



# Validation Report

Premier Inn, Foss Island, York Clegg Construction Limited. SHF.269.002.GE.R.001.B

'Experience and expertise working in union'







ASSOCIATION OF Geotechnical & Geoenvironmental Specialists



## **Contact Details:**

Enzygo Ltd.	tel: 0114 413 6444
Ducie House,	www: enzygo.com
Ducie Street,	
Manchester,	
M1 2JW	

# Validation Report

Project:	Premier Inn, Foss Island, York
For:	Clegg Construction Limited.
Ref:	SHF.269.002.GE.R.001
Status:	Rev B
Date:	February 2024
Author:	Reuben Fisher - BSc (Hons.), MSc, FGS, Geo-Environmental Consultant Engineer
Approver:	Nigel Ramsumair - MGeo (Hons.), FGS, Senior Geo-Environmental Engineer
Disclaimer:	

This report has been produced by Enzygo Limited within the terms of the contract with the client and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

Enzygo Limited Registered in England No. 06525159 Registered Office Gresham House, 5-7 St. Pauls Street, Leeds, England, LS1 2JG



## Contents

1.0	INTRO	DDUCTION
	1.1	Background3
	1.2	Proposed Development
	1.3	Existing Information
	1.4	Planning Consent
	1.5	Objectives
2.0	REME	EDIATION METHOD STATEMENT
	2.1	General4
	2.2	Asbestos Management
	2.3	Validation of Cover Soils4
	2.4	Unforeseen Contaminations5
	2.5	Utilities5
3.0	VALIC	DATION
	3.1	General
	3.2	Asbestos Management
	3.3	Cover Soils
	3.4	Unforeseen Contamination7
	3.5	Utilities7
4.0	CONC	CLUSION
	4.1	General8



## Drawings and Appendices

Appendix 1 - Drawings	9
Appendix 2 - Chemical Testing Results	10
Appendix 3 – Exploratory Hole Logs	11
Appendix 4 - Site Photos	12
Appendix 5 - Additional Information	13
Appendix 6 - Human Health Assessment Reference Values	14



## 1.0 INTRODUCTION

### 1.1 Background

- 1.1.1 Enzygo Geo-Environmental Limited (Enzygo) has been commissioned by Clegg Construction Limited (the Client) to prepare a Validation Report for a proposed new Premier Inn Hotel at a site located off Foss Island Road, Layerthorpe, York, YO31 7US.
- 1.2 Proposed Development
- 1.2.1 The proposed development is for a new multi-storey hotel with associated parking [road] and landscaping. The proposed development is illustrated in the Enzygo drawing [Ref; SHF.269.002.GE.D.001] included in Appendix 1.
- 1.3 Existing Information
- 1.3.1 The existing information presented as part of this assessment is given below:

CBRE Limited, Phase I & II Environmental Assessment [Report Ref: 50BCD0297874], dated February 2020. Enzygo Geoenvironmental Ltd, Geo-Environmental Report [Report Ref:

MAN.1035.006.GE.R.001], dated November 2021.

Enzygo Geoenvironmental Ltd, Remediation Method Statement [Report Ref:

MAN.1035.006.GE.R.001.A], dated April 2020.

I.H. Equipment Ltd, Remediation Letter, dated June 2023.

- 1.4 Planning Consent
- 1.4.1 Outline Planning Consent [Ref: 20/00940/FULM], dated 11 June 2020, as granted by City of York Council includes the following conditions/directives as set out in 'Condition 10', which state the following.

'Prior to first occupation or use, the approved remediation scheme must be carried out in accordance with its terms and a verification report that demonstrates the effectiveness of the remediation carried out shall be submitted to and approved in writing by the Local Planning Authority.'

- 1.5 Objectives
- 1.5.1 The purpose of this report is to provide a record of the remedial works undertaken, as follows.

Any areas of unknown contamination encountered; and the remedial measures undertaken.

Waste disposal notes where appropriate.

Confirmation that the works observed complied with the remedial methodology; and Details of imported clean cover soils with the results of any chemical analysis.



## 2.0 REMEDIATION METHOD STATEMENT

- 2.1 General
- 2.1.1 An Enzygo Geoenvironmental Ltd, Remediation Method Statement [Report Ref: MAN.1035.006.GE.R.001.A], dated April 2020 was produced concluding the following:

Based upon the quantitative risk assessment undertaken by Enzygo, there are no viable source pathway-receptors identified, and; therefore, there can be no Risk[s]. Based upon this, significant remediation is not required nor is it planned.

- 2.1.2 Although significant remediation is not required, the following guidance was provided within the following headings.
- 2.2 Asbestos Management
- 2.2.1 Asbestos contaminated material has not been identified during the Ground Investigation. Nevertheless, asbestos management measures should be documented in an Asbestos Management Plan which will be incorporated into the Contractors Construction Stage Health and Safety Plan as required under the Construction Design and Management (CDM) regulations to mitigate risk to construction works. The asbestos management plan should document measures to mitigate the risk of potential asbestos materials to construction workers. These measures should be provided by an appropriately qualified asbestos contractor and may include the following however may include additional measures deemed necessary by the asbestos contractor:

Preventing access to the construction site by members of the public; Use of good hygiene measures, including washing down of plant; and Use of appropriate PPE, including face masks.

- 2.3 Validation of Cover Soils
- 2.3.1 Given the proposed plan and the landscaping requirements across the site it is recommended that the thickness of the imported materials is verified. The works will comprise the following:

Excavation of pits by hand, locations of which are yet to be determined. The number of pits and samples will be based on current NHBC guidance, which was developed in conjunction with the Environment Agency;

Measure the thickness of the cover soils; and

Photograph each pit with a measuring tape of staff used to show the thickness of the cover soils.

- 2.3.2 Soil samples will be collected from each pit from within the cover soils in appropriate containers provided by the analytical laboratory. One sample of cover soil per pit will be collected. Indicative locations were shown on the 'Exploratory Hole Location Plan Ref: SHF.269.002.GE.D.001, included within Appendix 1.
- 2.3.3 Samples will be stored in cool boxes prior to dispatch to the laboratory for analysis. All samples will be collected using appropriate sampling equipment that is cleaned at each sampling location and will be analysed at a laboratory which is UKAS and MCERTS accredited. Samples will be tested for the CLEA metal suite, pH, sulphate, cyanide, phenols, speciated Polycyclic



Aromatic Hydrocarbons (PAH), organic carbon, Speciated Total Petroleum Hydrocarbon (TPH) and asbestos screen.

- 2.3.4 Should soils fail the General Assessment Criteria (GAC) values these will be excavated and discarded off-site. Additional testing will be undertaken around the excavation to confirm that the adjacent soils are clean. Fresh soils will be imported and used to re-construct the cover soils.
- 2.4 Unforeseen Contaminations
- 2.4.1 If unforeseen contamination is encountered during construction works, such as localised spillage outside the areas investigated an Environmental Consultant will be available on a 'call out' basis to undertake an assessment of risk. If 'unforeseen contamination' is encountered the discovery strategy will be to remove the source as it is likely to be very limited in extent, and the Local Planning Authority advised.
- 2.5 Utilities
- 2.5.1 Results of the chemical analysis will be provided to the water authority and any requirements in relation to protecting potable waste supply pipes will be incorporated into the scheme.



## 3.0 VALIDATION

- 3.1 General
- 3.1.1 Although the site did not require any significant remedial works, the following headings discussed below confirm that site has been developed in accordance with the Enzygo RMS.

### 3.2 Asbestos Management

3.2.1 As far as Enzygo are aware, Asbestos measures were in accordance with the Asbestos Management Plan. As advised, this should be incorporated into the contractor's Construction Stage Health and Safety Plan, as required under the Construction Design and Management (CDM) Regulations, to mitigate risk to construction works and end users of the site.

### 3.3 Cover Soils

- 3.3.1 It is understood that topsoil has been imported to site from the client's chosen supplier. Conveyance notes detailing the movement of 'topsoil' should be kept on file for reference.
- 3.3.2 Enzygo attended site on 20<sup>th</sup> December 2023 to validate the soil thickness of the cover soils by excavating hand dug pits within the soft landscaped communal areas. One of the three areas [western area] was completed on the day of attendance proving a topsoil thickness ranging between the ranges of 400mm [S2] and 500mm [S1]. However, a sample was taken from a small stockpile of topsoil within the eastern communal area [S3] prior to completion.
- 3.3.3 Enzygo attended site on 25<sup>th</sup> January 2024, to collect a soil sample from a stockpile of topsoil within the within the area of S5. This sample was collected for chemical testing with placement of soils within the areas of S3 S5 to be undertaken at a later date.
- 3.3.4 Enzygo attended site on 31<sup>st</sup> January 2024 to validate the soil thickness of the cover soils by excavating hand dug pits [S3 to S5] within the two remaining soft landscaped communal areas [northern and eastern sections]. These pits proved a topsoil a thickness of 630mm [S5] for the northern section, and thicknesses between the range of 570mm [S4] to 590mm [S3] in the eastern section. An exploratory hole location plan is included within Appendix 1, the logs of the hand excavations are located within Appendix 3, and the photographs of the hand excavations included within Appendix 4.
- 3.3.5 Representative topsoil samples were collected for chemical testing from the communal areas as discussed above [S1 to S3 & S5]. Soil samples were collected in appropriate containers provided by the analytical laboratory. Samples were stored in cool boxes prior to dispatch to the laboratory for analysis. All samples were collected using appropriate sampling equipment that was cleaned at each sampling location.
- 3.3.6 Samples for chemical analysis were sent to the laboratories of I2 Analytical Ltd who are MCERTS accredited. Samples were tested for the CLEA metal suite, pH, sulphate, cyanide, phenols, speciated Polycyclic Aromatic Hydrocarbons (PAH), organic carbon, Speciated Total Petroleum Hydrocarbon (TPH CWG) and asbestos screen. The results of the chemical testing [for S1 to S3 and S5] are included with Appendix 2.
- 3.3.7 An assessment of the risks to human health has been undertaken by comparing the soil quality data with reference values obtained from the Contaminated Land Exposure Assessment (CLEA), Soil Guideline Values (SGV) and General Acceptance Criteria (GAC) published by LQM/CIEH. The



LQM/CIEH S4ULs values are used, and summary tables of the reference values are included in Appendix 6 - Human Health Assessment Reference Values

- 3.3.8 The development is for a proposed Premier Inn, therefore the GAC values for a 'commercial' end use are considered applicable.
- 3.3.9 No soils samples tested [S1-S3 and S5] have reported any exceedances when compared to GAC values for a 'commercial' end use and no positive IDs for asbestos were reported.
- 3.3.10 Based upon the observations made at the study site by Enzygo to date, the results of the attached chemical analysis and a review of information supplied by the Client the following has been established:

Supplied photographic information and site reconnaissance by Enzygo indicates that imported topsoil was placed to a depth of 300mm within communal open space areas; and Laboratory analysis of topsoil imported to the site did not record any elevated concentrations of any of the potential contaminants tested when compared to GAC values for a commercial end use.

- 3.3.11 It is therefore assessed that the laboratory testing appended to this report provides sufficient evidence to allow for the Local Planning Authority to discharge Condition 10 of the Planning Consent Ref: 20/00940/FULM, dated 11 June 2020.
- 3.4 Unforeseen Contamination
- 3.4.1 Enzygo understand that the appointed contractor followed the discovery strategy as per the Enzygo Geoenvironmental Ltd, Remediation Method Statement [Report Ref: SHF.1735.002.GE.R.002], dated February 2020. The I.H. Equipment Ltd Remediation Letter dated June 2023, included within Appendix 5, confirms that no unforeseen contamination was encountered during the works. Therefore, no change to the remedial methodology was considered necessary.
- 3.5 Utilities
- 3.5.1 Enzygo understand Clegg Construction Ltd have provided chemical analysis results to the water authority and any requirements in relation to protecting potable waste supply pipes will be incorporated into the scheme.



## 4.0 CONCLUSION

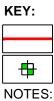
- 4.1 General
- 4.1.1 It is considered that the proposed new Premier Inn hotel has been generally developed in accordance with the Enzygo Geoenvironmental Ltd, Remediation Method Statement [Report Ref: MAN.1035.006.GE.R.001.A], dated April 2020 to date.



Appendix 1 - Drawings







Site Boundary Hand Pits (S1-S5)

DO NOT SCALE FROM THIS DRAWING

ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND DOCUMENTS ASSOCIATED WITH THIS PROJECT.

ALL EXISTING AND PROPOSED DIMENSIONS, LEVELS AND LOCATIONS TO BE CHECKED AND VERIFIED BY THE MAIN CONTRACTOR ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS AND ANY ANOMALIES REPORTED TO THE ENGINEER.

P02	05 02 24	S5 & S3 Location	ΙB	RF	RF	
P02 05.02.24		Amended	LD		ΝΓ	
D04	25.01.24	Issued for comment /	1 D	NR	NR	
PUI	25.01.24	approval	LB	INK	INK	
Rev	Date	Description	DRA	снк	APP	

Project

Premier Inn, Foss Island, York

Client

Clegg Construction Limited

Drawing Title

Exploratory Hole Location Plan

Scale 1:500 @ A3

Date Status 25.01.24

DWG No.

Preliminary

SHF269002-ENZ-XX-XX-DR-G-0001

 $\mathbf{OOOC}$ 

Bristol Cardiff 01454 269 237 02920 023 700 Manchester Cambridge 0161 413 6444 01799 542 473 Sheffield Belfast 0114 321 5151 07377673948

50m

@enzygo enzygo.com hello@enzygo.com

Revision

ZVQ

P02



Appendix 2 - Chemical Testing Results



Reuben Fisher Enzygo Geoenvironmental Ltd□ Ducie House, Ducie Street, M1 2JW



i2 Analytical Ltd. 7 Woodshots Meadow, Croxley Green Business Park, Watford, Herts, WD18 8YS t: 01923 225404 f: 01923 237404 e: reception@i2analytical.com

e: Reuben.Fisher@enzygo.com

# **Analytical Report Number : 23-76460**

	Replaces Analytical Report Number: 23-76460, issue no. 1 Client sampling date amended. Sample Date Added To All Samples As Requested By Client.				
Project / Site name:	Foss Island York	Samples received on:	20/12/2023		
Your job number:	SHF 269 002	Samples instructed on/ Analysis started on:	21/12/2023		
Your order number:	SHF 269 002	Analysis completed by:	17/01/2024		
Report Issue Number:	2	Report issued on:	17/01/2024		
Samples Analysed:	3 soil samples				



Joanna Szwagrzak Reporting Specialist For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils - 4 weeks from reporting
	leachates - 2 weeks from reporting
	waters - 2 weeks from reporting
	asbestos - 6 months from reporting
Excel copies of reports are only valid when accompanied by this PDF certificate.	

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.





Analytical Report Number: 23-76460 Project / Site name: Foss Island York Your Order No: SHF 269 002

Lab Sample Number				2919637	2919638	2919639
Sample Reference					\$2	S3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)	0.40	0.30	0.40			
Date Sampled				19/12/2023	19/12/2023	19/12/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	25	23
Total mass of sample received	kg	0.001	NONE	1.4	1.4	1.4
Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	0.16	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.2	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	1.7	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	1.4	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	13	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	2.6	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	18	< 0.05	0.08
Pyrene	mg/kg	0.05	MCERTS	14	< 0.05	0.06
Benzo(a)anthracene	mg/kg	0.05	MCERTS	6.7	< 0.05	< 0.05

Specialeu FALIS						
Naphthalene	mg/kg	0.05	MCERTS	0.16	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.2	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	1.7	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	1.4	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	13	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	2.6	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	18	< 0.05	0.08
Pyrene	mg/kg	0.05	MCERTS	14	< 0.05	0.06
Benzo(a)anthracene	mg/kg	0.05	MCERTS	6.7	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	5.7	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	6.3	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	3.3	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.4	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.8	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.88	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	3.1	< 0.05	< 0.05

Total	DAL
TULAI	ГАП

Speciated Total EPA-16 PAHs         mg/kg         0.8         ISO 17025         85.6         < 0.80						
	mg/kg	0.8	ISO 17025	85.6	< 0.80	< 0.80

### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.3	2.4	1.7
Boron (water soluble)	mg/kg	0.2	MCERTS	1	0.6	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	5.5	6.1
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	21	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	42	16	11
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	6	4.9
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140	43	30

### Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0





Analytical Report Number: 23-76460 Project / Site name: Foss Island York Your Order No: SHF 269 002

Lab Sample Number				2919637	2919638	2919639
Sample Reference				S1	S2	S3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.30	0.40
Date Sampled				19/12/2023	19/12/2023	19/12/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Petroleum Hydrocarbons	-		-			
TPH-CWG - Aliphatic >EC5 - EC6 <sub>HS_1D_AL</sub>	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC6 - EC8 <sub>HS_1D_AL</sub>	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050
TPH-CWG - Aliphatic >EC10 - EC12 <sub>EH_CU_1D_AL</sub>	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 <sub>EH_CU_1D_AL</sub>	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 <sub>EH_CU_1D_AL</sub>	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 <sub>EH_CU_1D_AL</sub>	mg/kg	8	MCERTS	30	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) <sub>EH_CU+HS_1D_AL</sub>	mg/kg	10	NONE	35	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 <sub>HS_1D_AR</sub>	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010
TPH-CWG - Aromatic >EC7 - EC8 <sub>HS_1D_AR</sub>	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050
TPH-CWG - Aromatic >EC10 - EC12 <sub>EH_CU_1D_AR</sub>	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 <sub>EH_CU_1D_AR</sub>	mg/kg	2	MCERTS	8.4	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 <sub>EH_CU_1D_AR</sub>	mg/kg	10	MCERTS	49	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 <sub>EH_CU_1D_AR</sub>	mg/kg	10	MCERTS	130	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) <sub>EH_CU+HS_1D_AR</sub>	mg/kg	10	NONE	180	< 10	< 10

 $\label{eq:US} U/S \ = \ Unsuitable \ Sample \quad I/S \ = \ Insufficient \ Sample \quad ND \ = \ Not \ detected$ 

This certificate should not be reproduced, except in full, without the express permission of the laboratory. The results included within the report relate only to the sample(s) submitted for testing.





Analytical Report Number : 23-76460 Project / Site name: Foss Island York

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2919637	S1	None Supplied	0.4	Brown loam and clay with gravel and vegetation.
2919638	S2	None Supplied	0.3	Brown clay and sand with gravel and vegetation.
2919639	S3	None Supplied	0.4	Brown clay and sand with gravel and vegetation.

This certificate should not be reproduced, except in full, without the express permission of the laboratory. The results included within the report relate only to the sample(s) submitted for testing.





Analytical Report Number : 23-76460 Project / Site name: Foss Island York

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status	
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS	
Asbestos identification in soil	s identification in soil Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques. In house method based on HSG 248		A001-PL	D	ISO 17025	
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS	
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE	
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS	
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE	
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	MCERTS	
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. Refer to CoA for band specific accreditation.	In-house method with silica gel split/clean up.	L088/76-PL	D	MCERTS	
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS	

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined aravimetrically using the moisture content which is carried out at a maximum of 30oC. Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by

the client. The instructed on date indicates the date on which this information was provided to the laboratory.

## Information in Support of Analytical Results

### List of HWOL Acronyms and Operators

	Acronym	Descriptions
1	HS	Headspace Analysis
	MS	Mass spectrometry
1	FID	Flame Ionisation Detector
	GC	Gas Chromatography
	EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
	CU	Clean-up - e.g. by Florisil®, silica gel
	1D	GC - Single coil/column gas chromatography
	2D	GC-GC - Double coil/column gas chromatography
	Total	Aliphatics & Aromatics
	AL	Aliphatics
	AR	Aromatics
	#1	EH_2D_Total but with humics mathematically subtracted
	#2	EH_2D_Total but with fatty acids mathematically subtracted
	-	Operator - understore to separate acronyms (exception for +)
	+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total



Analytical Report Number : 23-76460 Project / Site name: Foss Island York

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample I D	Other I D		Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
S1	None Supplied	S	2919637	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
S1	None Supplied	S	2919637	b	TPHCWG (Soil)	L088/76-PL	b
S2	None Supplied	S	2919638	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
S2	None Supplied	S	2919638	b	TPHCWG (Soil)	L088/76-PL	b
S3	None Supplied	S	2919639	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
S3	None Supplied	S	2919639	b	TPHCWG (Soil)	L088/76-PL	b

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

This certificate should not be reproduced, except in full, without the express permission of the laboratory. The results included within the report relate only to the sample(s) submitted for testing.





Enzygo Geoenvironmental Ltd□ Ducie House Ducie Street M1 2JW i2 Analytical Ltd. 7 Woodshots Meadow, Croxley Green Business Park, Watford, Herts, WD18 8YS

t: 01923 225404 f: 01923 237404 e: reception@i2analytical.com

e: Reuben.Fisher@enzygo.com

## Analytical Report Number : 24-000964

Replaces Analytical Report Number: 24-000964, issue no. 1 Client references/information amended. Sample reference amended as per client's request

Project / Site name:	Foss Island	Samples received on:	26/01/2024
Your job number:	SHF 269 002	Samples instructed on/ Analysis started on:	30/01/2024
Your order number:	SHF 269 002	Analysis completed by:	05/02/2024
Report Issue Number:	2	Report issued on:	22/02/2024
Samples Analysed:	1 soil sample		



Joanna Szwagrzak Reporting Specialist For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.





Analytical Report Number: 24-000964 Project / Site name: Foss Island Your Order No: SHF 269 002

Lab Sample Number				106768
Sample Reference				S5
Sample Number	None Supplied			
Depth (m)	None Supplied			
Date Sampled	25/01/2024			
Time Taken	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	15
Total mass of sample received	kg	0.1	NONE	1.3

#### Asbestos

Asbestos in Soil Detected/Not Detected	Туре	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.1
Pyrene	mg/kg	0.05	MCERTS	0.08
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenzo(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05

#### Total PAH

Speciated Total EPA-16 PAHs mg/kg 0.8 ISO 17025 < 0.80	TOTAL PAR			
	Speciated Total EPA-16 PAHs	0.8	ISO 17025	< 0.80

### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	3.7
Copper (aqua regia extractable)	mg/kg	1	MCERTS	10
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	4.4
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	24





Analytical Report Number: 24-000964 Project / Site name: Foss Island Your Order No: SHF 269 002

Lab Sample Number				106768
Sample Reference	S5			
Sample Number	None Supplied			
Depth (m)	None Supplied			
Date Sampled	25/01/2024			
Time Taken	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

	_		
mg/kg	0.02	NONE	< 0.020
mg/kg	0.02	NONE	< 0.020
mg/kg	0.05	NONE	< 0.050
mg/kg	1	MCERTS	< 1.0
mg/kg	2	MCERTS	< 2.0
mg/kg	8	MCERTS	< 8.0
mg/kg	8	MCERTS	< 8.0
mg/kg	10	NONE	< 10
	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	mg/kg         0.02           mg/kg         0.05           mg/kg         1           mg/kg         2           mg/kg         8           mg/kg         8	mg/kg         0.02         NONE           mg/kg         0.05         NONE           mg/kg         1         MCERTS           mg/kg         2         MCERTS           mg/kg         8         MCERTS           mg/kg         8         MCERTS

TPHCWG - Aromatic >EC5 - EC7 Hs_1D_AR	mg/kg	0.01	NONE	< 0.010
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	NONE	< 0.010
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	< 0.050
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR_#1_#2	mg/kg	1	MCERTS	< 1.0
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR_#1_#2	mg/kg	2	MCERTS	< 2.0
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR_#1_#2	mg/kg	10	MCERTS	< 10
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR_#1_#2	mg/kg	10	MCERTS	< 10
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR_#1_#2	mg/kg	10	NONE	< 10

#### VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected





Analytical Report Number : 24-000964 Project / Site name: Foss Island

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	e Sample Reference	Sample Number	Depth (m)	Sample Description *
106768	S5	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation





Analytical Report Number : 24-000964 Project / Site name: Foss Island

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088	D/W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromlum in soll by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	w	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (Wardol). For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride). For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland. Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC. Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.



Appendix 3 – Exploratory Hole Logs



Site									
	Premier Inn, F							S1	
Job No		Date	s Start 2	0-12-23	Grou	ind Level (1	m) Co-Ordinates	31	
SF	IF.269.002		Finish	20-12-23	3				
Client								Sheet 1 of 1	
	Clegg Constru							1 01 1	
Water Levels	Samples & Ir			Depth (m)	Level (mAD)	Legend	Stratum Description		
Levels	Depth (m)	No/Type	Results	(11)		<u><u><u>x</u></u>, <u>x</u>, <u>x</u>, <u>y</u>, <u>x</u>, <u>y</u>, <u>x</u>, <u>y</u>, <u>x</u>, <u>x</u>, <u>x</u>, <u>x</u>, <u>x</u>, <u>x</u>, <u>x</u>, <u>x</u></u>	Brown slightly clayey sandy TOPSOIL. Sand is fine to coarse.		+ 0
						$\frac{1}{1} \cdot \frac{\sqrt{1}}{1} \cdot \frac{\sqrt{1}}{1}$			
						<u>. 16</u> . 16 . 1			
						1, <u>1, 1,</u>			-
						$\frac{\sqrt{i_j}}{\sqrt{i_j}} = \frac{\sqrt{i_j}}{\sqrt{i_j}} = \sqrt{$			
						<u>N12</u> <u>N12</u> <u>N</u>			_
						<u><u>1</u><u>1</u><u>1</u><u>1</u><u>1</u><u>1</u><u>1</u><u>1</u><u>1</u><u>1</u><u>1</u><u>1</u><u>1</u></u>			
						11 111. 111			
						NIC NIC			
						1, 11, 11			
						<u>in 1, in 1, in 1</u>			
	0.40	ES				11 N 12 N 14			
	0.40	23				<u><u><u>x</u></u><u></u><u></u><u>x</u><u></u><u>x</u><u></u><u>x</u><u>x</u><u>x</u><u>x</u><u>x</u><u>x</u><u>x</u></u>			-
						$\frac{1}{1} \frac{1}{1} \frac{1}$			
				0.50			MADE GROUND: Medium dense grey slightly silty sandy angular to	subangular gravel	+
							of limestone. Sand is fine to coarse		
				0.60			Trial Pit completed at 0.60m.		+
									-
									_
									_
G				{1.00}					- 1
Dimens 1. Hand 2.Densi 3. No v	al Remarks ions: xx0.60 l excavated inspe ties and soil cons isual or olfactory ndwater was not	evidenc	e of conta	ound level ed on insit amination	to 0.60n tu tests. observe	n begl. d.			

1.1 ENZYGO TP LOG BLANK.GPJ GINT STD AGS 3\_1 ENZYGO.GPJ 6/2/24



Site									
	Premier Inn, F							S2	
Job No		Dates	Start 2	0-12-23	Grou	ind Level (r	m) Co-Ordinates	32	
SF	IF.269.002			20-12-23	3				
Client							She	et 1 of 1	
	Clegg Constru	ction I	<u>_imited</u>					1 01 1	
Water	Samples & In			Depth	Level	Legend	Stratum Description		
Levels	Depth (m)	No/Type	Results	(m)	(mAD)	<u><u>st</u> 1<sub>1</sub>. <u>st</u> 1<sub>1</sub>. <u>s</u></u>			+ o
	0.30	ES		0.40			Brown slightly clayey sandy TOPSOIL. Sand is fine to coarse. MADE GROUND: Medium dense grey slightly silty sandy angular to subar of limestone. Sand is fine to coarse Trial Pit completed at 0.50m.	ngular gravel	
				{1.00}					- 1
Dimens 1. Hand 2.Densi 3. No v	al Remarks sions: xx0.50 d excavated inspec- ities and soil cons isual or olfactory indwater was not o	evidence	e of conta	ound level	to 0.50n u tests. observe	n begl. d.			

Logged By NR



	<b>U</b> .				1105			
Site								
	Premier Inn, I						- S3	
Job No SH	) HF.269.002	Dates Start 3 Finish	31-01-24 n 31-01-24		und Level (1	n) Co-Ordinates		
Client		uction Limited	<u>1</u>				Sheet 1 of 1	
Water Levels	Samples & II Depth (m)	In Situ Testing	Depth (m)	Level (mAD)	Legend	Stratum Description		
Gener	0.40 Tal Remarks	ES	0.59 0.69 {1.00}				fine to coarse	
Dimens 1. Hand 2.Densi 3. No y	sions: xx0.69 d excavated inspe ities and soil cons	ection pit from gro sistencies are base y evidence of cont t encoutered.	sed on insit	tu tests.				



	F.269.002	Dates Start 3 Finish	31-01-24 n 31-01-24		und Level (r	Co-Ordinates	S4
Client <u>Cl</u>	legg Constru	action Limited	1			She	eet 1 of 1
ater vels	Samples & In		Depth	Level (mAD)	Legend	Stratum Description	
			0.57 0.67			ADE GROUND: Greyish brown slightly silty sandy fine to coarse angula bangular gravel of Limestone. Sand is fine to coarse.	ır to

4. Groundwater was not encoutered.



ob No SHF.269.002	Dates Start Start	31-01-24 h 31-01-24		ind Level (m)	Co-Ordinates	S5
Client Clegg Con	struction Limited	<u>d</u>				Sheet 1 of 1
	& In Situ Testing	Depth	Level (mAD)	Legend	Stratum Description	
0.30	ES	0.63			d <u>is</u> h brown silty clayey sandy TOPSOIL. Sand is fine to coars NDE GROUND: Greyish brown slightly silty sandy fine to coars bangular gravel of Limestone. Sand is fine to coarse.	

Dimensions: xx0.73
1. Hand excavated inspection pit from ground level to 0.73m begl.
2.Densities and soil consistencies are based on insitu tests.
3. No visual or olfactory evidence of contamination observed.
4. Groundwater was not encoutered.



Appendix 4 - Site Photos



Photo 1: Overview of S1.





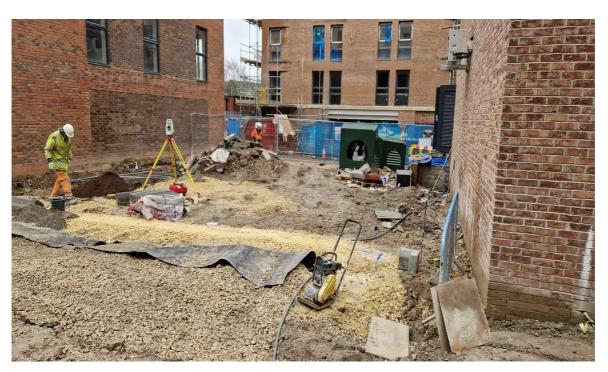


Photo 5: Small stockpile of topsoil within soft landscaping within eastern section of site.





Photo 7: Overview of S3.

Photo 8: Ir	nternal view of S3 excavtaion.	
environmental consultants Enzygo GeoEnvironmental Ltd	Premier Inn, Foss Island, York	Drawing Title Site Photos
Manchester 215 Ducie Street Tel: 0161 413 6444	<sup>Client</sup> Clegg Construction Limited	Project No. SHF.269.002



Photo 9: Overview of S4.





Photo 11: Stockpile of topsoil within soft landscaping within northern section of site.

Photo 12: Sa	ampled stockpile of topsoil [S5].	
environmental consultants Enzygo GeoEnvironmental Ltd	Project Premier Inn, Foss Island, York	Drawing Title Site Photos
Manchester 215 Ducie Street Tel: 0161 413 6444	Client Clegg Construction Limited	Project No. SHF.269.002







Appendix 5 - Additional Information



49A Langthwaite Business Park South Kirkby Pontefract WF9 3NR Tel: 01977 644489

26<sup>th</sup> June 2023

## Re: Premier Inn, York

This is to confirm that IH Equipment completed the demolition works on the above project.

No remediation works were required due to no ground contamination.

Liam Hobson Project Manager I H EQUIPMENT LTD Mob:



## Appendix 6 - Human Health Assessment Reference Values

		GAC Value Residential						
Determinant	Units	Wit	With Plant Uptake			Without Plant Uptake		
Arsenic	mg/kg	37			40			
Cadmium	mg/kg	11		85				
Chromium	mg/kg		910			910		
Chromium VI	mg/kg		6			6		
Lead	mg/kg		200			310		
Mercury	mg/kg		40			56		
Nickel	mg/kg		130			180		
Selenium	mg/kg		250		430			
Copper	mg/kg		2400		7100			
Zinc	mg/kg		3700			40000		
Cyanide	mg/kg		791			800		
	4				<b>.</b>			
SOM	%	1	2.5	6	1	2.5	6	
Phenol	mg/kg	280	550	1100	750	1300	2300	
Napthalene	mg/kg	2.3	5.6	13	2.3	5.6	13	
Acenaphtylene	mg/kg	170	420	920	2900	4600	6000	
Acenaphthene	mg/kg	210	510	1100	3000	4700	6000	
Flourene	mg/kg	170	400	860	2800	3800	4500	
Phenanthrene	mg/kg	95	220	440	1300	1500	1500	
Anthracene	mg/kg	2400	5400	11000	31000	35000	37000	
Fluoranthene	mg/kg	280	560	890	1500	1600	1600	
Pyrene	mg/kg	620	1200	2000	3700	3800	3800	
Benzo(a)Anthracene	mg/kg	7.2	11	13	11	14	15	
Chrysene	mg/kg	15	22	27	30	31	32	
Benzo(b)Flouranthene	mg/kg	2.6	3.3	3.7	3.9	4.0	4.0	
Benzo(k)Flouranthene	mg/kg	77	93	100	110	110	110	
Benzo(a)Pyrene	mg/kg	2.2	2.7	3.0	3.2	3.2	3.2	
Indeno(123-cd)Pyrene	mg/kg	27	36	41	45	46	46	
Dibenzo(a,h)Anthracene	mg/kg	0.24	0.28	0.3	0.31	0.32	0.32	
Benzo(ghi)Perylene	mg/kg	320	340	350	360	360	360	
Benzo(gin)Feryiene	ilig/kg	320	340	350	300	300	300	
TPH C₅-C <sub>6</sub> Aliphatic	mg/kg	42	78	160	42	78	160	
		100	230	530	42		530	
TPH C <sub>6</sub> -C <sub>8</sub> Aliphatic	mg/kg					230	150	
TPH C <sub>8</sub> -C <sub>10</sub> Aliphatic	mg/kg	27	65 220	150	27	65		
TPH C <sub>10</sub> -C <sub>12</sub> Aliphatic	mg/kg	130	330	760	130	330	770	
TPH C <sub>12</sub> -C <sub>16</sub> Aliphatic	mg/kg	1100	2400	4300	1100	2400	4400	
TPH C <sub>16</sub> -C <sub>35</sub> Aliphatic	mg/kg	65000	92000	110000	65000	92000	110000 110000	
TPH C <sub>35</sub> -C <sub>44</sub> Aliphatic	mg/kg	65000	92000	110000	65000	92000	110000	
TPH C₅-C7 Aromatic	mg/kg	70	140	300	370	690	1400	
TPH C <sub>7</sub> -C <sub>8</sub> Aromatic	mg/kg	130	290	660	860	1800	3900	
TPH C <sub>8</sub> -C <sub>10</sub> Aromatic	mg/kg	34	83	190	47	110	270	
TPH C <sub>10</sub> -C <sub>12</sub> Aromatic	mg/kg	74	180	380	250	590	1200	
TPH C <sub>12</sub> -C <sub>16</sub> Aromatic	mg/kg	140	330	660	1800	2300	2500	
TPH C <sub>12</sub> -C <sub>16</sub> Aromatic	mg/kg	260	540	930	1900	1900	1900	
TPH C <sub>21</sub> -C <sub>35</sub> Aromatic	mg/kg	1100	1500	1700	1900	1900	1900	
TPH C <sub>21</sub> -C <sub>35</sub> Aromatic	mg/kg	1100	1500	1700	1900	1900	1900	
	iiig/kg	1100	1300	1700	1900	1700	1900	
Benzene	ma/ka	0.087	0.17	0.37	0.38	0.70	1.4	
Toluene	mg/kg	130	290	660	880	1900	3900	
	mg/kg							
Ethylebenzene	mg/kg	47	110	260	83	190	440	

Copyright Land Quality Management Ltd reproduced with permission Publication No S4UL3250. All rights reserved.



Deletininality         Units         Residential POS         Commercial Top           Arsenic         mg/kg         120         190         190           Cadmium         mg/kg         1500         8600         77         33           Lead         mg/kg         120         1100         2330         100           Orromium VI         mg/kg         230         980         100         6800         77         733         1000         1000         1000         1000         1000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000         10000	Determinent	Lipita			GA	C Value		
Asintic         ······a         ·····a         ·····a           Cadomium         mg/kg         150         8600           Chromium M         mg/kg         150         8603           Chromium VI         mg/kg         630         233           Laad         mg/kg         100         1100           Nickal         mg/kg         100         1000           Solentium         mg/kg         1000         60000           Dopper         mg/kg         1000         60000           Zopper         mg/kg         1000         60000           Cynnde         mg/kg         1000         2500           Sold         %         1         25         6           Phenol         mg/kg         700         1500         3200           Nikapthaleni         mg/kg         4700         4900         490         190         10000           Accnaphthone         mg/kg         15000         15000         8300         97000         100000           Accnaphthone         mg/kg         1000         3100         3100         22000         2300           Phene         mg/kg         1000         1000         10000	Determinant	Units	Re	sidential	POS		Commerc	cial
Caturnium         mg/kg         1500         8600           Chromium VI         mg/kg         7.7         33           Lead         mg/kg         7.7         33           Lead         mg/kg         7.7         33           Maccury         mg/kg         7.00         23.0           Nickel         mg/kg         7.00         66000           Scientium         mg/kg         1100         7.0000           Copper         mg/kg         81000         7.0000           Copper         mg/kg         81000         7.0000           Copper         mg/kg         81000         7.0000           SOM         %         1         2.5         6         1         2.5           SOM         %         1         2.5         6         1         0.000           Accapthione         mg/kg         16000         1500         1500         100000           Accapthione         mg/kg         1000         1500         1500         100000           Accapthione         mg/kg         100         3100         3100         2000         2000           Pierneal         mg/kg         7400         7400         <	Arsenic	mg/kg	79					
Chromium W         mpkg         7.7         33           Load         mpkg         630         2330           Marcury         mpkg         630         2330           Nikkel         mpkg         120         1100           Nikkel         mpkg         1200         4860           Selenium         mpkg         1100         12000           Copper         mpkg         1200         73000           Cyanide         mgkg         1000         73000           Cyanide         mgkg         1         2.5         6         1         2.5         6           Prenol         mgkg         1000         4900         4900         4900         4900         1400         10000           Accmapthiene         mgkg         1500         15000         8300         97000         100000           Accmapthiene         mgkg         3100         3100         2000         2200	Cadmium	mg/kg						
Closinal N         -9-9         -630         2330           Mecrury         mg/kg         120         1100           Nickel         mg/kg         220         90           Steinian         mg/kg         1100         12000           Copper         mg/kg         1100         12000           Copper         mg/kg         8100         70000           Cyanile         mg/kg         8100         70000           Cyanile         mg/kg         100         3200           Naphalene         mg/kg         760         1500         1000           Accnupthiene         mg/kg         4900         4900         4900         1900         460           Accnupthiene         mg/kg         15000         15000         83000         68000         17000           Phenanthrene         mg/kg         1900         1900         460         100000         2000         20000         2000 </td <td>Chromium</td> <td>mg/kg</td> <td></td> <td>1500</td> <td></td> <td colspan="3">8600</td>	Chromium	mg/kg		1500		8600		
Marcury         mg/kg         120         1100           Nickel         mg/kg         230         980           Selenium         mg/kg         1100         12000           Copper         mg/kg         1000         68000           Zinc         mg/kg         81000         730000           Cyande         mg/kg         1000         70000           SOM         %         1         25         6         1         25         6           Phenol         mg/kg         760         1500         3200         7600         1500         3200           Naghtheine         mg/kg         15000         15000         15000         84000         97000         100000           Acenaphthene         mg/kg         15000         15000         15000         50000         540000           Fluorene         mg/kg         74000         74000         74000         22000         22000         23000           Fluoranthene         mg/kg         7400         7400         74000         54000         54000         54000         54000         54000         54000         54000         54000         54000         54000         54000         54000	Chromium VI	mg/kg		7.7				
Matcal         Imgrag         230         980           Selenium         mg/kg         1100         12000         66000           Capper         mg/kg         12000         66000         72000           Dine         mg/kg         81000         72000         72000         72000           Cyanide         mg/kg         N/A         760         1500         3200         760         1500         3200           Naptinalene         mg/kg         760         1500         3200         760         10000         3000         97000         100000         3200         7600         100000         7600         100000         7600         100000         7600         100000         7600         100000         7600         100000         7600         100000         7600         100000         7600         100000         7600         7600         7600         7600         76000         76000         76000         76000         76000         76000         76000         52000         540000         540000         540000         540000         540000         54000         54000         54000         54000         54000         54000         54000         54000         54000         5400	Lead	mg/kg		630			2330	
Mode         199-19         1100         12000           Gopper         mg/kg         12000         66000           Zinc:         mg/kg         12000         760000           Cyande         mg/kg         N/A         1620           Cyande         mg/kg         760         1500         3200         760         1500           SOM         %         1         2.5         6         1         2.5         6           Phenal         mg/kg         760         1500         3200         760         1500         3200           Napthalene         mg/kg         15000         15000         15000         83000         97000         10000           Acenaphthene         mg/kg         1100         3100         3100         2000         23000         3100         3100         3100         3100         3100         3100         3100         3100         3100         3100         310	Mercury	mg/kg		120			1100	
Johenduni         Img-kg         12000         66000           Zinc         mg-kg         31000         730000           Cyande         mg-kg         N/A         76000           SOM         %         1         2.5         6         1         2.5         6           Phenol         mg-kg         760         1500         3200         760         1500         3200         7000         10000           Maprthalene         mg-kg         15000         15000         15000         83000         97000         100000           Acenaphtylene         mg-kg         7400         74000         74000         74000         7000         100000           Acenaphtylene         mg-kg         3100         3100         3100         20000         22000         23000           Prene         mg-kg         74000         74000         74000         520000         540000         540000         54000	Nickel	mg/kg		230			980	
Copyand         Mg/rg         B1000         730000           Zinc         mg/kg         N/A         16.200           Cyanide         mg/kg         N/A         16.200           SOM         %         1         2.5         6         1         2.5         6           Phenol         mg/kg         760         1500         3200         760         1500         3200           Nagthalene         mg/kg         1500         15000	Selenium	mg/kg		1100			12000	
Life         Myra         N/A         16200           Cyanide         mg/kg         N/A         16200           SOM         %         1         2.5         6         1         2.5         6           Phenol         mg/kg         4900         4900         4900         190         460         1100           Acenaphtylene         mg/kg         15000         15000         15000         97000         100000           Acenaphtylene         mg/kg         15000         15000         64000         97000         100000           Acenaphtylene         mg/kg         3100         3100         22000         22000         23000           Phenanthrene         mg/kg         74000         74000         74000         52000         540000         540000           Fluoranthrene         mg/kg         7400         7400         74000         54000         54000         54000         54000         54000         54000         54000         54000         54000         54000         54000         54000         54000         170         180         175         57         35         35         36         160         160         170         180         1700	Copper	mg/kg		12000		68000		
SOM         %         1         2.5         6         1         2.5         6           Phenol         mg/kg         760         1500         3200         760         1500         3200           Naphthalene         mg/kg         15000         15000         15000         84000         97000         100000           Acenaphthene         mg/kg         15000         15000         84000         97000         100000           Acenaphthene         mg/kg         15000         15000         84000         97000         100000           Prene         mg/kg         3100         3100         22000         22000         23000         23000           Anthracene         mg/kg         74000         74000         74000         54000 </td <td>Zinc</td> <td>mg/kg</td> <td></td> <td>81000</td> <td></td> <td></td> <td>730000</td> <td></td>	Zinc	mg/kg		81000			730000	
Show         n         1 <th1< th="">         1         <th1< th=""> <th1< th=""></th1<></th1<></th1<>	Cyanide	mg/kg		N/A			16200	
Show         n         1 <th1< th="">         1         <th1< th=""> <th1< th=""></th1<></th1<></th1<>			1	25	6	1	25	6
Napthalene         mg/kg         4900         4900         4900         190         460         1100           Acenaphtlene         mg/kg         15000         15000         15000         83000         97000         100000           Acenaphtlene         mg/kg         1900         15000         15000         63000         97000         100000           Ploarene         mg/kg         9900         9900         9900         5000         540000         74000           Anthracene         mg/kg         74000         74000         74000         54000         54000         510         1510         150 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
Naghtalene         1.19, Mg         15000         15000         15000         15000         15000         15000         100000           Accnaphtylene         mg/kg         15000         15000         15000         84000         97000         100000           Accnaphtylene         mg/kg         9900         9900         63000         68000         71000           Phenanthrene         mg/kg         74000         74000         52000         23000         23000           Anthracene         mg/kg         74000         74000         54000         540000         540000         540000         540000         540000         540000         540000         540000         540000         540000         540000         540000         54000         5100         550								
Accmaphthene								
Actival interitie         11.9 mg/kg         9900         9900         63000         68000         71000           Phenanthrene         mg/kg         3100         3100         3100         22000         22000         23000           Anthracene         mg/kg         74000         74000         74000         520000         540000         540000           Fluoranthene         mg/kg         7400         7400         74000         540000         540000         540000           Deprene         mg/kg         7400         7400         54000         54000         54000           Berzo(a)Anthracene         mg/kg         29         29         27         170         170         180           Chrysene         mg/kg         7.1         7.2         7.2         44         44         45           Berzo(a)Pjrone         mg/kg         7.1         7.2         7.7         5.7         3.5         3.6           Indenot(23-cd)Pyrene         mg/kg         82         82         82         500         510         510           Dibenzo(a,h)Anthracene         mg/kg         57000         59000         60000         3200         5900         12000           TPH Cs	· •							
Phonember         Ing/kg         3100         3100         2000         22000         23000           Anthracene         mg/kg         74000         74000         74000         540000         540000         540000           Fluoranthene         mg/kg         3100         3100         23000         23000         23000           Pyrene         mg/kg         7400         7400         7400         54000         54000           Benzo(a)Anthracene         mg/kg         29         29         170         170         180           Chrysene         mg/kg         7.1         7.2         7.4         44         45           Benzo(b)Flouranthene         mg/kg         7.1         7.2         7.7         44         44           Benzo(a)Pyrene         mg/kg         5.7         5.7         5.7         35         35         36           Indeno(123-cdp)Pyrene         mg/kg         0.57         0.57         0.58         3.5         3.6         3.6           Benzo(a)Pyrene         mg/kg         640         640         640         3000         4000         4000           TPH C <sub>2</sub> -C <sub>a</sub> Aliphatic         mg/kg         13000         13000         13000								
Interactine         Interactine <thinteractine< th=""> <thinteractine< th=""></thinteractine<></thinteractine<>								
Antimizerie         mg/kg         3100         3100         23000								
Protect         mg/kg         7400         7400         54000         54000         54000           Benzo(a)Anthracene         mg/kg         29         29         29         170         170         180           Chrysene         mg/kg         57         57         57         350         350         350           Benzo(a)Anthracene         mg/kg         71         7.2         7.2         44         44         45           Benzo(b)Flouranthene         mg/kg         57         5.7         5.7         35         35         36           Indeno(123-cd)Pyrene         mg/kg         6.7         5.7         5.7         35         3.6         3.6           Dibenzo(a,h)Anthracene         mg/kg         0.57         0.57         0.58         3.5         3.6         3.6           Benzo(gh)Perylene         mg/kg         640         640         640         4000         4000         4000           TPH C <sub>2</sub> -C <sub>6</sub> Allphatic         mg/kg         570000         590000         600000         3200         5900         12000           TPH C <sub>2</sub> -C <sub>16</sub> Allphatic         mg/kg         13000         13000         13000         13000         13000         13000         13								
Fyrine         Implying         29         29         29         170         170         180           Benzo(a)Anthracene         mg/kg         57         57         350         350         350           Benzo(a)Flouranthene         mg/kg         7.1         7.2         44         44         45           Benzo(a)Pyrene         mg/kg         190         190         190         1200         1200         1200           Benzo(a)Pyrene         mg/kg         5.7         5.7         5.7         35         35         36           Indeno(123-cd)Pyrene         mg/kg         82         82         800         510         510         510           Dibenzo(a,h)Anthracene         mg/kg         640         640         640         3900         4000         4000           TPH C <sub>5</sub> -C <sub>6</sub> Aliphatic         mg/kg         570000         590000         600000         3200         5900         12000           TPH C <sub>5</sub> -C <sub>6</sub> Aliphatic         mg/kg         13000         13000         13000         13000         13000         4800         11000           TPH C <sub>10</sub> -C <sub>10</sub> Aliphatic         mg/kg         13000         13000         13000         13000         13000         13000 </td <td>Fluoranthene</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Fluoranthene							
Bertodap/mit active         Improg         Improg <thimprog< th="">         Improg         <thimpro< th="">         &lt;</thimpro<></thimprog<>	•							
Chrystein         Img/kg         7.1         7.2         7.2         44         44         45           Benzo(b)Flouranthene         mg/kg         190         190         190         1200         1200         1200           Benzo(a)Pyrene         mg/kg         5.7         5.7         5.7         35         35         36           Indeno(123-cd)Pyrene         mg/kg         82         82         82         500         510         510           Dibenzo(a,h)Anthracene         mg/kg         0.57         0.57         0.58         3.5         3.6         3.6           Benzo(ghi)Perylene         mg/kg         640         640         640         3900         4000         4000           TPH C5-C6, Aliphatic         mg/kg         570000         590000         600000         3200         5900         12000           TPH C5-C6, Aliphatic         mg/kg         13000         13000         13000         2000         4800         11000           TPH C5-C10 Aliphatic         mg/kg         13000         13000         13000         13000         13000         10000         170000         1800000           TPH C5-C5 Aliphatic         mg/kg         250000         250000	Benzo(a)Anthracene							
Belt20(0)/r001antiterie         mg/kg         190         190         190         1200         1200         1200           Benzo(k)Flouranthene         mg/kg         57         5.7         5.7         35         35         36           Indeno(123-cd)Pyrene         mg/kg         82         82         82         500         510         510           Dibenzo(a,h)Anthracene         mg/kg         0.57         0.57         0.58         3.5         3.6         3.6           Benzo(ghi)Perylene         mg/kg         640         640         640         3900         4000         4000           TPH Cs-Cs_Aliphatic         mg/kg         570000         590000         600000         3200         5900         12000           TPH Cs-Cs_Aliphatic         mg/kg         13000         13000         13000         23000         40000           TPH Cs-Cs_Aliphatic         mg/kg         13000         13000         13000         13000         13000         13000         180000         1800000           TPH Cs-Cs Aliphatic         mg/kg         50000         250000         250000         1600000         170000         1800000           TPH Cs-Cs Araiphatic         mg/kg         5000         500	•							
Derizologin Outpaintene         Ingrkg         F.7         5.7         5.7         35         35         36           Benzo(a)Pyrene         mg/kg         82         82         82         500         510         510           Dibenzo(a,h)Anthracene         mg/kg         0.57         0.57         0.58         3.5         3.6         3.6           Benzo(gh)Perylene         mg/kg         640         640         640         3900         4000         4000           TPH C <sub>3</sub> -C <sub>4</sub> Allphatic         mg/kg         570000         590000         600000         3200         5900         4000           TPH C <sub>3</sub> -C <sub>6</sub> Allphatic         mg/kg         600000         610000         620000         7800         17000         40000           TPH C <sub>3</sub> -C <sub>6</sub> Allphatic         mg/kg         13000         13000         13000         2000         4800         11000           TPH C <sub>3</sub> -C <sub>1</sub> Aliphatic         mg/kg         13000         13000         13000         13000         13000         13000         13000         13000         13000         13000         13000         13000         13000         13000         13000         13000         13000         13000         130000         1600000         1600000	Benzo(b)Flouranthene							
Bert/D(a)Pytene         Ing.kg         82         82         500         510           Indeno(123-cd)Pyrene         mg/kg         0.57         0.57         0.58         3.5         3.6         3.6           Dibenzo(a,h)Anthracene         mg/kg         640         640         640         3900         4000         4000           Benzo(ghi)Perylene         mg/kg         67000         590000         600000         3200         59000         12000           TPH Cs-C <sub>6</sub> Aliphatic         mg/kg         600000         610000         620000         7800         17000         40000           TPH Cs-C <sub>8</sub> Aliphatic         mg/kg         13000         13000         13000         2000         4800         11000           TPH Cs-C <sub>10</sub> Aliphatic         mg/kg         13000         13000         13000         23000         47000           TPH Cs-C <sub>14</sub> Aliphatic         mg/kg         13000         13000         13000         13000         13000         13000         13000         13000         1600000         1700000         1800000           TPH Cs-C <sub>14</sub> Aliphatic         mg/kg         250000         250000         250000         1600000         170000         1800000           TPH Cs-C <sub>14</sub> Aromatic <td>Benzo(k)Flouranthene</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Benzo(k)Flouranthene							
Indeho(129-Cut/Pytelle         Img/kg         0.57         0.57         0.58         3.5         3.6         3.6           Dibenzo(a,h)Anthracene         mg/kg         0.67         0.57         0.58         3.5         3.6         3.6           Benzo(gh)Perylene         mg/kg         640         640         640         3900         4000           TPH C <sub>5</sub> -C <sub>6</sub> Aliphatic         mg/kg         570000         590000         600000         3200         5900         12000           TPH C <sub>5</sub> -C <sub>6</sub> Aliphatic         mg/kg         600000         610000         620000         7800         17000         40000           TPH C <sub>5</sub> -C <sub>6</sub> Aliphatic         mg/kg         13000         13000         13000         2000         4800         11000           TPH C <sub>10</sub> -C <sub>12</sub> Aliphatic         mg/kg         13000         13000         13000         59000         82000         90000           TPH C <sub>10</sub> -C <sub>12</sub> Aliphatic         mg/kg         250000         250000         1600000         170000         1800000           TPH C <sub>5</sub> -C <sub>5</sub> Aliphatic         mg/kg         56000         56000         56000         160000         180000           TPH C <sub>5</sub> -C <sub>14</sub> Aromatic         mg/kg         5000         5000         5000	Benzo(a)Pyrene							
Dibertz/o(a,10,411h az erre         ing/kg         640         640         640         3900         4000           Benzo(ghi)Perylene         mg/kg         570000         590000         600000         3200         5900         12000           TPH C <sub>5</sub> -C <sub>6</sub> Aliphatic         mg/kg         600000         610000         620000         7800         17000         40000           TPH C <sub>6</sub> -C <sub>6</sub> Aliphatic         mg/kg         13000         13000         13000         2000         4800         11000           TPH C <sub>10</sub> -C <sub>12</sub> Aliphatic         mg/kg         13000         13000         13000         59000         82000         90000           TPH C <sub>10</sub> -C <sub>12</sub> Aliphatic         mg/kg         13000         13000         13000         1700000         1800000           TPH C <sub>10</sub> -C <sub>12</sub> Aliphatic         mg/kg         250000         250000         1600000         1700000         180000           TPH C <sub>35</sub> -C <sub>44</sub> Aliphatic         mg/kg         56000         56000         56000         160000         1700000         180000           TPH C <sub>35</sub> -C <sub>4</sub> Aromatic         mg/kg         5000         5000         56000         56000         3500         11000         180000           TPH C <sub>35</sub> -C <sub>4</sub> Aromatic         mg/kg         50	Indeno(123-cd)Pyrene							
Benzolgini/Pet yiene         mg/kg         570000         590000         600000         3200         5900         12000           TPH C5-C6 Aliphatic         mg/kg         600000         610000         620000         7800         17000         40000           TPH C6-Ca Aliphatic         mg/kg         13000         13000         2000         4800         11000           TPH Ca-C10 Aliphatic         mg/kg         13000         13000         13000         23000         47000           TPH C1-C12 Aliphatic         mg/kg         13000         13000         13000         9700         23000         47000           TPH C1-C12 Aliphatic         mg/kg         13000         13000         13000         170000         180000           TPH C1-C12 Aliphatic         mg/kg         250000         250000         250000         1700000         1800000           TPH C3-C3 Aliphatic         mg/kg         250000         250000         26000         46000         86000           TPH C3-C4 Aliphatic         mg/kg         56000         56000         56000         170000         180000           TPH C3-C5 Aromatic         mg/kg         56000         56000         56000         35000         31000         170000	Dibenzo(a,h)Anthracene							
TPH C <sub>6</sub> -C <sub>6</sub> Aliphatic         mg/kg         600000         610000         620000         7800         17000         40000           TPH C <sub>6</sub> -C <sub>6</sub> Aliphatic         mg/kg         13000         13000         13000         2000         4800         11000           TPH C <sub>6</sub> -C <sub>10</sub> Aliphatic         mg/kg         13000         13000         13000         23000         47000           TPH C <sub>10</sub> -C <sub>12</sub> Aliphatic         mg/kg         13000         13000         59000         82000         90000           TPH C <sub>16</sub> -C <sub>55</sub> Aliphatic         mg/kg         250000         250000         250000         1600000         170000         1800000           TPH C <sub>56</sub> -C <sub>7</sub> Aromatic         mg/kg         250000         250000         26000         1600000         170000         1800000           TPH C <sub>56</sub> -C <sub>7</sub> Aromatic         mg/kg         56000         56000         56000         10000         180000           TPH C <sub>56</sub> -C <sub>7</sub> Aromatic         mg/kg         5000         5000         3500         8100         17000           TPH C <sub>10</sub> -C <sub>12</sub> Aromatic         mg/kg         5000         5000         3500         8100         17000           TPH C <sub>10</sub> -C <sub>12</sub> Aromatic         mg/kg         5000         5000         36000         370	Benzo(ghi)Perylene	mg/kg	640	640	640	3900	4000	4000
TPH C <sub>6</sub> -C <sub>8</sub> Aliphatic         mg/kg         600000         610000         620000         7800         17000         40000           TPH C <sub>6</sub> -C <sub>10</sub> Aliphatic         mg/kg         13000         13000         13000         2000         4800         11000           TPH C <sub>10</sub> -C <sub>12</sub> Aliphatic         mg/kg         13000         13000         13000         9700         23000         47000           TPH C <sub>12</sub> -C <sub>16</sub> Aliphatic         mg/kg         13000         13000         13000         59000         82000         90000           TPH C <sub>12</sub> -C <sub>16</sub> Aliphatic         mg/kg         250000         250000         250000         1600000         1700000         1800000           TPH C <sub>5</sub> -C <sub>7</sub> Aromatic         mg/kg         250000         250000         26000         46000         86000           TPH C <sub>5</sub> -C <sub>7</sub> Aromatic         mg/kg         56000         56000         56000         100000         180000           TPH C <sub>5</sub> -C <sub>7</sub> Aromatic         mg/kg         5000         5000         3500         8100         17000           TPH C <sub>10</sub> -C <sub>12</sub> Aromatic         mg/kg         5000         5000         36000         34000           TPH C <sub>10</sub> -C <sub>12</sub> Aromatic         mg/kg         5000         5000         36000         36000<	TPH Cs-C6 Aliphatic	mg/kg	570000	590000	600000	3200	5900	12000
TPH C <sub>8</sub> -C <sub>10</sub> Aliphatic         mg/kg         13000         13000         13000         2000         4800         11000           TPH C <sub>10</sub> -C <sub>12</sub> Aliphatic         mg/kg         13000         13000         13000         9700         23000         47000           TPH C <sub>10</sub> -C <sub>12</sub> Aliphatic         mg/kg         13000         13000         13000         59000         82000         90000           TPH C <sub>12</sub> -C <sub>16</sub> Aliphatic         mg/kg         250000         250000         1600000         1700000         1800000           TPH C <sub>16</sub> -C <sub>35</sub> Aliphatic         mg/kg         250000         250000         250000         1600000         1700000         1800000           TPH C <sub>5</sub> -C <sub>7</sub> Aromatic         mg/kg         56000         56000         56000         160000         1700000         180000           TPH C <sub>5</sub> -C <sub>7</sub> Aromatic         mg/kg         5000         56000         56000         10000         180000           TPH C <sub>5</sub> -C <sub>7</sub> Aromatic         mg/kg         5000         5000         56000         56000         10000         180000           TPH C <sub>5</sub> -C <sub>7</sub> Aromatic         mg/kg         5000         5000         5000         3500         8100         17000           TPH C <sub>10</sub> -C <sub>12</sub> Aromatic         mg/kg <t< td=""><td>· · ·</td><td></td><td>600000</td><td>610000</td><td>620000</td><td>7800</td><td>17000</td><td>40000</td></t<>	· · ·		600000	610000	620000	7800	17000	40000
TPH C10 <sup>-</sup> C12 Aliphatic         mg/kg         13000         13000         13000         9700         23000         47000           TPH C12 <sup>-</sup> C16 Aliphatic         mg/kg         13000         13000         13000         59000         82000         90000           TPH C12 <sup>-</sup> C16 Aliphatic         mg/kg         250000         250000         250000         1600000         1700000         1800000           TPH C35 <sup>-</sup> C4 Aliphatic         mg/kg         250000         250000         250000         1600000         1700000         1800000           TPH C5 <sup>-</sup> C7 Aromatic         mg/kg         56000         56000         26000         46000         86000           TPH C5 <sup>-</sup> C7 Aromatic         mg/kg         56000         56000         56000         110000         180000           TPH C3 <sup>-</sup> C6 Aromatic         mg/kg         5000         5000         5000         3500         8100         17000           TPH C3 <sup>-</sup> C6 Aromatic         mg/kg         5000         5000         5000         3500         8100         17000           TPH C3 <sup>-</sup> C6 Aromatic         mg/kg         5000         5000         36000         37000         38000           TPH C3 <sup>-</sup> C16 Aromatic         mg/kg         3800         3800         3800 </td <td></td> <td></td> <td>13000</td> <td></td> <td>13000</td> <td>2000</td> <td></td> <td></td>			13000		13000	2000		
TPH C12·C16 Aliphatic         mg/kg         13000         13000         13000         59000         82000         90000           TPH C16·C35 Aliphatic         mg/kg         250000         250000         250000         1600000         1700000         1800000           TPH C35·C44 Aliphatic         mg/kg         250000         250000         250000         1600000         1700000         1800000           TPH C5·C7 Aromatic         mg/kg         56000         56000         56000         26000         46000         86000           TPH C5·C7 Aromatic         mg/kg         56000         56000         56000         100000         1800000           TPH C6·C3 Aromatic         mg/kg         5000         5000         56000         10000         180000           TPH C3·C10 Aromatic         mg/kg         5000         5000         5000         3500         8100         17000           TPH C3·C12 Aromatic         mg/kg         5000         5000         36000         37000         38000           TPH C10·C12 Aromatic         mg/kg         5100         5100         5000         36000         37000         38000           TPH C10·C12 Aromatic         mg/kg         3800         3800         3800 <t< td=""><td>· · ·</td><td></td><td>13000</td><td>13000</td><td>13000</td><td>9700</td><td>23000</td><td>47000</td></t<>	· · ·		13000	13000	13000	9700	23000	47000
TPH C <sub>16</sub> -C <sub>35</sub> Aliphatic         mg/kg         250000         250000         250000         1600000         1700000         1800000           TPH C <sub>35</sub> -C <sub>44</sub> Aliphatic         mg/kg         250000         250000         250000         1600000         1700000         1800000           TPH C <sub>35</sub> -C <sub>44</sub> Aliphatic         mg/kg         56000         56000         26000         46000         86000           TPH C <sub>5</sub> -C <sub>7</sub> Aromatic         mg/kg         56000         56000         56000         10000         180000           TPH C <sub>7</sub> -C <sub>8</sub> Aromatic         mg/kg         56000         56000         56000         10000         180000           TPH C <sub>8</sub> -C <sub>10</sub> Aromatic         mg/kg         5000         5000         5000         3500         8100         17000           TPH C <sub>10</sub> -C <sub>12</sub> Aromatic         mg/kg         5000         5000         5000         36000         37000         38000           TPH C <sub>16</sub> -C <sub>21</sub> Aromatic         mg/kg         3100         5100         5000         28000         28000         28000           TPH C <sub>16</sub> -C <sub>21</sub> Aromatic         mg/kg         3800         3800         3800         28000         28000         28000         28000         28000         28000         28000         28000						59000		
TPH C35-C44 Aliphatic         mg/kg         250000         250000         250000         1600000         1700000         1800000           TPH C35-C7 Aromatic         mg/kg         56000         56000         56000         26000         46000         86000           TPH C5-C7 Aromatic         mg/kg         56000         56000         56000         110000         180000           TPH C5-C7 Aromatic         mg/kg         5000         56000         56000         110000         180000           TPH C3-C10 Aromatic         mg/kg         5000         5000         5000         3500         8100         17000           TPH C10-C12 Aromatic         mg/kg         5000         5000         5000         36000         34000           TPH C10-C12 Aromatic         mg/kg         5100         5100         5000         36000         38000         38000           TPH C10-C12 Aromatic         mg/kg         3800         3800         3800         28000<						1		1800000
TPH C5-C/ Atomatic         mg/kg         56000         56000         56000         110000         180000           TPH C7-C8 Aromatic         mg/kg         5000         5000         5000         3500         8100         17000           TPH C8-C10 Aromatic         mg/kg         5000         5000         5000         3500         8100         17000           TPH C8-C10 Aromatic         mg/kg         5000         5000         5000         36000         28000         34000           TPH C10-C12 Aromatic         mg/kg         5100         5100         5000         36000         37000         38000           TPH C10-C12 Aromatic         mg/kg         3800         3800         3800         28000 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>								
TPH C5-C/ Atomatic         mg/kg         56000         56000         56000         110000         180000           TPH C7-C8 Aromatic         mg/kg         5000         5000         5000         3500         8100         17000           TPH C8-C10 Aromatic         mg/kg         5000         5000         5000         3500         8100         17000           TPH C8-C10 Aromatic         mg/kg         5000         5000         5000         36000         28000         34000           TPH C10-C12 Aromatic         mg/kg         5100         5100         5000         36000         37000         38000           TPH C10-C12 Aromatic         mg/kg         3800         3800         3800         28000 <t< td=""><td></td><td></td><td>F(000</td><td>F(000</td><td>F(000</td><td>2(000</td><td>4(000</td><td>0(000</td></t<>			F(000	F(000	F(000	2(000	4(000	0(000
TPH Cy-Cg Atomatic         Ing/kg         5000         5000         5000         3500         8100         17000           TPH Cg-C10 Aromatic         mg/kg         5000         5000         5000         3500         8100         17000           TPH Cg-C12 Aromatic         mg/kg         5000         5000         5000         16000         28000         34000           TPH Cg-C12 Aromatic         mg/kg         5100         5100         5000         36000         37000         38000           TPH Cg-C16 Aromatic         mg/kg         5100         5100         5000         36000         37000         38000           TPH Cg-C21 Aromatic         mg/kg         3800         3800         3800         280	TPH C <sub>5</sub> -C <sub>7</sub> Aromatic							
TPH C8-C10 Atomatic         Ingrkg         5000         5000         5000         16000         28000         34000           TPH C10-C12 Aromatic         mg/kg         5100         5100         5000         36000         37000         38000           TPH C10-C12 Aromatic         mg/kg         5100         5100         5000         36000         37000         38000           TPH C10-C12 Aromatic         mg/kg         3800         3800         3800         28000 <td>TPH C<sub>7</sub>-C<sub>8</sub> Aromatic</td> <td>0 0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	TPH C <sub>7</sub> -C <sub>8</sub> Aromatic	0 0						
TPH C10°C12 Atomatic         mg/kg         5100         5100         5000         36000         37000         38000           TPH C12°C16 Aromatic         mg/kg         5100         5100         5000         36000         37000         38000           TPH C12°C16 Aromatic         mg/kg         3800         3800         3800         28000         28000         28000           TPH C21°C35 Aromatic         mg/kg         3800         3800         3800         28000         1000         180000         1000         180000         10000         180000         27000         27000         27000         27000 <td>TPH C<sub>8</sub>-C<sub>10</sub> Aromatic</td> <td>0 0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	TPH C <sub>8</sub> -C <sub>10</sub> Aromatic	0 0						
TPH C <sub>16</sub> -C <sub>21</sub> Aromatic         mg/kg         3800         3800         3800         28000         270         270	TPH C <sub>10</sub> -C <sub>12</sub> Aromatic							
TPH C <sub>21</sub> -C <sub>35</sub> Aromatic         mg/kg         3800         3800         3800         28000<	TPH C <sub>12</sub> -C <sub>16</sub> Aromatic		-					
TPH C <sub>35</sub> -C <sub>44</sub> Aromatic         mg/kg         3800         3800         3800         28000<	TPH C <sub>16</sub> -C <sub>21</sub> Aromatic	0 0	-					
Benzene         mg/kg         72         72         73         27         47         90           Toluene         mg/kg         56000         56000         56000         110000         180000	TPH C <sub>21</sub> -C <sub>35</sub> Aromatic		-					
Toluene         mg/kg         56000         56000         56000         110000         180000           Toluene         mg/kg         24000         25000         56000         13000         27000	TPH C <sub>35</sub> -C <sub>44</sub> Aromatic	mg/kg	3800	3800	3800	28000	28000	28000
Toluene         mg/kg         56000         56000         56000         110000         180000           Toluene         mg/kg         24000         25000         56000         13000         27000	Benzene	mg/kg	72	72	73	27	47	90
		0 0						
		0 0	24000	24000	25000	5700	13000	27000
Xylene         mg/kg         41000         42000         43000         5900         14000         30000	2	0 0	41000	42000	43000	5900	14000	30000

Copyright Land Quality Management Ltd reproduced with permission Publication No S4UL3250. All rights reserved.



Determinant	Units		GAC Value					
Determinant	01113		Park PO	S		Allotmen	ts	
Arsenic	mg/kg	170			43			
Cadmium	mg/kg	532		1.9				
Chromium	mg/kg		33000			18000		
Chromium VI	mg/kg		220			1.8		
Lead	mg/kg		1300			80		
Mercury	mg/kg		240			19		
Nickel	mg/kg		800			53		
Selenium	mg/kg		1800			88		
Copper	mg/kg		44000		520			
Zinc	mg/kg		170000			620		
Cyanide	mg/kg							
			Ĩ	T	T	1		
SOM	%	1	2.5	6	1	2.5	6	
Phenol	mg/kg	760	1500	3200	66	140	280	
Napthalene	mg/kg	1200	1900	3000	4.1	10	24	
Acenaphtylene	mg/kg	29000	30000	30000	28	69	160	
Acenaphthene	mg/kg	29000	30000	30000	34	85	200	
Flourene	mg/kg	20000	20000	20000	27	67	160	
Phenanthrene	mg/kg	6200	6200	6300	15	38	90	
Anthracene	mg/kg	150000	150000	150000	380	950	2200	
Fluoranthene	mg/kg	6300	6300	6400	52	130	290	
Pyrene	mg/kg	15000	15000	15000	110	270	620	
Benzo(a)Anthracene	mg/kg	49	56	62	2.9	6.5	13	
Chrysene	mg/kg	93	110	120	4.1	9.4	19	
Benzo(b)Flouranthene	mg/kg	13	15	16	0.99	2.1	3.9	
Benzo(k)Flouranthene	mg/kg	370	410	440	37	75	130	
Benzo(a)Pyrene	mg/kg	11	12	13	0.97	2.0	3.5	
Indeno(123-cd)Pyrene	mg/kg	150	170	180	9.5	21	39	
Dibenzo(a,h)Anthracene	mg/kg	1.1	1.3	1.4	0.14	0.27	0.43	
Benzo(ghi)Perylene	mg/kg	1400	1500	1600	290	470	640	
			1		I			
TPH C <sub>5</sub> -C <sub>6</sub> Aliphatic	mg/kg	95000	130000	180000	730	1700	3900	
TPH C <sub>6</sub> -C <sub>8</sub> Aliphatic	mg/kg	150000	220000	320000	2300	5600	13000	
TPH C <sub>8</sub> -C <sub>10</sub> Aliphatic	mg/kg	14000	18000	21000	320	770	1700	
TPH C <sub>10</sub> -C <sub>12</sub> Aliphatic	mg/kg	21000	23000	24000	2200	4400	7300	
TPH C <sub>12</sub> -C <sub>16</sub> Aliphatic	mg/kg	25000	25000	26000	11000	13000	13000	
TPH C <sub>16</sub> -C <sub>35</sub> Aliphatic	mg/kg	450000	480000	490000	260000	270000	270000	
TPH C <sub>35</sub> -C <sub>44</sub> Aliphatic	mg/kg	450000	480000	490000	260000	270000	270000	
	ma/ka	76000	84000	92000	13	27	57	
TPH C <sub>5</sub> -C <sub>7</sub> Aromatic	mg/kg mg/kg	87000	95000	100000	22	51	120	
TPH C <sub>7</sub> -C <sub>8</sub> Aromatic	mg/kg	7200	8500	9300	8.6	21	51	
TPH C <sub>8</sub> -C <sub>10</sub> Aromatic		9200	9700	10000	13	31	74	
TPH C <sub>10</sub> -C <sub>12</sub> Aromatic	mg/kg	10000	10000	10000				
TPH C <sub>12</sub> -C <sub>16</sub> Aromatic	mg/kg	7600	7700	7800	23	57	130	
TPH C <sub>16</sub> -C <sub>21</sub> Aromatic	mg/kg	7800	7800	7900	46	110	260	
TPH C <sub>21</sub> -C <sub>35</sub> Aromatic	mg/kg	7800	7800	7900	370	820	1600	
TPH C <sub>35</sub> -C <sub>44</sub> Aromatic	mg/kg	7800	7000	7900	370	820	1600	
Benzene	mg/kg	90	100	110	0.017	0.034	0.075	
Toluene	mg/kg	87000	95000	100000	22	51	120	
Ethylebenzene	mg/kg	17000	22000	27000	16	39	91	
Xylene	mg/kg	17000	23000	31000	28	67	160	

Copyright Land Quality Management Ltd reproduced with permission Publication No S4UL3250. All rights reserved.



Enzygo specialise in a wide range of technical services:

Property and Sites Waste and Mineral Planning Flooding, Drainage and Hydrology Landscape Architecture Arboriculture Permitting and Regulation Waste Technologies and Renewables Waste Contract Procurement Noise and Vibration Ecology Services Contaminated Land and Geotechnical Traffic and Transportation Planning Services

#### BRISTOL

The Byre Woodend Lane Cromhall Gloucestershire GL12 8AA Tel: 01454 269 237

#### SHEFFIELD

Samuel House 5 Fox Valley Way Stocksbridge Sheffield S36 2AA Tel: 0114 321 5151

#### MANCHESTER

Ducie House Ducie Street Manchester M1 2JW Tel: 0161 413 6444

#### CARDIFF

Regus House Malthouse Avenue Cardiff Gate Buisness Park CF23 8RU Tel: 02920 023 700

Please visit our website for more information.

