

Appendix 10.3 - Laboratory Reports.

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Attention : Deirdre Larkin
Date : 10th September, 2020
Your reference : 5193890
Our reference : Test Report 20/11913 Batch 1
Location : Bray
Date samples received : 4th September, 2020
Status : Final report
Issue : 1

Two samples were received for analysis on 4th September, 2020 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Simon Gomery BSc
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Atkins
Reference: 5193890
Location: Bray
Contact: Deirdre Larkin
EMT Job No: 20/11913

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-4	5-8									Please see attached notes for all abbreviations and acronyms		
											LOD/LOR	Units	Method No.
Sample ID	SW01	SW02											
Depth													
COC No / misc													
Containers	V P G	V P G											
Sample Date	03/09/2020 10:59	03/09/2020 10:30											
Sample Type	Surface Water	Surface Water											
Batch Number	1	1											
Date of Receipt	04/09/2020	04/09/2020											
Dissolved Arsenic #	3.0	<2.5									<2.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7									<7	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2									<2	ug/l	TM30/PM14
Dissolved Zinc #	4	6									<3	ug/l	TM30/PM14
Total Arsenic	<2.5	<2.5									<2.5	ug/l	TM30/PM14
Total Cadmium	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Chromium	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Total Copper	<7	<7									<7	ug/l	TM30/PM14
Total Mercury	<1	<1									<1	ug/l	TM30/PM14
Total Nickel	<2	<2									<2	ug/l	TM30/PM14
Total Phosphorus	38	44									<5	ug/l	TM30/PM14
Total Zinc	6	8									<3	ug/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Acenaphthene #	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Fluorene #	<0.014	<0.014									<0.014	ug/l	TM4/PM30
Phenanthrene #	<0.011	<0.011									<0.011	ug/l	TM4/PM30
Anthracene #	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Fluoranthene #	<0.012	<0.012									<0.012	ug/l	TM4/PM30
Pyrene #	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.015	<0.015									<0.015	ug/l	TM4/PM30
Chrysene #	<0.011	<0.011									<0.011	ug/l	TM4/PM30
Benzo(k)fluoranthene #	<0.018	<0.018									<0.018	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.016	<0.016									<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.011	<0.011									<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.01	<0.01									<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.011	<0.011									<0.011	ug/l	TM4/PM30
PAH 16 Total #	<0.195	<0.195									<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01									<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01									<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	80	83									<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #													
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	106	106									<0	%	TM15/PM10

Element Materials Technology

Client Name: Atkins
Reference: 5193890
Location: Bray
Contact: Deirdre Larkin
EMT Job No: 20/11913

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
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EMT Sample No.		1-4	5-8									Please see attached notes for all abbreviations and acronyms		
Sample ID	SW01	SW02										LOD/LOR	Units	Method No.
Depth														
COC No / misc														
Containers	V P G	V P G												
Sample Date	03/09/2020 10:59	03/09/2020 10:30												
Sample Type	Surface Water	Surface Water												
Batch Number	1	1												
Date of Receipt	04/09/2020	04/09/2020												
Surrogate Recovery 4-Bromofluorobenzene	97	97										<0	%	TM15/PM10
TPH CWG														
Aliphatics														
>C5-C6 #	<10	<10										<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10										<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10										<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5										<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10										<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10										<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10										<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10										<10	ug/l	TM5/PM16/PM30
Aromatics														
>C5-EC7 #	<10	<10										<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10										<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10										<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5										<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10										<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10										<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10										<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10										<10	ug/l	TM5/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10										<10	ug/l	TM5/PM16/PM30
Total Phenols HPLC	<0.15	<0.15										<0.15	mg/l	TM26/PM0
Fluoride	<0.3	<0.3										<0.3	mg/l	TM173/PM0
Nitrate as NO ₃ #	2.8	3.0										<0.2	mg/l	TM38/PM0
Nitrite as NO ₂ #	<0.02	<0.02										<0.02	mg/l	TM38/PM0
MRP Ortho Phosphate as P	<0.03	<0.03										<0.03	mg/l	TM38/PM0
Inorganic Nitrogen	0.64	0.68										<0.05	mg/l	TM38/PM0
Total Cyanide #	<0.01	<0.01										<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	<0.03	<0.03										<0.03	mg/l	TM38/PM0
Hexavalent Chromium	<0.006	<0.006										<0.006	mg/l	TM38/PM0
Total Ammonia as N #	<0.03	<0.03										<0.03	mg/l	TM38/PM0
Total Dissolved Chromium III	<6	<6										<6	ug/l	TM0/PM0

Client Name: Atkins
Reference: 5193890
Location: Bray
Contact: Deirdre Larkin

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 20/11913						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/11913

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 20/11913

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM0	Not available	PM0	No preparation is required.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			

EMT Job No: 20/11913

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE re	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993 (comparabl	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993 (comparabl	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.				

Customer

Deirdre Larkin
Atkins Global
150 Airside Business Park
Swords
Dublin

Certificate Of Analysis

Job Number: 20-83289
Issue Number: 1
Report Date: 11 September 2020

Site: Bray
PO Number: Not Supplied
Date Samples Received: 03/09/2020

Please find attached the results for the samples received at our laboratory on 03/09/2020.

Should you have any queries regarding the report or require any further services, we would be happy to discuss your requirements. For additional information about the company please log-on to our website at the above address.

Thank you for choosing City Analysts Limited. We look forward to assisting you again.

Authorised By:



Louise Morrow

Authorised Date: 11 September 2020

Notes are not INAB accredited

Results relate only to the items tested.
Information on methods of analysis and uncertainty of measurement is available on request.
Any opinions or interpretations indicated are outside the scope of our INAB accreditation.
This test report shall not be reproduced except in full or with written approval of City Analysts Limited.

Certificate Of Analysis

Customer

Deirdre Larkin
Atkins Global
150 Airside Business Park
Swords
Dublin

Report Reference: 20-83289

Report Version: 1

Site: Bray

Sample Description: SW01

Sample Type: Surface

Lab Reference Number: 530707

Date of Sampling: 03/09/2020

Date Sample Received: 03/09/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D3000#	08/09/2020	Ammonia as N	0.061	mg/l	-
D/D1003#	04/09/2020	CBOD5	< 2	mg/l O2	-
D/D3011#	03/09/2020	Conductivity @ 20°C	329.0	uS/cm @20°C	-
D/D3000	09/09/2020	Dissolved Inorganic Nitrogen	0.847	mg/l	-
D/D3000#	08/09/2020	Orthophosphate as P	< 0.025	mg/l	-
D/D1041#	03/09/2020	PH	8.08	pH Unit	-
D/D3001#	04/09/2020	Phosphorus, Total as P	< 0.050	mg/l	-
D/D	03/09/2020	Total Dissolved Solids	161.000	mg/l	-
D/D1049#	03/09/2020	Total Suspended Solids	< 2	mg/l	-
D/D1201#	03/09/2020	Coliforms	5540.0	MPN/100ml	-
D/D1201#	03/09/2020	E.coli	727.0	MPN/100ml	-
D/D3221#	03/09/2020	Faecal Coliforms	870	cfu/100ml	-

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:

PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.

For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.

NAC & ATC - No abnormal change and acceptable to customers.

TVC - Total viable count

Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

Certificate Of Analysis

Customer

Deirdre Larkin
Atkins Global
150 Airside Business Park
Swords
Dublin

Report Reference: 20-83289

Report Version: 1

Site: Bray
Sample Description: SW02
Sample Type: Surface
Lab Reference Number: 530708

Date of Sampling: 03/09/2020

Date Sample Received: 03/09/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D3000#	08/09/2020	Ammonia as N	0.030	mg/l	-
D/D1003#	04/09/2020	CBOD5	< 2	mg/l O2	-
D/D3011#	03/09/2020	Conductivity @ 20°C	585.0	uS/cm @20°C	-
D/D3000	09/09/2020	Dissolved Inorganic Nitrogen	0.862	mg/l	-
D/D3000#	08/09/2020	Orthophosphate as P	< 0.025	mg/l	-
D/D1041#	03/09/2020	PH	7.90	pH Unit	-
D/D3001#	04/09/2020	Phosphorus, Total as P	< 0.050	mg/l	-
D/D	03/09/2020	Total Dissolved Solids	287.000	mg/l	-
D/D1049#	03/09/2020	Total Suspended Solids	3	mg/l	-
D/D1201#	03/09/2020	Coliforms	5830.0	MPN/100ml	-
D/D1201#	03/09/2020	E.coli	866.4	MPN/100ml	-
D/D3221#	03/09/2020	Faecal Coliforms	900	cfu/100ml	-

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:

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