

Scientific Analysis Laboratories Ltd

Certificate of Analysis

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Scientific Analysis Laboratories is a
limited company registered in England and
Wales (No 2514788) whose address is at
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Report Number: 451637-1

Date of Report: 03-Feb-2015

Customer: Ground Investigation & Piling Ltd
Devonshire House
Ettingshall Road
Wolverhampton
WV2 2JT

Customer Contact: Mr Matt Laws

Customer Job Reference: ML/22349

Customer Purchase Order: 37681

Customer Site Reference: Oakamoor

Date Job Received at SAL: 26-Jan-2015

Date Analysis Started: 29-Jan-2015

Date Analysis Completed: 03-Feb-2015

The results reported relate to samples received in the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with QP22



Report checked
and authorised by :
Chris Murphy
Project Manager

Issued by :
Chris Murphy
Project Manager



Waste Acceptance Criteria

Customer Sample Reference : S1
 SAL Sample Reference : 451637 001
 Project Site : Oakamoor
 Customer Reference : ML/22349
 Date Sampled : 23-JAN-2015
 Type : Clay

Soil					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Acid Neutralising Capacity (pH 4)	Titration	2	Mol/kg	N	<2			
Acid Neutralising Capacity (pH 7)	Titration	2	Mol/kg	N	<2			
BTEX (Sum)	Calc	0.040	mg/kg	U	<0.040	6.0		
Loss on Ignition	Grav	0.1	%	N	6.1			10.0
PAH (Sum)	Calc	1.6	mg/kg	N	<1.6	100.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035	1.0		
pH	Probe			M	7.9		> 6.0	
Total Organic Carbon	OX/IR	0.1	%	N	0.8	3.0	5.0	6.0
Total Petroleum Hydrocarbons C10-C40 (Sum)	Calc	1	mg/kg	N	<1	500.0		

Data for BS EN 12457-2 (10:1)					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony	Calc WAC ICP/MS	0.010	mg/kg	N	<0.010	0.06	0.7	5.0
Arsenic	Calc WAC ICP/MS	0.0020	mg/kg	N	0.0040	0.5	2.0	25.0
Barium	Calc WAC ICP/MS	0.010	mg/kg	N	0.11	20.0	100.0	300.0
Cadmium	Calc WAC ICP/MS	0.00020	mg/kg	N	<0.00020	0.04	1.0	5.0
Chloride	Calc (W)	10	mg/kg	N	21	800.0	15000.0	25000.0
Chromium	Calc WAC ICP/MS	0.010	mg/kg	N	0.016	0.5	10.0	70.0
Copper	Calc WAC ICP/MS	0.0050	mg/kg	N	0.030	2.0	50.0	100.0
Dissolved Organic Carbon	Calc	10	mg/kg	N	330	500.0	800.0	1000.0
Fluoride	Calc (W)	0.50	mg/kg	N	2.1	10.0	150.0	500.0
Lead	Calc WAC ICP/MS	0.0030	mg/kg	N	<0.0030	0.5	10.0	50.0
Mercury	Calc WAC ICP/MS	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum	Calc WAC ICP/MS	0.010	mg/kg	N	<0.010	0.5	10.0	30.0
Nickel	Calc WAC ICP/MS	0.010	mg/kg	N	0.032	0.4	10.0	40.0
Phenols (Total-Mono)	Calc	1.0	mg/kg	N	<1.0	1.0		
Selenium	Calc WAC ICP/MS	0.0050	mg/kg	N	<0.0050	0.1	0.5	7.0
Sulphate	Calc (W)	5	mg/kg	N	<5	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc WAC ICP/MS	1000	mg/kg	N	<1000	4000.0	60000.0	100000.0
Zinc	Calc WAC ICP/MS	0.020	mg/kg	N	0.084	4.0	50.0	200.0

Following the recommendation from the Environment Agency (England and Wales)*, the leachate preparation in this report has been carried out to BS EN 12457-2 : One Stage batch test at a liquid to solid ratio of 10 l/kg. This is also compliant with Schedule 10 of the Environmental Permitting Regulations 2010.

Note : This is the minimum amount of testing which is required.

Further testing may be required if :

- evidence of immediately leachable parameters becomes available.
- evidence to indicate that the sample could be classified as hazardous under H1-H14 of the Waste(England and Wales) Regulations 2011(as amended) becomes available.

Acceptance of waste at landfill is always at the discretion of the Landfill Operator.

* Waste Sampling and Testing for Disposal at Landfill, EBPRI 11507B, Environment Agency (England and Wales) March 2013

Waste Acceptance Criteria

Customer Sample Reference : S2

SAL Sample Reference : 451637 002

Project Site : Oakamoor

Customer Reference : ML/22349

Date Sampled : 23-JAN-2015

Type : Clay

Soil					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Acid Neutralising Capacity (pH 4)	Titration	2	Mol/kg	N	<2			
Acid Neutralising Capacity (pH 7)	Titration	2	Mol/kg	N	<2			
BTEX (Sum)	Calc	0.040	mg/kg	U	<0.040	6.0		
Loss on Ignition	Grav	0.1	%	N	7.9			10.0
PAH (Sum)	Calc	1.6	mg/kg	N	<1.6	100.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035	1.0		
pH	Probe			M	7.0		> 6.0	
Total Organic Carbon	OX/IR	0.1	%	N	1.6	3.0	5.0	6.0
Total Petroleum Hydrocarbons C10-C40 (Sum)	Calc	1	mg/kg	N	<1	500.0		

Data for BS EN 12457-2 (10:1)					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony	Calc WAC ICP/MS	0.010	mg/kg	N	<0.010	0.06	0.7	5.0
Arsenic	Calc WAC ICP/MS	0.0020	mg/kg	N	0.0047	0.5	2.0	25.0
Barium	Calc WAC ICP/MS	0.010	mg/kg	N	0.11	20.0	100.0	300.0
Cadmium	Calc WAC ICP/MS	0.00020	mg/kg	N	<0.00020	0.04	1.0	5.0
Chloride	Calc (W)	10	mg/kg	N	370	800.0	15000.0	25000.0
Chromium	Calc WAC ICP/MS	0.010	mg/kg	N	0.015	0.5	10.0	70.0
Copper	Calc WAC ICP/MS	0.0050	mg/kg	N	0.073	2.0	50.0	100.0
Dissolved Organic Carbon	Calc	10	mg/kg	N	240	500.0	800.0	1000.0
Fluoride	Calc (W)	0.50	mg/kg	N	<0.50	10.0	150.0	500.0
Lead	Calc WAC ICP/MS	0.0030	mg/kg	N	<0.0030	0.5	10.0	50.0
Mercury	Calc WAC ICP/MS	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum	Calc WAC ICP/MS	0.010	mg/kg	N	<0.010	0.5	10.0	30.0
Nickel	Calc WAC ICP/MS	0.010	mg/kg	N	0.032	0.4	10.0	40.0
Phenols (Total-Mono)	Calc	1.0	mg/kg	N	<1.0	1.0		
Selenium	Calc WAC ICP/MS	0.0050	mg/kg	N	<0.0050	0.1	0.5	7.0
Sulphate	Calc (W)	5	mg/kg	N	190	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc WAC ICP/MS	1000	mg/kg	N	<1000	4000.0	60000.0	100000.0
Zinc	Calc WAC ICP/MS	0.020	mg/kg	N	0.084	4.0	50.0	200.0

Following the recommendation from the Environment Agency (England and Wales)*, the leachate preparation in this report has been carried out to BS EN 12457-2 : One Stage batch test at a liquid to solid ratio of 10 l/kg. This is also compliant with Schedule 10 of the Environmental Permitting Regulations 2010.

Note : This is the minimum amount of testing which is required.

Further testing may be required if :

- evidence of immediately leachable parameters becomes available.
- evidence to indicate that the sample could be classified as hazardous under H1-H14 of the Waste(England and Wales) Regulations 2011(as amended) becomes available.

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* Waste Sampling and Testing for Disposal at Landfill, EBPRI 11507B, Environment Agency (England and Wales) March 2013

Waste Acceptance Criteria

Customer Sample Reference : S3
 SAL Sample Reference : 451637 003
 Project Site : Oakamoor
 Customer Reference : ML/22349
 Date Sampled : 23-JAN-2015
 Type : Clay

Soil					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Acid Neutralising Capacity (pH 4)	Titration	2	Mol/kg	N	<2			
Acid Neutralising Capacity (pH 7)	Titration	2	Mol/kg	N	<2			
BTEX (Sum)	Calc	0.040	mg/kg	U	<0.040	6.0		
Loss on Ignition	Grav	0.1	%	N	5.9			10.0
PAH (Sum)	Calc	1.6	mg/kg	N	<1.6	100.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035	1.0		
pH	Probe			M	7.7		> 6.0	
Total Organic Carbon	OX/IR	0.1	%	N	0.9	3.0	5.0	6.0
Total Petroleum Hydrocarbons C10-C40 (Sum)	Calc	1	mg/kg	N	<1	500.0		

Data for BS EN 12457-2 (10:1)					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony	Calc WAC ICP/MS	0.010	mg/kg	N	<0.010	0.06	0.7	5.0
Arsenic	Calc WAC ICP/MS	0.0020	mg/kg	N	0.0038	0.5	2.0	25.0
Barium	Calc WAC ICP/MS	0.010	mg/kg	N	0.11	20.0	100.0	300.0
Cadmium	Calc WAC ICP/MS	0.00020	mg/kg	N	<0.00020	0.04	1.0	5.0
Chloride	Calc (W)	10	mg/kg	N	24	800.0	15000.0	25000.0
Chromium	Calc WAC ICP/MS	0.010	mg/kg	N	0.013	0.5	10.0	70.0
Copper	Calc WAC ICP/MS	0.0050	mg/kg	N	0.026	2.0	50.0	100.0
Dissolved Organic Carbon	Calc	10	mg/kg	N	260	500.0	800.0	1000.0
Fluoride	Calc (W)	0.50	mg/kg	N	1.3	10.0	150.0	500.0
Lead	Calc WAC ICP/MS	0.0030	mg/kg	N	<0.0030	0.5	10.0	50.0
Mercury	Calc WAC ICP/MS	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum	Calc WAC ICP/MS	0.010	mg/kg	N	<0.010	0.5	10.0	30.0
Nickel	Calc WAC ICP/MS	0.010	mg/kg	N	0.029	0.4	10.0	40.0
Phenols (Total-Mono)	Calc	1.0	mg/kg	N	<1.0	1.0		
Selenium	Calc WAC ICP/MS	0.0050	mg/kg	N	<0.0050	0.1	0.5	7.0
Sulphate	Calc (W)	5	mg/kg	N	<5	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc WAC ICP/MS	1000	mg/kg	N	<1000	4000.0	60000.0	100000.0
Zinc	Calc WAC ICP/MS	0.020	mg/kg	N	0.078	4.0	50.0	200.0

Following the recommendation from the Environment Agency (England and Wales)*, the leachate preparation in this report has been carried out to BS EN 12457-2 : One Stage batch test at a liquid to solid ratio of 10 l/kg. This is also compliant with Schedule 10 of the Environmental Permitting Regulations 2010.

Note : This is the minimum amount of testing which is required.

Further testing may be required if :

- evidence of immediately leachable parameters becomes available.
- evidence to indicate that the sample could be classified as hazardous under H1-H14 of the Waste(England and Wales) Regulations 2011(as amended) becomes available.

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* Waste Sampling and Testing for Disposal at Landfill, EBPRI 11507B, Environment Agency (England and Wales) March 2013

SAL Reference: 451637								
Project Site: Oakamoor								
Customer Reference: ML/22349								
Soil Analysed as Soil								
MCERTS Preparation								
SAL Reference					451637 001	451637 002	451637 003	
Customer Sample Reference					S1	S2	S3	
Test Sample					AR	AR	AR	
Date Sampled					23-JAN-2015	23-JAN-2015	23-JAN-2015	
Type					Clay	Clay	Clay	
Determinand		Method	LOD	Units	Symbol			
MCERTS Classification		Process			M	-	-	-
Moisture @ 105 C		Grav (1 Dec) (105 C)	0.1	%	N	25	28	26

SAL Reference: 451637										
Project Site: Oakamoor										
Customer Reference: ML/22349										
Soil Analysed as Soil										
PCB EC7										
SAL Reference					451637 001		451637 002		451637 003	
Customer Sample Reference					S1		S2		S3	
Test Sample					M105		M105		M105	
Date Sampled					23-JAN-2015		23-JAN-2015		23-JAN-2015	
Type					Clay		Clay		Clay	
Determinand		Method		LOD	Units	Symbol				
Polychlorinated biphenyl BZ#28		GC/MS (HR) (MCERTS)		0.05	µg/kg	M	<0.05	<0.05	<0.05	
Polychlorinated biphenyl BZ#52		GC/MS (HR) (MCERTS)		0.05	µg/kg	M	<0.05	<0.05	<0.05	
Polychlorinated biphenyl BZ#101		GC/MS (HR) (MCERTS)		0.05	µg/kg	M	<0.05	<0.05	<0.05	
Polychlorinated biphenyl BZ#118		GC/MS (HR) (MCERTS)		0.05	µg/kg	M	<0.05	<0.05	<0.05	
Polychlorinated biphenyl BZ#153		GC/MS (HR) (MCERTS)		0.05	µg/kg	M	<0.05	<0.05	<0.05	
Polychlorinated biphenyl BZ#138		GC/MS (HR) (MCERTS)		0.05	µg/kg	M	<0.05	<0.05	<0.05	
Polychlorinated biphenyl BZ#180		GC/MS (HR) (MCERTS)		0.05	µg/kg	M	<0.05	<0.05	<0.05	

SAL Reference: 451637							
Project Site: Oakamoor							
Customer Reference: ML/22349							
Soil		Analysed as Soil					
BTEX							
SAL Reference					451637 001	451637 002	451637 003
Customer Sample Reference					S1	S2	S3
Test Sample					M105	M105	M105
Date Sampled					23-JAN-2015	23-JAN-2015	23-JAN-2015
Type					Clay	Clay	Clay
Determinand	Method	LOD	Units	Symbol			
Benzene	GC/MS(Head Space)(MCERTS)	10	µg/kg	M	(13) <10	(13) <10	(13) <10
Toluene	GC/MS(Head Space)(MCERTS)	10	µg/kg	M	<10	<10	<10
EthylBenzene	GC/MS(Head Space)(MCERTS)	10	µg/kg	M	<10	<10	<10
Meta/Para-Xylene	GC/MS(Head Space)(MCERTS)	10	µg/kg	M	<10	<10	<10
Ortho-Xylene	GC/MS(Head Space)(MCERTS)	10	µg/kg	M	<10	<10	<10

SAL Reference: 451637									
Project Site: Oakamoor									
Customer Reference: ML/22349									
Soil		Analysed as Soil							
TPH									
		SAL Reference		451637 001		451637 002		451637 003	
		Customer Sample Reference		S1		S2		S3	
		Test Sample		M105		M105		M105	
		Date Sampled		23-JAN-2015		23-JAN-2015		23-JAN-2015	
		Type		Clay		Clay		Clay	
Determinand		Method	LOD	Units	Symbol				
Total Petroleum Hydrocarbons (C10-C35)		GC/FID	1	mg/kg	M	<1	<1	<1	
Total Petroleum Hydrocarbons (C35-C40)		GC/FID	1	mg/kg	N	<1	<1	<1	

SAL Reference: 451637							
Project Site: Oakamoor							
Customer Reference: ML/22349							
Soil Analysed as Soil							
Total and Speciated USEPA16 PAH							
SAL Reference					451637 001	451637 002	451637 003
Customer Sample Reference					S1	S2	S3
Test Sample					M105	M105	M105
Date Sampled					23-JAN-2015	23-JAN-2015	23-JAN-2015
Type					Clay	Clay	Clay
Determinand	Method	LOD	Units	Symbol			
Naphthalene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Acenaphthylene	GC/MS (MCERTS)	0.1	mg/kg	U	<0.1	<0.1	<0.1
Acenaphthene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Fluorene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Phenanthrene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Anthracene	GC/MS (MCERTS)	0.1	mg/kg	U	<0.1	<0.1	<0.1
Fluoranthene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Pyrene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Benzo(a)Anthracene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Chrysene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Benzo(b/k)Fluoranthene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Benzo(a)Pyrene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Polyaromatic Hydrocarbons (Total)	GC/MS (MCERTS)	0.1	mg/kg	U	<0.1	<0.1	<0.1
Coronene	GC/MS	0.1	mg/kg	N	<0.1	<0.1	<0.1
Phenol	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1

SAL Reference: 451637							
Project Site: Oakamoor							
Customer Reference: ML/22349							
Leachate to BS EN 12457-2 (10:1)		Analysed as Water					
Waste Acceptance Criteria							
SAL Reference					451637 001	451637 002	451637 003
Customer Sample Reference					S1	S2	S3
Test Sample					10:1	10:1	10:1
Date Sampled					23-JAN-2015	23-JAN-2015	23-JAN-2015
Type					Clay	Clay	Clay
Determinand	Method	LOD	Units	Symbol			
Antimony (Dissolved)	ICP/MS (Filtered)	1	µg/l	U	<1	<1	<1
Arsenic (Dissolved)	ICP/MS (Filtered)	0.2	µg/l	U	0.4	0.5	0.4
Barium (Dissolved)	ICP/MS (Filtered)	1	µg/l	U	11	11	11
Cadmium (Dissolved)	ICP/MS (Filtered)	0.02	µg/l	U	<0.02	<0.02	<0.02
Chloride	Discrete Analyser	1	mg/l	U	2	37	2
Chromium (Dissolved)	ICP/MS (Filtered)	1	µg/l	U	2	2	1
Copper (Dissolved)	ICP/MS (Filtered)	0.5	µg/l	U	3.0	7.3	2.6
Dissolved Organic Carbon	OX/IR	1	mg/l	N	33	24	26
Electrical Conductivity	Probe	10	µS/cm	N	79	68	75
Fluoride	Discrete Analyser	0.05	mg/l	U	0.21	<0.05	0.13
Lead (Dissolved)	ICP/MS (Filtered)	0.3	µg/l	U	<0.3	<0.3	<0.3
Mercury (Dissolved)	ICP/MS (Filtered)	0.05	µg/l	U	<0.05	<0.05	<0.05
Molybdenum (Dissolved)	ICP/MS (Filtered)	1	µg/l	N	<1	<1	<1
Nickel (Dissolved)	ICP/MS (Filtered)	1	µg/l	U	3	3	3
Phenols (Total-Mono)	Colorimetry	0.1	mg/l	U	<0.1	<0.1	<0.1
Selenium (Dissolved)	ICP/MS (Filtered)	0.5	µg/l	U	<0.5	<0.5	<0.5
Sulphate	Discrete Analyser	0.5	mg/l	U	<0.5	19	<0.5
Total Dissolved Solids	Grav	100	mg/l	N	<100	<100	<100
Zinc (Dissolved)	ICP/MS (Filtered)	2	ua/l	U	8	8	8

Index to symbols used in 451637-1

Value	Description
10:1 S	Data for BS EN 12457-2 (10:1)
10:1	Leachate to BS EN 12457-2 (10:1)
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
AR	As Received
13	Results have been blank corrected.
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited