



Appendix E7

Landscaping – Tarporley Source Testing

Document ref: R/14656/020

19 September 2016

Ashlea Ltd.
Scotland Road
Carnforth
Lancashire
LA5 9RE

For the attention of Wayne Dand

Dear Wayne,

Re: Proposed Topsoil Source - Tarporley

Please find below our assessment of the Topsoil recently sampled and analysed from the David Wilson Homes Development site at Tarporley on behalf of Ashlea Landscaping Ltd.

1.0 Introduction

On 5th June 2016, Hydrock, were instructed by Ashlea Landscaping (email from Wayne Dand of Ashlea to Karen Dale of Hydrock) to attend the site of an ongoing residential development off Nantwich Road, Tarporley.

Prior to the residential development, the site is understood to have being open fields with no previous history of development. Ashlea Landscaping have provided Hydrock with a copy of Consolidated Geo-Environmental Report for the site written by Opus for Gladman Developments Ltd, reference J-D0952.00_Ro_PT dated 3rd December 2013.

Hydrock visited the site on Wednesday 7th September 2016. The purpose of the site visit was to sample a stockpile of topsoil resulting from the pre-construction site strip. It is understood that it is the intention of Ashlea Landscaping to import the soil for use in the landscaped areas of the North Wales Prison development site.

2.0 Description of the Stockpile

At the time of the site visit the stockpile was located along the northern edge of the development, adjacent to the northern site boundary with residential properties to the north. The topsoil comprises brown, sandy, gravelly clay and was largely homogenous in nature. No evidence of man-made materials was noted in the stockpile. Vegetation has become established on the surface of the stockpile.

Photographs taken during the site visit are presented at Annex A.

3.0 **Sampling and Testing**

A total of six representative soil samples were recovered from various points across the faces of the stockpile. The samples were then dispatched to the laboratories of i2 Analytical, where they were tested for the Hydrock Default Soil Suite of determinands and Level 2 speciated petroleum hydrocarbons (aromatic / aromatic split).

4.0 **Results**

The chemical testing results have been assessed against the Generic Assessment Criteria (GAC) for the CLEA Public Open Space (Residential) land use scenario, as these were felt to be the most appropriate screening criteria for the proposed end use.

The results of the assessment are summarised in Table 4.1. It should be noted that only those determinands which were recorded at detectable concentrations are considered below. The full assessment results are included at Annex B.

Table 4.1 Tarporeley Topsoil Stockpile - Chemical Testing Results and Assessment

Determinand	Import Criteria (mg/kg)	Min. (mg/kg)	Max. (mg/kg)	No. of Exceedances
Arsenic	32	1.9	8	0
Beryllium	51	0.41	0.48	0
Boron	290	0.3	1.4	0
Chromium (III)	463	15	23	0
Copper	2300	22	37	0
Lead	200	20	90	0
Nickel	130	12	14	0
Vanadium	74	19	23	0
Zinc	3700	33	77	0
Total TPH	50	175	-	1

A single sample from the stockpile recorded elevated concentrations of petroleum hydrocarbons. Subsequent assessment of the individual fractions of petroleum hydrocarbons reveals that there are no exceedances above the relevant GAC for Public Open Space. Therefore, given the fact all individual fractions are significantly lower than the relevant GAC and marginal nature of the exceedance, Hydrock consider this material to still be suitable for importing on to site.

Asbestos screening was also carried out on all samples by the laboratory, and was found to be absent.

5.0 Summary and Conclusions

The six representative samples of the topsoil currently stockpiled at the ongoing residential development off Nantwich Road, Tarporley have been sampled at source prior to importation and chemically tested.

The results of the testing, when assessed against GAC appropriate to a Public Open Space (Residential) end use, did not identify any exceedances of the GAC, with all samples also proven to be free of asbestos fibres.

It is therefore concluded that the soils are chemically suitable for their intended landscaping use at the North Wales Prison development at Wrexham.

We trust that the above meets your current requirements.

Yours sincerely
for **Hydrock**



Karen Dale MGeol FGS
Geo-environmental Consultant



Annex A

Photographs



Plate 1: Looking along the southeast extent of the stockpile



Plate 2: Looking east along the northern extent of the stockpile



Plate 3: Looking west along the northern extent



Plate 4: showing the northern extent of the stockpile.



Plate 5: Looking along the south western extent of the stockpile



Plate 6: looking along the top of the stockpile



Annex B

Chemical Soil Testing Certificates

**Karen Dale**

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Analytical Report Number : 16-27326

Project / Site name:	North Wales Prison	Samples received on:	09/09/2016
Your job number:	C14565	Samples instructed on:	09/09/2016
Your order number:		Analysis completed by:	15/09/2016
Report Issue Number:	1	Report issued on:	15/09/2016
Samples Analysed:	6 soil samples		


Signed: _____

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.


Signed: _____

Dr Irma Doyle
Senior Account Manager
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.

Analytical Report Number: 16-27326

Project / Site name: North Wales Prison

Lab Sample Number	626997	626998	626999	627000	627001
Sample Reference	Tar/SP/7.9.16/TS/a	Tar/SP/7.9.16/TS/b	Tar/SP/7.9.16/TS/c	Tar/SP/7.9.16/TS/d	Tar/SP/7.9.16/TS/e
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	07/09/2016	07/09/2016	07/09/2016	07/09/2016	07/09/2016
Time Taken	None Supplied	None Supplied	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
Moisture Content	%	N/A	NONE	12	15
Total mass of sample received	kg	0.001	NONE	1.2	1.2

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.5	6.6	7.5	6.3	6.6
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.014	0.015	0.022	0.0099	0.030
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	13.7	14.6	22.1	9.9	30.4
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.013	0.014	0.021	0.012	0.017

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.28	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.81	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.67	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.36	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.33	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.40	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.24	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.34	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.20	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.27	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	3.90	< 1.60	< 1.60
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.0	2.1	3.7	6.0	1.9
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.47	0.48	0.43	0.41	0.46
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	0.9	0.3	1.1	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	15	15	23	16	18
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	15	23	16	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	25	37	32	28
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	23	90	33	30
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.7	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	13	14	12	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	19	21	20	22	23
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	34	34	77	33	37

Analytical Report Number: 16-27326
Project / Site name: North Wales Prison

Lab Sample Number	626997	626998	626999	627000	627001
Sample Reference	Tar/SP/7.9.16/TS/a	Tar/SP/7.9.16/TS/b	Tar/SP/7.9.16/TS/c	Tar/SP/7.9.16/TS/d	Tar/SP/7.9.16/TS/e
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	07/09/2016	07/09/2016	07/09/2016	07/09/2016	07/09/2016
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	41	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	< 10	< 10	41	< 10	< 10
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	31	< 8.4	< 8.4

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	77	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	26	< 8.4	< 8.4

Analytical Report Number: 16-27326

Project / Site name: North Wales Prison

Lab Sample Number				627002				
Sample Reference				Tar/SP/7.9.16/TS/f				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				07/09/2016				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	11				
Total mass of sample received	kg	0.001	NONE	1.3				

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.0				
Free Cyanide	mg/kg	1	MCERTS	< 1				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	13.3				
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.013				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10				
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10				
Fluorene	mg/kg	0.1	MCERTS	< 0.10				
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10				
Anthracene	mg/kg	0.1	MCERTS	< 0.10				
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10				
Pyrene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10				
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10				
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60				
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.5				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.47				
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	15				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	20				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	35				

Analytical Report Number: 16-27326
Project / Site name: North Wales Prison

Lab Sample Number				627002				
Sample Reference				Tar/SP/7.9.16/TS/f				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				07/09/2016				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	< 10				
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4				



Analytical Report Number : 16-27326

Project / Site name: North Wales Prison

* 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 topsoil/loam 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 *
626997	ar/SP/7.9.16/TS	None Supplied	None Supplied	Brown loam and sand with vegetation.
626998	ar/SP/7.9.16/TS	None Supplied	None Supplied	Brown loam and sand with vegetation.
626999	ar/SP/7.9.16/TS	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
627000	ar/SP/7.9.16/TS	None Supplied	None Supplied	Brown loam and sand with vegetation.
627001	ar/SP/7.9.16/TS	None Supplied	None Supplied	Brown loam and sand with gravel and vegetation.
627002	ar/SP/7.9.16/TS	None Supplied	None Supplied	Brown loam and sand with vegetation.

Analytical Report Number : 16-27326

Project / Site name: North Wales Prison

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

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 disperion 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
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
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.	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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
TPH Chromatogram	TPH Chromatogram.	In-house method	L064-PL	D	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 16-27326

Project / Site name: North Wales Prison

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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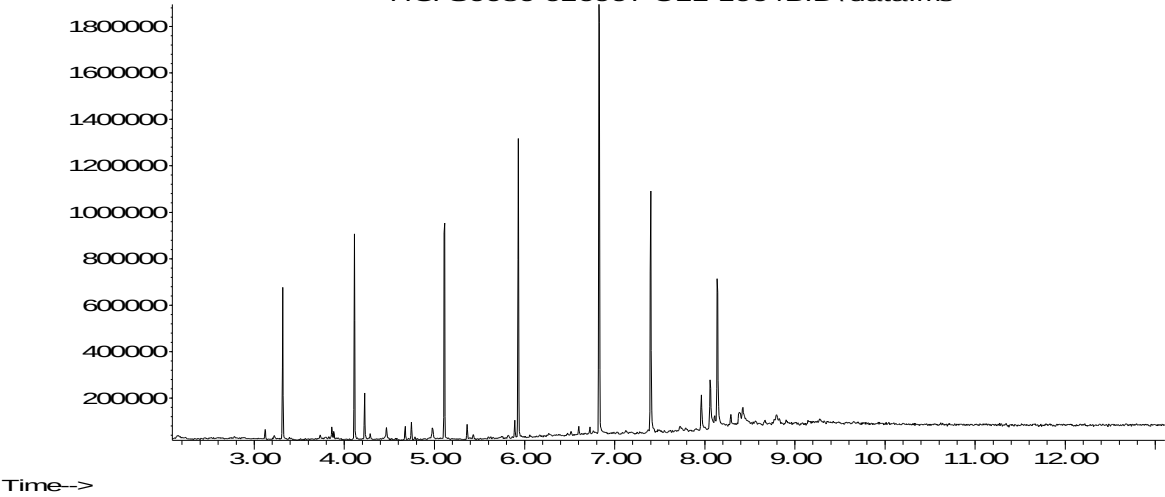
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' 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.

Abundance

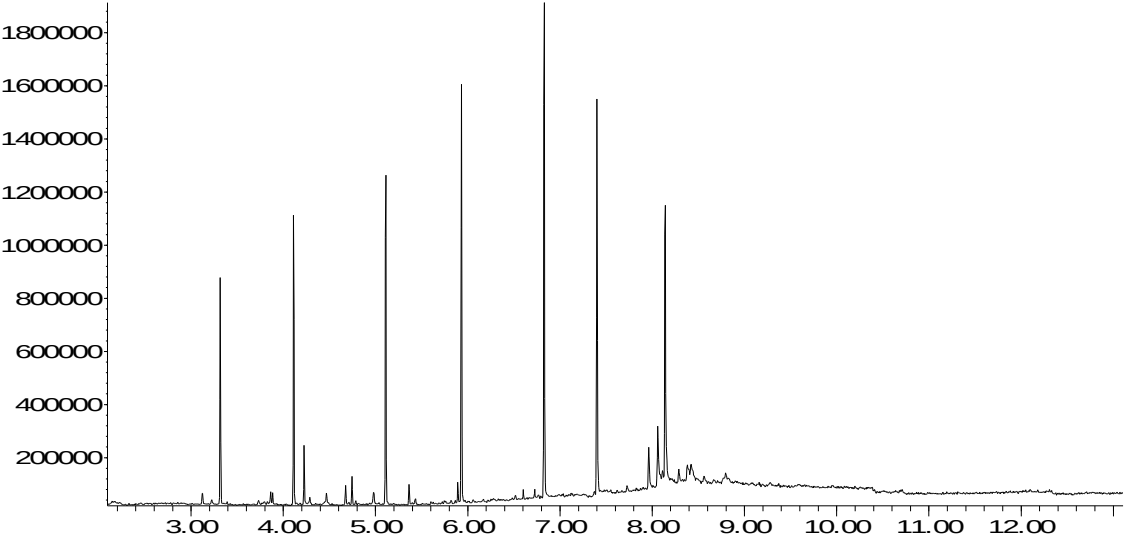
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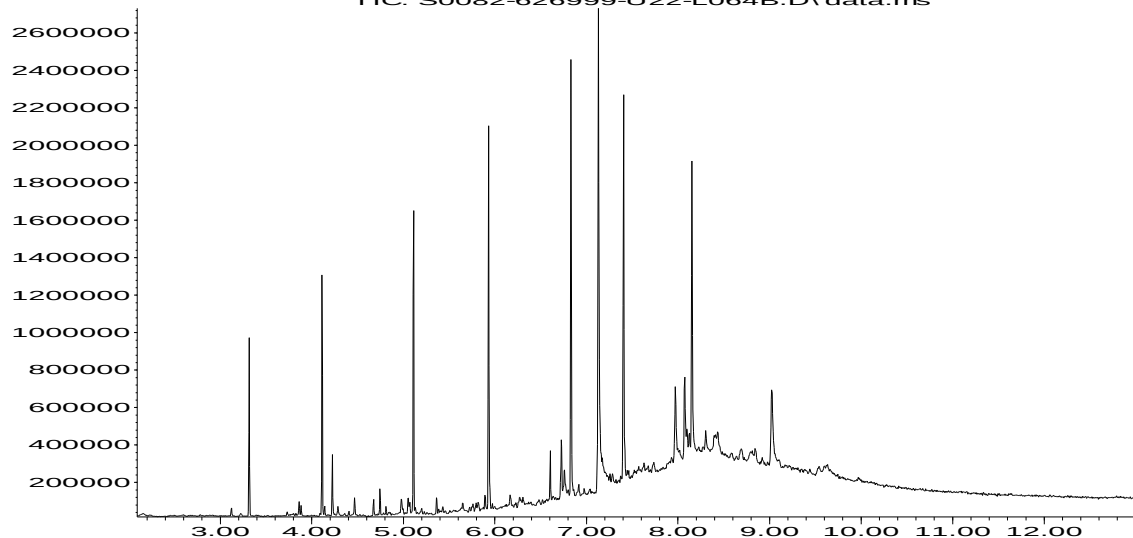
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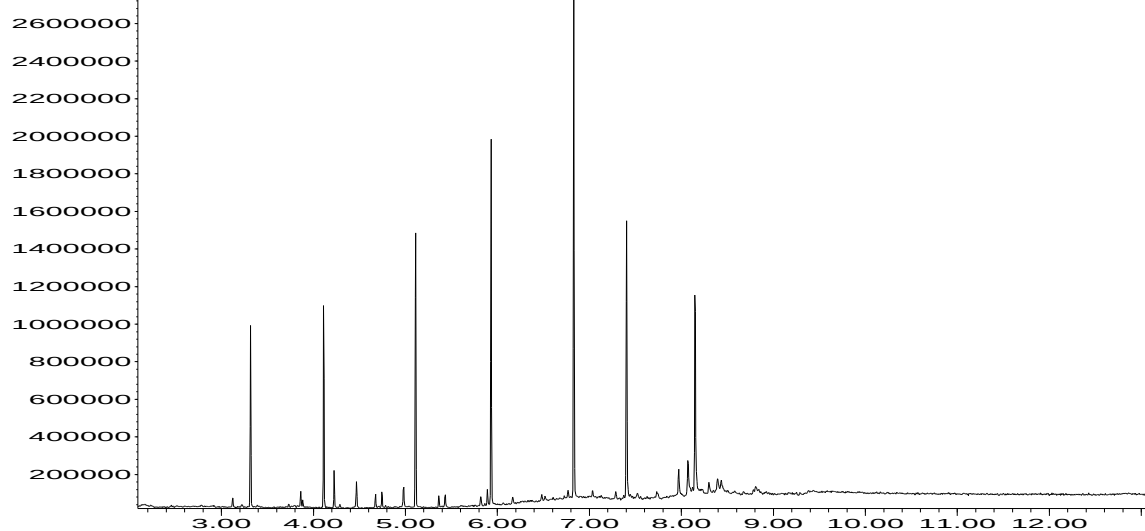
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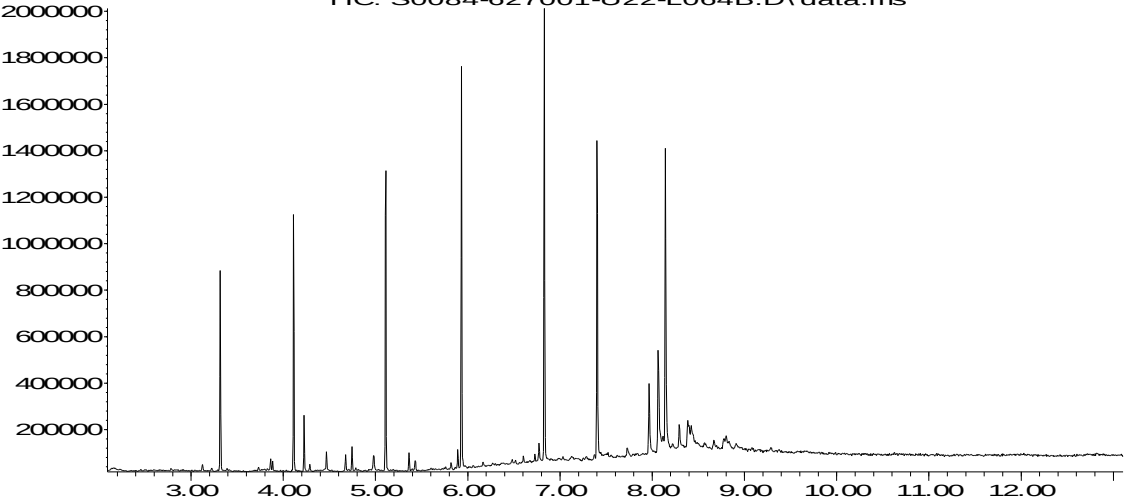
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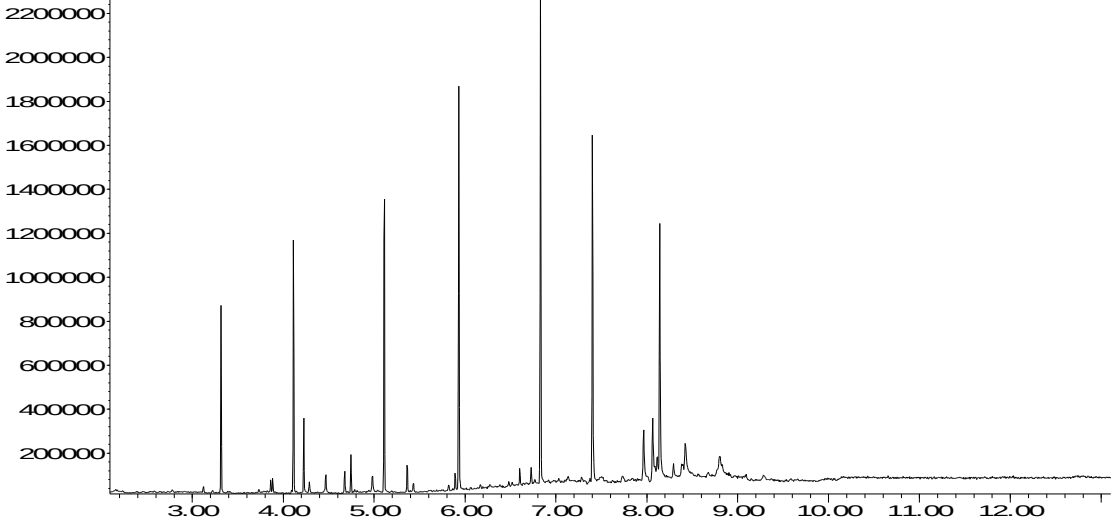
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