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Llandarcy  
SA10 6HJ

**Attention:** John Fitzgerald

## CERTIFICATE OF ANALYSIS

**Date of report Generation:** 09 May 2021  
**Customer:** Atkins Global Ltd  
**Sample Delivery Group (SDG):** 210422-141  
**Your Reference:**  
**Location:** Llanwern  
**Report No:** 597135

We received 7 samples on Thursday April 22, 2021 and 7 of these samples were scheduled for analysis which was completed on Sunday May 09, 2021. 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 Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

**Sonia McWhan**

Operations Manager





## CERTIFICATE OF ANALYSIS

Validated

**SDG:** 210422-141  
**Location:** Llanwern

**Client Reference:**  
**Order Number:** 108282

**Report Number:** 597135  
**Superseded Report:**

### Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24128920	D5-C		0.00 - 0.00	21/04/2021
24129050	Ellens Reen		0.00 - 0.00	21/04/2021
24128988	EWD-E		0.00 - 0.00	21/04/2021
24129005	KW-C		0.00 - 0.00	21/04/2021
24128944	ML-N		0.00 - 0.00	21/04/2021
24129028	ML-S		0.00 - 0.00	21/04/2021
24128967	R3-C		0.00 - 0.00	21/04/2021

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











24128944	ML-N		0.00 - 0.00	H2SO4 (ALE244)	SW			
				250ml Amber Gl. PTFE/PE (ALE219)	SW			
				1000ml glass bottle (ALE220)	SW	X		
				0.5l glass bottle (ALE227)	SW			
				ZnAc (ALE246)	SW			
				Vial (ALE297)	SW		X	
				NaOH (ALE245)	SW			
				HNO3 Unfiltered (ALE204)	SW			
				HNO3 Filtered (ALE204)	SW			
				H2SO4 (ALE244)	SW			
24128905	KW-C		0.00 - 0.00	250ml Amber Gl. PTFE/PE (ALE219)	SW			
				1000ml glass bottle (ALE220)	SW	X		
				0.5l glass bottle (ALE227)	SW			
				ZnAc (ALE246)	SW			
				Vial (ALE297)	SW			
				NaOH (ALE245)	SW			
				HNO3 Unfiltered (ALE204)	SW			
				HNO3 Filtered (ALE204)	SW			
				H2SO4 (ALE244)	SW			
				250ml Amber Gl. PTFE/PE (ALE219)	SW			
24128988	EWD-E		0.00 - 0.00	1000ml glass bottle (ALE220)	SW			
				0.5l glass bottle (ALE227)	SW			
				ZnAc (ALE246)	SW			
				Vial (ALE297)	SW			
				NaOH (ALE245)	SW		X	
				HNO3 Unfiltered (ALE204)	SW			
				HNO3 Filtered (ALE204)	SW			
				H2SO4 (ALE244)	SW			
				250ml Amber Gl. PTFE/PE (ALE219)	SW			
				1000ml glass bottle (ALE220)	SW	X		





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Validated

SDG: 210422-141  
Location: Llanwern

Client Reference:  
Order Number: 108282

Report Number: 597135  
Superseded Report:

## Results Legend

- X** Test  
**N** No Determination Possible

## 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
				HNO3 Filtered (ALE204)	H2SO4 (ALE244)	250ml Amber Gl. PTFE/PE (ALE219)	1000ml glass bottle (ALE220)	0.5l glass bottle (ALE227)	ZnAc (ALE246)	Vial (ALE297)	NaOH (ALE245)	HNO3 Unfiltered (ALE204)	HNO3 Filtered (ALE204)	H2SO4 (ALE244)	250ml Amber Gl. PTFE/PE (ALE219)	1000ml glass bottle (ALE220)	0.5l glass bottle (ALE227)	
24128944	ML-N		0.00 - 0.00															SW
24129028	ML-S		0.00 - 0.00															SW
24128967	R3-C		0.00 - 0.00															SW
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 7																
Anions by Kone (w)	All	NDPs: 0 Tests: 7																
BOD True Total	All	NDPs: 0 Tests: 7																
COD Unfiltered	All	NDPs: 0 Tests: 7																
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 7																
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 7																
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 7																
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 7																
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 7																
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 7																
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 7																
Fluoride	All	NDPs: 0 Tests: 7																
GRO by GC-FID (W)	All	NDPs: 0 Tests: 7																
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 7																
Mercury Dissolved	All	NDPs: 0 Tests: 7																





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SDG: 210422-141  
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Client Reference:  
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## Results Legend

- X** Test  
**N** No Determination Possible

## Sample Types -

S - Soil/Solid  
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GW - Ground Water  
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LE - Land Leachate  
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<div>Results Legend</div> <div><div>X</div> Test</div> <div><div>N</div> No Determination Possible</div> <div>Sample Types -</div> <div>S - Soil/Solid</div> <div>UNS - Unspecified Solid</div> <div>GW - Ground Water</div> <div>SW - Surface Water</div> <div>LE - Land Leachate</div> <div>PL - Prepared Leachate</div> <div>PR - Process Water</div> <div>SA - Saline Water</div> <div>TE - Trade Effluent</div> <div>TS - Treated Sewage</div> <div>US - Untreated Sewage</div> <div>RE - Recreational Water</div> <div>DW - Drinking Water Non-regulatory</div> <div>UNL - Unspecified Liquid</div> <div>SL - Sludge</div> <div>G - Gas</div> <div>OTH - Other</div>	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	24128944		ML-N				0.00 - 0.00		HNO3 Filtered (ALE204)		SW	
	24129028		ML-S				0.00 - 0.00		H2SO4 (ALE244)		SW	
	24128967		R3-C				0.00 - 0.00		250ml Amber Gl. PTFE/PE (ALE219)		SW	
									1000ml glass bottle (ALE220)		SW	
									0.5l glass bottle (ALE227)		SW	
									ZnAc (ALE246)		SW	
								Vial (ALE297)		SW		
								NaOH (ALE245)		SW		
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24128967	R3-C		0.00 - 0.00	ZnAc (ALE246)	SW				
				ViaI (ALE297)	SW				
				NaOH (ALE245)	SW				X
				HNO3 Unfiltered (ALE204)	SW				



## CERTIFICATE OF ANALYSIS

SDG: 210422-141  
Location: LlanwernClient Reference:  
Order Number: 108282Report Number: 597135  
Superseded Report:

Results Legend			Customer Sample Ref.		D5-C	Ellens Reen	EWD-E	KW-C	ML-N	ML-S
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
M	mCERTS accredited.				Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
aq	Aqueous / settled sample.				21/04/2021	21/04/2021	21/04/2021	21/04/2021	21/04/2021	21/04/2021
diss.filt	Dissolved / filtered sample.				00:00	00:00	00:00	00:00	00:00	00:00
tot.unfilt	Total / unfiltered sample.				22/04/2021	22/04/2021	22/04/2021	22/04/2021	22/04/2021	22/04/2021
+	Subcontracted - refer to subcontractor report for accreditation status.				210422-141	210422-141	210422-141	210422-141	210422-141	210422-141
..	% 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				24128920	24129050	24128988	24129005	24128944	24129028
(F)	Trigger breach confirmed									
1-4*5@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
Suspended solids, Total	<2 mg/l	TM022			4.5	25.5	222	9	53	25.5
					#	#	#	#	#	#
BOD, unfiltered	<1 mg/l	TM045			1.84	3.91	<1	<1	2.01	<1
					#	#	#	#	#	#
Oxygen, dissolved	<0.3 mg/l	TM046			9.98	10.4	9.9	9.58	9.75	9.45
Carbon, Organic (diss.filt)	<3 mg/l	TM090			8.08	7.19	9.06	8.46	7.08	8.07
Organic Carbon, Total	<3 mg/l	TM090			7.75	6.55	8.13	7.36	6.67	7.05
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099			1.12	2.82	8.19	1.12	1.88	1.67
					#	#	#	#	#	#
Sulphide	<0.01 mg/l	TM101			<0.01	<0.01	<0.01	<0.01	0.026	<0.01
Fluoride	<0.5 mg/l	TM104			1.11	<0.5	1.5	0.57	0.536	0.539
COD, unfiltered	<7 mg/l	TM107			19.7	19.8	79.6	23.4	20.1	13.2
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
Redox potential	mV	TM110			134	132	134	126	129	130
Conductivity @ 20 deg.C (diss.filt)	<0.02 mS/cm	TM120			0.678	0.892	0.671	0.681	0.507	0.549
Dissolved solids, Total (meter)	<5 mg/l	TM123			503	638	505	512	369	410
					#	#	#	#	#	#
Antimony (diss.filt)	<1 µg/l	TM152			1.63	<1	1.32	<1	<1	<1
					#	#	#	#	#	#
Antimony (tot.unfilt)	<4 µg/l	TM152			<4	<4	<4	<4	<4	<4
					#	#	#	#	#	#
Arsenic (diss.filt)	<0.5 µg/l	TM152			3.49	2.21	6.72	2.49	1.96	2.23
					#	#	#	#	#	#
Arsenic (tot.unfilt)	<2 µg/l	TM152			3.54	2.28	11.8	2.77	2.39	2.29
					#	#	#	#	#	#
Barium (diss.filt)	<0.2 µg/l	TM152			57.6	106	48.3	60.3	27.2	34.8
					#	#	#	#	#	#
Barium (tot.unfilt)	<0.5 µg/l	TM152			59.1	109	190	60.1	38.3	39.8
					#	#	#	#	#	#
Beryllium (diss.filt)	<0.1 µg/l	TM152			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
					#	#	#	#	#	#
Beryllium (tot.unfilt)	<1 µg/l	TM152			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Boron (diss.filt)	<10 µg/l	TM152			156	101	151	136	124	126
					#	#	#	#	#	#
Boron (tot.unfilt)	<20 µg/l	TM152			144	91.3	149	132	116	118
					#	#	#	#	#	#
Cadmium (diss.filt)	<0.08 µg/l	TM152			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
					#	#	#	#	#	#
Cadmium (tot.unfilt)	<0.5 µg/l	TM152			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
					#	#	#	#	#	#
Chromium (tot.unfilt)	<3 µg/l	TM152			<3	<3	24.8	<3	<3	<3
					#	#	#	#	#	#
Chromium (diss.filt)	<1 µg/l	TM152			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Copper (tot.unfilt)	<1 µg/l	TM152			3.52	3.83	14.2	2.07	1.73	2.41
					#	#	#	#	#	#
Lead (tot.unfilt)	<1 µg/l	TM152					45.6			
							#			
Copper (diss.filt)	<0.3 µg/l	TM152			2.55	4.16	2.07	1.01	0.411	1.06
					#	#	#	#	#	#
Manganese (tot.unfilt)	<1 µg/l	TM152			25.6	10	448	180	41.7	53.5
					#	#	#	#	#	#
Lead (diss.filt)	<0.2 µg/l	TM152			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
					#	#	#	#	#	#
Nickel (tot.unfilt)	<1 µg/l	TM152			1.78	2.83	16	2.06	2.43	2.43
					#	#	#	#	#	#
Manganese (diss.filt)	<3 µg/l	TM152			3.83	<3	5.86	148	<3	5.39
					#	#	#	#	#	#



## CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-141  
Location: LlanwernClient Reference:  
Order Number: 108282Report Number: 597135  
Superseded Report:

Results Legend			Customer Sample Ref.		D5-C	Ellens Reen	EWD-E	KW-C	ML-N	ML-S
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
M	mCERTS accredited.				Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
aq	Aqueous / settled sample.				21/04/2021	21/04/2021	21/04/2021	21/04/2021	21/04/2021	21/04/2021
diss.filt	Dissolved / filtered sample.				00:00	00:00	00:00	00:00	00:00	00:00
tot.unfilt	Total / unfiltered sample.				22/04/2021	22/04/2021	22/04/2021	22/04/2021	22/04/2021	22/04/2021
*	Subcontracted - refer to subcontractor report for accreditation status.				210422-141	210422-141	210422-141	210422-141	210422-141	210422-141
**	% 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				24128920	24129050	24128988	24129005	24128944	24129028
(F)	Trigger breach confirmed									
1-4+5@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
Phosphorus (tot.unfilt)	<20 µg/l	TM152			30.9	<20	245	61.6	31.6	42
					#	#	#	#	#	#
Selenium (tot.unfilt)	<1 µg/l	TM152			1.2	1.71	3.06	<1	<1	<1
					#	#	#	#	#	#
Nickel (diss.filt)	<0.4 µg/l	TM152			1.52	2.59	2.95	1.51	2.2	2.22
					#	#	#	#	#	#
Phosphorus (diss.filt)	<10 µg/l	TM152			11.7	<10	18.7	18.8	<10	<10
					#	#	#	#	#	#
Selenium (diss.filt)	<1 µg/l	TM152			1.93	1.62	3.53	1.43	1.16	1.14
					#	#	#	#	#	#
Vanadium (tot.unfilt)	<5 µg/l	TM152			30.5	9.85	79	6.98	6.43	7.03
					#	#	#	#	#	#
Zinc (tot.unfilt)	<5 µg/l	TM152			6.4	<5	125	<5	<5	<5
					#	#	#	#	#	#
Vanadium (diss.filt)	<1 µg/l	TM152			29.6	8.83	41.7	4.74	5.01	4.92
					#	#	#	#	#	#
Zinc (diss.filt)	<1 µg/l	TM152			2.92	1.37	<1	<1	1.67	<1
					#	#	#	#	#	#
Lead (tot.unfilt)	<0.001 mg/l	TM152			0.00104	<0.001		<0.001	<0.001	<0.001
					#	#		#	#	#
Magnesium (Dis.Filt)	<0.036 mg/l	TM152			3.71	3.23	3.2	14.1	10.7	13
					#	#	#	#	#	#
Calcium (Dis.Filt)	<0.2 mg/l	TM152			77.3	75.5	97.1	72.7	30.9	41.2
					#	#	#	#	#	#
Iron (Dis.Filt)	<0.019 mg/l	TM152			0.0195	<0.019	0.128	0.0489	0.025	0.0317
					#	#	#	#	#	#
Hardness, Total as CaCO3	<0.65 mg/l	TM152			209	202	256	240	122	157
Magnesium (Tot. Unfilt.)	<0.05 mg/l	TM152			3.78	3.75	6.27	14.5	11.5	13.5
					#	#	#	#	#	#
Calcium (Tot. Unfilt.)	<0.057 mg/l	TM152			74.6	78.1	106	70.1	44.8	47.4
					#	#	#	#	#	#
Iron (Tot. Unfilt.)	<0.024 mg/l	TM152			0.168	0.0358	13.6	0.621	0.294	0.287
					#	#	#	#	#	#
Naphthalene (diss.filt)	<0.01 µg/l	TM178			0.0559	0.0586	0.0462	<0.01	0.0289	<0.01
Acenaphthene (diss.filt)	<0.005 µg/l	TM178			0.0069	0.0294	0.013	<0.005	0.067	<0.005
Acenaphthylene (diss.filt)	<0.005 µg/l	TM178			0.00825	0.0241	0.0186	<0.005	0.0108	<0.005
Fluoranthene (diss.filt)	<0.005 µg/l	TM178			0.00799	0.0567	0.0876	<0.005	0.0622	0.007
Anthracene (diss.filt)	<0.005 µg/l	TM178			<0.005	0.00692	0.026	0.00845	0.0101	<0.005
Phenanthrene (diss.filt)	<0.005 µg/l	TM178			0.00753	0.165	0.0497	<0.005	0.106	<0.005
Fluorene (diss.filt)	<0.005 µg/l	TM178			<0.005	0.0184	0.124	<0.005	0.0661	<0.005
Chrysene (diss.filt)	<0.005 µg/l	TM178			<0.005	<0.005	0.0827	<0.005	<0.005	<0.005
Pyrene (diss.filt)	<0.005 µg/l	TM178			<0.005	0.0157	0.367	0.0172	0.0357	0.017
Benzo(a)anthracene (diss.filt)	<0.005 µg/l	TM178			<0.005	<0.005	0.0817	<0.005	<0.005	<0.005
Benzo(b)fluoranthene (diss.filt)	<0.005 µg/l	TM178			<0.005	<0.005	0.0632	<0.005	<0.005	<0.005
Benzo(k)fluoranthene (diss.filt)	<0.005 µg/l	TM178			<0.005	<0.005	0.0224	<0.005	<0.005	<0.005
Benzo(a)pyrene (diss.filt)	<0.002 µg/l	TM178			<0.002	<0.002	0.0292	<0.002	<0.002	<0.002
Dibenzo(a,h)anthracene (diss.filt)	<0.005 µg/l	TM178			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo(g,h,i)perylene (diss.filt)	<0.005 µg/l	TM178			<0.005	<0.005	0.0297	<0.005	<0.005	<0.005
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.005 µg/l	TM178			<0.005	<0.005	0.0234	<0.005	<0.005	<0.005







## CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-141  
Location: LlanwernClient Reference:  
Order Number: 108282Report Number: 597135  
Superseded Report:

Results Legend			Customer Sample Ref.	R3-C				
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00				
M	mCERTS accredited.			Surface Water (SW)				
aq	Aqueous / settled sample.			21/04/2021				
diss.filt	Dissolved / filtered sample.			00:00				
tot.unfilt	Total / unfiltered sample.			22/04/2021				
*	Subcontracted - refer to subcontractor report for accreditation status.			210422-141				
**	% 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			24128967				
(F)	Trigger breach confirmed							
1-4*5@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Suspended solids, Total	<2 mg/l	TM022	8.5	#				
BOD, unfiltered	<1 mg/l	TM045	2.23	#				
Oxygen, dissolved	<0.3 mg/l	TM046	9.78					
Carbon, Organic (diss.filt)	<3 mg/l	TM090	8.16					
Organic Carbon, Total	<3 mg/l	TM090	7.06	◆ #				
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	<0.3	#				
Sulphide	<0.01 mg/l	TM101	<0.01					
Fluoride	<0.5 mg/l	TM104	0.583					
COD, unfiltered	<7 mg/l	TM107	15.8	◆ #				
Redox potential	mV	TM110	126					
Conductivity @ 20 deg.C (diss.filt)	<0.02 mS/cm	TM120	0.907					
Dissolved solids, Total (meter)	<5 mg/l	TM123	698	#				
Antimony (diss.filt)	<1 µg/l	TM152	<1	#				
Antimony (tot.unfilt)	<4 µg/l	TM152	<4	#				
Arsenic (diss.filt)	<0.5 µg/l	TM152	2.68	#				
Arsenic (tot.unfilt)	<2 µg/l	TM152	2.96	#				
Barium (diss.filt)	<0.2 µg/l	TM152	83.9	#				
Barium (tot.unfilt)	<0.5 µg/l	TM152	81.8	#				
Beryllium (diss.filt)	<0.1 µg/l	TM152	<0.1	#				
Beryllium (tot.unfilt)	<1 µg/l	TM152	<1	#				
Boron (diss.filt)	<10 µg/l	TM152	188	#				
Boron (tot.unfilt)	<20 µg/l	TM152	162	#				
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	#				
Cadmium (tot.unfilt)	<0.5 µg/l	TM152	<0.5	#				
Chromium (tot.unfilt)	<3 µg/l	TM152	<3	#				
Chromium (diss.filt)	<1 µg/l	TM152	<1	#				
Copper (tot.unfilt)	<1 µg/l	TM152	1.57	#				
Lead (tot.unfilt)	<1 µg/l	TM152	1.24	#				
Copper (diss.filt)	<0.3 µg/l	TM152	0.554	#				
Manganese (tot.unfilt)	<1 µg/l	TM152	956	#				
Lead (diss.filt)	<0.2 µg/l	TM152	0.45	#				
Nickel (tot.unfilt)	<1 µg/l	TM152	1.88	#				
Manganese (diss.filt)	<3 µg/l	TM152	872	#				



## CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-141  
Location: LlanwernClient Reference:  
Order Number: 108282Report Number: 597135  
Superseded Report:

Results Legend		Customer Sample Ref.	R3-C					
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Surface Water (SW) 21/04/2021 00:00 22/04/2021 210422-141 24128967	#	#	#	#	#
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% 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							
1-4*§@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Phosphorus (tot.unfilt)	<20 µg/l	TM152	78.4	#				
Selenium (tot.unfilt)	<1 µg/l	TM152	<1	#				
Nickel (diss.filt)	<0.4 µg/l	TM152	1.4	#				
Phosphorus (diss.filt)	<10 µg/l	TM152	23.6	#				
Selenium (diss.filt)	<1 µg/l	TM152	<1	#				
Vanadium (tot.unfilt)	<5 µg/l	TM152	5.81	#				
Zinc (tot.unfilt)	<5 µg/l	TM152	5.61	#				
Vanadium (diss.filt)	<1 µg/l	TM152	4.22	#				
Zinc (diss.filt)	<1 µg/l	TM152	8.8	#				
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	24.2	#				
Calcium (Dis.Filt)	<0.2 mg/l	TM152	108	#				
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.0345	#				
Hardness, Total as CaCO3	<0.65 mg/l	TM152	371					
Magnesium (Tot. Unfilt.)	<0.05 mg/l	TM152	24.6	#				
Calcium (Tot. Unfilt.)	<0.057 mg/l	TM152	103	#				
Iron (Tot. Unfilt.)	<0.024 mg/l	TM152	0.461	#				
Naphthalene (diss.filt)	<0.01 µg/l	TM178	<0.01					
Acenaphthene (diss.filt)	<0.005 µg/l	TM178	<0.005					
Acenaphthylene (diss.filt)	<0.005 µg/l	TM178	<0.005					
Fluoranthene (diss.filt)	<0.005 µg/l	TM178	0.00594					
Anthracene (diss.filt)	<0.005 µg/l	TM178	<0.005					
Phenanthrene (diss.filt)	<0.005 µg/l	TM178	0.00631					
Fluorene (diss.filt)	<0.005 µg/l	TM178	<0.005					
Chrysene (diss.filt)	<0.005 µg/l	TM178	<0.005					
Pyrene (diss.filt)	<0.005 µg/l	TM178	<0.005					
Benzo(a)anthracene (diss.filt)	<0.005 µg/l	TM178	<0.005					
Benzo(b)fluoranthene (diss.filt)	<0.005 µg/l	TM178	<0.005					
Benzo(k)fluoranthene (diss.filt)	<0.005 µg/l	TM178	<0.005					
Benzo(a)pyrene (diss.filt)	<0.002 µg/l	TM178	<0.002					
Dibenzo(a,h)anthracene (diss.filt)	<0.005 µg/l	TM178	<0.005					
Benzo(g,h,i)perylene (diss.filt)	<0.005 µg/l	TM178	<0.005					
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.005 µg/l	TM178	<0.005					
PAH Sum of EPA 16 detected (Diss.filt)	<0.082 µg/l	TM178	<0.082					









# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 210422-141  
**Location:** Llanwern

**Client Reference:**  
**Order Number:** 108282

**Report Number:** 597135  
**Superseded Report:**

## SVOC MS (W) - Aqueous

Results Legend			Customer Sample Ref.		D5-C	Ellens Reen	EWD-E	KW-C	ML-N	ML-S
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
M	mCERTS accredited.				Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
aq	Aqueous / settled sample.				21/04/2021	21/04/2021	21/04/2021	21/04/2021	21/04/2021	21/04/2021
diss.filt	Dissolved / filtered sample.				00:00	00:00	00:00	00:00	00:00	00:00
tot.unfilt	Total / unfiltered sample.				22/04/2021	22/04/2021	22/04/2021	22/04/2021	22/04/2021	22/04/2021
Subcontracted - refer to subcontractor report for accreditation status.					210422-141	210422-141	210422-141	210422-141	210422-141	210422-141
% 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					24128920	24129050	24128988	24129005	24128944	24129028
(F)	Trigger breach confirmed									
1-4*5@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
2,4-Dichlorophenol (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
2,4-Dimethylphenol (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
2-Chloronaphthalene (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
2-Chlorophenol (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
2-Methylnaphthalene (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
2-Methylphenol (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
2-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
2-Nitrophenol (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
3-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
4-Bromophenylphenylether (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
4-Chloroaniline (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
4-Methylphenol (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
4-Nitroaniline (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
4-Nitrophenol (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176			<2	3.38	<8	11.7	<2	<2
					#	#	#	#	#	#
Butylbenzyl phthalate (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
Carbazole (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
Dibenzofuran (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#
n-Dibutyl phthalate (aq)	<1 µg/l	TM176			<1	<1	<4	<1	<1	<1
					#	#	#	#	#	#







## CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-141  
Location: LlanwernClient Reference:  
Order Number: 108282Report Number: 597135  
Superseded Report:

## SVOC MS (W) - Aqueous

Results Legend			Customer Sample Ref.				
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	R3-C  0.00 - 0.00 Surface Water (SW) 21/04/2021 00:00 22/04/2021 210422-141 24128967			
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% 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						
1-4*§@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	#			
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	#			
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	#			
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	#			
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	#			
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	#			
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	#			
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	#			
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	#			
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	#			
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	#			
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	#			
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	#			
2-Methylphenol (aq)	<1 µg/l	TM176	<1	#			
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	#			
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	#			
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	#			
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	#			
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	#			
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	#			
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	#			
4-Methylphenol (aq)	<1 µg/l	TM176	<1	#			
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	#			
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	#			
Azobenzene (aq)	<1 µg/l	TM176	<1	#			
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	#			
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	#			
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	#			
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	#			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	#			
Carbazole (aq)	<1 µg/l	TM176	<1	#			
Dibenzofuran (aq)	<1 µg/l	TM176	<1	#			
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1	#			





## CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-141  
Location: LlanwernClient Reference:  
Order Number: 108282Report Number: 597135  
Superseded Report:

## TPH CWG (W)

Results Legend			Customer Sample Ref.		D5-C	Ellens Reen	EWD-E	KW-C	ML-N	ML-S
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
M	mCERTS accredited.				Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
aq	Aqueous / settled sample.				21/04/2021	21/04/2021	21/04/2021	21/04/2021	21/04/2021	21/04/2021
diss.filt	Dissolved / filtered sample.				00:00	00:00	00:00	00:00	00:00	00:00
tot.unfilt	Total / unfiltered sample.				22/04/2021	22/04/2021	22/04/2021	22/04/2021	22/04/2021	22/04/2021
*	Subcontracted - refer to subcontractor report for accreditation status.				210422-141	210422-141	210422-141	210422-141	210422-141	210422-141
**	% 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				24128920	24129050	24128988	24129005	24128944	24129028
(F)	Trigger breach confirmed									
1-4*5@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
GRO Surrogate % recovery**	%	TM245			85	93	87	88	92	90
					◆	◆	◆	◆	◆	◆
GRO >C5-C12	<50 µg/l	TM245			<50	<50	<50	<50	<50	<50
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245			<3	<3	<3	<3	<3	<3
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
Benzene	<7 µg/l	TM245			<7	<7	<7	<7	<7	<7
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
Toluene	<4 µg/l	TM245			<4	<4	<4	<4	<4	<4
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
Ethylbenzene	<5 µg/l	TM245			<5	<5	<5	<5	<5	<5
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
m,p-Xylene	<8 µg/l	TM245			<8	<8	<8	<8	<8	<8
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
o-Xylene	<3 µg/l	TM245			<3	<3	<3	<3	<3	<3
					◆ #	◆ #	◆ #	◆ #	◆ #	◆ #
Sum of detected Xylenes	<11 µg/l	TM245			<11	<11	<11	<11	<11	<11
					◆	◆	◆	◆	◆	◆
Sum of detected BTEX	<28 µg/l	TM245			<28	<28	<28	<28	<28	<28
					◆	◆	◆	◆	◆	◆
Aliphatics >C5-C6	<10 µg/l	TM245			<10	<10	<10	<10	<10	<10
					◆	◆	◆	◆	◆	◆
Aliphatics >C6-C8	<10 µg/l	TM245			<10	<10	<10	<10	<10	<10
					◆	◆	◆	◆	◆	◆
Aliphatics >C8-C10	<10 µg/l	TM245			<10	<10	<10	<10	<10	<10
					◆	◆	◆	◆	◆	◆
Aliphatics >C10-C12	<10 µg/l	TM245			<10	<10	<10	<10	<10	<10
					◆	◆	◆	◆	◆	◆
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174			<10	<10	<10	<10	<10	<10
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174			<10	<10	34	<10	<10	<10
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174			<10	<10	123	<10	<10	<10
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174			<10	<10	157	<10	<10	<10
Aromatics >EC5-EC7	<10 µg/l	TM245			<10	<10	<10	<10	<10	<10
					◆	◆	◆	◆	◆	◆
Aromatics >EC7-EC8	<10 µg/l	TM245			<10	<10	<10	<10	<10	<10
					◆	◆	◆	◆	◆	◆
Aromatics >EC8-EC10	<10 µg/l	TM245			<10	<10	<10	<10	<10	<10
					◆	◆	◆	◆	◆	◆
Aromatics >EC10-EC12	<10 µg/l	TM245			<10	<10	<10	<10	<10	<10
					◆	◆	◆	◆	◆	◆
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174			<10	<10	<10	<10	<10	<10
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174			<10	<10	38	<10	<10	<10
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174			<10	<10	97	<10	<10	<10
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174			<10	<10	135	<10	<10	<10
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174			<10	<10	292	<10	<10	<10
Aliphatics >C16-C35 Aqueous	<10 µg/l	TM174			<10	<10	157	<10	<10	<10



## CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-141  
Location: LlanwernClient Reference:  
Order Number: 108282Report Number: 597135  
Superseded Report:

## TPH CWG (W)

Results Legend		Customer Sample Ref.	R3-C				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Surface Water (SW) 21/04/2021 00:00 22/04/2021 210422-141 24128967				
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% 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						
1-4*5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
GRO Surrogate % recovery**	%	TM245	96	◆			
GRO >C5-C12	<50 µg/l	TM245	<50	◆ #			
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3	◆ #			
Benzene	<7 µg/l	TM245	<7	◆ #			
Toluene	<4 µg/l	TM245	<4	◆ #			
Ethylbenzene	<5 µg/l	TM245	<5	◆ #			
m,p-Xylene	<8 µg/l	TM245	<8	◆ #			
o-Xylene	<3 µg/l	TM245	<3	◆ #			
Sum of detected Xylenes	<11 µg/l	TM245	<11	◆			
Sum of detected BTEX	<28 µg/l	TM245	<28	◆			
Aliphatics >C5-C6	<10 µg/l	TM245	<10	◆			
Aliphatics >C6-C8	<10 µg/l	TM245	<10	◆			
Aliphatics >C8-C10	<10 µg/l	TM245	<10	◆			
Aliphatics >C10-C12	<10 µg/l	TM245	<10	◆			
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	<10				
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10				
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10				
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	<10				
Aromatics >EC5-EC7	<10 µg/l	TM245	<10	◆			
Aromatics >EC7-EC8	<10 µg/l	TM245	<10	◆			
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	◆			
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	◆			
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	<10				
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	<10				
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	<10				
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	<10				
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174	<10				
Aliphatics >C16-C35 Aqueous	<10 µg/l	TM174	<10				



# CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-141  
Location: Llanwern

Client Reference:  
Order Number: 108282

Report Number: 597135  
Superseded Report:

## VOC MS (W)

Results Legend			Customer Sample Ref.		D5-C	Ellens Reen	EWD-E	KW-C	ML-N	ML-S
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
M	mCERTS accredited.				Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
aq	Aqueous / settled sample.				21/04/2021	21/04/2021	21/04/2021	21/04/2021	21/04/2021	21/04/2021
diss.filt	Dissolved / filtered sample.				00:00	00:00	00:00	00:00	00:00	00:00
tot.unfilt	Total / unfiltered sample.				22/04/2021	22/04/2021	22/04/2021	22/04/2021	22/04/2021	22/04/2021
*	Subcontracted - refer to subcontractor report for accreditation status.				210422-141	210422-141	210422-141	210422-141	210422-141	210422-141
**	% 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				24128920	24129050	24128988	24129005	24128944	24129028
(F)	Trigger breach confirmed									
1-4\$@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
Dibromofluoromethane**	%	TM208			110	2.25	101	112	102	115
Toluene-d8**	%	TM208			97.1	97.2	97.3	97.3	96.9	96.7
4-Bromofluorobenzene**	%	TM208			96.5	97.3	94.2	96.3	95.2	95.3
Dichlorodifluoromethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Chloromethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Vinyl chloride	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Bromomethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Chloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Carbon disulphide	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Dichloromethane	<3 µg/l	TM208			<3	<3	<3	<3	<3	<3
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
2,2-Dichloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Chloroform	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
1,1-Dichloropropene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Carbontetrachloride	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Benzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Trichloroethene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Dibromomethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Bromodichloromethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
Toluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
1,3-Dichloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1



## CERTIFICATE OF ANALYSIS

Validated

SDG: 210422-141  
Location: LlanwernClient Reference:  
Order Number: 108282Report Number: 597135  
Superseded Report:

## VOC MS (W)

Results Legend			Customer Sample Ref.		D5-C	Ellens Reen	EWD-E	KW-C	ML-N	ML-S
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
M	mCERTS accredited.				Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
aq	Aqueous / settled sample.				21/04/2021	21/04/2021	21/04/2021	21/04/2021	21/04/2021	21/04/2021
dis.filt	Dissolved / filtered sample.				00:00	00:00	00:00	00:00	00:00	00:00
tot.unfilt	Total / unfiltered sample.				22/04/2021	22/04/2021	22/04/2021	22/04/2021	22/04/2021	22/04/2021
*	Subcontracted - refer to subcontractor report for accreditation status.				210422-141	210422-141	210422-141	210422-141	210422-141	210422-141
**	% 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				24128920	24129050	24128988	24129005	24128944	24129028
(F)	Trigger breach confirmed									
1-4+5@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
Tetrachloroethene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Dibromochloromethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2-Dibromoethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Chlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Ethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
m,p-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
o-Xylene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Styrene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Bromoform	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Isopropylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2,3-Trichloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Bromobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Propylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
2-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,3,5-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
4-Chlorotoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
tert-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2,4-Trimethylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
sec-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
4-iso-Propyltoluene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,3-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,4-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
n-Butylbenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2-Dichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Hexachlorobutadiene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
Naphthalene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,2,3-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1
					#	#	#	#	#	#
1,3,5-Trichlorobenzene	<1 µg/l	TM208			<1	<1	<1	<1	<1	<1



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 210422-141  
**Location:** Llanwern

**Client Reference:**  
**Order Number:** 108282

**Report Number:** 597135  
**Superseded Report:**

## VOC MS (W)

Results Legend			Customer Sample Ref.				
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	R3-C			
M	mCERTS accredited.			0.00 - 0.00			
aq	Aqueous / settled sample.			Surface Water (SW)			
diss.filt	Dissolved / filtered sample.			21/04/2021			
tot.unfilt	Total / unfiltered sample.			00:00			
*	Subcontracted - refer to subcontractor report for accreditation status.			22/04/2021			
**	% 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			210422-141			
(F)	Trigger breach confirmed			24128967			
1-4*5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM208	113				
Toluene-d8**	%	TM208	98				
4-Bromofluorobenzene**	%	TM208	97.5				
Dichlorodifluoromethane	<1 µg/l	TM208	<1	♦ #			
Chloromethane	<1 µg/l	TM208	<1	#			
Vinyl chloride	<1 µg/l	TM208	<1	#			
Bromomethane	<1 µg/l	TM208	<1	#			
Chloroethane	<1 µg/l	TM208	<1	#			
Trichlorofluoromethane	<1 µg/l	TM208	<1	#			
1,1-Dichloroethene	<1 µg/l	TM208	<1	#			
Carbon disulphide	<1 µg/l	TM208	<1	#			
Dichloromethane	<3 µg/l	TM208	<3	#			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	#			
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	#			
1,1-Dichloroethane	<1 µg/l	TM208	<1	#			
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	#			
2,2-Dichloropropane	<1 µg/l	TM208	<1				
Bromochloromethane	<1 µg/l	TM208	<1	#			
Chloroform	<1 µg/l	TM208	<1	#			
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	#			
1,1-Dichloropropene	<1 µg/l	TM208	<1	#			
Carbontetrachloride	<1 µg/l	TM208	<1	#			
1,2-Dichloroethane	<1 µg/l	TM208	<1	#			
Benzene	<1 µg/l	TM208	<1	#			
Trichloroethene	<1 µg/l	TM208	<1	#			
1,2-Dichloropropane	<1 µg/l	TM208	<1	#			
Dibromomethane	<1 µg/l	TM208	<1	#			
Bromodichloromethane	<1 µg/l	TM208	<1	#			
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	#			
Toluene	<1 µg/l	TM208	<1	#			
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	#			
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	#			
1,3-Dichloropropane	<1 µg/l	TM208	<1	#			



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## VOC MS (W)

Results Legend		Customer Sample Ref.	R3-C				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Surface Water (SW) 21/04/2021 00:00 22/04/2021 210422-141 24128967				
M	mCERTS accredited.						
sq	Aqueous / settled sample.						
dis.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% 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						
1-4+§@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Tetrachloroethene	<1 µg/l	TM208	<1	#			
Dibromochloromethane	<1 µg/l	TM208	<1	#			
1,2-Dibromoethane	<1 µg/l	TM208	<1	#			
Chlorobenzene	<1 µg/l	TM208	<1	#			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	#			
Ethylbenzene	<1 µg/l	TM208	<1	#			
m,p-Xylene	<1 µg/l	TM208	<1	#			
o-Xylene	<1 µg/l	TM208	<1	#			
Styrene	<1 µg/l	TM208	<1	#			
Bromoform	<1 µg/l	TM208	<1	#			
Isopropylbenzene	<1 µg/l	TM208	<1	#			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	#			
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	#			
Bromobenzene	<1 µg/l	TM208	<1	#			
Propylbenzene	<1 µg/l	TM208	<1	#			
2-Chlorotoluene	<1 µg/l	TM208	<1	#			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	#			
4-Chlorotoluene	<1 µg/l	TM208	<1	#			
tert-Butylbenzene	<1 µg/l	TM208	<1	#			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	#			
sec-Butylbenzene	<1 µg/l	TM208	<1	#			
4-iso-Propyltoluene	<1 µg/l	TM208	<1	#			
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	#			
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	#			
n-Butylbenzene	<1 µg/l	TM208	<1	#			
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	#			
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1				
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	#			
Hexachlorobutadiene	<1 µg/l	TM208	<1	#			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	#			
Naphthalene	<1 µg/l	TM208	<1	#			
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	#			
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1				





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**SDG:** 210422-141  
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## Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM045	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM046	Method 4500G, AWWA/APHA, 20th Ed., 1999	Measurement of Dissolved Oxygen by Oxygen Meter
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM110	BS 1377: Part 3 1990	Redox Potential
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
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
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM195	Colour and Turbidity of water. Methods for the Examination of Waters and Associated Materials. HMSO, 1981, ISBN 0 11 751955 3.	Determination of Turbidity in Waters & Associated Matrices
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
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
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.

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



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## Test Completion Dates

Lab Sample No(s)  
Customer Sample Ref.

AGS Ref.  
Depth  
Type

	24128920	24129050	24128988	24129005	24128944	24129028	24128967
	D5-C	Ellens Reen	EWD-E	KW-C	ML-N	ML-S	R3-C
	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Ammoniacal Nitrogen	07-May-2021	07-May-2021	07-May-2021	07-May-2021	07-May-2021	07-May-2021	07-May-2021
Anions by Kone (w)	06-May-2021	06-May-2021	06-May-2021	06-May-2021	06-May-2021	06-May-2021	06-May-2021
BOD True Total	28-Apr-2021	29-Apr-2021	29-Apr-2021	29-Apr-2021	28-Apr-2021	29-Apr-2021	29-Apr-2021
COD Unfiltered	05-May-2021	05-May-2021	05-May-2021	05-May-2021	05-May-2021	05-May-2021	05-May-2021
Conductivity (at 20 deg.C)	29-Apr-2021	29-Apr-2021	29-Apr-2021	29-Apr-2021	29-Apr-2021	29-Apr-2021	29-Apr-2021
Cyanide Comp/Free/Total/Thiocyanate	26-Apr-2021	26-Apr-2021	26-Apr-2021	26-Apr-2021	26-Apr-2021	26-Apr-2021	26-Apr-2021
Dissolved Metals by ICP-MS	06-May-2021	06-May-2021	06-May-2021	06-May-2021	06-May-2021	06-May-2021	06-May-2021
Dissolved Organic/Inorganic Carbon	09-May-2021	09-May-2021	09-May-2021	09-May-2021	09-May-2021	09-May-2021	09-May-2021
Dissolved Oxygen by Probe	30-Apr-2021	30-Apr-2021	30-Apr-2021	30-Apr-2021	30-Apr-2021	30-Apr-2021	30-Apr-2021
EPH CWG (Aliphatic) Aqueous GC (W)	04-May-2021	03-May-2021	04-May-2021	03-May-2021	04-May-2021	04-May-2021	04-May-2021
EPH CWG (Aromatic) Aqueous GC (W)	04-May-2021	03-May-2021	04-May-2021	03-May-2021	04-May-2021	04-May-2021	04-May-2021
Fluoride	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021
GRO by GC-FID (W)	06-May-2021	06-May-2021	06-May-2021	06-May-2021	06-May-2021	06-May-2021	06-May-2021
Hexavalent Chromium (w)	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021
Mercury Dissolved	26-Apr-2021	26-Apr-2021	26-Apr-2021	26-Apr-2021	26-Apr-2021	26-Apr-2021	26-Apr-2021
Mercury Unfiltered	04-May-2021	04-May-2021	04-May-2021	04-May-2021	04-May-2021	04-May-2021	04-May-2021
PAH in waters by GC-MS (diss.filt)	04-May-2021	30-Apr-2021	04-May-2021	04-May-2021	04-May-2021	04-May-2021	30-Apr-2021
PAH Spec MS - Aqueous (W)	29-Apr-2021	29-Apr-2021	29-Apr-2021	29-Apr-2021	29-Apr-2021	29-Apr-2021	29-Apr-2021
pH Value	27-Apr-2021	27-Apr-2021	27-Apr-2021	27-Apr-2021	27-Apr-2021	27-Apr-2021	27-Apr-2021
Phenols by HPLC (W)	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021
Phosphate by Kone (w)	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021
Redox Potential	27-Apr-2021	27-Apr-2021	27-Apr-2021	27-Apr-2021	27-Apr-2021	27-Apr-2021	27-Apr-2021
Sulphide	07-May-2021	07-May-2021	07-May-2021	07-May-2021	07-May-2021	07-May-2021	07-May-2021
Sulphur Dissolved by ICP-OES	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021
Suspended Solids	05-May-2021	04-May-2021	04-May-2021	04-May-2021	01-May-2021	04-May-2021	04-May-2021
SVOC MS (W) - Aqueous	29-Apr-2021	29-Apr-2021	30-Apr-2021	29-Apr-2021	29-Apr-2021	29-Apr-2021	29-Apr-2021
Total Dissolved Solids	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021	28-Apr-2021
Total Metals by ICP-MS	26-Apr-2021	27-Apr-2021	26-Apr-2021	26-Apr-2021	26-Apr-2021	26-Apr-2021	26-Apr-2021
Total Organic and Inorganic Carbon	09-May-2021	09-May-2021	09-May-2021	09-May-2021	09-May-2021	09-May-2021	09-May-2021
TPH CWG (W)	06-May-2021	06-May-2021	06-May-2021	06-May-2021	06-May-2021	06-May-2021	06-May-2021
Turbidity in waters	22-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021	23-Apr-2021
VOC MS (W)	05-May-2021	06-May-2021	05-May-2021	05-May-2021	05-May-2021	05-May-2021	05-May-2021



# CERTIFICATE OF ANALYSIS

<b>SDG:</b>	210422-141	<b>Client Reference:</b>		<b>Report Number:</b>	597135
<b>Location:</b>	Llanwern	<b>Order Number:</b>	108282	<b>Superseded Report:</b>	

## Appendix

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 NH<sub>4</sub> by the BRE method, VOC TICs and SVOC TICs.

2. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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%. 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.

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

11. 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.

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

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

14. 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.

15. 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.

16. 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.

## General

17. **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.

### 18. 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	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

### 19. Asbestos

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.

#### 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).

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

#### Visual Estimation Of Fibre Content

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

#### Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

**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.