Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

4041

Accredited to ISO/IEC 17025:2017

I2 Analytical Ltd

Issue No: 093 **Issue date:** 07 October 2020

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Testing performed by the Organisation at the locations specified below

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details		Activity	Location code
Address 7 Woodshots Meadow Croxley Park Croxley Green Hertfordshire WD18 8YS	**Local contact** Dr Claire Stone	Environmental Analysis	A
Address Sp. z o.o. ul. Pionerów 39 41-711 Ruda Ślaska Poland	**Local contact** Mrs Marzena Babik Tel: 00 48 323 426 011 Fax: 00 48 323 426 012 E-Mail: m.babik@i2analytical.com	Environmental Analysis Environmental Sampling Health and Hygiene Aggregates: Physical Tests Soils: Mechanical & Physical tests Fuel Technology	B
Address Unit 8 Delta Court Sky Business Park Hayfield Lane Finningley Doncaster DN9 3GN	**Local contact** Dr Claire Stone Tel: +44 (0) 1923 225404	Sample storage, Preparation and administration Aggregates: Sampling from Stockpiles Soils: Mechanical & Physical tests	C
Address 8 Harrowden Road Brackmills Northampton Northamptonshire NN4 7EB	**Local contact** Dr Claire Stone Tel: 44 (0) 1923 225404	Sample storage, and Preparation and administration Aggregates: Sampling from Stockpiles; Physical Testing Soils Physical testing	D
Address 40 Carron Pl, East Kilbride, Glasgow G75 0YL	Local contact Dr Claire Stone Tel: 44 (0) 1923 225404	Sample receipt,Storage and Customer Service. Environmental and Geotechnical Samples	F

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Testing performed by the Organisation at the locations specified

Site activities performed away from the locations listed above:

Location details		**Activity**	**Location code**
All locations suitable for the activities listed	**Local contact** Dr Claire Stone Tel: 44 (0) 1923 225404	Testing: Soils; physical tests	Site

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS	Chemical Tests	Documented In-House Methods	
	Inorganic Analysis:		
	pH	L005M using pH meter	A
SOILS	Chemical Tests	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil	
	Inorganic Analysis:		
	pH	L005M using pH meter	A
WATERS	Chemical Tests		
	Inorganic Analysis:		
- Surface and potable waters	pH	L005M using pH meter	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
Analysis at Site B			
	<u>Health and Hygiene</u>	Health and Safety Executive Asbestos: The analysts' guide for sampling, analysis and clearance procedures (HSG 248)	
ASBESTOS IN BULK MATERIALS including materials and products suspected of containing asbestos	Identification of: Amosite Chrysotile Crocidolite Fibrous Actinolite Fibrous Anthophyllite Fibrous Tremolite	HSG 248:February 2005 by Documented In-House Method A001 using stereo-microscopy, polarised light microscopy and dispersion staining	B
ASBESTOS IN SOILS AND SEDIMENTS (fibre screening and identification)	Asbestos Fibre Screening and Identification of: Amosite Chrysotile Crocidolite Fibrous Actinolite Fibrous Anthophyllite Fibrous Tremolite	Documented In-House Method A001 using stereo-microscopy, polarised light optical microscopy and dispersion staining	B
ASBESTOS in Soils (Quantification)	Abestos in Soils quantification (Gravimetric and Fibre Counting (PCM) Methodology)	Documented in house method A006 using Stereomicroscopy, Polarisling Light Microscopy, Gravmetric Analysis and Phase Contrast Microscopy	B
ASBESTOS in Soils (Dustiness)	Measurement of Dustiness	Documented in house method (A007B) based on BSEN15051-2:2013 "Measurement of the dustiness of bulk materials; Part 2: Rotating drum method"	B
SOILS	<u>Chemical Tests</u> Inorganic Analysis:		
	pH	L005B using pH electrode	B
	pH	L099 using Automated pH meter	B
	Electrical Conductivity	L031B using automated EC meter	B
	Loss on Ignition (LOI) at 450 °C	L047B using gravimetry	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)		
	Inorganic Analysis: (cont'd)		
	Metals: Arsenic Barium Beryllium Boron (total) Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Molybdenum Nickel Selenium Tin Vanadium Zinc Antimony Sulphur (Total) Water-soluble boron Aluminium Calcium Potassium Magnesium Sodium Phosphorus	L038B using ICP-OES	B
	Water-soluble Sulphate (16hr extract)	L038B using ICP-OES	B
	Water-soluble Sulphate (Ihr extract)	L038B using ICP-OES	B
	Total sulphate	L038B using ICP-OES	B
	Hexavalent Chromium	L080B by segmented flow autoanalyser	B
	Calorific Value	Documented In-House Method L013B based upon : BS EN 15400:2011 and BS EN ISO 18125:2017-07 using Bomb Calorimetry	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd) Inorganic Analysis: (cont'd)		
	Monohydric phenols	L080B using continuous flow analyser	B
	Total cyanide Free Cyanide Complex Cyanide (By Calculation)	L080B using continuous flow analyser	B
	Sulphide	L010B using ISE	B
	Water Soluble Chloride Ammonia	LO82B using Discrete Analyser	B
	Elemental Sulphur	L021B using HPLC	B
	Organic Matter Total Organic Carbon (by Calculation)	L009B using Potentiometric Detection	B
	Fraction Organic Carbon by Calulation (Expressed as fraction of TOC)	L009B using Potentiometric Titration	B
	Total organic carbon Organic matter	L023B using Titration	B
	Fraction Organic Carbon by Calulation (Expressed as fraction of TOC)	L023B using Titration	B
	Petroleum Range Organics (C6-C12) (C6-C10) C6-C8 C8-C10 Banded aliphatic Fractions: C5-C6 C6-C8 C8-C10 Banded aromatic Fractions C5-C7 C7-C8 C8-C10	L088 using headspace GCMS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)		
	Total petroleum hydrocarbons (C_{10}-C_{40}) with banding: - C12-C35 - C10-C25 - C25-C40 - C10-C12 - C12-C16 - C16-C21 - C21-C35 - C35-C40 - C10-C20 - C21-C40	L076 using GC-FID	B
	Banded Pentane-Extractable Petroleum Hydrocarbons, as specified: Banded Aliphatic Fraction: C8-C10 C10-C12 C12-C16 C16-C21 C21-C35 C35-C40 C16-C35 Banded Aromatic Fraction: C8-C10 C10-C12 C12-C16 C16-C21 C21-C35	L076B using solid phase separation and GC-FID	B
	Banded Aliphatic Fraction (By calculation C5-C35 C5-C40 Banded Aromatic Fraction (By Calculation) C5-C35	L088 using HSGCMS and L076 using GCFID	B
	Total Pentane-Extractable Petroleum Hydrocarbons, C8-C35	L076B using solid phase separation and GC-FID	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)		
	Polynuclear aromatic hydrocarbons: Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Benzo(ghi)perylene Chrysene Dibenzo(ah)anthracene Fluoranthene Fluorene Indeno(123-cd)pyrene Naphthalene Phenanthrene Pyrene Total PAH (sum of EPA 16)	L064B using GC-MS	B
	Semi-volatile organic compounds, specifically: Phenol 2-Chlorophenol Bis(2-chloroethyl)ether 1,3-Dichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene Bis(2-chloroisopropyl)ether 2-Methylphenol Hexachloroethane Nitrobenzene Isophorone 2-Nitrophenol 2,4-Dimethylphenol Bis(2-chloroethoxy)methane 1,2,4-Trichlorobenzene 2,4-Dichlorophenol Hexachlorobutadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene Dimethylphthalate 2,6-Dinitrotoluene 2,4-Dinitrotoluene Dibenzofuran	L064B using GC-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)		
	Semi-volatile organic compounds: (cont'd) 4-Chlorophenyl phenyl ether Diethylphthalate 4-Nitroaniline Azobenzene Bromophenyl phenyl ether Hexachlorobenzene Carbazole Dibutylphthalate Anthraquinone Butylbenzylphthalate	L064B using GC-MS	B
	Volatile Organic Compounds, specifically: Chloromethane Bromomethane 1,1,2-Trichloro-1,2,2-trifluoroethane MTBE 1,1-Dichloroethane *cis*-Dichloroethene 2,2-Dichloropropane Chloroform 1,1,1-Trichloroethane 1,1-Dichloropropene Carbon tetrachloride 1,2-Dichloroethane Trichloroethene 1,2-Dichloropropane Dibromomethane Bromodichloromethane *cis*-1,3-Dichloropropene 1,3-Dichloropropane *trans*-1,3-Dichloropropene 1,1,2-Trichloroethane 1,1,2,2-Tetrachloroethane Dibromochloromethane 1,2-Dibromoethane Chlorobenzene 1,1,1,2-Tetrachloroethane Styrene Isopropylbenzene Bromobenzene *N*-Propylbenzene 2-Chlorotoluene	L073B using Head Space GC-MS (HS/GCMS)	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)		
	Volatile Organic Compounds, specifically: (cont'd) 1,3,5-Trimethylbenzene 4-Chlorotoluene *tert*-Butylbenzene 1,2,4-Trimethylbenzene *sec*-Butylbenzene *p*-Isopropyltoluene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Butylbenzene 1,2-Dichlorobenzene 1,2-Dibromo-3-chloropropane 1,2,4-Trichlorobenzene Hexachlorobutadiene Naphthalene 1,2,3-Trichlorobenzene Benzene Toluene Ethylbenzene (*m*+*p*)-Xylenes *o*-Xylene Total BTEX (By calculation)	L073B using Head Space GC-MS (HS/GCMS)	B
	Polychlorinated Biphenyls: PCB Congener 28 PCB Congener 52 PCB Congener 101 PCB Congener 118 PCB Congener 138 PCB Congener 153 PCB Congener 180 Total of the seven PCB congeners listed above	L027 using GCMS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil	
	Speciated Phenols, specifically: Resorcinol Catechol Phenol 2,3,5-Trimethylphenol 2-Isopropylphenol Total Cresols: (Sum of: 2-Methylphenol, 4-Methylphenol and 3-Methylphenol)	L030 using HPLC	B
	Total Xylenols and Ethylphenols: (Sum of: 3,4-Dimethylphenol, 2,6-Dimethylphenol, 4-Ethylphenol and 2,4-Dimethylphenol)	L030 using HPLC	B
	Total Napthols: (Sum of: 1-Naphthol and 2-Naphthol)		
	pH	L005B using pH meter	B
	pH	L099 using Automated pH meter	B
	Electrical Conductivity	L031B using automated EC meter	B
	Loss on Ignition (LOI) at 450 °C	L047B using gravimetry	B
	Water-soluble Sulphate (16hr extract) Water-soluble Sulphate (Ihr extract) Total sulphate (acid soluble)	L038B using ICP-OES	B
	Hexavalent Chromium	L080B by segmented flow autoanalyser	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil	
	Sulphide	L010B using ISE	B
	Metals: Barium Beryllium Chromium Cobalt Copper Lead Manganese Molybdenum Nickel Vanadium Zinc Arsenic Boron Cadmium Iron Mercury Selenium Tin	L038B using ICP-OES	B
	Sulphur (Total)	L038B using ICP-OES	B
	Water-soluble boron	L038B using ICP-OES	B
	Monohydric phenols	L080B using continuous flow analyser	B
	Total cyanide Free Cyanide Complex Cyanide (By Calculation)	L080B using continuous flow analyser	B
	Water Soluble Chloride Ammonia	LO82B using Discrete Analyser	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil	
	Elemental Sulphur	L021B using HPLC	B
	Organic Matter Total Organic Carbon (by Calculation)	L009B using Potentiometric Detection	B
	Fraction Organic Carbon by Calulation (Expressed as fraction of TOC)	L009B using Potentiometric Titration	B
	Total organic carbon Organic matter	L023B using Titration	B
	Fraction Organic Carbon by Calulation (Expressed as fraction of TOC)	L023B using Titration	B
	Total petroleum hydrocarbons (C_{10}-C_{40}) with banding: - C12-C35 - C10-C25 - C25-C40 - C10-C12 - C12-C16 - C16-C21 - C21-C35 - C35-C40 - C10-C20 - C21-C40	L076 using GC-FID	B
	Banded Pentane-Extractable Petroleum Hydrocarbons, as specified: Banded Aliphatic Fraction: C8-C10 C10-C12 C12-C16 C16-C21 C21-C35 C35-C40 C16-C35	L076B using solid phase separation and GC-FID	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil	
	Banded Pentane-Extractable Petroleum Hydrocarbons, as specified:	L076B using solid phase separation and GC-FID	B
	Banded Aromatic Fraction: C8-C10 C10-C12 C12-C16 C16-C21 C21-C35	L076B using solid phase separation and GC-FID	B
	Total Pentane-Extractable Petroleum Hydrocarbons, C8-C35		
	Petroleum Range Organics (C6-C10) C6-C8 C8-C10	L088 using headspace GCMS	B
	Banded aliphatic Fractions: C5-C6 C6-C8 C8-C10	L088 using headspace GCMS	B
	Banded aromatic Fractions C5-C7 C7-C8 C8-C10		
	Banded Aliphatic Fraction (By calculation C5-C35 C5-C40	L088 using HSGCMS and L076 using GCFID	B
	Banded Aromatic Fraction (By Calculation) C5-C35		

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil	
	Polynuclear aromatic hydrocarbons: Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-c,d)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene Total PAH (sum of EPA 16)	L064B using GC-MS	B
	Semi-volatile organic compounds: 2-Chlorophenol Bis(2-chloroethyl)ether 1,3-Dichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene Bis(2-chloroisopropyl)ether 2-Methylphenol Hexachloroethane Nitrobenzene Isophorone 2-Nitrophenol 2,4-Dimethylphenol Bis(2-chloroethoxy)methane 1,2,4-Trichlorobenzene 2,4-Dichlorophenol Hexachlorobutadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene Dimethylphthalate 2,6-Dinitrotoluene 2,4-Dinitrotoluene	L064B using GC-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil	
	Semi-volatile organic compounds (CTD): Dibenzofuran 4-Chlorophenyl phenyl ether Diethylphthalate 4-Nitroaniline Azobenzene Bromophenyl phenyl ether Hexachlorobenzene Carbazole Dibutylphthalate Anthraquinone	L064B using GC-MS	B
	Volatile Organic Compounds, specifically: Chloromethane Bromomethane 1,1,2-Trichloro-1,2,2-trifluoroethane MTBE 1,1-Dichloroethane *cis*-Dichloroethene 2,2-Dichloropropane Chloroform 1,1,1-Trichloroethane 1,1-Dichloropropene Carbon tetrachloride 1,2-Dichloroethane Trichloroethene 1,2-Dichloropropane Dibromomethane Bromodichloromethane *cis*-1,3-Dichloropropene 1,3-Dichloropropane *trans*-1,3-Dichloropropene 1,1,2-Trichloroethane 1,1,2,2-Tetrachloroethane Dibromochloromethane Chlorobenzene 1,1,1,2-Tetrachloroethane Styrene Isopropylbenzene Bromobenzene 2-Chlorotoluene	L073B using Head Space GC-MS (HS/GCMS)	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)	Documented In-House Method to meet the requirements of the Environment Agency MCERTS Performance Standard - chemical testing of soil	
	Volatile Organic Compounds, specifically: (cont'd) 1,3,5-Trimethylbenzene 4-Chlorotoluene *tert*-Butylbenzene *sec*-Butylbenzene 1,4-Dichlorobenzene Butylbenzene 1,2-Dichlorobenzene 1,2,4-Trichlorobenzene Hexachlorobutadiene Benzene Toluene Ethylbenzene (*m*+*p*)-Xylenes *o*-Xylene Total BTEX (By calculation)	L073B using Head Space GC-MS (HS/GCMS)	B
	Polychlorinated Biphenyls: PCB Congener 28 PCB Congener 52 PCB Congener 101 PCB Congener 118 PCB Congener 138 PCB Congener 153 PCB Congener 180 Total of the seven PCB congeners listed above	L027 using GCMS	B
RECYCLED WASTE Trommel Fines	Loss on Ignition at 440°C	Documented in house method ref L011B – using Gravimetric Analysis in accordance with HMRC Excise Notice LFT1 27 March 2015	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS - surface water, groundwater, potable (non-regulatory) and prepared leachate)	<u>Chemical Tests</u> pH	L005B using pH electrode	B
Surface water, groundwater, potable (non-regulatory) and prepared leachate), final sewage effluent and Landfill Leachate	Biochemical Oxygen Demand	L086B by DO meter	B
	Alkalinity Chloride Nitrite Thiocyanate	L082 using discrete analyser	B
Surface water, groundwater, potable (non-regulatory) and prepared leachate), Landfill Leachate and final sewage effluent	Sulphate Boron	L039B using ICP-OES	B
	Hardness	L045 by calculation	B
	Metals (total & dissolved): Aluminium Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Molybdenum Nickel Phosphorus	L039B using ICP-OES	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
Surface water, groundwater, potable (non-regulatory) and prepared leachate), Landfill Leachate and final sewage effluent	<u>Chemical Tests</u>		
	Metals (total & dissolved)CTD: Potassium Selenium Sodium Tin Vanadium Zinc	L039B using ICP-OES	B
Landfill Leachate and final sewage effluent	Silver (total & dissolved)	L039B using ICP-OES	B
WATERS – Process Water	Metals (total and Dissolved): Aluminium Copper Iron Sulphate Zinc	L039B using ICP-OES	B
WATERS - surface water, groundwater, potable (non-regulatory) and prepared leachate	Metals: Cadmium Arsenic Selenium Beryllium Cobalt Copper Molybdenum Tin Zinc Nickel Vanadium Antimony Chromium Lead Manganese Barium Phosphorous Iron Sodium Magnesium Potassium	Metals Analysis by In house method L012B using ICPMS analysis	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests		
WATERS - surface water and potable water (non-regulatory)	Mercury	Metals Analysis by In house method L012B using ICPMS analysis	B
WATERS - surface water, groundwater and prepared leachate	Boron	Metals Analysis by In house method L012B using ICPMS analysis	B
WATERS - surface water, potable (non-regulatory and prepared leachate	Aluminium	Metals Analysis by In house method L012B using ICPMS analysis	B
WATERS - surface water, groundwater, potable (non-regulatory) and prepared leachate	Mercury	In house method L085B using Atomic Fluorescence Spectroscopy	B
Surface water, groundwater, potable (non-regulatory) and prepared leachate, final sewage effluent and landfill leachate	Monohydric phenols Total cyanide Cyanide (free) Complex cyanide (by Calculation)	L080B using continuous flow analyser	B
Surface water, groundwater, potable (non-regulatory) and prepared leachate, final sewage effluent and landfill leachate	Chemical Oxygen Demand (COD)	Hach DR/890 Colorimeter by in house method L065	B
WATERS - Surface water, groundwater and potable (non-regulatory) Water, final sewage effluent and landfill leachate	Ammonia Phosphate	L082 using discrete analyser	B
- Surface water, groundwater and potable (non-regulatory) Water, final sewage effluent landfill leachate and prepared Leachate	Hexavalent Chromium	L080B by segmented flow autoanalyser	B
Surface water, groundwater and potable (non-regulatory) water	Fluoride	L033 by ion selective electrode	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (Cont'd) Surface water, groundwater, potable (non-regulatory) water and prepared leachates final sewage effluent and landfill leachate	Chemical Tests Fluoride	L033B by Metrohm Analyser with ion selective electrode	B
Surface water, groundwater and potable (non-regulatory) water final sewage effluent and landfill leachate	Nitrate	L078 by spectrophotometry	B
Surface water, groundwater and potable (non-regulatory) water final sewage effluent and landfill leachate	Calcium	In house method L12B using ICPMS analysis	B
Surface water, groundwater and potable (non-regulatory) water final sewage effluent and landfill leachate	Total Organic Carbon (TOC) Dissolved Organic Carbon (DOC)	L037B by TOC analyser	B
Surface and groundwater, potable (non-regulatory) water, Sewage Effluent, Landfill Leachate and prepared Leachates	pH	L099 using Automated pH meter	B
Surface water, groundwater, potable (non-regulatory) water, Sewage Effluent, and prepared Leachates	Electrical Conductivity Total Dissolved Solids (By Calculation)	L031B using automated EC meter	B
- Surface water, groundwater and potable (non-regulatory) water (cont'd)	Volatile Organic Compounds, specifically: Chloromethane Bromomethane Chloroethane 1,1,2-Trichloro-1,2,2-trifluoroethane 1,1-Dichloroethylene MTBE *trans*-Dichloroethylene 1,1-Dichloroethane *cis*-Dichloroethylene 2,2-Dichloropropane Chloroform 1,1,1-Trichloroethane 1,1-Dichloropropene	L073B using Head Space GC-MS (HS/GCMS)	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd) - Surface water, groundwater and potable (non-regulatory) water (cont'd)	<u>Chemical Tests</u> (cont'd) Volatile Organic Compounds, specifically: (cont'd) Carbon tetrachloride 1,2-Dichloroethane Trichloroethylene 1,2-Dichloropropane Dibromomethane Bromodichloromethane *cis*-1,3-Dichloropropene 1,3-Dichloropropane *trans*-1,3-Dichloropropene 1,1,2-Trichloroethane *n*-Propylbenzene 2-Chlorotoluene 1,3,5-Trimethylbenzene 4-Chlorotoluene *tert*-Butylbenzene 1,2,4-Trimethylbenzene *sec*-Butylbenzene *p*-Isopropyltoluene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Butylbenzene 1,2-Dichlorobenzene 1,2-Dibromo-3-chloropropane 1,2,4-Trichlorobenzene Hexachlorobutadiene Naphthalene 1,2,3-Trichlorobenzene 1,1,2,2-Tetrachloroethane Tetrachloroethylene Dibromochloromethane 1,2-Dibromoethane Chlorobenzene 1,1,1,2-Tetrachloroethane Styrene Bromoform Isopropylbenzene Bromobenzene	L073B using Head Space GC-MS (HS/GCMS)	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd)	Chemical Tests (cont'd)		
- Surface water, groundwater and potable (non-regulatory) water and prepared leachates	Benzene Toluene Ethylbenzene (*m*+*p*)-Xylenes *o*-Xylene Total BTEX (By calculation)	L073B using Head Space GC-MS (HS/GCMS)	B
	Total Petroleum Hydrocarbons (C10-C40) and (C12-C35)	L070B using GC-MS	B
Waters -Surface, Ground and potable (non-regulatory)	Polyaromatic Hydrocarbons: Naphthalene Acenaphthene Acenaphthylene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Polyaromatic Hydrocarbons: Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benz(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene Total PAH (Sum of 16 individuals)	L102B using GCMS	B
- Surface water, groundwater and potable (non-regulatory) water and prepared leachates (cont'd)	Petroleum Range Organics (C6-C12) (C6-C10) C6-C8 C8-C10 Banded aliphatic Fractions: C5-C6 C6-C8 C8-C10 Banded aromatic Fractions C5-C7 C7-C8 C8-C10	L088 using headspace GCMS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd) - Surface water, groundwater and potable (non-regulatory) water, prepared leachates, final sewage effluent and landfill leachate	<u>Chemical Tests</u> (cont'd) Anions, specifically: Fluoride Chloride Nitrite Bromide Nitrate Phosphate Sulphate	L008B using Ion Chromatography	B
Surface water, groundwater and potable (non-regulatory) water and prepared leachates	Bromate	L008B using Ion Chromatography	B
Potable water (non regulatory), surface water, groundwater, final sewage effluent, process water (closed system heating and cooling waters), landfill leachate	Total Suspended Solids at 105°C	L004B By gravimetric analysis	B
	Total Dissolved Solids at 180°C	L004B By gravimetric analysis	B
	Volatile Suspended Solids at 550°C	L004B By gravimetric analysis	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd) - Surface water, groundwater and potable (non-regulatory) water and prepared leachates	Chemical Tests (cont'd) Total petroleum hydrocarbons (C10-C40) and (C12-C35) with banding: Banded Aliphatic Fraction: C10-C12 C12-C16 C16-C21 C21-C35 Banded Aromatic Fraction: C10-C12 C12-C16 C16-C21 C21-C35	L101 using GC/GC FID	B
- Surface water, groundwater and potable (non-regulatory) water and prepared leachates	Banded Aliphatic Fraction (By calculation C5-C35 Banded Aromatic Fraction (By Calculation) C5-C35	L088 using HSGCMS and L101B using GC/GC FID	B
- Surface water, groundwater and potable (non-regulatory) water and prepared leachates	Speciated Phenols, specifically: Resorcinol Catechol Phenol 2,3,5-Trimethylphenol 2-Isopropylphenol Total Cresols: (Sum of: 2-Methylphenol, 4-Methylphenol and 3-Methylphenol) Total Xylenols and Ethylphenols: (Sum of: 3,4-Dimethylphenol, 2,6-Dimethylphenol, 4-Ethylphenol and 2,4-Dimethylphenol) Total Napthols: (Sum of:1-Naphthol and 2-Naphthol)	L030 using HPLC	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
AIR Ambient Air and Soil Vapour (in pre-collected in Summa Gas Cannisters)	<u>Chemical Tests</u> Volatile Organic Compounds: 1,1,1-trichloroethane 1,1,2,2-tetrachloroethane 1,1,2-trichloroethane 1,1-dichloroethane 1,1-dichloroethene 1,2,4-trichlorobenzene 1,2,4-trimethyl benzene 1,2-dibromoethane 1,2-dichlorobenzene 1,2-dichloroethane 1,2-dichloropropane 1,3,5-trimethyl benzene 1,3-butadiene 1,3-dichlorobenzene 1,4-dichlorobenzene 1,4-dioxane 2-hexanone (MBK) 4-ethyl toluene acetone acrolein benzene benzyl chloride bromodichloromethane bromoform bromomethane carbon disulphide carbon tetrachloride chlorobenzene chloroethane chloroform chloromethane cis-1,2-dichloroethene cis-1,3-dichloropropene cyclohexane dibromochloromethane dichlomethane dichlorodifluoromethane dichlorotetrafluoroethane ethanol ethyl acetate ethyl benzene	In house method L106B based on TO-15 using Thermal desorption and GCMS detection methodology	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
AIR	Chemical Tests		
Ambient Air and Soil Vapour (in pre-collected in Summa Gas Cannisters)	Volatile Organic Compounds Ctd: heptane hexachlorobutadiene hexane isopropyl alcohol m/p-xylene MEK methyl methacrylate MIBK MTBE naphthalene o-xylene propene styrene tetrachloroethene THF toluene trans-1,2-dichloroethene trans-1,3-dichloropropene trichloroethene trichlorofluoromethane trichlorotrifluoroethane vinyl acetate vinyl chloride	In house method L106B based on TO-15 using Thermal desorption and GCMS detection methodology	B
Ambient Air and Soil Vapour (in pre-collected in Summa Gas Cannisters)	Petrol Range Organics including banding: Benzene toluene ethyl benzene m/p-xylene o-xylene >C5-C6 >C6-C8 >C8-C10 >C10-C12 >C5-C10 >C6-C10 >C6-C12 Total >C5-C12 Total	In house method L107B based on TO-15 using Thermal desorption and GCMS detection methodology	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
AIR Ambient Air and Soil Vapour (in pre-collected in Tedlar Bags)	<u>Chemical Tests</u> Bulk Gases: hydrogen ethylene propane propylene i-butane n-butane propadiene ethane acetylene t-2-butene 1-butene i-butylene c-2-butene i-pentane n-pentane methane 1,3-butadiene methyl-acetylene carbon monoxide t-2-pentene 1-pentene 2-methyl-2-butene c-2-pentene	In house method L108B using GCFID detection	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SRF (Solid Recovered fuel) and RDF (Refuse Derived Fuel) and Soild Biofuel	<u>Chemical Tests</u> (cont'd) Sample Preparation and Moisture Content	Documented in house method L015 based on BS EN 15413:2011, BS EN ISO 14780:2017-07, BS EN 15414-3:2011 and BS EN ISO 18134-3:2015-11 using gravimetry	B
	Moisture Content	Documented in house method L015 based on BS EN 15413:2011, BS EN ISO 14780:2017-07, BS EN 15414-3:2011 and BS EN ISO 18134-3:2015-11 using gravimetry	B
SRF (Solid Recovered fuel) and RDF (Refuse Derived Fuel) and Soild Biofuel	Ash Content	Documented in house method L018B based on BS EN 15403: 2011 and BS EN ISO 18122: 2015 using Gravimetry	B
SRF (Solid Recovered fuel) and RDF (Refuse Derived Fuel) and Soild Biofuel	Biomass and Non-biomass content	Documented in house method L022B based on EN 15440: 2011 using selective dissolution method	B
SRF (Solid Recovered fuel) and RDF (Refuse Derived Fuel) and Soild Biofuel	<u>Sulphur</u> Fluorine Chlorine Bromine	Documented In-House Method L008B based upon BS EN 15408:2011 and BS EN ISO 16994:2016-10 using Ion Chromatography	B
SRF (Solid Recovered fuel) and RDF (Refuse Derived Fuel) and Soild Biofuel	<u>Metals:</u> Aluminium Arsenic Cadmium Cobalt Chromium Copper Mercury Manganese Nickel Lead Antimony Tin Vanadium Zinc	Documented in house method L038B based on BS EN 15411:2011, BS EN ISO 16968:2015 and BS EN ISO 16967:2015 using ICP-OES	B
SRF (Solid Recovered fuel) and RDF (Refuse Derived Fuel) and Soild Biofuel	<u>Metals Oxides:</u> SiO2, Al2O3,Fe2O3, CaO, MgO, Na2O, K2O, TiO2, SO3, P2O5, MnO2, BaO, SrO	Documented in house method L038B based on BS EN 15411:2011, BS EN ISO 16968:2015 and BS EN ISO 16967:2015 using ICP-OES	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
SRF (Solid Recovered fuel) and RDF (Refuse Derived Fuel) and Soild Biofuel	Calorific value	Documented In-House Method L013B based upon : BS EN 15400:2011 and BS EN ISO 18125:2017-07 using Bomb Calorimetry	B
	Sampling		
Soils	Soil Sampling	In Compliance with ISO 10381-4:2003 and ISO 10381-5:2005	B
Rivers and Streams	Water Sampling	In Compliance with ISO 5667-6:2014	B
Underground Water	Water Sampling	In Compliance with ISO 5667-11:2009	B
SOILS for civil engineering purposes	Geotechnical Testing		
	Sample Preparation	In house method G043	B,C,D
	Sampling earthworks materials - from stockpiles - laid materials - excavations	Documented In-House Method SS05 - Sampling Earthworks	Site
	Moisture content - oven drying method	BS 1377-2:1990	B, C, D
	Liquid limit - cone penetrometer	BS 1377-2:1990	B
	Liquid limit - cone penetrometer - one point	BS 1377-2:1990	B
	Plastic limit	BS 1377-2:1990	B
	Plasticity index	BS 1377-2:1990	B
	Particle density - gas jar	BS 1377-2:1990	B
	Linear Shrinkage	BS 1377-2:1990	B
	Particle size distribution - wet sieving	BS 1377-2:1990	B
	Particle size distribution - dry sieving	BS 1377-2:1990	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS for civil engineering purposes (cont'd)	Geotechnical Testing (cont'd)		
	Particle size distribution - sedimentation - hydrometer method	BS 1377-2:1990	B
	Dry density/moisture content relationship (2.5 kg rammer)	BS 1377-4:1990	B
	Dry density/moisture content relationship (4.5 kg rammer)	BS 1377-4:1990	B
	Dry density/moisture content relationship(vibrating hammer)	BS 1377-4:1990	B
	Moisture condition value(MCV)	BS 1377-4:1990	B, D, Site
	MCV - natural moisture content	BS 1377-4:1990	B, D, Site
	MCV/moisture content relation	BS 1377-4:1990	B, D
	California Bearing Ratio (CBR)	BS 1377-4:1990	B
	Swelling of soaked CBR specimen	BS1377-4:1990	B
	Undrained shear strength - triaxial compression without measurement of pore pressure	BS 1377-7:1990	B
	Undrained shear strength - triaxial compression with multistage loading and without measurement of pore pressure	BS 1377-7:1990	B
	Shear strength by direct shear (small shearbox apparatus)	BS1377-7:1990	B
	Effective shear strength – consolidated-undrained triaxial compression test with measurement of pore pressure	BS1377-8:1990	B
	Effective shear strength – consolidated-drained triaxial compression test with measurement of volume change	BS 1377- 8:1990	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS for civil engineering purposes (cont'd)	Geotechnical Testing (cont'd)		
	Effective shear strength – consolidated drained multistage triaxial compression test with measurement of volume change	Documented in House method G084	B
	Effective shear strength – consolidated undrained multistage triaxial compression test with measurement of pore pressure	Documented in House method G084	B
	Saturation Moisture of Chalk	BS 1377–2:1990	B
	One-dimensional consolidation properties	BS 1377-5:1990, clause 3	B
	Determination of Swelling and collapse Characteristics	BS 1377-5:1990, clause 4	B
	In-situ density - sand replacement method (small pouring cylinder)	BS 1377-9:1990	Site
	In-situ density - sand replacement method (large pouring cylinder)	BS 1377-9:1990	Site
	In-situ density - core cutter method	BS 1377-9:1990	Site
	In-situ California Bearing Ratio (CBR)	BS 1377-9:1990	Site
	Vertical deformation and strength characteristics by the plate loading test	BS 1377-9:1990	Site
	Calculation of equivalent CBR values using the plate loading test	Specification for Highway Works: Design Guidance for Road Pavement Foundations Interim Advice Note 73/06 rev1	Site
	Dynamic Cone Penetration	Specification for Highway Works: Design Guidance for Road Pavement Foundations Interim Advice Note 73/06 rev1 Design Manual for Roads and Bridges, HMSO, HD 29/08	Site

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS for civil engineering purposes (cont'd)	Geotechnical Testing (cont'd)		
	Hand shear vane	Guideline for handheld shear vane test: New Zealand Geotechnical Society Inc, August 2001	Site
	Permeability constant head in a rigid wall permeameter	BS EN ISO 17892-11:2019	B
	Permeability - Filtration Coefficient for 1x10-3 to 1 x 10-6 m/s USBCS (0.01<D20<2.00mm)	Hydrogeologia Ogolna: 1990 by Z. Pazdro and B. Kozerski	B
	Shear strength by direct shear (large shearbox apparatus)	BS 1377-7:1990	B
	Determination of effective angle of internal friction and effective cohesion of earthworks materials (using 300 mm shearbox)	Specification for Highway Works, HMSO November 2009 Clause 636	B
	MCV/moisture content relation	BS 1377-4:1990	B
	In-situ bulk density - nuclear method - absolute tests - compliance tests	BS 1377-9:1990	Site
	In-situ moisture density - nuclear method - absolute tests - compliance tests	BS 1377-9:1990	Site
	In-situ density - dielectric method	Documented In-House Method SS17	Site
Hydraulically Bound and Stabilized materials for Civil Engineerring Purposes	Moisture Condition Value (MCV)	BS EN 13826-46:2003	D,Site
	Laboratory reference density and water content - proctor compaction	BS EN 13286-2:2010	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Geotechnial Testing (Ctd)		
Hydraulically Bound and Stabilized materials for Civil Engineerring Purposes	Laboratory reference density and water content - vibrating hammer	BS EN 13286-4:2003	B
	Moisture condition value (MCV)	BS EN 13286-46:2003	B
	California bearing ratio, immediate bearing index and linear swelling	BS EN 13286-47:2012	B
AGGREGATES	Sampling aggregates - from stockpiles	BS EN 932-1:1997	Site
	Particle size distribution - sieving method	EN 933-1:2012 BS EN 933-1:2012	B
	Water Content	EN 1097-5:2008 BS EN 1097-5:2008	B,C,D
	Sample Reduction by quartering	EN 932-2:1999 BS EN 932-2:1999	B,C,D
	Sample reduction using a riffle box	EN 932-2:1999 BS EN 932-2:1999	B,C,D
	Uniformity Coefficient	BS EN ISO 14688-2: 2004 +A1: 2013	B
	Coefficient of Curvature	BS EN ISO 14688-2: 2004 +A1: 2013	B
	Resistance to fragmentation by the Los Angeles test method	EN 1097-2:2010 BS EN 1097-2:2010	B
	Classification test for the constituents of coarse recycled Aggregates	EN 933-11:2009 BS EN 933-11:2009	B
	Particle shape – Flakiness Index	BS EN 933-3:2012	B
	Particle shape – Shape Index	BS EN 933-4:2008	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Geotechnial Testing (Ctd)		
AGGREGATES	Percentage of crushed and broken surfaces in coarse aggregate	BS EN 933-5:1998	B
	Resistance to wear (Micro-Deval)	BS EN 1097-1:2011	B
	Loose Bulk Density and voids	BS EN 1097-3:1998	B
	Particle density and water absorption - wire basket method for aggregate particles between 31.5 and 63 mm	BS EN 1097-6:2013	B
	Particle density and water absorption - pyknometer method for aggregate particles between 4 mm and 31.5 mm	BS EN 1097-6:2013	B
	Particle density and water absorption - pyknometer method for aggregate particles between 0.063 mm and 4 mm	BS EN 1097-6: 2013	B
	Methods for determination of aggregate crushing value	BS 812-110:1990	B
	Methods for determination of ten per cent fines value	BS 812-111:1990	B
	Magnesium Sulphate test	BS EN 1367-2:2009	B
GEOTECHNICAL INVESTIGATION and TESTING - Laboratory testing of soil	Sample Preparation	In house method G043	B,C,D
	Water Content	BS EN ISO 17892-1:2014	B,C,D
	Bulk Density – immersion in fluid method	BS EN ISO 17892-2:2014	B
	Bulk Density – Linear measurement method	BS EN ISO 17892-2:2014	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Geotechnial Testing (Ctd)		
GEOTECHNICAL INVESTIGATION and TESTING - Laboratory testing of soil	Determination of particle density - fluid pycnometer method	BS EN ISO 17892-3:2015	B
	Determination of particle size distribution - Sieving method	BS EN ISO 17892-4:2016	B
	Determination of particle size distribution - Hydrometer method	BS EN ISO 17892-4:2016	B
	Determination of liquid limit (fall cone method)	BS EN 17892-12:2018	B
	Determination of liquid limit (one-point fall cone method)	BS EN 17892-12:2018	B
	Determination of plastic limit	BS EN 17892-12:2018	B
	Determination of plasticity limit	BS EN 17892-12:2018	B
Rock and Natural Stone	Determination of point load strength and anisotropy indices	The Complete ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 – 2006, Editors: R Ulusay & J A Hudson	B
	Determination of Uniaxial Compressive Strength	ISRM Commission on Testing Methods, Suggested Method for Determining Uniaxial Compressive Strength 1985	B
Bituminous Mixtures for Road and other Paved Areas	Sampling - from the material around the augers of the paver,	BS EN 12697-27:2017	Site
	Preparation of samples for determining binder content, water content and grading	BS EN 12697-28:2001	Site

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Geotechnial Testing (Ctd)		
Bituminous Mixtures for Road and other Paved Areas	Temperature measurement by contact measuring device - in a lorry - of material after it has been laid and before rolling - in a heap,	BS EN 12697-13:2017	Site
	Temperature measurement by infrared measuring device - in a paver	BS EN 12697-13:2017	Site
	Bulk density dry - saturated surface dry (SSD) - sealed specimen	BS EN 12697-6:2012	Site
	Air voids content (Vm)	BS EN 12697-8:2018	Site
Bituminous Road Surfacing	In-Situ Density – Nuclear Method	BS 594987:2015+A1:2017 and Documented In-House Method SS16	Site
	In-Situ Density – Dielectric Method	BS 594987:2015+A1:2017 and Documented In-House Method SS15	Site
Pavement Surface	Pavement surface macrotexture depth using a volumetric patch technique	BS EN 13036-1:2010	Site
	Texture depth by the sand-patch method	BS 598-105:2000 (withdrawn)	Site
Unbound and Hydraulically bound Materials	Degree of Pulverization	BS EN 13286-48 – 2005	Site
END			