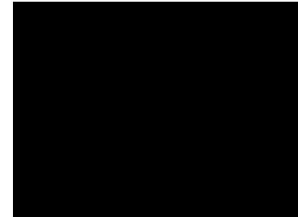




Environmental Science

4041  
Jane Sell  
Geotechnical & Environmental Associates

i2 Analytical Ltd.



### **Analytical Report Number : 18-17523**

<b>Project / Site name:</b>	Kingsgate Primary Lower School, Liddell Road NW6 2DJ	<b>Samples received on:</b>	07/11/2018
<b>Your job number:</b>	J14212C	<b>Samples instructed on:</b>	07/11/2018
<b>Your order number:</b>	J14212C	<b>Analysis completed by:</b>	14/11/2018
<b>Report Issue Number:</b>	1	<b>Report issued on:</b>	14/11/2018
<b>Samples Analysed:</b>	5 soil samples		



Jordan Hill  
Reporting Manager  
**For & on behalf of i2 Analytical Ltd.**

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at:



Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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MCERTS



Environmental Science

Analytical Report Number: 18-17523

Project / Site name: Kingsgate Primary Lower School, Liddell Road NW6 2DJ

Your Order No: J14212C

Lab Sample Number	1086251				1086252				1086253				1086254				1086255			
Sample Reference	TP1				TP2				TP4				TP5				TP6			
Sample Number	None Supplied				None Supplied				None Supplied				None Supplied				None Supplied			
Depth (m)	0.20				0.10				0.10				0.30				0.10			
Date Sampled	06/11/2018				06/11/2018				06/11/2018				06/11/2018				06/11/2018			
Time Taken	None Supplied				None Supplied				None Supplied				None Supplied				None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status																	
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	14	24	13	12	15												
Total mass of sample received	kg	0.001	NONE	1.3	1.3	1.3	1.2	1.3												

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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**General Inorganics**

pH - Automated	pH Units	N/A	MCERTS	8.1	7.8	7.8	7.7	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO <sub>4</sub>	mg/kg	50	MCERTS	670	680	530	700	650
Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.086	0.11	0.086	0.16	0.051
Sulphide	mg/kg	1	MCERTS	1.2	1.1	1.6	< 1.0	< 1.0
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	14	12	8.2	19	12
Total Organic Carbon (TOC)	%	0.1	MCERTS	2.0	2.8	2.2	2.6	2.4

**Total Phenols**

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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**Speciated PAHs**

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.23	0.37	1.0	0.19	0.28
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.33	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.76	1.5	1.9	0.49	1.1
Pyrene	mg/kg	0.05	MCERTS	0.69	1.2	1.7	0.44	0.95
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.47	0.92	1.0	0.29	0.62
Chrysene	mg/kg	0.05	MCERTS	0.44	0.88	0.80	0.26	0.55
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.67	1.3	1.1	0.47	0.83
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.30	0.67	0.54	0.22	0.41
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.52	0.97	1.0	0.32	0.60
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.26	0.47	0.45	0.17	0.36
Dibenzo(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.14	0.14	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.37	0.62	0.65	0.19	0.42

**Total PAH**

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	4.71	9.06	10.6	3.04	6.09
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Environmental Science

Analytical Report Number: 18-17523

Project / Site name: Kingsgate Primary Lower School, Liddell Road NW6 2DJ

Your Order No: J14212C

Lab Sample Number	1086251				1086252				1086253				1086254				1086255			
Sample Reference	TP1				TP2				TP4				TP5				TP6			
Sample Number	None Supplied				None Supplied				None Supplied				None Supplied				None Supplied			
Depth (m)	0.20				0.10				0.10				0.30				0.10			
Date Sampled	06/11/2018				06/11/2018				06/11/2018				06/11/2018				06/11/2018			
Time Taken	None Supplied				None Supplied				None Supplied				None Supplied				None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status																	
<b>Heavy Metals / Metalloids</b>																				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	13	10	8.8	16												
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2												
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	20	17	16	24												
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26	28	25	15	31												
Lead (aqua regia extractable)	mg/kg	1	MCERTS	130	160	73	38	250												
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.8	< 0.3	< 0.3	< 0.3	0.7												
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	26	13	10	8.0	18												
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.6	3.2												
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	91	130	96	66	140												

**Petroleum Hydrocarbons**

TPH C10 - C40	mg/kg	10	MCERTS	49	28	170	43	40
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21)	mg/kg	1	MCERTS	9.0	5.2	30	4.9	9.5
TPH (C21 - C35)	mg/kg	1	MCERTS	30	17	120	38	30

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\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1086251	TP1	None Supplied	0.20	Brown loam and sand with gravel and vegetation.
1086252	TP2	None Supplied	0.10	Brown loam and sand with gravel and vegetation.
1086253	TP4	None Supplied	0.10	Brown loam and sand with gravel and vegetation.
1086254	TP5	None Supplied	0.30	Brown loam and sand with gravel and vegetation.
1086255	TP6	None Supplied	0.10	Brown loam and sand with gravel and vegetation.

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Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)



Environmental Science

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests"	L009-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 300C.

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