

Appendix B Chemical Criteria for Imported Aggregates Subsoil and Topsoil

Table B: Chemical Test Criteria - Imported Material (topsoil/subsoil and recycled aggregate)

Determinand	Dry Soil		Source
	units	Maximum Acceptable Concentration	
Asbestos	%	Natural Materials – None visible and none detected Recycled Aggregate - <0.001% and none visible	Waterman in house criteria
Metals			
Arsenic	mg/kg	40	LQM S4ULs 2015
Antimony	mg/kg	550	CL:AIRE 2009
Barium	mg/kg	542	Non-hazardous waste threshold for Barium Chromate
Beryllium	mg/kg	1.7	LQM S4ULs 2015
Boron (Water Soluble)	mg/kg	107	Non-hazardous waste threshold for Boron Tribromide
Cadmium	mg/kg	85	LQM S4ULs 2015
Chromium (Total)	mg/kg	684	Non-hazardous waste threshold for Chromium III compounds
Chromium (VI)	mg/kg	6	LQM S4ULs 2015
Copper	mg/kg	200	BS3882: 2015 (Soil pH >7.0)
Lead	mg/kg	310	DEFRA C4SLs
Mercury	mg/kg	1.2	LQM S4ULs 2015
Molybdenum	mg/kg	670	CL:AIRE 2009
Nickel	mg/kg	110	BS3882: 2015 (Soil pH >7.0)
Selenium	mg/kg	430	LQM S4ULs 2015
Vanadium	mg/kg	1,200	LQM S4ULs 2015
Zinc	mg/kg	300	BS3882: 2015 (Soil pH >7.0)
TPH			
Total of TPH-CWG (C5-C44) not to exceed 500mg/kg (inert WAC threshold for mineral oil C10-C40) and TPH-CWG not to exceed the following:			
Aliphatic EC5 - EC6	mg/kg	42	LQM S4ULs 2015
Aliphatic EC6 - EC8	mg/kg	100	LQM S4ULs 2015
Aliphatic EC8-EC10	mg/kg	27	LQM S4ULs 2015
Aliphatic EC10-EC12	mg/kg	130	LQM S4ULs 2015
Aliphatic EC12-EC16	mg/kg	500	Inert WAC for mineral oil C10-C40
Aliphatic EC16-EC21	mg/kg	500	Inert WAC for mineral oil C10-C40

Determinand	Dry Soil		Source
	units	Maximum Acceptable Concentration	
Aliphatic EC21-EC35	mg/kg	500	Inert WAC for mineral oil C10-C40
Aliphatic EC35-EC44	mg/kg	500	Inert WAC for mineral oil C10-C40
Aromatic C5-C7	mg/kg	370	LQM S4ULs 2015
Aromatic C7-C8	mg/kg	500	Inert WAC for mineral oil C10-C40
Aromatic C8-C10	mg/kg	47	LQM S4ULs 2015
Aromatic C10-C12	mg/kg	250	LQM S4ULs 2015
Aromatic C12-C16	mg/kg	500	Inert WAC for mineral oil C10-C40
Aromatic C16-C21	mg/kg	500	Inert WAC for mineral oil C10-C40
Aromatic C21-C35	mg/kg	500	Inert WAC for mineral oil C10-C40
Aromatic C35-C44	mg/kg	500	Inert WAC for mineral oil C10-C40
BTEX			
Sum of BTEX not to exceed 6mg/kg (inert WAC threshold for BTEX) and individual compounds not to exceed the following:			
Benzene	mg/kg	0.38	LQM S4ULs 2015
Toluene	mg/kg	6	Inert WAC for BTEX
Ethyl Benzene	mg/kg	6	Inert WAC for BTEX
Xylene - m	mg/kg	6	Inert WAC for BTEX
Xylene - o	mg/kg	6	Inert WAC for BTEX
Xylene - p	mg/kg	6	Inert WAC for BTEX
PAH			
Sum of PAHs (16) not to exceed 100mg/kg (inert WAC threshold for PAHs) and speciated PAHs not to exceed the following:			
Naphthalene	mg/kg	2.3	LQM S4ULs 2015
Acenaphthylene	mg/kg	100	Inert WAC for PAHs
Acenaphthene	mg/kg	100	Inert WAC for PAHs
Fluorene	mg/kg	100	Inert WAC for PAHs
Phenanthrene	mg/kg	100	Inert WAC for PAHs
Anthracene	mg/kg	100	Inert WAC for PAHs
Fluoranthene	mg/kg	100	Inert WAC for PAHs
Pyrene	mg/kg	100	Inert WAC for PAHs
Benzo(a)anthracene	mg/kg	11	LQM S4ULs 2015
Chrysene	mg/kg	30	LQM S4ULs 2015
Benzo(b)fluoranthene	mg/kg	3.9	LQM S4ULs 2015

Determinand	Dry Soil		Maximum Acceptable Concentration	Source
	units			
Benzo(k)fluoranthene	mg/kg	100		Inert WAC for PAHs
Benzo(a)pyrene	mg/kg	3.2		LQM S4ULs 2015
Indeno(1,2,3-cd)pyrene	mg/kg	45		LQM S4ULs 2015
Di-benzo(a,h.)anthracene	mg/kg	0.31		LQM S4ULs 2015
Benzo(g,h,i.) Perylene	mg/kg	100		Inert WAC for PAHs
Other Organics/Inorganics				
Sum of 7 Congener PCBs	mg/kg	1		Inert WAC for PCBs (Sum of 7 Congeners)
Total Cyanide	mg/kg	26		Waterman GAC - CLEA v1.06 (free cyanide)
Total Phenols	mg/kg	750		LQM S4ULs 2015

LQM S4ULs 2015 and DEFRA C4SLs values are based on residential (without plant uptake) soils with 1% soil organic matter.

Note: In addition to meeting the chemical criteria discussed above, imported materials must be free from anthropogenic materials such as bricks, wood, concrete, glass, metal and plastic, and no visual or olfactory evidence of contamination should be present.

Appendix C Chemical Criteria for Re-used Soils & Aggregates

Table B: Chemical Test Criteria – soils and aggregates for re-use

Determinand	Dry Soil		Source
	units	Maximum Acceptable Concentration	
Metals			
Arsenic	mg/kg	40	DEFRA C4SLs
Barium	mg/kg	1300	LQM S4ULs 2015
Beryllium	mg/kg	1.7	LQM S4ULs 2015
Boron (Water Soluble)	mg/kg	11,000	LQM S4ULs 2015
Cadmium	mg/kg	150	DEFRA C4SLs
Chromium (Total)	mg/kg	910	LQM S4ULs 2015
Chromium (VI)	mg/kg	21	DEFRA C4SLs
Copper	mg/kg	7100	LQM S4ULs 2015
Lead	mg/kg	310	DEFRA C4SLs
Mercury	mg/kg	1.2	LQM S4ULs 2015
Nickel	mg/kg	180	LQM S4ULs 2015
Selenium	mg/kg	430	LQM S4ULs 2015
Vanadium	mg/kg	1,200	LQM S4ULs 2015
Zinc	mg/kg	40,000	LQM S4ULs 2015
TPH			
Total of TPH-CWG (C5-C44) not to exceed 500mg/kg (inert WAC threshold for mineral oil C10-C40) and TPH-CWG not to exceed the following:			
Aliphatic EC5 - EC6	mg/kg	42	LQM S4ULs 2015
Aliphatic EC6 - EC8	mg/kg	100	LQM S4ULs 2015
Aliphatic EC8-EC10	mg/kg	27	LQM S4ULs 2015
Aliphatic EC10-EC12	mg/kg	130	LQM S4ULs 2015
Aliphatic EC12-EC16	mg/kg	1100	LQM S4ULs 2015
Aliphatic EC16-EC21	mg/kg	65,000	LQM S4ULs 2015
Aliphatic EC21-EC35	mg/kg	65,000	LQM S4ULs 2015
Aliphatic EC35-EC44	mg/kg	65,000	LQM S4ULs 2015
Aromatic C5-C7	mg/kg	370	LQM S4ULs 2015
Aromatic C7-C8	mg/kg	500	LQM S4ULs 2015
Aromatic C8-C10	mg/kg	47	LQM S4ULs 2015
Aromatic C10-C12	mg/kg	250	LQM S4ULs 2015
Aromatic C12-C16	mg/kg	1,800	LQM S4ULs 2015

Determinand	Dry Soil		Source
	units	Maximum Acceptable Concentration	
Aromatic C16-C21	mg/kg	1,900	LQM S4ULs 2015
Aromatic C21-C35	mg/kg	1,900	LQM S4ULs 2015
Aromatic C35-C44	mg/kg	1,900	LQM S4ULs 2015
BTEX			
Sum of BTEX not to exceed 6mg/kg (inert WAC threshold for BTEX) and individual compounds not to exceed the following:			
Benzene	mg/kg	0.38	LQM S4ULs 2015
Toluene	mg/kg	880	LQM S4ULs 2015
Ethyl Benzene	mg/kg	83	LQM S4ULs 2015
Xylene - m	mg/kg	82	LQM S4ULs 2015
Xylene – o/p	mg/kg	88	LQM S4ULs 2015
PAH			
Sum of PAHs (16) not to exceed 100mg/kg (inert WAC threshold for PAHs) and speciated PAHs not to exceed the following:			
Naphthalene	mg/kg	2.3	LQM S4ULs 2015
Acenaphthylene	mg/kg	2,900	LQM S4ULs 2015
Acenaphthene	mg/kg	3,000	LQM S4ULs 2015
Fluorene	mg/kg	2,800	LQM S4ULs 2015
Phenanthrene	mg/kg	1,300	LQM S4ULs 2015
Anthracene	mg/kg	31,000	LQM S4ULs 2015
Fluoranthene	mg/kg	1,500	LQM S4ULs 2015
Pyrene	mg/kg	3,700	LQM S4ULs 2015
Benzo(a)anthracene	mg/kg	11	LQM S4ULs 2015
Chrysene	mg/kg	30	LQM S4ULs 2015
Benzo(b)fluoranthene	mg/kg	3.9	LQM S4ULs 2015
Benzo(k)fluoranthene	mg/kg	100	LQM S4ULs 2015
Benzo(a)pyrene	mg/kg	3.2	LQM S4ULs 2015
Indeno(1,2,3-cd)pyrene	mg/kg	45	LQM S4ULs 2015
Di-benzo(a,h.)anthracene	mg/kg	0.31	LQM S4ULs 2015
Benzo(g,h,i.) Perylene	mg/kg	360	LQM S4ULs 2015
Other Organics/Inorganics			
Total Cyanide	mg/kg	26	Waterman GAC - CLEA v1.06 (free cyanide)



Determinand	Dry Soil		Maximum Acceptable Concentration	Source
	units			
Total Phenols	mg/kg	750		LQM S4ULs 2015

LQM S4ULs 2015 and DEFRA C4SLs values are based on residential (without plant uptake) soils with 1% soil organic matter.

These criteria relate to materials to be re-used beneath the cover system only.