



Analytical Report Number: 21-85847
Project / Site name: Contract Chemicals

Lab Sample Number	1932091			
Sample Reference	PPS11			
Sample Number	None Supplied			
Depth (m)	0.00-0.30			
Date Sampled	06/07/2021			
Time Taken	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accuracy from Standard	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	14
Total mass of sample received	kg	0.001	NONE	0.50

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.8
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Speciated PAHs

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

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80
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Heavy Metals / Metalloids

Arsenic (aque regia extractable)	mg/kg	1	MCERTS	3.5
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3
Cadmium (aque regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (aque regia extractable)	mg/kg	1	MCERTS	16
Copper (aque regia extractable)	mg/kg	1	MCERTS	17
Lead (aque regia extractable)	mg/kg	1	MCERTS	12
Mercury (aque regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aque regia extractable)	mg/kg	1	MCERTS	11
Selenium (aque regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aque regia extractable)	mg/kg	1	MCERTS	17
Zinc (aque regia extractable)	mg/kg	1	MCERTS	40

Monoaromatics & Oxygenates

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



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Date Sampled				06/07/2021
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Scheme	
Petroleum Hydrocarbons				
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10

VOCs

Chloromethane	µg/kg	1	ISO 17025	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0
1,1-Dichloroethane	µg/kg	1	NONE	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0
Cis-1,2-dichloroethane	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	MCERTS	< 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	MCERTS	< 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	MCERTS	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0



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Date Sampled	06/07/2021			
Time Taken	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Acceptable Screen	
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0
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
Tetrachloroethane	µg/kg	1	NONE	< 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	MCERTS	< 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	NONE	< 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	MCERTS	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0
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	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0

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-chloroethoxy)ether	mg/kg	0.2	MCERTS	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2
Bis(2-chloroisopropoxy)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



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Date Sampled	06/07/2021			
Time Taken	None Supplied			
Analytical Parameter (Soil Analysis)	Unit	Limit of detection	Acceptance criteria	
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05
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
3,4,6-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	< 0.1
3-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	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2
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	0.05	MCERTS	< 0.05
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	0.05	MCERTS	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05

U/S = Unsuitable Sample I/S = Insufficient Sample



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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 loam (MCERTS) soil types. Data for unaccredited types of soil 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 *
1932061	PP51	None Supplied	0.00-0.30	Brown clay with vegetation.
1932062	PP52	None Supplied	0.00-0.30	Brown clay with vegetation.
1932063	PP53	None Supplied	0.00-0.30	Brown clay.
1932064	PP54	None Supplied	0.00-0.30	Brown clay.
1932065	PP55	None Supplied	0.00-0.30	Brown clay.
1932066	PP56	None Supplied	0.00-0.30	Brown clay.
1932067	PP57	None Supplied	0.00-0.30	Brown clay.
1932068	PP58	None Supplied	0.00-0.30	Brown clay.
1932069	PP59	None Supplied	0.00-0.30	Brown clay.
1932090	PP510	None Supplied	0.00-0.30	Brown clay.
1932091	PP511	None Supplied	0.00-0.30	Brown clay with gravel.

APPENDIX D - PHOTOGRAPHIC PLATES



3 Images of the demolition and decommissioning of the site.





The first image is the metal top hat to protect the borehole installed for obtaining a water sample after removing the concrete slab.



The next 2 images show the concrete removed and the subsurface, to the left is the subbase under the concrete.



This image is the earth under the slab which did not present any odours or discolouration.



These 3 images show that the site has been cleared of relic items and the concrete slab has been peppered with holes in readiness to lift the concrete slab.



Former area of the Bonner Building and equipment.



View from the Bonner area towards the office.



View from the Bonner Building towards the outside storage area.



North centre of the site with relic tanks about to be removed from the site for recycling.



Chemical waste storage outside the chemical waste store.



Inside the chemical store with the last few remaining drums of unused products awaiting removal/disposal.



Another image of the remaining chemical products inside the storage building.



View of the site looking NorthEast from the office after clearing the site and leaving in place the tarmac road.



As the demolition progresses removing the slabs as shown here.



To commencing with the office building demolition.



Starting to process the concrete to form a crushed material for reuse.



Site being kept in a tidy state as the demolition works commence.



Starting to crush the concrete and form stockpiles.



Stockpiles of crushed material being formed.



These 3 images show the site after all the relict structures, tanks and wastes have been removed.



The final 3 images show the open site after demolition as the crushing is being completed.



Each sample location on the 20m grid and 10m grid was photographed during the 2025 sampling and testing. This is an example of the images to document every sample location.

APPENDIX E – WASTE REMOVAL

Invoice example from Avanti



Avanti Environmental Group Limited
 Atlas House, Third Avenue, Globe Business Park
 SL7 1EY Marlow
 T. 0845 603 2893

INVOICE

CUSTOMER		INVOICE
NAME:	Knowsley Redevelopments Limited	INVOICE NUMBER: 4635006131 INVOICE DATE: 31/07/2021 CURRENCY: GBP CUSTOMER CODE: 1100043043
BILLING ADDR:	c/o Contract Chemicals, Penrhyn Road	
CITY:	Knowsley Business Park, Prescott	
POST CODE:	L34 9HY	
VAT NUMBER:	GB356990844	
PRODUCER:	Knowsley Redevelopments (Knowsley)	

INVOICE DETAILS				
SERVICE	DESCRIPTION	QUANTITY	UNIT PRICE	AMOUNT
26.07.2021	Methyl-2-Bromotetradecanoate P.O.: Load 19 OUR/REF: 2819540 CONSIGNMENT NOTE: KNOWSL/0002R EWC: 070103	4.000 Dr 205l	487.00	1,948.00
26.07.2021	Stage 1 Cloquintecet P.O.: Load 19 OUR/REF: 2819540 CONSIGNMENT NOTE: KNOWSL/0002R EWC: 070103	5.000 1000lt	1,450.00	7,250.00
26.07.2021	Diocetylphosphonate P.O.: Load 19 OUR/REF: 2819540 CONSIGNMENT NOTE: KNOWSL/0002R EWC: 070103	2.000 Dr 205l	240.00	480.00
26.07.2021	3-Chloropropylidimethyl Ammonium Chi P.O.: Load 19 OUR/REF: 2819540 CONSIGNMENT NOTE: KNOWSL/0002R EWC: 070103	2.000 Dr 205l	270.00	540.00
26.07.2021	Bromopropionic Acid P.O.: Load 19 OUR/REF: 2819540 CONSIGNMENT NOTE: KNOWSL/0002R EWC: 070103	12.000 Dr 205l	497.00	5,964.00
26.07.2021	Methyl-2-Bromotetradecanoate			

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APPENDIX F – PLANT DECOMMISSIONING

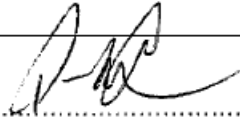
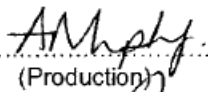
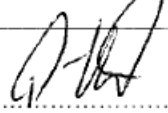
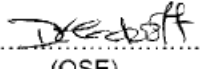


CONTRACT CHEMICALS LIMITED

Date: 29.07.20	Issue No: 006	BROMINE SYSTEM CLEAN DOWN	CCL/PROW/VCP-BROMINE SYSTEM	Page 1 of 12
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BROMINE SYSTEM CLEAN DOWN (SITE CLOSURE)

This document forms part of the Contract Chemicals Limited quality assurance system and adherence to its requirements is mandatory.

Issued by  (Competent Person)	Date 29/07/20
Approved by  (Production)	Date 29.7.20.
Approved by  (Technical)	Date 29/07/20
Approved by  (QSE)	Date 30/07/20

A full copy of this document and water testing can be found within Appendix D of the electronic file. As part of the surrender application.

APPENDIX G – HISTORIC REPORTS AND DOCUMENTS RECOVERED (SUMMARY)

The list below can be found in the electronic file as part of the surrender application, a full copy cannot be issued due to the large volume of records collected. However, if required a viewing can be arranged by appointment.

Appendix A Historic Ground/Condition Reports List oldest first

A Baseline Report Site Investigation by Cremer & Warner 27/04/1993 (Fully scanned)

A1 Ground Investigation (Condition Report) Ref report no 97/2 by Sub Soil Surveys Ltd, dated 02/1997

A2 Site Condition Report, Ref S09389C002, by Entec, dated 13/12/2002

A3

Appendix B Incidents

B Phosphorous Fire – Bonner Building 16/08/2004

B Distillation of Benzyl Bromocetate 5/1/2002

B Bonner Lev Fire 30/12/2009

B Trade Effluent Overspill 12/2010 – Entec report

B Trade Effluent Overspill Sampling 01/01/2011 (fully scanned)

B Bromododecane Spillage Investigation 01/09/2012 (fully scanned)

B Knowsley Brook Incident 13/08/2013

B Xylene Investigation 31/10/2017

B Bronner Building Vapour Cloud 12/06/2018

B Abnormal Occurrence Reports (examples taken from 2018)

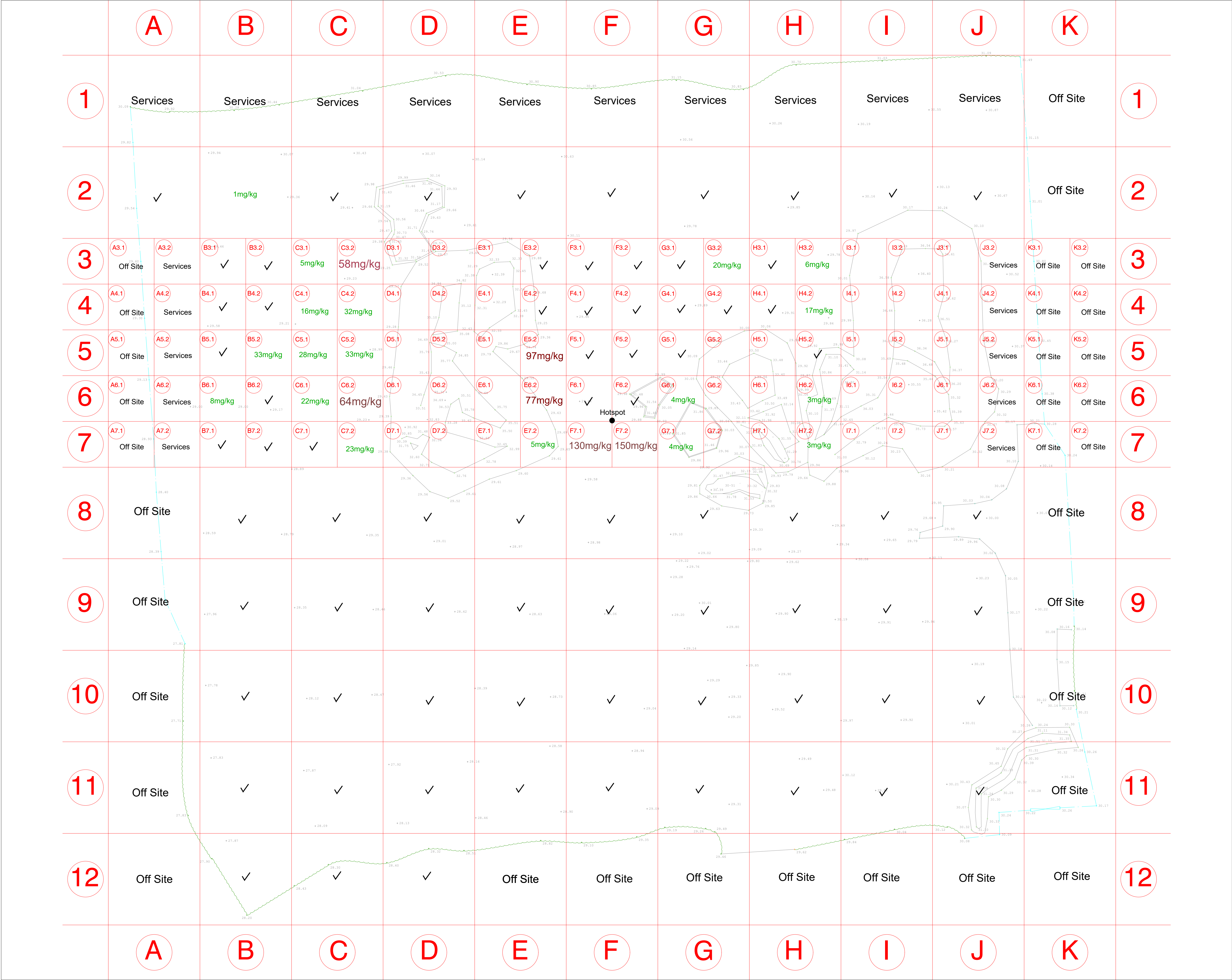
C G and J Phase1 Desk Top Investigation (2024 – 2025 reports)

C G and J Phase 2 Site Investigation

C G and J DQRA

C G and J RMS

APPENDIX H – 20M GRID SAMPLING AND TESTING RESULTS WITH LOCATION PLAN



This drawing must not be copied or reproduced without written permission or consent from DSM Demolition Ltd.

Only figured dimensions to be taken from this drawing, do not scale.

The Author of this drawing does not accept any liability for details or information provided by outside organisations.

Boundaries are shown for indicative purposes only, all boundaries are to be confirmed by the legal owner.

Test Results for:

1,2-Dichlorobenzene

All grid squares sampled, a tick refers to a sample of less then 1mg/kg or nil

Client

Contract number

Address PENRHYN ROAD, KNOWSLEY
L34 9HY

Drawing *Testing Grid*

Scale	Sheet Size	
n/a	A1	
Date	Drawn	Checked
14/08/2025		
Job No	Drawing No	Rev
PTW25025		

Portway Plant Ltd
Holly Farm
Whitepits Lane
Portway
Birmingham
B48 7HP

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

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

e: ichambers.portway@googlemail.com
jberry.portway@googlemail.com

Analytical Report Number : 25-042563

Project / Site name:	Knowsley	Samples received on:	11/08/2025
Your job number:	PTW25025	Samples instructed on/ Analysis started on:	11/08/2025
Your order number:	PTW25025	Analysis completed by:	15/08/2025
Report Issue Number:	1	Report issued on:	15/08/2025
Samples Analysed:	9 soil samples		

Signed:



Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

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

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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

Analytical Report Number: 25-042563
Project / Site name: Knowsley
Your Order No: PTW25025

Lab Sample Number				644064	644065	644066	644067	644068
Sample Reference				B8	C8	D8	E8	F8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.30-2.60	0.30-2.50	0.30-2.00	0.30-2.50	0.30-2.50
Date Sampled				06/08/2025	06/08/2025	06/08/2025	06/08/2025	06/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	18	12	11	11
Total mass of sample received	kg	0.1	NONE	0.1	0.1	0.1	0.1	0.1

VOCs

Chloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1-Trichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	µg/kg	7	MCERTS	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0
1,1-Dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0
Trichloroethene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
Dibromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0
1,3-Dichloropropane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Styrene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
n-Propylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
tert-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0



Analytical Report Number: 25-042563
Project / Site name: Knowsley
Your Order No: PTW25025

Lab Sample Number				644064	644065	644066	644067	644068
Sample Reference				B8	C8	D8	E8	F8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.30-2.60	0.30-2.50	0.30-2.00	0.30-2.50	0.30-2.50
Date Sampled				06/08/2025	06/08/2025	06/08/2025	06/08/2025	06/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
sec-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p-Isopropyltoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,4-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	320	< 5.0	< 5.0	< 5.0
Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
1,2,4-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

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

Analytical Report Number: 25-042563
Project / Site name: Knowsley
Your Order No: PTW25025

Lab Sample Number				644069	644070	644071	644072
Sample Reference				G8	H8	I8	J8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.30-3.00	0.30-2.70	0.30-2.50	0.30-2.00
Date Sampled				06/08/2025	06/08/2025	06/08/2025	06/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status				

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	11	12	6.6	8.6
Total mass of sample received	kg	0.1	NONE	0.1	0.1	0.1	0.1

VOCs

Chloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1-Trichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	µg/kg	7	MCERTS	< 7.0	< 7.0	< 7.0	< 7.0
1,1-Dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0
Trichloroethene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10
Dibromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0
1,3-Dichloropropane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
Styrene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Bromobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
n-Propylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
tert-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0



Analytical Report Number: 25-042563
Project / Site name: Knowsley
Your Order No: PTW25025

Lab Sample Number				644069	644070	644071	644072
Sample Reference				G8	H8	I8	J8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.30-3.00	0.30-2.70	0.30-2.50	0.30-2.00
Date Sampled				06/08/2025	06/08/2025	06/08/2025	06/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status				
sec-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,3-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p-Isopropyltoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,4-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
1,2,4-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0

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



Analytical Report Number : 25-042563
Project / Site name: Knowsley

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
644064	B8	None Supplied	0.30-2.60	Brown sandy clay
644065	C8	None Supplied	0.30-2.50	Brown clay and loam
644066	D8	None Supplied	0.30-2.00	Brown sandy clay
644067	E8	None Supplied	0.30-2.50	Brown loam and sand
644068	F8	None Supplied	0.30-2.50	Brown clay and sand
644069	G8	None Supplied	0.30-3.00	Brown clay and loam
644070	H8	None Supplied	0.30-2.70	Brown sandy clay
644071	I8	None Supplied	0.30-2.50	Brown loam with gravel
644072	J8	None Supplied	0.30-2.00	Brown loam and clay with gravel and vegetation



Analytical Report Number : 25-042563
Project / Site name: Knowsley

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)
Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

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

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

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Analytical Report Number : 25-042568

Project / Site name:	Knowsley	Samples received on:	11/08/2025
Your job number:	PTW25025	Samples instructed on/ Analysis started on:	11/08/2025
Your order number:	PTW25025	Analysis completed by:	15/08/2025
Report Issue Number:	1	Report issued on:	15/08/2025
Samples Analysed:	9 soil samples		

Signed:



Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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

Analytical Report Number: 25-042568
 Project / Site name: Knowsley
 Your Order No: PTW25025

Lab Sample Number				644116	644117	644118	644119	644120
Sample Reference				B9	C9	D9	E9	F9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.30-2.80	0.30-2.80	0.30-2.50	0.30-2.50	0.30-2.50
Date Sampled				05/08/2025	05/08/2025	05/08/2025	05/08/2025	05/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	21.5	< 0.1	< 0.1	< 0.1	27.3
Moisture Content	%	0.01	NONE	8.4	10	12	12	5.6
Total mass of sample received	kg	0.1	NONE	0.1	0.1	0.1	0.1	0.1

VOCs

Chloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1-Trichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	µg/kg	7	MCERTS	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0
1,1-Dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0
Trichloroethene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
Dibromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0
1,3-Dichloropropane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	MCERTS	< 5.0	13	< 5.0	48	38
1,1,1,2-Tetrachloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Styrene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
n-Propylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
tert-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0



Analytical Report Number: 25-042568
Project / Site name: Knowsley
Your Order No: PTW25025

Lab Sample Number				644116	644117	644118	644119	644120
Sample Reference				B9	C9	D9	E9	F9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.30-2.80	0.30-2.80	0.30-2.50	0.30-2.50	0.30-2.50
Date Sampled				05/08/2025	05/08/2025	05/08/2025	05/08/2025	05/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
sec-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p-Isopropyltoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,4-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichlorobenzene	µg/kg	5	MCERTS	90	17	38	55	38
Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
1,2,4-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

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

Analytical Report Number: 25-042568
Project / Site name: Knowsley
Your Order No: PTW25025

Lab Sample Number				644121	644122	644123	644124
Sample Reference				G9	H9	I9	J9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.30-2.50	0.30-2.50	0.30-2.50	0.30-2.50
Date Sampled				05/08/2025	05/08/2025	05/08/2025	05/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status				

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	21.9
Moisture Content	%	0.01	NONE	9.1	7.8	12	9.1
Total mass of sample received	kg	0.1	NONE	0.1	0.1	0.1	0.1

VOCs

Chloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1-Trichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	µg/kg	7	MCERTS	< 7.0	< 7.0	< 7.0	< 7.0
1,1-Dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0
Trichloroethene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10
Dibromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0
1,3-Dichloropropane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
Styrene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Bromobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
n-Propylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
tert-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0



Analytical Report Number: 25-042568
Project / Site name: Knowsley
Your Order No: PTW25025

Lab Sample Number				644121	644122	644123	644124
Sample Reference				G9	H9	I9	J9
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.30-2.50	0.30-2.50	0.30-2.50	0.30-2.50
Date Sampled				05/08/2025	05/08/2025	05/08/2025	05/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status				
sec-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,3-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p-Isopropyltoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,4-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
1,2,4-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0

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



Analytical Report Number : 25-042568
Project / Site name: Knowsley

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
644116	B9	None Supplied	0.30-2.80	Brown clay and sand with gravel and stones
644117	C9	None Supplied	0.30-2.80	Brown sandy clay with gravel
644118	D9	None Supplied	0.30-2.50	Brown clay and sand with gravel and vegetation
644119	E9	None Supplied	0.30-2.50	Brown clay and sand with gravel and vegetation
644120	F9	None Supplied	0.30-2.50	Brown loam and clay with gravel and vegetation
644121	G9	None Supplied	0.30-2.50	Brown clay and loam with gravel and vegetation
644122	H9	None Supplied	0.30-2.50	Brown clay and sand with gravel and vegetation
644123	I9	None Supplied	0.30-2.50	Brown clay and sand
644124	J9	None Supplied	0.30-2.50	Brown sandy clay with stones

Analytical Report Number : 25-042568
Project / Site name: Knowsley

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)
Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

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

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

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Analytical Report Number : 25-042570

Project / Site name:	Knowsley	Samples received on:	11/08/2025
Your job number:	PTW25025	Samples instructed on/ Analysis started on:	11/08/2025
Your order number:	PTW25025	Analysis completed by:	18/08/2025
Report Issue Number:	1	Report issued on:	18/08/2025
Samples Analysed:	9 soil samples		


Signed:

Rafał Szczepańczyk
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

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

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

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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

Analytical Report Number: 25-042570

Project / Site name: Knowsley

Your Order No: PTW25025

Lab Sample Number				644128	644129	644130	644131	644132
Sample Reference				B10	C10	D10	E10	F10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.30-2.50	0.30-2.50	0.30-2.60	0.30-2.50	0.30-3.00
Date Sampled				04/08/2025	04/08/2025	04/08/2025	04/08/2025	04/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	33	12	14	14	11
Total mass of sample received	kg	0.1	NONE	0.1	0.1	0.1	0.1	0.1

VOCs

Chloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1-Trichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	µg/kg	7	MCERTS	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0
1,1-Dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbon tetrachloride	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0
Trichloroethene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
Dibromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0
1,3-Dichloropropane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Styrene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
n-Propylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
tert-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Analytical Report Number: 25-042570

Project / Site name: Knowsley

Your Order No: PTW25025

Lab Sample Number				644128	644129	644130	644131	644132
Sample Reference				B10	C10	D10	E10	F10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.30-2.50	0.30-2.50	0.30-2.60	0.30-2.50	0.30-3.00
Date Sampled				04/08/2025	04/08/2025	04/08/2025	04/08/2025	04/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
1,2,4-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
sec-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p-Isopropyltoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,4-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
1,2,4-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

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

Analytical Report Number: 25-042570

Project / Site name: Knowsley

Your Order No: PTW25025

Lab Sample Number				644133	644134	644135	644136
Sample Reference				G10	H10	I10	J10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.30-2.60	0.30-2.60	0.30-2.50	0.30-2.50
Date Sampled				04/08/2025	04/08/2025	05/08/2025	05/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	11	8.8	12	10
Total mass of sample received	kg	0.1	NONE	0.1	0.1	0.1	0.1

VOCs

Chloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1-Trichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	µg/kg	7	MCERTS	< 7.0	< 7.0	< 7.0	< 7.0
1,1-Dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0
Trichloroethene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10
Dibromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0
1,3-Dichloropropane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
Styrene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Bromobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
n-Propylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
tert-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0

Analytical Report Number: 25-042570

Project / Site name: Knowsley

Your Order No: PTW25025

Lab Sample Number				644133	644134	644135	644136
Sample Reference				G10	H10	I10	J10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.30-2.60	0.30-2.60	0.30-2.50	0.30-2.50
Date Sampled				04/08/2025	04/08/2025	05/08/2025	05/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status				
1,2,4-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
sec-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,3-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p-Isopropyltoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,4-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
1,2,4-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0

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

Analytical Report Number : 25-042570
Project / Site name: Knowsley

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
644128	B10	None Supplied	0.30-2.50	Brown clay with gravel
644129	C10	None Supplied	0.30-2.50	Brown clay and loam with gravel
644130	D10	None Supplied	0.30-2.60	Brown clay and loam with gravel
644131	E10	None Supplied	0.30-2.50	Brown loam and sand with gravel
644132	F10	None Supplied	0.30-3.00	Brown clay and loam with gravel
644133	G10	None Supplied	0.30-2.60	Brown clay and loam with gravel
644134	H10	None Supplied	0.30-2.60	Brown clay and loam with gravel
644135	I10	None Supplied	0.30-2.50	Brown sandy clay
644136	J10	None Supplied	0.30-2.50	Brown loam and sand

Analytical Report Number : 25-042570

Project / Site name: Knowsley

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

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

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

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

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

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Analytical Report Number : 25-042567

Project / Site name:	Knowsley	Samples received on:	11/08/2025
Your job number:	PTW25025	Samples instructed on/ Analysis started on:	11/08/2025
Your order number:	PTW25025	Analysis completed by:	15/08/2025
Report Issue Number:	1	Report issued on:	15/08/2025
Samples Analysed:	9 soil samples		

Signed:



Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

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

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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

Analytical Report Number: 25-042567
Project / Site name: Knowsley
Your Order No: PTW25025

Lab Sample Number				644107	644108	644109	644110	644111
Sample Reference				B11	C11	D11	E11	F11
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.30-2.50	0.30-2.50	0.30-2.50	0.30-2.70	0.30-2.60
Date Sampled				04/08/2025	04/08/2025	04/08/2025	04/08/2025	04/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	11	9.8	6.6	11	8.2
Total mass of sample received	kg	0.1	NONE	0.1	0.1	0.1	0.1	0.1

VOCs

Chloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1-Trichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	µg/kg	7	MCERTS	< 7.0	< 7.0	< 7.0	< 7.0	< 7.0
1,1-Dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0
Trichloroethene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
Dibromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0
1,3-Dichloropropane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
Styrene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
n-Propylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
tert-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0



Analytical Report Number: 25-042567
Project / Site name: Knowsley
Your Order No: PTW25025

Lab Sample Number				644107	644108	644109	644110	644111
Sample Reference				B11	C11	D11	E11	F11
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.30-2.50	0.30-2.50	0.30-2.50	0.30-2.70	0.30-2.60
Date Sampled				04/08/2025	04/08/2025	04/08/2025	04/08/2025	04/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
sec-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p-Isopropyltoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,4-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
1,2,4-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

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

Analytical Report Number: 25-042567
 Project / Site name: Knowsley
 Your Order No: PTW25025

Lab Sample Number				644112	644113	644114	644115
Sample Reference				G11	H11	I11	J11
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.30-2.50	0.30-2.70	0.30-2.60	0.30-2.70
Date Sampled				04/08/2025	04/08/2025	04/08/2025	04/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	6.7	9.5	9.4	12
Total mass of sample received	kg	0.1	NONE	0.1	0.1	0.1	0.1

VOCs

Chloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1-Trichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	µg/kg	7	MCERTS	< 7.0	< 7.0	< 7.0	< 7.0
1,1-Dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0
Trichloroethene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10
Dibromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	10	MCERTS	< 10	< 10	< 10	< 10
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0	< 6.0
1,3-Dichloropropane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
Styrene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Bromobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
n-Propylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
tert-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0



Analytical Report Number: 25-042567
Project / Site name: Knowsley
Your Order No: PTW25025

Lab Sample Number				644112	644113	644114	644115
Sample Reference				G11	H11	I11	J11
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.30-2.50	0.30-2.70	0.30-2.60	0.30-2.70
Date Sampled				04/08/2025	04/08/2025	04/08/2025	04/08/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status				
sec-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,3-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p-Isopropyltoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,4-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	130	< 5.0
Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
1,2,4-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0

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



Analytical Report Number : 25-042567
Project / Site name: Knowsley

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
644107	B11	None Supplied	0.30-2.50	Brown sand with gravel
644108	C11	None Supplied	0.30-2.50	Brown sand with gravel
644109	D11	None Supplied	0.30-2.50	Brown sand with gravel
644110	E11	None Supplied	0.30-2.70	Brown sand
644111	F11	None Supplied	0.30-2.60	Brown loam and clay
644112	G11	None Supplied	0.30-2.50	Brown loam and clay with gravel
644113	H11	None Supplied	0.30-2.70	Brown loam and clay with gravel
644114	I11	None Supplied	0.30-2.60	Brown loam and sand with gravel and vegetation
644115	J11	None Supplied	0.30-2.70	Brown clay and sand with gravel



Analytical Report Number : 25-042567
Project / Site name: Knowsley

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)
Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

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

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

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Analytical Report Number : 25-042569

Project / Site name:	Knowsley	Samples received on:	11/08/2025
Your job number:	PTW25025	Samples instructed on/ Analysis started on:	11/08/2025
Your order number:	PTW25025	Analysis completed by:	15/08/2025
Report Issue Number:	1	Report issued on:	15/08/2025
Samples Analysed:	3 soil samples		

Signed:



Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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



Analytical Report Number: 25-042569
Project / Site name: Knowsley
Your Order No: PTW25025

Lab Sample Number				644125	644126	644127
Sample Reference				C12	D12	E12
Sample Number				None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A
Depth (m)				0.30-2.50	0.30-2.50	0.30-2.50
Date Sampled				04/08/2025	04/08/2025	04/08/2025
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status			

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	5.3	4	7.3
Total mass of sample received	kg	0.1	NONE	0.1	0.1	0.1

VOCs

Chloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Chloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Bromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,1-Dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0
Chloroform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,1,1-Trichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,2-Dichloroethane	µg/kg	7	MCERTS	< 7.0	< 7.0	< 7.0
1,1-Dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,2-Dichloropropane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0
Trichloroethene	µg/kg	10	MCERTS	< 10	< 10	< 10
Dibromomethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	10	MCERTS	< 10	< 10	< 10
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	6	MCERTS	< 6.0	< 6.0	< 6.0
1,3-Dichloropropane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
Styrene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Bromoform	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0
Bromobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
n-Propylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
tert-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0



Analytical Report Number: 25-042569
Project / Site name: Knowsley
Your Order No: PTW25025

Lab Sample Number				644125	644126	644127
Sample Reference				C12	D12	E12
Sample Number				None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A
Depth (m)				0.30-2.50	0.30-2.50	0.30-2.50
Date Sampled				04/08/2025	04/08/2025	04/08/2025
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status			
sec-Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,3-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
p-Isopropyltoluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,4-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,2-Dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Butylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
1,2,4-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0

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



Analytical Report Number : 25-042569
Project / Site name: Knowsley

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
644125	C12	None Supplied	0.30-2.50	Brown loam with gravel
644126	D12	None Supplied	0.30-2.50	Brown loam with gravel
644127	E12	None Supplied	0.30-2.50	Brown loam and sand with gravel



Analytical Report Number : 25-042569
Project / Site name: Knowsley

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)
Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

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

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

Cremer & Warner Ltd

**PRELIMINARY
CONTAMINATED SITE
INVESTIGATION
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LTD., KNOWSLEY**

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DATE: 27 April 1993

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C3971/1

Report No 93169

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1.0 INTRODUCTION

Cremer and Warner (C&W) was commissioned by Contract Chemicals Ltd (CC) to undertake a site investigation at their site at Knowsley, Prescott.

The scope of the work was based on Proposal Number P4246, dated 10 December 1992 and revised in subsequent telephone calls with Mr P Kinley (CC).

1.1 Aim-of the Study

The aim of this study was to conduct a preliminary appraisal of possible ground contamination conditions in an area which comprises land in the ownership of CC, an unused field owned by Knowsley Borough Council (KBC) and land owned by McGregor Cory Ltd (MC)

KBC required certain conditions to be met prior to allowing C&W access to KBC land. The conditions were unacceptable to CC and consequently no investigation work was undertaken on KBC land.

2.0 BACKGROUND TO THE SITE INVESTIGATION

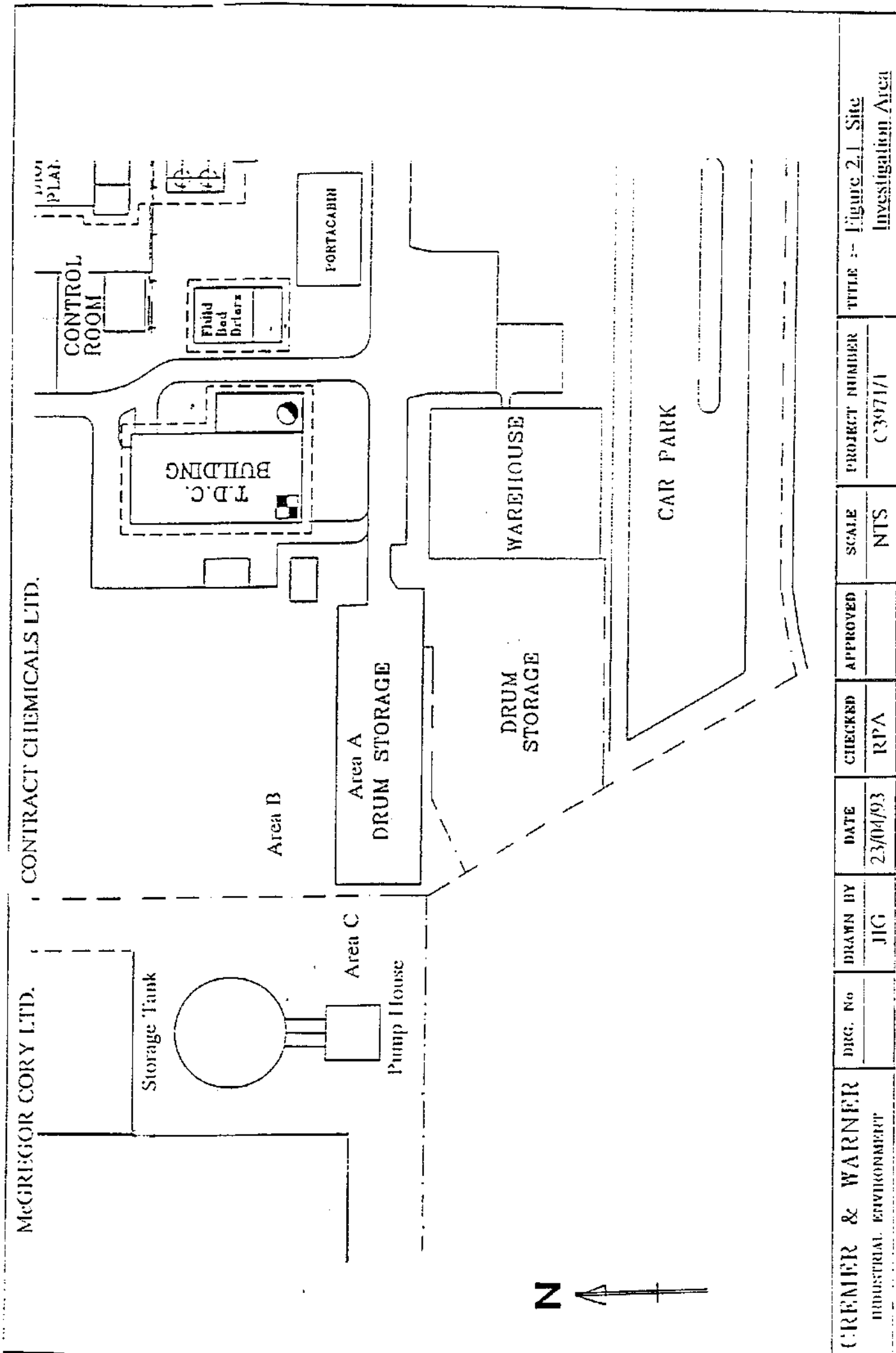
2.1 Site Geography and Description

The area investigated occupies approximately 0.2ha along the boundary of the CC and MC sites in Knowsley Industrial Park near Prescott. The area investigated is illustrated in Figure 2.1.

The western side of the CC site is used as a chemical storage area where waste products have been stored since 1982. A section of the storage area has recently been concreted over (referred to as Area A in Figure 2.1) with an area of approximately 0.2ha remaining with aggregate hardstanding (Area B). The MC site lies to the west of the storage area separated by a boundary fence. An embankment runs along the boundary with a downward gradient running from the CC storage area to the MC site. The area of investigation on MC land is referred to as Area C in Figure 2.1.

2.2 Site Operations

CC produce chemical intermediates to contract. Friedel-Crafts reactions are performed to alkylate aromatic hydrocarbons. Two proprietary compounds are produced on site with the trade name "Permanax" and are benzene dialkyl amines in character. Raw materials used in the processes operated include benzophenone, acetic acid and benzoyl chloride.



3.0 SITE INVESTIGATION

3.1 Sampling Strategy and Methods

Guidance on the investigation of contaminated land is issued in the British Standard Institution document DD175, entitled "Code of practice for the identification of potentially contaminated land and its investigation". However, DD175 is a ground investigation specification employed when land is to be redeveloped and the aim of this preliminary investigation is to determine whether contamination has occurred rather than enable the site to be redeveloped. Also DD175 does not provide guidance on site investigation requirements on sites as small as the area under investigation in this study.

Therefore, the following sampling program was devised to enable the maximum level of information to be obtained within the financial constraints of the study.

Sub surface samples were collected from a total of nine locations aligned in rows parallel to the site boundary between MC and CC. Samples collected from each row were combined into one composite sample for analysis. The rows were positioned at the following distances from the boundary fence:-

CC land

Row 1	15m	(sample reference TP3,4)
Row 2	3m	(sample reference TP1,2)

MC land

Row 3	1.5m	(sample reference TP7,8)
Row 4	5m	(sample reference TP5,6)

Following this protocol, an indication of contaminant concentration variations with distance on either side of the site perimeter could be attained.

A further two additional sampling locations for boreholes were located, one on CC property, the other on MC land.

All sampling locations are illustrated in Figure 3.1

3.1.1 Trial Pits

Eight trial pits (as detailed above) were excavated to depths of up to 0.8m using a back-hoe excavator on the 19 March 1993. The trial pits were not extended beyond these depths to prevent potential damage to unidentified

services and to prevent potential contamination in upper soil strata penetrating further through the soil column. The location of trial pits were restricted by three electric cables whose approximate locations were identified by a cable detector.

Samples were collected at depths of 0.1m, 0.3m and 0.5m and subsequently composited with other samples from locations equidistant from the site boundary. All samples were collected in 0.5 litre, airtight glass jars and transferred to the laboratory in cool boxes where they were refrigerated prior to analysis.

3.1.2 Boreholes

To monitor groundwater conditions beneath the investigation area, two boreholes were drilled one on either side of the perimeter fence between CC and MC land to depths of 3.5m on 19 March 1993. The boreholes were instrumented with 50mm slotted monitoring screens with a geotextile wrap. To prevent contamination of underlying strata, the boreholes were instrumented with slotted monitoring pipe, in a pea gravel annulus, to a depth of only 2m and the remaining void to the mudstone sealed with bentonite grout.

A soil sample from the clay strata underlying the surface fill material was collected from 0.5m in borehole BH1 to determine whether contamination from the drum storage area had penetrated into the underlying clay.

Groundwater was not encountered during drilling and no groundwater had accumulated in the boreholes when they were inspected 11 days later on the 30 March 1993.

Borehole and trial pit logs are presented in Appendix I.

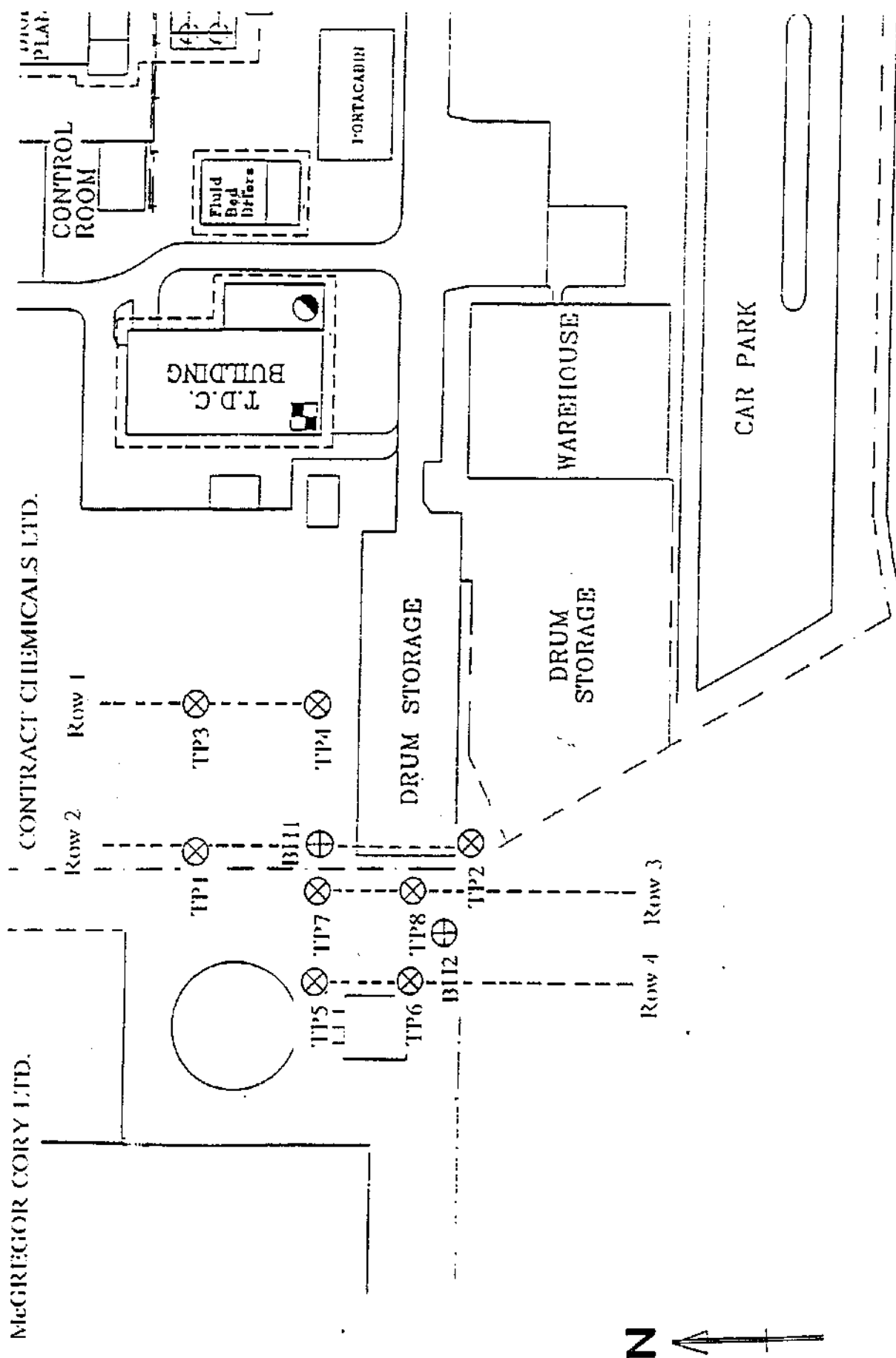
3.2 Analytical Strategy

The analytical technique most applicable to identify and quantify the aromatic and other hydrocarbon contaminants potentially present in the samples was a combination of gas chromatography and mass spectrometry (GC/MS).

The GC/MS technique used two different extractions to identify semi-volatile and volatile compounds respectively. The compounds expected to be identified were semi-volatile in nature and a full GC/MS scan was run for the sample collected on the MC site nearest the perimeter fence, i.e. Row 3 (sample reference TP7,8) where surface discoloration indicated the presence of contaminants. On the basis of this analysis, the ten most abundant contaminants were subsequently targeted for all other samples submitted.

To determine whether contamination by volatile compounds such as benzene, toluene and chloroform had occurred on the MC site, a single GC/MS scan was carried out on sample Row 3 (TP7,8). As a result of compositing samples, the analysis for volatile compounds, which could be lost during compositing, can only be regarded as semi-quantitative, but provides a good indication of whether contamination by volatiles has occurred.

All analytical work was performed by Scientific Analysis Laboratories, Eccles. The certificates of analysis detailing all the results are presented as received in Appendix II.



CREMIER & WARNER INDUSTRIAL ENVIRONMENT	DRG. No	DRAWN BY JIG	DATE 23/04/93	CHECKED RPA	APPROVED	SCALE NTS	PROJECT NUMBER	TITLE :- Figure 3.1 Trial Pit and Borehole Locations
							C3971/1	

4.0 CONTAMINATION CONDITIONS

4.1 On-site Observations

Surface Run-off

A surface walk-over indicated that overland flow from CC land to MC property occurs principally at two points. The first is located at the south west corner of Area A near to a drainage pipe running from CC to the site boundary, the other further along the perimeter fence opposite the storage tank on MC land.

At this second point of migration it was evident that potentially contaminated surface water from Area B drained along the embankment on the site boundary towards the south west corner of Area A where the water collected. Fine, purple to black silts possessing an acrid, pungent odour had built up in areas of water flow.

Where overland flow appeared to have occurred towards the storage tank, a degree of vegetation stress was observed, resulting in an absence of the grassward, which was present elsewhere in the vicinity.

Other Observations

By the southern corner of Area A near to the perimeter fence, black tar-like material was seeping slowly from the sides of Area A down towards the drainage pipe running from the CC site to the MC boundary.

The original area of hardstanding used for drum storage (Area B) was discoloured at a variety of locations. Occasional pools of potentially contaminated surface water were observed.

The upper 0.5m of the site investigation area comprised fill material consisting of bricks, building rubble, rags and glass in a clayey sand matrix. This was succeeded by firm clay overlying clayey mudstone. The mudstone base rock was encountered at a depth of 2m.

4.2 Ground Conditions

The results of the laboratory analysis can be summarised as follows:

The most prevalent semi-volatile organic contaminants identified by GC/MS were:

C₄ Benzene compounds (4 unidentified alkyl substituted benzene compounds)

Naphthalene

Benzophenone

Benzene diamine methyl ethyl phenyl

Benzene 1,1,1 methlidyne tris

A diamine with molecular weight of 268, corresponding to the molecular weight of "Permanax - 6PPD"

Unknown brominate, molecular weight 294

Unknown compound, molecular weight 218

Unknown compound, molecular weight 86

In addition, small quantities of the volatile compounds toluene and chloroform were detected.

The concentrations of semi-volatile compounds present in the samples collected are summarised below:

Chemical Species	Sample				
	Row 1 (TP3,4) ⁽²⁾	Row 2 (TP1,2) ⁽²⁾	Row 3 (TP7,8) ⁽³⁾	Row 4 (TP5,6) ⁽³⁾	BH1 ⁽²⁾
C ₄ Benzenes	16.70	ND ⁽¹⁾	4.19	ND	ND
Napthalene	1.60	ND	0.92	ND	ND
Unknown (M.Wt 218)	ND	ND	0.33	ND	ND
Benzophenone	1.70	0.42	1.40	0.06	27.5
Unknown Brominate (M.Wt 294)	3.00	1.90	3.50	0.32	ND
Unknown (M.Wt 86)	ND	ND	0.60	ND	ND
Benzene diamine methyl ethyl phenyl	ND	ND	1.00	ND	ND
Benzene 1, 1, 1 methlidyne trio	ND	ND	0.35	ND	ND
Unknown diamine (M.Wt 268)	6.00	ND	3.50	ND	0.02
pH	9.4	8.7	8.9	8.5	8.7

Notes: All values expressed in mg/Kg dry soil.

- (1) ND - Not detected.
 (2) Collected from CC land.
 (3) Collected from NC land.

4.3.1 UK Guidelines

In the UK, current government guidelines are issued by the Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL) in ICRCL guidance note 59/83 entitled "Guidance on the assessment and redevelopment of contaminated land".

The ICRCL guidelines propose various tentative contaminant trigger concentrations which are acceptable for a given proposed land-use. Above this trigger threshold concentration, remedial action may be needed, depending upon circumstances.

4.3.2 US, Dutch and Canadian Guidelines

Where appropriate UK guidelines are absent, reference is made to widely used overseas soil guidelines.

Dutch guidelines have found widespread use in the UK, but have recently been withdrawn in the Netherlands prior to review. They are included in this report for comparative purposes only. They have been based upon classifying contaminant concentrations into 3 classes; A, B and C. Concentrations above class B may require further investigation and above class C will require remedial action. The guidelines as they appeared prior to review are listed in Appendix III. Reference is also made to proposed State of New Jersey residential soil clean-up guidelines.

4.3.2 Comparison of Appropriate Guidelines with Contamination Conditions

Semi-Volatile Compounds

As stated previously, few of the guidelines referred to in Section 4.3.1 relate to compounds identified in this report. Where guidelines do exist they have been quoted in the following table in the context of maximum contaminant concentrations found in CC and MC land respectively.

Component	Maximum Concentration (CC land) mg/kg dry soil	Maximum Concentration (MC land) mg/kg dry soil	Appropriate Standard mg/kg dry soil
Naphthalene	1.60	0.92	0.1 (Dutch A classification) 5 (Dutch B classification) 50 (Dutch C classification) (See Notes 1 & 2)
Total aromatic hydrocarbons	29.00 ⁽³⁾	15.79 ⁽³⁾	7 (Dutch B classification) 70 (Dutch C classification)

Notes

- (1) ICRL threshold guideline for total polycyclic aromatic hydrocarbons for buildings and hard cover is 1000 mg/kg.
- (2) Proposed soil standard for naphthalene in the State of New Jersey (1992) is 230 mg/kg.
- (3) The contribution of contaminants other than those identified is unknown and therefore concentrations quoted should be taken as minimum expected values.

Volatile Compounds

Guidelines on acceptable concentrations of volatile soil compounds are not available in the UK. The concentrations of the volatile compounds identified benzene, toluene and chloroform, which as stated previously can only be regarded as semi-quantitative, were significantly below standards and guidelines in the US and The Netherlands.

4.4 Interpretation of Results

The results may be interpreted as follows:

- (i) Generally the highest concentrations of contaminants were found in the sample collected from Row 1 (TP3,4) 15m from the boundary fence on CC land.
- (ii) Only low concentration levels of several contaminants were detected in Row 2 near the boundary fence on CC land (TP1,2).
- (iii) Sample BH1 collected from the top of the underlying clay strata contained low concentrations of hydrocarbon contaminants with the exception of benzophenone.
- (iv) Moderate concentrations of aromatic contaminants were found in the sample collected from Row 3 (TP7,8). Row 3 was located on the MC site where surface run-off from the CC site appeared to have collected.
- (v) Row 3 (TP7,8) contained four compounds, two of which were unidentified, which were not detected at any other locations, either on MC land or CC property.
- (vi) Row 4 (TP5,6), located 5m from the boundary fence contained very low concentrations of only 2 contaminants present in Row 3 (TP7,8). Any of the other compounds which were being tested for were below detectable limits.
- (vii) All samples tested were slightly alkaline. The highest levels of pH are at Row 1 (TP3,4) and Row 3 (TP7,8) where the highest levels of organic contamination were detected.

These results indicate that contamination by identified compounds is probably limited on MC land to the vicinity of the boundary between CC and MC property. The identification of the proprietary compound "Permanax 6PPD" on MC land could only have originated from the CC site with migration of this and other compounds occurring overland through surface run-off from the drum storage area.

In conjunction with on-site observations the results from sample BH1 would indicate that the contamination was restricted mainly to the upper 0.5m of soil and that the underlying clay restricted vertical migration of contamination.

5.0 SUMMARY

The following key points and tentative conclusions can be drawn from this preliminary site investigation.

- (i) Soil contaminants identified on CC and MC sites suggests that contamination has migrated from CC property onto land owned by MC.
- (ii) From visual observations, migration appears to have occurred overland at two principal points, with contaminated surface water being channelled along the embankment bordering the MC and CC sites to collect in the south west corner of MC property. Based upon analytical results, contamination would appear to be concentrated in this area as a result and only very low levels of contamination were detected on MC property 5m from the site boundary.
- (iii) For most of the compounds identified, ground contamination standards are unavailable. However, where guidelines are available, for example, for total aromatic compounds, 'moderate' rather than 'heavy' contamination of the samples was identified.
- (iv) The surface ponding observed is a consequence of the impermeability of the underlying clay strata, generally found at a depth of 0.5m.
- (v) It is likely that the clay strata has restricted the vertical migration of contaminants to the upper soil layers.

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APPENDIX I

TRIAL PIT AND BOREHOLE LOGS

METHOD		CONTRACTOR	TRIAL PIT NO.	
Back Hoe Excavator		Maron (ICB) Hire	TP1	
SURFACE OBSERVATION Lightly stained surface		DATE: 19/03/93	GRID REF.	
		SITE: Contract Chemicals Ltd., Knowsley	LOGGED BY (Initials) JIG	
DEPTH (m)	DESCRIPTION OF STRATA		WATER	SAMPLES
	Aggregate hardstanding. Mild odour.		Slow water ingress	
	Fill: Stiff, brown boulder clay.			
0.5	Stiff, deep red clay.			
	Firm, plasticity brown to grey clay.			
1.0	Base of hole.			
1.5				
2.0				
2.5				
3.0				
CREMER & WARNER Safety Environment Engineering		CLIENT Contract Chemicals Ltd.		
		PROJECT: Contaminated Land Investigation		JOB NO. C3971/1

METHOD Back Hoe Excavator		CONTRACTOR Maron (ICB) Hire		TRIAL PIT NO. TP2	
SURFACE OBSERVATION Stained surface. Black tarry material on side of raised hardstanding.		DATE: 19/03/93		GRID REF.	
		SITE: Contract Chemicals Ltd., Knowsley		LOGGED BY (Initials) JIG	
DEPTH (m)	DESCRIPTION OF STRATA		WATER		SAMPLES
	Aggregate with coarse sands; fine to medium gravels. Moderate pungent odour		Moist soil		
0.5	Electric cable detected very close by. Hole abandoned.				
1.0					
1.5					
2.0					
2.5					
3.0					
CREMER & WARNER Safety, Environment, Engineering		CLIENT Contract Chemicals Ltd.			
		PROJECT: Contaminated Land Investigation		JOB NO. C3971/1	

METHOD		CONTRACTOR	TRIAL PIT NO.	
Back Hoe Excavator		Maron (JCB) Hire	TP3	
SURFACE OBSERVATION		DATE: 19/03/93	GRID REF.	
Black stained surface		SITE: Contract Chemicals Ltd., Knowsley	LOGGED BY (Initials)	
			JIG	
DEPTH (m)	DESCRIPTION OF STRATA	WATER	SAMPLES	
	Compacted aggregate.	Dry		
	Fill: Firm, clayey sand with ash.			
0.5	Fill: Building rubble, bricks, glass and cloth in clayey sand matrix.			
1.0	Base of hole.			
1.5				
2.0				
2.5				
3.0				
CREMER & WARNER Safety, Environment Engineering		CLIENT Contract Chemicals Ltd.		
		PROJECT: Contaminated Land Investigation		JOB NO. C3971A

METHOD		CONTRACTOR	TRIAL PIT NO.	
Back Hoe Excavator		Maron (ICB) Hire	TP4	
SURFACE OBSERVATION Visible pools of black, discoloured water		DATE: 19/03/93	GRID REF.	
		SITE: Contract Chemicals Ltd., Knowsley	LOGGED BY (Initials) JIG	
DEPTH (m)	DESCRIPTION OF STRATA		WATER	SAMPLES
	Compacted aggregate with coarse sands		Moist soil	
	Fill: Sandy, grey clay. Mild odour.			
0.5	Fill: Building rubble, bricks and cloth in clayey sand matrix.			
	Firm, red to grey marly clay. Moderate, pungent odour.			
1.0	Base of hole.			
1.5				
2.0				
2.5				
3.0				
CREMER & WARNER Safety, Environment Engineering		CLIENT Contract Chemicals Ltd.		
		PROJECT: Contaminated Land Investigation		JOB NO. G3971/1

METHOD Back Hoe Excavator		CONTRACTOR Maron (ICB) Hire	TRIAL PIT NO. TP5	
SURFACE OBSERVATION Grass cover. No visible surface contamination		DATE: 19/03/93	GRID REF.	
		SITE: McGregor Cory Ltd., Knowsley	LOGGED BY (Initials) JIG	
DEPTH (m)	DESCRIPTION OF STRATA		WATER	SAMPLES
—	Fill: Grey, clayey topsoil.		Dry	
—	Plasticity, red clay.			
0.5				
—	Electric cable running in very close vicinity alongside pump house and storage tank. Base of hole.			
1.0				
—				
1.5				
2.0				
2.5				
3.0				
CREMER & WARNER Safety Environment Engineering		CLIENT Contract Chemicals Ltd.		
		PROJECT: Contaminated Land Investigation		JOB NO. C3971/1

METHOD Back Hoe Excavator		CONTRACTOR Maron (JCB) Hire	TRIAL PIT NO. TP6	
SURFACE OBSERVATION Grass cover		DATE: 19/03/93	GRID REF.	
		SITE: McGregor Cory Ltd., Knowsley	LOGGED BY (Initials) JIG	
DEPTH (m)	DESCRIPTION OF STRATA	WATER	SAMPLES	
—	Loose, clayey topsoil matrix with fine gravels.	Dry		
—	Fill: Building rubble, bricks and wood fragments in sand matrix.			
0.5	Very mild organic odour			
—	Brittle, red, sandy clay.			
—	Base of hole.			
1.0				
1.5				
2.0				
2.5				
3.0				
CREMER & WARNER Safety Environment Engineering		CLIENT Contract Chemicals Ltd.		
		PROJECT: Contaminated Land Investigation		JOB NO. C3971/1

METHOD Back Hoe Excavator		CONTRACTOR Maron (JCB) Hire	TRIAL PIT NO. TP7	
SURFACE OBSERVATION Grass cover		DATE: 19/03/93	GRID REF.	
		SITE: McGregor Cory Ltd., Knowsley	LOGGED BY (Initials) JIG	
DEPTH (m)	DESCRIPTION OF STRATA		WATER	SAMPLES
—	Clayey topsoil with rootlets.		Moist soil	
—	Plastic grey clay with coarse gravels			
— 0.5	Fill: Building rubble and coarse angular stones in sandy matrix			
—	Hard, brittle red, sandy clayey marl (mudstone).			
—	Base of hole.			
— 1.0				
—				
— 1.5				
—				
— 2.0				
—				
— 2.5				
—				
— 3.0				
CREMER & WARNER Safety Environment Engineering		CLIENT Contract Chemicals Ltd.		
		PROJECT: Contaminated Land Investigation		JOB NO. C3971/1

METHOD		CONTRACTOR	TRIAL PIT NO.	
Back Hoe Excavator		Maron (JCB) Hire	TP8	
SURFACE OBSERVATION Large, discoloured, pool of surface water with oily film. Poor vegetation cover.		DATE: 19/03/93	GRID REF	
		SITE: McGregor Cory Ltd., Knowsley	LOGGED BY (Initials) JIG	
DEPTH (m)	DESCRIPTION OF STRATA	WATER	SAMPLES	
—	Loose, clayey topsoil matrix with fine gravels.	Moist soil		
—	Fill: Bricks and building rubble with cloth in clayey matrix.			
0.5	Moderate pungent odour			
—	Brittle, firm, red, sandy clay with occasional black streaking. Mild odour			
1.0	Base of hole.			
—				
—				
—				
—				
1.5				
—				
—				
—				
2.0				
—				
—				
—				
2.5				
—				
—				
—				
3.0				
GREMER & WARNER Safety/Environment/ Engineering		CLIENT Contract Chemicals Ltd.		
		PROJECT: Contaminated Land Investigation		JOB NO. C3971/1

METHOD		CONTRACTOR	TRIAL PIT NO.	
Light Percussion Drilling		IDEC Exploration	BH1	
SURFACE OBSERVATION		DATE: 19/03/93	GRID REF.	
		SITE: Contract Chemicals Ltd., Knowsley	LOGGED BY (Initials) HH	
DEPTH (m)	DESCRIPTION OF STRATA		WATER	SAMPLES
	Limestone hardstanding.			
0.5	Firm, red, marly clay with hard, laminated marl bands.			X
1.0				
1.5				
2.0	Hard, red, sandy, clayey marl (mudstone).			
2.5				
3.0				
CREMER & WARNER Safety Environment Engineering		CLIENT Contract Chemicals Ltd.		
		PROJECT: Contaminated Land Investigation		JOB NO. C3971/1

METHOD		CONTRACTOR	TRIAL PIT NO.
Light Percussion Drilling		IDEC Exploration	BH1 (cont'd)
SURFACE OBSERVATION		DATE: 19/03/93	GRID REF.
		SITE: Contract Chemicals Ltd., Knowsley	LOGGED BY (Initials) HH
DEPTH (m)	DESCRIPTION OF STRATA	WATER	SAMPLES
3.5	Hard, red, sandy, clayey marl.	Dry	
4.0	Base of hole.		
4.5			
5.0			

METHOD		CONTRACTOR	TRIAL PIT NO.	
Light Percussion Drilling		IDEC Exploration	BH2	
SURFACE OBSERVATION		DATE: 19/03/93	GRID REF.	
Light grass cover. Surface water nearby		SITE: McGregor Cory Ltd., Knowsley	LOGGED BY (Initials)	
			HH	
DEPTH (m)	DESCRIPTION OF STRATA		WATER	SAMPLES
0.5	Fill: Stiff, brown boulder clay with bricks.			
1.0				
1.5	Compact, brown to yellow, clayey sand.			
2.0	Stiff, red, marly clay with hard marl bands.			
2.5	Hard, red, clayey sandy marl (mudstone).			
3.0				
CREMER & WARNER		CLIENT		
Safety, Environment, Engineering		Contract Chemicals Ltd		
		PROJECT: Contaminated Land Investigation		JOB NO. C3971/1

METHOD		CONTRACTOR		TRIAL PIT NO.	
Light Percussion Drilling		IDEC Exploration		BH2 (cont'd)	
SURFACE OBSERVATION Light grass cover. Surface water nearby		DATE: 19/03/93		GRID REF.	
		SITE: McGregor Cory Ltd., Knowsley		LOGGED BY (Initials) HH	
DEPTH (m)	DESCRIPTION OF STRATA		WATER		SAMPLES
3.5	Hard, red, clayey, sandy marl.		Dry		
4.0	Base of hole.				
4.5					
5.0					
5.5					
6.0					
CREMER & WARNER Safety Environment Engineering		CLIENT Contract Chemicals Ltd.		JOB NO. C3971/1	
		PROJECT: Contaminated Land Investigation			

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APPENDIX II
ANALYTICAL RESULTS

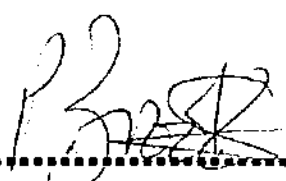
Scientific Analysis Laboratories Ltd

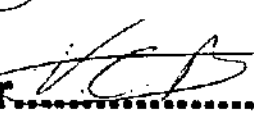
Certificate of Analysis

Job No.: 944E

All analytical results contained within have been obtained in accordance with validated standard operating procedures, which include full QA/QC.

Any deviations from standard operating procedures are noted in the accompanying text.

Analyst..........Date.....5/4/93.....

Quality Manager..........Date.....5/4/93.....

Report on the Analysis of 5 Samples for Semi-Volatile Components

SAL Job No. 944E

Method Summary

The soil samples (approximately 10g) were extracted, using the ultrasonic technique with three separate volumes of 50:50 Dichloromethane:Acetone. Prior to extraction each soil sample was spiked with a deuterated PAH mixture which acts as the internal standard for all quantitation. The solvent layers were decanted off and combined. The extracts were concentrated and combined prior to injection on the GC/MS. Sample 944E001 (your ref. TP7,8) was to be used to identify and quantitate the 10 largest components and these components were then to be targeted and quantitated in the remaining samples.

A method blank is processed in the same way.

A 1ul aliquot of the concentrated extract is injected in the splitless mode onto a 40 m J&W DB-5 fused silica capillary column directly coupled to the ion source of a VG7070HS mass spectrometer operating in the repetitive scanning mode from m/z 500 to m/z 50 at a resolving power of 500 (10% valley definition). Spectra of interest are identified by comparing them with those contained in the NIST mass spectral database. Confirmation is performed by the operator and, where appropriate, comments are made in the sample report.

The GC conditions used for the analysis are as follows:

Injector Temperature:	300°C
Initial Temperature:	60°C, held for 2 minutes
Ramp Rate:	8°C / minute
Final Temperature:	320°C, held for 5 minutes

Sample Results

The reconstructed total ion chromatograms for sample 944E001 is given in figure 1.

Table 1 gives the identification (where possible) and quantity of the 10 most abundant components of the mixture. The quantitation is based on comparison of the area of the unknown with that of the deuterated PAH standard with the assumption that the relative response of the unknown to the standard is unity.

TABLE 1

COMPOUND	ug in sample	ug/kg sample
C ₄ Benzene	4.6	460
C ₄ Benzene	13	1300
C ₄ Benzene	18	1800
C ₄ Benzene	6.3	630
Naphthalene	9.2	920
Unknown (M.Wt. 218)	3.3	330
Benzophenone	14	1400
Unknown brominated (M.Wt 294)	35	3500
Unknown (Base peak m/z 86)	6	600
Benzenediamine methylethyl phenyl	10	1000
Benzene 1,1,1 methylidyne tris	3.5	350
Unknown diamine (M.Wt. 268)	35	3500

Note: Unknown means that a library fit was not available but some of the spectral characteristics are represented in the table and were used to identify these components in the other samples.

Sample 944E002 (Your ref TP1,2)

COMPOUND	ug in sample	ug/kg sample
C ₄ Benzene	n.d.	n.d.
C ₄ Benzene	n.d.	n.d.
C ₄ Benzene	n.d.	n.d.
C ₄ Benzene	n.d.	n.d.
naphthalene	n.d.	n.d.
Unknown (M.Wt. 218)	n.d.	n.d.
Benzophenone	4.2	420
Unknown brominated (M.Wt 294)	19	1900
Unknown (Base peak m/z 86)	n.d.	n.d.
Benzenediamine methylethyl phenyl	n.d.	n.d.
Benzene 1,1,1 methylidyne tris	n.d.	n.d.
Unknown diamine (M.Wt. 268)	n.d.	n.d.

Sample 944E003 (Your ref TP3,4)

COMPOUND	ug in sample	ug/kg sample
C ₄ Benzene ,	33	3300
C ₄ Benzene	35	3500
C ₄ Benzene	65	6500
C ₄ Benzene	34	3400
Naphthalene	16	1600
Unknown (M.Wt. 218)	n.d.	n.d.
Benzophenone	17	1700
Unknown brominated (M.Wt 294)	30	3000
Unknown (Base peak m/z 86)	n.d.	n.d.
Benzenediamine methylethyl phenyl	n.d.	n.d.
Benzene 1,1,1 methylidyne tris	n.d.	n.d.
Unknown diamine (M.Wt. 268)	60	6000

Sample 944E004 (Your ref BH1 (0.5))

COMPOUND	ug in sample	ug/kg sample
C ₄ Benzene	n.d.	n.d.
C ₄ Benzene	n.d.	n.d.
C ₄ Benzene	n.d.	n.d.
C ₄ Benzene	n.d.	n.d.
Naphthalene	n.d.	n.d.
Unknown (M.WT. 218)	n.d.	n.d.
Benzophenone	275	27500
Unknown brominated (M.Wt 294)	n.d.	n.d.
Unknown (Base peak m/z 86)	n.d.	n.d.
Benzenediamine methylethyl phenyl	n.d.	n.d.
Benzene 1,1,1 methylidyne tris	n.d.	n.d.
Unknown diamine (M.Wt. 268)	0.2	20

Sample 944E005 (Your ref TP5,6)

COMPOUND	ug in sample	ug/kg sample
C ₄ Benzene	n.d.	n.d.
C ₄ Benzene	n.d.	n.d.
C ₄ Benzene	n.d.	n.d.
C ₄ Benzene	n.d.	n.d.
Naphthalene	n.d.	n.d.
Unknown (M.WT. 218)	n.d.	n.d.
Benzophenone	0.6	60
Unknown brominated (M.Wt 294)	3.2	320
Unknown (Base peak m/z 86)	n.d.	n.d.
Benzenediamine methylethyl phenyl	n.d.	n.d.
Benzene 1,1,1 methylidyne tris	n.d.	n.d.
Unknown diamine (M.Wt. 268)	n.d.	n.d.

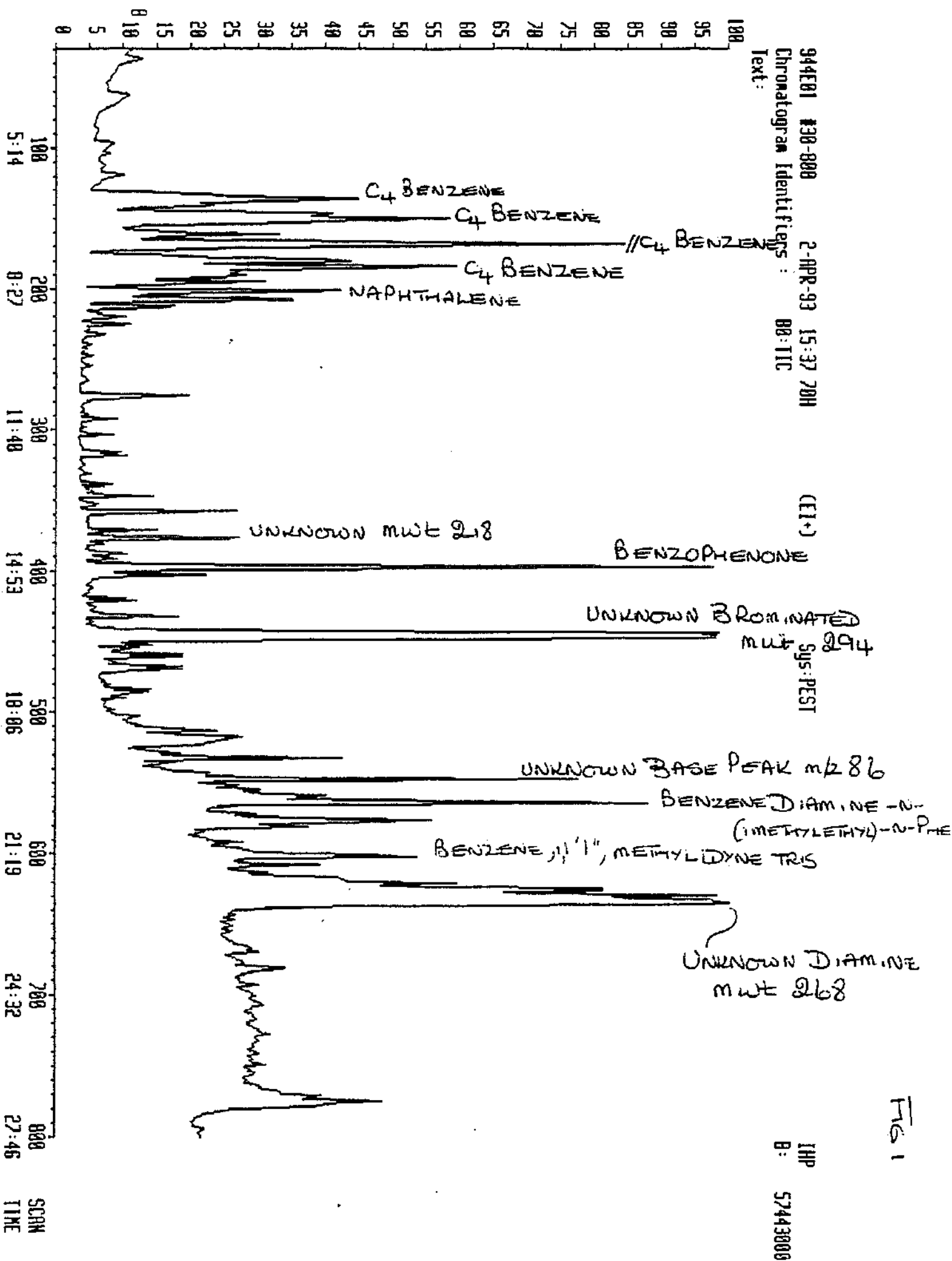


Fig 1

IHP
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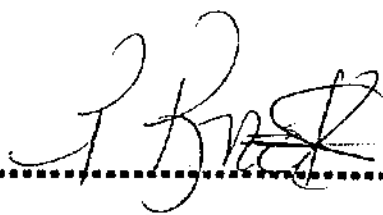
Scientific Analysis Laboratories Ltd

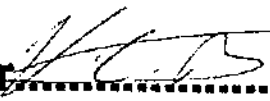
Certificate of Analysis

Job No.: 944E

All analytical results contained within have been obtained in accordance with validated standard operating procedures, which include full QA/QC.

Any deviations from standard operating procedures are noted in the accompanying text.

Analyst..........Date.....5/4/93.....

Quality Manager..........Date.....5/4/93.....

Report on the Analysis of a Sample for Volatiles

SAL Job No. 944E

Method Summary

50g of sample 944E001 (your ref. TP7,8) was transferred to 40 ml septum sealed glass vial. Deuterated Toluene was added to the sample to act as an internal standard for quantitation purposes. A 1 ml aliquot of the headspace from the sample was taken and injected in the splitless mode onto a 30m J&W DB-624 fused capillary column, directly coupled to the ion source of a VG7070HS mass spectrometer. The mass spectrometer is operated in the repetitive scanning mode from m/z 500 to m/z 35 at a resolving power of 500 (10% valley definition). Spectra are recorded as the GC column is heated and those of interest are identified by comparing them with those contained in the NIST mass spectral database. Confirmation is performed by the operator and, where appropriate, comments are made in the sample report.

Quantitation is achieved by comparison of peak areas of components in the sample to the area of the deuterated toluene internal standard. An assumption is made that the total ion response for all analytes is similar.

The GC Conditions used for the volatile analysis are as follows:

Injector Temperature:	140°C
Initial Temperature:	35°C, held for 4 minutes
Ramp Rate:	4°C / minute
Final Temperature:	200°C

The detection limit is estimated to be less than 0.5 ug/kg for components such as benzene.

Sample Results

Table 1 summarises the identities of the major components present in the headspace of sample 944E001 together with the quantitation expressed in ug/kg.

COMPONENT	QUANTITY (ug/kg)
2-Butene	5.4
Di-isopropyl ether	5.9
Chloroform	81
Benzene	1.8
Toluene	160
Ethyl benzene	0.7
m, p Xylene	3.8
Ethyl methyl hexane	2.4
o Xylene	1.1

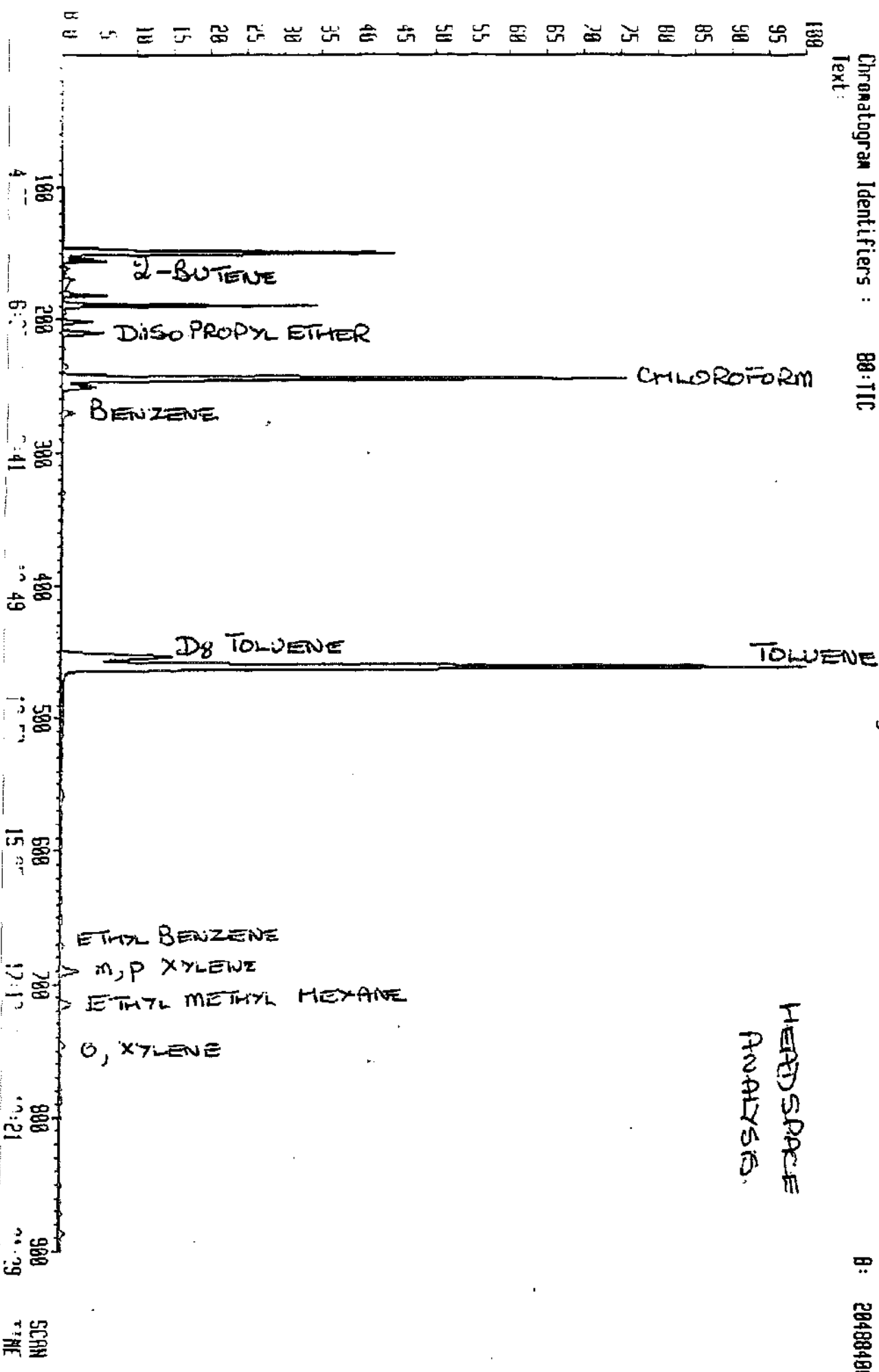
944615 #1-900 2-APR-93 14:56 70H
Chromatogram Identifiers : 80:11C
Text:

(EI+)

Sys:VOLATILE

IHP
B: 204884000

HEADSPACE
ANALYSIS



SCAN
TIME

APPENDIX III

UK AND DUTCH SOIL QUALITY STANDARDS

ICRCL 59/83 (Second Edition) TABLE 4: TENTATIVE "TRIGGER CONCENTRATIONS" FOR CONTAMINANTS ASSOCIATED WITH FORMER COAL CARBONISATION SITES

CONDITIONS

1. This table is invalid if reproduced without the conditions and footnotes.
2. All values are for concentrations determined on "spot" samples based on an adequate site investigation carried out prior to development. They do not apply to analysis of averaged, bulked or composited samples, nor to sites which have already been developed.
3. Many of these values are preliminary and will require regular updating. They should not be applied without reference to the current edition of the report "Problems Arising from the Development of Gas Works and Similar Sites".
4. If all sample values are below the threshold concentrations then the site may be regarded as uncontaminated as far as the hazards from these contaminants are concerned, and development may proceed. Above these concentrations, remedial action may be needed, especially if the contamination is still continuing. Above the action concentrations, remedial action will be required or the form of development changed.

Contaminants	Proposed Uses	Trigger Concentrations	(mg/kg air-dried soil)
		Threshold	Action
Polyaromatic hydrocarbons(1,2)	Domestic gardens, allotments, play areas.	50	500
	Landscaped areas, buildings, hard cover.	1000	10000
Phenols	Domestic gardens, allotments.	5	200
	Landscaped areas, buildings, hard cover.	5	1000
Free cyanide	Domestic gardens, allotments landscaped areas.	25	500
	Buildings, hard cover.	100	500
Complex cyanides	Domestic gardens, allotments.	250	1000
	Landscaped areas.	250	5000
	Buildings, hard cover.	250	NL
Thiocyanate(2)	All proposed uses.	50	NL
Sulphate	Domestic gardens, allotments, landscaped areas.	2000	10000
	Buildings(3).	2000(3)	50000(3)
	Hard cover.	2000	NL
Sulphide	All proposed uses.	250	1000
Sulphur	All proposed uses.	5000	20000
Acidity (pH less than)	Domestic gardens, allotments, landscaped areas.	pH5	pH3
	Buildings, hard cover.	NL	NL

NOTES

- NL: No limit set as the contaminant does not pose a particular hazard for this use.
- (1): Used here as a marker for coal tar, for analytical reasons. See "Problems Arising from the Redevelopment of Gasworks and Similar Sites" Annex A1.
- (2): See "Problems Arising from the Redevelopment of Gasworks and Similar Sites" for details of analytical methods.
- (3): See also BRE Digest 250: Concrete in sulphate-bearing soils and groundwater.

ICRCL 59/83 (Second Edition): TABLE 3 TENTATIVE "TRIGGER CONCENTRATIONS" FOR SELECTED INORGANIC CONTAMINANTS

CONDITIONS

1. This table is invalid if reproduced without the conditions and footnotes.
2. All values are for concentrations determined on "spot" samples based on an adequate site investigation carried out prior to development. They do not apply to analysis of averaged, bulked or composited samples, nor to sites which have already been developed. All proposed values are tentative.
3. The lower values in Group A are similar to the limits for metal content of sewage sludge applied to agricultural land. 2(b) The values in Group B are those above which phytotoxicity is possible.
4. If all sample values are below the threshold concentrations then the site may be regarded as uncontaminated as far as the hazards from these contaminants are concerned and development may proceed. Above these concentrations, remedial action may be needed, especially if the contamination is still continuing. Above the action concentration, remedial action will be required or the form of development changed.

Contaminants	Planned Uses	Trigger Concentrations (mg/kg air dried soil)		
		Threshold	Action	
<u>Group A: Contaminants which may pose hazards to health</u>				
Arsenic	Domestic gardens, allotments	10	*	
	Parks, playing fields, open space	40	*	
Cadmium	Domestic gardens, allotments	3	*	
	Parks, playing fields, open space	13	*	
Chromium (hexavalent) (1)	Domestic Gardens, allotments	25	*	
	Parks, playing fields, open space			
Chromium (total)	Domestic gardens, allotments	600	*	
	Parks, playing fields, open space	1,000	*	
Lead	Domestic gardens, allotments	500	*	
	Parks, playing fields, open space	2,000	*	
Mercury	Domestic gardens, allotments	1	*	
	Parks, playing fields, open space	20	*	
Selenium	Domestic gardens, allotments	3	*	
	Parks, playing fields, open space	6	*	
<u>Group B: Contaminants which are phytotoxic but not normally hazards to health</u>				
Boron (water-soluble) (3)	Any uses where plants are to be grown	(2, 6)	3	*
Copper (4, 5)	Any uses where plants are to be grown	(2, 6)	130	*
Nickel (4, 5)	Any uses where plants are to be grown	(2, 6)	70	*
Zinc (4, 5)	Any uses where plants are to be grown	(2, 6)	300	*

NOTES:

- * Action concentrations will be specified in the next edition of ICRCL 59/83.
1. Soluble hexavalent chromium extracted by 0.1M HCl at 37°C; solution adjusted to pH 1.0 if alkaline substances present.
 2. The soil pH value is assumed to be about 6.5 and should be maintained at this value. If the pH falls, the toxic effects and the uptake of these elements will be increased.
 3. Determined by standard ADAS method (soluble in hot water).
 4. Total concentration (extractable by HNO₃/HClO₄).
 5. The phytotoxic effects of copper, nickel and zinc may be additive. The trigger values given here are those applicable to the 'worst-case': phytotoxic effects may occur at these concentrations in acid, sandy soils. In neutral or alkaline soils phytotoxic effects are unlikely at these concentrations.
 6. Grass is more resistant to phytotoxic effects than are most other plants and its growth may not be adversely affected at these concentrations.

TABLE 2
NETHERLANDS
TEST TABLE FOR SOIL AND GROUNDWATER CONTAMINATION

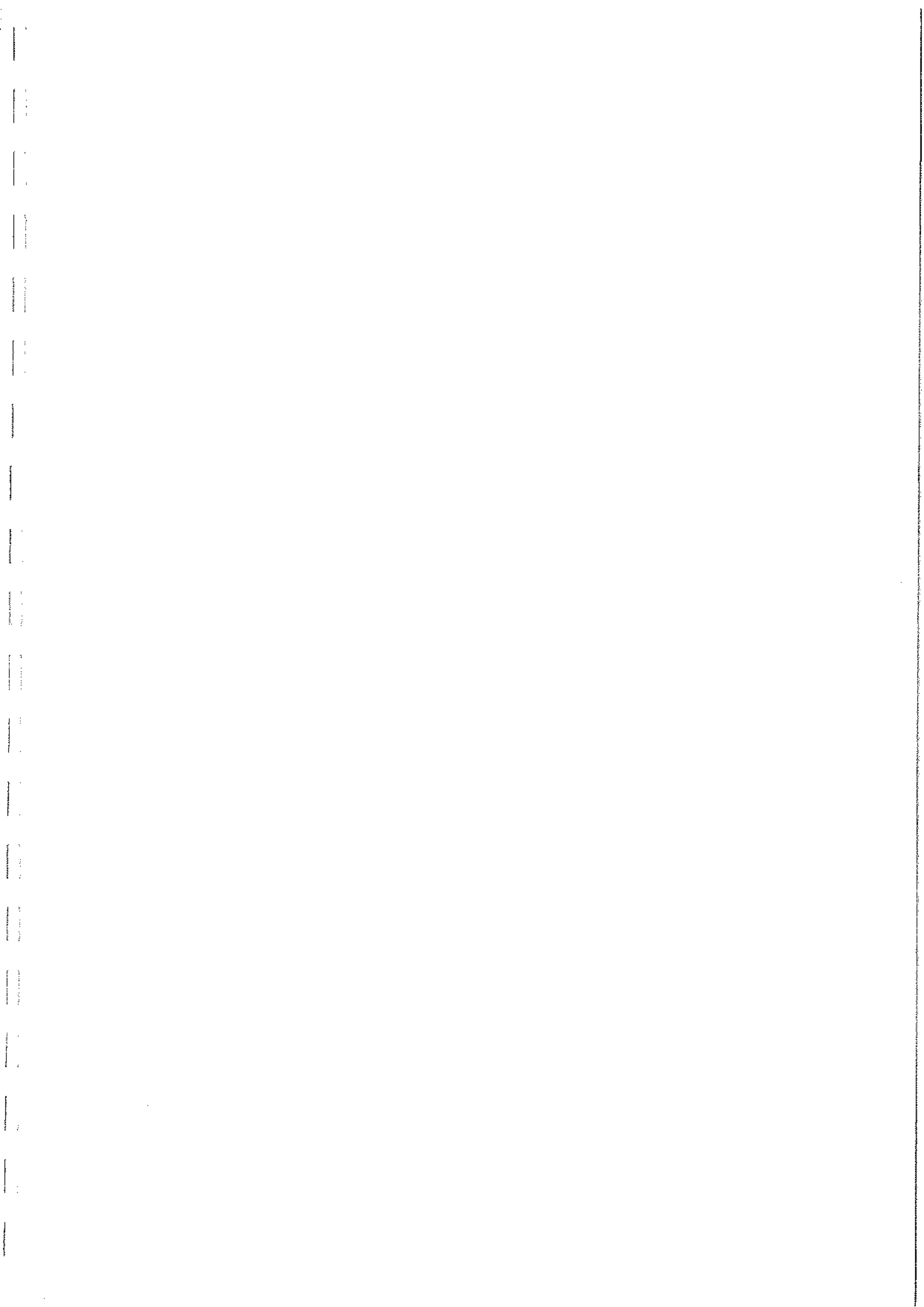
The treatment of polluted soil depends on the nature of the concentrations of polluted substances present in it. In connection with this, a test framework is used in the Netherlands, built up of three values which must be distinguished. These values - consisting of different, ascending levels of concentration A, B and C - are differentiated according to the nature of the pollution:

- * level A acts as a reference value. This level may be regarded as an indicative level above which there is demonstrable pollution and below which there is no demonstrable pollution;
- * level B is an assessment value. Pollutants above the B level should be investigated more thoroughly. The question asked is: To what extent are the nature, location and concentration of the pollutant(s) of such a nature that it is possible to speak of a risk of exposure to man or the environment;
- * level C is to be regarded as the assessment value above which the pollutant(s) should generally be treated.

Present in: Component/concentration	Soil (mg/kg dry matter)			Groundwater (µg/l)		
	A	B	C	A	B	C
i) Metals						
Cr	100	250	800	20	50	200
Co	20	50	300	20	50	200
Ni	50	100	500	20	50	200
Cu	50	100	500	20	50	200
Zn	200	500	3000	50	200	800
As	20	30	50	10	30	100
Mo	10	40	200	5	20	100
Cd	1	5	20	1	2.5	10
Sn	20	50	300	10	30	150
Ba	200	400	2000	50	100	500
Hg	0.5	2	10	0.2	0.5	2
Pb	50	150	600	20	50	200
ii) Inorganic pollutants						
NH ₄ (as N)	-	-	-	200	1000	3000
F (total)	200	400	2000	300	1200	4000
CN (total-free)	1	10	100	5	30	100
CN (total-combined)	5	50	500	10	50	200
S (total)	2	20	200	10	100	300
Br (total)	20	50	300	100	500	2000
PO ₄ (as P)	-	-	-	50	200	700
iii) Aromatic Compounds						
benzene	0.01	0.5	5	0.2	1	5
ethylbenzene	0.05	5	50	0.5	20	60
toluene	0.05	3	30	0.5	15	50
xylenes	0.05	5	50	0.5	20	60
phenols	0.02	1	10	0.5	15	50
aromatics (total)	0.1	7	70	1	30	100

TABLE 2 Continued.

Present in:		Soil (mg/kg dry matter)			Groundwater ($\mu\text{g/l}$)		
Component/concentration		A	B	C	A	B	C
iv) Polycyclic hydrocarbons							
naphthalene		0.1	5	50	0.2	7	30
anthracene		0.1	10	100	0.1	2	10
fenanthrene		0.1	10	100	0.1	2	10
fluoranthene		0.1	10	100	0.02	1	5
pyrene		0.1	10	100	0.02	1	5
1,2 benzopyrene		0.05	1	10	0.01	0.2	1
total polycyclic hydrocarbons		1	20	200	0.2	10	40
v) Chlorinated hydrocarbons							
aliphatic HC	(indiv)	0.1	5	50	1	10	50
aliphatic HC	(total)	0.1	7	70	1	15	70
chlorobenzenes	(indiv)	0.05	1	10	0.02	0.5	2
chlorobenzenes	(total)	0.05	2	20	0.02	1	5
chlorophenols	(indiv)	0.01	0.5	5	0.01	0.3	1.5
chlorophenols	(total)	0.01	1	10	0.01	0.5	2
chlorinated polycyclic HC	(total)	0.05	1	10	0.01	0.2	1
PCB's	(total)	0.05	1	10	0.01	0.2	1
EOCI	(total)	0.1	8	80	1	15	70
vi) Pesticides							
chlorinated organics	(indiv)	0.1	0.5	5	0.05	0.2	1
chlorinated organics	(indiv)	0.1	1	10	0.01	0.5	2
pesticides	(total)	0.1	2	20	0.01	1	5
vii) Other pollutants							
tetrahydrofuran		0.1	4	40	0.5	20	60
pyridine		0.1	2	20	0.5	10	30
tetrahydrothiophene		0.1	5	50	0.5	20	60
cyclohexanes		0.1	6	60	0.5	15	50
styrene		0.1	5	50	0.5	20	60
gasoline		20	100	800	10	40	150
mineral oil		100	1000	5000	20	200	600



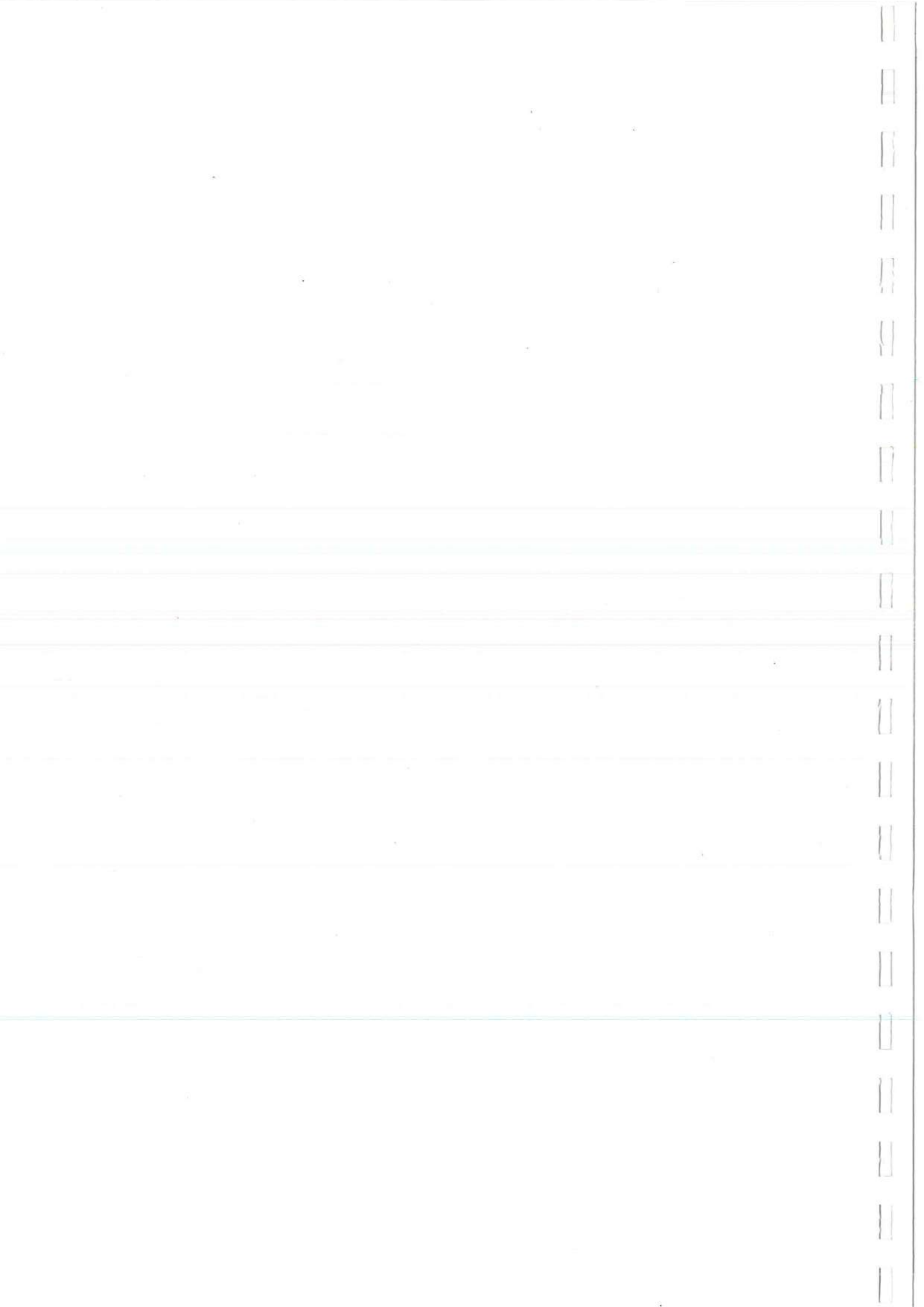
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Trade Effluent Overspill Sampling

Final Interpretive Report

January 2011

Entec UK Limited



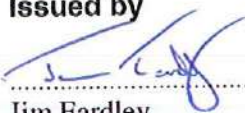
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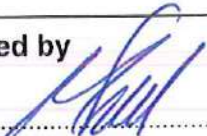
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Contract Chemicals Ltd

Trade Effluent Overspill Sampling

Final Interpretive Report

January 2011

Entec UK Limited



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Document Revisions

No.	Details	Date
1	Draft Report 10533i1	December 2010
2	Final Report 11002i1	January 2011

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1. Introduction

1.1 Background and Terms of Reference

Entec UK Ltd (Entec) was commissioned by Contract Chemicals Ltd (the client) to investigate the possible presence of contamination within the near surface soils on land adjacent to their site at Knowsley Business Park. The contamination is understood to have occurred as a result of an overspill from a trade effluent outflow within the Contract Chemicals site.

The site lies within a largely industrial area. The potential source of contamination is from a trade effluent drain which became blocked recently and caused an overspill of process waste on to the surface of adjacent land owned by a third party.

1.1.1 Purpose of This Report

The purpose of this report is to provide an outline interpretation of the soil sample data relevant to a recent overspill of trade effluent and a brief description of the associated potential liabilities. In preparing this report we have assumed that all information and/or documents provided to Entec by the client in connection with the preparation of this report are accurate, complete and not misleading.

1.2 Legislative Context

With respect to the Contract Chemicals site, there are a number of ways in which liabilities can arise from the presence of soil and groundwater contamination on a site. Of particular importance are:

- i) Statutory liability for clean-up of contaminated land;
- ii) Statutory liability for clean-up of water pollution; and
- iii) Liability to third parties for damage caused by contamination.

1.2.1 Part IIA of the Environmental Protection Act (1990) Scope of Works

The principal legislation governing the identification and remediation of contaminated land that is not undergoing development is Part IIA of the Environment Protection Act (EPA) 1990 which was implemented in April 2000. It was introduced in England in April 2000 by the Contaminated Land (England) Regulations 2000, which were later updated in 2006. The regulations are in turn supported by Statutory Guidance issued by the Department for the Environment Food and Rural Affairs (DEFRA) in September 2006, DEFRA Circular 01/2006.

Part 2A provides a statutory definition of 'Contaminated Land' and sets out the nature of liabilities that can be incurred by owners of contaminated land and groundwater. According to the Act, 'contaminated land' is defined as:

"any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substance in, on, or under the land that:

- *significant harm is being caused, or there is significant possibility of such harm being caused; or*
- *pollution of controlled waters is being, or is likely to be caused."*

Where harm is attributable to radioactivity, the definition of contaminated land has been modified as:

"any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:

- *Harm is being caused, or*
- *There is a significant possibility of such harm being caused."*

The following situations are defined where harm is to be regarded as significant:

- i) Death, disease, serious injury, genetic mutation, birth defects or the impairment of reproductive functions of humans;
- ii) Irreversible or other substantial adverse change to an ecological system, or harm which affects any special interest and which endangers the long term maintenance of the population of that species;
- iii) Structural failure, substantial damage, or interference with the right of occupation of buildings;
- iv) Death, serious disease or other physical damage to livestock or crops; and
- v) The pollution of controlled waters.

Central to the Part 2A regulatory approach is a rigorous procedure of risk assessment which is used to determine whether land meets the definition of 'contaminated land' in accordance with the Statutory Guidance. Under the risk assessment procedure for such harm to humans, the environment or pollution of controlled waters to be possible, there must be a 'pollutant linkage', as follows:

- **A Source** of pollution (Hazard);
- **A Pathway** for the pollutant to move from source to receptor; and
- **A Receptor** (Target) which is affected by the pollutant. This includes human beings, other living organisms, controlled waters, physical systems and built structures which could be affected by the hazard.

For a liability to exist a 'pollutant linkage' must exist which presents a risk to humans, to the environment or to controlled waters.

In apportioning liability for remediation the enforcing authority will, wherever possible, follow the 'polluter pays' principle. This will identify the 'appropriate person' under the Act who 'caused or knowingly permitted' the contamination to be present. There are two different categories of Appropriate Person:

Class A Person: The person who caused or knowingly permitted the contamination (i.e. the polluter). This has to be considered for each pollutant linkage.

Class B Person: The owner or occupier, where no Class A person can be found.

In most circumstances the site owner will be the Class A person unless the liabilities are transferred as part of any sale or lease agreement. The statutory guidance provides a basis for identifying liability groups, apportioning liability and exclusion tests for Class A persons where liability has been transferred e.g. 'payments have been made for remediation' or where the site has been 'sold with information' or other test.

Strict interpretation of pollution of controlled water under Part IIA means that any entry of contaminants from soil into controlled waters presents a liability. However in practice the Environment Agency typically assesses the risk from such pollution utilising water quality targets applicable to certain scenarios. For example this may comprise Drinking Water Standards for potable water and Environmental Quality Standards for rivers, estuaries etc. If, following risk assessment, it is considered that remediation is required remedial target for soils and / or groundwaters would need to be agreed with the Environment Agency. Derivation of such targets may utilise quantitative modelling (such as the Environment Agency's Remedial Targets Methodology), or some form of cost/benefit discussion.

In February 2010, Defra announced its decision to review the Statutory Guidance which underpins the contaminated land regime under Part 2A of the Environmental Protection Act 1990 and consider where it could be amended to reflect experience in delivering the regime and developments in scientific understanding.

It is anticipated that formal consultations on proposals to amend the Statutory Guidance will be undertaken in mid to late 2010. Defra has stated that while this work proceeds, Local Authorities should continue to fulfil their legal duty to identify and deal with contaminated land.

For the purpose of assessment within this report the legislation as it currently stands has been considered. However this appraisal may need to be re-assessed should there be changes in the Statutory Guidance.

It should be noted that in the event of change of site use it is likely that any issue of land quality would be addressed through the planning regime rather than Part IIA of the EPA.

1.2.2 Water Resources Act (1991)

Under Section 161 of the Water Resources Act 1991 (WRA) the Environment Agency has the power to take action to prevent or remedy the pollution of controlled waters by issuing a 'works notice' to any person who has 'caused or knowingly' permitted the pollutant or potential pollutant to be present. There is overlap between these powers and the Part IIA contaminated land regime.

Liability may also arise resulting in prosecution under Section 85, if a site owner fails to take adequate precautions to prevent unauthorised discharging of pollutants into controlled waters. In addition to unauthorised discharges direct into controlled waters, companies are held liable for unauthorised discharges to controlled waters occurring via surface water drains, or by discharge onto the land.

1.2.3 Civil Liabilities to Third Parties

If contamination on a site damages or unreasonably interferes with the use of a neighbouring property the owner/occupier may have a right for damages under private nuisance. For example, this can include damage to the right to extract groundwater from an aquifer, or damage to crops as a result of contaminant migration into groundwater abstracted for spray irrigation.

Nuisance can apply to isolated escapes from land even where the site owner has taken all possible precautions to prevent an escape (strict liability); however, there may be exceptions to this where the event was 'unforeseeable'.

1.2.4 Health and Safety

The Health and Safety at Work Act (1974) is concerned with risks to the public and employees at premises. Risks of this kind could arise from contamination. A number of Regulations have been made under the Act, all of which have a largely risk-based approach, requiring potential hazards to be identified and assessed, and control measures put in place to minimise all risks as far as is reasonably possible. These include:

- Management of Health and Safety at Work Regulations 1999;
- Control of Substances Hazardous to Health Regulations 2002; and
- Construction Design and Management Regulations 2007.

2. Investigation

2.1 Scope of Works

The works undertaken consisted of shallow soil samples taken from hand dug pits that were excavated on the site on 15th November 2010. Five hand dug pits were excavated to a maximum depth of 0.80m bgl. Four of the hand dug pits were excavated in an area indicated by the client as being where the spill impacted the ground, and one hand dug pit was excavated as a 'control' sample outside of the area impacted by the leak. Two samples were taken from each hand dug pit. The samples were taken to an MCERTS UKAS accredited laboratory (Alcontol) in Hawarden on the same day of sampling. The samples were scheduled for the following analysis:

- Volatile Organic Compounds (VOCs) including Tentatively Identified Compounds (TICs);
- Semi Volatile Organic Compounds (SVOCs) including Tentatively Identified Compounds (TICs);
- Alcohols Suite (including n-Heptyl alcohol);
- pH;
- Metals (arsenic, cadmium, chromium III and VI, lead, mercury, selenium, copper, nickel and zinc);
- Water soluble sulphate;
- Fraction Organic Carbon (FOC) (only on two uncontaminated samples from the control hand dug pit);
- Total Petroleum Hydrocarbons (TPH-CWG); and
- Leachate preparation and analysis (on one sample only).

2.2 Environmental Setting

The site lies in a largely industrial area. Information obtained from the Environment Agency website indicates that the site overlies a Secondary A Aquifer within the superficial geology beneath the site (Shirdley Hill Sand Formation) and a deeper Principal Aquifer within the Sherwood Sandstone Formation.

2.3 Ground Conditions

2.3.1 Hand Dug Pits

Hand dug pits were excavated to a maximum depth of 0.8m bgl. Table 2.1 below presents the hand dug pit logs which were logged in broad accordance with BS25177 2008:

Table 2.1 Hand Dug Pit Logs

Hand Dug Pit	Depth (m bgl)	Strata	Samples Taken (m bgl)
HDP01	0.0 - 0.4	Topsoil: Dark brown organic fine to medium SAND. Slight chemical odour.	0.1
	0.4 - 0.8	Dark brown organic slightly clayey fine to medium SAND, with occasional fine to coarse sub-angular brick gravel. End of hole at 0.8m bgl due to hollow sounding obstruction.	0.8
HDP02	0.0 - 0.2	Dark grey sandy TOPSOIL	0.1
	0.2 - 0.6	Very clayey fine to medium red brown SAND with occasional brick gravel and a slight chemical odour	
	0.6 - 0.8	Dark grey stained fine slightly clayey SAND with a strong chemical odour. End of hole at 0.8m bgl	0.7
HDP03	0.0 - 0.4	Very clayey SAND	0.1
	0.4 - 0.8	Fine to medium slightly clayey red brown SAND End of hole at 0.8m bgl	0.6
HDP04	0.0 - 0.3	Brown clayey TOPSOIL	0.1
	0.3 - 0.8	Very sandy stiff CLAY End of hole 0.8m bgl	0.7
HDP05	0.0 - 0.2	TOPSOIL: Medium to coarse sub-angular gravel hardcore	0.1
	0.2 - 0.7	Firm red brown CLAY	0.5

The location of hand dug pits is presented in Appendix C.

3. Chemical Assessment

3.1 Assessment Criteria

In order to identify contaminants of concern derived from the overspill incident and determine whether further assessment or management of risks is required a Generic Quantitative Risk Assessment (GQRA) has been undertaken. Chemical analysis data for soils and leachate have been compared with relevant generic assessment criteria (GAC), where available. Comparison was also made against the 'control' samples.

3.1.1 Soil Assessment Criteria

These GAC consist of either Entec GAC, Soil Guideline Values (SGVs), Chartered Institute of Environmental Health/LQM (CIEH/LQM) GAC or the Environmental Industries Commission/Association of Geotechnical and Geoenvironmental Specialists/CL:AIRE (EIC/AGS/CL:AIRE) GAC for the assessment of risks to human health. These GAC have been derived by Entec, Defra and the Environment Agency, the Chartered Institute of Environmental Health/LQM and EIC/AGS/CL:AIRE for selected substances in soils using the 'Contaminated Land Exposure Assessment' (CLEA) model.

SGVs were first published by Defra/Environment Agency in 2002. In 2008 these were withdrawn and a revised methodology for SGV derivation published (EA, 2009). To date updated SGVs have been published for eleven contaminants (benzene, toluene, ethylbenzene and xylene, selenium, mercury, arsenic, nickel, phenol, cadmium and dioxins, furans and dioxin-like PCBs). Where published we have used revised SGVs, in absence of updated SGVs we have used previously published SGVs.

SGVs are generic values for specific land-uses derived by Defra and the Environment Agency and calculated using the CLEA model.

The SGVs are presently published for the following land use:

- a) Residential;
- c) Allotments; and
- d) Commercial/industrial

Previous SGVs were published for an additional land-use of residential without plant uptake. Entec have therefore derived GAC for assessment of the residential without plant uptake land-use. For the purposes of this assessment GAC have been selected based on commercial/industrial land use.

The SGVs are derived for particular soil conditions, and therefore the specific values used have been selected based on soil organic matter content of the soil where appropriate. It should be noted that the updated SGVs have been derived using a sandy loam soil with 6% soil organic matter (SOM). For Made Ground materials such as those often encountered at contaminated land sites the soil organic matter content is generally lower than 6%. Entec has therefore

derived GAC for soil containing 1% and 3% SOM, which can be used as an alternative to the Environment Agency updated SGVs.

Entec has also derived GAC for 3% SOM for contaminants where LQM/CIEH and EIC/AGS/CL:AIRE GAC have derived GAC at 2.5% SOM in order to offer consistency in assessment across our use of GAC.

Any contaminants in excess of their respective GAC or the limit of detection (LOD) are taken forward for more detailed consideration using DQRA where appropriate for the conceptual model under consideration. Statistical consideration of the data has also been undertaken as part of the GQRA and DQRA.

In summary, the GQRA has been undertaken using the following assessment criteria:

Soils:

- Entec derived Generic Assessment Criteria for 1% Soil Organic Matter based on updated SGVs for a commercial land-use;
- Previously published CLEA Soil Guideline Values (SGVs) for a commercial land use (Lead only);
- Chartered Institute of Environmental Health/LQM Generic Assessment Criteria (CIEH/LQM) for a commercial land use, where published;
- Environmental Industries Commission/Association of Geotechnical and Geoenvironmental Specialists/CL:AIRE Generic Assessment Criteria (EIC/AGS/CL:AIRE) for a commercial land use, where published;
- Limit of Detection (LOD) (in the absence of any published GAC).

Organic Content of Soils

Fraction of organic carbon (*foc*) was analysed within the samples as part of the site investigation. The laboratory analysis recorded values ranging between 0.0114 and 0.0135 (average 0.012), equating to a soil organic matter (SOM) range from 1.97% to 2.33% (average 2.15 %). GAC applied to the samples of retrieved as part of the recent investigation will therefore assume the SOM band of 1%, as they are not above the 2.5% threshold.

3.1.2 Controlled Waters Assessment Criteria

There are currently no published UK guideline values for soils derived to be protective of controlled waters. However, identified contaminant concentrations in the leachate sample have been assessed using the following guidelines.

Environmental Quality Standards

Environmental Quality Standards (EQS) have been derived by the Environment Agency for the protection of surface water quality in England and Wales. Where an EQS value does not exist the appropriate DWS value has been used.

Drinking Water Standards

UK Drinking Water Standards (UKDWS), as set out in the Water Quality (Water Supply) Regulations, 2000. These values have been used for assessment where an EQS value does not exist. In addition, the former DWS for TPH (now withdrawn) has been used in the absence of any other suitable screening criteria.

3.1.3 Absence of Assessment Criteria

For a number of the determinands scheduled, in particular chlorinated solvents and other volatile and semi volatile compounds, there are no authoritative generic assessment criteria with which to assess potential risks to human health or the environment. Therefore, where these contaminants have been detected, they have been considered further at the risk evaluation stage. Where VOCs or SVOCs have been detected, consideration has also been given to associated compounds that may also be present at concentrations below the detection limit but which may be sufficient to present a risk to receptors.

3.2 Human Health Soils GQRA

Observed soil concentrations have been compared to the GAC discussed above. The comparison is presented below. Results screened against the relevant guideline values are presented in Appendix A.

None of the samples had concentrations in excess of any of the assessment criteria. Observations made within the data set are discussed below.

Values of pH ranged between 4.74 (HDP3 0.1m bgl) which is acidic to 8.45 (HDP1 0.8m bgl) which is slightly alkaline.

Metals and Metalloids

Hexavalent chromium was not encountered in excess of the laboratory limit of detection (LOD) and trivalent (total) chromium concentrations ranged between 18 and 54.9 mg/kg, arsenic ranged between 4.63 and 10.5 mg/kg, cadmium concentrations ranged between <0.02 and 0.451 mg/kg, copper concentrations ranged between 8.92 and 26.7 mg/kg, lead concentrations ranged between 11.5 and 34.9 mg/kg, mercury concentrations ranged between <0.14 and 0.63 mg/kg, nickel concentrations ranged between 15 and 100 mg/kg, selenium concentrations ranged between <1 and 1.05 mg/kg, zinc concentrations ranged between 33.2 and 235 mg/kg.

Inorganics

Water soluble sulphate was encountered in excess of the laboratory limit of detection (LOD) in eight out of the ten samples. HDP5 samples (the control) did not encounter sulphate in excess of the laboratory LOD.

Total Petroleum Hydrocarbons (TPH)

Speciated TPH analysis indicated that the majority of exceedance above the LOD were of the heavier fractions of aliphatic TPH. All ten samples were scheduled for TPH-CWG analysis and none of the samples encountered a concentration in excess of the screening criteria. The highest concentrations encountered for each fraction are detailed in Table 3.1:

Table 3.1 TPH Fraction Concentrations

TPH Fraction	Highest Concentration Encountered (mg/kg)	Sample	Sample Depth (m bgl)
Aliphatics >C5-C6	0.119	HDP1	0.8
Aliphatics >C6-C8	0.394	HDP2	0.7
Aliphatics >C8-C10	0.131	HDP1	0.8
Aliphatics >C10-C12	1.88	HDP2	0.7
Aliphatics >C12-C16	79.3	HDP3	0.1
Aliphatics >C16-C21	238	HDP2	0.1
Aliphatics >C21-C35	15.3	HDP2	0.7
Aliphatics >C35-C44	238	HDP2	0.1
Aromatics >EC5-EC7	None above detection limit		
Aromatics >EC7-EC8	0.0626	HDP1	0.8
Aromatics >EC8-EC10	0.124	HDP1	0.8
Aromatics >EC10-EC12	1.25	HDP2	0.7
Aromatics >EC12-EC16	30.5	HDP3	0.1
Aromatics >EC16-EC21	21.7	HDP2	0.7
Aromatics >EC21-EC35	229	HDP2	0.1
Aromatics >EC35-EC44	238	HDP2	0.1
Aromatics >EC40-EC44	102	HDP2	0.1

Alcohols

There were no exceedances above the laboratory limit of detection for alcohols encountered with the exception of methanol which was encountered in six of the samples taken, the highest concentration was 1.53 mg/kg which was encountered in HDP1 0.8m. Ethanol was also encountered in HDP2 0.7 m bgl (0.748 mg/kg).

Volatile and Semi Volatile Organic Compounds

There were no exceedances in excess of the available GAC. The following samples had concentrations in excess of the laboratory limit of detection:

- HDP2 0.7m encountered 2.58 mg/kg 1,2-Dichlorobenzene, 0.0239 mg/kg carbon disulphide, 0.0151 mg/kg chloroform, 3.97 mg/kg 1,2-Dichlorobenzene;

- HDP3 0.1m bgl encountered all of the PAHs exceedances encountered within the data set. 0.0136 mg/kg dichloromethane was also encountered, 0.123 mg/kg chloroform, 0.0283 mg/kg 1,3-Dichlorobenzene, 0.105 mg/kg 1,2-Dichlorobenzene;
- HDP1 0.8m encountered 0.0299 mg/kg carbon disulphide, 0.0499 mg/kg of dichloromethane, 0.0141 mg/kg methyl tertiary butyl ether, 0.0171 mg/kg chloroform, 0.0513 mg/kg 1,2-Dichlorobenzene;
- HDP1 0.1m bgl encountered 0.0195 mg/kg of dichloromethane, 0.0349 mg/kg chloroform, 0.015 mg/kg 1,3-Dichlorobenzene, 0.0628 mg/kg 1,2-Dichlorobenzene;
- HDP2 0.1m bgl encountered 0.0157 mg/kg of dichloromethane, 0.0822 mg/kg chloroform; and
- HDP3 0.6 m bgl encountered 0.014 mg/kg of dichloromethane.

BTEX

BTEX compounds consist of benzene, ethylbenzene, toluene and xylenes. BTEX was analysed via two methods and the data is discussed below:

- Benzene was encountered in excess of the laboratory limit of detection in samples: HDP1 0.8 (highest concentration of 0.0233mg/kg) and HDP4 0.1;
- Toluene was encountered in excess of the laboratory limit of detection in samples: HDP1 0.1 and 0.8 (highest concentration 0.117 mg/kg), HDP2 0.1 and 0.7, HDP3 0.1 and 0.6 and HDP4 0.1;
- Ethylbenzene was encountered in excess of the laboratory limit of detection in samples: HDP1 0.8 and HDP2 0.1 (highest concentration 0.00615 mg/kg); and
- Xylene compounds were encountered in HDP1 0.8 (0.0232 mg/kg m,p-xylene, 0.00812 mg/kg o-xylene).

Tentatively Identified Compounds (TICs)

Tentatively Identified Compounds (TICs) were encountered in some of the samples analysed. There are no GAC available for TICs and the identification and semi-quantification is outside the scope of the laboratory UKAS accreditation. TICs were encountered in a majority of the samples scheduled for analysis and the data is presented in Table 3.2:

Table 3.2 Tentatively Identified Compounds (TICs)

Hand Dug Pit	Depth of Sample (m bgl)	Tentative Compound Identification	Concentration (µg/kg)
HDP 1	0.80	Methanone, diphenyl-	3203
HDP 2	0.70	Tetradecane, bromo-	13841
		Benzene, bromo-methyl-	3612
		Propenamide, -methyl-phenyl-	1015
		Bromododecane	10523
		Diphenylmethanone	2610
		Sulphur, mol.	1507
		C4 – C12 Aliphatic Hydrocarbons	3902
		C7 – C12 Aromatic Hydrocarbons	1150
HDP 3	0.10	Cyclohexyl-cyclohexylamine isomer	1589
		Bromododecane isomer	27605
		Bromo methyl benzene isomer	416
		Dimethyl undecane	174
HDP 3	0.60	Benzenamine, methylenebis-dimethyl-	1565
		Chloro dodecane	408
		Diphenyl methane	208
		Bromo decane	3655
HDP 4	0.10	(Bromomethyl) fluoranthene	7398
		('Hydroxy-'-methoxyphenylazo)-	322
		Methanone, diphenyl-,	1192
		Bromo undecane	22960
HDP 4	0.70	Bromo decane	107
HDP 5	0.10	Dimethylbenzene isomer	1393
HDP 5	0.50	Dimethylbenzene isomer	1631

Note: No TICs were identified in HDP 1 0.10m, HDP 2 0.10m. There are a number of concentrations which are noted as 'unknown' in the laboratory certificate which have not been included in the table, and are presented in Appendix B.

Table 3.3 Tentatively Identified Compounds (TICs) in Leachate

Hand Dug Pit	Depth of Sample (m bgl)	Tentative Compound Identification	Concentration (µg/l)
HDP 2	0.10	bromo-Butane Isomer	17
		bromo-methyl-Butane Isomer	20
		bromo-methyl-Benzene Isomer	64
		butanoic acid, bromo-	38
		hexanoic acid, bromo-	209
		benzoic acid, bromo-	79
		methanone, diphenyl-	14

3.3 Controlled Waters GQRA

Leachate analysis was undertaken on the HDP2 0.1m bgl sample. It should be noted that leachate analysis only provides useful information for potential water contamination. In particular volatile contaminants are prone to being volatilised as part of the leachate preparation process. As such this analysis is useful for contaminants in proving a positive, i.e. a contaminant can be identified as present. However, the absence of volatile contaminants within leachate samples can not be taken as evidence that the contamination of the water is unlikely, as the bulk of the contaminant may have been lost during the preparation process.

There were two of exceedances encountered within the sample when screened against the relevant Controlled Waters Assessment Criteria:

- 0.00653 mg/l of copper was encountered in the 10:1 leach test;
- 0.112 mg/l selenium was encountered in the 10:1 leach test; and
- 0.161 mg/l gasoline range organics (GRO) >C5-C12.

A number of determinands (for which there are no assessment criteria) were encountered above the laboratory limit of detection:

- 0.047 mg/l Aliphatic >C6-C8, 0.013 mg/l Aliphatic >C8-C10, 0.051 mg/l Aliphatic >C10-C12;
- 0.034 mg/l Aromatic >EC10-EC12, 0.013 mg/l, 0.013 mg/l Aromatic >EC16-EC21; and
- 0.00209 mg/l nitrobenzene.

3.4 Assessment of Impact Against 'Control' Sample

HDP5 was excavated away from the area that was indicated as being impacted by the overspill. Two samples were taken from this pit, and the deeper sample taken from 0.5m bgl was used as the basis for the screening criteria against the other data. The screening was carried out against criteria of an order of magnitude greater than that detected in the HDP5 sample. Details of the screening can be seen in Appendix B.

Comparison with the control sample indicated more elevated petroleum hydrocarbon concentrations in the area of the former spill. However, it should be noted that these concentrations are not considered significantly elevated.

4. Conclusions and Recommendations

4.1 Conclusions

Slightly elevated organic contamination (in the form of petroleum hydrocarbon fractions) was identified in the samples from the spill area when compared to the control sample outside the spill area. However, none of the samples taken have contaminants present in excess of the commercial / industrial GAC for human health.

Assessment of the leachate result indicates that there is the possibility of slight impact on pore water quality from petroleum hydrocarbons. However, such impact is likely to be below the threshold for which remediation would be effective.

One sample location within the overspill area, HDP3, had a low near surface (0.1m depth) pH of 4.74 and higher pH of 8.15 at 0.6m depth indicating a near surface impact.

From discussion with site staff it is understood that the bulk of the spill appeared to run off the affected area quickly. Considering this and the general absence of significant contamination relative to both industrial/commercial GACs and the control samples it does not appear that significant residual contamination from the spill remains in soils of the affected area. The distressed vegetation is, therefore, likely to be associated with short term direct contact with the acidic effluent rather than up take from the soil.

4.2 Recommendations

Considering the lack of significant contaminative impact attributable to the overspill it is not considered that substantial remedial works will be required. It may be prudent to undertake a thin scrape of near surface soils (0.3 m) and replacement with suitable topsoil, where distressed vegetation is present to allow reseedling of the bank.

Appendix A

Laboratory Chemical Analysis Certificates

56 Pages



ALcontrol Laboratories

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Entec UK Ltd
Windsor House
Gadbrook Business Centre
Gadbrook Park
Northwich
Cheshire
CW9 7TN

Attention: Jim Eardley

CERTIFICATE OF ANALYSIS

Date:	26 November 2010	
Customer:	H_ENTEC_NWC-18	
Sample Delivery Group (SDG):	101115-88	Report No.: 104951
Your Reference:	29060	
Location:	Contract Chemicals	

We received 11 samples on Monday November 15, 2010 and 11 of these samples were scheduled for analysis which was completed on Tuesday November 23, 2010. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Iain Swinton

Business Director - Land, UK & Ireland



SDG:	101115-88	Customer:	Entec UK Ltd
Job:	H_ENTEC_NWC-18	Attention:	Jim Eardley
Client Reference:	29060	Order No.:	231202
Location:	Contract Chemicals	Report No:	104951

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
2405876	HDP 1		0.10	15/11/2010
2405894	HDP 1		0.80	15/11/2010
2405910	HDP 2		0.10	15/11/2010
2405934	HDP 2		0.70	15/11/2010
2405954	HDP 3		0.10	15/11/2010
2405972	HDP 3		0.60	15/11/2010
2405994	HDP 4		0.10	15/11/2010
2406012	HDP 4		0.70	15/11/2010
2406029	HDP 5		0.10	15/11/2010
2406044	HDP 5		0.50	15/11/2010
2405930	HDP 2 / Leach		0.10	15/11/2010

Only received samples which have had analysis scheduled will be shown on the following pages.

SDG:	101115-88
Job:	H_ENTEC_NWC-18
Client Reference:	29060
Location:	Contract Chemicals

Customer: Entec UK Ltd
Attention: Jim Eardley
Order No.: 231202
Report No: 104951

SOLID Results Legend X Test N No Determination Possible	Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Container
	2405044	NDP 5		0.50	100 VOC 400g Tub 2500 Ambient Air
	2405029	NDP 5		0.10	100 VOC 400g Tub 2500 Ambient Air
	2405012	NDP 4		0.70	100 VOC 400g Tub 2500 Ambient Air
	2405994	NDP 4		0.10	100 VOC 400g Tub 2500 Ambient Air
	2405972	NDP 3		0.80	100 VOC 400g Tub 2500 Ambient Air
2405954	NDP 3		0.10	100 VOC 400g Tub 2500 Ambient Air	
2405934	NDP 2		0.70	100 VOC 400g Tub 2500 Ambient Air	
2405930	NDP 2 / Leach		0.10	100 VOC 400g Tub 2500 Ambient Air	
2405910	NDP 2		0.10	100 VOC 400g Tub 2500 Ambient Air	
2405894	NDP 1		0.80	100 VOC 400g Tub 2500 Ambient Air	
2405876	NDP 1		0.10	100 VOC 400g Tub 2500 Ambient Air	
Alcohols/Acetates MS (S)	All	NDPs: 0 Tests: 10			
Alcohols/Acetates MS (W)	All	NDPs: 0 Tests: 1			
Anions by Kone (soil)	All	NDPs: 0 Tests: 10			
Anions by Kone (w)	All	NDPs: 0 Tests: 1			
CEN Readings	All	NDPs: 0 Tests: 1			
Chromium III	All	NDPs: 0 Tests: 11			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1			
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 1			
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 10			
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 1			
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 10			
GRO by GC-FID (S)	All	NDPs: 0 Tests: 10			
GRO by GC-FID (W)	All	NDPs: 0 Tests: 1			
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 10			
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1			
Mercury Dissolved	All	NDPs: 0 Tests: 1			

SDG: 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No: 104951

SOLID**Results Legend**

Test



No Determination Possible

Lab Sample No(s)

Customer Sample Ref.

AGS Ref.

Depth (m)

Container

Metals by iCap-OES (Soil)

Arsenic

NDPs: 0
Tests: 10

Cadmium

NDPs: 0
Tests: 10

Chromium

NDPs: 0
Tests: 10

Copper

NDPs: 0
Tests: 10

Lead

NDPs: 0
Tests: 10

Mercury

NDPs: 0
Tests: 10

Nickel

NDPs: 0
Tests: 10

Selenium

NDPs: 0
Tests: 10

Zinc

NDPs: 0
Tests: 10

pH

All

NDPs: 0
Tests: 10

pH Value

All

NDPs: 0
Tests: 1

Sample description

All

NDPs: 0
Tests: 11

Semi Volatile Organic Compounds

All

NDPs: 0
Tests: 10

SVOC MS (W) - Aqueous

All

NDPs: 0
Tests: 1

Total Organic Carbon

All

NDPs: 0
Tests: 2

TPH CWG (W)

All

NDPs: 0
Tests: 1

TPH CWG GC (S)

All

NDPs: 0
Tests: 10

Validated

ALcontrol Laboratories Analytical Services

SDG: 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No: 104951

SOLID

Results Legend



Test



No Determination Possible

Lab Sample No(s)

Customer Sample Ref.

AGS Ref.

Depth (m)

Container

VOC MS (S)

All

NDPs: 0
Tests: 10

VOC MS (W)

All

NDPs: 0
Tests: 1

Sample Descriptions

Grain Sizes

very fine <0.063mm fine 0.063mm - 0.1mm medium 0.1mm - 2mm coarse 2mm - 10mm very coarse >10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
2405876	HDP 1	0.10	Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	Vegetation
2405894	HDP 1	0.80	Dark Brown	Sandy Clay Loam	0.1 - 2 mm	Vegetation	None
2405910	HDP 2	0.10	Dark Brown	Sandy Clay Loam	0.1 - 2 mm	Stones	Vegetation
2405934	HDP 2	0.70	Dark Brown	Silt Loam	0.063 - 0.1 mm	Stones	None
2405954	HDP 3	0.10	Light Brown	Silt Loam	0.1 - 2 mm	Stones	Vegetation
2405972	HDP 3	0.60	Orange	Sand	0.1 - 2 mm	Stones	N/A
2405994	HDP 4	0.10	Dark Brown	Sandy Clay Loam	0.1 - 2 mm	None	None
2406012	HDP 4	0.70	Orange	Sandy Loam	0.1 - 2 mm	Stones	N/A
2406029	HDP 5	0.10	Light Brown	Sandy Loam	0.1 - 2 mm	Stones	Vegetation
2406044	HDP 5	0.50	Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	N/A
2405930	HDP 2 / Leach	0.10	Light Brown	Sandy Clay	0.063 - 0.1 mm	Stones	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

ALcontrol Laboratories Analytical Services

SDG:	101115-88	Customer:	Entec UK Ltd
Job:	H_ENTEC_NWC-18	Attention:	Jim Eardley
Client Reference:	29060	Order No.:	231202
Location:	Contract Chemicals	Report No:	104951

Validated

ALcontrol Laboratories Analytical Services

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No: 104951

Test Completion Dates

Lab Sample No(s)	2405876	2405894	2405910	2405934	2405954	2405972	2405994	2406012	2406029	2405930
Customer Sample Ref.	HDP 1	HDP 1	HDP 2	HDP 2	HDP 3	HDP 3	HDP 4	HDP 4	HDP 6	HDP 2/Leach
AGS Ref.										
Depth	0.10	0.80	0.10	0.70	0.10	0.60	0.10	0.70	0.10	0.10
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Alcohols/Acetates MS (S)	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	
Alcohols/Acetates MS (W)										23/11/2010
Anions by Kone (soil)	18/11/2010	18/11/2010	18/11/2010	18/11/2010	17/11/2010	17/11/2010	18/11/2010	17/11/2010	17/11/2010	
Anions by Kone (w)										18/11/2010
CEN 10:1 Leachate (1 Stage)										18/11/2010
CEN Readings										17/11/2010
Chromium III	18/11/2010	18/11/2010	18/11/2010	18/11/2010	18/11/2010	19/11/2010	19/11/2010	18/11/2010	18/11/2010	19/11/2010
Dissolved Metals by ICP-MS										19/11/2010
EPH CWG (Aliphatic) Aqueous GC (W)										22/11/2010
EPH CWG (Aliphatic) GC (S)	19/11/2010	19/11/2010	19/11/2010	20/11/2010	19/11/2010	19/11/2010	19/11/2010	19/11/2010	19/11/2010	
EPH CWG (Aromatic) Aqueous GC (W)										22/11/2010
EPH CWG (Aromatic) GC (S)	19/11/2010	19/11/2010	19/11/2010	20/11/2010	19/11/2010	19/11/2010	19/11/2010	19/11/2010	19/11/2010	
GRO by GC-FID (S)	19/11/2010	19/11/2010	19/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	
GRO by GC-FID (W)										22/11/2010
Hexavalent Chromium (s)	18/11/2010	18/11/2010	18/11/2010	18/11/2010	18/11/2010	19/11/2010	19/11/2010	18/11/2010	18/11/2010	
Hexavalent Chromium (w)										19/11/2010
Mercury Dissolved										18/11/2010
Metals by ICap-OES (Soil)	18/11/2010	18/11/2010	18/11/2010	18/11/2010	18/11/2010	18/11/2010	18/11/2010	18/11/2010	18/11/2010	
pH	18/11/2010	18/11/2010	18/11/2010	18/11/2010	18/11/2010	18/11/2010	18/11/2010	18/11/2010	18/11/2010	
pH Value										18/11/2010
Sample description	16/11/2010	16/11/2010	16/11/2010	16/11/2010	16/11/2010	16/11/2010	16/11/2010	16/11/2010	16/11/2010	16/11/2010
Semi Volatile Organic Compounds	17/11/2010	17/11/2010	17/11/2010	17/11/2010	19/11/2010	19/11/2010	17/11/2010	19/11/2010	19/11/2010	
SVOC MS (W) - Aqueous										22/11/2010
Total Organic Carbon									18/11/2010	
TPH CWG (W)										22/11/2010
TPH CWG GC (S)	19/11/2010	19/11/2010	19/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	
VOC MS (S)	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	22/11/2010	
VOC MS (W)										18/11/2010

Lab Sample No(s) 2406044
 Customer Sample Ref. HDP 5
 AGS Ref.
 Depth 0.50
 Type SOLID

Alcohols/Acetates MS (S)	22/11/2010
Anions by Kone (soil)	19/11/2010
Chromium III	22/11/2010
EPH CWG (Aliphatic) GC (S)	20/11/2010
EPH CWG (Aromatic) GC (S)	20/11/2010
GRO by GC-FID (S)	22/11/2010
Hexavalent Chromium (s)	19/11/2010
Metals by ICap-OES (Soil)	22/11/2010
pH	18/11/2010
Sample description	17/11/2010
Semi Volatile Organic Compounds	19/11/2010
Total Organic Carbon	22/11/2010
TPH CWG GC (S)	22/11/2010
VOC MS (S)	22/11/2010

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No.: 104951

Results Legend		Customer Sample Ref.	HDP 1		HDP 1		HDP 2		HDP 2		HDP 3		HDP 3	
#	M		Depth (m)	Sample Type	Date Sampled	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference					
ISO17025 accredited.	noCERTS accredited.													
Aqueous / settled sample.														
Dissolved / Filtered sample.														
Total / unfiltered sample.														
subcontracted test.														
% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.														
Component	LOD/Units	Method												
pH	1 pH Units	TM133	6.13	M	8.45	M	7.08	M	7.92	M	4.74	M	8.15	M
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#	<0.6	#	<0.6	#	<0.6	#	<3	#	<0.6	#
Chromium, Trivalent	<0.9 mg/kg	TM181	23.4	M	24.2	M	24	M	20.6	M	23	M	29.5	M
Arsenic	<0.6 mg/kg	TM181	10.5	M	6.95	M	10.3	M	6.38	M	8.76	M	4.63	M
Cadmium	<0.02 mg/kg	TM181	<0.02	M	<0.02	M	<0.02	M	<0.02	M	0.451	M	0.361	M
Chromium	<0.9 mg/kg	TM181	23.4	M	24.2	M	24	M	20.6	M	23	M	29.5	M
Copper	<1.4 mg/kg	TM181	16.5	M	14.9	M	16.1	M	15.1	M	17.8	M	8.92	M
Lead	<0.7 mg/kg	TM181	34.9	M	25.2	M	31.2	M	17.3	M	28.3	M	11.5	M
Mercury	<0.14 mg/kg	TM181	<0.14	M	<0.14	M	<0.14	M	<0.14	M	<0.14	M	0.541	M
Nickel	<0.2 mg/kg	TM181	17.5	M	21.1	M	19.3	M	17.9	M	18.5	M	17.9	M
Selenium	<1 mg/kg	TM181	1.03	#	1.05	#	<1	#	<1	#	<1	#	1.04	#
Zinc	<1.9 mg/kg	TM181	215	M	55	M	87.5	M	64.9	M	84.1	M	37.3	M
Water Soluble Sulphate as SO4 2:1 Extract	<0.008 g/l	TM243	0.0745	M	0.102	M	0.2	M	0.141	M	0.301	M	0.063	M

SDG 101115-88
Job: H_ENTEC_NWC-18
Client Reference: 29060
Location: Contract Chemicals

Customer: Entec UK Ltd
Attention: Jim Eardley
Order No.: 231202
Report No: 104951

Alcohols/Acetates MS (S)

[illegible]

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No.: 104951

Semi Volatile Organic Compounds

Results Legend						Customer Sample Ref.	HDP 1	HDP 1	HDP 2	HDP 2	HDP 3	HDP 3
#	M	aq	diss.filt	tot.unfilt	"							
ISO17025 accredited. mCERIS accredited. Aqueous / filtered sample. Dissolved / filtered sample. Total / unfiltered sample. subcontracted test. " % recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.						Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405876	0.80 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405894	0.10 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405910	0.70 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405934	0.10 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405954	0.60 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405972
Component		LOD/Units	Method									
Phenol		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Pentachlorophenol		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
n-Nitroso-n-dipropylamine		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Nitrobenzene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Isophorone		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Hexachloroethane		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Hexachlorocyclopentadiene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2		
Hexachlorobutadiene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Hexachlorobenzene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
n-Dioctyl phthalate		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Dimethyl phthalate		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Diethyl phthalate		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
n-Dibutyl phthalate		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Dibenzofuran		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Carbazole		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Butylbenzyl phthalate		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
bis(2-Ethylhexyl) phthalate		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
bis(2-Chloroethoxy)methane		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
bis(2-Chloroethyl)ether		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Azobenzene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
4-Nitrophenol		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
4-Nitroaniline		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
4-Methylphenol		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
4-Chlorophenylphenylether		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
4-Chloroaniline		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
4-Chloro-3-methylphenol		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
4-Bromophenylphenylether		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
3-Nitroaniline		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
2-Nitrophenol		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
2-Nitroaniline		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
2-Methylphenol		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
1,2,4-Trichlorobenzene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
2-Chlorophenol		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
2,6-Dinitrotoluene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
2,4-Dinitrotoluene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
2,4-Dimethylphenol		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
2,4-Dichlorophenol		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
2,4,6-Trichlorophenol		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
2,4,5-Trichlorophenol		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		

Validated

ALcontrol Laboratories Analytical Services

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No: 104951

Semi Volatile Organic Compounds

Results Legend		Customer Sample Ref.	HDP 1		HDP 1		HDP 2		HDP 2		HDP 3		HDP 3	
#	ISO17025 accredited.		Depth (m)	0.10	0.80	0.10	0.10	0.70	0.10	0.60	0.10	0.60	0.10	0.60
M	mCERTS accredited.		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
eq	Aqueous / settled sample.		Date Sampled	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010
dis	Dissolved / filtered sample.		Date Received	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010
tot un	Total / unfiltered sample.		SDG Ref	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88
fil	Subcontracted test.		Lab Sample No.(s)	2405876	2405894	2405910	2405934	2405954	2405972					
*	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.		AGS Reference											
Component	LOD/Units	Method												
1,4-Dichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,3-Dichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,2-Dichlorobenzene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	2.58	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Chloronaphthalene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.19	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.166	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.159	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.202	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.25	<0.1	<0.1	<0.1	<0.1
Fluoranthene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.517	<0.1	<0.1	<0.1	<0.1
Fluorene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.326	<0.1	<0.1	<0.1	<0.1
Pyrene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.483	<0.1	<0.1	<0.1	<0.1
Naphthalene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	<0.1 mg/kg	TM157		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TIC report	-	TM157		See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached

SDG	101115-88
Job:	H_ENTEC_NWC-18
Client Reference:	29060
Location:	Contract Chemicals

Customer: Entec UK Ltd
Attention: Jim Eardley
Order No.: 231202
Report No: 104951

TPH CWG (S)

Result Legend		Customer Sample Ref.	HDP 1		HDP 1		HDP 2		HDP 2		HDP 3		HDP 3	
#	ISO17025 accredited. mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. subcontracted test. % recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.		0.10 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405876	0.60 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405894	0.10 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405910	0.70 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405934	0.10 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405954	0.60 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405972						
Component	LOD/Units	Method												
Aliphatics >C12-C16	<0.1 mg/kg	TM173	5.21	6.1	4.22	22.2	79.3	4.7						
Aliphatics >C16-C21	<0.1 mg/kg	TM173	2.08	3.05	238	38.1	9.51	1.66						
Aliphatics >C21-C35	<0.1 mg/kg	TM173	10.7	8.59	<0.1	15.3	11.4	5.18						
Aliphatics >C35-C44	<0.1 mg/kg	TM173	<0.1	<0.1	238	0.94	1.71	<0.1						
Aromatics >EC12-EC16	<0.1 mg/kg	TM173	1.44	1.87	<0.1	15.9	30.5	<0.1						
Aromatics >EC16-EC21	<0.1 mg/kg	TM173	2.41	6.47	7.37	21.7	6.54	<0.1						
Aromatics >EC21-EC35	<0.1 mg/kg	TM173	4.09	0.178	229	31.8	19.4	<0.1						
Aromatics >EC35-EC44	<0.1 mg/kg	TM173	0.916	0.253	238	9.39	5.89	<0.1						
Aromatics >EC40-EC44	<0.1 mg/kg	TM173	<0.1	<0.1	102	2.61	1.77	<0.1						
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173	18	17.7	480	76.4	102	11.5						
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173	8.85	8.77	475	78.7	62.3	<0.1						
Total Aliphatics >C5-35	<0.1 mg/kg	TM173	18.1	18.3	243	77.9	101	11.6						
Total Aromatics >C5-35	<0.1 mg/kg	TM173	7.98	8.86	236	70.7	56.6	<0.1						
Total Aliphatics & Aromatics >C5-35	<0.1 mg/kg	TM173	26.1	27.2	479	149	157	11.6						
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173	27	27.4	955	159	165	11.6						
GRO Surrogate % recovery**	%	TM089	107	104	123	62	62	94						
GRO >C5-C12	<0.044 mg/kg	TM089	0.141	0.936	0.399	3.77	0.517	0.0531						
Methyl tertiary butyl ether (MTBE)	<0.005 mg/kg	TM089	<0.005	0.0162	<0.005	<0.005	<0.005	<0.005						
Benzene	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01						
Toluene	<0.002 mg/kg	TM089	0.00372	0.0626	0.00615	0.00238	<0.002	0.00452						
Ethylbenzene	<0.003 mg/kg	TM089	<0.003	0.00464	0.00615	<0.003	<0.003	<0.003						
m,p-Xylene	<0.006 mg/kg	TM089	<0.006	0.0232	<0.006	<0.006	<0.006	<0.006						
o-Xylene	<0.003 mg/kg	TM089	<0.003	0.00812	<0.003	<0.003	<0.003	<0.003						
Aliphatics >C5-C6	<0.01 mg/kg	TM089	<0.01	0.119	0.059	0.0452	0.0189	<0.01						
Aliphatics >C6-C8	<0.01 mg/kg	TM089	0.0285	0.109	0.177	0.394	0.0403	<0.01						
Aliphatics >C8-C10	<0.01 mg/kg	TM089	0.026	0.131	0.0431	0.117	0.0252	0.0102						
Aliphatics >C10-C12	<0.01 mg/kg	TM089	0.0322	0.218	0.0467	1.88	0.246	0.0124						
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01						
Aromatics >EC7-EC8	<0.01 mg/kg	TM089	<0.01	0.0626	<0.01	<0.01	<0.01	<0.01						
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	0.0198	0.124	0.0344	0.0809	0.0214	<0.01						
Aromatics >EC10-EC12	<0.01 mg/kg	TM089	0.0211	0.146	0.0308	1.25	0.164	<0.01						
m,p,o-Xylene	<0.01 mg/kg	TM089	<0.01	0.0313	<0.01	<0.01	<0.01	<0.01						
BTEX, Total	<0.01 mg/kg	TM089	<0.01	0.0986	0.0123	<0.01	<0.01	<0.01						

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No: 104951

VOC MS (S)

Results Legend			Customer Sample Ref.		HDP 1	HDP 1	HDP 2	HDP 2	HDP 3	HDP 3
#	M	eq	Depth (m)	Sample Type	0.10	0.60	0.10	0.70	0.10	0.60
dis fil			Date Sampled		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
tot unfil			Date Received		15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010
*			SDG Ref		101115-88	101115-88	101115-88	101115-88	101115-88	101115-88
**			Lab Sample No(s)		2405876	2405894	2405910	2405934	2405954	2405972
AGS Reference										
Component	LOD/Units	Method								
Dibromofluoromethane**	%	TM116	106	104	104	99.7	105	106		
Toluene-d8**	%	TM116	103	104	102	104	101	105		
4-Bromofluorobenzene**	%	TM116	116	110	117	114	124	103		
Dichlorodifluoromethane	<0.004 mg/kg	TM116	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004		
Chloromethane	<0.007 mg/kg	TM116	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007		
Vinyl Chloride	<0.01 mg/kg	TM116	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Bromomethane	<0.013 mg/kg	TM116	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013		
Chloroethane	<0.014 mg/kg	TM116	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014		
Trichlorofluoromethane	<0.006 mg/kg	TM116	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006		
1,1-Dichloroethene	<0.01 mg/kg	TM116	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Carbon Disulphide	<0.007 mg/kg	TM116	<0.007	0.0299	<0.007	0.0239	<0.007	<0.007		
Dichloromethane	<0.01 mg/kg	TM116	0.0195	0.0499	0.0157	<0.01	0.0138	0.014		
Methyl Tertiary Butyl Ether	<0.011 mg/kg	TM116	<0.011	0.0141	<0.011	<0.011	<0.011	<0.011		
trans-1,2-Dichloroethene	<0.011 mg/kg	TM116	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011		
1,1-Dichloroethane	<0.008 mg/kg	TM116	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008		
cis-1,2-Dichloroethene	<0.005 mg/kg	TM116	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		
2,2-Dichloropropane	<0.012 mg/kg	TM116	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012		
Bromochloromethane	<0.014 mg/kg	TM116	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014		
Chloroform	<0.008 mg/kg	TM116	0.0349	0.0171	0.0822	0.0151	0.123	<0.008		
1,1,1-Trichloroethane	<0.007 mg/kg	TM116	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007		
1,1-Dichloropropene	<0.011 mg/kg	TM116	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011		
Carbontetrachloride	<0.014 mg/kg	TM116	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014		
1,2-Dichloroethane	<0.005 mg/kg	TM116	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		
Benzene	<0.009 mg/kg	TM116	<0.009	0.0233	<0.009	<0.009	<0.009	<0.009		
Trichloroethene	<0.009 mg/kg	TM116	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009		
1,2-Dichloropropane	<0.012 mg/kg	TM116	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012		
Dibromomethane	<0.009 mg/kg	TM116	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009		
Bromodichloromethane	<0.007 mg/kg	TM116	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007		
cis-1,3-Dichloropropene	<0.014 mg/kg	TM116	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014		
Toluene	<0.005 mg/kg	TM116	0.0145	0.117	0.00981	0.0226	0.00793	0.0102		
trans-1,3-Dichloropropene	<0.014 mg/kg	TM116	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014		
1,1,2-Trichloroethane	<0.01 mg/kg	TM116	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
1,3-Dichloropropane	<0.007 mg/kg	TM116	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007		
Tetrachloroethene	<0.005 mg/kg	TM116	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		
Dibromochloromethane	<0.013 mg/kg	TM116	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013		
1,2-Dibromoethane	<0.012 mg/kg	TM116	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012		
Chlorobenzene	<0.005 mg/kg	TM116	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		
1,1,1,2-Tetrachloroethane	<0.01 mg/kg	TM116	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Ethylbenzene	<0.004 mg/kg	TM116	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004		

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No.: 104951

VOC MS (S)

Results Legend		Customer Sample Ref.	HDP 1		HDP 1		HDP 2		HDP 2		HDP 3		HDP 3	
#	M		0.10	0.60	0.10	0.70	0.10	0.70	0.10	0.60	0.10	0.60	0.10	0.60
ISO17025 accredited.		Depth (m)	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
mCERTS accredited.		Sample Type	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010
Aqueous / filtered sample.		Date Sampled	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010
Dissolved / filtered sample.		Date Received	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88
Total / unfiltered sample.		SDG Ref	2405876	2405894	2405910	2405934	2405954	2405972						
Subcontracted test.		Lab Sample No(s)												
% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.		AGS Reference												
Component	LOD/Units	Method	HDP 1		HDP 1		HDP 2		HDP 2		HDP 3		HDP 3	
p/m-Xylene	<0.014 mg/kg	TM116	<0.014	#	0.02	#	<0.014	#	<0.014	#	<0.014	#	<0.014	#
o-Xylene	<0.01 mg/kg	TM116	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M
Styrene	<0.01 mg/kg	TM116	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M
Bromoform	<0.01 mg/kg	TM116	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M
Isopropylbenzene	<0.005 mg/kg	TM116	<0.005	M	<0.005	M	<0.005	M	<0.005	M	<0.005	M	<0.005	M
1,1,2,2-Tetrachloroethane	<0.01 mg/kg	TM116	<0.01	#	<0.01	#	<0.01	#	<0.01	#	<0.01	#	<0.01	#
1,2,3-Trichloropropane	<0.017 mg/kg	TM116	<0.017	M	<0.017	M	<0.017	M	<0.017	M	<0.017	M	<0.017	M
Bromobenzene	<0.01 mg/kg	TM116	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M
Propylbenzene	<0.011 mg/kg	TM116	<0.011	M	<0.011	M	<0.011	M	<0.011	M	<0.011	M	<0.011	M
2-Chlorotoluene	<0.009 mg/kg	TM116	<0.009	M	<0.009	M	<0.009	M	<0.009	M	<0.009	M	<0.009	M
1,3,5-Trimethylbenzene	<0.008 mg/kg	TM116	<0.008	#	<0.008	#	<0.008	#	<0.008	#	<0.008	#	<0.008	#
4-Chlorotoluene	<0.012 mg/kg	TM116	<0.012	M	<0.012	M	<0.012	M	<0.012	M	<0.012	M	<0.012	M
tert-Butylbenzene	<0.012 mg/kg	TM116	<0.012	#	<0.012	#	<0.012	#	<0.012	#	<0.012	#	<0.012	#
1,2,4-Trimethylbenzene	<0.009 mg/kg	TM116	<0.009	#	<0.009	#	<0.009	#	<0.009	#	<0.009	#	<0.009	#
sec-Butylbenzene	<0.01 mg/kg	TM116	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M
4-Isopropyltoluene	<0.011 mg/kg	TM116	<0.011	M	<0.011	M	<0.011	M	<0.011	M	<0.011	M	<0.011	M
1,3-Dichlorobenzene	<0.006 mg/kg	TM116	0.015	M	<0.006	M	<0.006	M	<0.006	M	0.0283	M	<0.006	M
1,4-Dichlorobenzene	<0.005 mg/kg	TM116	<0.005	M	<0.005	M	<0.005	M	<0.005	M	<0.005	M	<0.005	M
n-Butylbenzene	<0.01 mg/kg	TM116	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M	<0.01	M
1,2-Dichlorobenzene	<0.012 mg/kg	TM116	0.0628	M	0.0513	M	<0.012	M	3.97	M	0.105	M	<0.012	M
1,2-Dibromo-3-chloropropane	<0.014 mg/kg	TM116	<0.014	M	<0.014	M	<0.014	M	<0.014	M	<0.014	M	<0.014	M
Tert-amyl methyl ether	<0.015 mg/kg	TM116	<0.015		<0.015		<0.015		<0.015		<0.015		<0.015	
1,2,4-Trichlorobenzene	<0.006 mg/kg	TM116	<0.006	#	<0.006	#	<0.006	#	<0.006	#	<0.006	#	<0.006	#
Hexachlorobutadiene	<0.012 mg/kg	TM116	<0.012		<0.012		<0.012		<0.012		<0.012		<0.012	
Naphthalene	<0.013 mg/kg	TM116	<0.013	M	0.0233	M	<0.013	M	<0.013	M	<0.013	M	<0.013	M
1,2,3-Trichlorobenzene	<0.006 mg/kg	TM116	<0.006	M	<0.006	M	<0.006	M	<0.006	M	<0.006	M	<0.006	M
VOC TIC	-	TM116	No TIC's identified	No TIC's identified	No TIC's identified	No TIC's identified	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached	See Attached

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No: 104951

Results Legend			Customer Sample Ref.	HDP 2 / Leach	HDP 4	HDP 4	HDP 5	HDP 5	
#	ISO17025 accredited.		Depth (m)	0.10	0.10	0.70	0.10	0.50	
M	mCERTS accredited.		Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
aq	Aqueous / filtered sample.		Date Sampled	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	
disa filter	Dissolved / filtered sample.		Date Received	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	
tot unfiltered	Total / unfiltered sample.		SDG Ref	101115-88	101115-88	101115-88	101115-88	101115-88	
+	subcontracted test.		Lab Sample No.(s)	2405930	2405994	2406012	2406029	2406044	
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.		AGS Reference						
Component	LOD/Units	Method							
Moisture	%	PM114	16						
Moisture content ratio	%	PM114	19.1						
Dry matter content ratio	%	PM114	84						
Fraction Organic Carbon (FOC)	<0.002 -	TM132					0.0114	0.0135	
pH	1 pH Units	TM133			7.82	8.36	8.26	8.2	
					M	M	M	M	
Chromium, Hexavalent	<0.6 mg/kg	TM151			<0.6	<0.6	<0.6	<0.6	
					#	#	#	#	
Chromium, Trivalent	<0.9 mg/kg	TM181			22	18	54.9	24	
Arsenic	<0.6 mg/kg	TM181			7.1	6.07	4.84	7.27	
					M	M	M	M	
Cadmium	<0.02 mg/kg	TM181			<0.02	0.252	0.372	<0.02	
					M	M	M	M	
Chromium	<0.9 mg/kg	TM181			22	18	54.9	24	
					M	M	M	M	
Copper	<1.4 mg/kg	TM181			17.9	11.1	26.7	20.6	
					M	M	M	M	
Lead	<0.7 mg/kg	TM181			15.2	16.2	13.9	18.2	
					M	M	M	M	
Mercury	<0.14 mg/kg	TM181			<0.14	0.593	0.63	<0.14	
					M	M	M	M	
Nickel	<0.2 mg/kg	TM181			20.9	15	100	19.1	
					M	M	M	M	
Selenium	<1 mg/kg	TM181			<1	<1	<1	<1	
					#	#	#	#	
Zinc	<1.9 mg/kg	TM181			64.8	33.2	84.3	235	
					M	M	M	M	
Water Soluble Sulphate as SO4 2:1 Extract	<0.008 g/l	TM243			0.0639	0.0309	<0.008	<0.008	
					M	M	M	M	

SDG	101115-88
Job:	H_ENTEC_NWC-18
Client Reference:	29060
Location:	Contract Chemicals

Customer: Entec UK Ltd
Attention: Jim Eardley
Order No.: 231202
Report No: 104951

Alcohols/Acetates MS (S)

[illegible]

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No: 104951

Semi Volatile Organic Compounds

Results Legend		Customer Sample Ref.	HDP 4	HDP 4	HDP 5	HDP 5		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.10	0.70	0.10	0.50		
M	mCERTS accredited.		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
RS	Aqueous / filtered sample.		15/11/2010	15/11/2010	15/11/2010	15/11/2010		
dis filt	Dissolved / filtered sample.		15/11/2010	15/11/2010	15/11/2010	15/11/2010		
tot unfilt	Total / unfiltered sample.		101115-88	101115-88	101115-88	101115-88		
*	subcontracted test.		2405994	2406012	2406029	2406044		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.							
Component	LOD/Units	Method						
Phenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Pentachlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
n-Nitroso-n-dipropylamine	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Nitrobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Isophorone	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Hexachloroethane	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Hexachlorocyclopentadiene	<0.1 mg/kg	TM157	<0.1	<0.2	<0.2	<0.1		
Hexachlorobutadiene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Hexachlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
n-Dioctyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Dimethyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Diethyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
n-Dibutyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Dibenzofuran	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Carbazole	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Butylbenzyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
bis(2-Ethylhexyl) phthalate	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
bis(2-Chloroethoxy)methane	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
bis(2-Chloroethyl)ether	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
Azobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
4-Nitrophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
4-Nitroaniline	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
4-Methylphenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
4-Chlorophenylphenylether	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
4-Chloroaniline	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
4-Chloro-3-methylphenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
4-Bromophenylphenylether	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
3-Nitroaniline	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2-Nitrophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2-Nitroaniline	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2-Methylphenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
1,2,4-Trichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2-Chlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2,6-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2,4-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2,4-Dimethylphenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2,4-Dichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2,4,6-Trichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		
2,4,5-Trichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1		

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No: 104951

Semi Volatile Organic Compounds

Results Legend		Customer Sample Ref.	HDP 4	HDP 4	HDP 5	HDP 5		
#	M							
1	1	ISO17025 accredited.	0.10	0.70	0.10	0.50		
2	2	mCERIS accredited.	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
3	3	Aqueous / settled sample.	15/11/2010	15/11/2010	15/11/2010	15/11/2010		
4	4	Dissolved / filtered sample.	15/11/2010	15/11/2010	15/11/2010	15/11/2010		
5	5	Total / unfiltered sample.	101115-88	101115-88	101115-88	101115-88		
6	6	subcontracted test.	2405994	2406012	2406029	2406044		
7	7	% recovery of the surrogate						
8	8	standard to check the efficiency						
9	9	of the method. The results of the						
10	10	individual compounds within						
11	11	the samples are not corrected						
12	12	for this recovery.						
Component		LOD/Units	Method					
1,4-Dichlorobenzene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
1,3-Dichlorobenzene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
1,2-Dichlorobenzene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
2-Chloronaphthalene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
2-Methylnaphthalene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Acenaphthylene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Acenaphthene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Anthracene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Benzo(a)anthracene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Benzo(b)fluoranthene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Benzo(k)fluoranthene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Benzo(a)pyrene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Benzo(g,h,i)perylene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Chrysene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Fluoranthene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Fluorene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Indeno(1,2,3-cd)pyrene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Phenanthrene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Pyrene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Naphthalene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
Dibenzo(a,h)anthracene		<0.1 mg/kg	TM157	<0.1	<0.1	<0.1	<0.1	
TIC report		-	TM157	See Attached	See Attached	See Attached	See Attached	
</								

Validated

ALcontrol Laboratories Analytical Services

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No: 104951

TPH CWG (S)

Results Legend		Customer Sample Ref.	HDP 4		HDP 4		HDP 5		HDP 5	
#	ISO17025 accredited		0.10	0.70	0.10	0.50	0.10	0.50	0.10	0.50
M	mCERTS accredited	Depth (m)	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
eq	Aqueous / settled sample.	Sample Type	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010
dis. fin	Dissolved / filtered sample.	Date Sampled	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010	15/11/2010
tot. unfin	Total / unfiltered sample.	Date Received	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88	101115-88
*	subcontracted test.	SDG Ref	2405994	2406012	2406029	2406044	2406029	2406044	2406029	2406044
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.	Lab Sample No. (s)								
AGS Reference										
Component	LOD/Units	Method								
Aliphatics >C12-C16	<0.1 mg/kg	TM173	5.39	3.99	3.58	3.37				
Aliphatics >C16-C21	<0.1 mg/kg	TM173	2.76	1.41	1.46	2.86				
Aliphatics >C21-C35	<0.1 mg/kg	TM173	9.45	6.17	6.54	11.1				
Aliphatics >C35-C44	<0.1 mg/kg	TM173	<0.1	<0.1	0.644	<0.1				
Aromatics >EC12-EC16	<0.1 mg/kg	TM173	1.38	<0.1	<0.1	<0.1				
Aromatics >EC16-EC21	<0.1 mg/kg	TM173	9.6	<0.1	<0.1	<0.1				
Aromatics >EC21-EC35	<0.1 mg/kg	TM173	14.1	5.9	1.21	7.17				
Aromatics >EC35-EC44	<0.1 mg/kg	TM173	<0.1	<0.1	<0.1	2.45				
Aromatics >EC40-EC44	<0.1 mg/kg	TM173	<0.1	<0.1	<0.1	<0.1				
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173	17.6	11.6	12.2	17.4				
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173	25.1	5.9	1.21	9.62				
Total Aliphatics >C5-35	<0.1 mg/kg	TM173	17.6	11.6	11.6	17.4				
Total Aromatics >C5-35	<0.1 mg/kg	TM173	25.1	5.91	1.21	7.17				
Total Aliphatics & Aromatics >C5-35	<0.1 mg/kg	TM173	42.7	17.5	12.8	24.5				
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173	42.7	17.5	13.4	27				
GRO Surrogate % recovery**	%	TM089	114	113	161	112				
GRO >C5-C12	<0.044 mg/kg	TM089	<0.044	<0.044	<0.044	<0.044				
Methyl tertiary butyl ether (MTBE)	<0.005 mg/kg	TM089	<0.005	<0.005	<0.005	<0.005				
Benzene	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01				
Toluene	<0.002 mg/kg	TM089	<0.002	<0.002	<0.002	<0.002				
Ethylbenzene	<0.003 mg/kg	TM089	<0.003	<0.003	<0.003	<0.003				
m,p-Xylene	<0.006 mg/kg	TM089	<0.006	<0.006	<0.006	<0.006				
o-Xylene	<0.003 mg/kg	TM089	<0.003	<0.003	<0.003	<0.003				
Aliphatics >C5-C8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01				
Aliphatics >C8-C10	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01				
Aliphatics >C10-C12	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01				
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01				
Aromatics >EC7-EC8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01				
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01				
Aromatics >EC10-EC12	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01				
m,p,o-Xylene	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01				
BTEX, Total	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01				

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No.: 104951

VOC MS (S)

Results Legend		Customer Sample Ref.	HDP 4	HDP 4	HDP 5	HDP 5		
#	M							
ISO17025 accredited.								
mCERTS accredited.								
Aqueous / filtered sample.								
Dissolved / filtered sample.								
Total / unfiltered sample.								
subcontracted test.								
% recovery of the surrogate								
standard to check the efficiency								
of the method. The results of the								
individual compounds within								
the samples are not corrected								
for this recovery.								
Component	LOD/Units	Method	0.10 Soil/Solid 15/11/2010 15/11/2010 101115-88 2405994	0.70 Soil/Solid 15/11/2010 15/11/2010 101115-88 2406012	0.10 Soil/Solid 15/11/2010 15/11/2010 101115-88 2406029	0.50 Soil/Solid 15/11/2010 15/11/2010 101115-88 2406044		
Dibromofluoromethane**	%	TM116	110	108	99.7	108		
Toluene-d8**	%	TM116	103	105	102	105		
4-Bromofluorobenzene**	%	TM116	109	96	114	99.9		
Dichlorodifluoromethane	<0.004 mg/kg	TM116	<0.004 M	<0.004 M	<0.004 M	<0.004 M		
Chloromethane	<0.007 mg/kg	TM116	<0.007 #	<0.007 #	<0.007 #	<0.007 #		
Vinyl Chloride	<0.01 mg/kg	TM116	<0.01 #	<0.01 #	<0.01 #	<0.01 #		
Bromomethane	<0.013 mg/kg	TM116	<0.013 M	<0.013 M	<0.013 M	<0.013 M		
Chloroethane	<0.014 mg/kg	TM116	<0.014 M	<0.014 M	<0.014 M	<0.014 M		
Trichlorofluoromethane	<0.006 mg/kg	TM116	<0.006 M	<0.006 M	<0.006 M	<0.006 M		
1,1-Dichloroethene	<0.01 mg/kg	TM116	<0.01 #	<0.01 #	<0.01 #	<0.01 #		
Carbon Disulphide	<0.007 mg/kg	TM116	<0.007 M	<0.007 M	<0.007 M	<0.007 M		
Dichloromethane	<0.01 mg/kg	TM116	<0.01 #	<0.01 #	<0.01 #	<0.01 #		
Methyl Tertiary Butyl Ether	<0.011 mg/kg	TM116	<0.011 M	<0.011 M	<0.011 M	<0.011 M		
trans-1,2-Dichloroethene	<0.011 mg/kg	TM116	<0.011 M	<0.011 M	<0.011 M	<0.011 M		
1,1-Dichloroethane	<0.008 mg/kg	TM116	<0.008 M	<0.008 M	<0.008 M	<0.008 M		
cis-1,2-Dichloroethene	<0.005 mg/kg	TM116	<0.005 M	<0.005 M	<0.005 M	<0.005 M		
2,2-Dichloropropane	<0.012 mg/kg	TM116	<0.012 M	<0.012 M	<0.012 M	<0.012 M		
Bromochloromethane	<0.014 mg/kg	TM116	<0.014 M	<0.014 M	<0.014 M	<0.014 M		
Chloroform	<0.008 mg/kg	TM116	<0.008 M	<0.008 M	<0.008 M	<0.008 M		
1,1,1-Trichloroethane	<0.007 mg/kg	TM116	<0.007 M	<0.007 M	<0.007 M	<0.007 M		
1,1-Dichloropropene	<0.011 mg/kg	TM116	<0.011 M	<0.011 M	<0.011 M	<0.011 M		
Carbontetrachloride	<0.014 mg/kg	TM116	<0.014 M	<0.014 M	<0.014 M	<0.014 M		
1,2-Dichloroethane	<0.005 mg/kg	TM116	<0.005 M	<0.005 M	<0.005 M	<0.005 M		
Benzene	<0.009 mg/kg	TM116	0.0103 M	<0.009 M	<0.009 M	<0.009 M		
Trichloroethene	<0.009 mg/kg	TM116	<0.009 M	<0.009 M	<0.009 M	<0.009 M		
1,2-Dichloropropane	<0.012 mg/kg	TM116	<0.012 M	<0.012 M	<0.012 M	<0.012 M		
Dibromomethane	<0.009 mg/kg	TM116	<0.009 M	<0.009 M	<0.009 M	<0.009 M		
Bromodichloromethane	<0.007 mg/kg	TM116	<0.007 M	<0.007 M	<0.007 M	<0.007 M		
cis-1,3-Dichloropropene	<0.014 mg/kg	TM116	<0.014 M	<0.014 M	<0.014 M	<0.014 M		
Toluene	<0.005 mg/kg	TM116	0.0108 M	<0.005 M	<0.005 M	<0.005 M		
trans-1,3-Dichloropropene	<0.014 mg/kg	TM116	<0.014 M	<0.014 M	<0.014 M	<0.014 M		
1,1,2-Trichloroethane	<0.01 mg/kg	TM116	<0.01 M	<0.01 M	<0.01 M	<0.01 M		
1,3-Dichloropropane	<0.007 mg/kg	TM116	<0.007 #	<0.007 #	<0.007 #	<0.007 #		
Tetrachloroethene	<0.005 mg/kg	TM116	<0.005 M	<0.005 M	<0.005 M	<0.005 M		
Dibromochloromethane	<0.013 mg/kg	TM116	<0.013 M	<0.013 M	<0.013 M	<0.013 M		
1,2-Dibromoethane	<0.012 mg/kg	TM116	<0.012 M	<0.012 M	<0.012 M	<0.012 M		
Chlorobenzene	<0.005 mg/kg	TM116	<0.005 M	<0.005 M	<0.005 M	<0.005 M		
1,1,1,2-Tetrachloroethane	<0.01 mg/kg	TM116	<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Ethylbenzene	<0.004 mg/kg	TM116	<0.004 M	<0.004 M	<0.004 M	<0.004 M		

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No: 104951

VOC MS (S)

Results Legend		Customer Sample Ref.	HDP 4	HDP 4	HDP 5	HDP 5		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No. (s) AGS Reference	0.10	0.70	0.10	0.50		
M	mCERTS accredited.		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
aq	Aqueous / settled sample.		15/11/2010	15/11/2010	15/11/2010	15/11/2010		
dis.filt	Dissolved / filtered sample.		15/11/2010	15/11/2010	15/11/2010	15/11/2010		
tot.unfilt	Total / unfiltered sample.		101115-88	101115-88	101115-88	101115-88		
*	subcontracted test.		2405994	2406012	2406029	2406044		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.							
Component	LOD/Units	Method						
p/m-Xylene	<0.014 mg/kg	TM116	<0.014 #	<0.014 #	<0.014 #	<0.014 #		
o-Xylene	<0.01 mg/kg	TM116	<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Styrene	<0.01 mg/kg	TM116	<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Bromoform	<0.01 mg/kg	TM116	<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Isopropylbenzene	<0.005 mg/kg	TM116	<0.005 M	<0.005 M	<0.005 M	<0.005 M		
1,1,2,2-Tetrachloroethane	<0.01 mg/kg	TM116	<0.01 #	<0.01 #	<0.01 #	<0.01 #		
1,2,3-Trichloropropane	<0.017 mg/kg	TM116	<0.017 M	<0.017 M	<0.017 M	<0.017 M		
Bromobenzene	<0.01 mg/kg	TM116	<0.01 M	<0.01 M	<0.01 M	<0.01 M		
Propylbenzene	<0.011 mg/kg	TM116	<0.011 M	<0.011 M	<0.011 M	<0.011 M		
2-Chlorotoluene	<0.009 mg/kg	TM116	<0.009 M	<0.009 M	<0.009 M	<0.009 M		
1,3,5-Trimethylbenzene	<0.008 mg/kg	TM116	<0.008 #	<0.008 #	<0.008 #	<0.008 #		
4-Chlorotoluene	<0.012 mg/kg	TM116	<0.012 M	<0.012 M	<0.012 M	<0.012 M		
tert-Butylbenzene	<0.012 mg/kg	TM116	<0.012 #	<0.012 #	<0.012 #	<0.012 #		
1,2,4-Trimethylbenzene	<0.009 mg/kg	TM116	<0.009 #	<0.009 #	<0.009 #	<0.009 #		
sec-Butylbenzene	<0.01 mg/kg	TM116	<0.01 M	<0.01 M	<0.01 M	<0.01 M		
4-Isopropyltoluene	<0.011 mg/kg	TM116	<0.011 M	<0.011 M	<0.011 M	<0.011 M		
1,3-Dichlorobenzene	<0.006 mg/kg	TM116	<0.006 M	<0.006 M	<0.006 M	<0.006 M		
1,4-Dichlorobenzene	<0.005 mg/kg	TM116	<0.005 M	<0.005 M	<0.005 M	<0.005 M		
n-Butylbenzene	<0.01 mg/kg	TM116	<0.01 M	<0.01 M	<0.01 M	<0.01 M		
1,2-Dichlorobenzene	<0.012 mg/kg	TM116	<0.012 M	<0.012 M	<0.012 M	<0.012 M		
1,2-Dibromo-3-chloropropane	<0.014 mg/kg	TM116	<0.014 M	<0.014 M	<0.014 M	<0.014 M		
Tert-amyl methyl ether	<0.015 mg/kg	TM116	<0.015	<0.015	<0.015	<0.015		
1,2,4-Trichlorobenzene	<0.008 mg/kg	TM116	<0.006 #	<0.006 #	<0.006 #	<0.006 #		
Hexachlorobutadiene	<0.012 mg/kg	TM116	<0.012	<0.012	<0.012	<0.012		
Naphthalene	<0.013 mg/kg	TM116	<0.013 M	<0.013 M	<0.013 M	<0.013 M		
1,2,3-Trichlorobenzene	<0.006 mg/kg	TM116	<0.006 M	<0.006 M	<0.006 M	<0.006 M		
VOC TIC	-	TM116	See Attached	See Attached	No TIC's identified	No TIC's identified		

Validated

ALcontrol Laboratories Analytical Services

SDG 101115-88
 Job: H_ENTEC_NWC-18
 Client Reference: 29060
 Location: Contract Chemicals

Customer: Entec UK Ltd
 Attention: Jim Eardley
 Order No.: 231202
 Report No: 104951

ASSOCIATED AQC DATA**Anions by Kone (soil)**

Component	Method Code	QC 21	QC 24	QC 28
Chloride (soluble)	TM243	108.32 64.05 : 143.91	100.46 78.07 : 121.93	93.64 78.07 : 121.93
Water Soluble Sulphate as SO4 2:1 Extract	TM243	101.33 89.98 : 116.12	100.86 85.87 : 114.13	101.44 85.87 : 114.13

Anions by Kone (w)

Component	Method Code	QC 21
Chloride	TM184	97.30 92.01 : 104.18
Nitrite as NO2	TM184	100.10 92.92 : 105.47
Phosphate (Ortho as PO4)	TM184	105.08 95.51 : 106.92
Sulphate (soluble)	TM184	102.20 95.09 : 105.03
TON as NO3	TM184	99.25 93.27 : 107.89

Dissolved Metals by ICP-MS

Component	Method Code	QC 24
Aluminium	TM152	93.48 85.00 : 115.00
Antimony	TM152	91.03 85.00 : 115.00
Arsenic	TM152	95.19 85.00 : 115.00
Barium	TM152	95.73 85.00 : 115.00
Beryllium	TM152	96.03 85.00 : 115.00
Bismuth	TM152	94.52 85.00 : 115.00
Boron	TM152	95.68 85.00 : 115.00
Cadmium	TM152	93.48 85.00 : 115.00
Chromium	TM152	93.89 85.00 : 115.00
Cobalt	TM152	91.83 85.00 : 115.00
Copper	TM152	93.08 85.00 : 115.00
Lead	TM152	97.44 85.00 : 115.00
Lithium	TM152	99.64 85.00 : 115.00
Manganese	TM152	93.11 85.00 : 115.00

Validated

ALcontrol Laboratories Analytical Services

SDG 101115-88
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		QC 24
Molybdenum	TM152	87.48 85.00 : 115.00
Nickel	TM152	92.05 85.00 : 115.00
Phosphorus	TM152	95.19 85.00 : 115.00
Selenium	TM152	96.12 85.00 : 115.00
Silver	TM152	94.61 85.00 : 115.00
Strontium	TM152	96.87 85.00 : 115.00
Tellurium	TM152	96.65 85.00 : 115.00
Thallium	TM152	96.85 85.00 : 115.00
Tin	TM152	96.00 85.00 : 115.00
Titanium	TM152	96.16 85.00 : 115.00
Uranium	TM152	98.89 85.00 : 115.00
Vanadium	TM152	96.77 85.00 : 115.00
Zinc	TM152	95.85 85.00 : 115.00

EPH CWG (Aliphatic) Aqueous GC (W)

Component	Method Code	QC 26
Total Aliphatics >C12-C35	TM174	87.42 77.43 : 102.04

EPH CWG (Aliphatic) GC (S)

Component	Method Code	QC 28	QC 27	QC 26	QC 24
Total Aliphatics >C12-C35	TM173	82.55 60.21 : 118.96	83.16 55.20 : 114.58	79.10 69.20 : 106.61	86.47 69.20 : 106.61

EPH CWG (Aromatic) Aqueous GC (W)

Component	Method Code	QC 20
Total Aromatics >EC12-EC35	TM174	87.61 70.83 : 112.31

EPH CWG (Aromatic) GC (S)

Validated

ALcontrol Laboratories Analytical Services

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Component	Method Code	QC 28	QC 27	QC 26	QC 24
Total Aromatics >EC12-EC35	TM173	105.43 63.33 : 135.33	110.81 54.00 : 123.00	103.68 66.16 : 121.82	106.00 66.16 : 121.82

Hexavalent Chromium (s)

Component	Method Code	QC 21	QC 21	QC 27
Hexavalent Chromium	TM151	100.20 92.03 : 118.13	102.00 92.03 : 118.13	99.60 92.03 : 118.13

Hexavalent Chromium (w)

Component	Method Code	QC 29
Hexavalent Chromium	TM241	97.80 92.14 : 111.57

Mercury Dissolved

Component	Method Code	QC 20
Mercury Dissolved (CVAF)	TM183	91.60 79.41 : 116.68

Metals by iCap-OES (Soil)

Component	Method Code	QC 24	QC 27	QC 27	QC 20
Aluminium	TM181	102.56 90.12 : 126.07	113.27 90.12 : 126.07	109.96 90.12 : 126.07	112.50 94.29 : 126.83
Antimony	TM181	115.91 63.92 : 138.56	120.02 63.92 : 138.56	119.20 63.92 : 138.56	119.20 94.61 : 132.06
Arsenic	TM181	101.29 77.96 : 122.04	109.56 77.96 : 122.04	107.67 77.96 : 122.04	106.03 93.69 : 117.92
Barium	TM181	96.83 90.49 : 117.24	98.87 90.49 : 117.24	106.41 90.49 : 117.24	104.16 92.15 : 121.48
Beryllium	TM181	108.17 81.31 : 128.52	115.15 81.31 : 128.52	112.95 81.31 : 128.52	112.49 101.04 : 118.96
Boron	TM181	101.61 68.78 : 139.11	120.68 68.78 : 139.11	109.76 68.78 : 139.11	115.67 71.45 : 144.21
Cadmium	TM181	113.27 77.70 : 122.81	114.29 77.70 : 122.81	114.69 77.70 : 122.81	108.78 99.69 : 120.31
Chromium	TM181	95.52 82.90 : 117.10	103.29 82.90 : 117.10	100.57 82.90 : 117.10	102.15 86.66 : 111.67
Cobalt	TM181	104.26 78.26 : 121.74	108.35 78.26 : 121.74	105.68 78.26 : 121.74	107.82 91.65 : 115.98
Copper	TM181	94.90 86.52 : 113.48	98.98 86.52 : 113.48	99.00 86.52 : 113.48	100.49 90.86 : 109.48
Iron	TM181	100.96 92.49 : 115.39	105.13 92.49 : 115.39	105.40 92.49 : 115.39	107.21 93.15 : 116.30
Lead	TM181	101.94 81.22 : 118.78	103.72 81.22 : 118.78	95.73 81.22 : 118.78	101.89 81.17 : 121.35