1

ELAB Reference	230851	230853	230854	230855	230856
Customer Reference	ES1	ES1	ES1	ES1	ES1
Sample ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP6	TP7	TP8	TP9	TP10
Sample Depth (m)	1.20	0.70	1.20	0.40	0.90
Sampling Date	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021

Determinand	Codes	Units	LOD					
Soil sample preparation parameters								
Moisture Content	N	%	0.1	16.6	12.2	12.4	12.6	12.2
Material removed	N	%	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	None	None	None	None	None
Metals								
Arsenic	M	mg/kg	1	16.0	16.7	19.9	15.2	12.7
Cadmium	M	mg/kg	0.5	< 0.5	0.6	0.9	< 0.5	< 0.5
Chromium	M	mg/kg	5	16.3	58.0	49.8	32.7	18.3
Copper	M	mg/kg	5	19.4	20.5	72.1	15.5	13.6
Lead	M	mg/kg	5	73.2	52.1	154	24.9	24.6
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	15.9	13.3	12.6	9.4	8.4
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	5	257	201	575	87.5	78.4
Inorganics								
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Miscellaneous								
pH	M	pH units	0.1	8.9	9.4	8.9	9.0	8.9
Soil Organic Matter	U	%	0.1	0.1	0.1	0.6	0.3	0.2
Total Organic Carbon	N	%	0.01	0.22	0.10	0.60	0.10	0.17
Phenols								
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5	< 5
Polyaromatic hydrocarbons								
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	1.4	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	< 0.1	1.8	0.1	0.2	< 0.1
Pyrene	M	mg/kg	0.1	< 0.1	1.5	0.1	0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	1.0	0.2	0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	1.3	0.2	0.1	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1	< 0.1	0.9	0.2	0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	1.1	0.2	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1	< 0.1	0.9	0.2	0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	< 0.1	0.7	0.2	0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	0.6	0.2	0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	< 0.4	11.9	1.6	1.3	< 0.4



Results Summary

2683

Report No.: 21-32708, issue number 1

ELAB Reference	230851	230853	230854	230855	230856
Customer Reference	ES1	ES1	ES1	ES1	ES1
Sample ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP6	TP7	TP8	TP9	TP10
Sample Depth (m)	1.20	0.70	1.20	0.40	0.90
Sampling Date	16/03/2021	16/03/2021	16/03/2021	16/03/2021	16/03/2021

Determinand	Codes	Units	LOD					
TPH CWG								
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	< 1.0	1.4	1.7	1.5	< 1.0
>C35-C40 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	1.7	2.1	1.7	< 1.0
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	2.5	2.5	2.2	1.1



Results Summary

2683

Report No.: 21-32708, issue number 1

ELAB Reference	230857	230858
Customer Reference	ES1	ES1
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	TP11	TP12
Sample Depth (m)	0.60	0.55
Sampling Date	16/03/2021	16/03/2021

Determinand	Codes	Units	LOD		
Soil sample preparation parameters					
Moisture Content	N	%	0.1	10.5	11.2
Material removed	N	%	0.1	69.0	36.2
Description of Inert material removed	N		0	Stones	Stones
Metals					
Arsenic	M	mg/kg	1	18.9	16.8
Cadmium	M	mg/kg	0.5	0.6	0.8
Chromium	M	mg/kg	5	500	504
Copper	M	mg/kg	5	43.8	56.5
Lead	M	mg/kg	5	106	144
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	47.9	23.7
Selenium	M	mg/kg	1	< 1.0	1.3
Zinc	M	mg/kg	5	289	362
Inorganics					
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0
Miscellaneous					
pH	M	pH units	0.1	10.0	10.4
Soil Organic Matter	U	%	0.1	0.8	1.4
Total Organic Carbon	N	%	0.01	1.1	1.2
Phenols					
Phenol	M	mg/kg	1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	0.1	0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	0.5	0.7
Pyrene	M	mg/kg	0.1	0.6	0.8
Benzo(a)anthracene	M	mg/kg	0.1	0.7	0.8
Chrysene	M	mg/kg	0.1	1.0	1.3
Benzo(b)fluoranthene	M	mg/kg	0.1	1.0	1.3
Benzo(k)fluoranthene	M	mg/kg	0.1	1.1	1.4
Benzo(a)pyrene	M	mg/kg	0.1	1.0	1.4
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	1.0	1.5
Dibenzo(a,h)anthracene	M	mg/kg	0.1	0.3	0.4
Benzo[g,h,i]perylene	M	mg/kg	0.1	0.9	1.2
Total PAH(16)	M	mg/kg	0.4	8.5	10.8



Results Summary

2683

Report No.: 21-32708, issue number 1

ELAB Reference	230857	230858
Customer Reference	ES1	ES1
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	TP11	TP12
Sample Depth (m)	0.60	0.55
Sampling Date	16/03/2021	16/03/2021

Determinand	Codes	Units	LOD		
TPH CWG					
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	4.2	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	3.8	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	8.3	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	1.2	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	15.1	5.3
>C35-C40 Aromatic	M	mg/kg	1	7.2	1.1
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	23.5	6.8
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	31.8	7.1



Results Summary

2683

Report No.: 21-32708, issue number 1

ELAB Reference	230849	230852
Customer Reference	WS1	WS2
Sample ID		
Sample Type	WATER	WATER
Sample Location	TP4	TP6
Sample Depth (m)	1.00	1.00
Sampling Date	16/03/2021	16/03/2021

Determinand	Codes	Units	LOD		
Dissolved Metals					
Arsenic	U	ug/l	5	29	30
Cadmium	U	ug/l	1	< 1	< 1
Chromium	U	ug/l	5	5	5
Copper	U	ug/l	5	8	8
Mercury	U	ug/l	0.1	< 0.1	< 0.1
Nickel	U	ug/l	5	< 5	< 5
Lead	U	ug/l	1	< 1	< 1
Selenium	U	ug/l	5	< 5	< 5
Zinc	U	ug/l	5	< 5	< 5
Inorganics					
Total Cyanide	U	ug/l	5	c < 5	c < 5
Miscellaneous					
pH	U	pH units	0.1	9.0	9.0
Total Organic Carbon	N	mg/l	0.9	6	6
Phenols					
Phenol	N	ug/l	1	< 1	< 1
M,P-Cresol	N	ug/l	1	< 1	< 1
O-Cresol	N	ug/l	1	< 1	< 1
3,4-Dimethylphenol	N	ug/l	1	< 1	< 1
2,3-Dimethylphenol	N	ug/l	1	< 1	< 1
2,3,5-trimethylphenol	N	ug/l	1	< 1	< 1
Total Monohydric Phenols	N	ug/l	1	< 1	< 1
Polyaromatic hydrocarbons					
Naphthalene GCMS	N	ug/l	0.01	0.12	0.10
Acenaphthylene GCMS	N	ug/l	0.01	0.03	0.02
Acenaphthene GCMS	N	ug/l	0.01	0.02	0.02
Fluorene GCMS	N	ug/l	0.01	0.04	0.03
Phenanthrene GCMS	N	ug/l	0.01	0.27	0.21
Anthracene GCMS	N	ug/l	0.01	0.05	0.04
Fluoranthene GCMS	N	ug/l	0.01	0.37	0.28
Pyrene GCMS	N	ug/l	0.01	0.34	0.25
Benzo (a) anthracene GCMS	N	ug/l	0.01	0.28	0.22
Chrysene GCMS	N	ug/l	0.01	0.35	0.27
Benzo (b) fluoranthene GCMS	N	ug/l	0.01	0.38	0.31
Benzo (k) fluoranthene GCMS	N	ug/l	0.01	0.39	0.29
Benzo (a) pyrene GCMS	N	ug/l	0.01	0.42	0.33
Indeno (1,2,3-cd) pyrene GCMS	N	ug/l	0.01	0.25	0.20
Dibenzo(a,h)anthracene GCMS	N	ug/l	0.01	0.12	0.09
Benzo(ghi)perylene GCMS	N	ug/l	0.01	0.29	0.24
Total PAH(16) GCMS	N	ug/l	0.01	3.74	2.89



Results Summary

2683

Report No.: 21-32708, issue number 1

ELAB Reference	230849	230852
Customer Reference	WS1	WS2
Sample ID		
Sample Type	WATER	WATER
Sample Location	TP4	TP6
Sample Depth (m)	1.00	1.00
Sampling Date	16/03/2021	16/03/2021

Determinand	Codes	Units	LOD		
TPH CWG					
>C5-C6 Aliphatic	N	ug/l	1	< 1.0	< 1.0
>C6-C8 Aliphatic	N	ug/l	1	< 1.0	< 1.0
>C8-C10 Aliphatic	N	ug/l	5	< 5.0	< 5.0
>C10-C12 Aliphatic	N	ug/l	5	< 5.0	< 5.0
>C12-C16 Aliphatic	N	ug/l	5	< 5.0	< 5.0
>C16-C21 Aliphatic	N	ug/l	5	5.3	< 5.0
>C21-C35 Aliphatic	N	ug/l	5	42.8	< 5.0
>C35-C40 Aliphatic	N	ug/l	5	< 5.0	< 5.0
Total (>C5-C40) Aliphatic	N	ug/l	5	48.1	< 5.0
>C5-C7 Aromatic	N	ug/l	1	< 1.0	< 1.0
>C7-C8 Aromatic	N	ug/l	1	< 1.0	< 1.0
>C8-C10 Aromatic	N	ug/l	5	< 5.0	< 5.0
>C10-C12 Aromatic	N	ug/l	5	< 5.0	< 5.0
>C12-C16 Aromatic	N	ug/l	5	< 5.0	< 5.0
>C16-C21 Aromatic	N	ug/l	5	< 5.0	< 5.0
>C21-C35 Aromatic	N	ug/l	5	30.2	10.5
>C35-C40 Aromatic	N	ug/l	5	< 5.0	< 5.0
Total (>C5-C40) Aromatic	N	ug/l	5	30.2	10.5
Total (>C5-C40) Ali/Aro	N	ug/l	5	78.3	10.5



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Results Summary

Report No.: 21-32708, issue number 1

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
230845	0.30	TP1 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
230846	0.40	TP2 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
230847	1.20	TP3 ES1	Brown sandy soil	No asbestos detected	n/t	n/t	n/t	n/t
230848	0.30	TP4 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
230850	0.40	TP5 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
230851	1.20	TP6 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
230853	0.70	TP7 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
230854	1.20	TP8 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
230855	0.40	TP9 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
230856	0.90	TP10 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
230857	0.60	TP11 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
230858	0.55	TP12 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 21-32708, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
pH	M	Air dried sample	23/03/2021	113	Electromeric
Phenols in solids	M	As submitted sample	19/03/2021	121	HPLC
PAH (GC-FID)	M	As submitted sample	19/03/2021	133	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	22/03/2021	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	22/03/2021	181	GC-MS
Total cyanide	M	As submitted sample	19/03/2021	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	22/03/2021	210	IR
TPH CWG soil by gc-gc	M	As submitted sample	18/03/2021	271	
Asbestos identification	U	Air dried sample	22/03/2021	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	19/03/2021	300	ICPMS
Soil organic matter	U	Air dried sample	25/03/2021	BS1377:P3	Titrimetry
Water					
Aliphatic/Aromatic hydrocarbons in water	N		23/03/2021		GC-FID
Aromatic hydrocarbons in water	N		23/03/2021		GC-FID
Phenols in waters	N		19/03/2021		HPLC
Dissolved organic carbon	N		22/03/2021	102	IR
pH of waters	U		22/03/2021	113	Electromeric
PAHs and/or PCBs in waters	N		23/03/2021	135	GC-MS
Low range Aliphatic hydrocarbons water	N		22/03/2021	200	GC-MS
Low range Aromatic hydrocarbons water	N		22/03/2021	200	GC-MS
Cyanide in waters	U		23/03/2021	205	Colorimetry
Aliphatic hydrocarbons in water	N		23/03/2021	215	GC-FID
Aromatic hydrocarbons in water	N		23/03/2021	215	GC-FID
Dissolved metals by ICP in waters	U		19/03/2021	301	ICPMS

Tests marked N are not UKAS accredited

Report Information

Report No.: 21-32708, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

LOD LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.
Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.
ELAB are unable to provide an interpretation or opinion on the content of this report.
The results relate only to the sample received.
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request
Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage



2683



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 21-32708

Issue: 1b

Date of Issue: 25/03/2021

Contact: Lisa Williams

Customer Details: GBV Properties Ltd
19 Mardon Park
Baglan Energy Park
Port Talbot
SA12 7AX

Quotation No: Q21-02092

Order No: Not Supplied

Customer Reference: MP15

Date Received: 18/03/2021

Date Approved: 25/03/2021

Details: Mardon Park Area 2

Approved by: 

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

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Sample Summary

Report No.: 21-32708, issue number 1b

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
230855	TP9 ES1 0.40	16/03/2021	18/03/2021	Sand	
230856	TP10 ES1 0.90	16/03/2021	18/03/2021	Sand	



Results Summary

2683

Report No.: 21-32708, issue number 1b

ELAB Reference	230855	230856
Customer Reference	ES1	ES1
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	TP9	TP10
Sample Depth (m)	0.40	0.90
Sampling Date	16/03/2021	16/03/2021

Determinand	Codes	Units	LOD		
Soil sample preparation parameters					
Moisture Content	N	%	0.1	12.6	12.2
Material removed	N	%	0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	None	None
Metals					
Arsenic	M	mg/kg	1	15.2	12.7
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	32.7	18.3
Copper	M	mg/kg	5	15.5	13.6
Lead	M	mg/kg	5	24.9	24.6
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	9.4	8.4
Selenium	M	mg/kg	1	< 1.0	< 1.0
Zinc	M	mg/kg	5	87.5	78.4
Inorganics					
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0
Miscellaneous					
pH	M	pH units	0.1	9.0	8.9
Soil Organic Matter	U	%	0.1	0.3	0.2
Total Organic Carbon	N	%	0.01	0.10	0.17
Phenols					
Phenol	M	mg/kg	1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	0.2	< 0.1
Pyrene	M	mg/kg	0.1	0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	0.1	< 0.1
Chrysene	M	mg/kg	0.1	0.1	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1	0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1	0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	1.3	< 0.4



Results Summary

2683

Report No.: 21-32708, issue number 1b

ELAB Reference	230855	230856
Customer Reference	ES1	ES1
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	TP9	TP10
Sample Depth (m)	0.40	0.90
Sampling Date	16/03/2021	16/03/2021

Determinand	Codes	Units	LOD		
TPH CWG					
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	1.5	< 1.0
>C35-C40 Aromatic	M	mg/kg	1	< 1.0	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	1.7	< 1.0
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	2.2	1.1



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Results Summary

Report No.: 21-32708, issue number 1b

Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
230855	0.40	TP9 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t
230856	0.90	TP10 ES1	Brown sandy soil with stones	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 21-32708, issue number 1b

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
pH	M	Air dried sample	23/03/2021	113	Electromeric
Phenols in solids	M	As submitted sample	19/03/2021	121	HPLC
PAH (GC-FID)	M	As submitted sample	19/03/2021	133	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	22/03/2021	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	22/03/2021	181	GC-MS
Total cyanide	M	As submitted sample	19/03/2021	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	22/03/2021	210	IR
TPH CWG soil by gc-gc	M	As submitted sample	18/03/2021	271	
Asbestos identification	U	Air dried sample	22/03/2021	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	19/03/2021	300	ICPMS
Soil organic matter	U	Air dried sample	25/03/2021	BS1377:P3	Titrimetry

Tests marked N are not UKAS accredited



Report Information

Report No.: 21-32708, issue number 1b

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

LOD LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.
Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.
ELAB are unable to provide an interpretation or opinion on the content of this report.
The results relate only to the sample received.
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request
Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

APPENDIX C
B.G.S. RADON REPORT
UNIT 21
MARDON PARK
BAGLAN

Richard Davies
Rhondda Geotechnical Services
56 Meyler Street
Thomastown
Tonyrefail
Porth
CF39 8EA

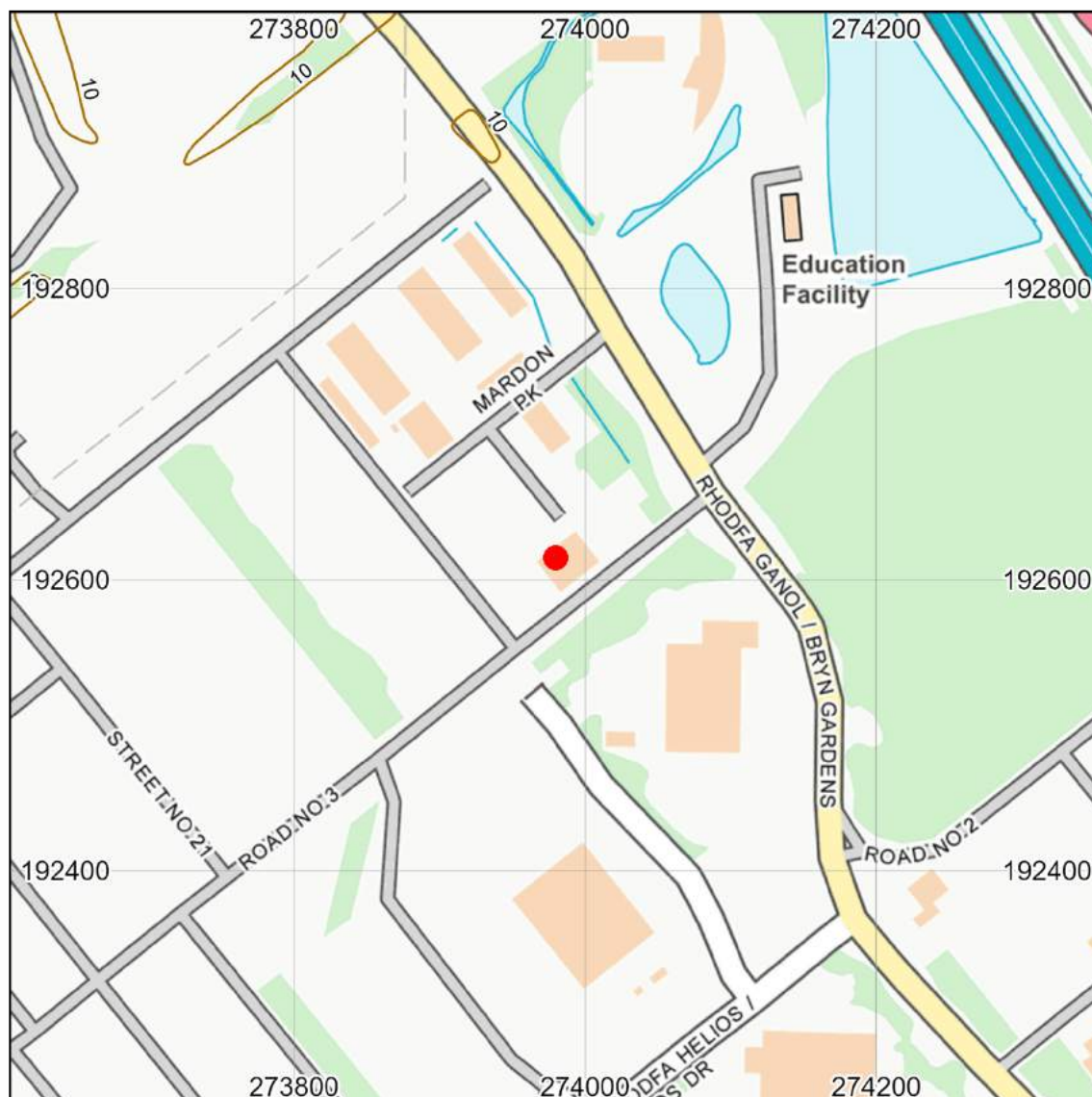
Radon Report

Advisory report on the requirement for radon protective measures in new buildings, conversions and extensions to existing buildings. The report also indicates whether a site is located within a radon Affected Area

Report Id: *BGS_337577/53028*

Client reference: MARDON PARK

Search location



Contains OS data © Crown Copyright and database right 2024. OS OpenMap Local: Scale: 1:5 000 (1cm = 50 m)

Search location indicated in red

Point centred at: 273980,192615

Radon Report: UK

When extensions are made to existing buildings in high radon areas, or new buildings are constructed in these areas, the Building Regulations for England, Wales, Scotland and Northern Ireland require that protective measures are taken against radon entering the building.

This report provides information on whether radon protective measures are required. Depending on the probability of buildings having high radon levels, the Regulations may require either:

1. No protective measures
2. Basic protective measures
3. Full protective measures

This is an advisory report on the requirement for radon protective measures in new buildings, conversions and extensions. The report also indicates whether a site is located within a radon Affected Area

Requirement for radon protective measures

The determination below follows advice in *BR211 Radon: Guidance on protective measures for new buildings (2023 edition)*, which also provides guidance on what to do if the result indicates that protective measures are required.

Is the property in an area where radon protective measures are required for new buildings or extensions to existing ones as described in publication BR211 (2023 edition) Radon: Guidance on protective measures for new buildings?

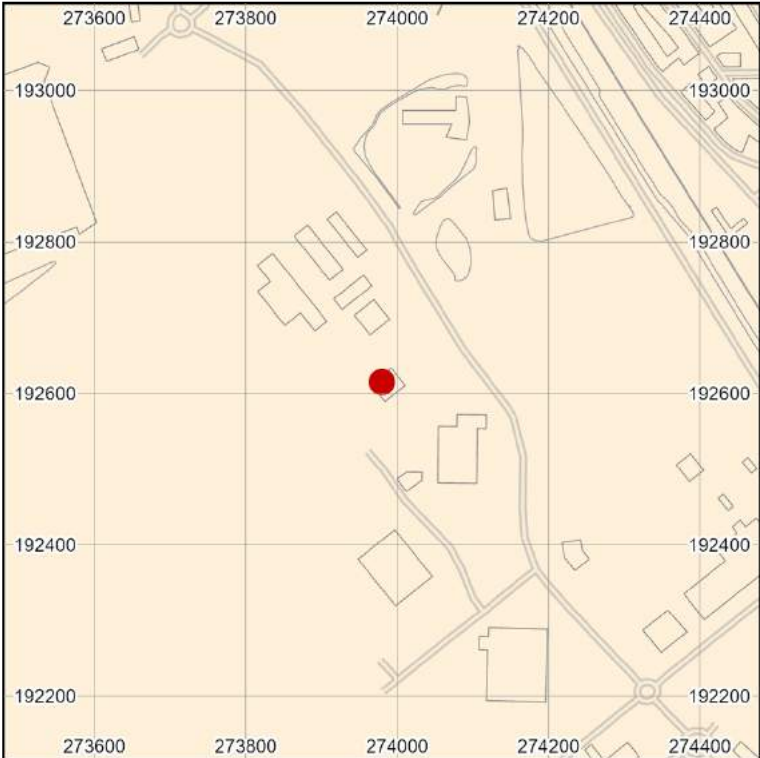
NO RADON PROTECTIVE MEASURES ARE REQUIRED FOR THE REPORT AREA.

More details of the protective measures required are available in *BR211 Radon: Guidance on protective measures for new buildings (2023 Edition)*.

Whether or not the radon level in a building is above or below the radon Action Level can only be established by having the building tested. The UKHSA provides a radon testing service which can be accessed at www.ukradon.org or by telephone (01235 822622).

If you require further information or guidance, you should contact your local authority building control officer or approved inspector.

Radon Affected Area



% Homes estimated to be at or above the action level
0-1%
1-3%
3-5%
5-10%
10-30%
30-100%

Contains OS data © Crown Copyright and database right 2024
Scale: 1:10 000 (1cm = 100 m)
Search area indicated in red

Is the property in a radon Affected Area as defined by the UK Health Security Agency (UKHSA) and if so what percentage of homes are estimated to be at or above the Action Level? **NO**

Additional Information

THE PROPERTY IS IN AN AREA WHERE LESS THAN 1% OF HOMES ARE ESTIMATED TO BE AT OR ABOVE THE ACTION LEVEL. THE PROPERTY IS NOT IN A RADON AFFECTED AREA.

The UKHSA recommends a radon 'Action Level' of 200 Becquerels per cubic metre of air (Bq m^{-3}) for the annual average of the radon gas concentration in a home. Where 1% or more of homes are estimated to be at or above the Action Level the area should be regarded as a radon Affected Area.

This report informs you whether the property is in a radon Affected Area and the percentage of homes that are estimated to be at or above the radon Action Level at this location. Being in an Affected Area does not necessarily mean there is a high radon level within the property; the only way to determine the radon level is to carry out a radon measurement.

The UKHSA advises that radon gas should be measured in all properties within radon Affected Areas and that homes with radon levels at or above the Action Level (200 Bq m⁻³) should be remediated. Householders with levels between the Target Level (100 Bq m⁻³) and Action Level should seriously consider reducing their radon level, especially if they are at greater risk, such as if they are current or ex smokers. Whether or not a home is in fact above or below the Action Level or Target Level can only be established by having the building tested. The UKHSA provides a validated radon testing service which can be accessed at www.ukradon.org.

The information in this report provides an answer to one of the standard legal enquiries on house purchase in England and Wales, known as Law Society CON29 Enquiries of the Local Authority (2016); 3.14 Radon Gas: Do records indicate that the property is in a “Radon Affected Area” as identified by the UKHSA. The data can also be used to advise house buyers and sellers in Scotland and Northern Ireland.

If you are buying a new build property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

If you are buying a currently occupied property in a radon Affected Area, you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were at or above the radon Action Level and if so, whether remedial measures were installed, radon levels were re-tested, and if the results of re-testing confirmed the effectiveness of the measures.

Further information on radon is available from the UKHSA at www.ukradon.org.

What is radon?

Radon is a naturally occurring radioactive gas, which is produced by the radioactive decay of radium which, in turn, is derived from the radioactive decay of uranium. Uranium is found in small quantities in all soils and rocks, although the amount varies from place to place. Radon released from rocks and soils is quickly diluted in the atmosphere. Concentrations in the open air are normally very low and do not present a hazard. Radon that enters enclosed spaces such as some buildings (particularly basements), caves, mines, and tunnels may reach high concentrations in some circumstances. The construction method and degree of ventilation will influence radon levels in individual buildings. A person's exposure to radon will also vary according to how particular buildings and spaces are used.

Inhalation of the radioactive decay products of radon gas increases the chance of developing lung cancer. If individuals are exposed to high concentrations for significant periods of time, there may be cause for concern. In order to limit the risk to individuals, the Government has adopted an Action Level for radon in homes of 200 becquerels per cubic metre (Bq m^{-3}). The Government advises householders that, where the radon level is at or above the Action Level, measures should be taken to reduce the concentration.

Radon in workplaces

The Ionising Radiation Regulations 2017 require employers to take action when radon is present above a defined level in the workplace. Advice may be obtained from your local Health and Safety Executive Area Office or the Environmental Health Department of your local authority. The BRE publishes a guide (BR293): **Radon in the workplace**. BRE publications may be obtained from the BRE Bookshop, Tel: 01923 664262, email: bookshop@bre.co.uk website: www.brebookshop.com

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**Report issued by
BGS Enquiry Service**

APPENDIX D
RADON MONITORING RESULTS
UNIT 21
MARDON PARK
BAGLAN

Device Name	21 Mardon
Device SN	HF13EQ000328
Radon Unit	Bq/m3
The number of data	209
Duration	26/01/2024 ~ 25/04/2024
Measurement Time	Radon Hourly Reading
16/04/2024 15:42	7
16/04/2024 16:42	18
16/04/2024 17:42	25
16/04/2024 18:42	32
16/04/2024 19:42	25
16/04/2024 20:42	29
16/04/2024 21:42	49
16/04/2024 22:42	36
16/04/2024 23:42	51
17/04/2024 00:42	38
17/04/2024 01:42	45
17/04/2024 02:42	34
17/04/2024 03:42	22
17/04/2024 04:42	23
17/04/2024 05:42	22
17/04/2024 06:42	36
17/04/2024 07:42	40
17/04/2024 08:42	40
17/04/2024 09:42	31
17/04/2024 10:42	27
17/04/2024 11:42	36
17/04/2024 12:42	38
17/04/2024 13:42	32
17/04/2024 14:42	38
17/04/2024 15:42	32
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17/04/2024 17:42	34
17/04/2024 18:42	38
17/04/2024 19:42	34
17/04/2024 20:42	18
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18/04/2024 00:42	71
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18/04/2024 03:42	45
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18/04/2024 08:42	45
18/04/2024 09:42	34
18/04/2024 10:42	56
18/04/2024 11:42	51
18/04/2024 12:42	23
18/04/2024 13:42	22

18/04/2024 14:42	34
18/04/2024 15:42	27
18/04/2024 16:42	36
18/04/2024 17:42	20
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25/04/2024 05:42	31
25/04/2024 06:42	45
25/04/2024 07:42	42
AVERAGE	39.5