



Appendix C6

Bulk Earthworks Documentation – Soft Spot Area

NOTE ON REMEDIATION AROUND ATP 2

No root cause source of this contamination was found, e.g. no buried fuel tank. It appeared to be just a small accumulation of contaminated soil re-worked during the demolition of the factory that previously occupied the site.

The TPS Resident Engineer Amy Jones was appointed to supervise the excavation of the material, which was required to create the attenuation tank. This necessitated removal of all material for potential re-use on site in accordance with the MMP.

The excavated material with hydrocarbon contamination was windrowed adjacent to the excavation and subsequently re-tested by Redhill on 16/06/15 acting for Jones Bros at which point TPH was found to be below the level of contamination that required the material to be removed from site the material was then incorporated into the bund adjacent to Gate 1 (main site entrance and the Southern boundary of the site).

Laboratory test records relevant to the ATP2 material were not handed over but in terms of verification, the amount of potentially contaminated materials is very small and the end use of the area is particularly low risk (car park or landscape bund below 1m depth). In both cases the likelihood of a significant SPR being created is very low.

Document ref: C14656/005

10 April 2015

Lend Lease Construction (EMEA) Limited
Clarendon House
76-90 High Street
Solihull
West Midlands
B91 3TA

For the attention of Tom Maguire

Dear Tom

Re: Excavations 31/03/2015 in 'Soft Spot' and Attenuation Tank Area

Please find below our report on the investigations and testing carried out on Tuesday 31 March 2015. This letter (and the email that pre-ceded it) is intended to give you all the information that you need to progress matters, as confirmed in our site meeting on 10 April. The matter will be reported to the Local Authority as part of Validation Reporting.

Abbreviations in this letter are as follows: TPH = Total Petroleum Hydrocarbons; PAH = Polycyclic Aromatic Hydrocarbons; VOC = Volatile Organic Compounds; TIC = Tentatively Identified Compounds; SVOC = Semi Volatile Organic Compounds; GAC = Generic Acceptance Criteria (contaminant concentrations below which no risk anticipated).

Note that the basis of this risk assessment is that to Human Health. The site conceptual model rules out a risk to ground water because of the thickness of clay below the site.

1. Locations Investigated

Sketch plans attached show the locations of where the samples were taken from. These are:

- The 'soft spot' area; and
- The attenuation tank area.

2. Soil Samples Taken for Chemical Analysis

Samples Taken

Chemical analysis results are attached, coded as follows:

- S1-S4 and S6: edges of the soft spot area as excavated
- S5: base of soft spot area excavation beyond the limit of the concrete obstruction.

- SP1 –SP3: samples of the excavated material stockpile
- ATP1 –ATP5 (ATP4 not used): attenuation tank area pit samples

Testing and Results

The samples were subject to the following wide-spectrum test regime:

- Hydrock suite of inorganic compounds
- Speciated PAH
- TPH Level 2 (TPHCWG)
- VOC and TIC
- SVOC and TIC

3. Soft Spot Area

Methodology

This area contained soils identified as having hydrocarbon contamination. The material was excavated downwards as far as a concrete obstruction and outwards until there was no trace of hydrocarbon contamination by sight or smell and no significant readings on a portable PID device. Where the concrete base was not present, the excavation was taken down to natural clay. On completion, the pit was refilled using the excavated material as a temporary measure.

Observations

Please see photographs attached. The excavated material had a hydrocarbon odour and there was a 'sheen' on some soil samples but the material could not be described as grossly contaminated. Water that accumulated in the pit had a slight hydrocarbon sheen.

Soil Test Results

The laboratory test data are attached.

Interpretation

The data were run through a CLEA 1.06 spreadsheet for a commercial end use assumption with the following results:

Validation Samples S1 –S6 (all taken from approximately 1m below ground level):

- There are no exceedences of the GAC by inorganic substances
- There are no exceedences of the GAC by any of PAH species
- There are no exceedences of the GAC by any of TPH species
- No VOC were recorded above detection levels
- Several SVOC were recorded above detection levels but most of these were PAHs and all were less than the GAC value. The exception is a single 0.9 mg/kg concentration of Carbazole in S4 for which no UK GAC is available. However a USEPA references cites 24mg/kg as an acceptable value for a more

stringent residential end use (see attached); whilst this value is not strictly valid in the UK the source is authoritative and given the comparatively small concentration noted the risk is considered to be acceptably low.

Stockpile Samples SP1 –SP3

- There are no exceedences of the GAC by inorganic compounds
- There are no exceedences of the GAC by any of PAH species
- There are no exceedences of the GAC by any of TPH species
- No VOC were recorded above detection levels
- Several SVOC were recorded above detection levels but most of these were PAHs and all were less than the GAC value.

The stockpile test data were also processed using the CAT-Waste tool (output attached) and for all relevant parameters the material is categorised as non-hazardous waste.

Conclusions

- The discrepancy between the observed contamination (i.e. odour and sheens) and the laboratory testing is probably explained by the loss of volatiles as the material is excavated and stockpiled.
- The hot spot has been delineated laterally and the sides of the excavation have been validated at being acceptably 'clean';
- The quality of the material below the slab is unknown with the slab still in place

Recommendations

- The slab requires excavation and the material beneath it dug out until clean ground is proven across the relevant parts of the excavation;
- Given the slight potential odour nuisance (but accepting that contaminant concentrations are below the relevant GACs) it is recommended that the material that has been stockpiled and tested is used at depths >1.0m in the landscape bund
- The materials associated with the slab will require examination and testing on the basis of which their fate can be decided (noting that all testing to date has determined this material to be non-hazardous).

4. Attenuation Tank Area

Methodology

4 samples were taken from pits in the Attenuation tank area:

- ATP 1, ATP 3, and ATP 5: Trial Pits excavated under Hydrock supervision, soils sample taken from each
- ATP 4: Trial Pit excavated under Hydrock supervision; visually clean material, no sample taken
- ATP2: pit excavated by LL contractor, sample taken of black 'resin' material.

Observations

Please see photographs attached. Contamination was observed only in ATP2, where a black resinous material was encountered, and in ATP 5, which was similar to that encountered in the 'soft-spot' area.

Soil Test Results

The laboratory test data are attached.

Interpretation

The data were run through a CLEA 1.06 spreadsheet for a commercial end use assumption with the following results:

- There are no exceedences of the GAC by inorganic compounds
- There are no exceedences of the GAC by any of PAH species but in respect of ATP2 the material is recorded as unsuitable for testing, possibly because it is a resinous material only (no soil)
- There are several exceedences of the GAC for TPH species in ATP2 and one species in ATP5
- There are numerous VOC above detection in ATP2 but all values are below GAC (and there are some for which no GAC is available)
- There are numerous SVOC above detection in ATP5 and to a lesser extent in ATP2 including some for which no GAC is available but otherwise the concentrations are less than the GAC

Conclusions

- The key issue is the TPH contamination around ATP2 which is unacceptably high.
- The presence of VOCs and SVOCs above detection levels in other trial pits is noted but none of the materials are > GAC so, in principle, the materials arising from the attenuation tank excavation can be re-used on site, subject to stockpile testing (see below)

Recommendations

- The area around ATP2 is a contamination hot spot which requires excavation and removal until the sides and base of the excavation appear to be clean (same principle at the 'soft spot' area).
- The excavated material from the ATP 2 area will require stockpiling and testing to determine what its fate should be (at this stage, off-site disposal looks to be the most likely option)
- There is evidence from the testing at ATP3 and ATP5 that low-level organic contamination is present so it is suggested that this excavated material is stockpiled and testing to confirm its suitability for re-use on site or otherwise.

5. Note on Asbestos

Asbestos fibres (chrysotile) were reported in the soil sample from ATP1 but in none of the other samples. The stockpile testing should therefore include asbestos screening and quantification if the result is positive.



Attachments:

- Sketch plan of locations;
- Chemical test data;
- CLEA spreadsheets;
- Cat –Waste output;
- Photographs.

**Yours sincerely
for Hydrock**

A handwritten signature in blue ink, appearing to read 'Eric Cooper'.

**Eric Cooper SiLC
Technical Director**

ericcooper@hydrock.com



Notes:

DEVELOPMENT FOOTPRINT AREA

AREA 1

Survey Key (Major Features)

Bushes

ATP1 - Trial pit location within attenuation tank

S1 - Validation samples

Approximate location of excavation

A	07/10/14	Slight Annotations	LW	TW
Rev	Date	Description	By	Cld
Architect:				
Client:				
LEND LEASE				
Project Title:				
NORTH WALES PRISON				
Drawing Title:				
VALIDATION SAMPLE LOCATION PLAN				
Drawing Status:				
FINAL				
Hydrock Job No:				
C/14656				
Drawn	Checked	Scale @ A1	Date	Issue Date
RD	EC	As Shown	10/09/14	10/09/14
Drawing Number:				Revision:
				A

**Richard Dawid**

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Analytical Report Number : 15-69370

Project / Site name: Wrexham Prison

Your job number: C14656

Your order number:

Report Issue Number: 1

Samples Analysed: 13 soil samples

Samples received on: 02/04/2015

Samples instructed on: 02/04/2015

Analysis completed by: 08/04/2015

Report issued on: 08/04/2015

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

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

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

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.



4041



Analytical Report Number: 15-69370

Project / Site name: Wrexham Prison

Lab Sample Number				431322	431323	431324	431325	431326	431327
Sample Reference				S1	S2	S3	S4	S5	S6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015
Time Taken				None Supplied	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	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	4.8	3.9	6.5	5.5	16	9.0
Total mass of sample received	kg	0.001	NONE	0.54	0.54	0.53	0.51	0.47	0.51

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected

General Inorganics

pH	pH Units	N/A	MCERTS	8.5	8.5	8.3	8.1	8.1	8.1
Free Cyanide	mg/kg	1	NONE	< 1	< 1	< 1	< 1	< 1	< 1
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0082	0.022	0.027	0.085	0.0047	0.11
Water Soluble Sulphate (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	8.2	21.5	27.4	85.4	4.7	106
Fraction Organic Carbon (FOC)	N/A	0.00001	NONE	0.0015	0.0023	0.0015	0.0006	0.0007	0.0004

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 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	0.66	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	2.5	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	2.4	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.48	12	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.13	3.8	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.40	10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.32	8.1	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	3.8	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	3.1	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	2.7	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	1.6	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	2.5	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	1.2	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.29	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	1.2	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	56.0	< 1.60	< 1.60
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.6	9.4	7.8	7.5	5.7	7.8
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.6	0.7	0.6	1.2	1.5	0.6
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.5	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	21	23	13	13	44	20
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	23	13	13	44	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	27	21	24	31	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	29	16	19	26	21
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	30	30	21	27	46	28
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	23	26	20	35	41	29
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	60	59	41	50	75	63



Analytical Report Number: 15-69370

Project / Site name: Wrexham Prison

Lab Sample Number				431322	431323	431324	431325	431326	431327
Sample Reference				S1	S2	S3	S4	S5	S6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015
Time Taken				None Supplied	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	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 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	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 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	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 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	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 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	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 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	2.4	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	13	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	NONE	< 10	< 10	< 10	13	< 10	< 10
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 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	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 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	2.1	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	33	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	120	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	190	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	12	< 8.4	< 8.4



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Lab Sample Number	431322	431323	431324	431325	431326	431327
Sample Reference	S1	S2	S3	S4	S5	S6
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied

Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						
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VOCs

Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 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	< 1.0
1,1-dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 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	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	< 1.0	< 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	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	MCERTS	< 1.0	< 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	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
P-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 15-69370

Project / Site name: Wrexham Prison

Lab Sample Number				431322	431323	431324	431325	431326	431327
Sample Reference				S1	S2	S3	S4	S5	S6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.66	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	0.5	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	2.5	< 0.10	< 0.10
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	1.7	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	2.4	< 0.10	< 0.10
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.48	12	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.13	3.8	< 0.10	< 0.10
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	0.9	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.40	10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.32	8.1	< 0.10	< 0.10
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	3.8	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	3.1	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	2.7	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	1.6	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	2.5	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	1.2	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.29	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	1.2	< 0.05	< 0.05



Analytical Report Number: 15-69370

Project / Site name: Wrexham Prison

Lab Sample Number	431328	431329	431330	431331	431332	431333
Sample Reference	SP1	SP2	SP3	ATP1	ATP2	ATP3
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015
Time Taken	None Supplied	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	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	19	8.8	12	5.5	15	13
Total mass of sample received	kg	0.001	NONE	0.51	0.60	0.52	0.50	0.48	0.54

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	Chrysotile- Loose fibres	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Detected	Not-detected	Not-detected

General Inorganics

pH	pH Units	N/A	MCERTS	7.8	8.0	7.9	8.4	U/S	7.8
Free Cyanide	mg/kg	1	NONE	< 1	< 1	< 1	< 1	< 1	< 1
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.13	0.055	0.14	0.013	0.24	0.33
Water Soluble Sulphate (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	129	54.8	139	13.1	235	327
Fraction Organic Carbon (FOC)	N/A	0.00001	NONE	0.0034	0.0004	0.0041	0.0021	0.061	0.0028

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 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	U/S	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	U/S	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	U/S	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	U/S	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	0.65	< 0.10	0.91	< 0.10	6.0	< 0.10
Anthracene	mg/kg	0.1	MCERTS	0.13	< 0.10	0.16	< 0.10	U/S	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	0.78	< 0.10	0.81	< 0.10	U/S	0.40
Pyrene	mg/kg	0.1	MCERTS	0.57	< 0.10	0.65	< 0.10	U/S	0.34
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.34	< 0.10	0.29	< 0.10	U/S	0.19
Chrysene	mg/kg	0.05	MCERTS	0.23	< 0.05	0.29	< 0.05	U/S	0.21
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.37	< 0.10	0.32	< 0.10	U/S	0.27
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.16	< 0.10	0.12	< 0.10	U/S	0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.26	< 0.10	0.22	< 0.10	U/S	0.21
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	U/S	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	U/S	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	U/S	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	3.49	< 1.60	3.77	< 1.60	5.99	1.72
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.3	7.0	8.0	9.3	4.1	9.0
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.8	0.6	0.6	0.6	0.3	0.8
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2	< 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	< 1.2
Chromium (III)	mg/kg	1	NONE	23	26	17	18	16	25
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	26	17	18	16	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	29	57	23	20	38
Lead (aqua regia extractable)	mg/kg	1	MCERTS	33	26	34	22	93	53
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	33	23	25	15	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	29	29	25	21	18	28
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	53	100	63	51	180	66



Analytical Report Number: 15-69370

Project / Site name: Wrexham Prison

Lab Sample Number				431328	431329	431330	431331	431332	431333
Sample Reference				SP1	SP2	SP3	ATP1	ATP2	ATP3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015
Time Taken				None Supplied	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	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	110000	31
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	45000	1.7
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	100000	5.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	46000	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 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	1.0	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	1300	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	2600	0.2
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	89	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	19	< 2.0	< 2.0	< 2.0	620	3.2
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	40	12	9.0	< 8.0	28000	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	18	27	16	< 8.0	38000	29
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	NONE	58	39	25	< 10	66000	29
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	450	< 8.4

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 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	110	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	280	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	1.2	< 1.0	< 1.0	< 1.0	49	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	7.8	< 2.0	< 2.0	< 2.0	750	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	20	< 10	< 10	< 10	30000	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	110000	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	22000	< 8.4



Analytical Report Number: 15-69370

Project / Site name: Wrexham Prison

Lab Sample Number				431328	431329	431330	431331	431332	431333
Sample Reference				SP1	SP2	SP3	ATP1	ATP2	ATP3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						
VOCs									
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 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	< 1.0
1,1-dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	110000	31
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	45000	1.7
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	100000	5.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	46000	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	7700	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	3900	< 1.0
2-Chlorotoluene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	4100	< 1.0
Tert-Butylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	2200	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	6500	< 1.0
Sec-Butylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	370	< 1.0
1,3-dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
P-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	170	< 1.0
1,2-dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	1000	< 1.0
1,4-dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	290	< 1.0
Butylbenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 15-69370

Project / Site name: Wrexham Prison

Lab Sample Number				431328	431329	431330	431331	431332	431333
Sample Reference				SP1	SP2	SP3	ATP1	ATP2	ATP3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015	31/01/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status						
SVOCs									
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.8	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	3.3	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	U/S	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	1.0	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	U/S	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	U/S	< 0.10
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	U/S	< 0.10
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.1	MCERTS	0.65	< 0.10	0.91	< 0.10	6.0	< 0.10
Anthracene	mg/kg	0.1	MCERTS	0.13	< 0.10	0.16	< 0.10	U/S	< 0.10
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.1	MCERTS	0.78	< 0.10	0.81	< 0.10	U/S	0.40
Pyrene	mg/kg	0.1	MCERTS	0.57	< 0.10	0.65	< 0.10	U/S	0.34
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.34	< 0.10	0.29	< 0.10	U/S	0.19
Chrysene	mg/kg	0.05	MCERTS	0.23	< 0.05	0.29	< 0.05	U/S	0.21
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.37	< 0.10	0.32	< 0.10	U/S	0.27
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.16	< 0.10	0.12	< 0.10	U/S	0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.26	< 0.10	0.22	< 0.10	U/S	0.21
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	U/S	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	U/S	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	U/S	< 0.05

Analytical Report Number: 15-69370

Project / Site name: Wrexham Prison

Lab Sample Number				431334		
Sample Reference				ATP5		
Sample Number				None Supplied		
Depth (m)				None Supplied		
Date Sampled				31/01/2015		
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	6.4		
Total mass of sample received	kg	0.001	NONE	0.56		

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected		

General Inorganics

pH	pH Units	N/A	MCERTS	8.1		
Free Cyanide	mg/kg	1	NONE	< 1		
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.13		
Water Soluble Sulphate (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	132		
Fraction Organic Carbon (FOC)	N/A	0.00001	NONE	0.0078		

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	1.9		
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10		
Acenaphthene	mg/kg	0.1	MCERTS	0.50		
Fluorene	mg/kg	0.1	MCERTS	0.93		
Phenanthrene	mg/kg	0.1	MCERTS	4.2		
Anthracene	mg/kg	0.1	MCERTS	2.7		
Fluoranthene	mg/kg	0.1	MCERTS	2.2		
Pyrene	mg/kg	0.1	MCERTS	1.4		
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.42		
Chrysene	mg/kg	0.05	MCERTS	0.40		
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.29		
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.11		
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.20		
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	15.2		
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.7		
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4		
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2		
Chromium (III)	mg/kg	1	NONE	17		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	66		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	110		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	25		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	200		

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Project / Site name: Wrexham Prison

Lab Sample Number				431334		
Sample Reference				ATP5		
Sample Number				None Supplied		
Depth (m)				None Supplied		
Date Sampled				31/01/2015		
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	19		
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	3.3		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	69		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	420		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	180		
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	NONE	600		
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	1.4		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	55		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	170		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	77		
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4		

Analytical Report Number: 15-69370

Project / Site name: Wrexham Prison

Lab Sample Number				431334		
Sample Reference				ATP5		
Sample Number				None Supplied		
Depth (m)				None Supplied		
Date Sampled				31/01/2015		
Time Taken				None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
VOCs						
Chloromethane	µg/kg	1	ISO 17025	< 1.0		
Chloroethane	µg/kg	1	ISO 17025	< 1.0		
Bromomethane	µg/kg	1	ISO 17025	< 1.0		
Vinyl Chloride	µg/kg	1	ISO 17025	< 1.0		
Trichlorofluoromethane	µg/kg	1	ISO 17025	< 1.0		
1,1-dichloroethene	µg/kg	1	MCERTS	< 1.0		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0		
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0		
1,1-dichloroethane	µg/kg	1	MCERTS	< 1.0		
2,2-Dichloropropane	µg/kg	1	NONE	< 1.0		
Trichloromethane	µg/kg	1	MCERTS	< 1.0		
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0		
1,2-dichloroethane	µg/kg	1	MCERTS	< 1.0		
1,1-Dichloropropene	µg/kg	1	NONE	< 1.0		
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0		
Benzene	µg/kg	1	MCERTS	< 1.0		
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0		
1,2-dichloropropane	µg/kg	1	MCERTS	< 1.0		
Trichloroethene	µg/kg	1	MCERTS	< 1.0		
Dibromomethane	µg/kg	1	MCERTS	< 1.0		
Bromodichloromethane	µg/kg	1	NONE	< 1.0		
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0		
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0		
Toluene	µg/kg	1	MCERTS	19		
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0		
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0		
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0		
Tetrachloroethene	µg/kg	1	MCERTS	< 1.0		
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0		
Chlorobenzene	µg/kg	1	MCERTS	< 1.0		
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0		
p & m-xylene	µg/kg	1	MCERTS	< 1.0		
Styrene	µg/kg	1	MCERTS	< 1.0		
Tribromomethane	µg/kg	1	MCERTS	< 1.0		
o-xylene	µg/kg	1	MCERTS	< 1.0		
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0		
Isopropylbenzene	µg/kg	1	NONE	< 1.0		
Bromobenzene	µg/kg	1	MCERTS	< 1.0		
N-Propylbenzene	µg/kg	1	ISO 17025	< 1.0		
2-Chlorotoluene	µg/kg	1	NONE	< 1.0		
4-Chlorotoluene	µg/kg	1	NONE	< 1.0		
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0		
Tert-Butylbenzene	µg/kg	1	NONE	< 1.0		
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0		
Sec-Butylbenzene	µg/kg	1	NONE	< 1.0		
1,3-dichlorobenzene	µg/kg	1	ISO 17025	3300		
P-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0		
1,2-dichlorobenzene	µg/kg	1	MCERTS	< 1.0		
1,4-dichlorobenzene	µg/kg	1	MCERTS	210		
Butylbenzene	µg/kg	1	NONE	< 1.0		
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0		
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	43000		
Hexachlorobutadiene	µg/kg	1	NONE	< 1.0		
1,2,3-Trichlorobenzene	µg/kg	1	NONE	9700		

Analytical Report Number: 15-69370

Project / Site name: Wrexham Prison

Lab Sample Number				431334		
Sample Reference				ATP5		
Sample Number				None Supplied		
Depth (m)				None Supplied		
Date Sampled				31/01/2015		
Time Taken				None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
SVOCs						
Aniline	mg/kg	0.1	NONE	< 0.1		
Phenol	mg/kg	0.2	ISO 17025	< 0.2		
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1		
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2		
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	5.5		
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	0.8		
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2		
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1		
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3		
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05		
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3		
4-Methylphenol	mg/kg	0.2	NONE	< 0.2		
Isophorone	mg/kg	0.2	MCERTS	< 0.2		
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3		
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3		
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3		
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	48		
Naphthalene	mg/kg	0.05	MCERTS	1.9		
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3		
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1		
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1		
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1		
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1		
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2		
2-Methylnaphthalene	mg/kg	0.1	NONE	0.3		
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1		
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1		
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1		
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10		
Acenaphthene	mg/kg	0.1	MCERTS	0.50		
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2		
Dibenzofuran	mg/kg	0.2	MCERTS	0.9		
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3		
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2		
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2		
Fluorene	mg/kg	0.1	MCERTS	0.93		
Azobenzene	mg/kg	0.3	MCERTS	< 0.3		
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2		
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3		
Phenanthrene	mg/kg	0.1	MCERTS	4.2		
Anthracene	mg/kg	0.1	MCERTS	2.7		
Carbazole	mg/kg	0.3	MCERTS	1.2		
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2		
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3		
Fluoranthene	mg/kg	0.1	MCERTS	2.2		
Pyrene	mg/kg	0.1	MCERTS	1.4		
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3		
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.42		
Chrysene	mg/kg	0.05	MCERTS	0.40		
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.29		
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.11		
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.20		
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		



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* 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 *
431322	S1	None Supplied	None Supplied	Light brown sand with gravel.
431323	S2	None Supplied	None Supplied	Light brown sand with gravel.
431324	S3	None Supplied	None Supplied	Light brown sand with gravel.
431325	S4	None Supplied	None Supplied	Light brown sand with gravel.
431326	S5	None Supplied	None Supplied	Light brown clay.
431327	S6	None Supplied	None Supplied	Light brown sand with gravel.
431328	SP1	None Supplied	None Supplied	Light brown sandy clay with gravel.
431329	SP2	None Supplied	None Supplied	Light brown gravelly sand.
431330	SP3	None Supplied	None Supplied	Light brown sand with gravel.
431331	ATP1	None Supplied	None Supplied	Light brown sand with gravel.
431332	ATP2	None Supplied	None Supplied	Black tar with gravel and oil / petroleum.
431333	ATP3	None Supplied	None Supplied	Light brown topsoil and clay with gravel and vegetation.
431334	ATP5	None Supplied	None Supplied	Brown gravelly topsoil with clinker.

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Project / Site name: Wrexham 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	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-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	NONE
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	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-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. Stones not passing through a 10 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample results are not corrected for the stone content of the sample.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by extraction with water followed by ICP-OES. Results reported corrected for extraction ratio (soil equivalent) as g/l and mg/kg; and upon the 2:1 leachate (g/l).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPH Chromatogram	TPH Chromatogram.	In-house method	L064-PL	D	NONE



Analytical Report Number : 15-69370

Project / Site name: Wrexham 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
TPH in (Soil)	Determination of TPH bands by GC-MS/GC-FID	In-house method, TPH with carbon banding.	L064-PL		NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-PL	W	MCERTS

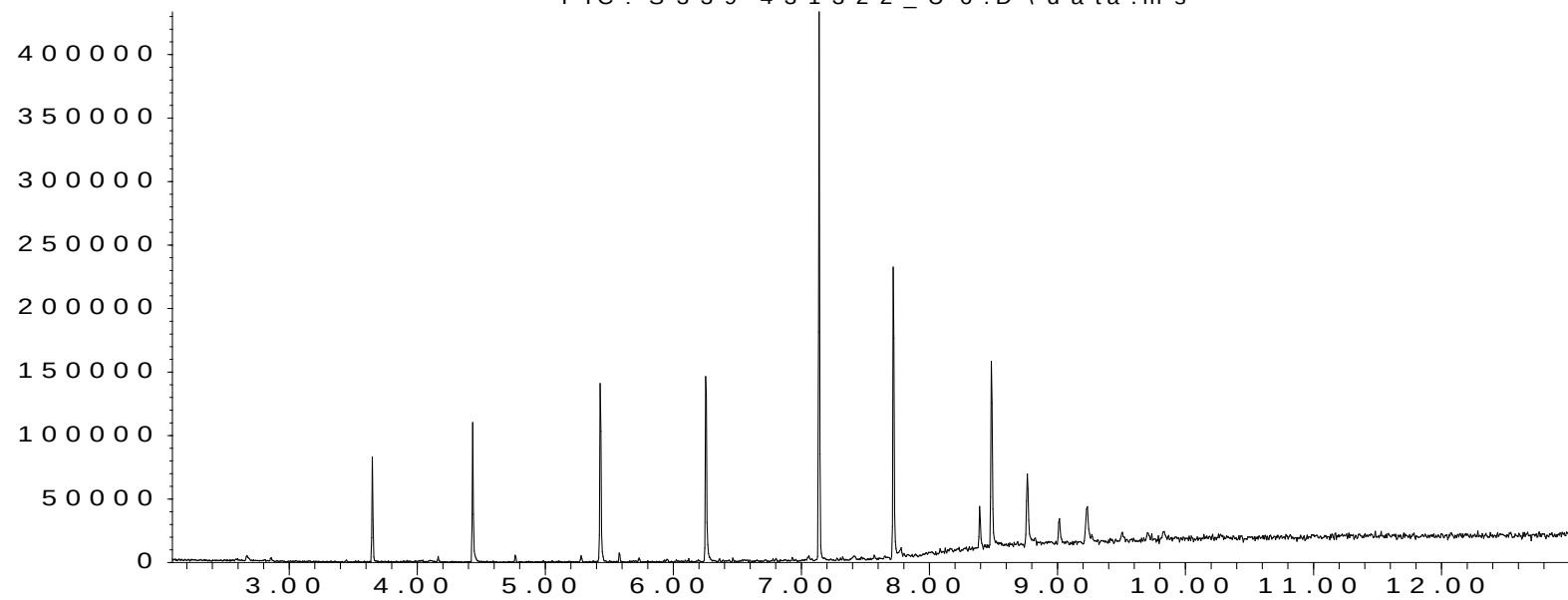
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

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 30°C.

Abundance

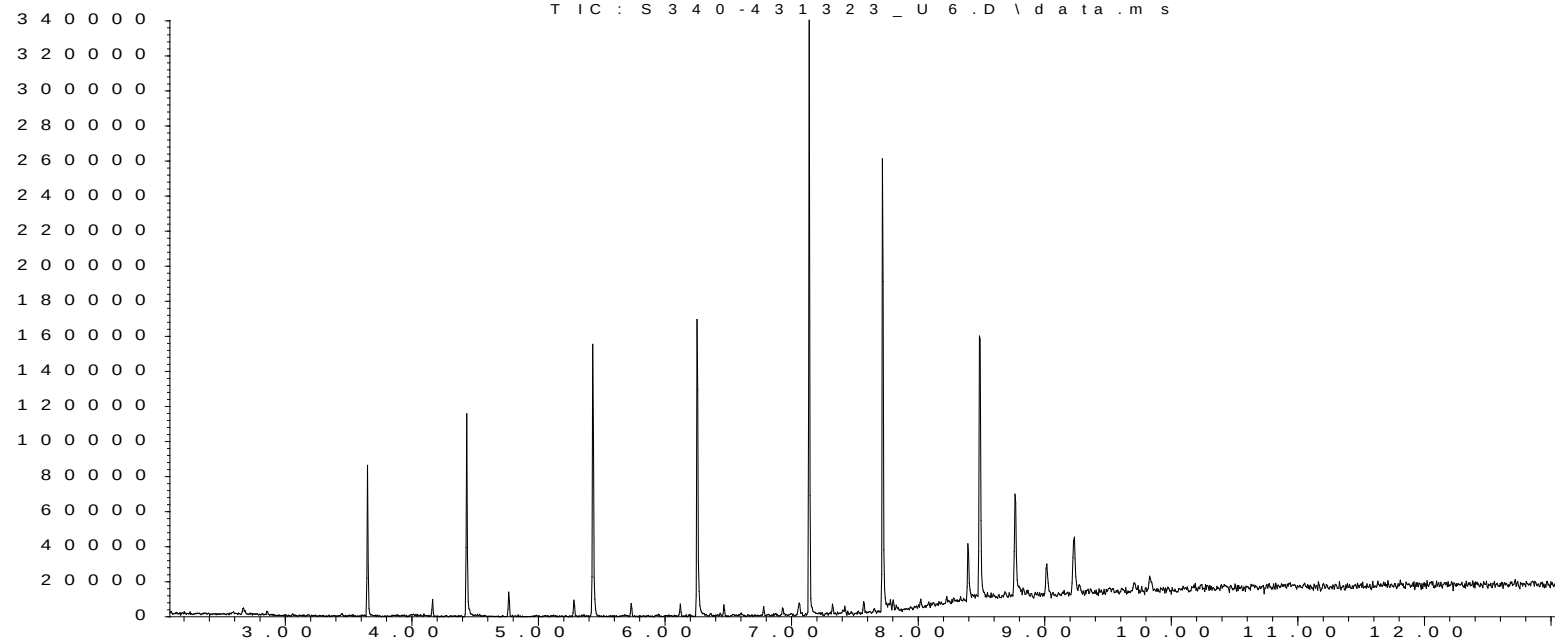
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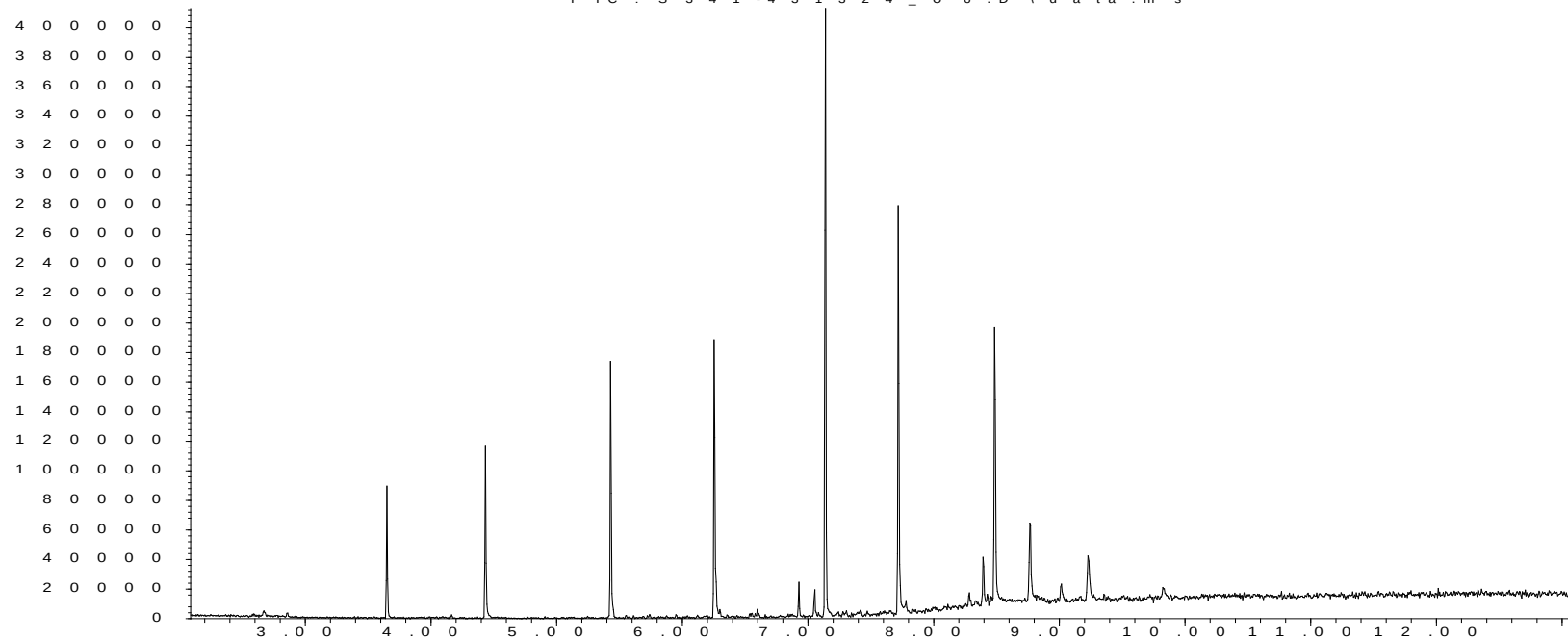
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T i m e -->

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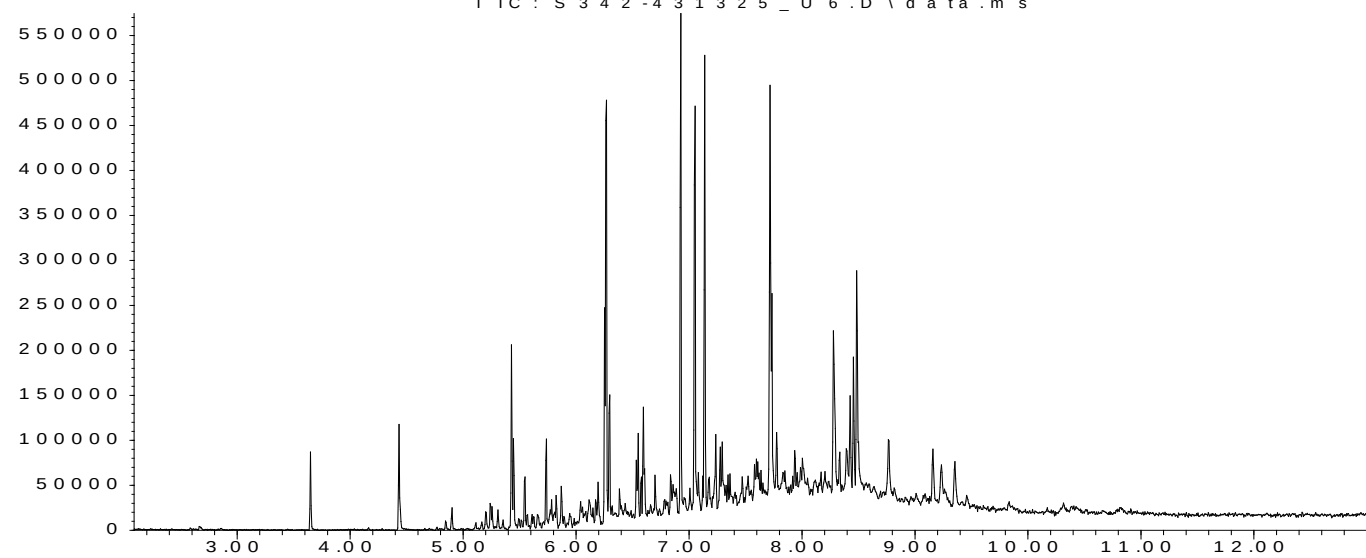
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T i m e - - >

Abundance

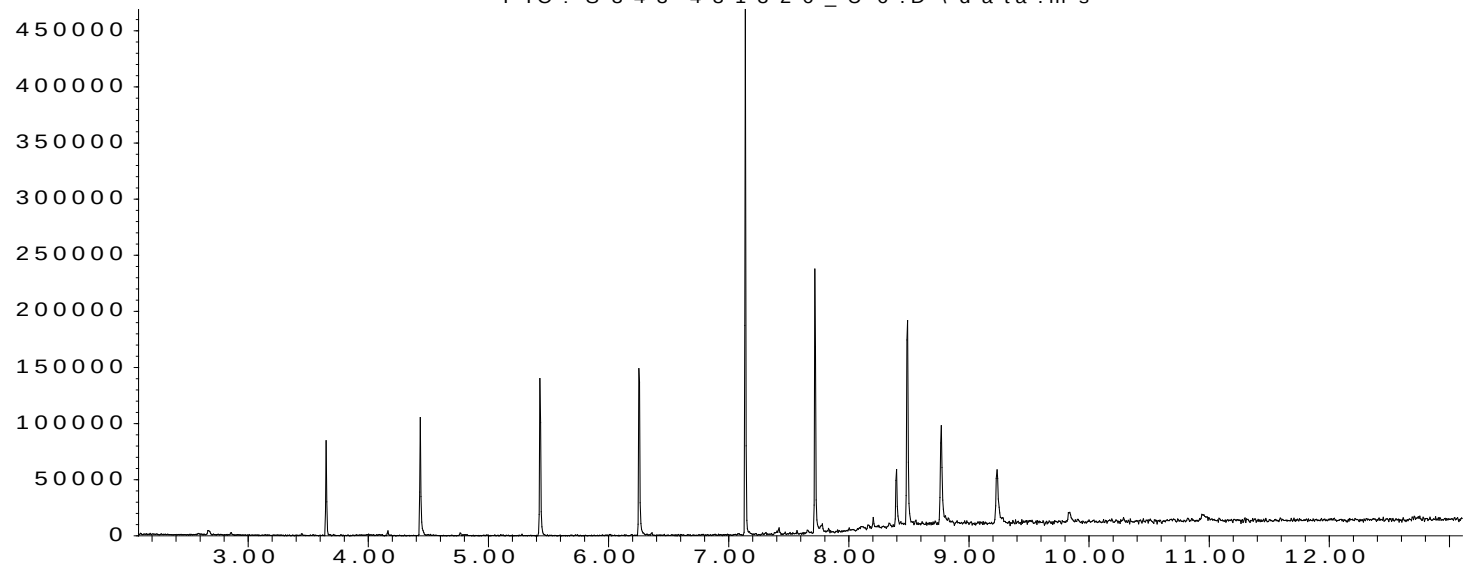
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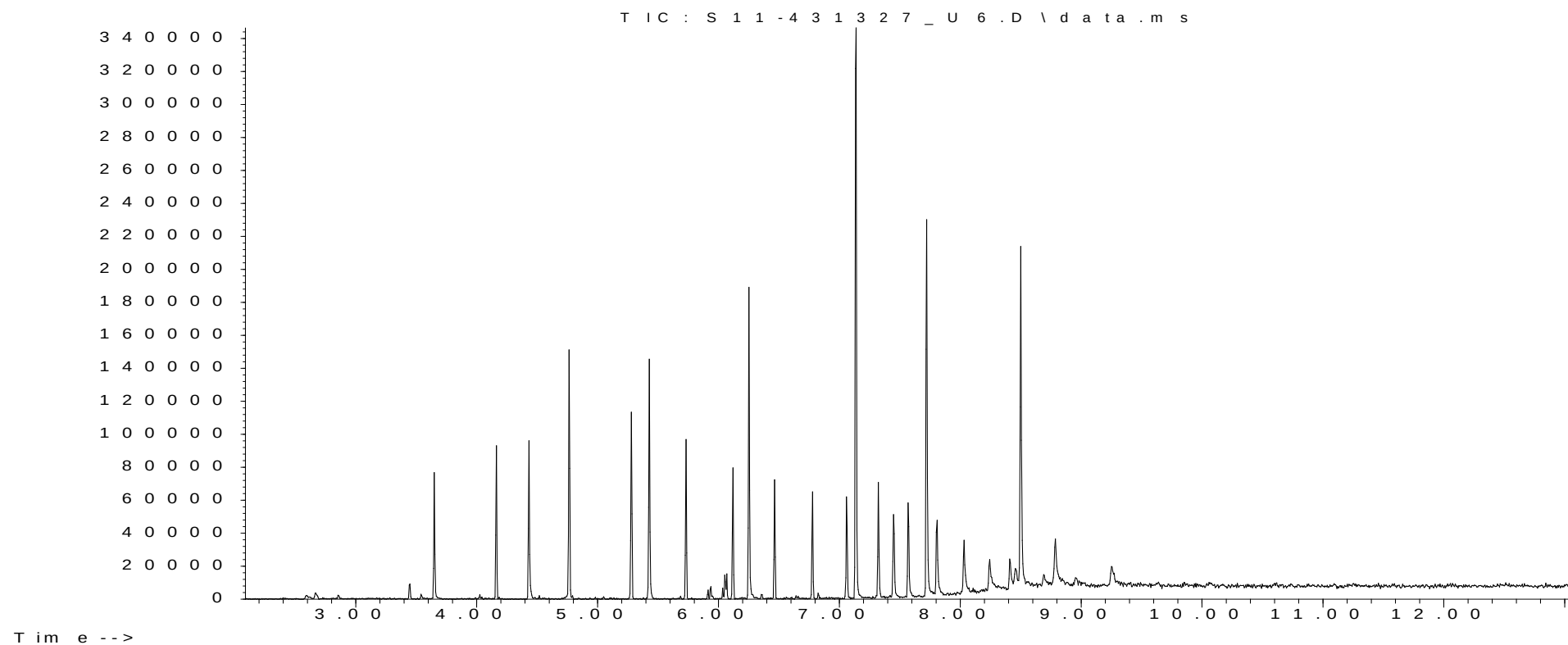
Abundance

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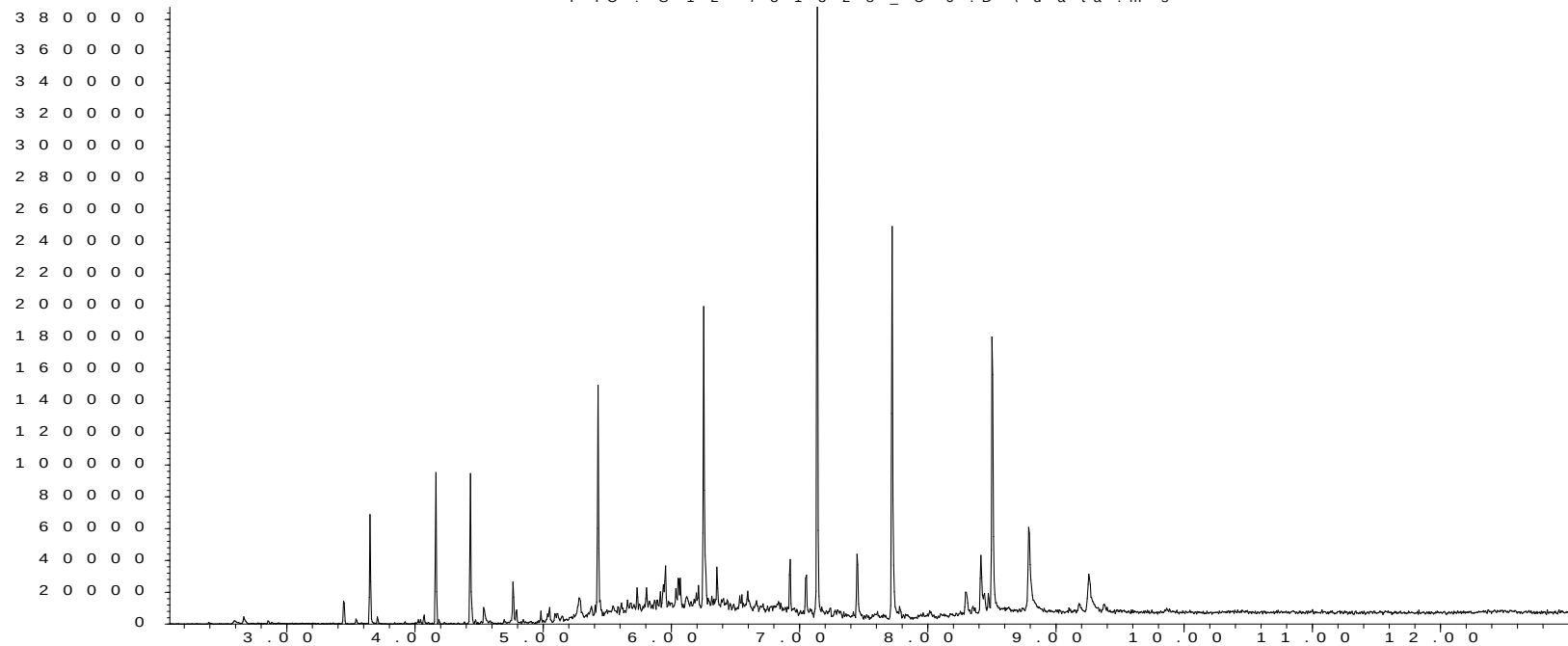
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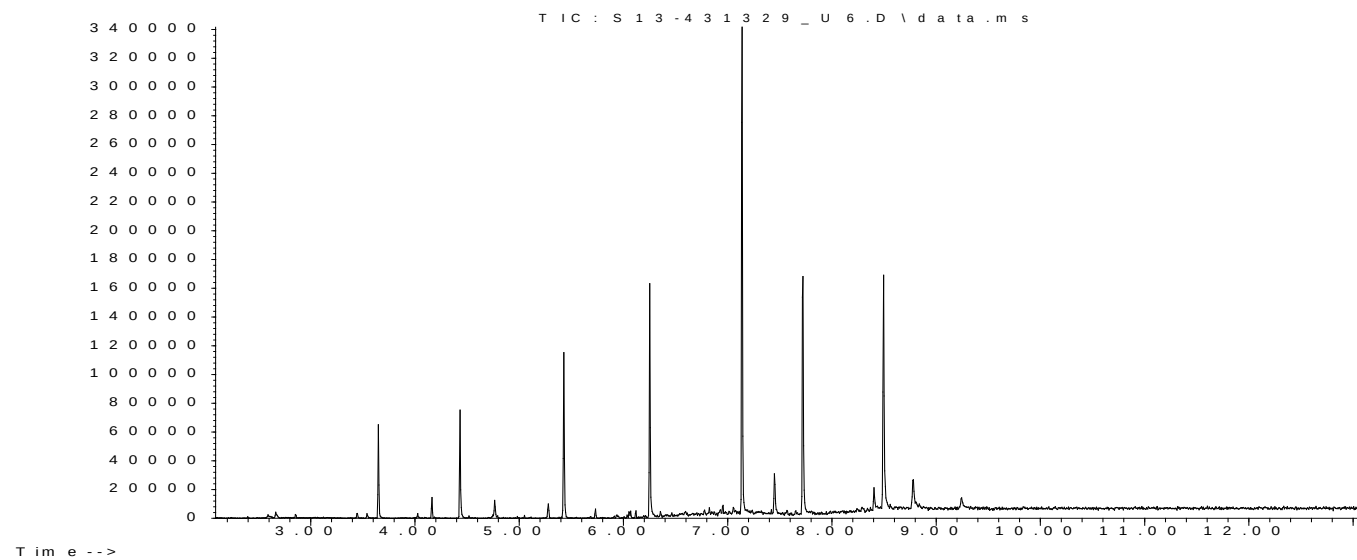
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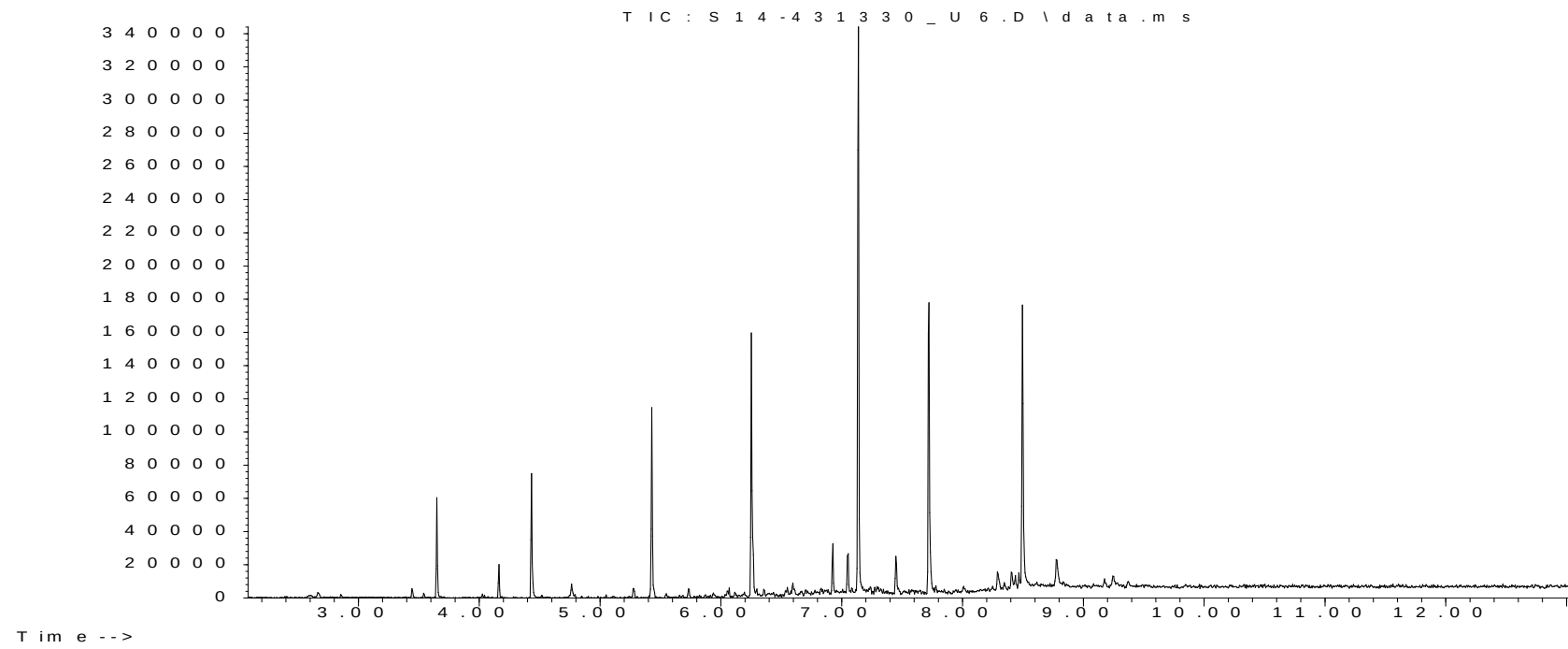


T i m e - - >

A b u n d a n c e

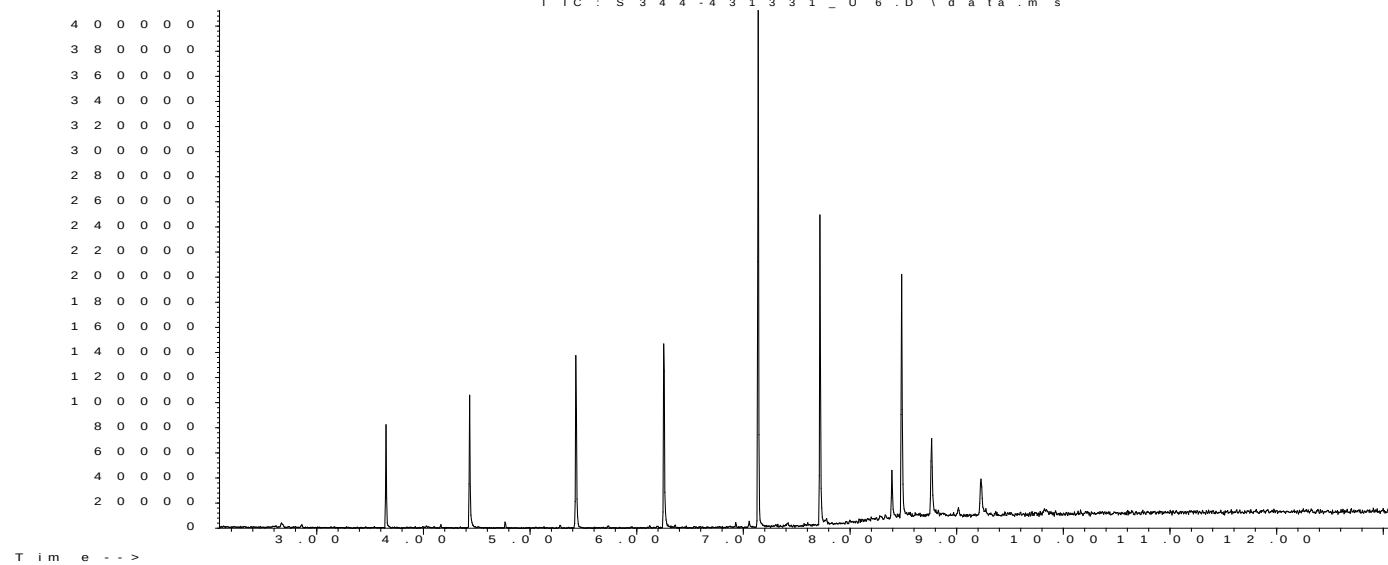


Abundance



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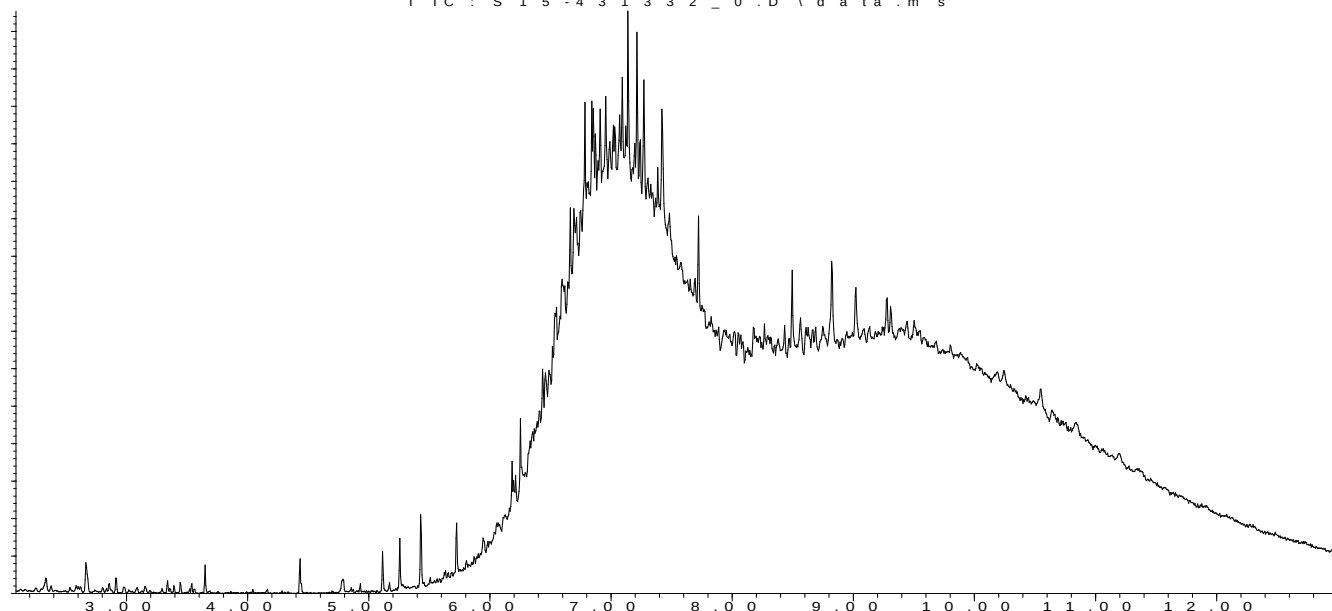


A b u n d a n c e

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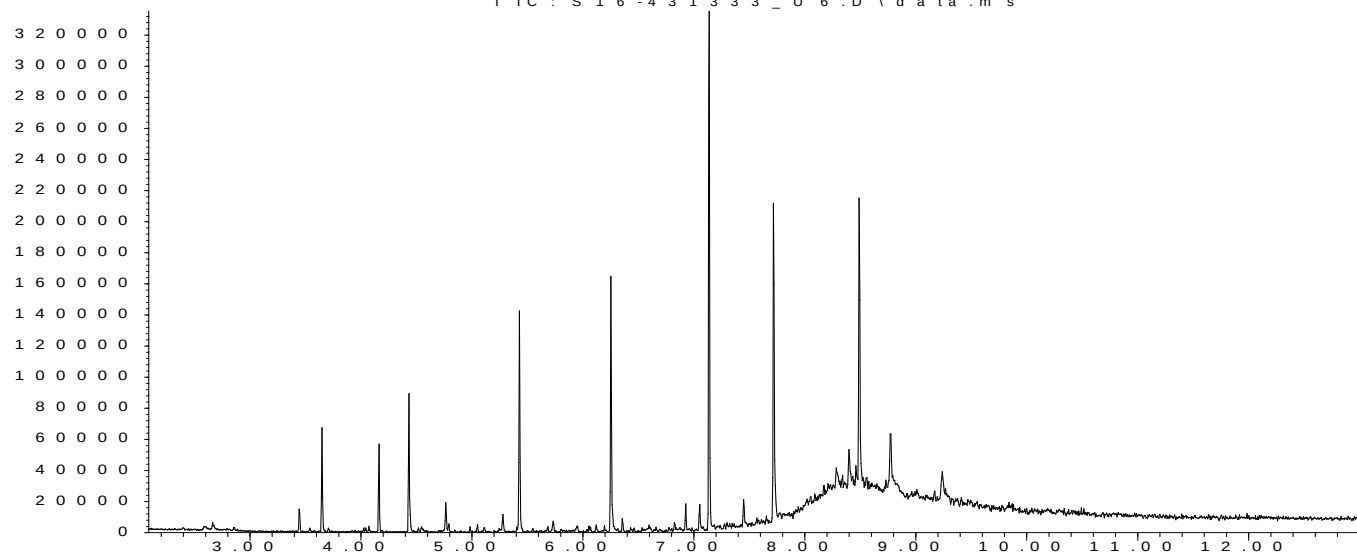
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7 0 0 0 0 0
6 0 0 0 0 0
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0

T i m e - - >



Abundance

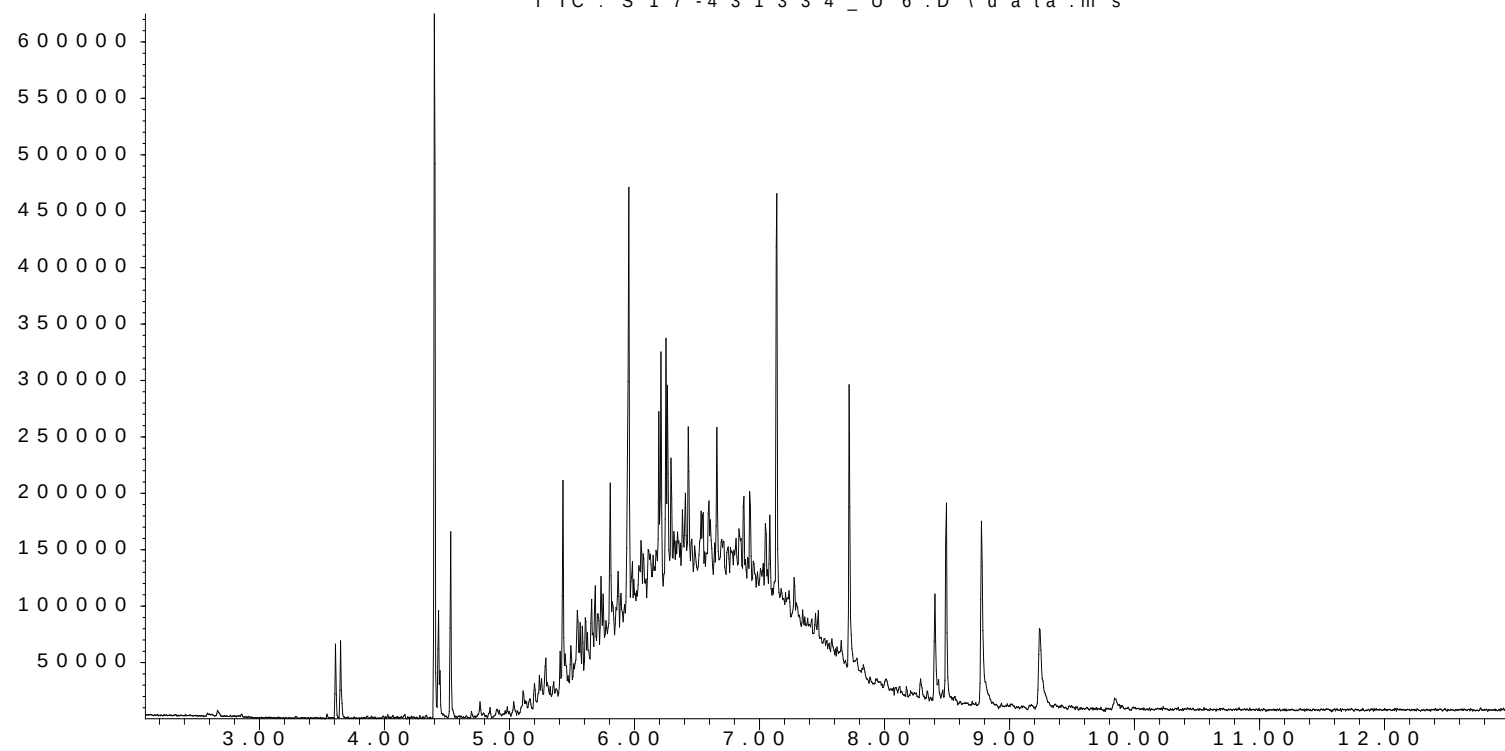
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Time -->

Abundance

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Time-->

Assessment of Chemicals of Potential Concern to Human Health



All values in mg/kg unless otherwise stated								Soil Type														
								Location & Depth	S1	S2	S3	S4	S5	S6	SP1	SP2	SP3	ATP1	ATP2	ATP3	ATP5	
Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US ₉₅	Result of Significance Test														
Arsenic	1	13	4.1	20	0	640	13.149771	POTENTIALLY SUITABLE FOR USE	9.6	9.4	7.8	7.5	5.7	7.8	6.3	7	8	9.3	4.1	9	20	
Beryllium	0.06	13	0.3	1.5	0	390	1.1063669	POTENTIALLY SUITABLE FOR USE	0.6	0.7	0.6	1.2	1.5	0.6	0.8	0.6	0.6	0.6	0.3	0.8	0.7	
Boron	0.2	13	0.2	0.2	0	190000	0.2	POTENTIALLY SUITABLE FOR USE	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
Cadmium	0.2	13	0.2	0.5	0	220	0.3546422	POTENTIALLY SUITABLE FOR USE	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	
Chromium (III)	1	13	13	44	0	8400	30.931833	POTENTIALLY SUITABLE FOR USE	21	23	13	13	44	20	23	26	17	18	16	25	17	
Chromium (VI)	1.2	13	1.2	1.2	0	33	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
Copper	1	13	20	66	0	69000	49.370739	POTENTIALLY SUITABLE FOR USE	31	27	21	24	31	27	31	29	57	23	20	38	66	
Lead	1	13	16	110	0	2330	74.490852	POTENTIALLY SUITABLE FOR USE	21	29	16	19	26	21	33	26	34	22	93	53	110	
Mercury, inorganic	0.3	13	0.3	0.3	0	3600	0.3	POTENTIALLY SUITABLE FOR USE	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
Nickel	1	13	15	46	0	1700	36.403704	POTENTIALLY SUITABLE FOR USE	30	30	21	27	46	28	25	33	23	25	15	30	27	
Selenium	1	13	1	1	0	13000	1	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1	1	1	1	1	1	1	1	
Vanadium	1	13	18	41	0	3100	34.36306	POTENTIALLY SUITABLE FOR USE	23	26	20	35	41	29	29	29	25	21	18	28	25	
Zinc	1	13	41	200	0	670000	142.47653	POTENTIALLY SUITABLE FOR USE	60	59	41	50	75	63	53	100	63	51	180	66	200	
Cyanide (free)	1	13	1	1	0	16000	1	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1	1	1	1	1	1	1	1	
Phenol (total)	1	13	1	1	0	760	1	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1	1	1	1	1	1	1	1	
Acenaphthene	0.1	12	0.1	2.5	0	84000	1.2042316	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	2.5	0.1	0.1	0.1	0.1	0.1	0.1	U/S	0.1	0.5	
Acenaphthylene	0.1	12	0.1	0.1	0	83000	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	U/S	0.1	0.1	
Anthracene	0.1	12	0.1	3.8	0	520000	2.2006267	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.13	3.8	0.1	0.1	0.13	0.1	0.16	0.1	U/S	0.1	2.7	
Benz(a)anthracene	0.1	12	0.1	3.8	0	86	1.8025588	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	3.8	0.1	0.1	0.34	0.1	0.29	0.1	U/S	0.19	0.42	
Benzo(a)pyrene	0.1	12	0.1	2.5	0	14	1.2000302	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	2.5	0.1	0.1	0.26	0.1	0.22	0.1	U/S	0.21	0.2	
Benzo(b)fluoranthene	0.1	12	0.1	2.7	0	97	1.313518	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	2.7	0.1	0.1	0.37	0.1	0.32	0.1	U/S	0.27	0.29	
Benzo(ghi)perylene	0.05	12	0.05	1.2	0	630	0.5636667	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05	1.2	0.05	0.05	0.05	0.05	0.05	0.05	U/S	0.05	0.05	
Benzo(k)fluoranthene	0.1	12	0.1	1.6	0	140	0.7749739	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	1.6	0.1	0.1	0.16	0.1	0.12	0.1	U/S	0.1	0.11	
Chrysene	0.05	12	0.05	3.1	0	140	1.4697205	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05	3.1	0.05	0.05	0.23	0.05	0.29	0.05	U/S	0.21	0.4	
Dibenz(a,h)anthracene	0.1	12	0.1	0.29	0	12	0.1848667	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.29	0.1	0.1	0.1	0.1	0.1	0.1	U/S	0.1	0.1	
Fluoranthene	0.1	12	0.1	10	0	23000	4.8106877	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.4	10	0.1	0.1	0.78	0.1	0.81	0.1	U/S	0.4	2.2	
Fluorene	0.1	12	0.1	2.4	0	63000	1.2230754	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	2.4	0.1	0.1	0.1	0.1	0.1	0.1	U/S	0.1	0.93	
Indeno(1,2,3,cd)pyrene	0.1	12	0.1	1.2	0	58	0.5913333	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	1.2	0.1	0.1	0.1	0.1	0.1	0.1	U/S	0.1	0.1	
Naphthalene	0.05	12	0.05	1.9	0	190	0.9433626	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05	0.66	0.05	0.05	0.05	0.05	0.05	0.05	U/S	0.05	1.9	
Phenanthrene	0.1	13	0.1	12	0	22000	6.2129121	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.48	12	0.1	0.1	0.65	0.1	0.91	0.1	6	0.1	4.2	
Pyrene	0.1	12	0.1	8.1	0	54000	3.8542359	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.32	8.1	0.1	0.1	0.57	0.1	0.65	0.1	U/S	0.34	1.4	
	Mean																					
FOC (dimensionless)	0.007								0.0015	0.0023	0.0015	0.0006	0.0007	0.0004	0.0034	0.0004	0.0041	0.0021	0.061	0.0028	0.0078	
SOM (calculated)	1.17%								0.26%	0.40%	0.26%	0.10%	0.12%	0.07%	0.59%	0.07%	0.71%	0.36%	10.52%	0.48%	1.34%	
pH (su)	8.1								8.5	8.5	8.3	8.1	8.1	8.1	7.8	8	7.9	8.4	U/S	7.8	8.1	

Risk parameter: Human health - commercial (1%SOM)

Data set: Samples 31.03.2015

Client: Lend Lease

Site: North Wales Prison

Job no.: C14656

Lab. report no(s): 15-69370-1

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate. Values in red are equal to, or greater than, the generic assessment criterion (GAC).
MG denotes Made Ground
NAT denotes natural ground

Hydrock

Legend: Values in **blue** are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate. Values in **red** are equal to, or greater than, the generic assessment criterion (GAC).
MG denotes Made Ground
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Assessment of Chemicals of Potential Concern to Human Health

All values in mg/kg unless otherwise stated								Soil Type														
								Location & Depth	S1	S2	S3	S4	S5	S6	SP1	SP2	SP3	ATP1	ATP2	ATP3	ATP5	
Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US ₉₅	Result of Significance Test														
Aliphatics EC5-EC6	0.1	13	0.1	1	0	300	0.471077	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	0.1	
Aliphatics >EC6-EC8	0.1	13	0.1	1300	1	140	536.0588	FURTHER ASSESSMENT REQUIRED	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1300	0.1	0.1	
Aliphatics >EC8-EC10	0.1	13	0.1	2600	1	78	1072.064	FURTHER ASSESSMENT REQUIRED	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2600	0.2	0.1	
Aliphatics >EC10-EC12	1	13	1	89	1	48	37.40575	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1	1	1	1	1	89	1	3.3	
Aliphatics >EC12-EC16	2	13	2	620	2	24	262.2345	FURTHER ASSESSMENT REQUIRED	2	2	2	2.4	2	2	19	2	2	2	620	3.2	69	
Aliphatics >EC16-EC35	10	13	10	66000	0	1000000	27253.52	POTENTIALLY SUITABLE FOR USE	10	10	10	13	10	10	58	39	25	10	66000	29	600	
Aliphatics >EC35-EC44	8.4	13	8.4	450	0	1000000	190.4751	POTENTIALLY SUITABLE FOR USE	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	450	8.4	8.4	
Aromatics EC5-EC7	0.1	13	0.1	0.1	0	1200	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Aromatics >EC7-EC8	0.1	13	0.1	110	0	870	45.41262	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	110	0.1	0.1	
Aromatics >EC8-EC10	0.1	13	0.1	280	0	610	115.5049	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	280	0.1	0.1	
Aromatics >EC10-EC12	1	13	1	49	0	360	20.87846	POTENTIALLY SUITABLE FOR USE	1	1	1	2.1	1	1	1.2	1	1	1	49	1	1.4	
Aromatics >EC12-EC16	2	13	2	750	0	36000	315.5711	POTENTIALLY SUITABLE FOR USE	2	2	2	33	2	2	7.8	2	2	2	750	2	55	
Aromatics >EC16-EC21	10	13	10	30000	1	28000	12389.01	POTENTIALLY SUITABLE FOR USE	10	10	10	120	10	10	20	10	10	10	30000	10	170	
Aromatics >EC21-EC35	10	13	10	110000	1	28000	45371.87	FURTHER ASSESSMENT REQUIRED	10	10	10	190	10	10	10	10	10	10	110000	10	77	
Aromatics >EC35-EC44	8.4	13	8.4	22000	0	28000	9075.882	POTENTIALLY SUITABLE FOR USE	8.4	8.4	8.4	12	8.4	8.4	8.4	8.4	8.4	8.4	22000	8.4	8.4	
ADDITIVITY CHECK									HAZARD QUOTIENTS FOR EACH FRACTION													
									Aliphatics EC5-EC6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
									Aliphatics >EC6-EC8	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	9.286	0.001	0.001
Considered additive									Aliphatics >EC8-EC10	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	33.333	0.003	0.001
									Aliphatics >EC10-EC12	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	1.854	0.021	0.069
									Aliphatics >EC12-EC16	0.083	0.083	0.083	0.100	0.083	0.083	0.792	0.083	0.083	0.083	25.833	0.133	2.875
									Aliphatics >EC16-EC35	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.066	0.000	0.001
									Aliphatics >EC35-EC44	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
									Aromatics EC5-EC7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Considered additive									Aromatics >EC7-EC8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.126	0.000	0.000
									Aromatics >EC8-EC10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.459	0.000	0.000
									Aromatics >EC10-EC12	0.003	0.003	0.003	0.006	0.003	0.003	0.003	0.003	0.003	0.003	0.136	0.003	0.004
									Aromatics >EC12-EC16	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.000	0.002
Considered additive									Aromatics >EC16-EC21	0.000	0.000	0.000	0.004	0.000	0.000	0.001	0.000	0.000	0.000	1.071	0.000	0.006
									Aromatics >EC21-EC35	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	3.929	0.000	0.003
									Aromatics >EC35-EC44	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.786	0.000	0.000	
									Hazard Index for ali>C8-C16	0.105	0.105	0.105	0.122	0.105	0.105	0.814	0.105	0.105	0.105	61.021	0.157	2.945
									Hazard Index for aro>C8-C16	0.003	0.003	0.003	0.007	0.003	0.003	0.004	0.003	0.003	0.003	0.616	0.003	0.006
									Hazard Index for aro>C16-C35	0.001	0.001	0.001	0.011	0.001	0.001	0.001	0.001	0.001	0.001	5.000	0.001	0.009
Risk parameter: Human health - commercial (1%SOM)									Hazard Index table - HI or HQ greater than 1 highlighted with yellow shading.													
Data set: Samples 31.03.2015									Legend: Main table values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate. Main table alues in red are equal to, or greater than, the generic assessment criterion (GAC). MG denotes Made Ground NAT denotes natural ground													
Client: Lend Lease																						
Site: North Wales Prison																						
Job no.: C14656																						
Lab. report no(s).: 15-69370-1																						

Assessment of Chemicals of Potential Concern to Human Health

All values in mg/kg unless otherwise stated								Soil Type													
								Location & Depth	S1	S2	S3	S4	S5	S6	SP1	SP2	SP3	ATP1	ATP2	ATP3	ATP5
Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US ₉₅	Result of Significance Test													
Benzene	0.001	13	0.001	0.001	0	27	0.001	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Toluene	0.001	13	0.001	110	0	870	45.35679	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	110	0.031	0.019
Ethylbenzene	0.001	13	0.001	45	0	520	18.55447	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	45	0.0017	0.001
Xylene, o-	0.001	13	0.001	46	0	480	18.96674	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	46	0.001	0.001
Xylene, m- & p-	0.001	13	0.001	100	0	580	41.23155	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	100	0.005	0.001
MTBE	0.001	13	0.001	0.001	0	7500	0.001	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Iso-propylbenzene	0.001	13	0.001	7.7	0	390	3.175357	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	7.7	0.001	0.001
Propylbenzene	0.001	13	0.001	3.9	0	400	1.608588	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	3.9	0.001	0.001
1,2,4-Trimethylbenzene	0.001	13	0.001	6.5	0	39	2.680588	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	6.5	0.001	0.001
Bromobenzene	0.001	13	0.001	0.001	0	92	0.001	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Chlorobenzene	0.001	13	0.001	0.001	0	56	0.001	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
1,2-Dichlorobenzene	0.001	13	0.001	1	0	570	0.412895	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	1	0.001	0.001
1,3-Dichlorobenzene	0.001	13	0.001	3.3	0	30	1.361203	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	3.3
1,4-Dichlorobenzene	0.001	13	0.001	0.29	0	230	0.154093	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.29	0.001	0.001
Hexachlorobenzene		0	0	0	0	0.2															
Pentachlorobenzene		0	0	0	0	43															
1,2,3-trichlorobenzene	0.001	13	0.001	9.7	0	100	3.999972	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	9.7	0.001	9.7
1,2,4-trichlorobenzene	0.001	13	0.001	43	0	220	17.72982	POTENTIALLY SUITABLE FOR USE	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	43	0.001	43
1,3,5-trichlorobenzene		0	0	0	0	23															
1,2,3,4-tetrachlorobenzene		0	0	0	0	120															
1,2,3,5-tetrachlorobenzene		0	0	0	0	39															
1,2,4,5-tetrachlorobenzene		0	0	0	0	20															
</																					

Assessment of Chemicals of Potential Concern to Human Health

All values in mg/kg unless otherwise stated								Soil Type																	
								Location & Depth	S1	S2	S3	S4	S5	S6	SP1	SP2	SP3	ATP1	ATP2	ATP3	ATP5				
Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US ₉₅	Result of Significance Test																	
2-Chlorophenol	0.1	13	0.1	0.1	0	3.9	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
2,4-Dichlorophenol	0.3	13	0.3	0.3	0	0.91	0.3	POTENTIALLY SUITABLE FOR USE	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3			
2,4-Dimethylphenol	0.3	13	0.3	0.3	0	20	0.3	POTENTIALLY SUITABLE FOR USE	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3			
2-Methylphenol	0.3	13	0.3	0.3	0	85	0.3	POTENTIALLY SUITABLE FOR USE	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3			
3-Methylphenol		0	0	0	0	85																			
4-Methylphenol	0.2	13	0.2	0.2	0	84	0.2	POTENTIALLY SUITABLE FOR USE	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2			
Pentachlorophenol		0	0	0	0	0.56																			
2,3,4,6-Tetrachlorophenol		0	0	0	0	0.89																			
2,4,6-Trichlorophenol	0.1	13	0.1	0.1	0	1.5	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Bis (2-ethylhexyl) phthalate		0	0	0	0	290																			
Butyl benzyl phthalate	0.3	13	0.3	0.3	0	1500	0.3	POTENTIALLY SUITABLE FOR USE	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3			
Diethyl Phthalate	0.2	13	0.2	0.2	0	120	0.2	POTENTIALLY SUITABLE FOR USE	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2			
Di-n-butyl phthalate	0.2	13	0.2	0.2	0	13	0.2	POTENTIALLY SUITABLE FOR USE	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2			
Di-n-octyl phthalate		0	0	0	0	2800																			
ADDITIVITY CHECK									HAZARD QUOTIENTS FOR EACH SUBSTANCE																
Considered additive (chlorophenols)									2-Chlorophenol	0.025641	0.025641	0.025641	0.025641	0.025641	0.025641	0.025641	0.025641	0.025641	0.025641	0.025641	0.025641	0.025641			
									2,4-Dichlorophenol	0.32967	0.32967	0.32967	0.32967	0.32967	0.32967	0.32967	0.32967	0.32967	0.32967	0.32967	0.32967	0.32967	0.32967	0.32967	0.32967
									2,3,4,6-Tetrachlorophenol																
									2,4,6-Trichlorophenol	0.066667	0.066667	0.066667	0.066667	0.066667	0.066667	0.066667	0.066667	0.066667	0.066667	0.066667	0.066667	0.066667	0.066667	0.066667	0.066667
Considered additive (cresols)									2-Methylphenol	0.003529	0.003529	0.003529	0.003529	0.003529	0.003529	0.003529	0.003529	0.003529	0.003529	0.003529	0.003529	0.003529			
									3-Methylphenol																
									4-Methylphenol	0.002381	0.002381	0.002381	0.002381	0.002381	0.002381	0.002381	0.002381	0.002381	0.002381	0.002381	0.002381	0.002381	0.002381	0.002381	0.002381
									Hazard Index for chlorophenols																
									Hazard Index for cresols																
Risk parameter: Human health - residential with plant uptake (1%SOM)																									
Data set: Samples 31.03.2015																									
Client: Lend Lease																									
Site: North Wales Prison																									
Job no.: C14656																									
Lab. report no(s): 15-69370-1																									
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Site Name	NorthWales Prison, Wrexham
Location	Wrexham
Site ID	F1
Job Number	C14656
Date	4/8/2015 1:45:47 PM
User Name	terrywraxton@hydrock.com
Company Name	Hydrock Consultants Ltd.

[illegible]

[illegible]

[illegible]

[illegible]



Figure 1: Northwestern edge of 'soft spot' excavation where S3 was taken.



Figure 2: Southwestern edge of 'soft spot' excavation where S4 was taken.



Figure 3: Southeastern edge of 'soft spot' excavation where S6 was taken.



Figure 4: Southeastern corner of 'soft spot' excavation where S1 was taken.



Figure 5: Northeastern edge of 'soft spot' excavation where S2 was taken.



Figure 6: Water perched on top of concrete slab.



Figure 7: Excavated material stockpile in which sample SP1-SP3 were taken.



Figure 8: Location of ATP2 showing black 'resin' material.

From: Eric Cooper
Sent: 09 April 2015 15:38
To: 'Maguire, Tom'
Subject: RE: Hydrocarbon Test Results & Plan of Works
Attachments: 31.03.2015 Contamination Hotspot E-mail.pdf; SVOCs and VOCs with no GAC.docx

Tom

Please either call me to talk through this or we can discuss it when I am on site tomorrow. Photographs will be included in letter report.

Herewith our report on the investigations and testing carried out on Tuesday 31 March. This email is intended to give you all the information that you need to progress matters but we will follow it up with a more formal letter report in the next few days. The matter will be reported to the Local Authority as part of Validation Reporting.

Abbreviations: TPH = Total Petroleum Hydrocarbons; PAH = Polycyclic Aromatic Hydrocarbons; VOC = Volatile Organic Compounds; TIC = Tentatively Identified Compounds; SVOC = Semi Volatile Organic Compounds; GAC = Generic Acceptance Criteria (contaminant concentrations below which no risk anticipated).

Note that the basis of this risk assessment is that to Human Health. The site conceptual model rules out a risk to ground water because of the thickness of clay below the site.

1. Locations Investigated

Sketch plans attached show the locations of where the samples were taken from. These are:

- The 'soft spot' area; and
- The attenuation tank area.

2. Soil Samples Taken for Chemical Analysis

Samples Taken

Chemical analysis results are attached, coded as follows:

- S1-S4 and S6: edges of the soft spot area as excavated
- S5: base of soft spot area excavation beyond the limit of the concrete obstruction.
- SP1 –SP3: samples of the excavated material stockpile
- ATP1 –ATP5 (ATP4 not used): attenuation tank area pit samples

Testing and Results

The samples were subject to the following wide-spectrum test regime:

- Hydrock suite of inorganic compounds
- Speciated PAH
- TPH Level 2 (TPHCWG)
- VOC and TIC
- SVOC and TIC

3. Soft Spot Area

Methodology

This area contained soils identified as having hydrocarbon contamination. The material was excavated downwards as far as a concrete obstruction and outwards until there was no trace of hydrocarbon contamination by sight or smell and no significant readings on a portable PID device. Where the concrete base was not present, the excavation was taken down to natural clay. On completion, the pit was refilled using the excavated material as a temporary measure.

Observations

Please see photographs attached. The excavated material had a hydrocarbon odour and there was a 'sheen' on some soil samples but the material could not be described as grossly contaminated. Water that accumulated in the pit had a slight hydrocarbon sheen.

Soil Test Results

The laboratory test data are attached.

Interpretation

The data were run through a CLEA 1.06 spreadsheet for a commercial end use assumption with the following results:

Validation Samples S1 –S6 (all taken from approximately 1m below ground level):

- There are no exceedences of the GAC by inorganic substances
- There are no exceedences of the GAC by any of PAH species
- There are no exceedences of the GAC by any of TPH species
- No VOC were recorded above detection levels
- Several SVOC were recorded above detection levels but most of these were PAHs and all were less than the GAC value. The exception is a single 0.9 mg/kg concentration of Carbazole in S4 for which no UK GAC is available. However a USEPA references cites 24mg/kg as an acceptable value for a more stringent residential end use (see attached); whilst this value is not strictly valid in the UK the source is authoritative and given the comparatively small concentration noted the risk is considered to be acceptably low.

Stockpile Samples SP1 –SP3

- There are no exceedences of the GAC by inorganic compounds
- There are no exceedences of the GAC by any of PAH species
- There are no exceedences of the GAC by any of TPH species
- No VOC were recorded above detection levels
- Several SVOC were recorded above detection levels but most of these were PAHs and all were less than the GAC value.

The stockpile test data were also processed using the CAT-Waste tool (output attached) and for all relevant parameters the material is categorised as non-hazardous waste.

Conclusions

- The discrepancy between the observed contamination (i.e. odour and sheens) and the laboratory testing is probably explained by the loss of volatiles as the material is excavated and stockpiled.
- The hot spot has been delineated laterally and the sides of the excavation have been validated at being acceptably 'clean';
- The quality of the material below the slab is unknown with the slab still in place

Recommendations

- The slab requires excavation and the material beneath it dug out until clean ground is proven across the relevant parts of the excavation;
- Given the slight potential odour nuisance (but accepting that contaminant concentrations are below the relevant GACs) it is recommended that the material that has been stockpiled and tested is used at depths >1.0m in the landscape bund
- The materials associated with the slab will require examination and testing on the basis of which their fate can be decided (noting that all testing to date has determined this material to be non-hazardous).

4. Attenuation Tank Area

Methodology

4 samples were taken from pits in the Attenuation tank area:

- ATP 1, ATP 3, and ATP 5: Trial Pits excavated under Hydrock supervision, soils sample taken from each
- ATP 4: Trial Pit excavated under Hydrock supervision; visually clean material, no sample taken
- ATP2: pit excavated by LL contractor, sample taken of black 'resin' material.

Observations

Please see photographs attached. Contamination was observed only in ATP2, where a black resinous material was encountered, and in ATP 5, which was similar to that encountered in the 'soft-spot' area.

Soil Test Results

The laboratory test data are attached.

Interpretation

The data were run through a CLEA 1.06 spreadsheet for a commercial end use assumption with the following results:

- There are no exceedences of the GAC by inorganic compounds
- There are no exceedences of the GAC by any of PAH species but in respect of ATP2 the material is recorded as unsuitable for testing, possibly because it is a resinous material only (no soil)
- There are several exceedences of the GAC for TPH species in ATP2 and one species in ATP5
- There are numerous VOC above detection in ATP2 but all values are below GAC (and there are some for which no GAC is available)
- There are numerous SVOC above detection in ATP5 and to a lesser extent in ATP2 including some for which no GAC is available but otherwise the concentrations are less than the GAC

Conclusions

- The key issue is the TPH contamination around ATP2 which is unacceptably high.
- The presence of VOCs and SVOCs above detection levels in other trial pits is noted but none of the materials are > GAC so, in principle, the materials arising from the attenuation tank excavation can be re-used on site, subject to stockpile testing (see below)

Recommendations

- The area around ATP2 is a contamination hot spot which requires excavation and removal until the sides and base of the excavation appear to be clean (same principle at the 'soft spot' area).
- The excavated material from the ATP 2 area will require stockpiling and testing to determine what its fate should be (at this stage, off-site disposal looks to be the most likely option)

- There is evidence from the testing at ATP3 and ATP5 that low-level organic contamination is present so it is suggested that this excavated material is stockpiled and testing to confirm its suitability for re-use on site or otherwise.

5. Note on Asbestos

Asbestos fibres (chrysotile) were reported in the soil sample from ATP1 but in none of the other samples. The stockpile testing should therefore include asbestos screening and quantification if the result is positive.

Regards

Eric

Eric Cooper SiLC
Technical Director

Hydrock

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From: Maguire, Tom [<mailto:Tom.Maguire@lendlease.com>]
Sent: 07 April 2015 12:16
To: Eric Cooper
Subject: RE: Hydrocarbon Test Results & Plan of Works

Eric

Thanks for the update. I am available on Friday, but have a meeting arranged for 10.30. Please let me know when suits

Thanks

From: Eric Cooper [<mailto:EricCooper@hydrock.com>]
Sent: 07 April 2015 10:38
To: Maguire, Tom; Richard Dawid
Subject: RE: Hydrocarbon Test Results & Plan of Works

Tom

The labs have said that the results will be available today (which probably means late and we won't be able to review them until tomorrow morning).

However, Richard is pretty confident that he has dug out the extent of contamination laterally and although we need proof of that from the testing, we see no reason why you can't excavate the material that was replaced and set it aside until we know what it contains (and hence what we do with it).

Regarding depth, you will need to grub out the concrete base and associated pipework to make sure that there is nothing pooling beneath and around it.

If the labs promise is kept we would expect to have a full report to you by noon tomorrow

Regards

Eric

Eric Cooper SiLC
Technical Director

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From: Maguire, Tom [<mailto:Tom.Maguire@lendlease.com>]
Sent: 07 April 2015 08:31
To: Eric Cooper; Richard Dawid
Subject: Hydrocarbon Test Results & Plan of Works

Eric/Richard

Could you please update as to when the results/report will be available. We have machinery on site that is coming to end on its current task and would like to then move it onto excavating the contamination hotspot. We also have a good weather window so are keen to push on with it this week

Thanks

Tom

Tom Maguire | Senior Project Manager | Construction | Lend Lease
Telephone +44 (0) 0121 712 1700
Lend Lease, Clarendon House, 76/90 High Street, Solihull, B91 3TA
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From: Eric Cooper
Sent: 10 April 2015 15:38
To: Maguire, Tom (Tom.Maguire@lendlease.com)
Subject: North Wales Prison
Attachments: ATP 2 Soil Quality Test Data for Waste Disposal Purposes.pdf

Tom

Herewith a response/comment on the meetings held on site this morning

1. Excavation of Hot Spot at ATP2:
 - a. The excavation will be carried out on Thursday 16 April. Richard Dawid of Hydrock will supervise. Cost estimate for works as Box 1 below.
 - b. Mike Davies asked for advice on information to send to the landfills. See attached.
 - c. PPE requirements. Our advice is that: *if the material excavated is similar in nature to that exposed already there is no requirement for vapour masks. However if the excavation/hot spot removal works around ATP2 reveals material significantly more grossly contaminated and malodorous than has been indicated by the small excavation undertaken to date, the works must stop until such time as they can be continued by operatives wearing face-fitted vapour masks.*
2. Excavation of concrete slab below 'soft spot':
 - a. This will be undertaken by Jones Bros with a remit to remove all material containing hydrocarbon contamination by sight or smell.
 - b. This work will be undertaken before Thursday 16th so that Richard Dawid can inspect the stockpile and test it for vapours using a PID instrument.
 - c. Sample (s) will be taken for chemical analysis to determine the fate of the excavated material plus one validation sample from the base of the pit.
3. Asbestos in cut area:
 - a. An area approximately 170m x 60m has been identified where, at the finished level, there are obvious pockets of AIB at or just below ground level
 - b. The extent of the hot spots is to be investigated by a series of radial trenches outwards from the hot spot to determine their extent
 - c. The results will be reported back to Hydrock for consideration and advice
4. Validation testing on completion of Jones Bros contract. Testing will be carried out on a 75m grid basis as previously agreed.
5. Validation Report on completion of Jones Bros contract: Hydrock to liaise with Russell of Jones Bros when he returns to work 20 April
6. MMP for other contracts. Based on the discussions with Kiernan and Jennings representatives Hydrock will prepare a list of information requirements for the MMP and will advise as required reference the materials tracking system

Box 1: Costs for ATP 2 Excavation etc.:

It will be necessary to excavate down and outwards from the centre until – by sight and smell - the base and sides of the excavation are clean. Soil samples are then taken from the base and sides for testing and the test results compared with standard acceptance criteria values to prove that the contamination has been removed. The excavated soil should be placed on some impermeable geotextile sheeting to stop it contaminating the underlying soil. Based on testing already carried out on a sample from ATP2 this material will be disposed of to landfill (chemical test data and Cat Waste analysis attached to email).

This programme of work will be in accordance with the requirements of the Contamination Planning Condition and the Remediation Method Statement.

Richard Dawid (an experienced geo-environmental consultant who is familiar with the site) will be available from 0830 hrs 16 April to supervise this work. On arrival on site he will report to Tom Maguire. We agreed that Jones Bros would be able to provide use of the excavator and if there is concrete foundation material in the affected area it will need to be equipped with a breaker.

Remit will also include inspection of 'soft spot' area after slab excavation and testing if necessary.

Costs will be based on rates agreed in the original BoQ and assuming that the site works can be completed in one day, these are:

1. One day engineer time plus travel: £490.5
2. Lab testing of soils £1114.00 (allow 8 standard suites plus speciated TPH, VOCs and SVOCs)
3. Reporting £710.0
4. **TOTAL: £2314.5 plus VAT**

Regards

Eric

Eric Cooper SiLC

Technical Director

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Leon Warrington

From: Eric Cooper
Sent: 15 April 2015 08:07
To: Maguire, Tom (Tom.Maguire@lendlease.com)
Cc: Richard Dawid; Dale, Gareth (Gareth.Dale@lendlease.com)
Subject: FW: hydroc soft spot

Also Tom you need similar records of the slab removal in the original soft spot, including validation of the base after slab removal and what happened to the excavated material

Regards

Eric

Eric Cooper SiLC
Technical Director

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-----Original Message-----

From: Eric Cooper
Sent: 14 April 2015 21:03
To: 'Maguire, Tom'; Richard Dawid
Cc: Dale, Gareth
Subject: RE: hydroc soft spot

Ok thanks Tom

This will have to be reported as unexpected contamination in the validation report so we will need records of extent of excavation, volume of material, fate of the excavated material (based on stockpile test data), validation of the edges of the excavated area etc.

Regards

Eric

Eric Cooper SiLC
Technical Director

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-----Original Message-----

From: Maguire, Tom [<mailto:Tom.Maguire@lendlease.com>]
Sent: 14 April 2015 17:48
To: Eric Cooper; Richard Dawid
Cc: Dale, Gareth
Subject: FW: hydroc soft spot

Eric/Richard

Please see note from JB below. They have been able to excavate and side cast the material in the attenuation tank area. It proved more straight forward than first thought as the material was visible when excavated. There is no need for Richard to attend on Thursday anymore. Apologies for any inconvenience.

Regards

Tom

-----Original Message-----

From: Mike Davies [<mailto:mike@jones-bros.com>]
Sent: 14 April 2015 16:11
To: Maguire, Tom
Subject: hydroc soft spot

Hi tom

Just reminder of what we spoke about yesterday, we don't require hydroc for site visit this week the way its going

Many thanks

Mike

--

Mike Davies
Contracts Manager
E-mail - mike@jones-bros.com
Mobile - 07919 477776

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