

GroundSolve Ltd

Consulting Geotechnical, Engineering Geology and Environmental Engineers.

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Well House Barns,
Chester Road, Bretton,
Flintshire, CH4 0DH

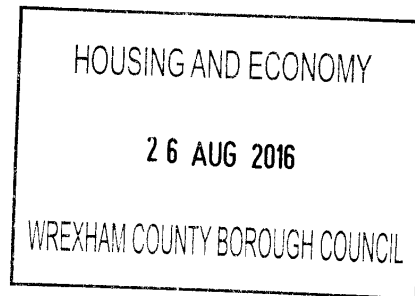
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Mob: 07977 218184

Email: mikescott@groundsolve.com

REF: 1788/TF/TankA/mjs

Angela Guy
Public Protection Service
Wrexham County Borough Council
Ruthin Road
Wrexham LL13 7TU



24th August 2016

Dear Angela,

RE: TOTAL FITNESS, WREXHAM: FUEL TANK VALIDATION

Following our tank validation letter for the above site, dated 8th August 2016, we have now received the final test results, which are attached. The trace of Chrysotile asbestos found in the hardcore at a depth of 0.30 to 0.40m was subjected to a full asbestos quantification test, which recorded a concentration of <0.001%.

We would therefore conclude that there is no evidence of contamination from the above ground fuel tank and the asbestos does not present risk to site users, especially as this area is to remain as tarmac hardstanding within the development. However, in accordance with good practice a watching brief will be kept on all excavations in the vicinity.

We trust this is satisfactory, should you have any queries please call Mike Scott on 01244 661361.

Yours sincerely

M J Scott

Enc

CC Mike Forgrave



ALcontrol Laboratories

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Ground Solve
Unit 1
Well House Barns
Chester Road
Bretton
Cheshire
CH4 0DH

Attention: Elgan Williams

CERTIFICATE OF ANALYSIS

Date: 16 August 2016
Customer: H_GRSOLVE_BRE
Sample Delivery Group (SDG): 160727-104
Your Reference: 1778
Location: Total Fitness Tank
Report No: 373646

This report has been revised and directly supersedes 372234 in its entirety.

We received 2 samples on Wednesday July 27, 2016 and 2 of these samples were scheduled for analysis which was completed on Tuesday August 16, 2016. 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.

Approved By:

Sonia McWhan
Operations Manager



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CERTIFICATE OF ANALYSIS

Validated

SDG:	160727-104	Location:	Total Fitness Tank	Order Number:	1778/erw
Job:	H_GRSOLVE_BRE-187	Customer:	Ground Solve	Report Number:	373646
Client Reference:	1778	Attention:	Elgan Williams	Superseded Report:	372234

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13858032	TANK		0.30 - 0.40	27/07/2016
13858031	TANK		0.70 - 0.80	27/07/2016

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

CERTIFICATE OF ANALYSIS

Validated

SDG: 160727-104 **Location:** Total Fitness Tank **Order Number:** 1778/erw
Job: H_GRSOLVE_BRE-187 **Customer:** Ground Solve **Report Number:** 373646
Client Reference: 1778 **Attention:** Elgan Williams **Superseded Report:** 372234

SOLID Results Legend ☒ Test ☐ No Determination Possible	Lab Sample No(s)	13656031	13656032
	Customer Sample Reference	TANK	TANK
	AGS Reference		
	Depth (m)	0.30 - 0.40	0.70 - 0.80
	Container	500 VOC (AL/E215) 250g Amber Jar (AL)	500 VOC (AL/E215) 250g Amber Jar (AL)
Anions by Kone (soil)	All	NDPs: 0 Tests: 2	X X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 2	X X
Asbestos Quantification - Full	All	NDPs: 0 Tests: 1	X
Chromium III	All	NDPs: 0 Tests: 2	X X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2	X X
Easily Liberated Sulphide	All	NDPs: 0 Tests: 2	X X
Elemental Sulphur	All	NDPs: 0 Tests: 2	X X
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 2	X X
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 2	X X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2	X X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 2	X X
Metals in solid samples by OES	All	NDPs: 0 Tests: 2	X X
PAH by GCMS	All	NDPs: 0 Tests: 2	X X
pH	All	NDPs: 0 Tests: 2	X X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 2	X X

CERTIFICATE OF ANALYSIS

Validated

SDG: 160727-104 Location: Total Fitness Tank Order Number: 1778/enw
 Job: H_GRSOLVE_BRE-187 Customer: Ground Solve Report Number: 373646
 Client Reference: 1778 Attention: Eigan Williams Superseded Report: 372234

SOLID Results Legend ☒ Test ☐ No Determination Possible		Lab Sample No(s)	13656031 13656032
		Customer Sample Reference	TANK
		AGS Reference	
		Depth (m)	0.70 - 0.80 0.30 - 0.40
		Container	800 VOC (ALE215) 250g Amber Jar (AL) 600 VOC (ALE215) 250g Amber Jar (AL)
Sample description	All	NDPs: 0 Tests: 2	X X
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 2	X X
Total Organic Carbon	All	NDPs: 0 Tests: 2	X X
TPH CWG GC (S)	All	NDPs: 0 Tests: 2	X X
VOC MS (S)	All	NDPs: 0 Tests: 2	X X

SDG: 160727-104
Job: H_GRSOLVE_BRE-187
Client Reference: 1778

Location: Total Fitness Tank
Customer: Ground Solve
Attention: Elgan Williams

Order Number: 1778/erw
Report Number: 373646
Superseded Report: 372234

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
13858031	TANK	0.70 - 0.80	Dark Brown	Clay Loam	0.002 - 0.063 mm	Stones	Vegetation
13858032	TANK	0.30 - 0.40	Light Brown	Loamy Sand	0.063 - 2.00 mm	Brick	Stones

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.

Order Number: 1778/erw
Report Number: 373646
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Order Number:	1778/erw
Report Number:	373646
Superseded Report:	372234

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CERTIFICATE OF ANALYSIS

Validated

SDG: 160727-104
 Job: H_GRSOLVE_BRE-187
 Client Reference: 1778

Location: Total Fitness Tank
 Customer: Ground Solve
 Attention: Elgan Williams

Order Number: 1778/erw
 Report Number: 373646
 Superseded Report: 372234

Semi Volatile Organic Compounds

Results Legend		Customer Sample R	TANK	TANK			
#	ISO17025 accredited.	Depth (m)	0.30 - 0.40	0.70 - 0.80			
M	mCERTS accredited.	Sample Type	Soil/Solid	Soil/Solid			
aq	Aqueous / settled sample.	Date Sampled	27/07/2016	27/07/2016			
dis.filt	Dissolved / filtered sample.	Sample Time					
tot.unfilt	Total / unfiltered sample.	Date Received	27/07/2016	27/07/2016			
*	Subcontracted test.	SDG Ref	160727-104	160727-104			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	13858032	13858031			
(F)	Trigger breach confirmed	AGS Reference					
1-54	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Phenol	<100 µg/kg	TM157	<100	<100			
Pentachlorophenol	<100 µg/kg	TM157	<100	<100			
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157	<100	<100			
Nitrobenzene	<100 µg/kg	TM157	<100	<100			
Isophorone	<100 µg/kg	TM157	<100	<100			
Hexachloroethane	<100 µg/kg	TM157	<100	<100			
Hexachlorocyclopentadiene	<100 µg/kg	TM157	<100	<100			
Hexachlorobutadiene	<100 µg/kg	TM157	<100	<100			
Hexachlorobenzene	<100 µg/kg	TM157	<100	<100			
n-Dioctyl phthalate	<100 µg/kg	TM157	<100	<100			
Dimethyl phthalate	<100 µg/kg	TM157	<100	<100			
Diethyl phthalate	<100 µg/kg	TM157	<100	<100			
n-Dibutyl phthalate	<100 µg/kg	TM157	<100	<100			
Dibenzofuran	<100 µg/kg	TM157	<100	<100			
Carbazole	<100 µg/kg	TM157	<100	<100			
Butylbenzyl phthalate	<100 µg/kg	TM157	<100	<100			
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157	<100	<100			
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157	<100	<100			
bis(2-Chloroethyl)ether	<100 µg/kg	TM157	<100	<100			
Azobenzene	<100 µg/kg	TM157	<100	<100			
4-Nitrophenol	<100 µg/kg	TM157	<100	<100			
4-Nitroaniline	<100 µg/kg	TM157	<100	<100			
4-Methylphenol	<100 µg/kg	TM157	<100	<100			
4-Chlorophenylphenylether	<100 µg/kg	TM157	<100	<100			
4-Chloroaniline	<100 µg/kg	TM157	<100	<100			
4-Chloro-3-methylphenol	<100 µg/kg	TM157	<100	<100			
4-Bromophenylphenylether	<100 µg/kg	TM157	<100	<100			
3-Nitroaniline	<100 µg/kg	TM157	<100	<100			
2-Nitrophenol	<100 µg/kg	TM157	<100	<100			
2-Nitroaniline	<100 µg/kg	TM157	<100	<100			
2-Methylphenol	<100 µg/kg	TM157	<100	<100			
1,2,4-Trichlorobenzene	<100 µg/kg	TM157	<100	<100			

CERTIFICATE OF ANALYSIS

Validated

SDG: 160727-104
 Job: H_GRSOLVE_BRE-187
 Client Reference: 1778

Location: Total Fitness Tank
 Customer: Ground Solve
 Attention: Elgan Williams

Order Number: 1778/ew
 Report Number: 373646
 Superseded Report: 372234

Semi Volatile Organic Compounds

Results Legend		Customer Sample R	TANK	TANK				
#	ISO17025 accredited.							
M	mcCERTS accredited.							
AQ	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-5&16	Sample deviation (see appendix)							
Component	LOD/Units	Method						
2-Chlorophenol	<100 µg/kg	TM157	<100	<100				
2,6-Dinitrotoluene	<100 µg/kg	TM157	<100	<100				
2,4-Dinitrotoluene	<100 µg/kg	TM157	<100	<100				
2,4-Dimethylphenol	<100 µg/kg	TM157	<100	<100				
2,4-Dichlorophenol	<100 µg/kg	TM157	<100	<100				
2,4,6-Trichlorophenol	<100 µg/kg	TM157	<100	<100				
2,4,5-Trichlorophenol	<100 µg/kg	TM157	<100	<100				
1,4-Dichlorobenzene	<100 µg/kg	TM157	<100	<100				
1,3-Dichlorobenzene	<100 µg/kg	TM157	<100	<100				
1,2-Dichlorobenzene	<100 µg/kg	TM157	<100	<100				
2-Chloronaphthalene	<100 µg/kg	TM157	<100	<100				
2-Methylnaphthalene	<100 µg/kg	TM157	<100	<100				
Acenaphthylene	<100 µg/kg	TM157	<100	<100				
Acenaphthene	<100 µg/kg	TM157	<100	<100				
Anthracene	<100 µg/kg	TM157	<100	<100				
Benzo(a)anthracene	<100 µg/kg	TM157	236	<100				
Benzo(b)fluoranthene	<100 µg/kg	TM157	224	<100				
Benzo(k)fluoranthene	<100 µg/kg	TM157	217	<100				
Benzo(a)pyrene	<100 µg/kg	TM157	343	<100				
Benzo(g,h,i)perylene	<100 µg/kg	TM157	298	<100				
Chrysene	<100 µg/kg	TM157	268	<100				
Fluoranthene	<100 µg/kg	TM157	616	<100				
Fluorene	<100 µg/kg	TM157	<100	<100				
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157	321	<100				
Phenanthrene	<100 µg/kg	TM157	211	<100				
Pyrene	<100 µg/kg	TM157	669	<100				
Naphthalene	<100 µg/kg	TM157	<100	<100				
Dibenzo(a,h)anthracene	<100 µg/kg	TM157	<100	<100				
Bis(2-chloroisopropyl) ether	<100 µg/kg	TM157	<100	<100				

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SDG: 160727-104
 Job: H_GRSOLVE_BRE-187
 Client Reference: 1778

Location: Total Fitness Tank
 Customer: Ground Solve
 Attention: Elgan Williams

Order Number: 1778/erw
 Report Number: 373646
 Superseded Report: 372234

TPH CWG (S)

Results Legend		Customer Sample R		TANK	TANK				
#	ISO17825 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
dis.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted test.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-54.9@	Sample deviation (see appendix)								
AGS Reference		Lab Sample No.(s)							
Component	LOD/Units	Method							
GRO Surrogate % recovery**	%	TM089	86	84					
GRO TOT (Moisture Corrected)	<44 µg/kg	TM089	<44	<44					
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089	<5	<5					
Benzene	<10 µg/kg	TM089	<10	<10					
Toluene	<2 µg/kg	TM089	<2	<2					
Ethylbenzene	<3 µg/kg	TM089	<3	<3					
m,p-Xylene	<6 µg/kg	TM089	<6	<6					
o-Xylene	<3 µg/kg	TM089	<3	<3					
sum of detected mpo xylene by GC	<9 µg/kg	TM089	<9	<9					
sum of detected BTEX by GC	<24 µg/kg	TM089	<24	<24					
Aliphatics >C5-C6	<10 µg/kg	TM089	<10	<10					
Aliphatics >C6-C8	<10 µg/kg	TM089	<10	<10					
Aliphatics >C8-C10	<10 µg/kg	TM089	<10	<10					
Aliphatics >C10-C12	<10 µg/kg	TM089	<10	<10					
Aliphatics >C12-C16	<100 µg/kg	TM173	772	<100					
Aliphatics >C16-C21	<100 µg/kg	TM173	4820	<100					
Aliphatics >C21-C35	<100 µg/kg	TM173	79600	<100					
Aliphatics >C35-C44	<100 µg/kg	TM173	35700	<100					
Total Aliphatics >C12-C44	<100 µg/kg	TM173	121000	<100					
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10	<10					
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10	<10					
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10	<10					
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10	<10					
Aromatics >EC12-EC16	<100 µg/kg	TM173	337	292					
Aromatics >EC16-EC21	<100 µg/kg	TM173	3950	914					
Aromatics >EC21-EC35	<100 µg/kg	TM173	82000	6120					
Aromatics >EC35-EC44	<100 µg/kg	TM173	63300	3880					
Aromatics >EC40-EC44	<100 µg/kg	TM173	25900	1830					
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	150000	11200					
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173	270000	11200					

CERTIFICATE OF ANALYSIS

Validated

SDG: 160727-104
Job: H_GRSOLVE_BRE-187
Client Reference: 1778

Location: Total Fitness Tank
Customer: Ground Solve
Attention: Elgan Williams

Order Number: 1778/erw
Report Number: 373646
Superseded Report: 372234

VOC MS (S)

Results Legend			Customer Sample R		TANK	TANK				
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s)	0.30 - 0.40 Soil/Solid 27/07/2016 27/07/2016 160727-104 13858032	0.70 - 0.80 Soil/Solid 27/07/2016 27/07/2016 160727-104 13858031					
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
dis.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
*	Subcontracted test.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery									
(F)	Trigger breach confirmed									
1-55	Sample deviation (see appendix)									
Component	LOD/Units	Method	AGS Reference							
Dibromofluoromethane**	%	TM116	112	119						
Toluene-d8**	%	TM116	105	111						
4-Bromofluorobenzene**	%	TM116	83.8	88.7						
Dichlorodifluoromethane	<6 µg/kg	TM116	<6	<6						
Chloromethane	<7 µg/kg	TM116	<7	<7						
Vinyl Chloride	<6 µg/kg	TM116	<6	<6						
Bromomethane	<10 µg/kg	TM116	<10	<10						
Chloroethane	<10 µg/kg	TM116	<10	<10						
Trichlorofluoromethane	<6 µg/kg	TM116	<6	<6						
1,1-Dichloroethene	<10 µg/kg	TM116	<10	<10						
Carbon Disulphide	<7 µg/kg	TM116	<7	<7						
Dichloromethane	<10 µg/kg	TM116	<10	<10						
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	<10						
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10	<10						
1,1-Dichloroethane	<8 µg/kg	TM116	<8	<8						
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6	<6						
2,2-Dichloropropane	<10 µg/kg	TM116	<10	<10						
Bromochloromethane	<10 µg/kg	TM116	<10	<10						
Chloroform	<8 µg/kg	TM116	<8	<8						
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7	<7						
1,1-Dichloropropene	<10 µg/kg	TM116	<10	<10						
Carbontetrachloride	<10 µg/kg	TM116	<10	<10						
1,2-Dichloroethane	<5 µg/kg	TM116	<5	<5						
Benzene	<9 µg/kg	TM116	<9	<9						
Trichloroethene	<9 µg/kg	TM116	<9	<9						
1,2-Dichloropropane	<10 µg/kg	TM116	<10	<10						
Dibromomethane	<9 µg/kg	TM116	<9	<9						
Bromodichloromethane	<7 µg/kg	TM116	<7	<7						
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10						
Toluene	<7 µg/kg	TM116	<7	<7						
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	<10						
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10	<10						

CERTIFICATE OF ANALYSIS

Validated

SDG: 160727-104
 Job: H_GRSOLVE_BRE-187
 Client Reference: 1778

Location: Total Fitness Tank
 Customer: Ground Solve
 Attention: Elgan Williams

Order Number: 1778/erw
 Report Number: 373646
 Superseded Report: 372234

VOC MS (S)

Results Legend			Customer Sample R		TANK	TANK				
#	ISO17025 accredited.		Depth (m)	0.30 - 0.40	0.70 - 0.80					
M	mCERTS accredited.		Sample Type	Soil/Solid	Soil/Solid					
AQ	Aqueous / settled sample.		Date Sampled	27/07/2016	27/07/2016					
dis.filt	Dissolved / filtered sample.		Sample Time							
tot.unfilt	Total / unfiltered sample.		Date Received	27/07/2016	27/07/2016					
+	Subcontracted test.		SDG Ref	160727-104	160727-104					
..	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		Lab Sample No.(s)	13858032	13858031					
(F)	Trigger breach confirmed		AGS Reference							
1-44-150	Sample deviation (see appendix)									
Component	LOD/Units	Method								
1,3-Dichloropropane	<7 µg/kg	TM116	<7	M	<7	M				
Tetrachloroethene	<5 µg/kg	TM116	<5	M	<5	M				
Dibromochloromethane	<10 µg/kg	TM116	<10	M	<10	M				
1,2-Dibromoethane	<10 µg/kg	TM116	<10	M	<10	M				
Chlorobenzene	<5 µg/kg	TM116	<5	M	<5	M				
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10	M	<10	M				
Ethylbenzene	<4 µg/kg	TM116	<4	M	<4	M				
p/m-Xylene	<10 µg/kg	TM116	<10	#	<10	#				
o-Xylene	<10 µg/kg	TM116	<10	M	<10	M				
Styrene	<10 µg/kg	TM116	<10	#	<10	#				
Bromoform	<10 µg/kg	TM116	<10	M	<10	M				
Isopropylbenzene	<5 µg/kg	TM116	<5	#	<5	#				
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10	M	<10	M				
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16	M	<16	M				
Bromobenzene	<10 µg/kg	TM116	<10	M	<10	M				
Propylbenzene	<10 µg/kg	TM116	<10	M	<10	M				
2-Chlorotoluene	<9 µg/kg	TM116	<9	M	<9	M				
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8	M	<8	M				
4-Chlorotoluene	<10 µg/kg	TM116	<10	M	<10	M				
tert-Butylbenzene	<14 µg/kg	TM116	<14	M	<14	M				
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9	#	<9	#				
sec-Butylbenzene	<10 µg/kg	TM116	<10	M	<10	M				
4-Isopropyltoluene	<10 µg/kg	TM116	<10	M	<10	M				
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8	M	<8	M				
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5	M	<5	M				
n-Butylbenzene	<11 µg/kg	TM116	<11		<11					
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10	M	<10	M				
1,2-Dibromo-3-chloroprop ane	<14 µg/kg	TM116	<14	M	<14	M				
Tert-amyl methyl ether	<10 µg/kg	TM116	<10	#	<10	#				
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20		<20					
Hexachlorobutadiene	<20 µg/kg	TM116	<20		<20					
Naphthalene	<13 µg/kg	TM116	<13	M	<13	M				

CERTIFICATE OF ANALYSIS

Validated

SDG: 160727-104 Location: Total Fitness Tank Order Number: 1778/erw
 Job: H_GRSOLVE_BRE-187 Customer: Ground Solve Report Number: 373646
 Client Reference: 1778 Attention: Elgan Williams Superseded Report: 372234

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TANK 0.30 - 0.40 SOLID 27/07/2016 00:00:00 29/07/2016 08:38:48 160727-104 13858032 TM048	05/08/16	Tomasz Pawlikowski	Loose fibres in soil.	Not Detected (#)	Trace (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TANK 0.70 - 0.80 SOLID 27/07/2016 00:00:00 29/07/2016 08:26:05 160727-104 13858031 TM048	05/08/16	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

Validated

SDG: 160727-104
Job: H_GRSOLVE_BRE-187
Client Reference: 1778

Location: Total Fitness Tank
Customer: Ground Solve
Attention: Elgan Williams

Order Number: 1778/erw
Report Number: 373646
Superseded Report: 372234

Asbestos Quantification - Full

		Additional Asbestos Components (Using TM048)	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM Evaluation - %	Asbestos Quantification - Total - %
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TANK 0.30 - 0.40 SOLID 27/07/2016 00:00:00 11/08/2016 10:42:10 160727-104 13858032 TM 304	None (#)	N/C	<0.001 (#)	<0.001 (#)	<0.001 (#)

CERTIFICATE OF ANALYSIS

Validated

SDG:	160727-104	Location:	Total Fitness Tank	Order Number:	1778/erw
Job:	H_GRSOLVE_BRE-187	Customer:	Ground Solve	Report Number:	373646
Client Reference:	1778	Attention:	Elgan Williams	Superseded Report:	372234

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
ASB_PREP				
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
TM 304				
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990; BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM136	Method 17.10, Second Site property, March 2003	Determination of Sulphur by HPLC		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser		
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM218	Microwave extraction – EPA method 3546	Microwave extraction - EPA method 3546		
TM243		Mixed Anions In Soils By Kone		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

Validated

SDG: 160727-104
Job: H_GRSOLVE_BRE-187
Client Reference: 1778

Location: Total Fitness Tank
Customer: Ground Solve
Attention: Elgan Williams

Order Number: 1778/erw
Report Number: 373646
Superseded Report: 372234

Test Completion Dates

Lab Sample No(s)	13858031	13858032
Customer Sample Ref.	TANK	TANK
AGS Ref.		
Depth	0.70 - 0.80	0.30 - 0.40
Type	SOLID	SOLID
Anions by Kone (soil)	02-Aug-2016	02-Aug-2016
Asbestos ID in Solid Samples	05-Aug-2016	05-Aug-2016
Asbestos Quantification - Full		16-Aug-2016
Chromium III	03-Aug-2016	03-Aug-2016
Cyanide Comp/Free/Total/Thiocyanate	04-Aug-2016	04-Aug-2016
Easily Liberated Sulphide	04-Aug-2016	04-Aug-2016
Elemental Sulphur	03-Aug-2016	03-Aug-2016
EPH CWG (Aliphatic) GC (S)	03-Aug-2016	03-Aug-2016
EPH CWG (Aromatic) GC (S)	03-Aug-2016	04-Aug-2016
GRO by GC-FID (S)	05-Aug-2016	05-Aug-2016
Hexavalent Chromium (s)	03-Aug-2016	03-Aug-2016
Metals in solid samples by OES	02-Aug-2016	02-Aug-2016
PAH by GCMS	02-Aug-2016	02-Aug-2016
pH	05-Aug-2016	05-Aug-2016
Phenols by HPLC (S)	04-Aug-2016	04-Aug-2016
Sample description	29-Jul-2016	29-Jul-2016
Semi Volatile Organic Compounds	03-Aug-2016	03-Aug-2016
Total Organic Carbon	05-Aug-2016	05-Aug-2016
TPH CWG GC (S)	05-Aug-2016	05-Aug-2016
VOC MS (S)	05-Aug-2016	05-Aug-2016

SDG: 160727-104
Job: H_GRSOLVE_BRE-187
Client Reference: 1778

Location: Total Fitness Tank
Customer: Ground Solve
Attention: Elgan Williams

Order Number: 1778/erw
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Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

22. 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 material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
6	Sampled on date not provided
*	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than:
- Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.