



# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16719032	WS202	ES	0.00 - 0.10	05/12/2017
16719037	WS202	ES	0.70 - 1.00	05/12/2017
16719044	WS202	ES	2.10 - 2.30	05/12/2017
16719054	WS202	ES	2.70 - 2.90	05/12/2017
16718906	WS202	ES	3.50 - 3.70	05/12/2017
16718901	WS203	ES	0.00 - 0.20	05/12/2017
16718981	WS203	ES	1.00 - 1.30	05/12/2017
16719014	WS203	ES	2.10 - 2.30	05/12/2017
16719021	WS203	ES	2.50 - 2.80	05/12/2017
16719027	WS203	ES	3.90 - 4.10	05/12/2017
16718915	WS205	ES	0.00 - 0.20	05/12/2017
16718922	WS205	ES	0.70 - 1.00	05/12/2017
16718930	WS205	ES	2.10 - 2.30	05/12/2017
16718937	WS205	ES	3.50 - 3.70	05/12/2017
16718943	WS205	ES	3.70 - 4.00	05/12/2017
16718949	WS207	ES	0.00 - 0.20	05/12/2017
16719003	WS207	ES	0.40 - 0.60	05/12/2017
16718957	WS207	ES	1.10 - 1.30	05/12/2017
16718963	WS207	ES	2.00 - 2.20	05/12/2017
16718971	WS207	ES	2.60 - 2.80	05/12/2017
16718990	WS207	ES	3.00 - 3.20	05/12/2017
16719009	WS207	ES	3.60 - 3.80	05/12/2017
16718997	WS207	ES	4.10 - 4.30	05/12/2017

Maximum Sample/Coolbox Temperature (°C) : 10.2

**ISO5667-3 Water quality - Sampling - Part3 -**

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

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



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Results Legend			Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
<p><b>X</b> Test</p> <p><b>N</b> No Determination Possible</p> <p>Sample Types -</p> <p>S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</p>			16719032	16719032	WS202	WS202	ES	ES	0.00 - 0.10	250g Amber Jar (ALE210)	S	S		
			16719037	16719037	WS202	WS202	ES	ES	0.70 - 1.00	250g Amber Jar (ALE210)	S	S		
			16718981	16718981	WS203	WS203	ES	ES	1.00 - 1.30	400g Tub (ALE215)	S	S		
			16719014	16719014	WS203	WS203	ES	ES	2.10 - 2.30	250g Amber Jar (ALE210)	S	S		
			16718922	16718922	WS205	WS205	ES	ES	0.70 - 1.00	60g VOC (ALE215)	S	S		
			16718930	16718930	WS205	WS205	ES	ES	2.10 - 2.30	400g Tub (ALE215)	S	S		
			16718937	16718937	WS205	WS205	ES	ES	3.50 - 3.70	250g Amber Jar (ALE210)	S	S		
			16718949	16718949	WS207	WS207	ES	ES	0.00 - 0.20	400g Tub (ALE214)	S	S		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 8		X		X		X		X		X		X
Boron Water Soluble	All	NDPs: 0 Tests: 8	X	X		X		X		X		X		X
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 8		X		X		X		X		X		X
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 8		X		X		X		X		X		X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 8				X		X		X		X		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 8	X	X		X		X		X		X		X
Metals in solid samples by OES	All	NDPs: 0 Tests: 8	X	X		X		X		X		X		X
PAH by GCMS	All	NDPs: 0 Tests: 8		X		X		X		X		X		X
pH	All	NDPs: 0 Tests: 8		X		X		X		X		X		X
Sample description	All	NDPs: 0 Tests: 10	X	X		X		X		X		X		X
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 2				X				X				
Total Organic Carbon	All	NDPs: 0 Tests: 10	X	X		X		X		X		X		X
TPH CWG GC (S)	All	NDPs: 0 Tests: 8		X		X		X		X		X		X
VOC MS (S)	All	NDPs: 0 Tests: 8				X		X		X		X		X



16718957	WS207	ES	1.10 - 1.30	60g VOC (ALE215)	S																	
				400g Tub (ALE214)		250g Amber Jar (ALE210)	60g VOC (ALE215)	400g Tub (ALE214)	250g Amber Jar (ALE210)													
16719003	WS207	ES	0.40 - 0.60	60g VOC (ALE215)	S																	
				400g Tub (ALE214)	S	X																
				250g Amber Jar (ALE210)	S		X															
				60g VOC (ALE215)	S			X														
				400g Tub (ALE214)	S	X																
				250g Amber Jar (ALE210)	S				X													
										X												
						X																
							X															
						X																
								X														
						X																
									X													
						X																
										X												
											X											
												X										
													X									



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Superseded Report:

## 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	Inclusions	Inclusions 2
16719032	WS202	0.00 - 0.10	Dark Brown	Sandy Clay	Vegetation	Stones
16719037	WS202	0.70 - 1.00	Dark Brown	Sandy Clay	Fibres	Vegetation
16718981	WS203	1.00 - 1.30	Dark Brown	Clay	Fibres	N/A
16719014	WS203	2.10 - 2.30	Dark Brown	Sandy Loam	Stones	None
16718922	WS205	0.70 - 1.00	Dark Brown	Sandy Clay	Crushed Brick	N/A
16718930	WS205	2.10 - 2.30	Dark Brown	Sandy Clay	Stones	None
16718937	WS205	3.50 - 3.70	Dark Brown	Sandy Loam	Vegetation	Stones
16718949	WS207	0.00 - 0.20	Dark Brown	Sandy Loam	Stones	None
16718957	WS207	1.10 - 1.30	Light Brown	Sandy Clay	Stones	None
16719003	WS207	0.40 - 0.60	Light Brown	Loamy Sand	Stones	None

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.



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Results Legend			Customer Sample Ref.		WS202	WS202	WS203	WS203	WS205	WS205
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.10	0.70 - 1.00	1.00 - 1.30	2.10 - 2.30	0.70 - 1.00	2.10 - 2.30	
M	mCERTS accredited.			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
aq	Aqueous / settled sample.			05/12/2017	05/12/2017	05/12/2017	05/12/2017	05/12/2017	05/12/2017	
diss.filt	Dissolved / filtered sample.			.	.	.	.	.	.	
tot.unfilt	Total / unfiltered sample.			08/12/2017	08/12/2017	08/12/2017	08/12/2017	08/12/2017	08/12/2017	
-	Subcontracted test.			171208-120	171208-120	171208-120	171208-120	171208-120	171208-120	
**	% 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			16719032	16719037	16718981	16719014	16718922	16718930	
(F)	Trigger breach confirmed			ES	ES	ES	ES	ES	ES	
1-5&*\$@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
Moisture Content Ratio (% of as received sample)	%	PM024	14	15	19	18	18	15		
Soil Organic Matter (SOM)	<0.35 %	TM132	3.62	<0.35	0.367	<0.35	2.38	<0.35		
pH	1 pH Units	TM133	#	8.12	7.54	7.18	8.48	9.49		
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6	<0.6		<0.6	<0.6		
Arsenic	<0.6 mg/kg	TM181	16.5	52.6	81.3		24.6	18.7		
Barium	<0.6 mg/kg	TM181	41.8	83.8	76.8		48.3	54.1		
Beryllium	<0.01 mg/kg	TM181	0.533	2.5	1.88		1.63	1.45		
Cadmium	<0.02 mg/kg	TM181	0.0373	0.64	0.347		0.452	<0.02		
Chromium	<0.9 mg/kg	TM181	26.2	42.1	86.2		34.6	23.7		
Copper	<1.4 mg/kg	TM181	12.1	23.5	15.7		22.5	16.5		
Lead	<0.7 mg/kg	TM181	16.6	29.4	22.7		37.3	16.2		
Mercury	<0.14 mg/kg	TM181	<0.14	<1.4	<0.14		<1.4	0.922		
Nickel	<0.2 mg/kg	TM181	15.7	56.2	64.3		39.4	30		
Selenium	<1 mg/kg	TM181	<1	<10	<10		<10	<1		
Vanadium	<0.2 mg/kg	TM181	32.1	113	135		76.2	67.7		
Zinc	<1.9 mg/kg	TM181	143	121	117		99	84.6		
Boron, water soluble	<1 mg/kg	TM222	<1	<1	<1		<1	<1		



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Results Legend		Customer Sample Ref.	WS205	WS207	WS207	WS207		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		3.50 - 3.70	0.00 - 0.20	0.40 - 0.60	1.10 - 1.30		
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
diss.filt	Dissolved / filtered sample.		05/12/2017	05/12/2017	05/12/2017	05/12/2017		
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		08/12/2017	08/12/2017	08/12/2017	08/12/2017		
(F)	Trigger breach confirmed		171208-120	171208-120	171208-120	171208-120		
1-5&*\$@	Sample deviation (see appendix)		16718937	16718949	16719003	16718957		
			ES	ES	ES	ES		
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	16	8.9	11	15		
Soil Organic Matter (SOM)	<0.35 %	TM132	0.44	1.26	<0.35	<0.35		
pH	1 pH Units	TM133	7.56		8.11	8.14		
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6	<0.6	<0.6		
Arsenic	<0.6 mg/kg	TM181		9.84	21.9	14.5		
Barium	<0.6 mg/kg	TM181		38.5	38	69.1		
Beryllium	<0.01 mg/kg	TM181		0.783	1.39	1.31		
Cadmium	<0.02 mg/kg	TM181		0.0389	0.538	<0.02		
Chromium	<0.9 mg/kg	TM181		2.02	16.1	31.2		
Copper	<1.4 mg/kg	TM181		21.6	<14	15.8		
Lead	<0.7 mg/kg	TM181		12.7	13.6	14.1		
Mercury	<0.14 mg/kg	TM181		0.623	<1.4	0.746		
Nickel	<0.2 mg/kg	TM181		9.48	28	35.5		
Selenium	<1 mg/kg	TM181		<1	<10	<1		
Vanadium	<0.2 mg/kg	TM181		45.7	54	62.7		
Zinc	<1.9 mg/kg	TM181		84.4	66.4	81.3		
Boron, water soluble	<1 mg/kg	TM222		<1	<1	<1		



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## PAH by GCMS

Results Legend			Customer Sample Ref.	WS202	WS203	WS203	WS205	WS205	WS205
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.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&*\$@	Sample deviation (see appendix)								
Component	LOD/Units	Method	Depth (m)	0.70 - 1.00	1.00 - 1.30	2.10 - 2.30	0.70 - 1.00	2.10 - 2.30	3.50 - 3.70
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/12/2017	05/12/2017	05/12/2017	05/12/2017	05/12/2017	05/12/2017
			Sampled Time						
			Date Received	08/12/2017	08/12/2017	08/12/2017	08/12/2017	08/12/2017	08/12/2017
			SDG Ref	171208-120	171208-120	171208-120	171208-120	171208-120	171208-120
			Lab Sample No.(s)	16719037	16718981	16719014	16718922	16718930	16718937
			AGS Reference	ES	ES	ES	ES	ES	ES
Naphthalene-d8 % recovery**	%	TM218		92.2	100	100	99.2	106	98.8
Acenaphthene-d10 % recovery**	%	TM218		86.7	98	93.9	100	101	90.7
Phenanthrene-d10 % recovery**	%	TM218		86.2	95.9	92.4	94	101	88.7
Chrysene-d12 % recovery**	%	TM218		84.7	98.7	86.5	91.4	96	80.6
Perylene-d12 % recovery**	%	TM218		84.8	102	90.7	98.7	99.3	80.1
Naphthalene	<0.009 mg/kg	TM218		<0.009 M	<0.009 M	<0.009 M	<0.009 M	<0.009 M	<0.009 M
Acenaphthylene	<0.012 mg/kg	TM218		<0.012 M	<0.012 M	<0.012 M	<0.012 M	<0.012 M	<0.012 M
Acenaphthene	<0.008 mg/kg	TM218		<0.008 M	<0.008 M	<0.008 M	<0.008 M	<0.008 M	<0.008 M
Fluorene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M
Phenanthrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	<0.015 M	0.0274 M	<0.015 M	<0.015 M
Anthracene	<0.016 mg/kg	TM218		<0.016 M	<0.016 M	<0.016 M	<0.016 M	<0.016 M	<0.016 M
Fluoranthene	<0.017 mg/kg	TM218		<0.017 M	<0.017 M	<0.017 M	0.0659 M	<0.017 M	<0.017 M
Pyrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	<0.015 M	0.0606 M	<0.015 M	<0.015 M
Benz(a)anthracene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M	<0.014 M	0.0768 M	<0.014 M	<0.014 M
Chrysene	<0.01 mg/kg	TM218		<0.01 M	<0.01 M	<0.01 M	0.0446 M	<0.01 M	<0.01 M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	<0.015 M	0.0761 M	<0.015 M	<0.015 M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218		<0.014 M	<0.014 M	<0.014 M	0.0409 M	<0.014 M	<0.014 M
Benzo(a)pyrene	<0.015 mg/kg	TM218		<0.015 M	<0.015 M	<0.015 M	0.057 M	<0.015 M	<0.015 M
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218		<0.018 M	<0.018 M	<0.018 M	0.0451 M	<0.018 M	<0.018 M
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218		<0.023 M	<0.023 M	<0.023 M	<0.023 M	<0.023 M	<0.023 M
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218		<0.024 M	<0.024 M	<0.024 M	0.0635 M	<0.024 M	<0.024 M
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218		<0.118	<0.118	<0.118	0.558	<0.118	<0.118



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## PAH by GCMS

Results Legend		Customer Sample Ref.	WS207	WS207			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference					
M	mCERTS accredited.		0.40 - 0.60	1.10 - 1.30			
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)			
diss.filt	Dissolved / filtered sample.		05/12/2017	05/12/2017			
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		08/12/2017	08/12/2017			
(F)	Trigger breach confirmed		171208-120	171208-120			
1-5&*\$@	Sample deviation (see appendix)		16719003	16718957			
			ES	ES			
Component	LOD/Units	Method					
Naphthalene-d8 % recovery**	%	TM218	93.2	95.4			
Acenaphthene-d10 % recovery**	%	TM218	89.3	92.3			
Phenanthrene-d10 % recovery**	%	TM218	88	89.7			
Chrysene-d12 % recovery**	%	TM218	87.8	89.6			
Perylene-d12 % recovery**	%	TM218	90.1	92.2			
Naphthalene	<0.009 mg/kg	TM218	<0.009	<0.009	M	M	
Acenaphthylene	<0.012 mg/kg	TM218	<0.012	<0.012	M	M	
Acenaphthene	<0.008 mg/kg	TM218	<0.008	<0.008	M	M	
Fluorene	<0.01 mg/kg	TM218	<0.01	<0.01	M	M	
Phenanthrene	<0.015 mg/kg	TM218	<0.015	<0.015	M	M	
Anthracene	<0.016 mg/kg	TM218	<0.016	<0.016	M	M	
Fluoranthene	<0.017 mg/kg	TM218	<0.017	<0.017	M	M	
Pyrene	<0.015 mg/kg	TM218	<0.015	<0.015	M	M	
Benz(a)anthracene	<0.014 mg/kg	TM218	<0.014	<0.014	M	M	
Chrysene	<0.01 mg/kg	TM218	<0.01	<0.01	M	M	
Benzo(b)fluoranthene	<0.015 mg/kg	TM218	<0.015	<0.015	M	M	
Benzo(k)fluoranthene	<0.014 mg/kg	TM218	<0.014	<0.014	M	M	
Benzo(a)pyrene	<0.015 mg/kg	TM218	<0.015	<0.015	M	M	
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218	<0.018	<0.018	M	M	
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218	<0.023	<0.023	M	M	
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218	<0.024	<0.024	M	M	
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218	<0.118	<0.118			



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## Semi Volatile Organic Compounds

Results Legend		Customer Sample Ref.	WS203	WS205			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference					
M	mCERTS accredited.		1.00 - 1.30	2.10 - 2.30			
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)			
diss.filt	Dissolved / filtered sample.		05/12/2017	05/12/2017			
tot.unfilt	Total / unfiltered sample.		.	.			
*	Subcontracted test.		08/12/2017	08/12/2017			
**	% 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		171208-120	171208-120			
(F)	Trigger breach confirmed		16718981	16718930			
1-5&*\$@	Sample deviation (see appendix)		ES	ES			
Component	LOD/Units		Method				
Phenol	<0.1 mg/kg	TM157	<0.1	<0.1			
Pentachlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1			
n-Nitroso-n-dipropylamine	<0.1 mg/kg	TM157	<0.1	<0.1			
Nitrobenzene	<0.1 mg/kg	TM157	<0.1	<0.1			
Isophorone	<0.1 mg/kg	TM157	<0.1	<0.1			
Hexachloroethane	<0.1 mg/kg	TM157	<0.1	<0.1			
Hexachlorocyclopentadiene	<0.1 mg/kg	TM157	<0.1	<0.1			
Hexachlorobutadiene	<0.1 mg/kg	TM157	<0.1	<0.1			
Hexachlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1			
n-Dioctyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1			
Dimethyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1			
Diethyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1			
n-Dibutyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1			
Dibenzofuran	<0.1 mg/kg	TM157	<0.1	<0.1			
Carbazole	<0.1 mg/kg	TM157	<0.1	<0.1			
Butylbenzyl phthalate	<0.1 mg/kg	TM157	<0.1	<0.1			
bis(2-Ethylhexyl) phthalate	<0.1 mg/kg	TM157	<0.1	<0.1			
bis(2-Chloroethoxy)methane	<0.1 mg/kg	TM157	<0.1	<0.1			
bis(2-Chloroethyl)ether	<0.1 mg/kg	TM157	<0.1	<0.1			
Azobenzene	<0.1 mg/kg	TM157	<0.1	<0.1			
4-Nitrophenol	<0.1 mg/kg	TM157	<0.1	<0.1			
4-Nitroaniline	<0.1 mg/kg	TM157	<0.1	<0.1			
4-Methylphenol	<0.1 mg/kg	TM157	<0.1	<0.1			
4-Chlorophenylphenylether	<0.1 mg/kg	TM157	<0.1	<0.1			
4-Chloroaniline	<0.1 mg/kg	TM157	<0.1	<0.1			
4-Chloro-3-methylphenol	<0.1 mg/kg	TM157	<0.1	<0.1			
4-Bromophenylphenylether	<0.1 mg/kg	TM157	<0.1	<0.1			
3-Nitroaniline	<0.1 mg/kg	TM157	<0.1	<0.1			
2-Nitrophenol	<0.1 mg/kg	TM157	<0.1	<0.1			
2-Nitroaniline	<0.1 mg/kg	TM157	<0.1	<0.1			
2-Methylphenol	<0.1 mg/kg	TM157	<0.1	<0.1			
1,2,4-Trichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1			



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 171208-120  
**Location:** Kraft, Banbury

**Client Reference:** 70041591  
**Order Number:** 70041591-SO1

**Report Number:** 437139  
**Superseded Report:**

## Semi Volatile Organic Compounds

Results Legend		Customer Sample Ref.	WS203	WS205			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference					
M	mCERTS accredited.		1.00 - 1.30	2.10 - 2.30			
aq	Aqueous / settled sample.		Soil/Solid (S)	Soil/Solid (S)			
diss.filt	Dissolved / filtered sample.		05/12/2017	05/12/2017			
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		08/12/2017	08/12/2017			
(F)	Trigger breach confirmed		171208-120	171208-120			
1-5&*\$@	Sample deviation (see appendix)		16718981	16718930			
			ES	ES			
Component	LOD/Units	Method					
2-Chlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1			
2,6-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1	<0.1			
2,4-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1	<0.1			
2,4-Dimethylphenol	<0.1 mg/kg	TM157	<0.1	<0.1			
2,4-Dichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1			
2,4,6-Trichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1			
2,4,5-Trichlorophenol	<0.1 mg/kg	TM157	<0.1	<0.1			
1,4-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1			
1,3-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1			
1,2-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1	<0.1			
2-Chloronaphthalene	<0.1 mg/kg	TM157	<0.1	<0.1			
2-Methylnaphthalene	<0.1 mg/kg	TM157	<0.1	<0.1			
Acenaphthylene	<0.1 mg/kg	TM157	<0.1	<0.1			
Acenaphthene	<0.1 mg/kg	TM157	<0.1	<0.1			
Anthracene	<0.1 mg/kg	TM157	<0.1	<0.1			
Benzo(a)anthracene	<0.1 mg/kg	TM157	<0.1	<0.1			
Benzo(b)fluoranthene	<0.1 mg/kg	TM157	<0.1	<0.1			
Benzo(k)fluoranthene	<0.1 mg/kg	TM157	<0.1	<0.1			
Benzo(a)pyrene	<0.1 mg/kg	TM157	<0.1	<0.1			
Benzo(g,h,i)perylene	<0.1 mg/kg	TM157	<0.1	<0.1			
Chrysene	<0.1 mg/kg	TM157	<0.1	<0.1			
Fluoranthene	<0.1 mg/kg	TM157	<0.1	<0.1			
Fluorene	<0.1 mg/kg	TM157	<0.1	<0.1			
Indeno(1,2,3-cd)pyrene	<0.1 mg/kg	TM157	<0.1	<0.1			
Phenanthrene	<0.1 mg/kg	TM157	<0.1	<0.1			
Pyrene	<0.1 mg/kg	TM157	<0.1	<0.1			
Naphthalene	<0.1 mg/kg	TM157	<0.1	<0.1			
Dibenzo(a,h)anthracene	<0.1 mg/kg	TM157	<0.1	<0.1			
Bis(2-chloroisopropyl) ether	<0.1 mg/kg	TM157	<0.1	<0.1			





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## TPH CWG (S)

Results Legend			Customer Sample Ref.	WS202	WS203	WS203	WS205	WS205	WS205
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.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&*\$@	Sample deviation (see appendix)								
Component	LOD/Units	Method	Depth (m)	0.70 - 1.00	1.00 - 1.30	2.10 - 2.30	0.70 - 1.00	2.10 - 2.30	3.50 - 3.70
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/12/2017	05/12/2017	05/12/2017	05/12/2017	05/12/2017	05/12/2017
			Sampled Time						
			Date Received	08/12/2017	08/12/2017	08/12/2017	08/12/2017	08/12/2017	08/12/2017
			SDG Ref	171208-120	171208-120	171208-120	171208-120	171208-120	171208-120
			Lab Sample No.(s)	16719037	16718981	16719014	16718922	16718930	16718937
			AGS Reference	ES	ES	ES	ES	ES	ES
GRO Surrogate % recovery**	%	TM089		119	107	121	123	119	126
GRO TOT (Moisture Corrected)	<0.044 mg/kg	TM089		<0.044	6.47	<0.044	<0.044	<0.044	<0.044
Aliphatics >C5-C6	<0.01 mg/kg	TM089		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C6-C8	<0.01 mg/kg	TM089		<0.01	0.0394	<0.01	<0.01	<0.01	<0.01
Aliphatics >C8-C10	<0.01 mg/kg	TM089		<0.01	0.82	0.0146	<0.01	<0.01	<0.01
Aliphatics >C10-C12	<0.01 mg/kg	TM089		<0.01	3.02	0.0159	<0.01	<0.01	<0.01
Aliphatics >C12-C16	<0.1 mg/kg	TM173		<0.1	35.9	<0.1	<0.1	2.71	<0.1
Aliphatics >C16-C21	<0.1 mg/kg	TM173		0.85	48.5	<0.1	<0.1	5.97	<0.1
Aliphatics >C21-C35	<0.1 mg/kg	TM173		0.977	27.2	<0.1	8.9	4.84	<0.1
Aliphatics >C35-C44	<0.1 mg/kg	TM173		<0.1	0.925	2.61	1.99	<0.1	<0.1
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173		1.83	112	2.61	10.9	13.5	<0.1
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	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	<0.01 mg/kg	TM089		<0.01	0.569	<0.01	<0.01	<0.01	<0.01
Aromatics >EC10-EC12	<0.01 mg/kg	TM089		<0.01	2.01	0.011	<0.01	<0.01	<0.01
Aromatics >EC12-EC16	<0.1 mg/kg	TM173		<0.1	10.9	<0.1	<0.1	1.34	<0.1
Aromatics >EC16-EC21	<0.1 mg/kg	TM173		<0.1	18.2	<0.1	<0.1	1.97	<0.1
Aromatics >EC21-EC35	<0.1 mg/kg	TM173		<0.1	8.24	<0.1	8.3	2.7	0.923
Aromatics >EC35-EC44	<0.1 mg/kg	TM173		<0.1	<0.1	4.97	5.04	<0.1	<0.1
Aromatics >EC40-EC44	<0.1 mg/kg	TM173		<0.1	<0.1	3.18	1.85	<0.1	<0.1
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173		<0.1	37.4	4.97	13.3	6	0.923
Total Aliphatics & Aromatics >C5-C44	<0.1 mg/kg	TM173		1.83	156	7.63	24.2	19.5	0.923
Aromatics >EC16-EC35	<0.1 mg/kg	TM173		<0.1	26.5	<0.1	8.3	4.67	0.923



CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120
Location: Kraft, Banbury

Client Reference: 70041591
Order Number: 70041591-SO1

Report Number: 437139
Superseded Report:

TPH CWG (S)

Table with columns: Component, LOD/Units, Method, WS207 (0.40-0.60), WS207 (1.10-1.30). Rows include GRO Surrogate % recovery, GRO TOT, Aliphatics >C5-C6, Aromatics >EC5-EC7, etc.



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 171208-120  
**Location:** Kraft, Banbury

**Client Reference:** 70041591  
**Order Number:** 70041591-SO1

**Report Number:** 437139  
**Superseded Report:**

## VOC MS (S)

Results Legend			Customer Sample Ref.	WS202	WS203	WS203	WS205	WS205	WS205
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.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&*\$@	Sample deviation (see appendix)								
Component	LOD/Units	Method	Depth (m)	0.70 - 1.00	1.00 - 1.30	2.10 - 2.30	0.70 - 1.00	2.10 - 2.30	3.50 - 3.70
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	05/12/2017	05/12/2017	05/12/2017	05/12/2017	05/12/2017	05/12/2017
			Sampled Time						
			Date Received	08/12/2017	08/12/2017	08/12/2017	08/12/2017	08/12/2017	08/12/2017
			SDG Ref	171208-120	171208-120	171208-120	171208-120	171208-120	171208-120
			Lab Sample No.(s)	16719037	16718991	16719014	16718922	16718930	16718937
			AGS Reference	ES	ES	ES	ES	ES	ES
Dibromofluoromethane**	%	TM116			104			106	
Toluene-d8**	%	TM116			94.2			96.5	
4-Bromofluorobenzene**	%	TM116			94.7			95.7	
Dichlorodifluoromethane	<0.006 mg/kg	TM116			<0.06			<0.06	
Chloromethane	<0.007 mg/kg	TM116			<0.07			<0.07	
Vinyl Chloride	<0.006 mg/kg	TM116			<0.06			<0.06	
Bromomethane	<0.01 mg/kg	TM116			<0.1			<0.1	
Chloroethane	<0.01 mg/kg	TM116			<0.1			<0.1	
Trichlorofluoromethane	<0.006 mg/kg	TM116			<0.06			<0.06	
1,1-Dichloroethene	<0.01 mg/kg	TM116			<0.1			<0.1	
Carbon Disulphide	<0.007 mg/kg	TM116			<0.07			<0.07	
Dichloromethane	<0.01 mg/kg	TM116			<0.1			<0.1	
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-1,2-Dichloroethene	<0.01 mg/kg	TM116			<0.1			<0.1	
1,1-Dichloroethane	<0.008 mg/kg	TM116			<0.08			<0.08	
cis-1,2-Dichloroethene	<0.006 mg/kg	TM116			<0.06			<0.06	
2,2-Dichloropropane	<0.01 mg/kg	TM116			<0.1			<0.1	
Bromochloromethane	<0.01 mg/kg	TM116			<0.1			<0.1	
Chloroform	<0.008 mg/kg	TM116			<0.08			<0.08	
1,1,1-Trichloroethane	<0.007 mg/kg	TM116			<0.07			<0.07	
1,1-Dichloropropene	<0.01 mg/kg	TM116			<0.1			<0.1	
Carbontetrachloride	<0.01 mg/kg	TM116			<0.1			<0.1	
1,2-Dichloroethane	<0.005 mg/kg	TM116			<0.05			<0.05	
Benzene	<0.009 mg/kg	TM116		<0.09	<0.09	<0.09	<0.09	<0.09	<0.09
Trichloroethene	<0.009 mg/kg	TM116			<0.09			<0.09	
1,2-Dichloropropane	<0.01 mg/kg	TM116			<0.1			<0.1	
Dibromomethane	<0.009 mg/kg	TM116			<0.09			<0.09	
Bromodichloromethane	<0.007 mg/kg	TM116			<0.07			<0.07	
cis-1,3-Dichloropropene	<0.01 mg/kg	TM116			<0.1			<0.1	
Toluene	<0.007 mg/kg	TM116		<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
trans-1,3-Dichloropropene	<0.01 mg/kg	TM116			<0.1			<0.1	
1,1,2-Trichloroethane	<0.01 mg/kg	TM116			<0.1			<0.1	



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 171208-120  
**Location:** Kraft, Banbury

**Client Reference:** 70041591  
**Order Number:** 70041591-SO1

**Report Number:** 437139  
**Superseded Report:**

## VOC MS (S)

Results Legend			Customer Sample Ref.	WS202	WS203	WS203	WS205	WS205	WS205
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.70 - 1.00	1.00 - 1.30	2.10 - 2.30	0.70 - 1.00	2.10 - 2.30	3.50 - 3.70
M	mCERTS accredited.			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq	Aqueous / settled sample.			05/12/2017	05/12/2017	05/12/2017	05/12/2017	05/12/2017	05/12/2017
diss.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&*\$@	Sample deviation (see appendix)								
Component	LOD/Units	Method							
1,3-Dichloropropane	<0.007 mg/kg	TM116							
Tetrachloroethene	<0.005 mg/kg	TM116							
Dibromochloromethane	<0.01 mg/kg	TM116							
1,2-Dibromoethane	<0.01 mg/kg	TM116							
Chlorobenzene	<0.005 mg/kg	TM116							
1,1,1,2-Tetrachloroethane	<0.01 mg/kg	TM116							
Ethylbenzene	<0.004 mg/kg	TM116	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M	<0.04 M
p/m-Xylene	<0.01 mg/kg	TM116	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
o-Xylene	<0.01 mg/kg	TM116	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M
Styrene	<0.01 mg/kg	TM116							
Bromoform	<0.01 mg/kg	TM116							
Isopropylbenzene	<0.005 mg/kg	TM116							
1,1,2,2-Tetrachloroethane	<0.01 mg/kg	TM116							
1,2,3-Trichloropropane	<0.016 mg/kg	TM116							
Bromobenzene	<0.01 mg/kg	TM116							
Propylbenzene	<0.01 mg/kg	TM116							
2-Chlorotoluene	<0.009 mg/kg	TM116							
1,3,5-Trimethylbenzene	<0.008 mg/kg	TM116							
4-Chlorotoluene	<0.01 mg/kg	TM116							
tert-Butylbenzene	<0.014 mg/kg	TM116							
1,2,4-Trimethylbenzene	<0.009 mg/kg	TM116							
sec-Butylbenzene	<0.01 mg/kg	TM116							
4-Isopropyltoluene	<0.01 mg/kg	TM116							
1,3-Dichlorobenzene	<0.008 mg/kg	TM116							
1,4-Dichlorobenzene	<0.005 mg/kg	TM116							
n-Butylbenzene	<0.011 mg/kg	TM116							
1,2-Dichlorobenzene	<0.01 mg/kg	TM116							
1,2-Dibromo-3-chloropropane	<0.014 mg/kg	TM116							
Tert-amyl methyl ether	<0.01 mg/kg	TM116	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
1,2,4-Trichlorobenzene	<0.02 mg/kg	TM116							
Hexachlorobutadiene	<0.02 mg/kg	TM116							
Naphthalene	<0.013 mg/kg	TM116							





CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120 Client Reference: 70041591 Report Number: 437139  
Location: Kraft, Banbury Order Number: 70041591-SO1 Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	WS207	WS207			
#	ISO17025 accredited.	171208-120	0.40 - 0.60	1.10 - 1.30			
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.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&*\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116	<0.1 M	<0.1 M			
Benzene	<0.009 mg/kg	TM116	<0.09 M	<0.09 M			
Toluene	<0.007 mg/kg	TM116	<0.07 M	<0.07 M			
Ethylbenzene	<0.004 mg/kg	TM116	<0.04 M	<0.04 M			
p/m-Xylene	<0.01 mg/kg	TM116	<0.1 #	<0.1 #			
o-Xylene	<0.01 mg/kg	TM116	<0.1 M	<0.1 M			
Tert-amyl methyl ether	<0.01 mg/kg	TM116	<0.1 #	<0.1 #			



# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b>	171208-120	<b>Client Reference:</b>	70041591	<b>Report Number:</b>	437139
<b>Location:</b>	Kraft, Banbury	<b>Order Number:</b>	70041591-SO1	<b>Superseded Report:</b>	

## Asbestos Identification - Soil

		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	WS202 ES 0.00 - 0.10 SOLID 05/12/2017 00:00:00 09/12/2017 09:07:21 171208-120 16719032 TM048	15/12/2017	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	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	WS202 ES 0.70 - 1.00 SOLID 05/12/2017 00:00:00 09/12/2017 10:23:35 171208-120 16719037 TM048	15/12/2017	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	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	WS203 ES 1.00 - 1.30 SOLID 05/12/2017 00:00:00 09/12/2017 10:47:55 171208-120 16718981 TM048	15/12/2017	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	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	WS205 ES 0.70 - 1.00 SOLID 05/12/2017 00:00:00 09/12/2017 10:21:32 171208-120 16718922 TM048	15/12/2017	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	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	WS205 ES 2.10 - 2.30 SOLID 05/12/2017 00:00:00 09/12/2017 09:08:42 171208-120 16718930 TM048	15/12/2017	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



**CERTIFICATE OF ANALYSIS**

Validated

**SDG:** 171208-120      **Client Reference:** 70041591      **Report Number:** 437139  
**Location:** Kraft, Banbury      **Order Number:** 70041591-SO1      **Superseded Report:**

		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	WS207 ES 0.00 - 0.20 SOLID 05/12/2017 00:00:00 09/12/2017 09:25:32 171208-120 16718949 TM048	15/12/2017	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS207 ES 0.40 - 0.60 SOLID 05/12/2017 00:00:00 09/12/2017 09:23:57 171208-120 16719003 TM048	15/12/2017	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	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	WS207 ES 1.10 - 1.30 SOLID 05/12/2017 00:00:00 09/12/2017 09:26:41 171208-120 16718957 TM048	15/12/2017	Barbara Urbanek-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Table of Results - Appendix

Method No	Reference	Description
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
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
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone 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
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Determination of PAH by GCMS Microwave extraction	The determination of PAH in soil samples by microwave extraction and GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Test Completion Dates

Lab Sample No(s)  
Customer Sample Ref.

AGS Ref.  
Depth  
Type

	16719032	16719037	16718981	16719014	16718922	16718930	16718937	16718949	16718957	16719003
	WS202	WS202	WS203	WS203	WS205	WS205	WS205	WS207	WS207	WS207
	ES	ES	ES	ES	ES	ES	ES	ES	ES	ES
	0.00 - 0.10	0.70 - 1.00	1.00 - 1.30	2.10 - 2.30	0.70 - 1.00	2.10 - 2.30	3.50 - 3.70	0.00 - 0.20	1.10 - 1.30	0.40 - 0.60
	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Asbestos ID in Solid Samples	15-Dec-2017	15-Dec-2017	15-Dec-2017		15-Dec-2017	15-Dec-2017		15-Dec-2017	15-Dec-2017	15-Dec-2017
Boron Water Soluble	18-Dec-2017	14-Dec-2017	18-Dec-2017		18-Dec-2017	14-Dec-2017		14-Dec-2017	14-Dec-2017	14-Dec-2017
EPH CWG (Aliphatic) GC (S)		12-Dec-2017	12-Dec-2017	15-Dec-2017	13-Dec-2017	12-Dec-2017	12-Dec-2017		12-Dec-2017	15-Dec-2017
EPH CWG (Aromatic) GC (S)		12-Dec-2017	12-Dec-2017	15-Dec-2017	13-Dec-2017	12-Dec-2017	12-Dec-2017		12-Dec-2017	15-Dec-2017
GRO by GC-FID (S)		13-Dec-2017	13-Dec-2017	13-Dec-2017	13-Dec-2017	13-Dec-2017	13-Dec-2017		13-Dec-2017	13-Dec-2017
Hexavalent Chromium (s)	15-Dec-2017	15-Dec-2017	14-Dec-2017		15-Dec-2017	14-Dec-2017		15-Dec-2017	14-Dec-2017	14-Dec-2017
Metals in solid samples by OES	15-Dec-2017	15-Dec-2017	15-Dec-2017		15-Dec-2017	15-Dec-2017		15-Dec-2017	15-Dec-2017	15-Dec-2017
PAH by GCMS		14-Dec-2017	14-Dec-2017	14-Dec-2017	15-Dec-2017	15-Dec-2017	14-Dec-2017		14-Dec-2017	14-Dec-2017
pH		13-Dec-2017	14-Dec-2017	12-Dec-2017	14-Dec-2017	14-Dec-2017	12-Dec-2017		14-Dec-2017	14-Dec-2017
Sample description	09-Dec-2017	09-Dec-2017	09-Dec-2017	09-Dec-2017	09-Dec-2017	09-Dec-2017	09-Dec-2017	09-Dec-2017	09-Dec-2017	09-Dec-2017
Semi Volatile Organic Compounds			13-Dec-2017			13-Dec-2017				
Total Organic Carbon	12-Dec-2017	14-Dec-2017	12-Dec-2017	12-Dec-2017	14-Dec-2017	14-Dec-2017	12-Dec-2017	13-Dec-2017	13-Dec-2017	13-Dec-2017
TPH CWG GC (S)		13-Dec-2017	13-Dec-2017	15-Dec-2017	13-Dec-2017	13-Dec-2017	13-Dec-2017		13-Dec-2017	15-Dec-2017
VOC MS (S)		13-Dec-2017	13-Dec-2017	13-Dec-2017	13-Dec-2017	13-Dec-2017	13-Dec-2017		13-Dec-2017	13-Dec-2017



# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

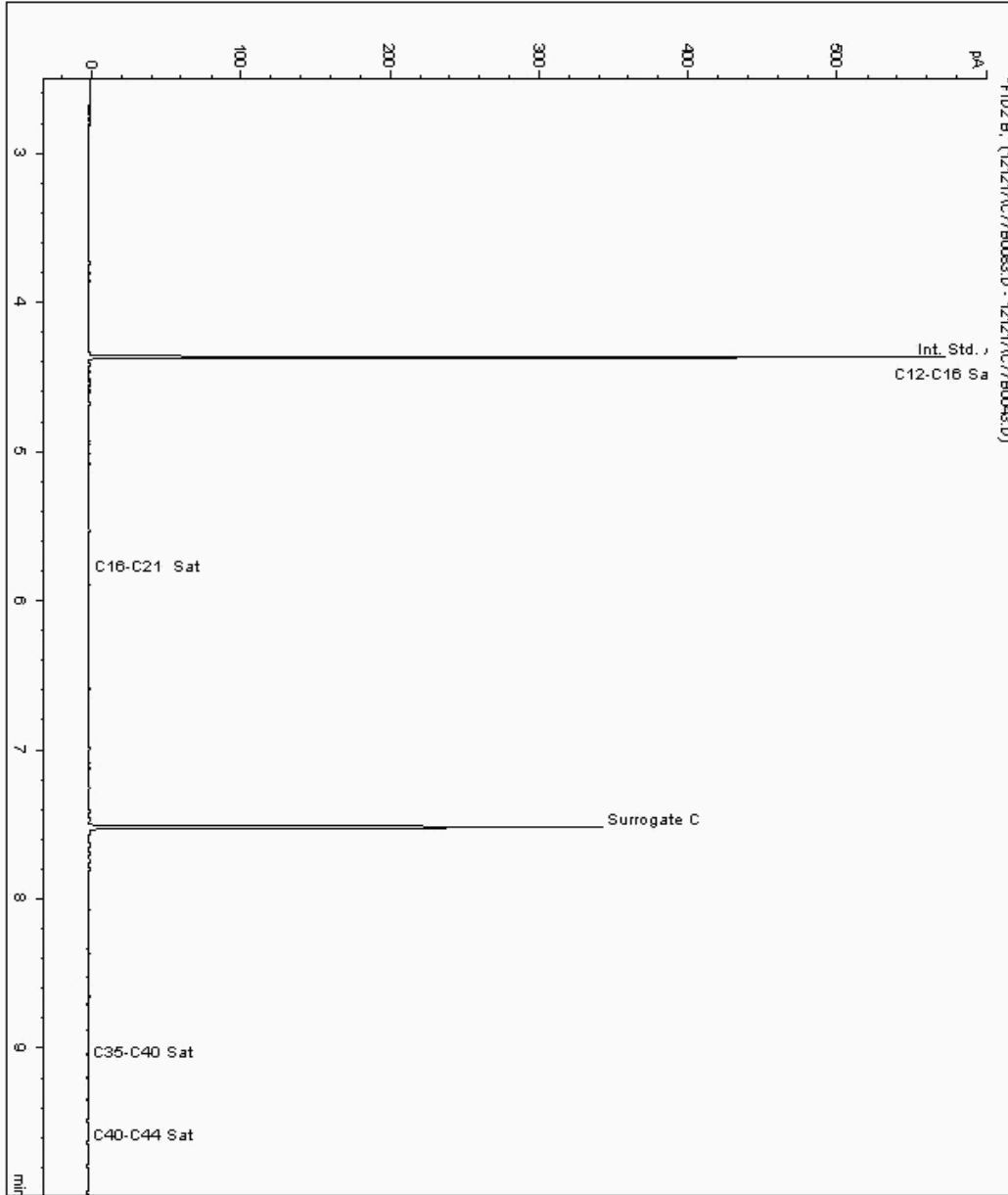
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 16724713  
Sample ID : WS207

Depth : 0.40 - 0.60

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 15682214-  
Date Acquired : 12/14/2017 6:46:56 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.970





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

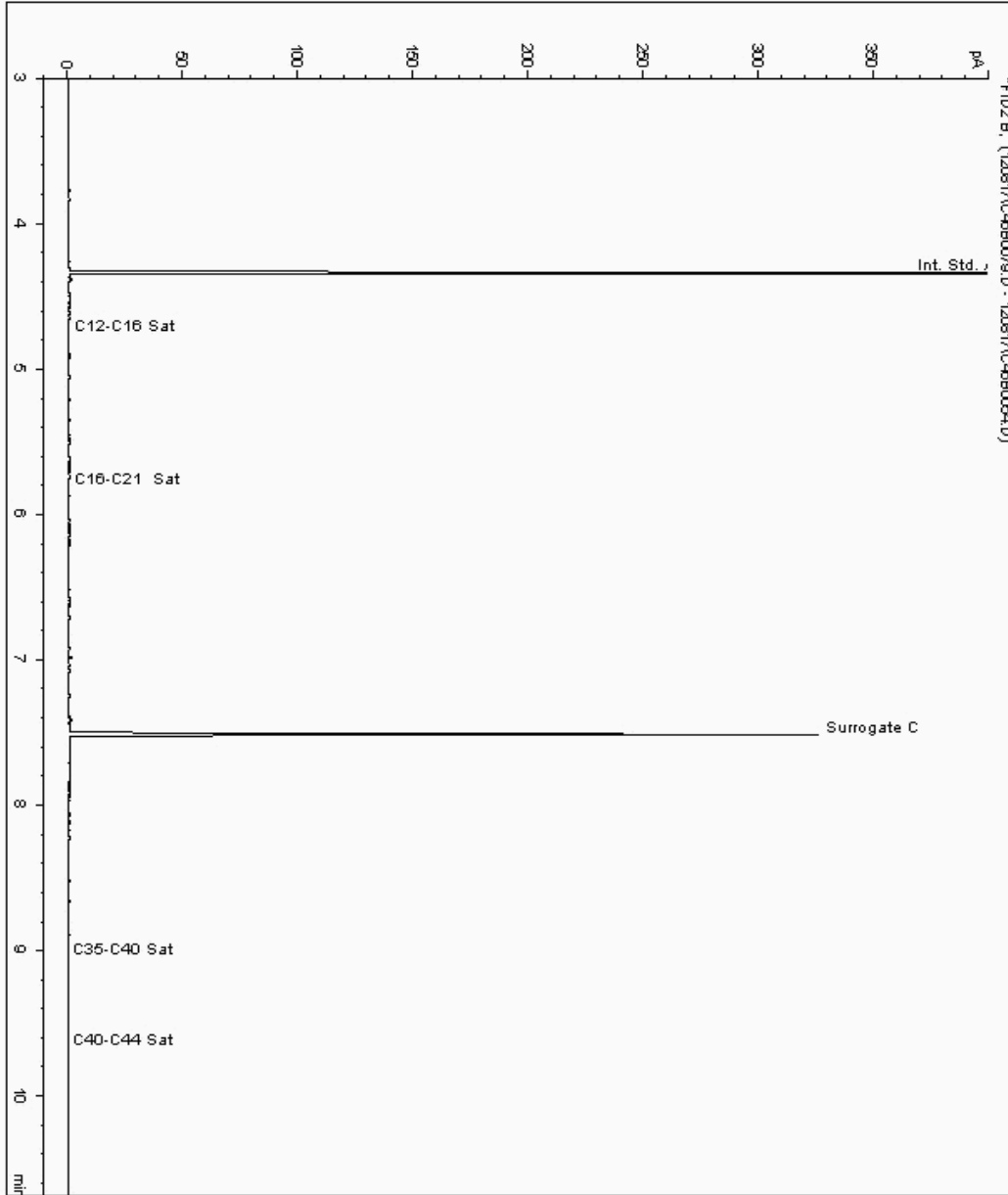
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 16724784  
Sample ID : WS207

Depth : 1.10 - 1.30

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682129-  
Date Acquired : 12/12/2017 04:05:56 PM  
Units : ppb  
Dilution: WS207[1.10 - 1.30]      ->





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

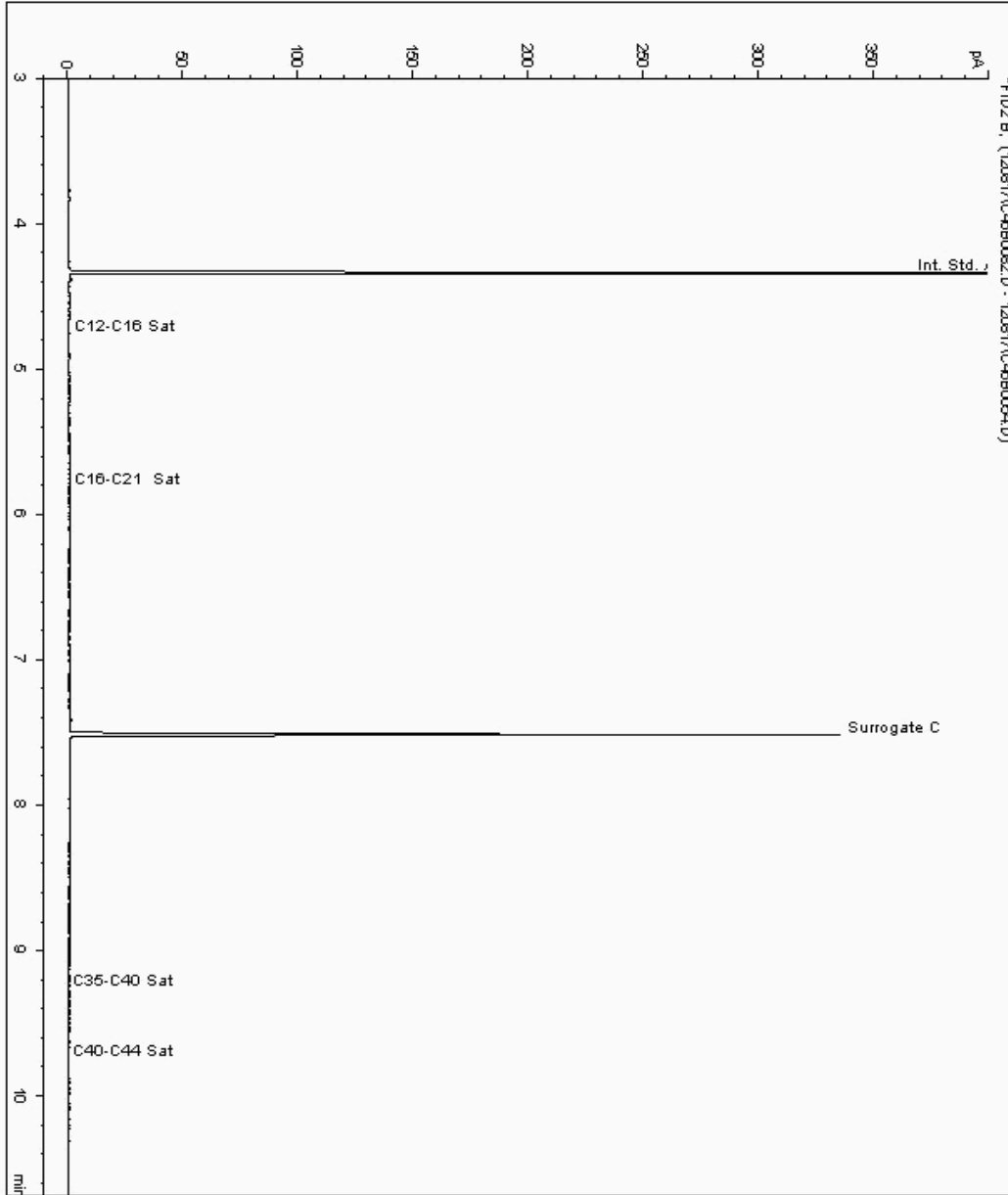
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 16724877  
Sample ID : WS202

Depth : 0.70 - 1.00

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682258-  
Date Acquired : 12/12/2017 05:05:04 PM  
Units : ppb  
Dilution: WS202[0.70 - 1.00]      ->





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

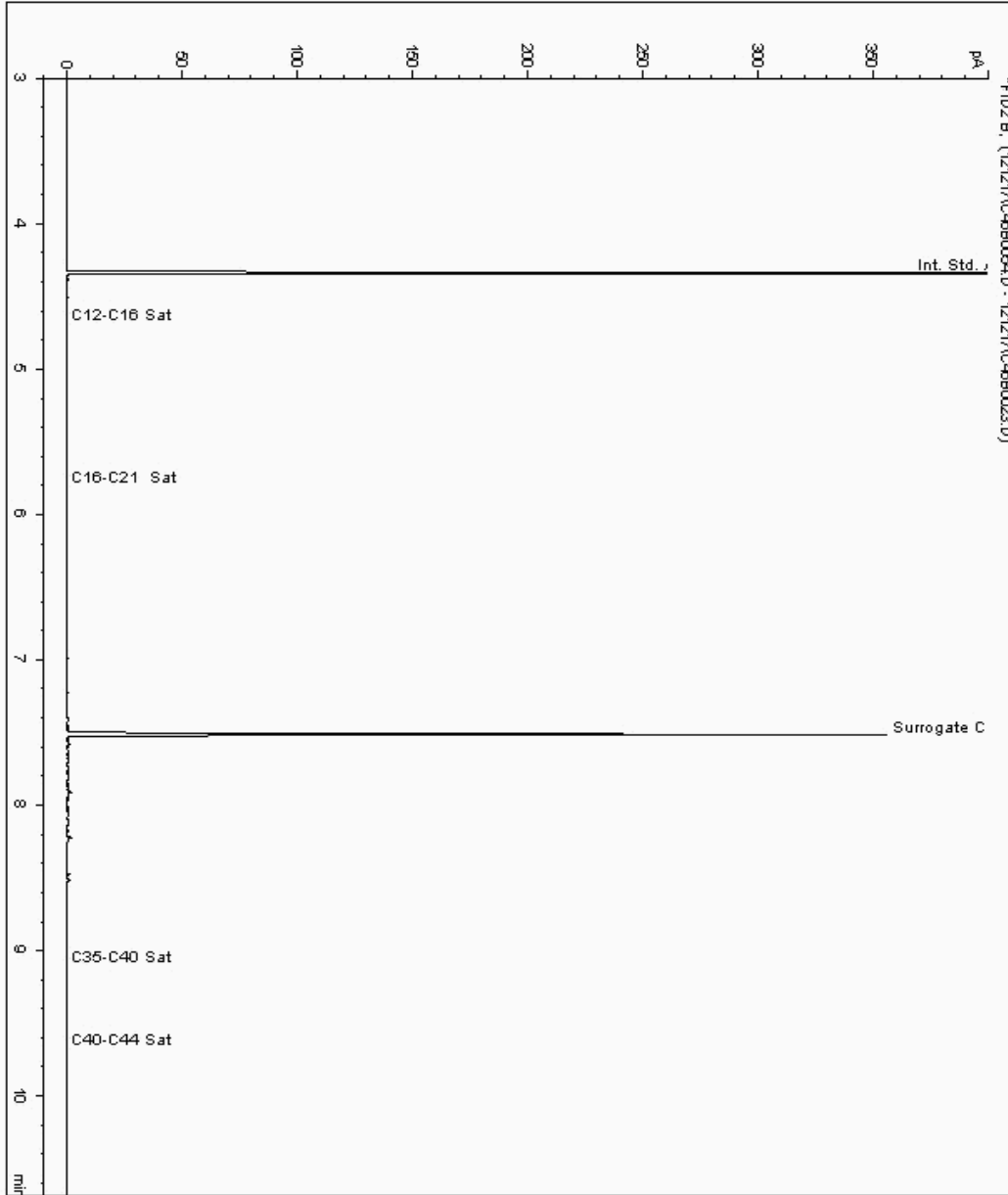
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 16724974  
Sample ID : WS205

Depth : 0.70 - 1.00

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682018-  
Date Acquired : 13/12/2017 06:51:24 PM  
Units : ppb  
Dilution: WS205[0.70 - 1.00]      ->





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

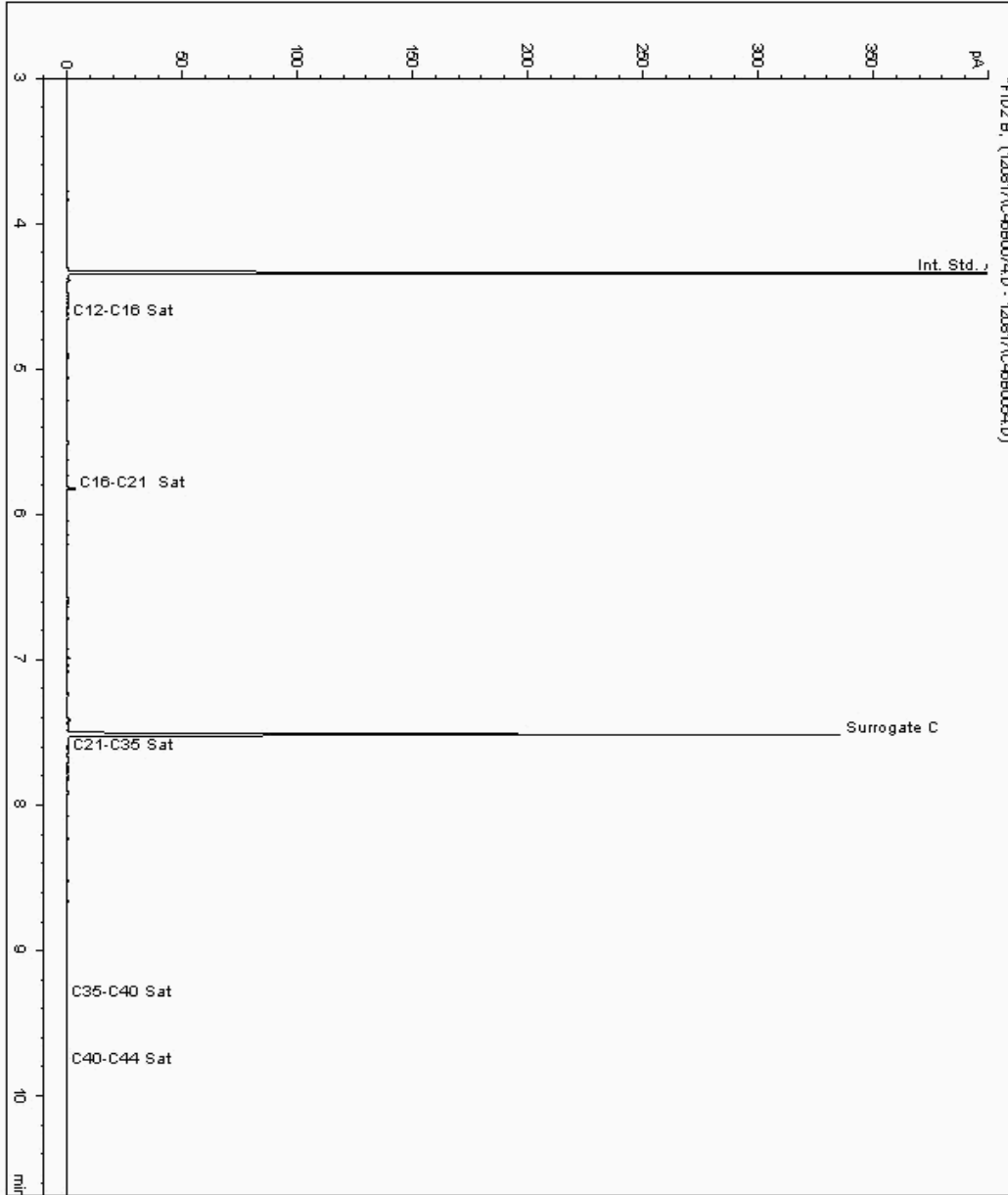
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 16725482  
Sample ID : WS205

Depth : 3.50 - 3.70

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682074-  
Date Acquired : 12/12/2017 02:42:35 PM  
Units : ppb  
Dilution: WS205[3.50 - 3.70] ->





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

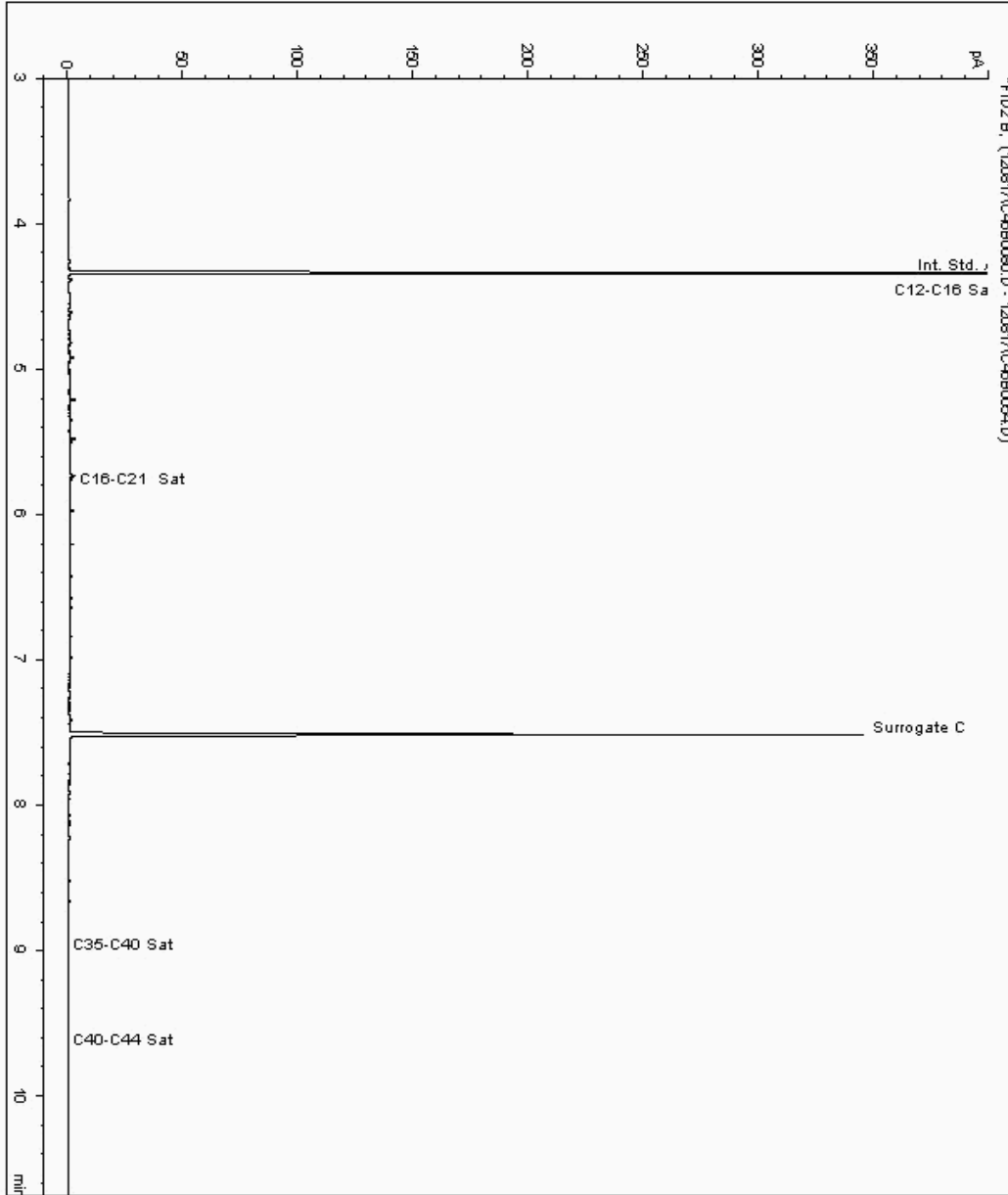
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 16725617  
Sample ID : WS205

Depth : 2.10 - 2.30

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682060-  
Date Acquired : 12/12/2017 04:25:41 PM  
Units : ppb  
Dilution: WS205[2.10 - 2.30] ->







# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

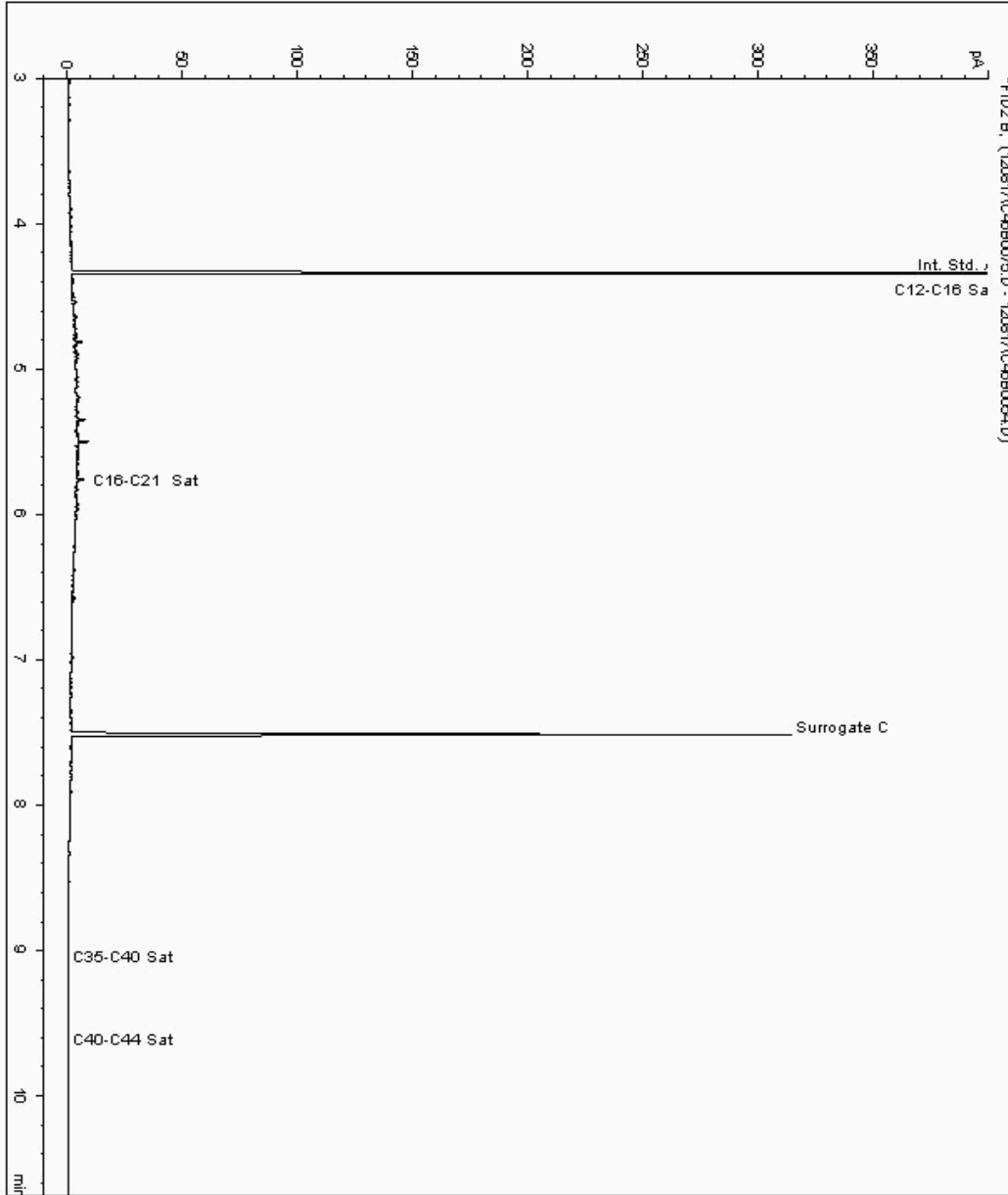
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 16725867  
Sample ID : WS203

Depth : 1.00 - 1.30

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682174-  
Date Acquired : 12/12/2017 03:02:38 PM  
Units : ppb  
Dilution: WS203[1.00 - 1.30]      ->





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

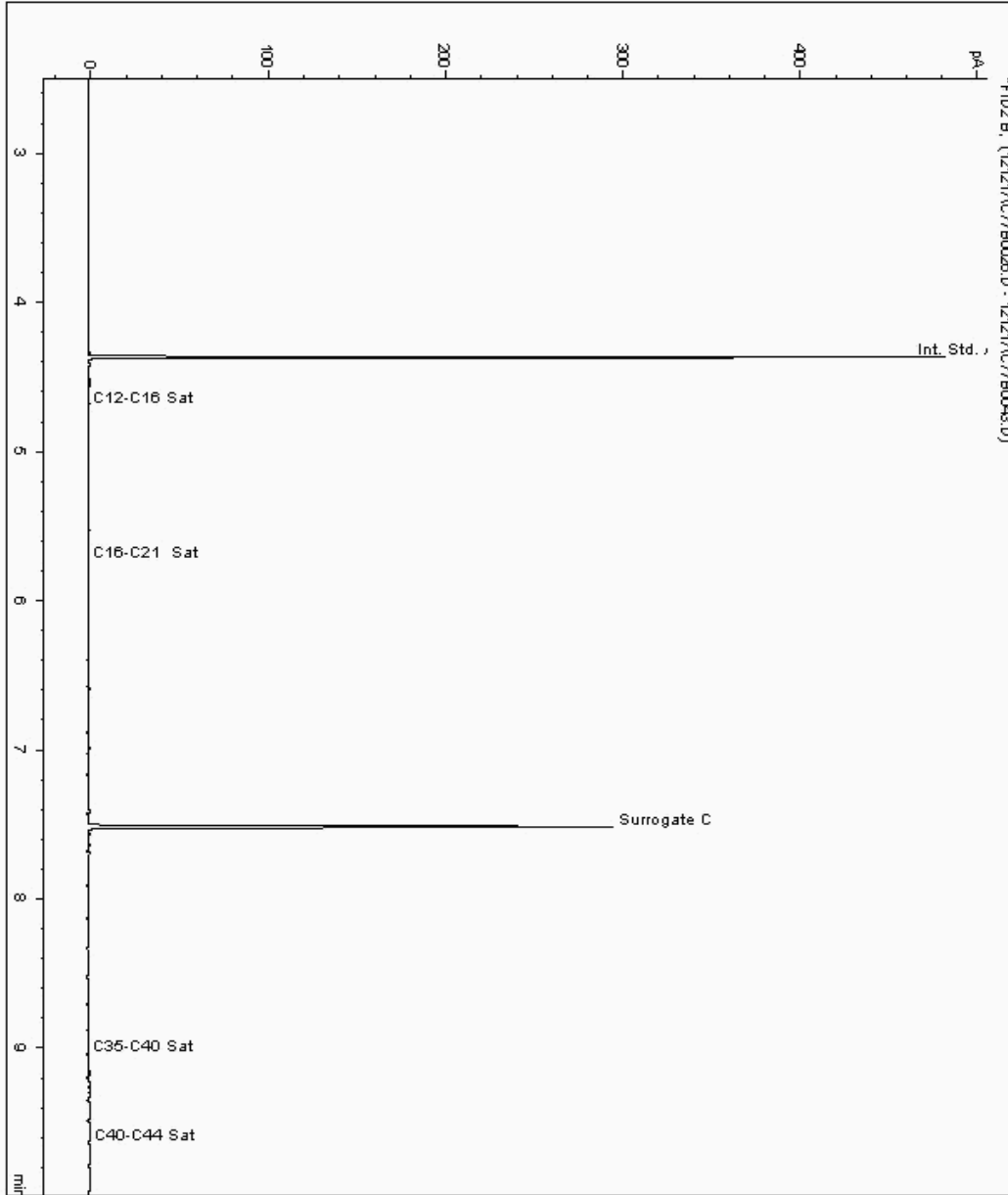
Analysis: EPH CWG (Aliphatic) GC (S)

Sample No : 16725955  
Sample ID : WS203

Depth : 2.10 - 2.30

Alcontrol/Geochem Analytical Services  
Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 15682233-  
Date Acquired : 12/12/2017 7:43:23 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.980





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

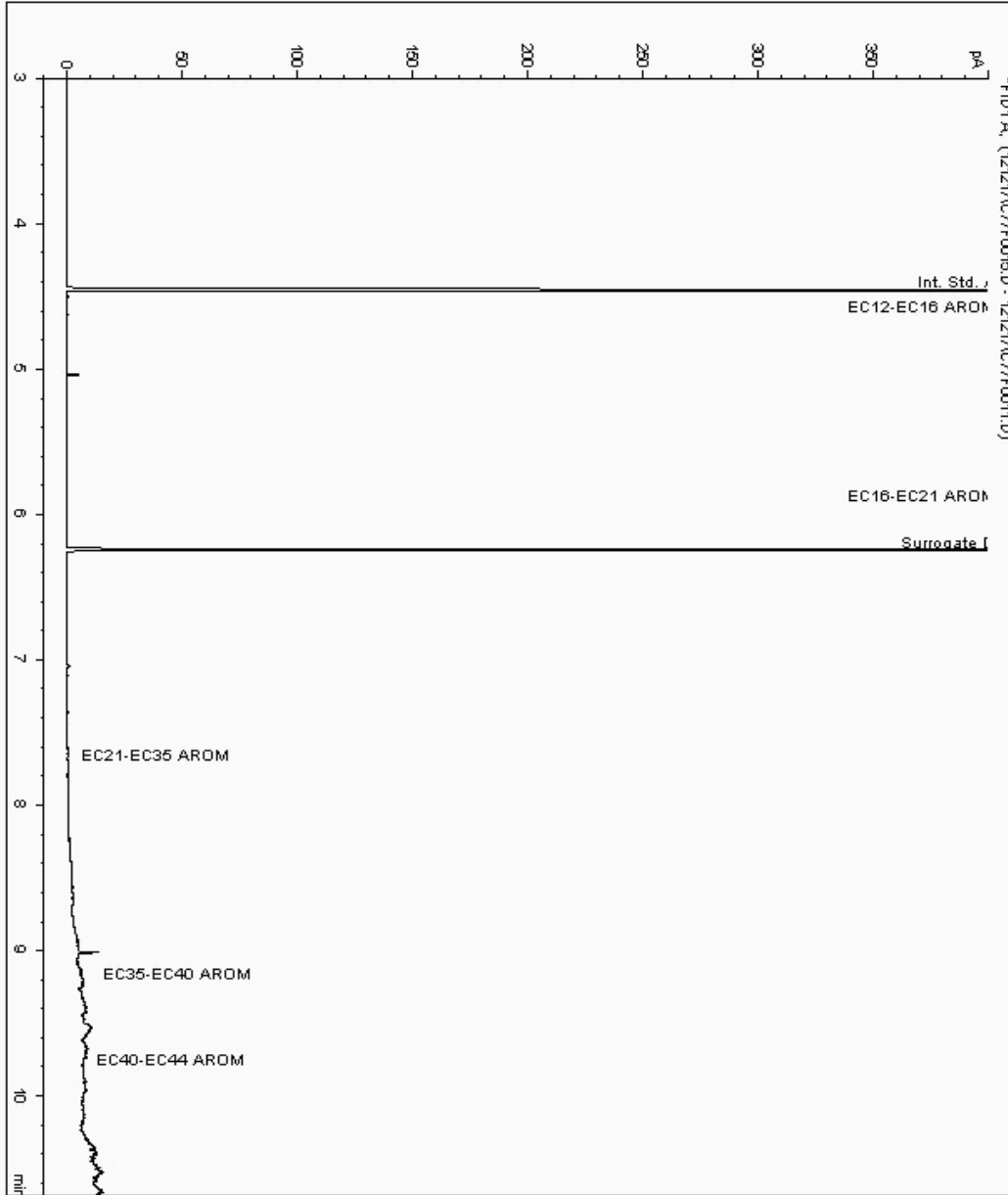
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 16724713  
Sample ID : WS207

Depth : 0.40 - 0.60

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682215-  
Date Acquired : 12/12/2017 4:21:59 PM  
Units : ppb  
Dilution:





CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120 Client Reference: 70041591 Report Number: 437139  
Location: Kraft, Banbury Order Number: 70041591-SO1 Superseded Report:

Chromatogram

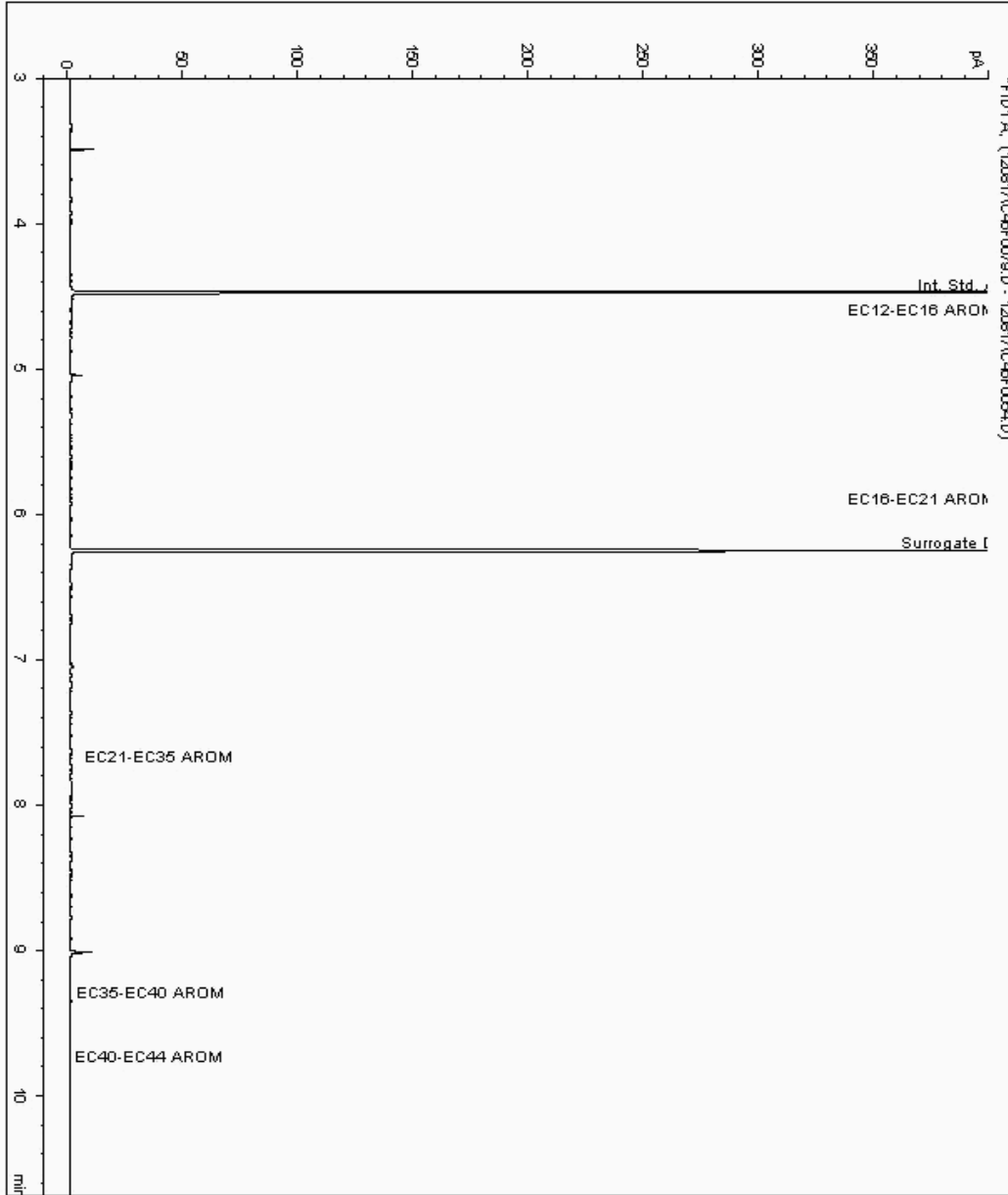
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 16724784  
Sample ID : WS207

Depth : 1.10 - 1.30

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682130-  
Date Acquired : 12/12/2017 04:05:56 PM  
Units : ppb  
Dilution: WS207[1.10 - 1.30] ->





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

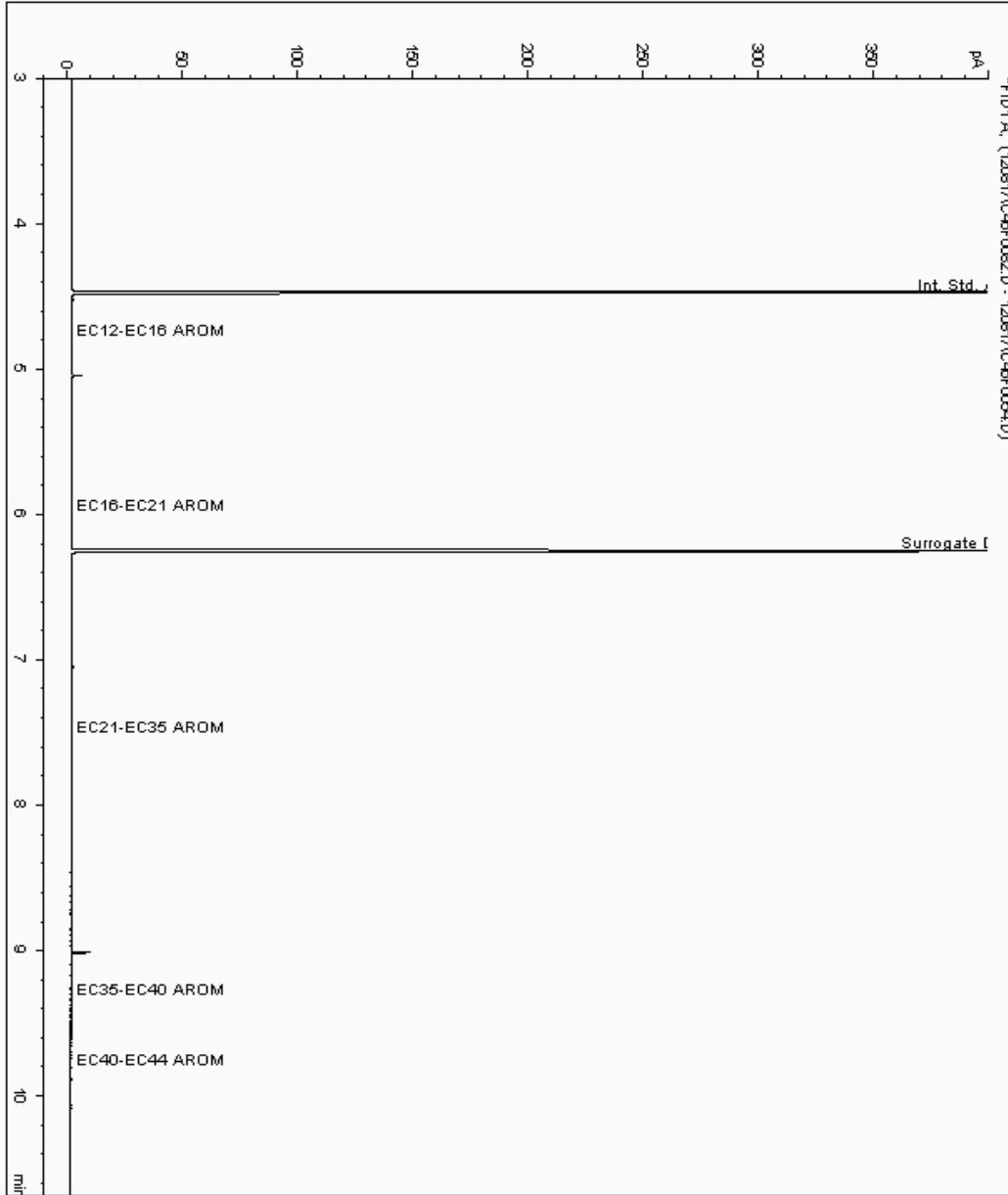
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 16724877  
Sample ID : WS202

Depth : 0.70 - 1.00

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682259-  
Date Acquired : 12/12/2017 05:05:04 PM  
Units : ppb  
Dilution: WS202[0.70 - 1.00] ->





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

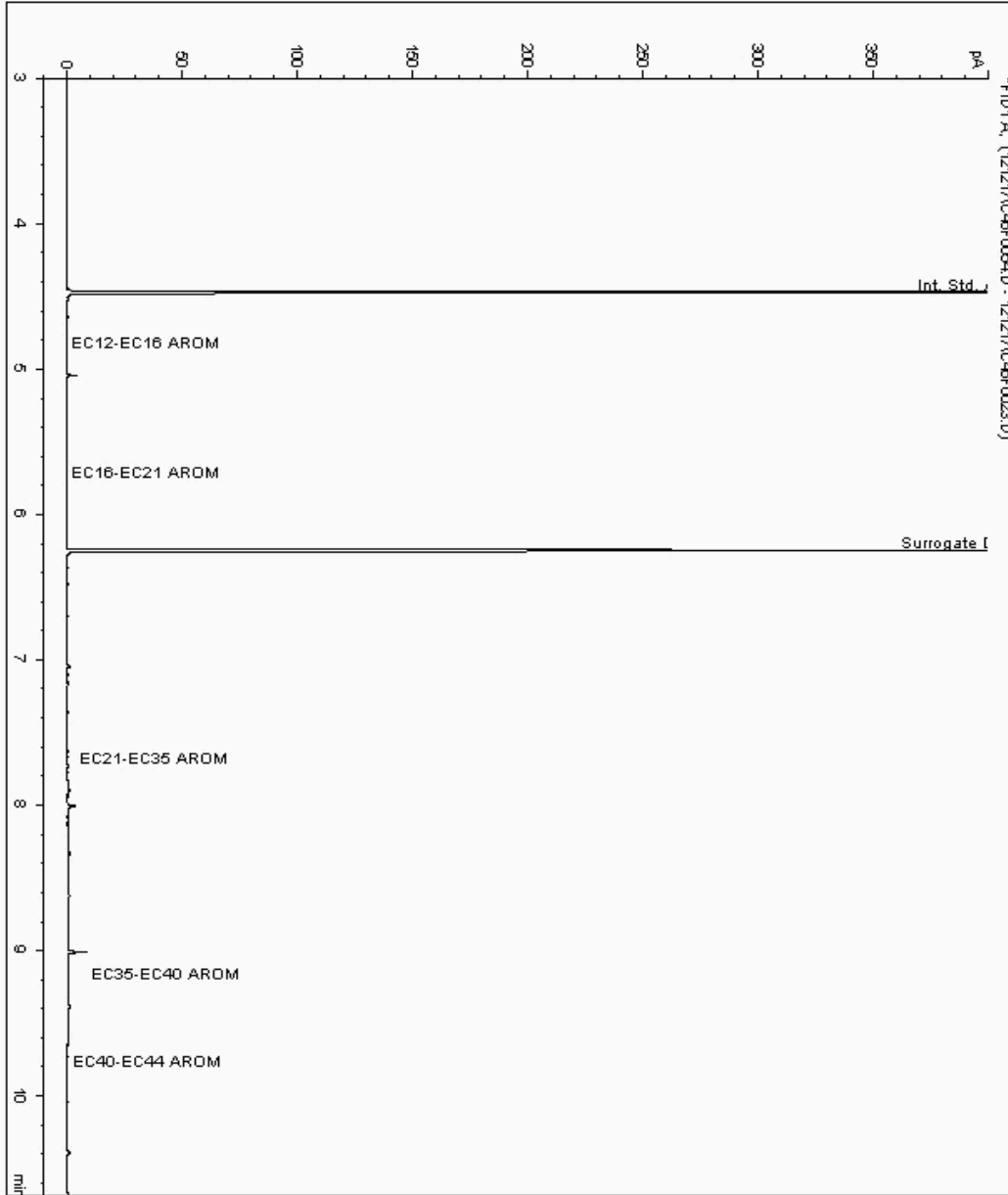
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 16724974  
Sample ID : WS205

Depth : 0.70 - 1.00

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682019-  
Date Acquired : 13/12/2017 06:51:24 PM  
Units : ppb  
Dilution: WS205[0.70 - 1.00] ->





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

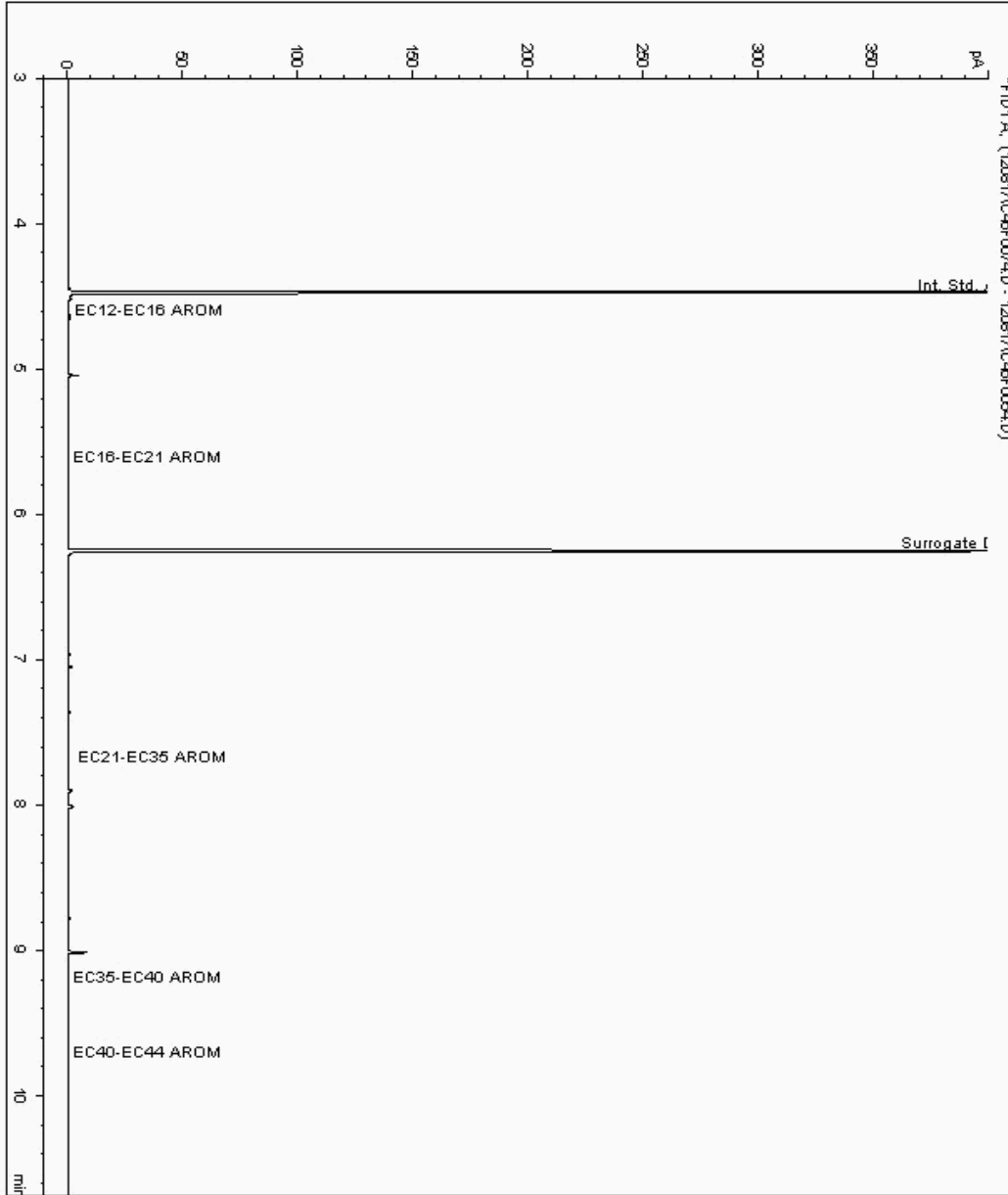
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 16725482  
Sample ID : WS205

Depth : 3.50 - 3.70

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682075-  
Date Acquired : 12/12/2017 02:42:35 PM  
Units : ppb  
Dilution: WS205[3.50 - 3.70] ->





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

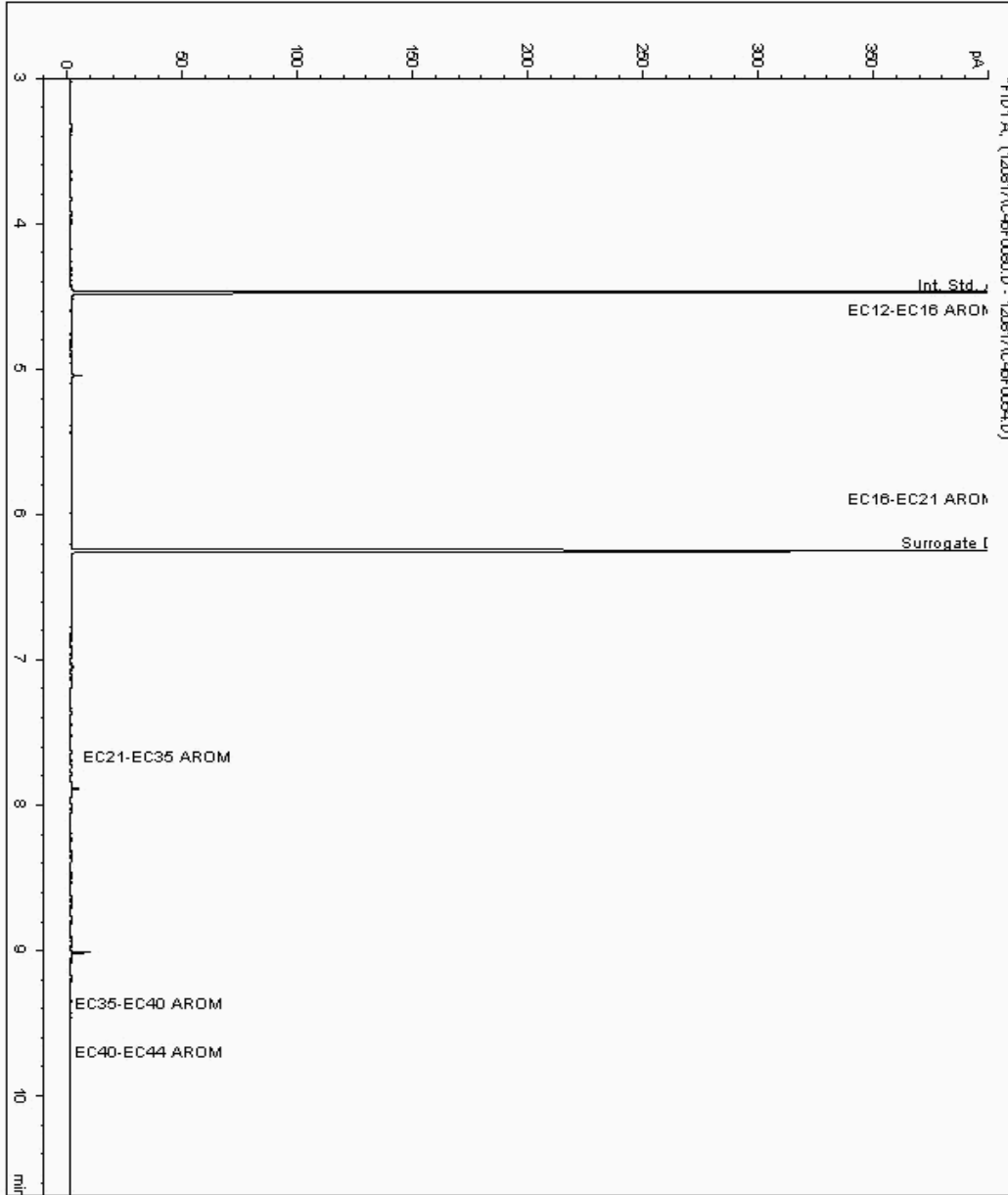
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 16725617  
Sample ID : WS205

Depth : 2.10 - 2.30

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682061-  
Date Acquired : 12/12/2017 04:25:41 PM  
Units : ppb  
Dilution: WS205[2.10 - 2.30] ->







# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

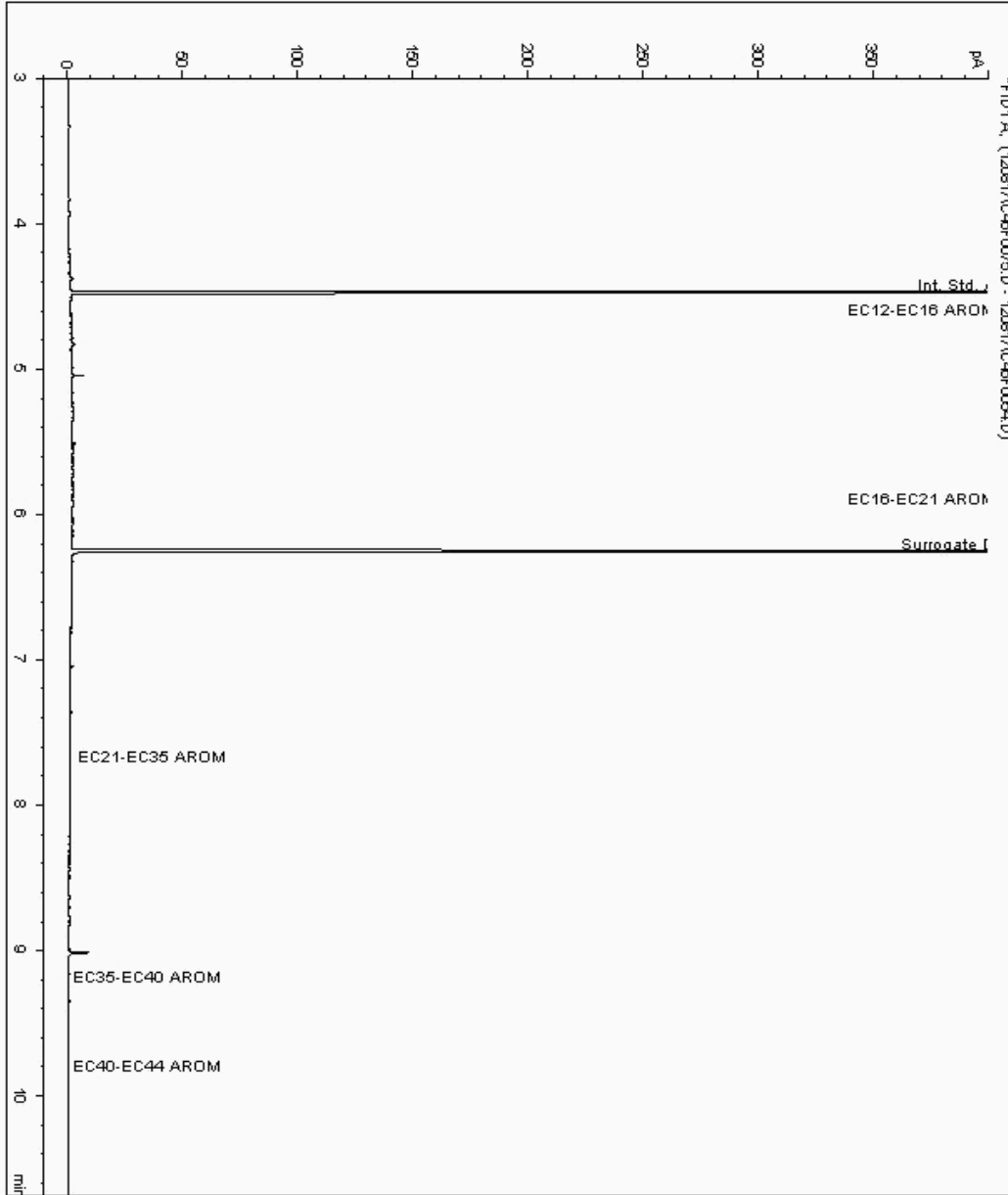
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 16725867  
Sample ID : WS203

Depth : 1.00 - 1.30

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682175-  
Date Acquired : 12/12/2017 03:02:38 PM  
Units : ppb  
Dilution: WS203[1.00 - 1.30] ->





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

Report Number: 437139  
Superseded Report:

## Chromatogram

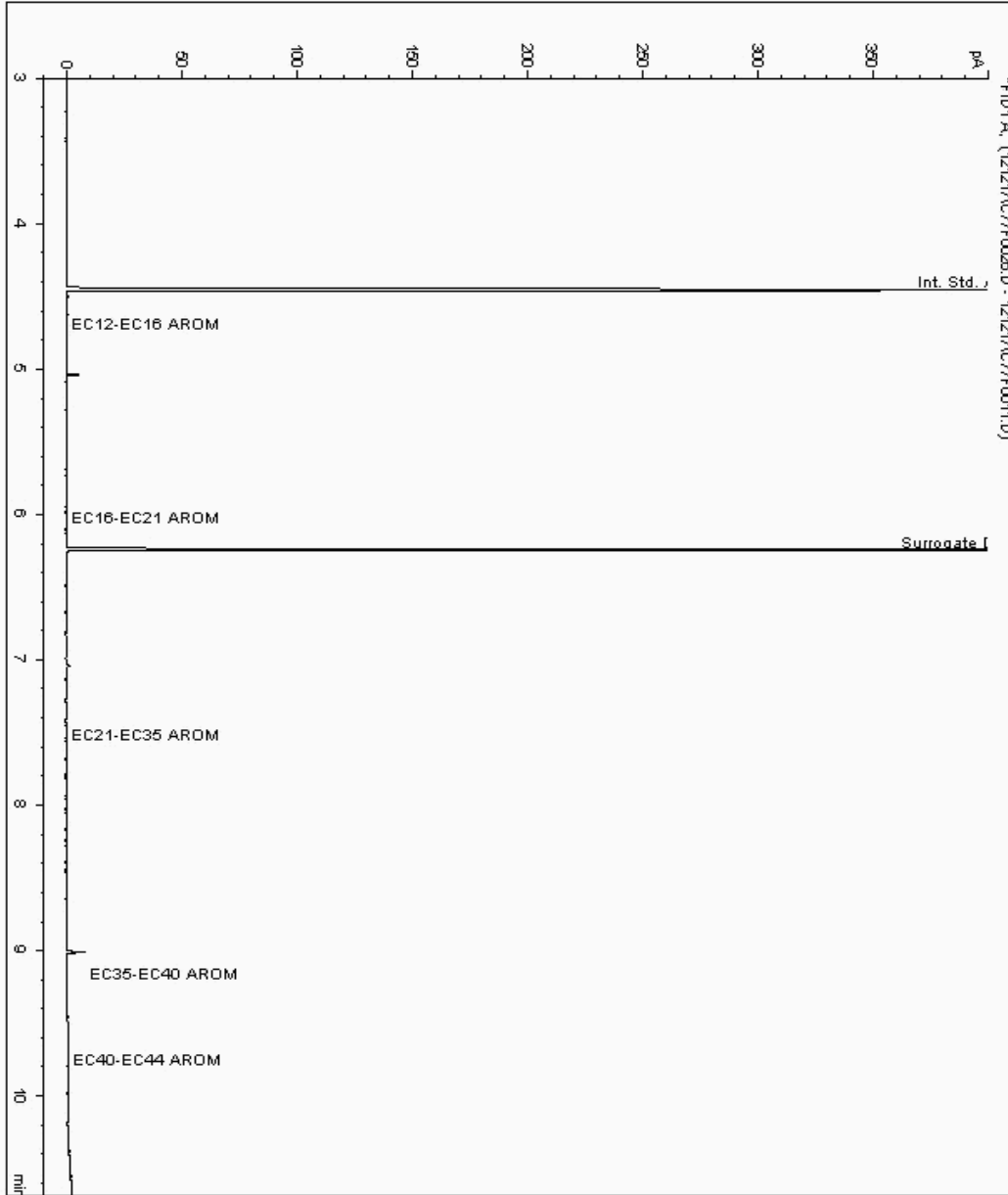
Analysis: EPH CWG (Aromatic) GC (S)

Sample No : 16725955  
Sample ID : WS203

Depth : 2.10 - 2.30

Speciated TPH - AROM ( C12 - C40 )

Sample Identity: 15682234-  
Date Acquired : 12/12/2017 7:43:23 PM  
Units : ppb  
Dilution:





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

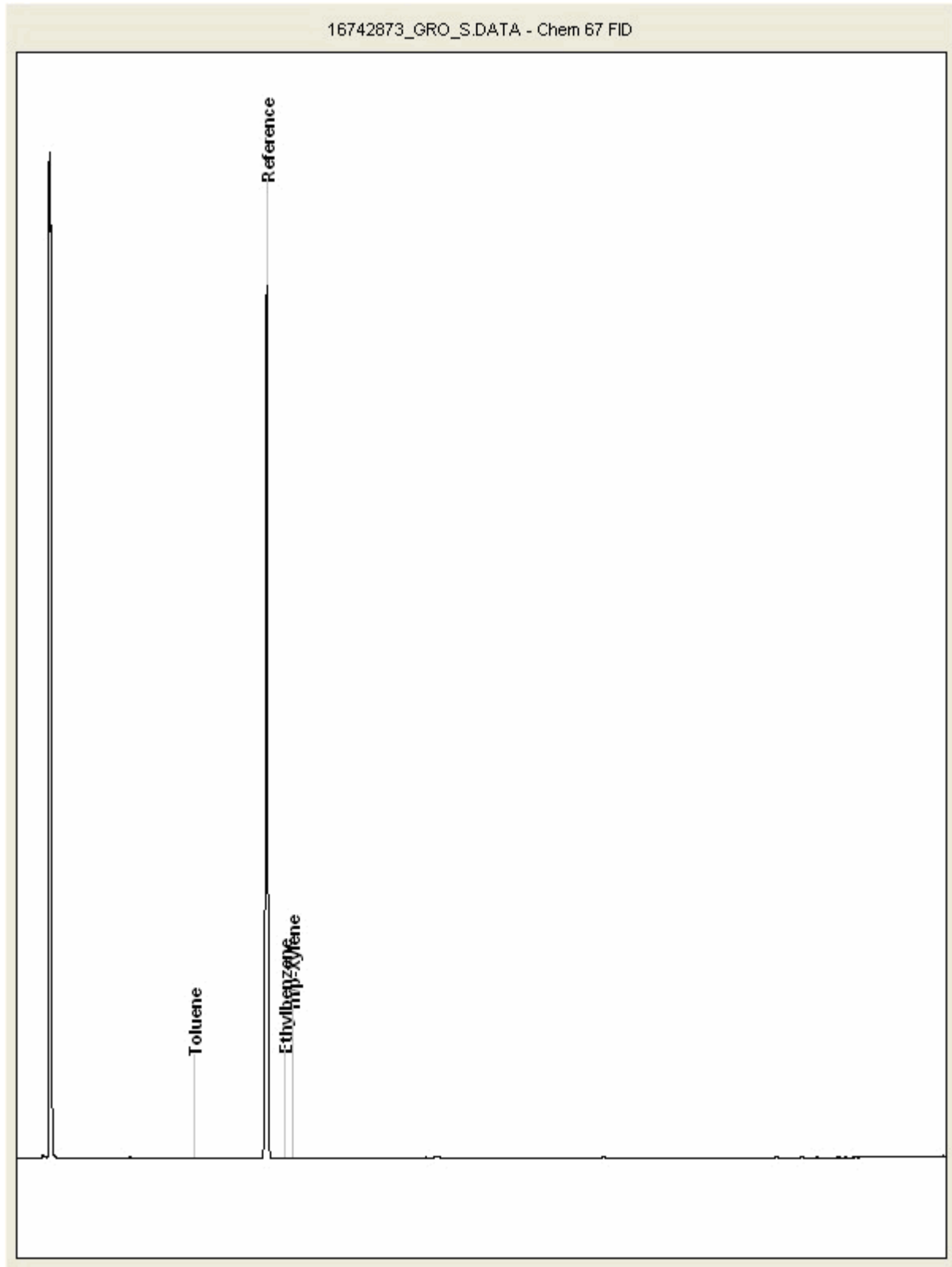
Report Number: 437139  
Superseded Report:

## Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 16742873  
Sample ID : WS207

Depth : 1.10 - 1.30





CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

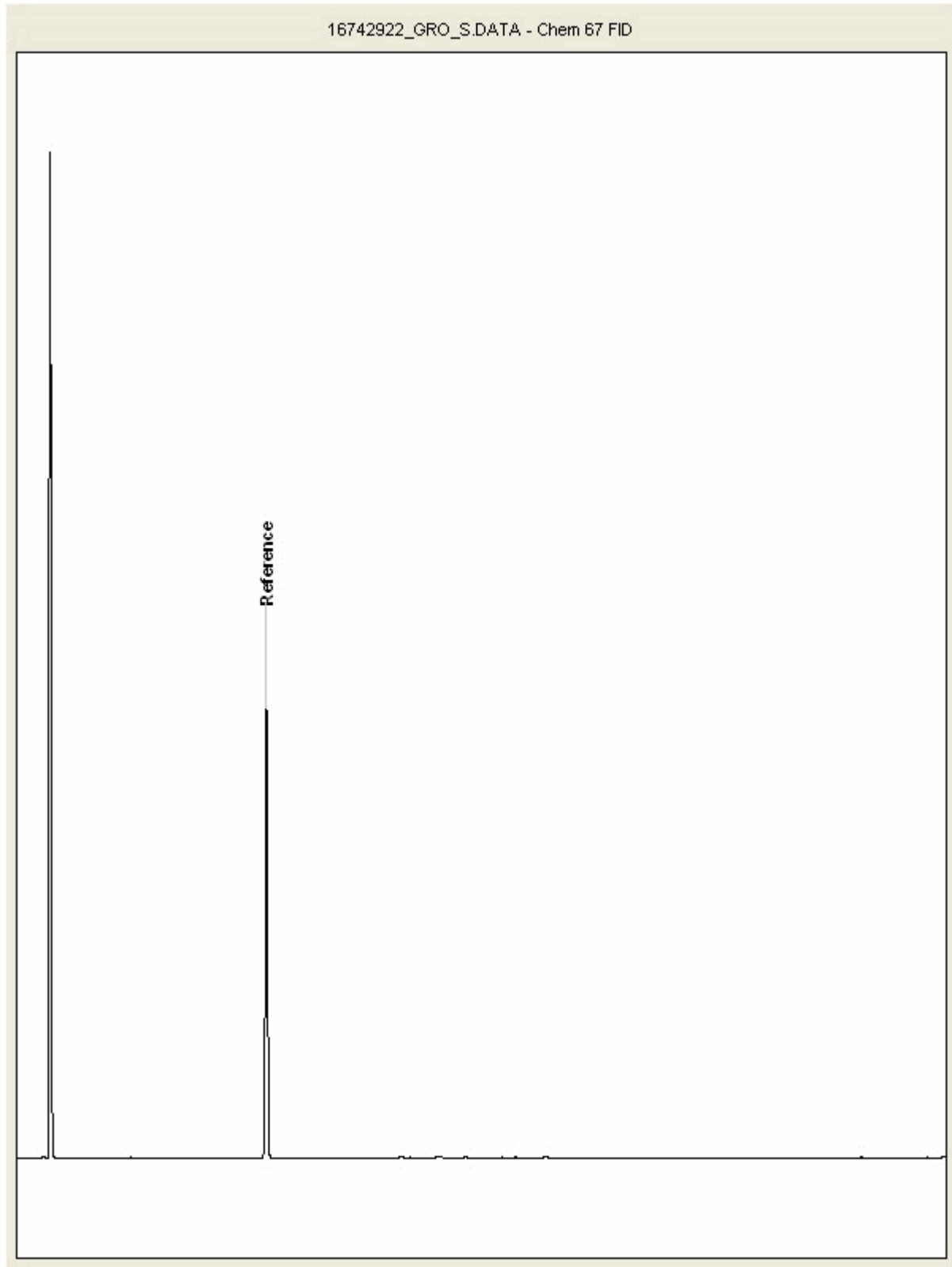
Report Number: 437139  
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 16742922  
Sample ID : WS203

Depth : 2.10 - 2.30





CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

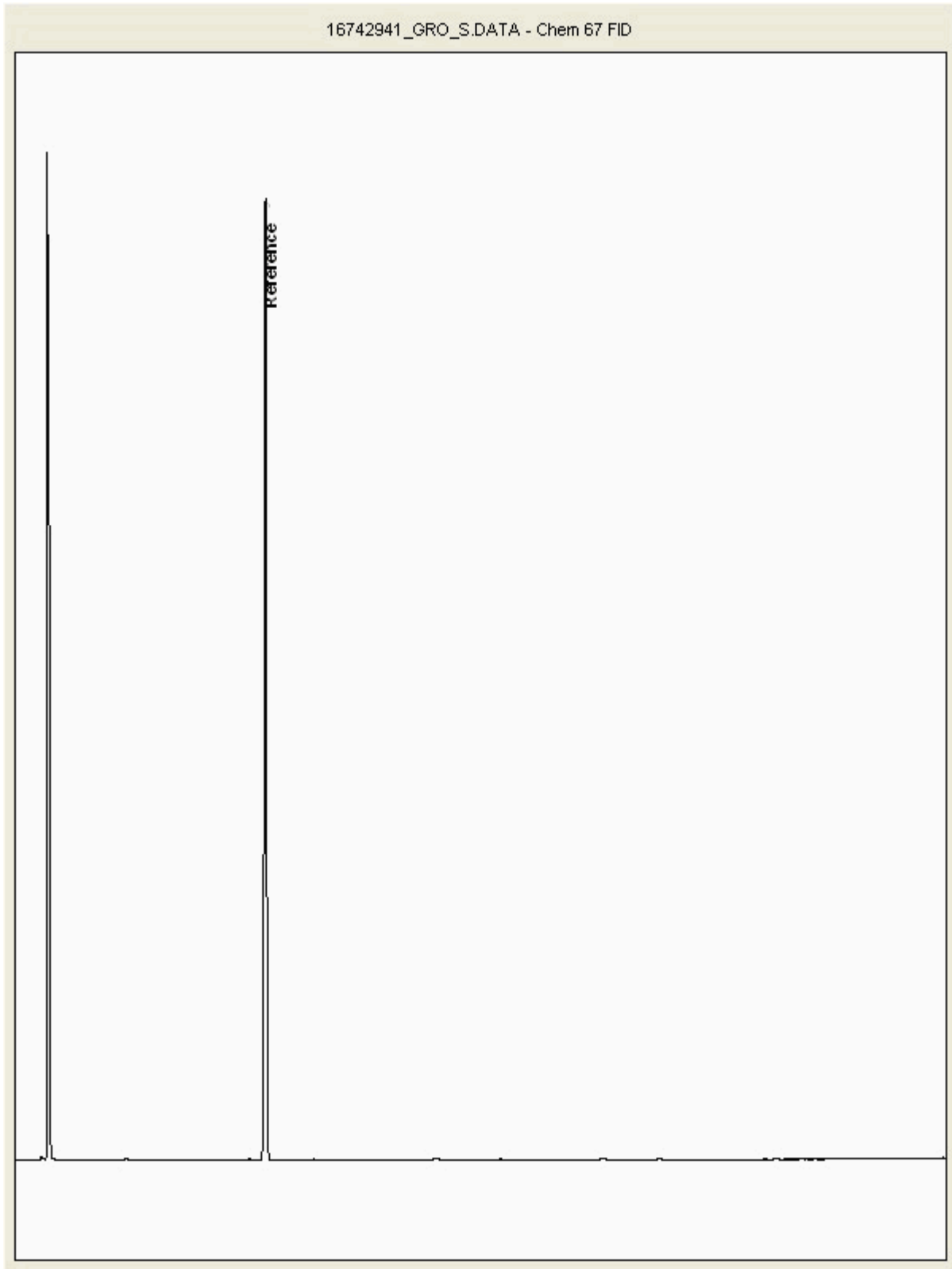
Report Number: 437139  
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 16742941  
Sample ID : WS207

Depth : 0.40 - 0.60





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

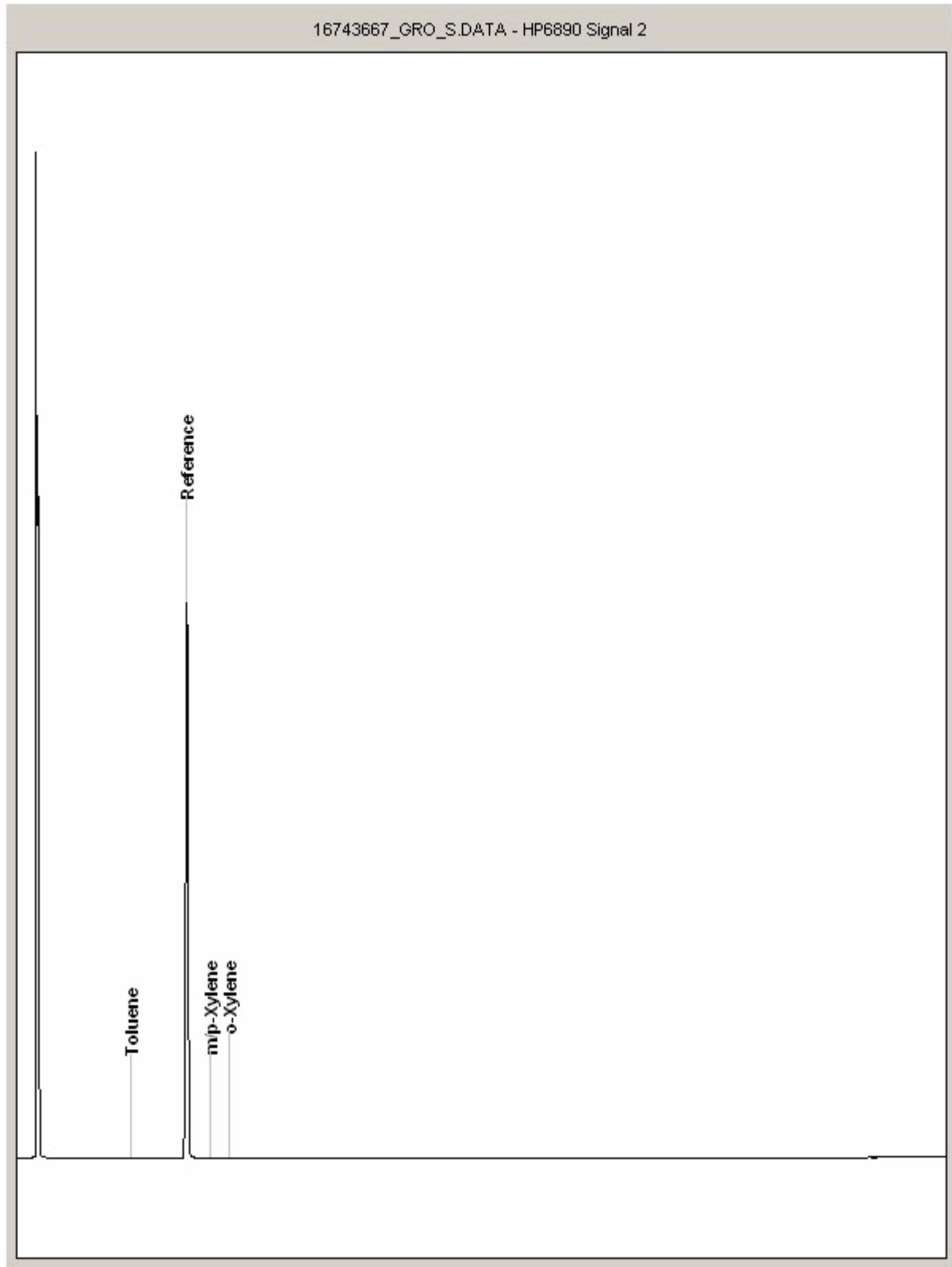
Report Number: 437139  
Superseded Report:

## Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 16743667  
Sample ID : WS205

Depth : 0.70 - 1.00





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

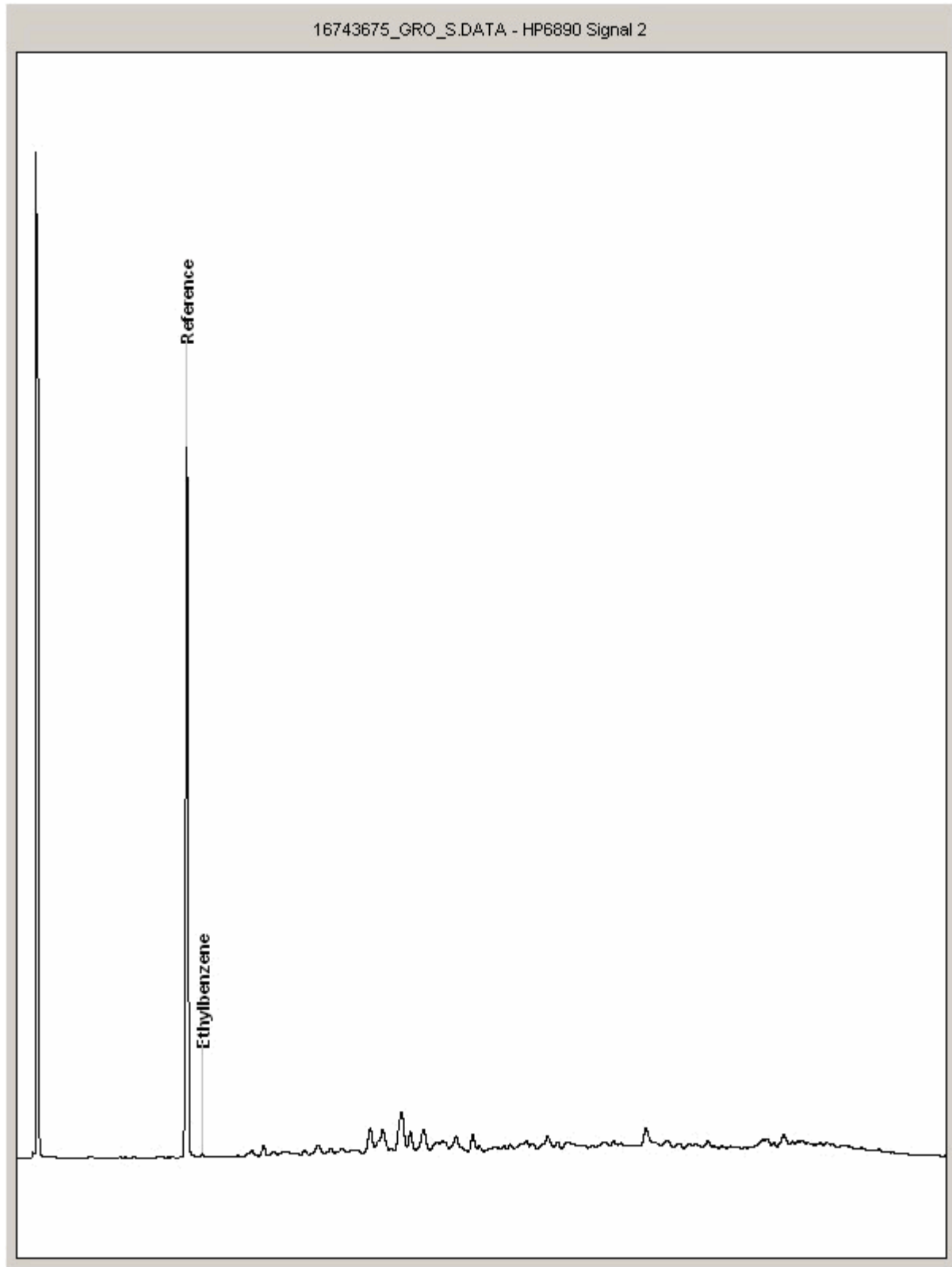
Report Number: 437139  
Superseded Report:

## Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 16743675  
Sample ID : WS203

Depth : 1.00 - 1.30





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

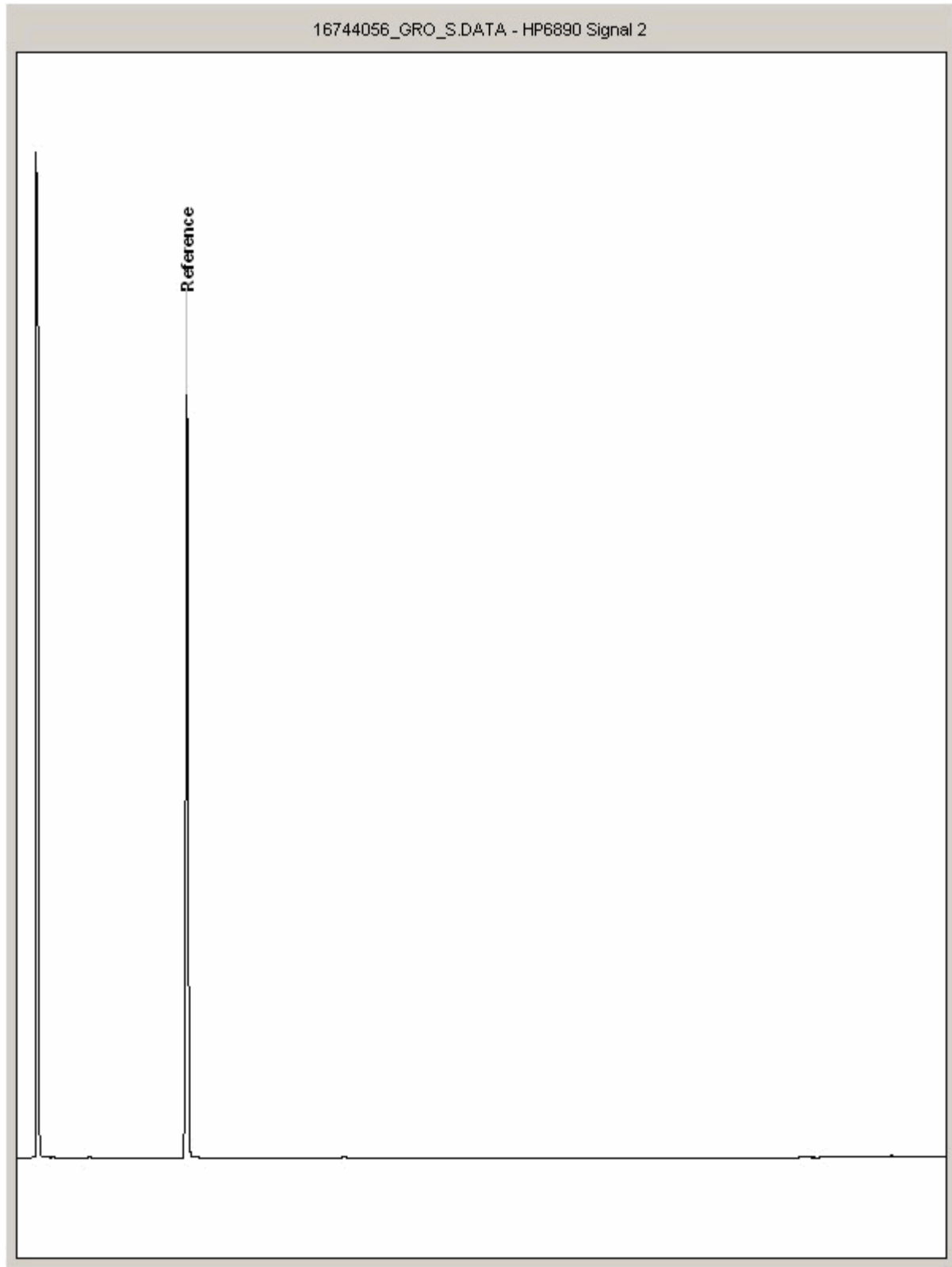
Report Number: 437139  
Superseded Report:

## Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 16744056  
Sample ID : WS205

Depth : 2.10 - 2.30







# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

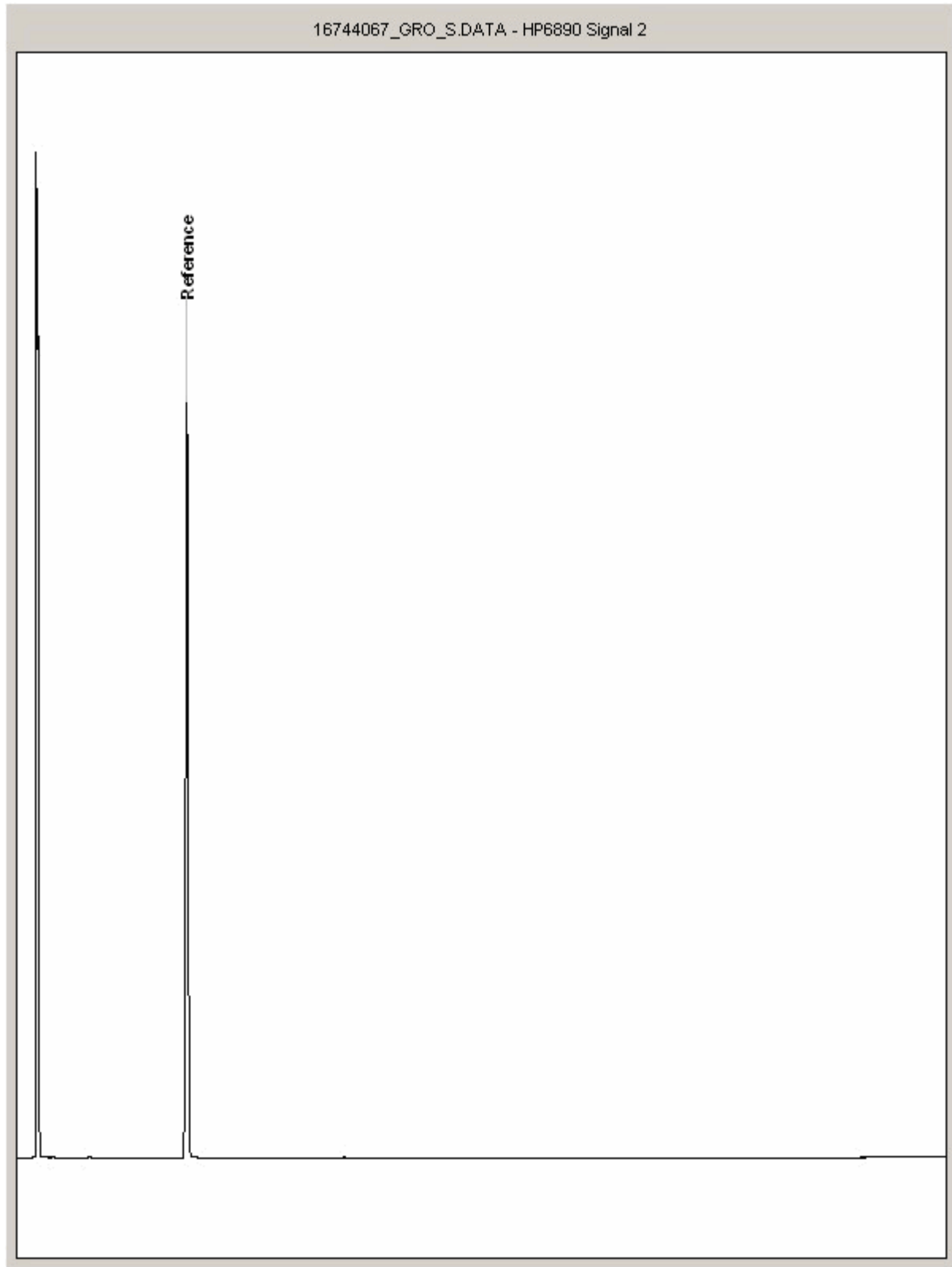
Report Number: 437139  
Superseded Report:

## Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 16744067  
Sample ID : WS202

Depth : 0.70 - 1.00





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171208-120  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 70041591-SO1

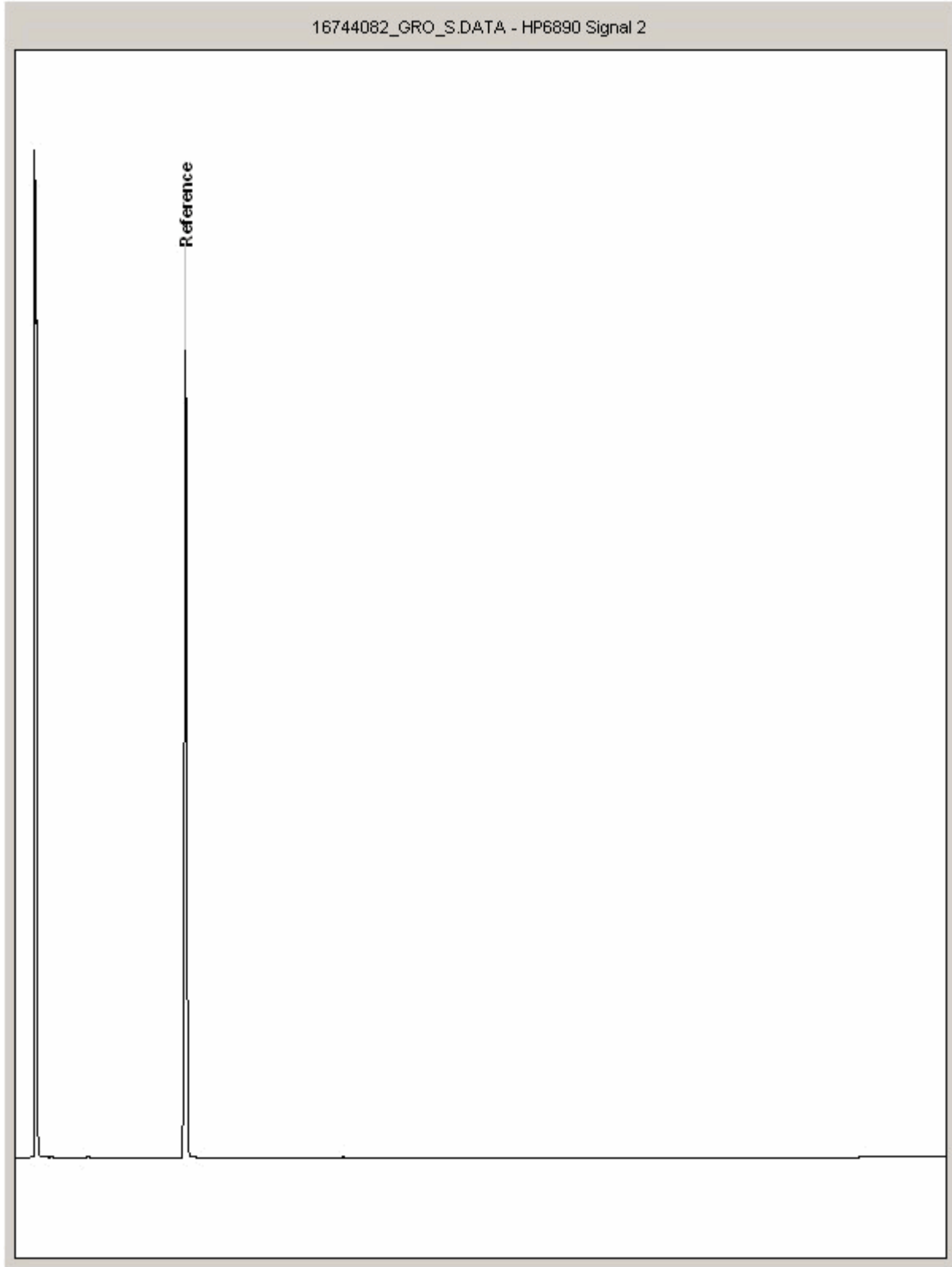
Report Number: 437139  
Superseded Report:

## Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 16744082  
Sample ID : WS205

Depth : 3.50 - 3.70





# CERTIFICATE OF ANALYSIS

<b>SDG:</b> 171208-120	<b>Client Reference:</b> 70041591	<b>Report Number:</b> 437139
<b>Location:</b> Kraft, Banbury	<b>Order Number:</b> 70041591-SO1	<b>Superseded Report:</b>

## 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. ALS 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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

21. 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.

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

If a sample is classed as deviated then the associated results may be compromised.

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
§	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 ALS (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 ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Astestost Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Coisidolite	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.**



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Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

WSP PB MLN  
The Victoria  
150-182 The Quays  
Salford  
Manchester  
Lancashire  
M50 3SP

**Attention:** Stephen Jones

## CERTIFICATE OF ANALYSIS

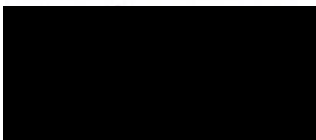
**Date:** 03 January 2018  
**Customer:** H\_WSP\_MAN  
**Sample Delivery Group (SDG):** 171219-19  
**Your Reference:** 70041591  
**Location:** Kraft, Banbury  
**Report No:** 438677

We received 4 samples on Tuesday December 19, 2017 and 3 of these samples were scheduled for analysis which was completed on Wednesday January 03, 2018. 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.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Approved By:



**Sonia McWhan**

Operations Manager





# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b> 171219-19	<b>Client Reference:</b> 70041591	<b>Report Number:</b> 438677
<b>Location:</b> Kraft, Banbury	<b>Order Number:</b> 6316510	<b>Superseded Report:</b>

## Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16785921	NO ID			
16785900	WS202	EW	0.00 - 0.00	15/12/2017
16785908	WS205	EW	0.00 - 0.00	15/12/2017
16785914	WS207	EW	0.00 - 0.00	15/12/2017

**Maximum Sample/Coolbox Temperature (°C) : 6.4**

ISO5667-3 Water quality - Sampling - Part3 -  
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

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



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 171219-19  
**Location:** Kraft, Banbury

**Client Reference:** 70041591  
**Order Number:** 6316510

**Report Number:** 438677  
**Superseded Report:**

<b>Results Legend</b>  <div style="display: flex; gap: 10px;"> <div style="border: 1px solid black; background-color: yellow; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;"><b>X</b></div> Test           <div style="border: 1px solid black; background-color: red; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; color: white;"><b>N</b></div> No Determination Possible         </div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	
		16785900	WS202	EW	0.00 - 0.00	1000ml glass bottle (ALEZ20)	GW
		16785908	WS205	EW	0.00 - 0.00	1000ml glass bottle (ALEZ20)	GW
		16785914	WS207	EW	0.00 - 0.00	1000ml glass bottle (ALEZ20)	GW
						11plastic (ALE221)	GW
						11plastic (ALE297)	GW
						Vial (ALE297)	GW
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3					
						X	
						X	
						X	
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 3					
						X	
						X	
						X	
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 3					
						X	
						X	
						X	
GRO by GC-FID (W)	All	NDPs: 0 Tests: 3					
						X	
						X	
						X	
Low Level Hexavalent Chromium (w)	All	NDPs: 0 Tests: 3					
						X	
						X	
						X	
Mercury Dissolved	All	NDPs: 0 Tests: 3					
						X	
						X	
						X	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 3					
						X	
						X	
						X	
pH Value	All	NDPs: 0 Tests: 3					
						X	
						X	
						X	
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 2					
						X	
						X	
TPH CWG (W)	All	NDPs: 0 Tests: 3					
						X	
						X	
						X	
VOC MS (W)	All	NDPs: 0 Tests: 3					
						X	
						X	
						X	





CERTIFICATE OF ANALYSIS

Validated

SDG: 171219-19
Location: Kraft, Banbury

Client Reference: 70041591
Order Number: 6316510

Report Number: 438677
Superseded Report:

PAH Spec MS - Aqueous (W)

Table with columns for Component, LOD/Units, Method, and sample locations WS202, WS205, WS207. Includes a Results Legend and a list of PAH compounds like Naphthalene, Acenaphthene, etc.





# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 171219-19  
**Location:** Kraft, Banbury

**Client Reference:** 70041591  
**Order Number:** 6316510

**Report Number:** 438677  
**Superseded Report:**

## SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	WS202	WS205			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference					
M	mCERTS accredited.		0.00 - 0.00	0.00 - 0.00			
aq	Aqueous / settled sample.		Ground Water (GW)	Ground Water (GW)			
diss.filt	Dissolved / filtered sample.		15/12/2017	15/12/2017			
tot.unfilt	Total / unfiltered sample.		.	.			
*	Subcontracted test.		19/12/2017	19/12/2017			
**	% 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		171219-19	171219-19			
(F)	Trigger breach confirmed		16785900	16785908			
1-5&*\$@	Sample deviation (see appendix)		EW	EW			
Component	LOD/Units		Method				
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
2-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
4-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Azobenzene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Acenaphthylene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Acenaphthene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Anthracene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	<2	@ #	@ #	
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	



# CERTIFICATE OF ANALYSIS

Validated

SDG: 171219-19  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 6316510

Report Number: 438677  
Superseded Report:

## SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	WS202	WS205			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00	0.00 - 0.00			
M	mCERTS accredited.		Ground Water (GW)	Ground Water (GW)			
aq	Aqueous / settled sample.		15/12/2017	15/12/2017			
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.		19/12/2017	19/12/2017			
*	Subcontracted test.		171219-19	171219-19			
**	% 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		16785900	16785908			
(F)	Trigger breach confirmed		EW	EW			
1-5&*\$@	Sample deviation (see appendix)						
Component	LOD/Units		Method				
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Carbazole (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Chrysene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Dibenzofuran (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Diethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5	<5	@ #	@ #	
Fluoranthene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Fluorene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Pentachlorophenol (aq)	<1 µg/l	TM176	<1	<1			
Phenol (aq)	<1 µg/l	TM176	<1	<1			
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Hexachloroethane (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Nitrobenzene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Naphthalene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Isophorone (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1	<1			
Phenanthrene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	
Pyrene (aq)	<1 µg/l	TM176	<1	<1	@ #	@ #	



CERTIFICATE OF ANALYSIS

Validated

SDG: 171219-19
Location: Kraft, Banbury

Client Reference: 70041591
Order Number: 6316510

Report Number: 438677
Superseded Report:

TPH CWG (W)

Table with columns: Results Legend, Customer Sample Ref., WS202, WS205, WS207, Component, LOD/Units, Method. Rows include GRO Surrogate % recovery, GRO >C5-C12, Aliphatics >C5-C6, Aromatics >EC5-EC7, etc.



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 171219-19  
**Location:** Kraft, Banbury

**Client Reference:** 70041591  
**Order Number:** 6316510

**Report Number:** 438677  
**Superseded Report:**

**VOC MS (W)**

Results Legend			Customer Sample Ref.	WS202	WS205	WS207			
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.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&*\$@ Sample deviation (see appendix)			Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 15/12/2017 19/12/2017 171219-19 16785900 EW	0.00 - 0.00 Ground Water (GW) 15/12/2017 19/12/2017 171219-19 16785908 EW	0.00 - 0.00 Ground Water (GW) 15/12/2017 19/12/2017 171219-19 16785914 EW			
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM208	104	106					
Toluene-d8**	%	TM208	98.4	98.9					
4-Bromofluorobenzene**	%	TM208	98.5	97.3					
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	#	#			
Chloromethane	<1 µg/l	TM208	<1	<1	#	#			
Vinyl chloride	<1 µg/l	TM208	<1	<1	#	#			
Bromomethane	<1 µg/l	TM208	<1	<1	#	#			
Chloroethane	<1 µg/l	TM208	<1	<1	#	#			
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	#	#			
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#			
Carbon disulphide	<1 µg/l	TM208	<1	<1	#	#			
Dichloromethane	<3 µg/l	TM208	<3	<3	#	#			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	#	#	<1		
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#			
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	#	#			
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#			
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#			
Bromochloromethane	<1 µg/l	TM208	<1	<1	#	#			
Chloroform	<1 µg/l	TM208	<1	<1	#	#			
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	#	#			
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#			
Carbontetrachloride	<1 µg/l	TM208	<1	<1	#	#			
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	#	#			
Benzene	<1 µg/l	TM208	<1	<1	#	#	<1		
Trichloroethene	<1 µg/l	TM208	<1	<1	#	#			
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#			
Dibromomethane	<1 µg/l	TM208	<1	<1	#	#			
Bromodichloromethane	<1 µg/l	TM208	<1	<1	#	#			
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#			
Toluene	<1 µg/l	TM208	<1	<1	#	#	<1		
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#			
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	#	#			



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 171219-19  
**Location:** Kraft, Banbury

**Client Reference:** 70041591  
**Order Number:** 6316510

**Report Number:** 438677  
**Superseded Report:**

**VOC MS (W)**

Results Legend		Customer Sample Ref.	WS202	WS205	WS207		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
M	mCERTS accredited.		0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
aq	Aqueous / settled sample.		Ground Water (GW)	Ground Water (GW)	Ground Water (GW)		
diss.filt	Dissolved / filtered sample.		15/12/2017	15/12/2017	15/12/2017		
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&*\$@	Sample deviation (see appendix)						
Component	LOD/Units		Method				
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1			
Tetrachloroethene	<1 µg/l	TM208	<1	<1			
Dibromochloromethane	<1 µg/l	TM208	<1	<1			
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1			
Chlorobenzene	<1 µg/l	TM208	<1	<1			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1			
Ethylbenzene	<1 µg/l	TM208	<1	<1	<1		
m,p-Xylene	<1 µg/l	TM208	<1	<1	<1		
o-Xylene	<1 µg/l	TM208	<1	<1	<1		
Styrene	<1 µg/l	TM208	<1	<1			
Bromoform	<1 µg/l	TM208	<1	<1			
Isopropylbenzene	<1 µg/l	TM208	<1	<1			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1			
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1			
Bromobenzene	<1 µg/l	TM208	<1	<1			
Propylbenzene	<1 µg/l	TM208	<1	<1			
2-Chlorotoluene	<1 µg/l	TM208	<1	<1			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	<1			
4-Chlorotoluene	<1 µg/l	TM208	<1	<1			
tert-Butylbenzene	<1 µg/l	TM208	<1	<1			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	<1			
sec-Butylbenzene	<1 µg/l	TM208	<1	<1			
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1			
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1			
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1			
n-Butylbenzene	<1 µg/l	TM208	<1	<1			
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1			
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1			
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1			
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1	<1		
Naphthalene	<1 µg/l	TM208	<1	<1			



CERTIFICATE OF ANALYSIS

Validated

SDG: 171219-19
Location: Kraft, Banbury

Client Reference: 70041591
Order Number: 6316510

Report Number: 438677
Superseded Report:

VOC MS (W)

Table with columns: Results Legend, Customer Sample Ref., WS202, WS205, WS207, Component, LOD/Units, Method. Rows include 1,2,3-Trichlorobenzene, 1,3,5-Trichlorobenzene, VOC TIC, Sum of detected Xylenes, Total VOC TIC.



# CERTIFICATE OF ANALYSIS

Validated

SDG: 171219-19 Client Reference: 70041591 Report Number: 438677  
Location: Kraft, Banbury Order Number: 6316510 Superseded Report:

## Table of Results - Appendix

Method No	Reference	Description
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM331		Low Level Hexavalent Chromium

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b> 171219-19	<b>Client Reference:</b> 70041591	<b>Report Number:</b> 438677
<b>Location:</b> Kraft, Banbury	<b>Order Number:</b> 6316510	<b>Superseded Report:</b>

## Test Completion Dates

Lab Sample No(s)	16785900	16785908	16785914
Customer Sample Ref.	WS202	WS205	WS207
AGS Ref.	EW	EW	EW
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water

Dissolved Metals by ICP-MS	29-Dec-2017	29-Dec-2017	29-Dec-2017
EPH CWG (Aliphatic) Aqueous GC (W)	28-Dec-2017	28-Dec-2017	28-Dec-2017
EPH CWG (Aromatic) Aqueous GC (W)	28-Dec-2017	28-Dec-2017	28-Dec-2017
GRO by GC-FID (W)	22-Dec-2017	22-Dec-2017	22-Dec-2017
Low Level Hexavalent Chromium (w)	28-Dec-2017	28-Dec-2017	28-Dec-2017
Mercury Dissolved	03-Jan-2018	03-Jan-2018	03-Jan-2018
PAH Spec MS - Aqueous (W)	28-Dec-2017	28-Dec-2017	28-Dec-2017
pH Value	27-Dec-2017	27-Dec-2017	27-Dec-2017
SVOC MS (W) - Aqueous	28-Dec-2017	28-Dec-2017	
TPH CWG (W)	28-Dec-2017	28-Dec-2017	28-Dec-2017
VOC MS (W)	22-Dec-2017	22-Dec-2017	22-Dec-2017





# CERTIFICATE OF ANALYSIS

Validated

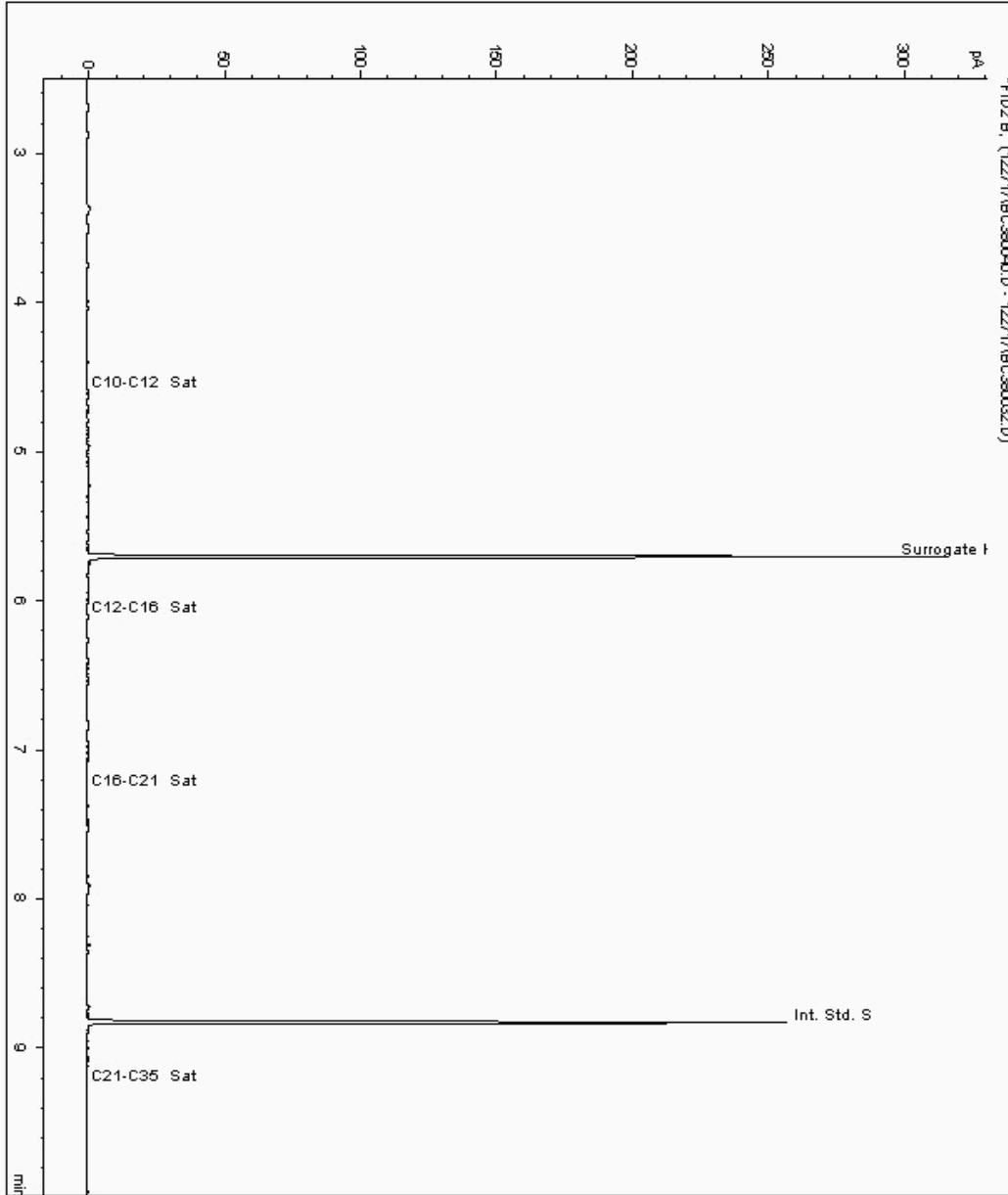
SDG: 171219-19 Client Reference: 70041591 Report Number: 438677  
Location: Kraft, Banbury Order Number: 6316510 Superseded Report:

## Chromatogram

Analysis: EPH CWG (Aliphatic) Aqueous GC (W) Sample No : 16786722 Depth : 0.00 - 0.00  
Sample ID : WS207

Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 15744796-  
Date Acquired : 28/12/17 10:30:35 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.025





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171219-19  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 6316510

Report Number: 438677  
Superseded Report:

## Chromatogram

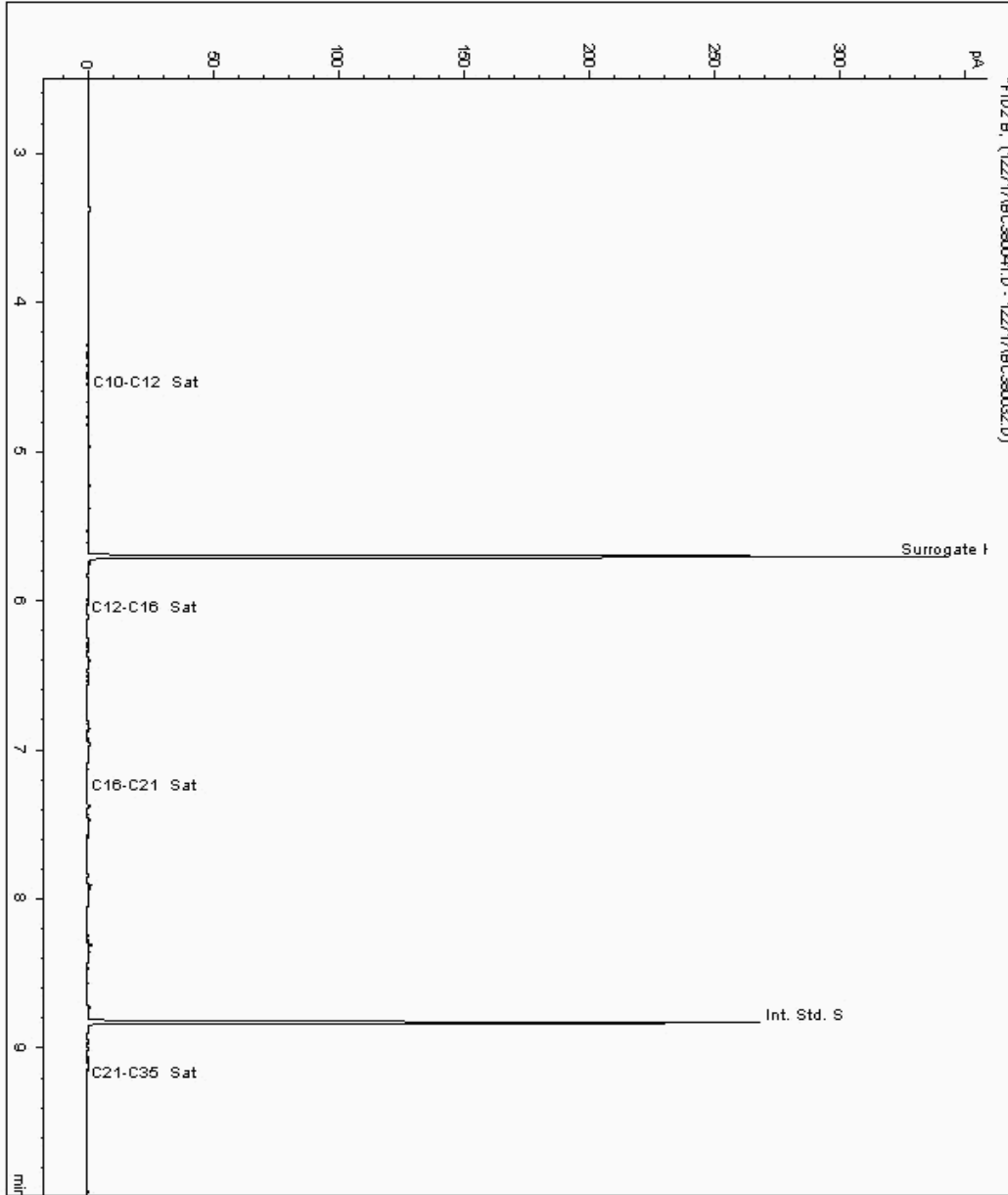
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 16786812  
Sample ID : WS205

Depth : 0.00 - 0.00

Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 15744784-  
Date Acquired : 28/12/17 10:52:28 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.025





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171219-19  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 6316510

Report Number: 438677  
Superseded Report:

## Chromatogram

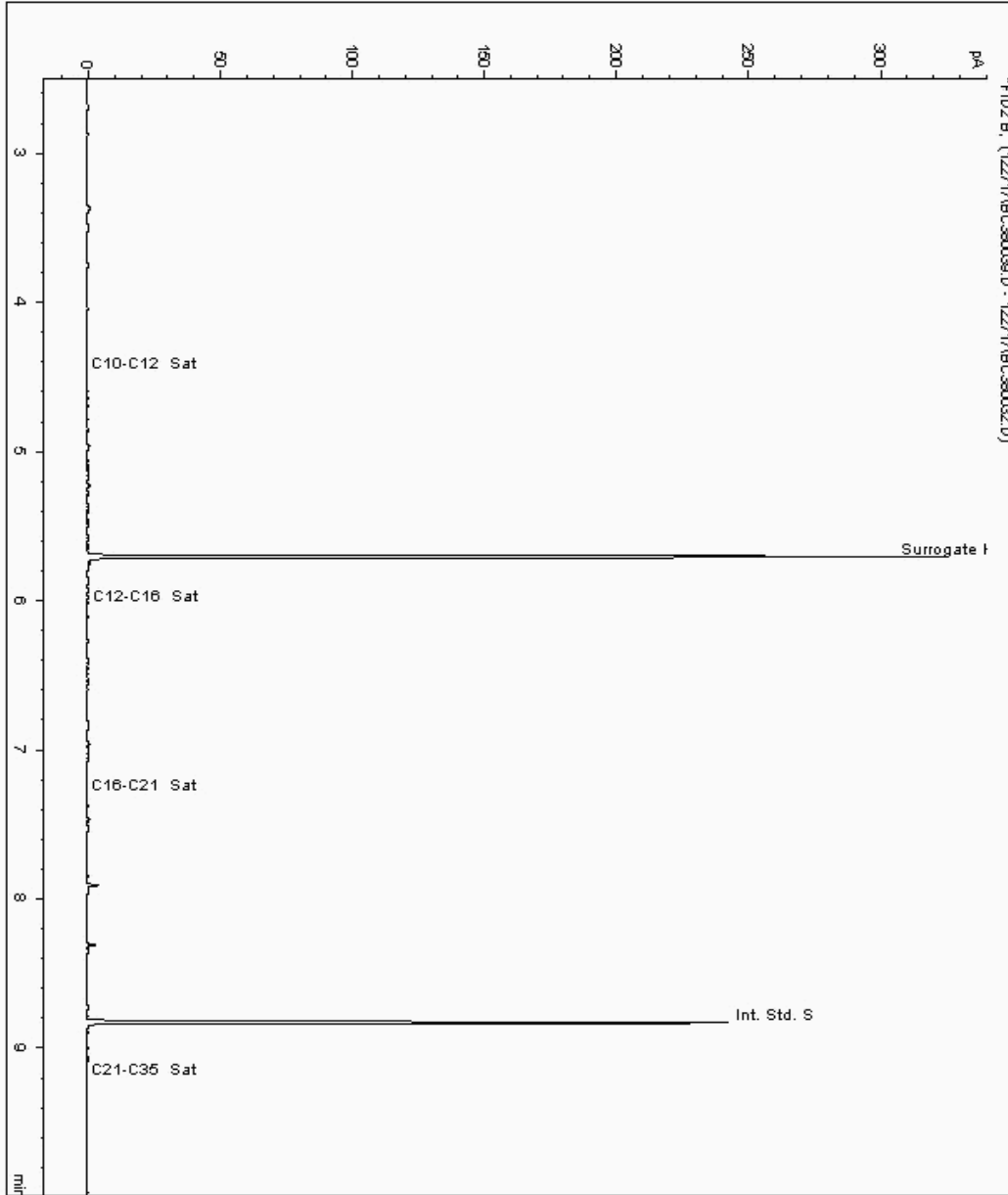
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 16786828  
Sample ID : WS202

Depth : 0.00 - 0.00

Speciated TPH - SATS ( C12 - C40 )

Sample Identity: 15744771-  
Date Acquired : 28/12/17 10:09:05 PM  
Units : ppb  
Dilution :  
CF : 1  
Multiplier : 0.025





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171219-19  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 6316510

Report Number: 438677  
Superseded Report:

## Chromatogram

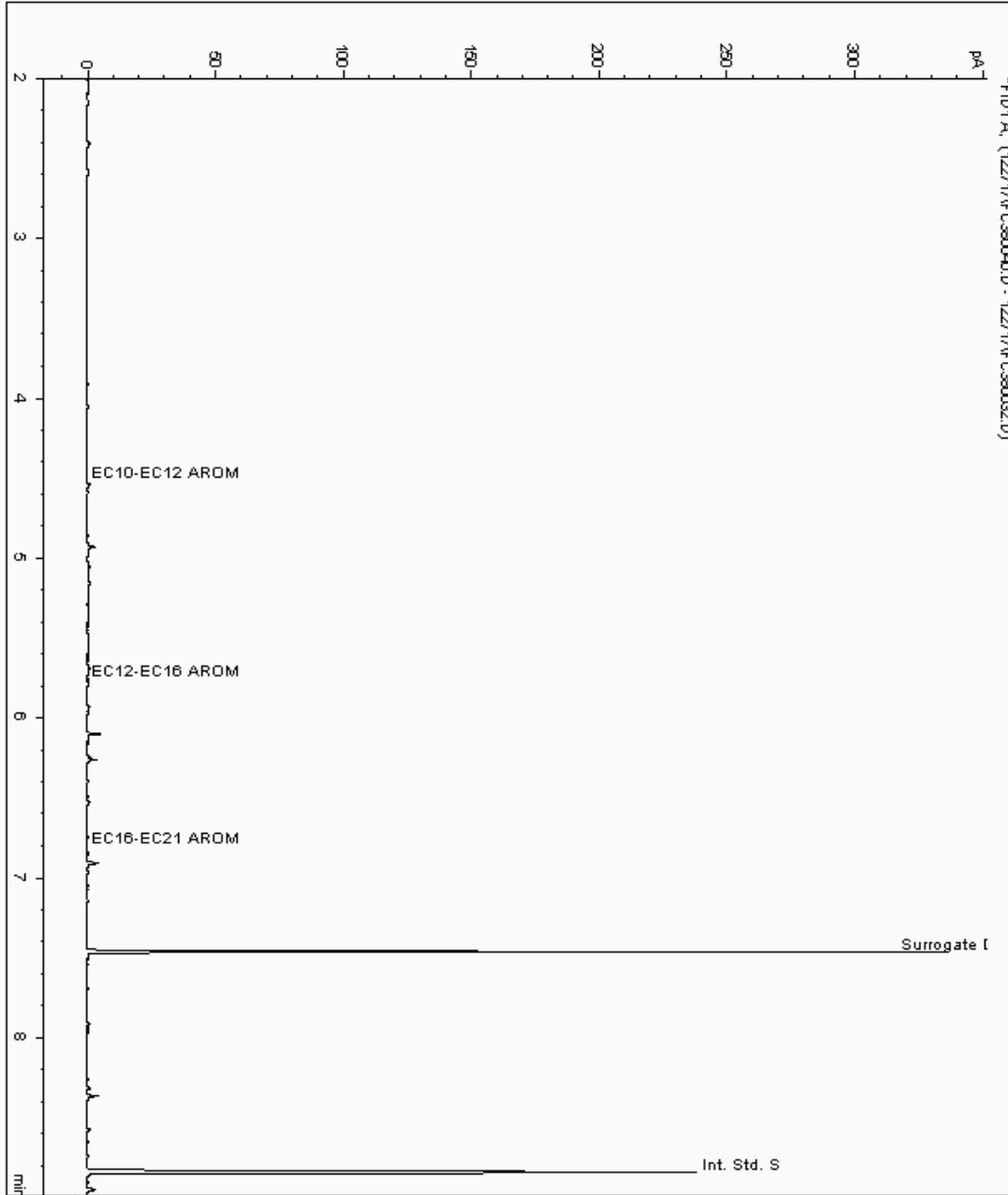
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 16786722  
Sample ID : WS207

Depth : 0.00 - 0.00

Alcontrol/Geochem Analytical Services  
EPH Range Organics ( C10 - C40 )

Sample Identity : 15744797-  
Date Acquired : 28/12/17 10:30:35 PM  
Units : mg/kg  
Sample Multiplier : 0.000  
Dilution :





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171219-19  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 6316510

Report Number: 438677  
Superseded Report:

## Chromatogram

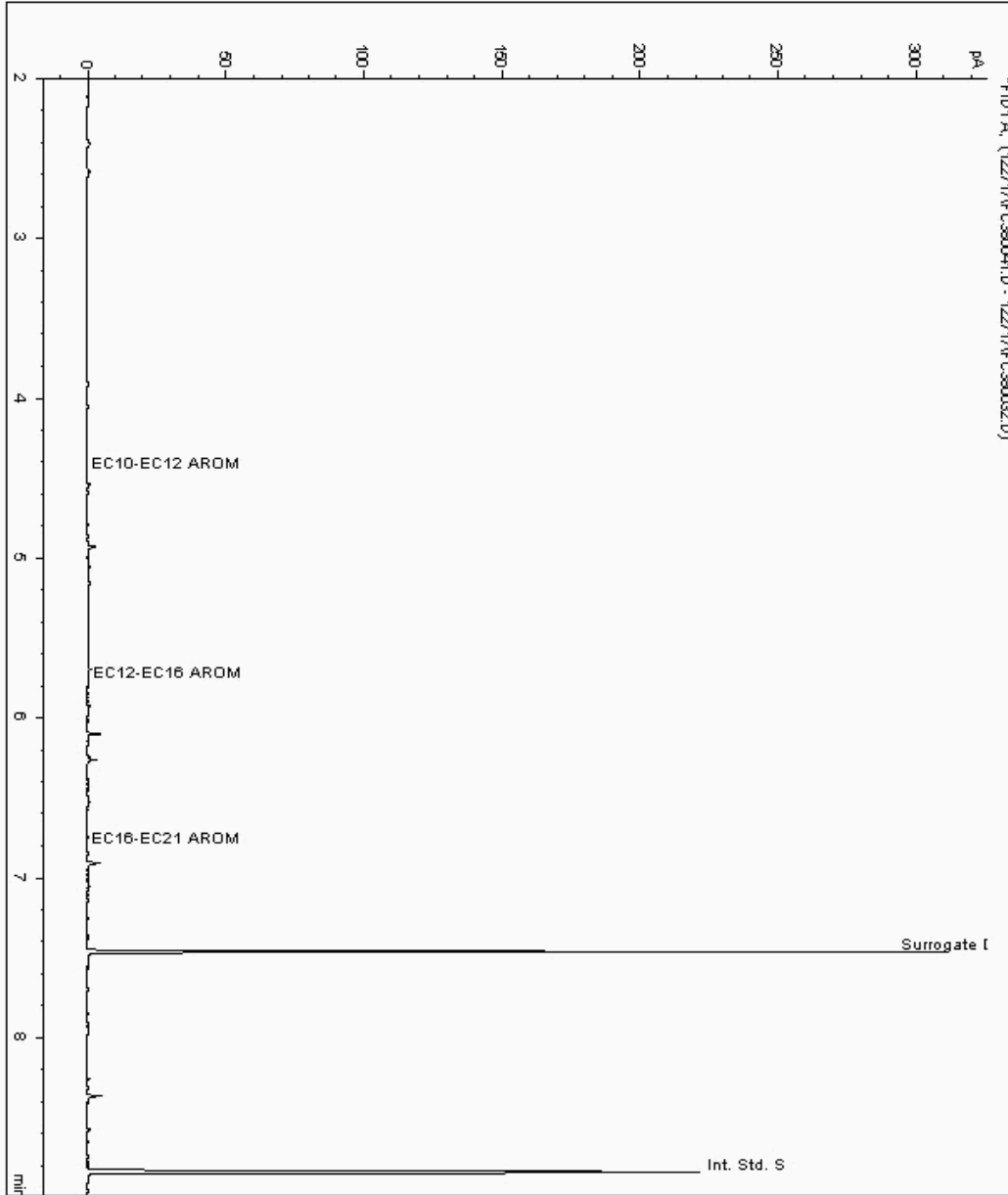
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 16786812  
Sample ID : WS205

Depth : 0.00 - 0.00

Alcontrol/Geochem Analytical Services  
EPH Range Organics ( C10 - C40 )

Sample Identity : 15744785-  
Date Acquired : 28/12/17 10:52:28 PM  
Units : mg/kg  
Sample Multiplier : 0.000  
Dilution :





CERTIFICATE OF ANALYSIS

Validated

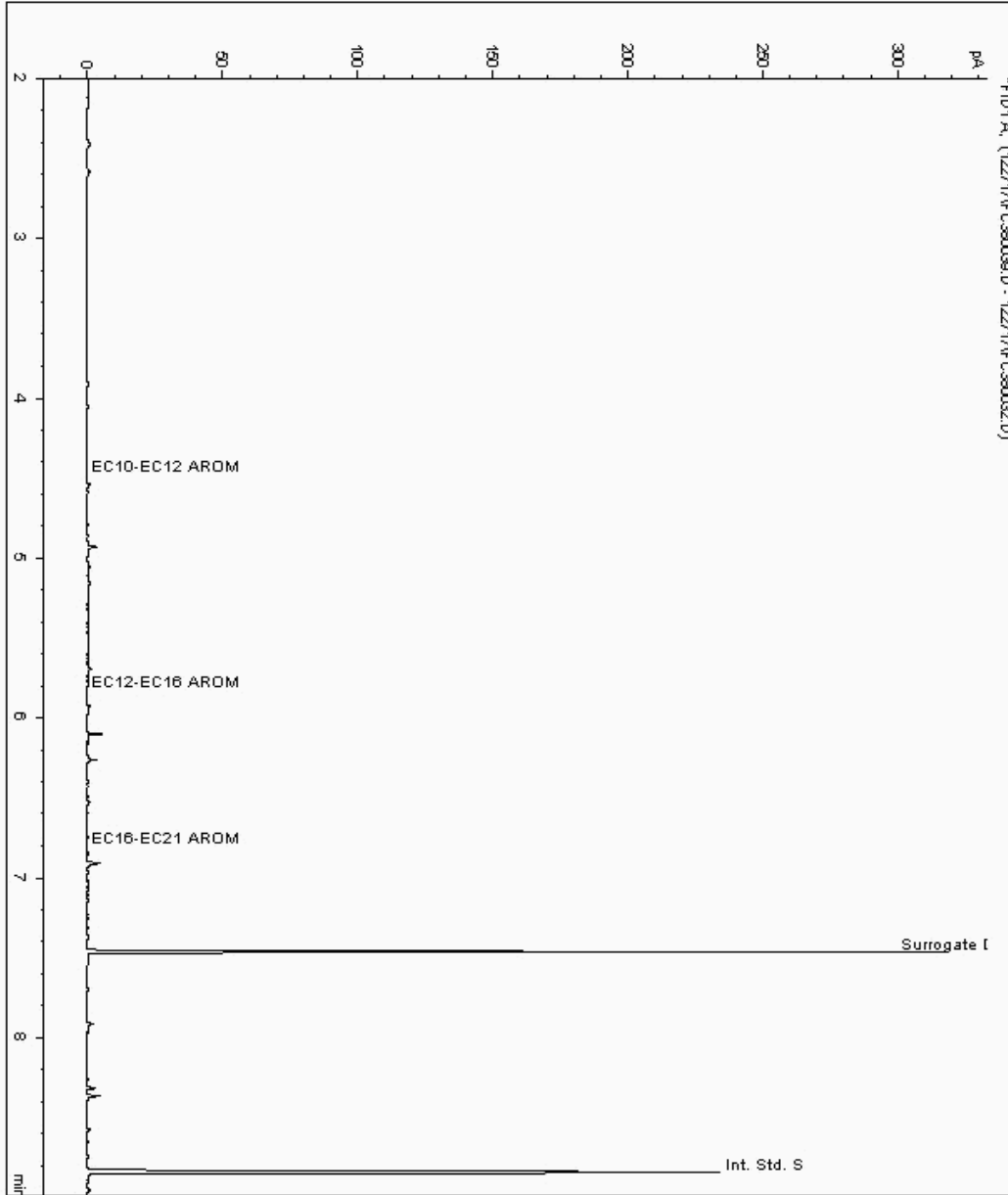
SDG: 171219-19 Client Reference: 70041591 Report Number: 438677  
Location: Kraft, Banbury Order Number: 6316510 Superseded Report:

Chromatogram

Analysis: EPH CWG (Aromatic) Aqueous GC (W) Sample No : 16786828 Depth : 0.00 - 0.00  
Sample ID : WS202

Alcontrol/Geochem Analytical Services  
EPH Range Organics ( C10 - C40 )

Sample Identity : 15744772-  
Date Acquired : 28/12/17 10:09:05 PM  
Units : mg/kg  
Sample Multiplier : 0.000  
Dilution :





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171219-19  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 6316510

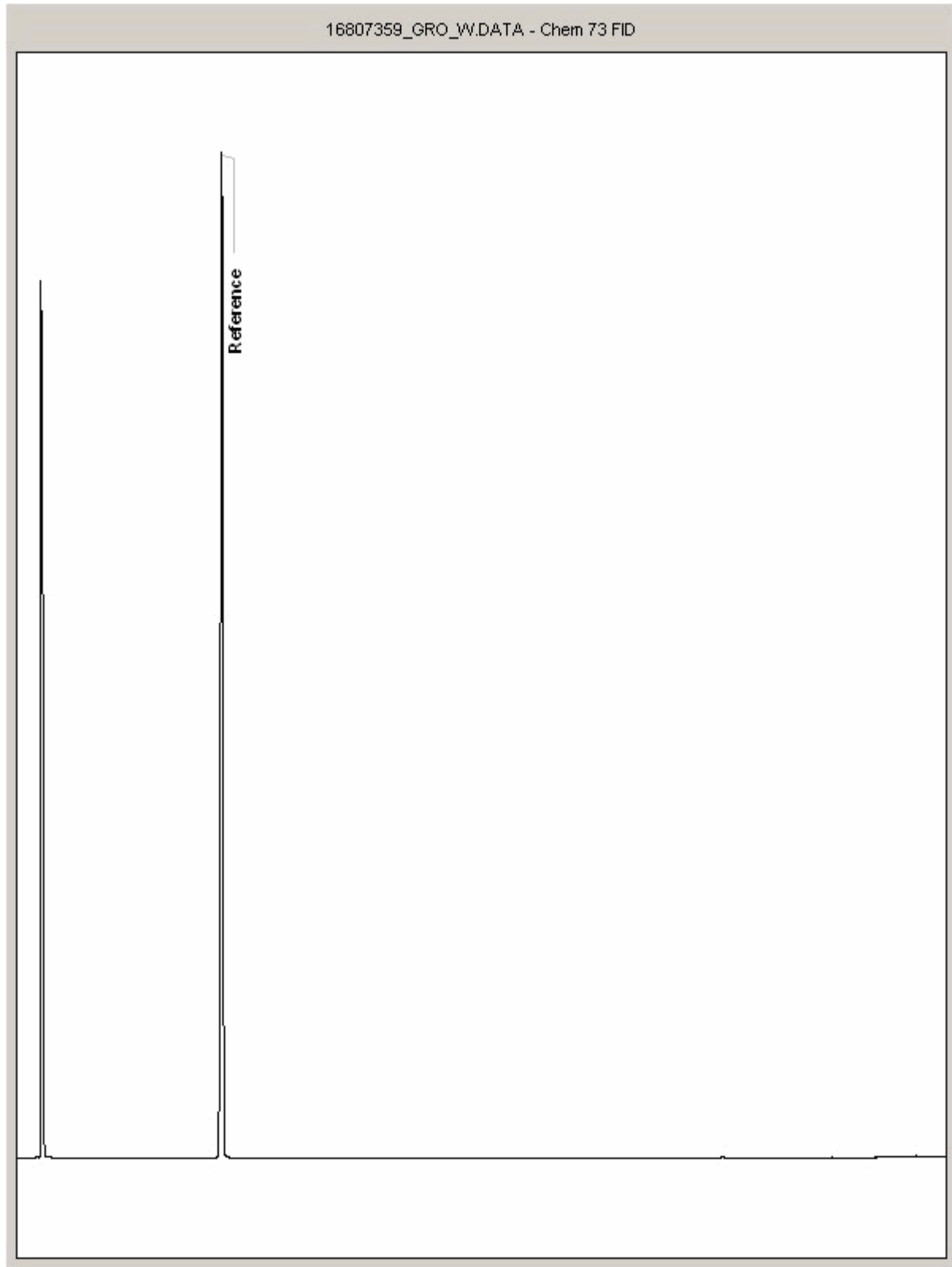
Report Number: 438677  
Superseded Report:

## Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 16807359  
Sample ID : WS202

Depth : 0.00 - 0.00





# CERTIFICATE OF ANALYSIS

Validated

SDG: 171219-19  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 6316510

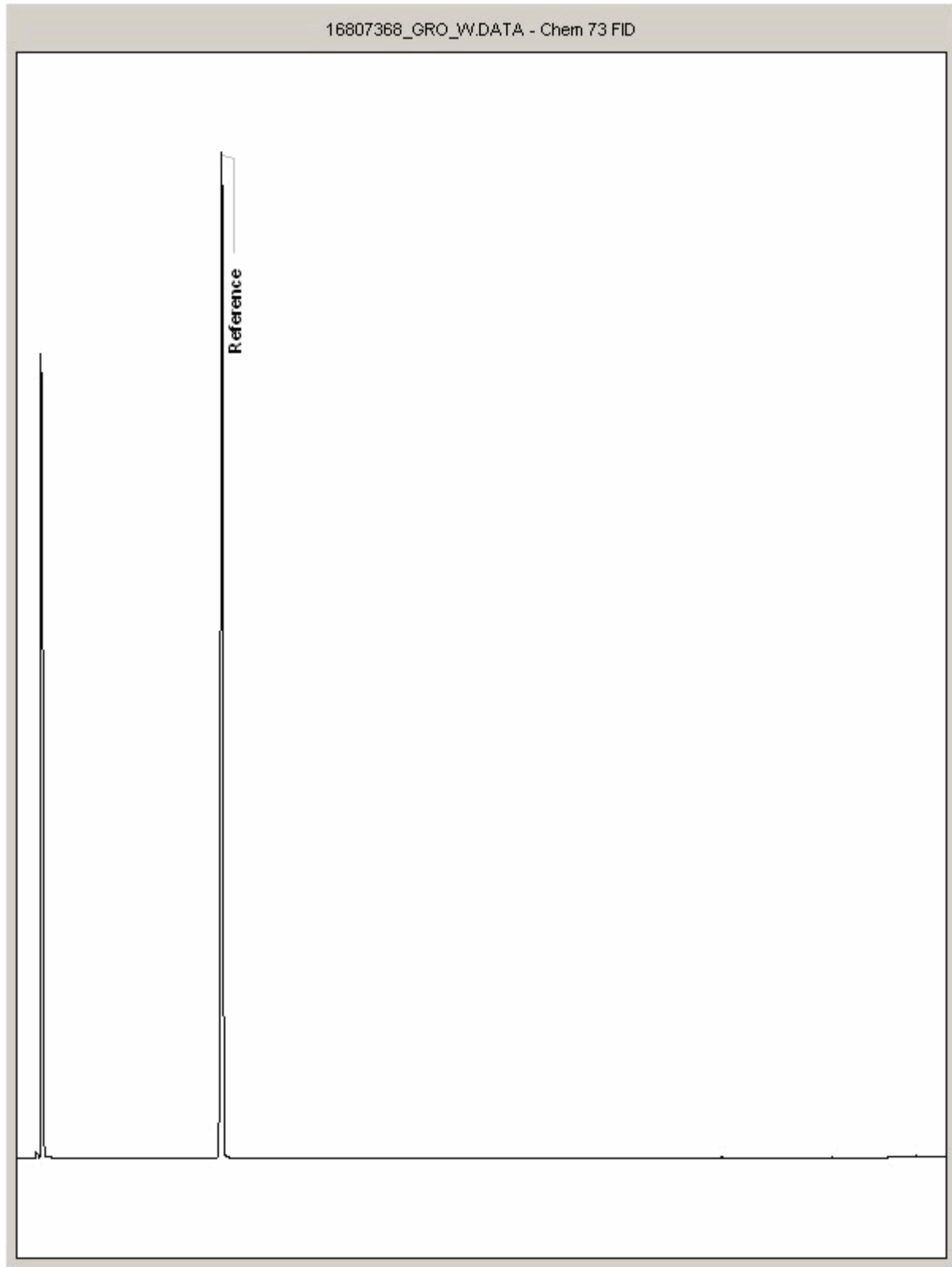
Report Number: 438677  
Superseded Report:

## Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 16807368  
Sample ID : WS207

Depth : 0.00 - 0.00







# CERTIFICATE OF ANALYSIS

Validated

SDG: 171219-19  
Location: Kraft, Banbury

Client Reference: 70041591  
Order Number: 6316510

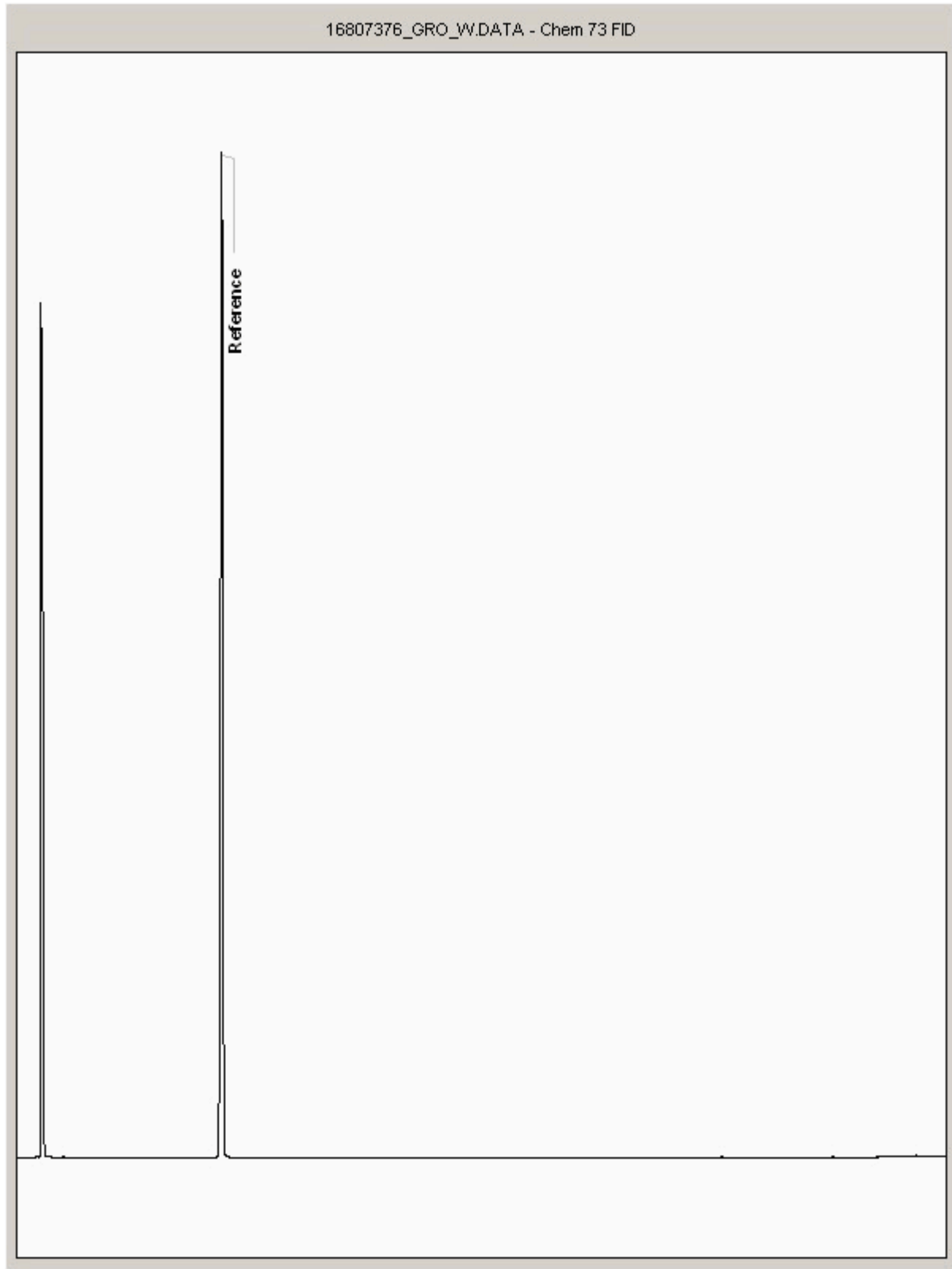
Report Number: 438677  
Superseded Report:

## Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 16807376  
Sample ID : WS205

Depth : 0.00 - 0.00





# CERTIFICATE OF ANALYSIS

<b>SDG:</b> 171219-19	<b>Client Reference:</b> 70041591	<b>Report Number:</b> 438677
<b>Location:</b> Kraft, Banbury	<b>Order Number:</b> 6316510	<b>Superseded Report:</b>

## 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. ALS 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 leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

21. 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.

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

If a sample is classed as deviated then the associated results may be compromised.

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
§	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 ALS (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 ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

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

### Visual Estimation Of Fibre Content

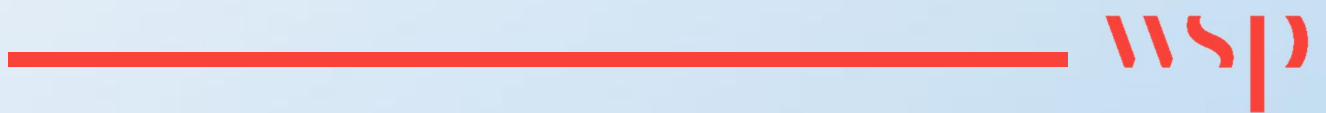
Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

**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.**

# Appendix D

HUMAN HEALTH GAC DERIVATION



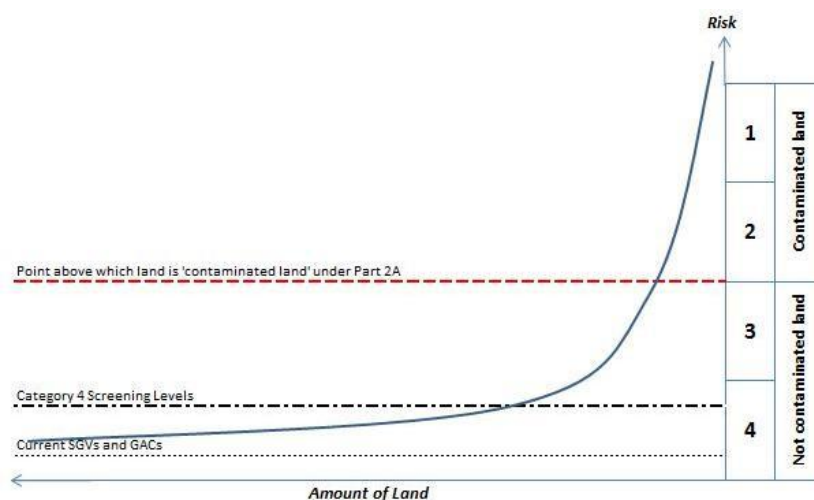
# METHODOLOGY FOR THE DERIVATION OF GENERIC QUANTITATIVE ASSESSMENT CRITERIA TO EVALUATE RISKS TO HUMAN HEALTH FROM SOIL & GROUNDWATER CONTAMINATION

## UK APPROACH

In the UK, the potential risks to human health from contamination in the ground are usually evaluated through a generic quantitative risk assessment (GQRA) approach. This allows generic and conservative exposure assumptions to be readily applied to risk assessments and can be a useful tool for rapidly screening data and to identify those contaminants or scenarios that could benefit from further investigation and/or site-specific detailed quantitative risk assessment (DQRA). Current industry good practice is to use the approach presented in the Environment Agency (EA) publications SR2<sup>1</sup> and SR3<sup>2</sup>. This approach allows the derivation of Generic Assessment Criteria (GACs), primarily for chronic exposure.

In April 2012, the Department of Environment, Food and Rural Affairs (Defra) published updated statutory guidance<sup>3</sup> which introduced a four category approach to determining whether land in England and Wales is contaminated or not on the grounds of significant possibility of significant harm (SPOSH). **Figure 1** presents a graphical representation of the categories.

**Figure 1: Four Categories for Determining if Land Represent a SPOSH**



Cases classified as Category 1 are considered to be SPOSH based on actual evidence or an unacceptably high probability of harm existing. Category 4 cases are those where there is no risk, or a low risk of SPOSH.

<sup>1</sup> Environment Agency 'Human Health Toxicological Assessment of Contaminants in Soil', Report SC050021/SR2. January 2009.

<sup>2</sup> Environment Agency 'Updated Technical Background to the CLEA Model,' Report SC050021/SR3. January 2009.

<sup>3</sup> Defra 'Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance'. April 2012.

GACs represent a minimal risk level, well within Category 4. A 2014 publication by Contaminated Land: Applications in Real Environments (CL:AIRE), SP1010<sup>4</sup> and endorsed by Defra<sup>5</sup> provided an approach to determine Category 4 Screening Levels (C4SLs) which are higher than the GACs whilst being “more pragmatic but still strongly precautionary”. It also provided C4SLs for six contaminants of concern. Although the C4SLs were designed to support Part 2A assessments to determine ‘contaminated land’ they are specifically mentioned, along with reference to the Part 2A statutory guidance, by the Department for Communities and Local Government (DCLG) for use in a planning context<sup>6</sup>.

An updated version the Contaminated Land Exposure Assessment (CLEA) Workbook (v1.071) was released by the EA in September 2015 to take into account the publication of SP1010. The updates comprised: additional toxicity data for the six chemicals for which C4SLs were derived; two new public open space land use scenarios; updated exposure parameters; options to run the model using C4SL exposure assumptions; and increased functionality. There were no changes to algorithms, so it is still possible to replicate the withdrawn SGVs using the input parameters held within v1.071.

It should be noted that the four category approach has not been adopted in Scotland under Part 2A or the planning regime. The Part 2A statutory guidance applicable in Scotland (Paper SE/2006/44 dated May 2006) does not reflect the changes introduced by Defra in April 2012 which allow for the use of C4SLs within Part 2A risk assessments. Additionally, it is considered that the principal of ‘minimal risk’ should still apply under planning in Scotland, based on current guidance.

## WSP APPROACH

Following the withdrawal of the SGVs, and in the absence of an industry-wide, accepted set of GACs it is down to individual practitioners to derive their own soil assessment criteria. WSP has used the approach provided within SR2, SR3, SP1010, CLEA Workbook v1.071 and SR4<sup>7</sup> to produce a set of minimal risk GACs. The chemical-specific data within two key publications were considered during their production: CL:AIRE 2010<sup>8</sup> and LQM 2015<sup>9</sup>. Both documents provide comprehensive sets of GACs for different contaminants of concern.

The LQM Suitable For Use Levels (S4ULs) have selected exposure parameters somewhere between those of the SR3 land uses and the C4SL exposure scenarios. This approach was rejected by WSP as not representing minimal risk, however, the LQM S4UL document was critically reviewed and the approach and chemical input parameters were utilised where considered to be appropriate.

An industry-led C4SL Working Group is in the process of deriving a larger set of C4SLs in the near future, for approximately 20 contaminants. This will include a critical review of the chemical input data for all selected substances, and may therefore lead to further amendments to the chemical input data used in the WSP in-house screening values. It is considered likely that the contaminant list will

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<sup>4</sup> CL:AIRE ‘Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination’ SP1010, Final Project Report (Revision 2). September 2014.

<sup>5</sup> Defra ‘SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document’. December 2014.

<sup>6</sup> DCLG Planning Practice Guidance ‘Land Affected by Contamination’, particularly Paragraphs 001 and 007. Ref IDs: 33-001-20140306 & 33-007-20140612.

<sup>7</sup> Environment Agency ‘CLEA Software (Version 1.05) Handbook (and Software)’, Report SC050021/SR4. September 2009.

<sup>8</sup> CL:AIRE ‘The EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment’. ISBN 978-1-05046-20-1. January 2010.

<sup>9</sup> Nathanail et al ‘The LQM/CIEH S4ULs for Human Health Risk Assessment’, Land Quality Press, ISBN 978-0-9931084-0-2. 2015.

crossover with the current CL:AIRE GACs. As such, this document was not critically reviewed by WSP.

WSP's current approach to the assessment of risks to human health is to continue to evaluate minimal risk through the use of in-house derived GACs, and to use the published C4SLs as a secondary tier of assessment until such time as additional C4SLs are published and/or in-house values are derived.

## EXPOSURE MODELS

### LAND USES

WSP has largely adopted the exposure assumptions of the generic land use scenarios included within SR3, with two additional public open space scenarios included from within SP1010:

- à Residential with homegrown produce consumption;
- à Residential without homegrown produce consumption;
- à Allotments;
- à Commercial;
- à Public open space near residential housing (POS<sub>resi</sub>); and
- à Public park (POS<sub>park</sub>).

Exceptions are described in the following Sections.

### SOIL PROPERTIES

SR3 assumes a sandy loam soil with a pH of 7 and a Soil Organic Matter (SOM) content of 6% for its generic land uses, based on the geographical spread of topsoils in the UK. WSP has adopted these default values. In addition, GACs based on an SOM of 1% and 2.5% have been derived, based on common experience of the nature of Made Ground and lack of topsoil on many brownfield sites.

### RECEPTOR CHARACTERISTICS AND BEHAVIOURS

SP1010 provides some updated exposure parameters for long-term inhalation rates<sup>10</sup> and the consumption rates for homegrown produce<sup>11</sup> compared to those provided in SR3. This data was used to derive WSP's GACs.

The changes in inhalation rates do not apply to the allotment generic land use scenario, as these are based on the breathing rates for short-term exposure of light to moderate intensity activity which were derived from a study that was not updated in USEPA 2011, so the SR3 rates were retained.

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<sup>10</sup> USEPA, National Centre for Environmental Assessment 'Exposure Factors Handbook: 2011 Edition' EPA/600/R-09/052F. September 2011.

<sup>11</sup> National Diet and Nutrition Survey 2008/2009 to 2010/2011.

## CHEMICAL DATA

### PHYSICO-CHEMICAL PARAMETERS

Physico-chemical properties for the contaminants for which GACs have been derived have been obtained following critical review of the following hierarchy of data sources:

1. Environment Agency/Defra SGV reports where available.
2. Environment Agency 'Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values', Report SC050021/SR7, November 2008.
3. Published fate and transport reviews within Nathanail et. al 2015 and CL:AIRE 2010.

Where appropriate, and where sufficient data is available, values were adjusted to reflect a UK soil temperature of 10°C (e.g.  $K_{aw}$ ).

### TOXICOLOGICAL DATA

Toxicological data for the derivation of minimal risk Health Criteria Values (HCV) for each contaminant was selected with due regard to the approach presented in SR2. Where appropriate, the following hierarchy of data sources was used:

1. UK toxicity reviews published by authoritative bodies including:
  - < EA;
  - < Public Health England (PHE);
  - < Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT); and
  - < Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (COC).
2. Authoritative European sources such as European Food Standards Agency (EFSA)
3. International organisations including:
  - < World Health Organisation (WHO); and
  - < Joint FAO/WHO Expert Committee on Food Additives (JECFA).
4. Authoritative country-specific sources including:
  - < United States Environmental Protection Agency (USEPA);
  - < US Agency for Toxic Substances and Disease Registry (ATSDR);
  - < US Integrated Risk Information System (IRIS); and
  - < Netherlands National Institute for Public Health and the Environment (RIVM).

Factors such as the applicability of the data to human health (e.g. epidemiological vs. animal studies), the quality of the data, the level of uncertainty in the results and the age of the data were also taken into account in the final selection. Details for specific substances are available on request.

## MEAN DAILY INTAKES

Estimations of background exposure for each threshold substance have been updated. In line with the SR2 approach, the exposure from non-threshold substances in the soil does not take into account exposure from other sources, and as such GACs were derived without consideration of the Mean Daily Intake (MDI) for those substances.

The data published by the EA in its series of TOX reports between 2002 and 2009 was evaluated to determine whether the values were considered to remain valid today. Values from these current UK published sources were not amended unless they were considered to be significantly different so that the GACs remained as comparable as possible with the revoked SGVs.

## ORAL MEAN DAILY INTAKES

Oral MDI were generally estimated as the sum of exposure via the ingestion of food and drinking water using the default adult physiological parameters presented in Table 3.3 of SR2.

Data on the exposure of substances from food ingestion was generally obtained from UK Total Diet Studies (TDS) published by the Food Standards Agency (FSA) and its predecessor the Ministry of Agriculture, Fisheries and Food (MAFF) and from studies commissioned by COT. Where no UK-specific data was available, MDI were derived from the European Food Safety Authority (EFSA), Health Canada and US sources. This was a rare occurrence, and in these instances, the data was evaluated to determine its applicability to the UK.

Data on the concentrations of substances in tap water was obtained from a variety of sources. UK data was used where available, with preference given to Drinking Water Inspectorate (DWI) 2014 data from water company tap water testing (LOD, 1<sup>st</sup> and 99<sup>th</sup> percentile data is available). Where the substance was not included in tap water testing, other UK sources of information were considered including:

- à DWI data from water company tap water testing from previous years;
- à COT; and
- à FSA.

Where UK data was not available, a number of other data sources were considered, largely WHO International Programme on Chemical Safety (IPCS) Concise International Chemical Assessment Documents (CICADs) and background documents for the development of Guidelines for Drinking Water Quality, using professional judgement on the relevance of the data to the UK. The final decision on the MDI from drinking water was made using professional judgement on the balance of relevance and probability, taking into account the detection limit where not detected, Koc and solubility, reduction in use of the substance, banned substances, tight controls (e.g. on explosives) and with due consideration to the SR2 instruction that “if no data or information in background exposure are available, background exposure should be assumed to be negligible and the MDI set to zero....”.

Data from other countries was generally not used because it was considered that the hydrogeology of these countries along with industrial practices were unlikely to be reflective of the UK.



## INHALATION MEAN DAILY INTAKES

Inhalation MDIs were based on estimates of average daily exposure by the inhalation pathway and calculated using the default adult physiological parameters presented in Table 3.3 of SR2.

The inhalation MDIs were generally estimated using background exposure data from the UK, derived from Defra's UK-AIR: Air Information Resource<sup>12</sup>, which provides ambient air quality data from a number of sites forming a UK-wide monitoring network. The MDIs for heavy metals were based on rolling annual average metal mass concentration data from Defra's UK Heavy Metals Monitoring Network from the period October 2009 to September 2010<sup>13</sup>.

Information for some substances was obtained from UK sources including Environment Agency TOX reports and data from the UK Expert Panel on Air Quality Standards (EPAQS). Where recent UK data was not available, data was sourced from the International Programme on Chemical Safety (IPCS), the World Health Organisation (WHO), the Agency for Toxic Substances and Diseases Registry (ATSDR), Health Canada, and various other peer-reviewed sources summarised by LQM/CIEH<sup>14</sup>.

For other substances, where no data or information on background exposure was available, background exposure was assumed to be negligible and the MDI set at 0.5\*TDI in accordance with guidance in SR2.

## PLANT UPTAKE

Soil to plant concentration factors are available in CLEA v1.071 for arsenic, cadmium, hexavalent chromium, lead, mercury, nickel and selenium. For all remaining inorganic chemicals, concentration factors were obtained using the PRISM model. Substance-specific correction factors have been selected in accordance with the guidance established within SR3. This is consistent to the approach utilised in the derivation of the LQM S4UL values and the EIC/AGS/CL:AIRE GAC.

Where there is a lack of appropriate data to enable the derivation of specific soil to plant concentrations factors for organic chemicals, plant uptake was modelled within CLEA v1.071 using the generic equations recommended within SR3, as follows:

- à Green Vegetables – Ryan et al. (1988);
- à Root Vegetables – Trapp (2002);
- à Tuber Vegetables – Trapp et al. (2007); and
- à Tree Fruit – Trapp et al. (2003).

There are no suitable models available for modelling uptake for herbaceous fruit or shrub fruit. Exposure is considered negligible.

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<sup>12</sup> Crown 2016 copyright Defra via uk-air.defra.gov.uk, licenced under the Open Government Licence (OGL).

<sup>13</sup> Defra, 2013 Spreadsheet of historic data for multiple years for the Metals network. Available online at: <http://uk-air.defra.gov.uk/data/metals-data>. [Accessed 13/03/2016].

<sup>14</sup> LQM/CIEH, 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment.

## SOIL SATURATION LIMITS

GACs are not limited to their theoretical soil saturation within CLEA, although where either the aqueous or the vapour-based saturation is exceeded, this is highlighted within the Workbook (compared with the lower of the two values). This affects pathways which depend on partitioning calculations so in reality this only affects the vapour pathways and is relevant to organic substances and other substances, such as elemental mercury, that have a significant volatile component. However, the Workbook highlights saturation for direct contact pathways to indicate to the user where further qualitative consideration of free phase contamination at surface may be required.

Where the lower of the two saturation limits is exceeded and the vapour pathway is the only exposure route being considered, the chronic risks to human health are likely to be negligible. Further evaluation could be undertaken using an alternative model suitable for evaluating non-aqueous phase liquids (NAPLs), such as the Johnson & Ettinger (J&E) approach described in USEPA 2003. However, WSP considers that if NAPLs are suspected, given the known limitations and over-simplifications of J&E, soil vapour monitoring is a more accurate way of assessing potential risks.

Where the lower saturation limit is exceeded for the vapour pathway and a number of exposure routes are being considered, then the contribution from the NAPL via vapour inhalation to the overall exposure can be evaluated using the procedure provided in SR4. WSP would evaluate this as part of a DQRA process or through soil vapour monitoring on-site to determine site-specific soil vapour concentrations.

## CHEMICAL SPECIFIC ASSUMPTIONS

### CYANIDES

Cyanide has high acute toxicity, and short term exposure is an important consideration when assessing the risks from soils contaminated with cyanide. The primary risk to human receptors from free cyanide in soils is an acute risk.

There is no current UK guidance available for calculating acute risks from free cyanide. Consequently, GAC for acute exposure were derived using the algorithms presented in MADEP 1992<sup>15</sup> and assuming a one-off ingestion of 10g of soil (this conservative value has been taken as an upper bound estimate for a one-off soil ingestion rate amongst children). Receptor body weights have been selected according to the critical receptor for each exposure scenario. The lowest of the chronic and acute GAC for each land use scenario were adopted by WSP. Brinckerhoff.

### LEAD

The SGV for lead was withdrawn by the EA in 2009, and in 2011 the EA withdrew their published TOX report in light of new scientific evidence. The C4SL for lead was derived using the latest scientific evidence from a large human dataset. As such, no chemical-specific margin was applied in the derivation of the C4SL for lead. It may be possible for WSP to derive a GAC for lead using the same dataset and applying a chemical-specific margin, but the value is likely to be lower than UK natural background concentrations. Therefore, WSP has adopted the toxicological data used to derive the C4SLs in deriving the GAC for lead until such time as alternative GACs are published by an authoritative body. The relative bioavailability was set at 100% in line with the approach taken for other GACs, whereas the C4SL assumes 60% for soil and 64% for airborne dust. Thus, the WSP GAC are lower than the C4SLs.

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<sup>15</sup> MADEP 'Background Documentation for the Development of an "Available Cyanide" Benchmark Concentration' 1992. [http://www.mass.gov/dep/toxics/cn\\_soil.htm](http://www.mass.gov/dep/toxics/cn_soil.htm)

## POLYCYCLIC AROMATIC HYDROCARBONS

WSP's approach to the assessment of polycyclic aromatic hydrocarbons (PAHs) uses the surrogate marker approach. BaP was used as a surrogate marker for all genotoxic PAHs in line with the Health Protection Agency 2010<sup>16</sup> recommendations and SP1010. This assumes that the PAH profile of the data is similar to that of the coal tars used in the Culp *et al* oral carcinogenicity study from which the toxicity data for BaP was produced. In reality, this profile has been shown by HPA to be applicable on the majority of contaminated sites based on assessment of sites across the country.

The alternative is the Toxic Equivalency Factor (TEF) approach which uses a reference compound and assigns TEFs for other compounds based on estimates of potency. Key uncertainties with this approach include the assumption that all compounds have the same toxic mechanism of action within the body and that no compounds with a greater potency than the reference compound are present. It is considered by the HPA that the TEF approach is likely to under predict the true carcinogenicity of PAHs and therefore favours the surrogate marker approach.

For these reasons, WSP considers that the adoption of BaP as a surrogate marker for genotoxic PAHs as opposed to the TEF approach is reasonable, even in cases where the PAH profile may differ from that of the Culp *et al* study. In addition, WSP has derived a GAC for naphthalene, which is commonly a risk driver due to its high volatility, relative to other PAH compounds, as an indicator compound for threshold PAHs.

## CHEMICAL GROUPS

For a number of chemical groups, the available toxicity data is for combinations of chemicals. Given that the physico-chemical parameters may differ between the chemicals, the GACs for the chemicals within the groups have been calculated and then the lowest GAC selected to represent the entire group. This was the approach taken by the EA for m-, o- and p-xylenes, and has also been adopted by WSP for:

- à 2-chlorophenol, 2,4-dichlorophenol, 2,4,6-trichlorophenol and 2,3,4,6-tetrachlorophenol;
- à 2-, 3- and 4-methylphenol (total cresols);
- à aldrin and dieldrin;
- à  $\alpha$ - and  $\beta$ -endosulphan; and
- à trimethylbenzenes.

## EXPOSURE TO VAPOURS

### INHALATION OF MEASURED VAPOURS

WSP has derived a set of soil vapour GACs ( $GAC_{sv}$ ) that allow for the assessment of measured site soil vapour concentrations, using J&E, in order to establish potential risks via indoor inhalation of vapours. This methodology enables a more robust assessment of exposure via the inhalation of soil vapours indoors than using CLEA-derived soil GAC, as it is based upon measured soil vapour concentrations beneath the site. It also allows for the assessment of vapours from all source terms (i.e. groundwater, soil or NAPL). Outdoor inhalation was not included. WSP considers that the indoor inhalation pathway is the significantly dominant risk-driver.

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<sup>16</sup> HPA Contaminated Land Information Sheet 'Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs) 2010

The generic land use scenarios within CLEA (residential and commercial) that were used to derive the soil GAC were used to define the receptor and building characteristics for the soil vapour GAC. Only residential and commercial generic land use scenarios include the indoor inhalation of vapours pathway.

The  $GAC_{sv}$  were derived for three different soil types; sand, sandy loam and clay, reflecting the importance of this parameter within the J&E model. A depth to contamination of 0.85 m below the base of the building foundation was assumed (i.e. 1 m below ground level). This differs from the depth assumed for the soil GAC (0.5 m bgl), but was selected by WSP as a reasonable worst case scenario.

It is acknowledged that the J&E commonly over-predicts indoor vapour concentrations. In particular, it will significantly over-predict vapour concentrations for suspended floor slabs, which many new builds are constructed with, it does not take into account lateral migration and assumes an infinite source of contamination at steady state conditions. In addition, it is common for soil gas/vapour wells to be installed with at least 1 m of plain riser at the surface and this equates to a total depth of 0.85 m below the building foundation plus a 0.15 m thick foundation, and so is more representative of the depth that samples will be taken from.

The TDSIs and IDs for each substance were converted from  $\mu\text{kg}^{-1}\text{bwday}^{-1}$  to  $\mu\text{g}\text{m}^{-3}$  using the standard conversions quoted in Table 3.3 of SR2, thereby replacing the need to model  $C_{air}$  in the equation:

$$C_{air} = \alpha \cdot C_{vap} \cdot 1,000,000\text{cm}^3\text{m}^{-3}$$

Where:

$C_{air}$  is the concentration of vapours within the building,  $\text{mg}\text{m}^{-3}$

$\alpha$  is the steady state attenuation coefficient between soil and indoor air, dimensionless

$C_{vap}$  is the soil vapour concentration,  $\text{mg}\text{cm}^{-3}$

The target concentrations within indoor air for each substance ( $C_{air}$ ) are a function of receptor inhalation rates and occupancy periods, as defined by the site conceptual exposure model (assuming standard CLEA occupancy periods and receptors).

The attenuation factor was calculated using J&E (Equation 10.4 in SR3) and the resulting  $C_{vap}$  is equivalent to the  $GAC_{sv}$  for the modelled exposure scenario.

Where the calculated  $GAC_{sv}$  for a substance exceeds the vapour saturation limit, no  $GAC_{sv}$  has been proposed.

## INHALATION OF GROUNDWATER-DERIVED VAPOURS

The CLEA model does not have the capacity to derive GACs to assess vapours derived from dissolved phase contamination. WSP has derived a set of groundwater GACs ( $GAC_{gw}$ ) to evaluate the potential risks through the indoor inhalation of groundwater-derived vapours by first applying the approach described above for the derivation of the WSP  $GAC_{sv}$  to determine the acceptable concentration in soil vapour directly above the water table.

The depth to groundwater was assumed to be 1 m bgl (i.e. 0.85 m below the base of the building foundation). This depth was considered to be more representative of commonly encountered groundwater conditions than the 0.5 m below the base of the building foundation (i.e. 0.65 m bgl) that is used by CLEA for an unsaturated source present in the overlying soil.

The  $GAC_{gw}$  was then back-calculated from the  $GAC_{sv}$  using the air-water partition coefficient ( $K_{aw}$ ) for each substance.

Where the calculated  $GAC_{gw}$  for a substance exceeds the solubility limit, no  $GAC_{gw}$  has been proposed.

# Appendix E

SCREENING TABLES



Aliphatics and Aromatics

Result > Assessment Criteria  
 Limit of detection > Assessment Criteria

Analyte	Units	LOD	GAC	PointID	WS202	WS203		WS205			WS207	
				0.7 - 1	1 - 1.3	2.1 - 2.3	0.7 - 1	2.1 - 2.3	3.5 - 3.7	0.4 - 0.6	1.1 - 1.3	
Depth (m bgl)				05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17
Sample Date												
Geology (at top depth of sample)				Made Ground Cohesive	Made Ground Cohesive	River Terrace Deposits	Made Ground Cohesive	Made Ground Cohesive	River Terrace Deposits	Made Ground Granular	Made Ground Cohesive	
Aliphatic C05-C06	mg/kg	0.010	3,190	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatic C06-C08	mg/kg	0.010	7,780	<0.01	0.0394	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatic C08-C10	mg/kg	0.010	2,000	<0.01	0.82	0.0146	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatic C10-C12	mg/kg	0.010	9,690	<0.01	3.02	0.0159	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatic C12-C16	mg/kg	0.10	58,800	<0.1	35.9	<0.1	<0.1	2.71	<0.1	1.05	<0.1	<0.1
Aliphatic C35-C44	mg/kg	0.10	1,910,000	<0.1	0.925	2.61	1.99	<0.1	<0.1	0.712	<0.1	<0.1
Aromatic C07-C08	mg/kg	0.010	56,100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatic C08-C10	mg/kg	0.010	3,460	<0.01	0.569	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatic C10-C12	mg/kg	0.010	16,200	<0.01	2.01	0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatic C12-C16	mg/kg	0.10	36,200	<0.1	10.9	<0.1	<0.1	1.34	<0.1	<0.1	<0.1	0.728
Aromatic C16-C21	mg/kg	0.10	28,600	<0.1	18.2	<0.1	<0.1	1.97	<0.1	<0.1	<0.1	0.798
Aromatic C21-C35	mg/kg	0.10	28,600	<0.1	8.24	<0.1	8.3	2.7	0.923	17.9	<0.1	1.86
Aromatic C35-C44	mg/kg	0.10	28,600	<0.1	<0.1	4.97	5.04	<0.1	<0.1	69.1	<0.1	<0.1

**Alkali and Alkaline Earth Metals**

Result > Assessment Criteria  
 Limit of detection > Assessment Criteria

Analyte	Units	LOD	GAC	PointID	WS202		WS203	WS205		WS207		
				0 - 0.1	0.7 - 1	1 - 1.3	0.7 - 1	2.1 - 2.3	0 - 0.1	0.4 - 0.6	1.1 - 1.3	
				Depth (m bgl)	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17
				Sample Date								
				Geology (at top depth of sample)	Topsoil	Made Ground Cohesive	Made Ground Cohesive	Made Ground Cohesive	Made Ground Cohesive	Made Ground Granular	Made Ground Granular	Made Ground Cohesive
<b>Barium</b>	mg/kg	0.60	22,100		41.8	83.8	76.8	48.3	54.1	38.5	38	69.1
<b>Beryllium</b>	mg/kg	0.010	12.0		0.533	2.5	1.88	1.63	1.45	0.783	1.39	1.31

**BTEX and Fuel Additives**

Result > Assessment Criteria  
 Limit of detection > Assessment Criteria

Analyte	Units	LOD	GAC	PointID	WS202	WS203		WS205			WS207	
				0.7 - 1	1 - 1.3	2.1 - 2.3	0.7 - 1	2.1 - 2.3	3.5 - 3.7	0.4 - 0.6	1.1 - 1.3	
Depth (m bgl)				05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17
Sample Date												
Geology (at top depth of sample)				Made Ground Cohesive	Made Ground Cohesive	River Terrace Deposits	Made Ground Cohesive	Made Ground Cohesive	River Terrace Deposits	Made Ground Granular	Made Ground Cohesive	
<b>1,2,4-Trimethylbenzene</b>	mg/kg	0.009	611		<0.09			<0.09				
<b>Benzene</b>	mg/kg	0.009	27.0	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09
<b>Ethylbenzene</b>	mg/kg	0.004	5,710	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
<b>Methyl t-butylether (MTBE)</b>	mg/kg	0.010	7,480	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<b>Toluene</b>	mg/kg	0.007	56,300	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07
<b>Xylene - Total (Summed)</b>	mg/kg	-999	5,920	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
<b>Xylene-m &amp; p</b>	mg/kg	0.010	5,920	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<b>Xylene-o</b>	mg/kg	0.010	5,920	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1



**Chlorinated Aliphatics**

Result > Assessment Criteria  
 Limit of detection > Assessment Criteria



Analyte	Units	LOD	GAC	PointID	WS203	WS205
					1 - 1.3	2.1 - 2.3
				Depth (m bgl)	05/12/17	05/12/17
				Sample Date		
				Geology (at top depth of sample)	Made Ground Cohesive	Made Ground Cohesive
1,1,1,2-Tetrachloroethane	mg/kg	0.010	108		<0.1	<0.1
1,1,1-Trichloroethane	mg/kg	0.007	1,580		<0.07	<0.07
1,1,2,2-Tetrachloroethane	mg/kg	0.010	274		<0.1	<0.1
1,1,2-Trichloroethane	mg/kg	0.010	89.0		<0.1	<0.1
1,1-Dichloroethane	mg/kg	0.008	263		<0.08	<0.08
1,1-Dichloroethene	mg/kg	0.010	24.0		<0.1	<0.1
1,2-Dichloroethane	mg/kg	0.005	0.67		<0.05	<0.05
1,2-Dichloropropane	mg/kg	0.010	3.10		<0.1	<0.1
Carbon tetrachloride	mg/kg	0.010	31.0		<0.1	<0.1
Chloroethane	mg/kg	0.010	904		<0.1	<0.1
Chloroform	mg/kg	0.008	99.0		<0.08	<0.08
Chloromethane	mg/kg	0.007	0.96		<0.07	<0.07
Cis 1,2-Dichloroethene	mg/kg	0.006	14.0		<0.06	<0.06
Dichloromethane	mg/kg	0.010	257		<0.1	<0.1
Hexachlorobutadiene	mg/kg	0.10	31.0		<0.1	<0.1
Hexachloroethane	mg/kg	0.10	21.0		<0.1	<0.1

**Chlorinated Aliphatics**

Result > Assessment Criteria  
 Limit of detection > Assessment Criteria



				PointID	WS203	WS205
					1 - 1.3	2.1 - 2.3
				Depth (m bgl)	05/12/17	05/12/17
				Sample Date		
				Geology (at top depth of sample)	Made Ground Cohesive	Made Ground Cohesive
Analyte	Units	LOD	GAC			
Tetrachloroethene (PCE)	mg/kg	0.005	19.0	<0.05	<0.05	
Trans-1,2-Dichloroethene	mg/kg	0.010	21.0	<0.1	<0.1	
Trichloroethene (TCE)	mg/kg	0.009	1.20	<0.09	<0.09	
Vinyl chloride	mg/kg	0.006	0.059	<0.06	<0.06	

**Chlorinated Aromatics**

 Result > Assessment Criteria  
 Limit of detection > Assessment Criteria



Analyte	Units	LOD	GAC	PointID	WS203	WS205
				Depth (m bgl)	Sample Date	Geology (at top depth of sample)
				1 - 1.3	2.1 - 2.3	
				05/12/17	05/12/17	
				Made Ground Cohesive	Made Ground Cohesive	
<b>1,2,3-Trichlorobenzene</b>	mg/kg	0.020	102	<0.2	<0.2	
<b>1,2,4-Trichlorobenzene</b>	mg/kg	0.10	265	<0.1	<0.1	
<b>1,2-Dichlorobenzene</b>	mg/kg	0.10	2,020	<0.1	<0.1	
<b>1,3-Dichlorobenzene</b>	mg/kg	0.008	30.0	<0.08	<0.08	
<b>1,4-Dichlorobenzene</b>	mg/kg	0.005	584	<0.05	<0.05	
<b>Chlorobenzene</b>	mg/kg	0.005	58.0	<0.05	<0.05	
<b>Hexachlorobenzene</b>	mg/kg	0.10	105	<0.1	<0.1	

**Chlorinated Phenols**

 Result > Assessment Criteria  
 Limit of detection > Assessment Criteria



				PointID	WS203	WS205
					1 - 1.3	2.1 - 2.3
				Depth (m bgl)	05/12/17	05/12/17
				Sample Date		
				Geology (at top depth of sample)	Made Ground Cohesive	Made Ground Cohesive
Analyte	Units	LOD	GAC			
2,4,6-Trichlorophenol	mg/kg	0.10	2,700	<0.1	<0.1	
2,4-Dichlorophenol	mg/kg	0.10	2,700	<0.1	<0.1	
2-Chlorophenol	mg/kg	0.10	2,700	<0.1	<0.1	
Chlorophenols - Total (Summed Isomers)	mg/kg	-999	2,700	0.1	0.1	

**Explosives**

 Result > Assessment Criteria  
 Limit of detection > Assessment Criteria

				PointID	WS203	WS205
					1 - 1.3	2.1 - 2.3
				Depth (m bgl)	05/12/17	05/12/17
				Sample Date		
				Geology (at top depth of sample)	Made Ground Cohesive	Made Ground Cohesive
Analyte	Units	LOD	GAC			
2,4-Dinitrotoluene	mg/kg	0.10	3,720		<0.1	<0.1
2,6-Dinitrotoluene	mg/kg	0.10	1,850		<0.1	<0.1

**Halogenated Hydrocarbons**

 Result > Assessment Criteria  
 Limit of detection > Assessment Criteria



				PointID	WS203	WS205
					1 - 1.3	2.1 - 2.3
				Depth (m bgl)	05/12/17	05/12/17
				Sample Date		
				Geology (at top depth of sample)	Made Ground Cohesive	Made Ground Cohesive
Analyte	Units	LOD	GAC			
<b>Bromobenzene</b>	mg/kg	0.010	91.0	<0.1	<0.1	
<b>Bromodichloromethane</b>	mg/kg	0.007	2.00	<0.07	<0.07	
<b>Bromoform</b>	mg/kg	0.010	714	<0.1	<0.1	

**Metals**

Result > Assessment Criteria  
 Limit of detection > Assessment Criteria

Analyte	Units	LOD	GAC	PointID	WS202		WS203	WS205		WS207		
				0 - 0.1	0.7 - 1	1 - 1.3	0.7 - 1	2.1 - 2.3	0 - 0.1	0.4 - 0.6	1.1 - 1.3	
Depth (m bgl)				05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	
Sample Date												
Geology (at top depth of sample)				Topsoil	Made Ground Cohesive	Made Ground Cohesive	Made Ground Cohesive	Made Ground Cohesive	Made Ground Granular	Made Ground Granular	Made Ground Cohesive	
<b>Arsenic</b>	mg/kg	0.60	635		16.5	52.6	81.3	24.6	18.7	9.84	21.9	14.5
<b>Boron</b>	mg/kg	1.00	207,000		<1	<1	<1	<1	<1	<1	<1	<1
<b>Cadmium</b>	mg/kg	0.020	223		0.0373	0.64	0.347	0.452	<0.02	0.0389	0.538	<0.02
<b>Copper</b>	mg/kg	1.40	69,800		12.1	23.5	15.7	22.5	16.5	21.6	<14	15.8
<b>Hexavalent Chromium</b>	mg/kg	0.60	24.0		<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
<b>Lead</b>	mg/kg	0.70	1,390		16.6	29.4	22.7	37.3	16.2	12.7	13.6	14.1
<b>Mercury</b>	mg/kg	0.14	1,110		<0.14	<1.4	<0.14	<1.4	0.922	0.623	<1.4	0.746
<b>Nickel</b>	mg/kg	0.20	1,710		15.7	56.2	64.3	39.4	30	9.48	28	35.5
<b>Selenium</b>	mg/kg	1.00	12,300		<1	<10	<10	<10	<1	<1	<10	<1
<b>Vanadium</b>	mg/kg	0.20	9,220		32.1	113	135	76.2	67.7	45.7	54	62.7
<b>Zinc</b>	mg/kg	1.90	1,050,000		143	121	117	99	84.6	84.4	66.4	81.3



Other

 Result > Assessment Criteria  
 Limit of detection > Assessment Criteria

Analyte	Units	LOD	GAC	PointID	WS203	WS205
				Depth (m bgl)	Sample Date	Geology (at top depth of sample)
					1 - 1.3	2.1 - 2.3
				05/12/17	05/12/17	
					Made Ground Cohesive	Made Ground Cohesive
<b>2-Chloronaphthalene</b>	mg/kg	0.10	370		<0.1	<0.1
<b>Carbon Disulphide</b>	mg/kg	0.007	11.0		<0.07	<0.07
<b>Styrene</b>	mg/kg	0.010	3,170		<0.1	<0.1





**PAHs**

 Result > Assessment Criteria  
 Limit of detection > Assessment Criteria



Analyte	Units	LOD	GAC	PointID	WS202			WS203			WS205			WS207	
				0.7 - 1	1 - 1.3	2.1 - 2.3	0.7 - 1	2.1 - 2.3	3.5 - 3.7	0.4 - 0.6	1.1 - 1.3				
				Depth (m bgl)	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17	05/12/17		
				Sample Date											
				Geology (at top depth of sample)	Made Ground Cohesive	Made Ground Cohesive	River Terrace Deposits	Made Ground Cohesive	Made Ground Cohesive	River Terrace Deposits	Made Ground Granular	Made Ground Cohesive			
<b>Benzo (a) pyrene</b>	mg/kg	0.015	38.0		<0.015	<0.015	<0.015	0.057	<0.015	<0.015	<0.015	<0.015	<0.015		
<b>Naphthalene</b>	mg/kg	0.009	193		<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009		

**Pesticides, Herbicides and Insecticides**

 Result > Assessment Criteria  
 Limit of detection > Assessment Criteria



Analyte	Units	LOD	GAC	PointID	WS203	WS205
				Depth (m bgl)	Sample Date	Geology (at top depth of sample)
					1 - 1.3	2.1 - 2.3
				05/12/17	05/12/17	
					Made Ground Cohesive	Made Ground Cohesive
<b>Pentachlorophenol</b>	mg/kg	0.10	406		<0.1	<0.1

**Phenols**

 Result > Assessment Criteria  
 Limit of detection > Assessment Criteria



				PointID	WS203	WS205
					1 - 1.3	2.1 - 2.3
				Depth (m bgl)	05/12/17	05/12/17
				Sample Date		
				Geology (at top depth of sample)	Made Ground Cohesive	Made Ground Cohesive
Analyte	Units	LOD	GAC			
2,4-Dimethylphenol	mg/kg	0.10	15,700	<0.1	<0.1	
2-Methylphenol (o-Cresol)	mg/kg	0.10	160,000	<0.1	<0.1	
4-Methylphenol	mg/kg	0.10	160,000	<0.1	<0.1	
Methylphenols Total (Summed)	mg/kg	-999	160,000	0.1	0.1	
Phenol	mg/kg	0.10	760	<0.1	<0.1	

**Phthalates**

 Result > Assessment Criteria  
 Limit of detection > Assessment Criteria

				PointID	WS203	WS205
					1 - 1.3	2.1 - 2.3
				Depth (m bgl)	05/12/17	05/12/17
				Sample Date		
				Geology (at top depth of sample)	Made Ground Cohesive	Made Ground Cohesive
Analyte	Units	LOD	GAC			
Bis (2-ethylhexyl) phthalate	mg/kg	0.10	85,200	<0.1	<0.1	
Butyl benzyl phthalate	mg/kg	0.10	940,000	<0.1	<0.1	
Diethyl phthalate	mg/kg	0.10	144,000	<0.1	<0.1	
Di-n-butyl phthalate	mg/kg	0.10	15,400	<0.1	<0.1	
Di-n-octyl phthalate	mg/kg	0.10	89,100	<0.1	<0.1	

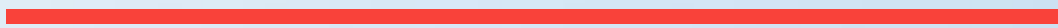
VOCs

 Result > Assessment Criteria  
 Limit of detection > Assessment Criteria

Analyte	Units	LOD	GAC	PointID	WS203	WS205
				Depth (m bgl)	Sample Date	Geology (at top depth of sample)
					1 - 1.3	2.1 - 2.3
				05/12/17	05/12/17	
					Made Ground Cohesive	Made Ground Cohesive
iso-Propylbenzene	mg/kg	0.005	1,300		<0.05	<0.05
n-Propylbenzene	mg/kg	0.010	3,860		<0.1	<0.1

# Appendix F

ZETICA REPORTS

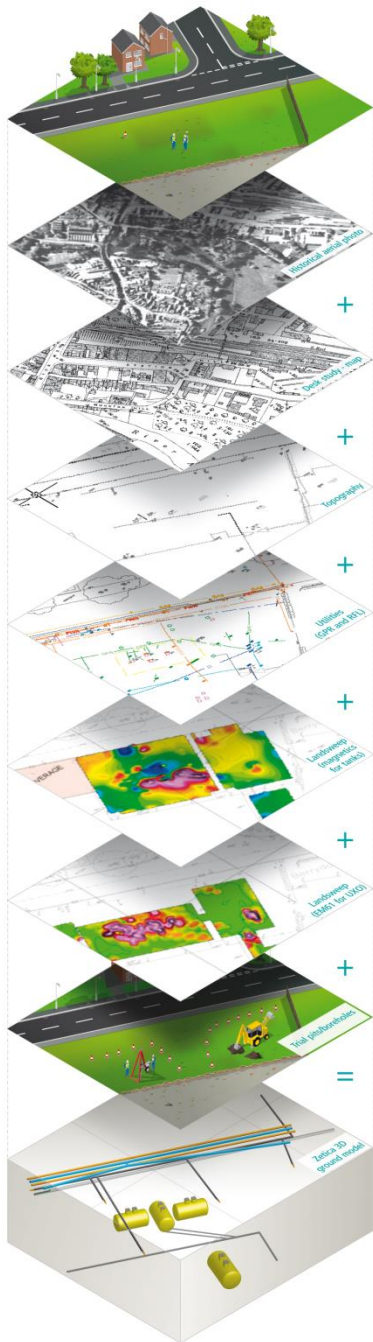


## Pre-Desk Study Assessment

Site:	Ruscote Avenue, Banbury, Oxfordshire
Client:	WSP
Contact:	Martin Lucass
Date:	24 <sup>th</sup> November 2017
Pre-WWI Military Activity on or Affecting the Site	None identified.
WWI Military Activity on or Affecting the Site	None identified.
WWI Strategic Targets (within 5km of Site)	The following strategic targets were located in the vicinity of the Site: <ul style="list-style-type: none"> <li>☐ Banbury National Filling Factory (NFF).</li> <li>☐ Industries important to the war effort, including iron foundries and engineering works.</li> <li>☐ Military barracks.</li> <li>☐ Transport infrastructure and public utilities.</li> <li>☐ Anti-Aircraft (AA) guns.</li> </ul>
WWI Bombing	None identified on the Site.
Interwar Military Activity on or Affecting the Site	None identified.
WWII Military Activity on or Affecting the Site	None identified.
WWII Strategic Targets (within 5km of Site)	The following strategic targets were located in the vicinity of the Site: <ul style="list-style-type: none"> <li>☐ Industries important to the war effort, including aluminium works.</li> <li>☐ Military barracks.</li> <li>☐ Transport infrastructure and public utilities.</li> <li>☐ AA and anti-invasion defences.</li> </ul>
WWII Bombing Decoys (within 5km of Site)	1No. located approximately 4.7km north of the Site.
WWII Bombing	During WWII the Site was located in the Municipal Borough (MB) of Banbury, which officially recorded 21No. High Explosive (HE) bombs with a very low bombing density of 4.1 bombs per 405 hectares (ha).  No readily available records have been found indicating that the Site was bombed.
Post-WWII Military Activity on or Affecting the Site	None identified.
Recommendation	No readily available records of bombing or other significant military activity on the Site have been found. It is considered that the Site is likely to have a low Unexploded Ordnance (UXO) hazard level.  A detailed desk study, whilst always prudent, is likely to do no more than confirm a low UXO hazard level for the Site.

This summary is based on a cursory review of readily available records. Caution is advised if you plan to action work based on this summary. It is possible that further research may change the level of identified hazard.

It should be noted that where a potentially significant source of UXO hazard has been identified on the Site, the requirement for a detailed desk study and risk assessment has been confirmed and no further research will be undertaken at this stage. It is possible that further in-depth research as part of a detailed UXO desk study and risk assessment may identify other potential sources of UXO hazard on the Site.



# groundcheck

**Location:** KRAFT Site, Ruscote Avenue, Banbury

**Client:** WSP

**Ref:** P7380-17-R1-A

**Date:** 12<sup>th</sup> January 2018

**Zetica Limited**  
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### SUMMARY REPORT

**Location:** Kraft Factory, Ruscote Avenue, Banbury  
**Client:** WSP  
**Reference:** P7380-17-R1-A

#### 1. INTRODUCTION

**Scope** WSP (the Client) commissioned Zetica Ltd to undertake a GroundCheck® geophysical survey across an area of the KRAFT factory site on Ruscote Avenue, Banbury (the Site).  
 The survey was undertaken to verify the existence of an underground storage tank (UST). The results are intended to assist the Client in determining whether the Site is suitable for development.  
 The survey was undertaken on 8<sup>th</sup> January 2018.

**The Site** The Site is a -0.1ha area within the grounds of the Kraft factory in Banbury as shown in Figure1 below.  
 Information provided by the Client indicated that a UST could be located within the highlighted in orange in Figure 1.



Source: Google Maps



North



Site



Historic location of UST

**Figure 1:** Site Location.

2. METHODOLOGY				
Summary of techniques	<p>The GroundCheck® survey utilised a combination of techniques comprising:</p> <ul style="list-style-type: none"> <li>• Magnetometer profiling (magnetics): to map ferrous metallic targets such as USTs, reinforced structures, and utility services to 4-5m.bgl depending on size of targets and burial setting.</li> <li>• Time-domain electromagnetic (TDEM) profiling: to map metallic targets such as USTs, reinforced structures, pipes and other scrap metal materials.</li> <li>• Ground penetrating radar (GPR) survey: to characterise the depth of structures and utility services to a typical depth of 1-2m depending on ground conditions.</li> <li>• Tracing utility services using radio frequency location (RFL) system.</li> </ul>			
Useful Link	<a href="http://www.zetica.com/methods/index.htm">http://www.zetica.com/methods/index.htm</a>			
Summary of survey design	Technique	Configuration	Line Spacing	Station interval
	Magnetics	Dual sensor, vertical gradient mode.	1m	10Hz sampling rate, nominal 0.25m sampling interval
	TDEM	Differential mode.	1m	10Hz sampling rate, nominal 0.25m sampling interval
	GPR	250 MHz and 700MHz antennas	1m	2.5cm 1m x 1m orthogonal grid
	RFL	Active and passive	N/A	N/A
Limitations	<p>The following clarifies some of the limitations relevant to the survey:-</p> <ul style="list-style-type: none"> <li>• Surface metal objects such as vehicles, fences, reinforced concrete, walls and above ground pipework can mask the subsurface response using magnetics and TDEM profiling methods.</li> <li>• Factors such as multiple utility services or conductive sub-surface conditions (such as water retentive soils) can reduce the detectability of utility services or structures.</li> <li>• GPR depth of detection is strongly dependent on the material properties of the ground. GPR signal can be attenuated by conductive soils and scattered by in ground targets (clutter) resulting in reduced detection depths.</li> <li>• Depths of interpreted features were indicated where possible and were measured relative to the ground surface. These are based on data modelling and may not necessarily indicate the exact depth.</li> <li>• The detectability depth for potential features depends on target size and Site-specific signal to noise ratios. Large diameter features will be detectable at greater burial depth than small diameter features in the same environment.</li> <li>• RFL depths are derived from an induced signal that is centred on the utility service. The diameter of the utility service has not been considered.</li> </ul>			

### 3. DATA

#### Data Presentation

The GroundCheck® survey results are presented as an interpretative CAD drawing and figures providing plots of the geophysical data. These are referenced below.

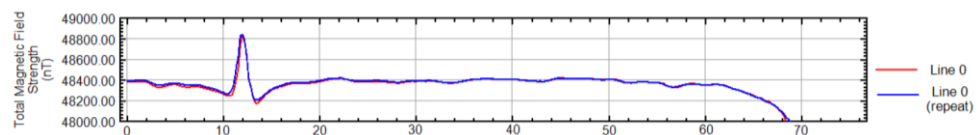
Zetica drawings P7380-17-DWG02-A (Map of Residual Magnetic Field Strength - Bottom Sensor (magnetics)), P7380-17-DWG03-A (Map of 3D Analytic Signal Amplitude - Bottom Sensor (magnetics)) and P7380-17-DWG04-A (Map of Secondary Decay Voltage (TDEM)) comprise colour-coded grids of the geophysical data with the colours representing the amplitude of the measured property. Cool colours (blue and cyan) represent relatively low values whilst warm colours (red and magenta) correspond to relatively high values.

Figure Reference	Title
Figure 1	Site Location
Figure 2	Data repeatability (magnetics - Total Magnetic Field Strength)
Figure 3	Data repeatability (TDEM - Secondary Decay Voltage)
Figure 4	Example radargram (utility service)
Drawing Reference	Title
P7380-17-DWG01-A	Summary Interpretation Plan
P7380-17-DWG02-A	Map of Residual Magnetic Field Strength - Bottom Sensor (magnetics)
P7380-17-DWG03-A	Map of 3D Analytic Signal Amplitude - Bottom Sensor (magnetics)
P7380-17-DWG04-A	Map of Secondary Decay Voltage (TDEM)

#### Data Quality

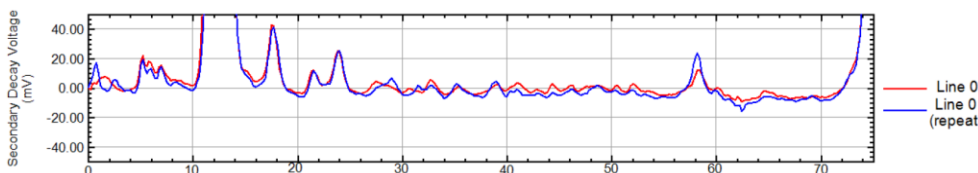
The quality of the magnetics and TDEM data across the Site was good. Figures 2 and 3 show an example of a repeat profile line for the magnetics and TDEM datasets respectively. Both figures show good repeatability and relatively low levels of background noise. Above ground fencing and reinforced concrete in some areas of the Site has resulted in elevated levels of background noise.

Repeatability is shown between a profile (red) and its repeat (blue).



**Figure 2:** Data repeatability (magnetics - Total Magnetic Field Strength)

Repeatability is shown between a profile (red) and its repeat (blue).



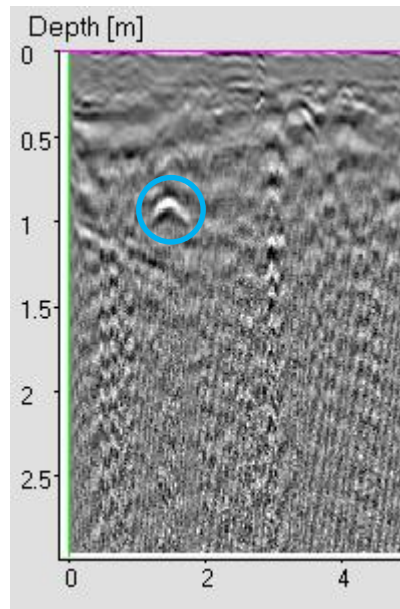
**Figure 3:** Data repeatability (TDEM - Secondary Decay Voltage)

The quality of the GPR data across the Site was typically good. The GPR survey achieved an estimated maximum detection depth of ~1.2m across the Site. This is derived from the average two-way travel time (TWTT) to the ‘noise floor’ (the time-depth at which the amplitude of noise exceeds that of the signal) of approximately 24ns, and a modelled signal velocity through the near-surface materials of ~100mm/ns. The signal velocity was determined using the hyperbolic curve-fitting method applied to selected anomalies observed within the datasets. The maximum detection depth is based on a utility service. Smaller features would have a lower maximum depth of detection.

Figure 4 comprises a grey-scale plot (termed a ‘radargram’) of the GPR. The colours of the radargram represent the measured GPR signal amplitude within the slice. Mid-tones (grey) represents low amplitude, white represents high positive amplitudes and black represents high negative amplitudes.

Where linear features have been detected by GPR it is not always possible to determine whether they are related to utility services or to establish the type of utility service. Detected linear features are presented with an appropriate line type in Zetica drawing P7380-17-DWG01-A (Summary Interpretation Plan).

Sample radargram showing the GPR response to an interpreted utility service (blue circle indicates hyperbola produced by reflection of radar signal).



**Figure 4:** Example radargram (utility service)

#### 4. RESULTS

The table below provides a summary of identified features detected on the Site. This table should be read in conjunction with Zetica Drawing P7380-17-DWG01-A (Summary Interpretation Plan). Reference should also be made to drawings P7380-17-DWG02-A (Map of Residual Magnetic Field Strength - Bottom Sensor (magnetics)), P7380-17-DWG03-A (Map of 3D Analytic Signal Amplitude - Bottom Sensor (magnetics)) and P7380-17-DWG04-A (Map of Secondary Decay Voltage (TDEM)).

##### Buried Features

Feature	No.	Estimated Depth Range (m)	Comments
Disturbed ground	1	-	An approximately 10m x 14m area of disturbed ground has been identified within the Site. The area corresponds to the anticipated location of the UST. There is no evidence of a UST being present in this area.
Water pipe	1	1.80-2.40m	
Linear GPR feature	6	0.20-0.85m	These features are interpreted as utility services.
Reinforced concrete	1	0.04-0.10m	A reinforced concrete footpath was identified running through the Site.








5. SUMMARY

<p>Summary</p>	<p>The GroundCheck® survey has identified an area of disturbed ground across the anticipated location of the UST. There is no evidence of a UST being present in this area.</p> <p>The survey has also identified a number of utility services and a section of reinforced concrete.</p> <p>The survey results are summarised on Zetica Drawing P7380-17-DWG01-A (Summary Interpretation Plan).</p>
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**Appendix 1: General Notes**

1. This report has been prepared in relation to the specific requirement of the contract or commission. The report should not be used by third parties without prior consultation with Zetica Ltd. Any advice, recommendations, or statements within the report should be addressed only in the context of the report as a whole.
2. The copyright for this report remains with Zetica Ltd. No part of this report may be reproduced, published or amended without prior written consent from Zetica Ltd.
3. The report refers to the conditions of the Property at the time of investigation. Zetica Ltd cannot accept liability for subsequent changes of Property conditions.
4. Zetica Ltd may have relied on externally provided information. Under no circumstances does Zetica Ltd accept responsibility for the accuracy of such information or data supplied.
5. By their nature, exploratory points, such as boreholes or trial pits, can only provide information on a relatively limited area or volume of a Property. In general, the conditions encountered may vary between exploratory points.
6. It should be noted that the detection performance is dependent on a sufficient physical (e.g. Magnetic) contrast between the item for detection and host materials. Where significant noise is present (e.g. an abundance of other Magnetic features in the host material), sufficient detection may not be possible.
7. Interpretation relies largely on experience of similar conditions. Site-specific conditions can create variations that may not be detectable by non-intrusive investigation techniques. It should be noted that the detail of an interpretation might vary from that identified by later intrusive investigation, although the general identification of a feature should not vary.
8. The report has been written in line with relevant guidance and legislation in use at the time of report compilation. Subsequent improvement in techniques, changes in legislation, or changes in Site conditions, may render parts of this report obsolete. If the report is used after such changes have occurred, or at a time in excess of 1 year of the issue date, it would be prudent to contact Zetica Ltd to reassess the report under a new contract.

## Established for over 26 years, Zetica's services include

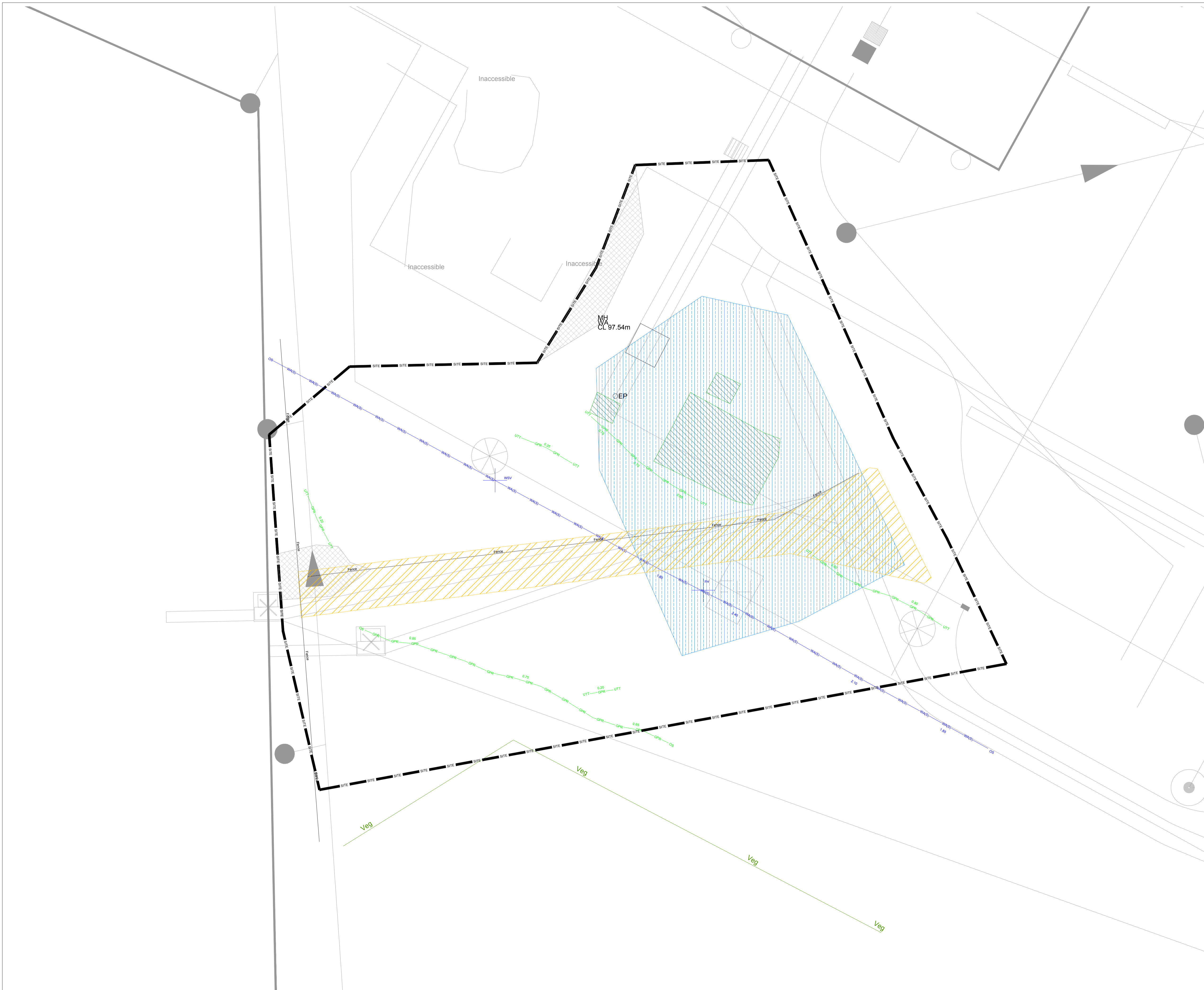
-  Desk studies
-  Unexploded ordnance risk assessments and risk mitigation
-  Topographic surveys
-  Utility services detection
-  Archaeological Geophysics
-  Environmental and engineering geophysical surveys
-  Transport infrastructure surveys
-  Pipeline & cable route surveys
-  Intrusive ground investigations

More details are available at

[www.zetica.com](http://www.zetica.com)







- Notes**
- A Base map constructed from Client provided drawing.
  - B This drawing to be read in conjunction with Zetica report P7380-17-R1-A.
  - C Limitations imposed by site conditions and current technologies mean that there can be no guarantee of detection for utility services. It is the responsibility of the user to satisfy themselves as to the location of site services prior to undertaking any excavation.
  - D Zetica do not accept responsibility for the accuracy of information supplied by third parties.
  - E Where they could be obtained, the depths for apparatus that were traced by RFL and GPR are identified alongside the apparatus in metres below ground level. The depths obtained are modelled and do not necessarily indicate the exact depth to a duct or pipe.
  - F Factors such as multiple utility services and made ground can reduce the detectability of utilities and features.

- Legend**
- Site Boundary
  - Water pipe
  - Below ground non-ferrous or non-metallic utility services
  - Linear feature detected by GPR
  - Disturbed ground
  - Un-reinforced concrete
  - Reinforced concrete
  - Inaccessible
  - WSV Water service valve
  - FH Fire hydrant
  - UTT Unable to trace
  - OS Off-site
  - MH Manhole
  - CL Cover level

**Draft**  
User to check for latest issue

Client  
**WSP**

Project  
**Banbury GroundCheck® Survey**

Location  
**KRAFT Site, Ruscote Avenue, Banbury**

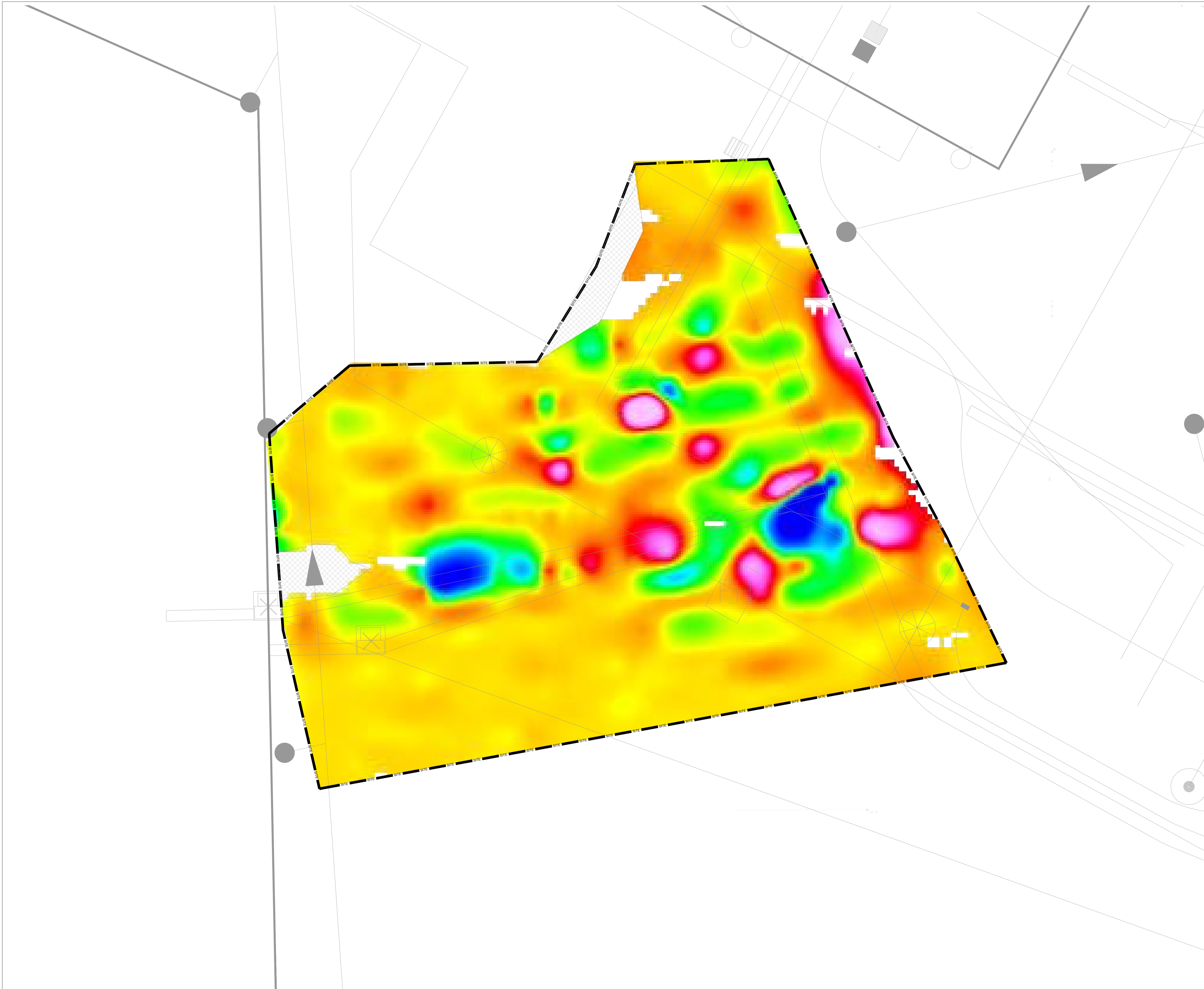
Title  
**Summary Interpretation Plan**

Drawn by <b>D Byrne</b>	Checked by <b>R Grant</b>
Horizontal Scale (A1) <b>1:75</b>	Date of Survey <b>08/01/2018</b>
Project Code <b>P7380-17</b>	Drawing No. <b>DWG01</b>
Issue Date <b>12/01/2018</b>	
Sheet <b>1 of 1</b>	
Issue <b>A</b>	

Issue	Remarks	Drawn	Checked	Date
A	Draft issue, for comment.	DB	RG	12/01/2018

**zetica**

Zetica Ltd  
Units 15 & 16  
Harborough Business Park  
Long Harborough  
OX20 8LH,  
UK  
Tel: 44 (0)1993 886682  
Fax: 44 (0)1993 886683  
Email: projects@zetica.com  
www.zetica.com

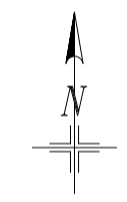
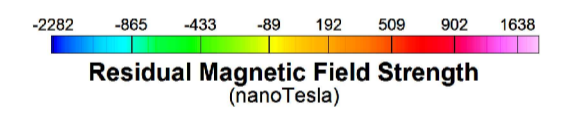


Notes

A	Base map constructed from Client-provided drawing.
B	This drawing to be read in conjunction with Zetica report P7380-17-R1-A.
C	Limitations imposed by site conditions and current technologies mean that there can be no guarantee of detection for utility services. It is the responsibility of the user to satisfy themselves as to the location of site services prior to undertaking any excavation.
D	Zetica do not accept responsibility for the accuracy of information supplied by third parties.
E	Where they could be obtained, the depths for apparatus that were traced by RFL and GPR are identified alongside the apparatus in metres below ground level. The depths obtained are modelled and do not necessarily indicate the exact depth to a duct or pipe.
F	Factors such as multiple utility services and made ground can reduce the detectability of utilities and features.

Legend

— SITE — Site Boundary



**Draft**  
User to check for latest issue

Client  
**WSP**

Project  
**Banbury GroundCheck® Survey**

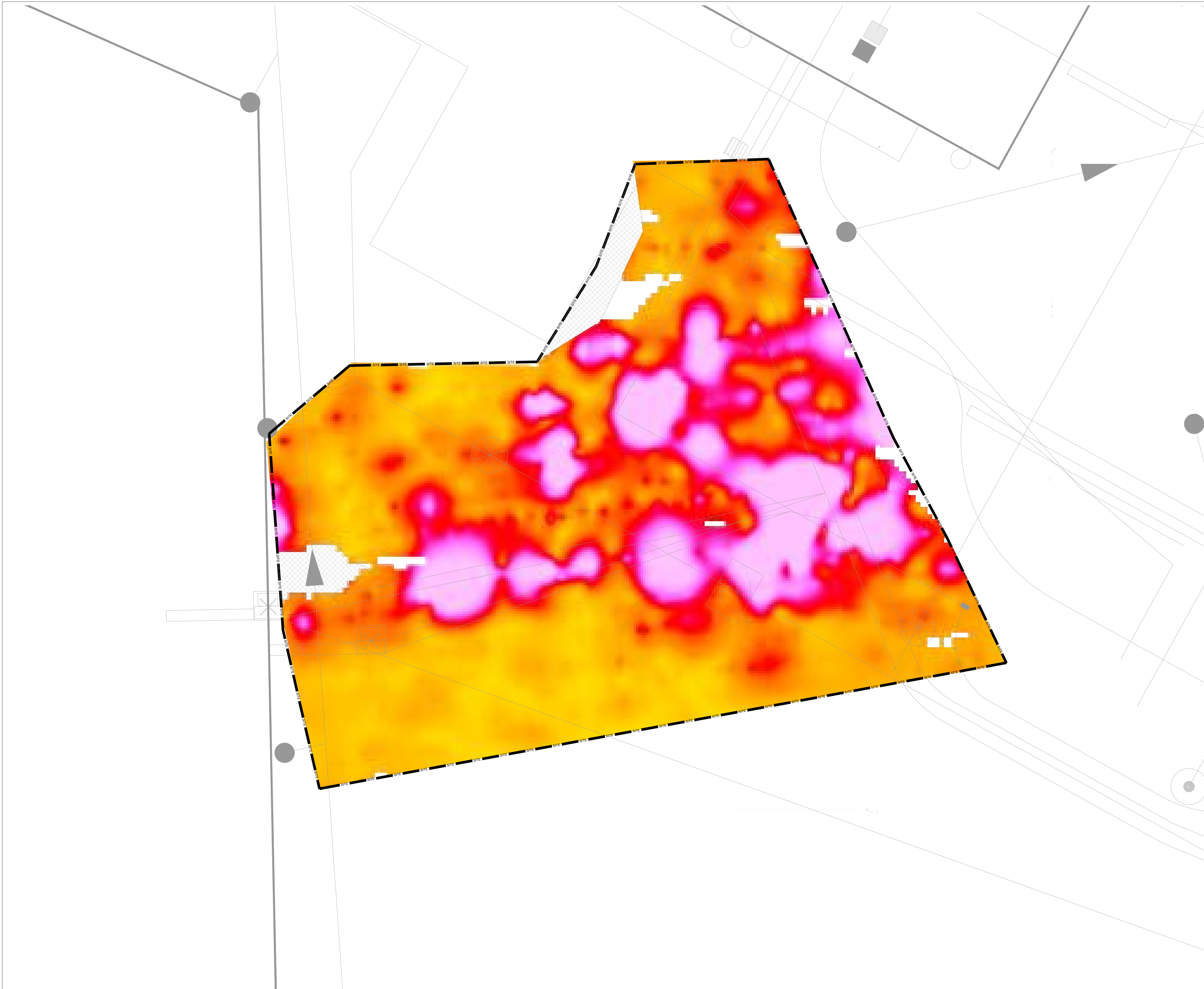
Location  
**KRAFT Site, Ruscote Avenue, Banbury**

Title  
**Map of Residual Magnetic Field (Bottom)**

Drawn by <b>D Byrne</b>	Checked by <b>R Grant</b>
Horizontal Scale (A1) <b>1:75</b>	Date of Survey <b>08/01/2018</b>
Project Code <b>P7380-17</b>	Issue Date <b>12/001/2018</b>
Drawing No. <b>DWG02</b>	Sheet <b>1 of 1</b>
	Issue <b>A</b>

Issue	Remarks	Drawn	Checked	Date
A	Draft issue, for comment.	DB	RG	12/001/2018



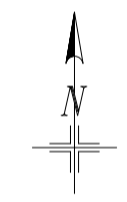
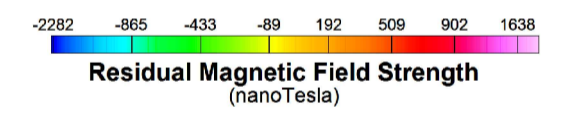


Notes

A	Base map constructed from Client-provided drawing.
B	This drawing to be read in conjunction with Zetica report P7380-17-R1-A.
C	Limitations imposed by site conditions and current technologies mean that there can be no guarantee of detection for utility services. It is the responsibility of the user to satisfy themselves as to the location of site services prior to undertaking any excavation.
D	Zetica do not accept responsibility for the accuracy of information supplied by third parties.
E	Where they could be obtained, the depths for apparatus that were traced by RFL and GPR are identified alongside the apparatus in metres below ground level. The depths obtained are modelled and do not necessarily indicate the exact depth to a duct or pipe.
F	Factors such as multiple utility services and made ground can reduce the detectability of utilities and features.

Legend

---	Site Boundary
-----	---------------



**Draft**  
User to check for latest issue

Client	<b>WSP</b>
Project	<b>Banbury GroundCheck® Survey</b>
Location	<b>KRAFT Site, Ruscote Avenue, Banbury</b>
Title	<b>Map of 3D Analytic Signal (Bottom)</b>

Drawn by	D Byrne	Checked by	R Grant
Horizontal Scale (A1)	1:75	Date of Survey	08/01/2018
		Issue Date	12/001/2018
Project Code	P7380-17	Drawing No.	DWG03
		Sheet	1 of 1
		Issue	A

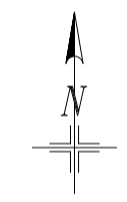
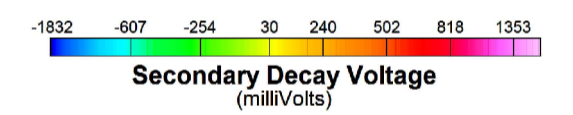
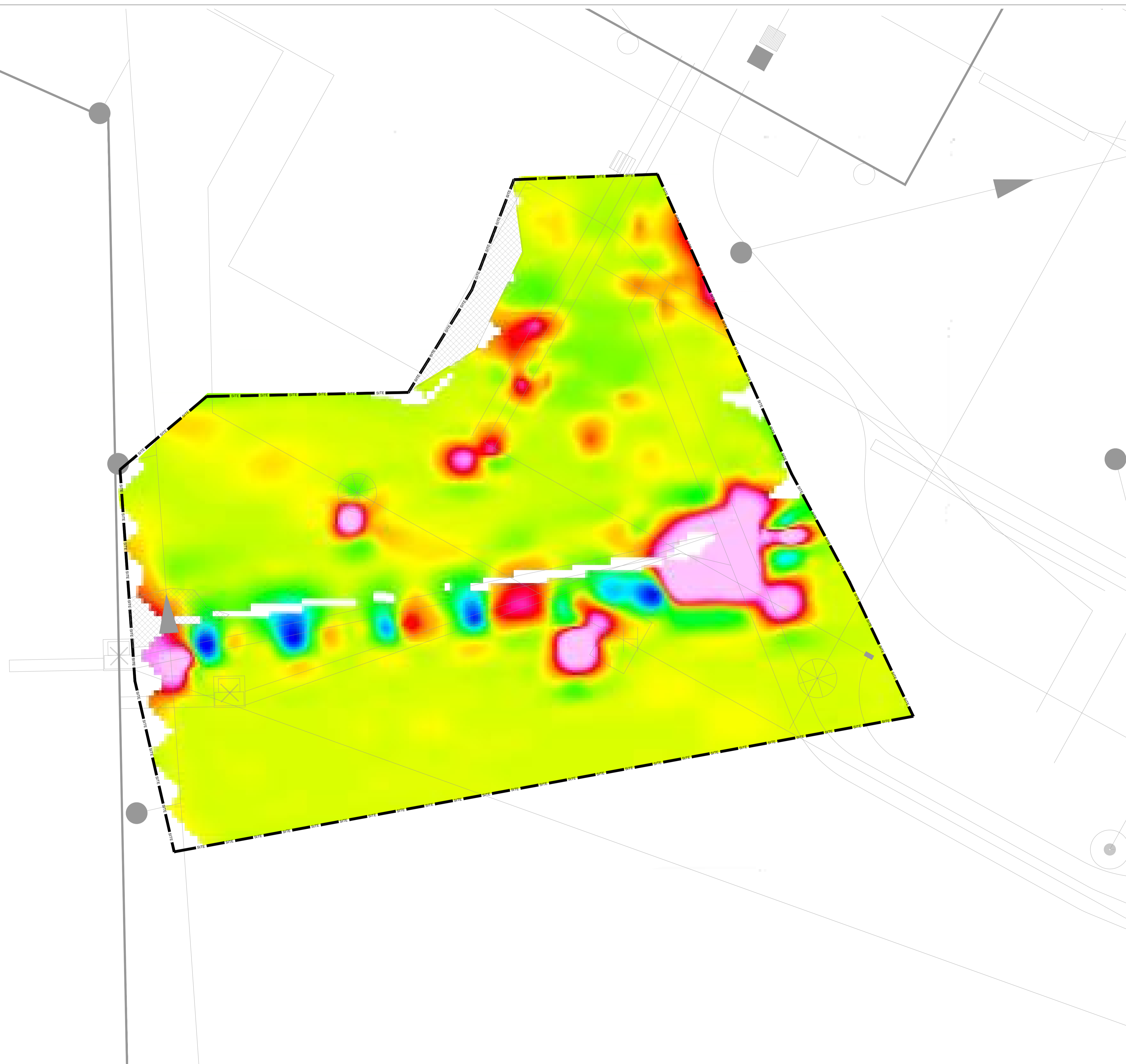
Issue	Remarks	Drawn	Checked	Date
A	Draft issue, for comment.	DB	RG	12/001/2018

Notes

A	Base map constructed from Client-provided drawing.
B	This drawing to be read in conjunction with Zetica report P7830-17-R1-A.
C	Limitations imposed by site conditions and current technologies mean that there can be no guarantee of detection for utility services. It is the responsibility of the user to satisfy themselves as to the location of site services prior to undertaking any excavation.
D	Zetica do not accept responsibility for the accuracy of information supplied by third parties.
E	Where they could be obtained, the depths for apparatus that were traced by RFL and GPR are identified alongside the apparatus in metres below ground level. The depths obtained are modelled and do not necessarily indicate the exact depth to a duct or pipe.
F	Factors such as multiple utility services and made ground can reduce the detectability of utilities and features.

Legend

— SITE — Site Boundary



**Draft**  
User to check for latest issue

Client  
**WSP**

Project  
**Banbury GroundCheck® Survey**

Location  
**KRAFT Site, Ruscote Avenue, Banbury**

Title  
**Map of Secondary Decay Voltage**

Drawn by <b>D Byrne</b>	Checked by <b>R Grant</b>
Horizontal Scale (A1) <b>1:75</b>	Date of Survey <b>08/01/2018</b>
Project Code <b>P7380-17</b>	Issue Date <b>12/001/2018</b>
Drawing No. <b>DWG04</b>	Sheet <b>1 of 1</b>
	Issue <b>A</b>

Issue	Remarks	Drawn	Checked	Date
A	Draft issue, for comment.	DB	RG	12/001/2018



The Victoria  
150-182 The Quays  
Salford  
M50 3SP

[wsp.com](http://wsp.com)



C11281, JDE Building, Banbury OX16 2NN

# Post Contract Information File



**Head Office**

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Arden Road  
Heartlands  
Birmingham  
B8 1DE

**Tel** 0121 322 2225

**Email** [info@dsmgroup.info](mailto:info@dsmgroup.info)

**Web** [www.dsmgroup.info](http://www.dsmgroup.info)



[www.dsmgroup.info](http://www.dsmgroup.info)

decommission / demolish / decontaminate

# Post Contract Information File

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### 4.0 IMPORTED MATERIALS

### 5.0 LEGAL NOTIFICATIONS

### 6.0 SITE ENVIRONMENTAL MONITORING

# Post Contract Information File

## 0.0 Document Status

### 0.1 Document Authorisation:

	Author	Approved
<b>Name</b>	Victoria McMahon	Robert Cooke
<b>Position</b>	Asst. Project Co Ordinator	Quality & Environmental Manager
<b>Signature</b>		

**Note:** Electronic versions of this document do not contain signatures

### 0.2 Document History:

Review Date	Version No.	Section	Comment / Amendments	Initials
04 Feb 2019	1		Initial Issue	VMc



# Post Contract Information File

## 1.0 Document Outline

This document contains the contract information relating to the works undertaken on site. It is divided into sections, detailed below, that group together the available information into sections for use by interested parties as required.

- Section Two - Health and Safety File Information
- Section Three – Waste Summary Details
- Section Four – Copies of waste and material transportation notes and tickets
- Section Five – Legal Notifications for DSM’s Works
- Section Six – Site Environmental Monitoring

## 2.0 Health and Safety File Information

This section contains the information relating to the future use of the site. The information includes that required by the principle designer when preparing the Health and Safety File for the site overall.

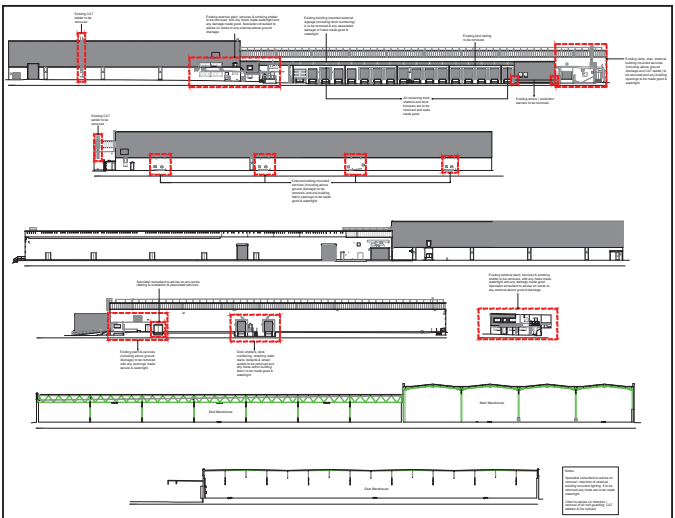
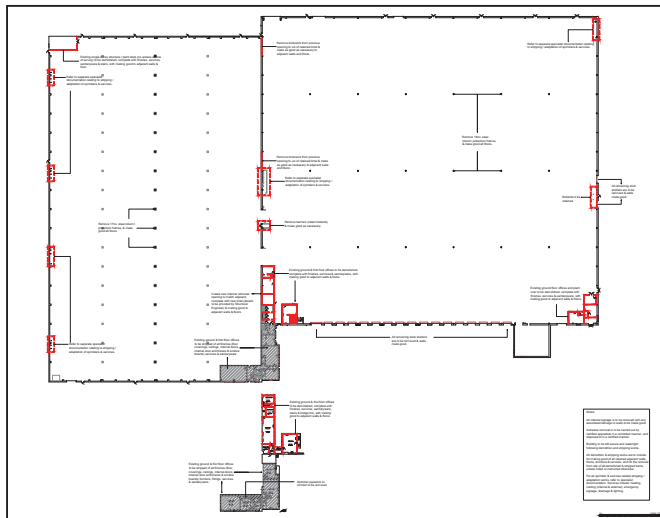
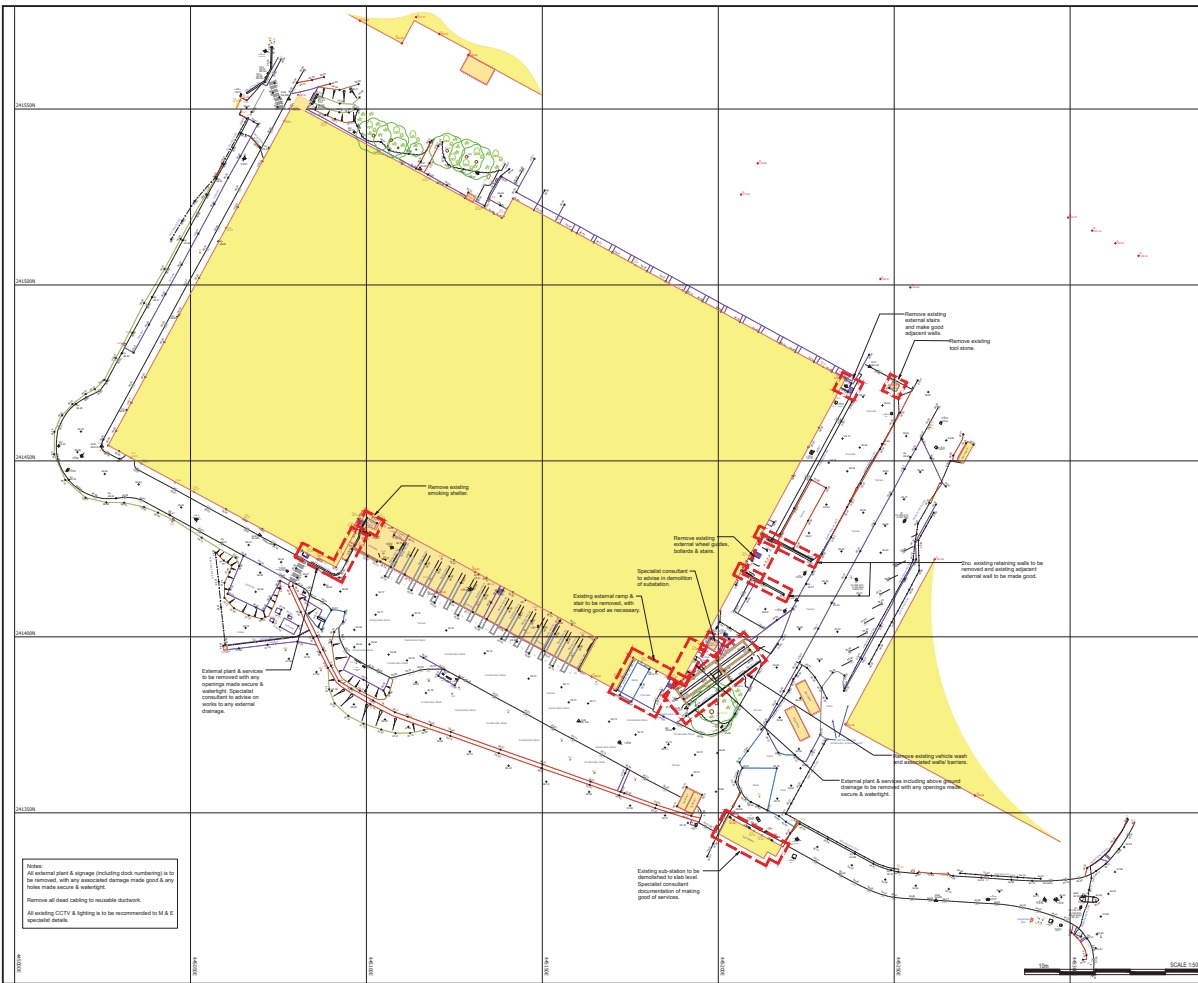
### 2.1 Outline Description of The Works Undertaken

The project works undertaken at the Banbury 200 unit included the internal strip of two warehouse units, identified offices and M&E fittings. The internal rain water items were retained. The identified buildings were cleared of all soft strip, ancillary items and asbestos containing materials.

The substation was demolished, and the floor slab and foundations removed up to one meter below ground level.

All waste was removed from site to waste facilities holding a suitable permit.

The following drawing illustrates the scope of works.



**SITE LOCATION**

Address   
 Postcode

**GENERAL INFORMATION**

Client

Principal Contractor  DSM  others

Welfare facilities by  DSM  others

Demo works Fencing by  DSM  others

Fencing specification  heras  hoarding  palisade  other (below)

**ASBESTOS**

NON-NOTIFIABLE present  YES  NO

NOTIFIABLE present  YES  NO

Asbestos removal by  DSM  others

Read asbestos survey in site pack prior to commencing site works. Do not commence demolition until clearance certification is received

**SERVICES**

Disconnections by  DSM  others

Status of services disconnections can be found in 'section 6' of the site pack  
**IF YOU DO NOT HAVE WRITTEN CONFIRMATION THAT IT IS DISCONNECTED THEN CONSIDER IT TO BE LIVE!!**

Any known live or retained services within working area will be shown on the plan  
 Any known drainage / sewers to be retained or protected will be shown on the plan

**DEMOLITION SPECIFICATION**

- Foundations
- Arisings
- Hardstandings

Demolition  
 Substation and breakout slabs up to 1m, remove internal offices, roller shutters, dock leveller, column protection, lorry wash, M&E, CAT ladder, signage, retaining walls, vehicle wash & protection frames.

**FINISHES**

Fencing after demo  heras  hoarding  palisade  other (below)

- fencing notes

Ground after demo  levelled  seeded  turfed  other (below)

-finishing notes

Additional comments

Signed		Drwg No:	C11281	rev	A
Project		JDE Building, Banbury			
Title		Scope of Works			
rev.	revision notes	date	16 08 18 AB	by	

date	16/08/18	Arden House Arden Road Heartlands Birmingham B8 1DE Tel: +44 (0) 121 322 2225 Tel: +44 (0) 121 322 2227 Email: mail@dsigroup.info
scale	n/a @A3	
drawn	Andrew Brain	
checked	Tony McGovern	
 www.dsigroup.info decommission / demolish / decontaminate		

# Post Contract Information File

## 2.2 Contract Dates

20<sup>th</sup> August 2018 – 2<sup>nd</sup> November 2018

## 2.3 Contract Directory

The following individuals and organisations were involved with the works DSM undertook on site.

### Client

Astec TM Ltd	Contact – Stephen Broadhurst
Brookfield Farm	Tel – 07968 556576
Nuneaton	
Church End	
Ansley	
CV10 0QU	

### Principle Designer

Curran Web Ltd	Contact – Jim Curran
Vale Park	Tel – 01386 765189
Enterprise Way	
Evesham	
WR11 1GS	

### Contractor

DSM Demolition Limited	Contact – Billy Young
Arden House	Tel – 0121 322 2225
Arden Road	
Heartlands	
Birmingham	
B8 1DE	

# Post Contract Information File



## 2.4 Services

All installations on site were disconnected prior to works commencing by the client.

- Electrical isolation certificate attached.

**Isolation Permit / Report**

Company DSM Group

Site JDE building

Date 20/08/2018

Location and details of Work

Site audit to check electrical services already isolated and are proved dead at utilities incoming and outgoing to enable demolition works.

Note; all complete and confirmed dead.

Method Statement Reference(s) n/a

Risk Assessments Reference(s)n/a

Persons carrying out the work must be in possession of relevant Method Statements and / or Risk Assessments. These must have been reviewed and approved by Dualec LTD

Equipment affected by the withdrawal: all electrical services.

I hereby authorise the withdrawal of service of the equipment described above

Name Keiron Jones

Signature

Company DSM group

**Electrical Services to be Isolated**

Service main incomes

Location

Means removed

Service

Location

Means

Service

Location

Means

**Authority to commence work**

**I have inspected the system and equipment identified in section1 of this permit and am satisfied that it is sufficiently isolated for the work described to proceed until:** Time                      Date

Name

Signature

Time

Date

 Responsible Person  
(Elec)

Steven day

S.d

8.30am

20/08/2018

Authorised Person

**6. Withdrawal of Permit**

**I have inspected the system and equipment and am satisfied that the work is completed or suspended and it is safe to remove the Isolations.**

Name

Signature

Time

Date

 Responsible Person  
(Elec)

 N/a service made  
redundant

Authorised Person

## 2.5 Other Known Residual Hazards

This section contains the details any site residual hazards known to DSM, and details of any hazardous materials used by DSM in the course of the works that remain on site. Details of the residual hazards posed by services on site are contained in section 2.4.

No other known residual hazards remain on site.

# Post Contract Information File



## 2.6 Details of Plant and Equipment Left on Site

This section contains the details, operating instructions, maintenance details etc of any equipment installed as part of DSM's works that remains on site.

No plant or equipment was left on site as part of DSM's works.



# Post Contract Information File



## 2.7 Test Results for Materials Left on Site

This section contains the test results for any materials remaining on to site. This includes materials such as site produced 6F2, 6F3, Type One Sub-Base etc.

No materials were left on site.

## 3.0 Waste Summary Details

Details of all the wastes produced on site and the disposal and treatment routes are contained within this section. For the contract the amount of material recycled, recovered and re-used by weight is calculated [Demolition Index DI] and where appropriate the amount of recycled, recovered and re-used material retained for future site use is calculated [Retained Material Index RMI].

## 3.1 Summary of Wastes

This section summarises all the wastes produced by the works including waste types; waste carriers used, waste facilities used and details of waste quantities and loads moved.

# Site Waste Management Plan - Summary of Produced Waste



Contract Name JDE Building, Banbury, OX16 2NN  
 Contract Number C11281

Phase Number Not Applicable Date of Issue 04 Feb 2019  
 Reason For Issue Final

Version Number 1

## Overall Achieved Recycling Rates

Parameter	Target	Actual
DI - Demolition Index	98	95
RMI - Retained Material Index	n/a	n/a

## Summary of Wastes (Amounts to the nearest whole tonne)

Waste / Material Type	EWC Code / Material	Operation	Facility Code Number	Carrier Code Number	Loads	Arisings (Tonnes)				
						Forecast		Actual		
						Total	RRR'd	Total	RRR'd	
Concrete & Brick	17 01 07	R O	158	2	26	500	500	468	468	
								468	468	
Asbestos Insul.	17 06 01	W	86	2	2	10	0	9	0	
								9	0	
Soft Strip	17 09 04	R O	123	2	2	40	34	34	11	
			83	2	1			8	7	
			86	2	6			5	4	
			86	2	6			21	0	
Iron & Steel	17 04 05	R O	44	23	28	180	180	170	170	
								170	170	
Operation Codes					Total	65	730	714	681	649

R S RRR'd On Site W Waste (Landfill) R O RRR'd Off Site R O-F RRR'd Off Site (as fuel)

**Notes**

DSM produces waste management plans as part of the process of developing working methods for its contracts. This ensures that the amount and composition of all arisings are taken into account when the works are designed. This ensures that the maximum amount of arisings are diverted from waste and into products that can be re-used.

There is now no legal requirement to produce waste management plans, but DSM still produces them as they ensure the maximum amount of arisings produced are re-used, recycled or recovered. All wastes produced on any contract are reviewed to determine the best disposal route and in all decisions the waste hierarchy is applied.

DSM, as part of its management system, sets a KPI [key performance indicator] for the amount of waste that is re-used, recycled or recovered [RRRR'd]. The nature of our core works produces large quantities of waste due to the legal definition of waste being "materials no longer required or needed by the holder or producer". The KPI use the demolition index [DI] which is defined as the percentage of waste produced that is re-used, recycled or recovered compared to the total amount of waste produced.

DSM also measures the retained material index [RMI] which is defined as the percentage of recovered waste that is left on the production site for future use. DSM does not set a KPI for this index as it is one we have no control over.

All of the planned or used waste carriers have been identified and their registration numbers identified and verified.

All of the planned or used waste facilities, operators and their permits or exemption from the need for a permit (under the Environmental Permitting (England and Wales) Regulations 2007 etc) have been verified as being valid.

As required by section 34 of the Environmental Protection Act 1990 copies of, or references to the written description of all the wastes have been obtained.

We have identified the waste management action proposed for each different waste type, including re-using, recycling, recovery and disposal, and have ensured that all waste from the site is dealt with in accordance with the waste duty of care in section 34 of the Environmental Protection Act 1990(3) and the Environmental Protection (Duty of Care) Regulations 1991(4); and materials will be handled efficiently and waste managed appropriately in accordance with the waste hierarchy as listed below:

<b>Operation</b>	<b>Code</b>	<b>Comments</b>
Reduce / Prevention	~	<i>Not applicable to DSM's core works - client decision</i>
Re-Use	<b>R S R O</b>	<i>Optimal solution where possible eg re-use roof slates</i>
Re-Cycle	<b>R S R O</b>	<i>By mass DSM's principal waste operation (concrete and brick into secondary aggregates)</i>
Recover	<b>R O-F</b>	<i>Typical operation is use of poor quality wood as a fuel</i>
Dispose	<b>W</b>	<i>Limited to disposal of materials normally with specific properties such as asbestos</i>

**Site Waste Management Plan - Waste Carriers  
and Disposal Facilities**



Contract Name JDE Building, Banbury, OX16 2NN  
Contract Number C11281

Phase Number Not Applicable Date of Issue 04 Feb 2019 Version Number 1  
Reason For Issue Final

**Registered Waste Carriers**

Code Number	Full Name	Postcode	Registration
23	European Metal Recycling Ltd	WA5 7NS	CB/ZE5607KJ
2	DSM Demolition Ltd	B8 1DE	CBDU101140

**Disposal Facility**

Code Number	Full Name	Postcode	Permit	Recycle Rate (%)
158	DSM Demolition, Fenny Compton	CV47 2XB	n/a	100
123	Mercian Recycling Ltd	B30 3JJ	100336	85
86	Veolia Ling Hall	CV23 9HH	48116	0
83	Tom White Waste Ltd Coventry	CV6 6AP	101653	85
44	EMR Swindon	SN2 8DZ	86340	100

# Post Contract Information File



## 3.2 Waste Tickets

This section contains copies of all waste duty of care notes and hazardous waste consignment notes for materials taken from site.

# DUTY OF CARE NOTE

55702



CARRIER DSM Demolition Ltd., Arden House, Arden Road, Heartlands, Birmingham B8 1DE  
 TELEPHONE 0121 322 2225 FAX 0121 322 2227 Carrier/Broker Licence No. - CBDUI01140

CARRIER DETAILS	DRIVER'S NAME <b>GARY HURST</b>											
	VEHICLE REG. <b>BK62 BYT</b>								DATE <b>18/09/18</b>			
SITE DETAILS	JOB NUMBER <b>C</b>								No. OF LOADS <b>6</b>			
	JOB NAME <b>BANBURY</b>											
	TAKEN TO <b>FENNY COMPTON</b>											
MATERIAL DETAILS (TO BE COMPLETED BY DRIVER)	MATERIAL Tick appropriate box <input checked="" type="checkbox"/>											
		CONC./BRICK	BITUMINOUS	SOFT STRIP	FERROUS	WOOD	PLASTERBOARD	ASBESTOS FIBROUS	ASBESTOS BONDED	SOIL - CLEAN	SOIL - CONTAM.	OTHER - DETAIL
	EWC 17	01-07	03-02	09-04	04-05	02-01	08-02	06-01	06-05	05-04	05-03	
	SIC CODE	<b>43.11</b>										
	DESCRIPTION	<b>CONCRETE</b>										

DECLARATION - Certified that the above particulars are true and relate to the load being conveyed in the vehicle described. Hazardous materials also require a hazardous waste consignment note to be completed, and where appropriate ADR to be complied with. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 21 of The Waste (England and Wales) Regulations 2011.

CONSIGNEE (RECEIVED BY)	COMPANY NAME <b>DSM</b>
	LOCATION
	NAME (print)
	SIGNATURE

# DUTY OF CARE NOTE

# 55571



**CARRIER** DSM Demolition Ltd., Arden House, Arden Road, Heartlands, Birmingham B8 1DE  
**TELEPHONE** 0121 322 2225 **FAX** 0121 322 2227 **Carrier/Broker Licence No.** - CBDU101140

<b>CARRIER DETAILS</b>	DRIVER'S NAME GAVIN											
	VEHICLE REG. BK62 BYU									DATE 19/9/18		
<b>SITE DETAILS</b>	JOB NUMBER C									No. OF LOADS 1x8		
	JOB NAME JOE BANBURY											
	TAKEN TO Tom Whites COVENTRY											
<b>MATERIAL DETAILS (TO BE COMPLETED BY DRIVER)</b>	MATERIAL Tick appropriate box											
		CONC./BRICK	BITUMINOUS	SOFT STRIP	FERROUS	WOOD	PLASTERBOARD	ASBESTOS FIBROUS	ASBESTOS BONDED	SOIL - CLEAN	SOIL - CONTAM.	OTHER - DETAIL
	EWC 17	01-07	03-02	09-04	04-05	02-01	08-02	06-01	06-05	05-04	05-03	
	SIC CODE	43.11										
	DESCRIPTION	DEMO WASTE 17.09.04										

**DECLARATION** - Certified that the above particulars are true and relate to the load being conveyed in the vehicle described. Hazardous materials also require a hazardous waste consignment note to be completed, and where appropriate ADR to be complied with. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 21 of The Waste (England and Wales) Regulations 2011.

<b>CONSIGNEE (RECEIVED BY)</b>	COMPANY NAME	[REDACTED]
	LOCATION	[REDACTED]
	NAME (print)	[REDACTED]
	SIGNATURE	[REDACTED]



# DUTY OF CARE NOTE

# 55572



CARRIER DSM Demolition Ltd., Arden House, Arden Road, Heartlands, Birmingham B8 1DE  
 TELEPHONE 0121 322 2225 FAX 0121 322 2227 Carrier/Broker Licence No. – CBDU101140

CARRIER DETAILS	DRIVER'S NAME Gavin											
	VEHICLE REG. BU62 BYU									DATE 19/9/18		
SITE DETAILS	JOB NUMBER C									No. OF LOADS 1x20		
	JOB NAME JOE BANBURY											
TAKEN TO FENNY COMPTON												
MATERIAL DETAILS (TO BE COMPLETED BY DRIVER)	MATERIAL Tick appropriate box	<input checked="" type="checkbox"/>										
		CONC./BRICK	BITUMINOUS	SOFT STRIP	FERROUS	WOOD	PLASTERBOARD	ASBESTOS FIBROUS	ASBESTOS BONDED	SOIL – CLEAN	SOIL – CONTAM.	OTHER – DETAIL
	EWC 17	01-07	03-02	09-04	04-05	02-01	08-02	06-01	06-05	05-04	05-03	
	SIC CODE	43.11										
	DESCRIPTION	Conc										

DECLARATION – Certified that the above particulars are true and relate to the load being conveyed in the vehicle described. Hazardous materials also require a hazardous waste consignment note to be completed, and where appropriate ADR to be complied with. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 21 of The Waste (England and Wales) Regulations 2011.

CONSIGNEE (RECEIVED BY)	COMPANY NAME	[REDACTED]
	LOCATION	[REDACTED]
	NAME (print)	
	SIGNATURE	

# DUTY OF CARE NOTE

# 55574



**CARRIER** DSM Demolition Ltd., Arden House, Arden Road, Heartlands, Birmingham B8 1DE  
**TELEPHONE** 0121 322 2225 **FAX** 0121 322 2227 **Carrier/Broker Licence No.** - CBDUI01140

<b>CARRIER DETAILS</b>	DRIVER'S NAME Gavin											
	VEHICLE REG. BU62 BYU								DATE 20/9/18			
<b>SITE DETAILS</b>	JOB NUMBER C								No. OF LOADS 1x8L			
	JOB NAME JDE BANBURY											
	TAKEN TO Fenny Compton											
<b>MATERIAL DETAILS (TO BE COMPLETED BY DRIVER)</b>	MATERIAL Tick appropriate box											
		CONC./BRICK	BITUMINOUS	SOFT STRIP	FERROUS	WOOD	PLASTERBOARD	ASBESTOS FIBROUS	ASBESTOS BONDED	SOIL - CLEAN	SOIL - CONTAM.	OTHER - DETAIL
	EWC 17	01-07	03-02	09-04	04-05	02-01	08-02	06-01	06-05	05-04	05-03	
	SIC CODE	43.11										
	DESCRIPTION	Hardcore										

**DECLARATION** - Certified that the above particulars are true and relate to the load being conveyed in the vehicle described. Hazardous materials also require a hazardous waste consignment note to be completed, and where appropriate ADR to be complied with. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 21 of The Waste (England and Wales) Regulations 2011.

<b>CONSIGNEE (RECEIVED BY)</b>	COMPANY NAME	[REDACTED]
	LOCATION	[REDACTED]
	NAME (print)	
	SIGNATURE	

# DUTY OF CARE NOTE

55575



CARRIER DSM Demolition Ltd., Arden House, Arden Road, Heartlands, Birmingham B8 1DE  
 TELEPHONE 0121 322 2225 FAX 0121 322 2227 Carrier/Broker Licence No. - CBDUI01140

CARRIER DETAILS	DRIVER'S NAME GAVIN											
	VEHICLE REG. BK62 BYU								DATE 20/9/18			
SITE DETAILS	JOB NUMBER C								No. OF LOADS 1x8			
	JOB NAME JDE BANBURY											
	TAKEN TO FENNY COMPTON											
MATERIAL DETAILS (TO BE COMPLETED BY DRIVER)	MATERIAL Tick appropriate box	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		CONC./BRICK	BITUMINOUS	SOFT STRIP	FERROUS	WOOD	PLASTERBOARD	ASBESTOS FIBROUS	ASBESTOS BONDED	SOIL - CLEAN	SOIL - CONTAM.	OTHER - DETAIL
	EWC 17	01-07	03-02	09-04	04-05	02-01	08-02	06-01	06-05	05-04	05-03	
	SIC CODE	43.11										
	DESCRIPTION	CANC										

DECLARATION - Certified that the above particulars are true and relate to the load being conveyed in the vehicle described. Hazardous materials also require a hazardous waste consignment note to be completed, and where appropriate ADR to be complied with. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 21 of The Waste (England and Wales) Regulations 2011.

CONSIGNEE (RECEIVED BY)	COMPANY NAME	[REDACTED]
	LOCATION	[REDACTED]
	NAME (print)	
	SIGNATURE	

# DUTY OF CARE NOTE

55576



CARRIER DSM Demolition Ltd., Arden House, Arden Road, Heartlands, Birmingham B8 1DE  
 TELEPHONE 0121 322 2225 FAX 0121 322 2227 Carrier/Broker Licence No. - CBDUI01140

<b>CARRIER DETAILS</b>	DRIVER'S NAME Gavin											
	VEHICLE REG. BU62 BYU									DATE 20/9/18		
<b>SITE DETAILS</b>	JOB NUMBER C									No. OF LOADS 128		
	JOB NAME JOE BANBURY											
	TAKEN TO Fenny Compton											
<b>MATERIAL DETAILS (TO BE COMPLETED BY DRIVER)</b>	MATERIAL Tick appropriate box <input checked="" type="checkbox"/>											
		CONC./BRICK	BITUMINOUS	SOFT STRIP	FERROUS	WOOD	PLASTERBOARD	ASBESTOS FIBROUS	ASBESTOS BONDED	SOIL - CLEAN	SOIL - CONTAM.	OTHER - DETAIL
	EWC 17	01-07	03-02	09-04	04-05	02-01	08-02	06-01	06-05	05-04	05-03	
	SIC CODE	43.11										
	DESCRIPTION	Conc										

DECLARATION - Certified that the above particulars are true and relate to the load being conveyed in the vehicle described. Hazardous materials also require a hazardous waste consignment note to be completed, and where appropriate ADR to be complied with. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 21 of The Waste (England and Wales) Regulations 2011.

<b>CONSIGNEE (RECEIVED BY)</b>	COMPANY NAME	[REDACTED]
	LOCATION	[REDACTED]
	NAME (print)	[REDACTED]
	SIGNATURE	[REDACTED]



# DUTY OF CARE NOTE

# 55577



**CARRIER** DSM Demolition Ltd., Arden House, Arden Road, Heartlands, Birmingham B8 1DE  
**TELEPHONE** 0121 322 2225 **FAX** 0121 322 2227 **Carrier/Broker Licence No.** - CBDU101140

<b>CARRIER DETAILS</b>	DRIVER'S NAME GAVIN											
	VEHICLE REG. B462 BYM									DATE 20/9/18		
<b>SITE DETAILS</b>	JOB NUMBER C									No. OF LOADS 1x80		
	JOB NAME JOE BANBURY											
	TAKEN TO FANNY COMPTON											
<b>MATERIAL DETAILS (TO BE COMPLETED BY DRIVER)</b>	MATERIAL Tick appropriate box	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		CONC./BRICK	BITUMINOUS	SOFT STRIP	FERROUS	WOOD	PLASTERBOARD	ASBESTOS FIBROUS	ASBESTOS BONDED	SOIL - CLEAN	SOIL - CONTAM.	OTHER - DETAIL
	EWC 17	01-07	03-02	09-04	04-05	02-01	08-02	06-01	06-05	05-04	05-03	
	SIC CODE	43.11										
	DESCRIPTION	CONC										

**DECLARATION** - Certified that the above particulars are true and relate to the load being conveyed in the vehicle described. Hazardous materials also require a hazardous waste consignment note to be completed, and where appropriate ADR to be complied with. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 21 of The Waste (England and Wales) Regulations 2011.

<b>CONSIGNEE (RECEIVED BY)</b>	COMPANY NAME	[REDACTED]
	LOCATION	[REDACTED]
	NAME (print)	[REDACTED]
	SIGNATURE	[REDACTED]

# DUTY OF CARE NOTE

# 55578



CARRIER DSM Demolition Ltd., Arden House, Arden Road, Heartlands, Birmingham B8 1DE  
 TELEPHONE 0121 322 2225 FAX 0121 322 2227 Carrier/Broker Licence No. - CBDU101140

<b>CARRIER DETAILS</b>	DRIVER'S NAME <i>GRAVIN</i>											
	VEHICLE REG. <i>BK62 BYU</i>								DATE <i>20/9/18</i>			
<b>SITE DETAILS</b>	JOB NUMBER <b>C</b>								No. OF LOADS <i>1282</i>			
	JOB NAME <i>TIDE BANBURY</i>											
	TAKEN TO <i>Fanny Campion</i>											
<b>MATERIAL DETAILS (TO BE COMPLETED BY DRIVER)</b>	MATERIAL Tick appropriate box											
		CONC./BRICK	BITUMINOUS	SOFT STRIP	FERROUS	WOOD	PLASTERBOARD	ASBESTOS FIBROUS	ASBESTOS BONDED	SOIL - CLEAN	SOIL - CONTAM.	OTHER - DETAIL
	EWC 17	01-07	03-02	09-04	04-05	02-01	08-02	06-01	06-05	05-04	05-03	
	SIC CODE	<b>43.11</b>										
	DESCRIPTION	<i>Conc</i>										

DECLARATION - Certified that the above particulars are true and relate to the load being conveyed in the vehicle described. Hazardous materials also require a hazardous waste consignment note to be completed, and where appropriate ADR to be complied with. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 21 of The Waste (England and Wales) Regulations 2011.

<b>CONSIGNEE (RECEIVED BY)</b>	COMPANY NAME	
	LOCATION	
	NAME (print)	
	SIGNATURE	

# DUTY OF CARE NOTE

# 55579



CARRIER DSM Demolition Ltd., Arden House, Arden Road, Heartlands, Birmingham B8 1DE  
 TELEPHONE 0121 322 2225 FAX 0121 322 2227 Carrier/Broker Licence No. - CBDU101140

CARRIER DETAILS	DRIVER'S NAME GAVIN											
	VEHICLE REG. BK62 BYU								DATE 20/9/18			
SITE DETAILS	JOB NUMBER C								No. OF LOADS 1x8w			
	JOB NAME JOE RANBURY											
	TAKEN TO FENNY COMPTON											
MATERIAL DETAILS (TO BE COMPLETED BY DRIVER)	MATERIAL Tick appropriate box	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		CONC./BRICK	BITUMINOUS	SOFT STRIP	FERROUS	WOOD	PLASTERBOARD	ASBESTOS FIBROUS	ASBESTOS BONDED	SOIL - CLEAN	SOIL - CONTAM.	OTHER - DETAIL
	EWC 17	01-07	03-02	09-04	04-05	02-01	08-02	06-01	06-05	05-04	05-03	
	SIC CODE	43.11										
	DESCRIPTION	CONC										

DECLARATION – Certified that the above particulars are true and relate to the load being conveyed in the vehicle described. Hazardous materials also require a hazardous waste consignment note to be completed, and where appropriate ADR to be complied with. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 21 of The Waste (England and Wales) Regulations 2011.

CONSIGNEE (RECEIVED BY)	COMPANY NAME	[REDACTED]
	LOCATION	[REDACTED]
	NAME (print)	
	SIGNATURE	

# DUTY OF CARE NOTE

54736



CARRIER DSM Demolition Ltd., Arden House, Arden Road, Heartlands, Birmingham B8 1DE  
 TELEPHONE 0121 322 2225 FAX 0121 322 2227 Carrier/Broker Licence No. – CBDU101140

<b>CARRIER DETAILS</b>	DRIVER'S NAME GAVIN											
	VEHICLE REG. BK62 BYU										DATE 24/9/18	
<b>SITE DETAILS</b>	JOB NUMBER C										No. OF LOADS 1x8u	
	JOB NAME JOE BANBURY											
	TAKEN TO PENNY COMPTON											
<b>MATERIAL DETAILS (TO BE COMPLETED BY DRIVER)</b>	MATERIAL Tick appropriate box	<input checked="" type="checkbox"/>										
		CONC./BRICK	BITUMINOUS	SOFT STRIP	FERROUS	WOOD	PLASTERBOARD	ASBESTOS FIBROUS	ASBESTOS BONDED	SOIL – CLEAN	SOIL – CONTAM.	OTHER – DETAIL
	EWC 17	01-07	03-02	09-04	04-05	02-01	08-02	06-01	06-05	05-04	05-03	
	SIC CODE	43.11										
	DESCRIPTION	CONC										

DECLARATION – Certified that the above particulars are true and relate to the load being conveyed in the vehicle described. Hazardous materials also require a hazardous waste consignment note to be completed, and where appropriate ADR to be complied with. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 21 of The Waste (England and Wales) Regulations 2011.

<b>CONSIGNEE (RECEIVED BY)</b>	COMPANY NAME	[REDACTED]
	LOCATION	[REDACTED]
	NAME (print)	[REDACTED]
	SIGNATURE	[REDACTED]



# DUTY OF CARE NOTE

54737



CARRIER DSM Demolition Ltd., Arden House, Arden Road, Heartlands, Birmingham B8 1DE  
 TELEPHONE 0121 322 2225 FAX 0121 322 2227 Carrier/Broker Licence No. - CBDU101140

CARRIER DETAILS	DRIVER'S NAME Gavin											
	VEHICLE REG. B1662 BYU										DATE 24/9/18	
SITE DETAILS	JOB NUMBER C										No. OF LOADS	
	JOB NAME JDE BARBURY											
	TAKEN TO FENNELL COMPTON											
MATERIAL DETAILS (TO BE COMPLETED BY DRIVER)	MATERIAL Tick appropriate box	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		CONC./BRICK	BITUMINOUS	SOFT STRIP	FERROUS	WOOD	PLASTERBOARD	ASBESTOS FIBROUS	ASBESTOS BONDED	SOIL - CLEAN	SOIL - CONTAM.	OTHER - DETAIL
	EWC 17	01-07	03-02	09-04	04-05	02-01	08-02	06-01	06-05	05-04	05-03	
	SIC CODE	43.11										
	DESCRIPTION	Conc										

DECLARATION - Certified that the above particulars are true and relate to the load being conveyed in the vehicle described. Hazardous materials also require a hazardous waste consignment note to be completed, and where appropriate ADR to be complied with. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 21 of The Waste (England and Wales) Regulations 2011.

CONSIGNEE (RECEIVED BY)	COMPANY NAME	[REDACTED]
	LOCATION	[REDACTED]
	NAME (print)	
	SIGNATURE	

# DUTY OF CARE NOTE

54738



CARRIER DSM Demolition Ltd., Arden House, Arden Road, Heartlands, Birmingham B8 1DE  
 TELEPHONE 0121 322 2225 FAX 0121 322 2227 Carrier/Broker Licence No. – CBDU101140

CARRIER DETAILS	DRIVER'S NAME Graw											
	VEHICLE REG. BK62 BYU										DATE 24/9/18	
SITE DETAILS	JOB NUMBER C										No. OF LOADS 1x50	
	JOB NAME JOE BANBURY											
	TAKEN TO FERNY COMPTON											
MATERIAL DETAILS (TO BE COMPLETED BY DRIVER)	MATERIAL Tick appropriate box	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		CONC./BRICK	BITUMINOUS	SOFT STRIP	FERROUS	WOOD	PLASTERBOARD	ASBESTOS FIBROUS	ASBESTOS BONDED	SOIL – CLEAN	SOIL – CONTAM.	OTHER – DETAIL
	EWC 17	01-07	03-02	09-04	04-05	02-01	08-02	06-01	06-05	05-04	05-03	
	SIC CODE	43.11										
	DESCRIPTION	Conc										

DECLARATION – Certified that the above particulars are true and relate to the load being conveyed in the vehicle described. Hazardous materials also require a hazardous waste consignment note to be completed, and where appropriate ADR to be complied with. I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 21 of The Waste (England and Wales) Regulations 2011.

CONSIGNEE (RECEIVED BY)	COMPANY NAME	[REDACTED]
	LOCATION	[REDACTED]
	NAME (print)	
	SIGNATURE	