

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors ⁽⁶⁾	Surface water receptors ⁽⁶⁾		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
<i>(Not determined)</i>	Specific pollutant	Copper	-	2,000 ⁽²⁾	1 bioavailable ^(6a)	3.76 dissolved, where DOC ≤1mg/l ^(6a) 3.76µg/l + (2.677µg/l x ((DOC/2) – 0.5µg/l)) dissolved, where DOC >1mg/l ^(6a)
Hazardous substance	Priority substance	Lead	-	10 ⁽²⁾	1.2 bioavailable ^(6a)	1.3 ^(6a)
Hazardous substance	Priority hazardous substance	Mercury	0.01 ⁽⁷⁾	1 ⁽²⁾	0.07 ^(6c)	0.07 ^(6c)
Non-hazardous pollutant	Priority substance	Nickel	-	20 ⁽²⁾	4.0 bioavailable ^(6a)	8.6 ^(6a)
Non-hazardous pollutant	-	Selenium	-	10 ⁽²⁾	-	-
Non-hazardous pollutant	Specific pollutant	Zinc	-	3,000 ⁽⁸⁾	10.9 bioavailable ^(6a)	6.8 dissolved ^(6a)
None	Specific pollutant	Iron	-	200 ⁽²⁾	1000 ^{(6a)*1}	1000 ^{(6a)*1}
None	Specific pollutant	Manganese	-	50 ⁽²⁾ (0.05mg/l)	123 bioavailable ^(6a) (0.123mg/l)	-
<i>(Not determined)</i>	-	Aluminium	-	200 ⁽²⁾	-	-

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors ⁽⁶⁾	Surface water receptors ⁽⁶⁾		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
Hazardous substance <i>(Not determined)</i>	Priority hazardous substance	Tributyltin compounds (Tributyltin-cation)	0.001 ⁽⁷⁾	-	0.0002 ^(6a)	0.0002 ^(6a)
	-	Sodium	-	200,000 ⁽²⁾ (200 mg/l)	-	-
Non-hazardous pollutant	Specific pollutant	Cyanide (Hydrogen cyanide)	-	50 ⁽²⁾ (0.05 mg/l)	1 ^(6a) (0.001 mg/l)	1 ^(6a) (0.001 mg/l)
Non-hazardous pollutant	-	Total ammonia ^{\$} (ammonium (as NH ₄ ⁺) plus ammonia (NH ₃))	-	500 ⁽²⁾ (0.5 mg/l)	300 ^(6f) (0.3 mg/l)	-
Non-hazardous pollutant	Specific pollutant	Ammonia un-ionised (NH ₃)	-	-	-	21 ^(6a) (0.021 mg/l)
Non-hazardous pollutant	Specific pollutant	Chlorine	-	-	2 ^(6a) (0.002 mg/l)	10 ^(6d) (0.01 mg/l)
<i>(Not determined)</i>	-	Chloride	-	250,000 ⁽²⁾ (250 mg/l)	-	-
<i>(Not determined)</i>	-	Sulphate	-	250,000 ⁽²⁾ (250 mg/l)	-	-
<i>(Not determined)</i>	-	Nitrate (as NO ₃)	-	50,000 ⁽²⁾ (50 mg/l)	-	-
<i>(Not determined)</i>	-	Nitrite (as NO ₂)	-	500 ⁽²⁾ (0.5 mg/l)	10 ⁽⁹⁾ (0.01 mg/l)	-

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors ⁽⁶⁾	Surface water receptors ⁽⁶⁾		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Volatile organic compounds (VOC)						
Non-hazardous pollutant	Other pollutant	Tetrachloroethene (tetrachloroethylene; PCE)	0.1 ⁽⁷⁾	10 ⁽²⁾ sum of TCE and PCE	10 ^(6a)	10 ^(6a)
Hazardous substance	Other pollutant	Trichloroethene (trichloroethylene; TCE)	0.1 ⁽⁷⁾		10 ^(6a)	10 ^(6a)
None	Specific pollutant	Tetrachloroethane	-	-	140 ^(6a)	-
Hazardous substance	Other pollutant	Carbon tetrachloride (tetrachloromethane)	0.1 ⁽⁷⁾	3.0 ⁽²⁾	12 ^(6a)	12 ^(6a)
Non-hazardous pollutant	Priority substance	1,2-Dichloroethane	1.0 ⁽⁷⁾	3.0 ⁽²⁾	10 ^(6a)	10 ^(6a)
Non-hazardous pollutant	-	1,2-Dichloroethene (DCE)	-	50.0 ⁽⁴⁾	-	-
Hazardous substance	-	Vinyl chloride (chloroethene)	-	0.5 ⁽²⁾	-	-
Non-hazardous pollutant	Priority substance	Dichloromethane	-	20 ⁽⁴⁾	20 ^(6a)	20 ^(6a)
Non-hazardous pollutant	Priority substance	Trichlorobenzenes	0.01 ⁽⁷⁾	-	0.4 ^(6a)	0.4 ^(6a)
(Not determined)	-	Trihalomethanes	-	100 ^(2a)	-	-

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors ⁽⁶⁾	Surface water receptors ⁽⁶⁾		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Hazardous substance	Priority substance	Trichloromethane (Chloroform)	0.1 ⁽⁷⁾	(see "Trihalomethanes" above)	2.5 ^(6a)	2.5 ^(6a)
Non-hazardous pollutant	Priority hazardous substance	Di(2-ethylhexyl) phthalate (bis(2-ethylhexyl) phthalate, DEHP)	-	8 ⁽⁴⁾	1.3 ^(6a)	1.3 ^(6a)
None	Specific pollutant	Benzyl butyl phthalate	-	-	7.5 ^(6a)	0.75 ^(6a)
Hazardous substance	Priority hazardous substance	Hexachlorobutadiene	0.005 ⁽⁷⁾	0.6 ⁽⁴⁾	0.6 ^(6c)	0.6 ^(6c)
Semi-volatile organic compounds (SVOC)						
(Not determined)	-	Acenaphthylene (C12-C16)	-	-	5.8 ⁽¹⁰⁾	
Hazardous substance	Priority hazardous substance	Anthracene (C16-C21)	-	-	0.1 ^(6a)	0.1 ^(6a)
Non-hazardous pollutant	Priority substance	Naphthalene (C10-C12)	-	-	2 ^(6a)	2 ^(6a)

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors ⁽⁶⁾	Surface water receptors ⁽⁶⁾		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Hazardous substance	Priority substance	Fluoranthene (C21-C35)	-	-	0.0063 ^(6a)	0.0063 ^(6a)
Hazardous substance(s)	Priority hazardous substance(s)	Benzo(a)pyrene (C21-C35)	-	0.01 ⁽²⁾	0.00017 ^(6a)	0.00017 ^(6a)
		Benzo(b)fluoranthene (C21-C35)	-	0.1 ⁽²⁾ sum of the concentration of the four specified compounds	No EQS for these substances. B(a)P should be used as the indicator compound instead.	
		Benzo(k)fluoranthene (C21-C35)	-			
		Benzo(g,h,i)perylene (C21-C35)	-			
		Indeno(1,2,3-cd)pyrene (C21-C35)	-			
Non-hazardous pollutant	Specific pollutant	Phenol		-	7.7 ^(6a)	7.7 ^(6a)
Hazardous substance	Specific pollutant	2,4-Dichlorophenol	0.1 ⁽⁷⁾	-	4.2 ^(6a)	0.42 ^(6a)
Hazardous substance	Priority substance	Pentachloro-phenol (PCP)	0.1 ⁽⁷⁾	9 ⁽⁴⁾	0.4 ^(6a)	0.4 ^(6a)

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors ⁽⁶⁾	Surface water receptors ⁽⁶⁾		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Petroleum hydrocarbons						
Hazardous substance	-	Total petroleum hydrocarbons	-	See Table 2 for individual (non-statutory) TPH CWG fractions with respect to drinking water receptors	See individual risk driving compounds (i.e. BTEX and PAH) for specific EQS	
Hazardous substance	Priority substance	Benzene (C5-C7)	1 ⁽⁷⁾	1 ⁽²⁾	10 ^(6a)	8 ^(6a)
Hazardous substance	Specific pollutant	Toluene (C7-C8)	4 ⁽⁷⁾	700 ⁽⁴⁾	74 ^(6a)	74 ^(6a)
Hazardous substance	-	Ethylbenzene (C8-C9)	-	300 ⁽⁴⁾	-	-
<i>(Not determined)</i>	-	Xylenes (C8-C10)	3 ⁽⁷⁾	500 ⁽⁴⁾	30 ⁽¹¹⁾	-
Non-hazardous pollutant	-	Methyl tertiary butyl ether (MTBE)	-	15 ⁽¹²⁾	-	-
Pesticides, fungicides, insecticides and herbicides						
Hazardous substance(s)	Other pollutant (Cyclodiene)	Aldrin	0.003 ⁽⁷⁾	0.03 ⁽²⁾	0.01 ^(6a) (sum of all four)	
		Dieldrin	0.003 ⁽⁷⁾	0.03 ⁽²⁾	0.005 ^(6a) (sum of all four)	

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors ⁽⁶⁾	Surface water receptors ⁽⁶⁾		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
	pesticides)	Endrin	0.003 ⁽⁷⁾	0.1 ^(2b)		
		Isodrin*2	0.003 ⁽⁷⁾	0.1 ^(2b)		
Hazardous substance	Other pollutant	DDT (total)	0.002 ⁽⁷⁾	1 ⁽⁴⁾	0.025 ^(6a)	0.025 ^(6a)
(Not determined) – assume to be Hazardous Substance	-	Total pesticides	-	0.5 ⁽²⁾	-	-
(Not determined) - assume to be Hazardous Substance	-	Other individual pesticides	-	0.1 ⁽²⁾		
Hazardous substance	Specific pollutant	Carbendazim	-	-	0.15 ^(6a)	-
Hazardous substance	Specific pollutant	Chlorothalonil	-	-	0.035 ^(6a)	-
Hazardous substance	Specific pollutant (until 22/12/18, after which it becomes a Priority substance)	Cypermethrin	-	-	0.0001 ^(6a) From 22/12/18: 8.0E-5 ^(6a)	0.0001 ^(6a) From 22/12/18: 8.0E-6 ^(6a)
Hazardous substance	Specific pollutant	Dimethoate	0.01 ⁽⁷⁾	-	0.48 ^(6a)	0.48 ^(6a)

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors ⁽⁶⁾	Surface water receptors ⁽⁶⁾		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
<i>(Not determined)</i>	Specific pollutant	Glyphosate	-	-	196 ^(6a)	196 ^(6a)
Hazardous substance	Specific pollutant	Linuron		-	0.5 ^(6a)	0.5 ^(6a)
Non-hazardous pollutant	Specific pollutant	Mecoprop	0.04 ⁽⁷⁾	-	18 ^(6a)	18 ^(6a)
Non-hazardous pollutant	Specific pollutant	Methiocarb	-	-	0.01 ^(6a)	-
Non-hazardous pollutant	Specific pollutant	Pendimethalin	-	20 ⁽⁴⁾	0.3 ^(6a)	-
Hazardous substance	Specific pollutant	Permethrin	0.001 ⁽⁷⁾	-	0.001 ^(6a)	0.0002 ^(6a)
Hazardous substance	Priority substance	Alachlor	-	20 ⁽⁴⁾	0.3 ^(6a)	0.3 ^(6a)
Hazardous substance	Priority substance	Atrazine	0.03 ⁽⁷⁾	100 ⁽⁴⁾	0.6 ^(6a)	0.6 ^(6a)
Hazardous substance	Priority substance	Diuron	-	-	0.2 ^(6a)	0.2 ^(6a)
Hazardous substance	Priority hazardous substance	Endosulphan	0.005 ⁽⁷⁾	-	0.005 ^(6a)	0.0005 ^(6a)

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors ⁽⁶⁾	Surface water receptors ⁽⁶⁾		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Non-hazardous pollutant	Priority substance	Isoproturon	-	9 ⁽⁴⁾	0.3 ^(6a)	0.3 ^(6a)
Hazardous substance	Priority substance	Simazine	0.03 ⁽⁷⁾	2 ⁽⁴⁾	1 ^(6a)	1 ^(6a)
Hazardous substance	Priority hazardous substance	Trifluralin	0.01 ⁽⁷⁾	20 ⁽⁴⁾	0.03 ^(6a)	0.03 ^(6a)
(Not determined)	From 22/12/18: Priority substance	Dichlorovos	-	-	From 22/12/18: 6.0E-4 ^(6a)	From 22/12/18: 6.0E-5 ^(6a)
Hazardous substance	From 22/12/18: Priority substance	Heptachlor and heptachlor epoxide	-	0.03 ⁽²⁾	From 22/12/18: 2.0E-7 ^(6a)	From 22/12/18: 1.0E-08 ^(6a)
Miscellaneous						
None	Specific pollutant	Triclosan (antibacterial agent)	-	-	0.1 ^(6a)	0.1 ^(6a)
Hazardous substance	From 22/12/18: Priority hazardous substance	Perfluoro-octane sulfonic acid (and its derivatives) (PFOS)	-	-	From 22/12/18: 6.5E-4 ^(6a)	From 22/12/18: 1.3E-4 ^(6a)
Hazardous substance	From 22/12/18: Priority hazardous substance	Hexabromo cyclododecane (HBCDD)	-	-	From 22/12/18: 0.0016 ^(6a)	From 22/12/18: 0.0008 ^(6a)

Substance classification		Determinant	Target concentrations (µg/l)			
Groundwater receptors ⁽⁶⁾	Surface water receptors ⁽⁶⁾		Minimum reporting value	UK drinking water standard (or best equivalent)	EQS or best equivalent	
					Freshwater	Transitional (estuaries) and coastal waters
Notes: ‘-’ A target concentration is not available. ^{\$}Please note that total ammonia (NH₄⁺ and NH₃) is equivalent to ammoniacal nitrogen in laboratory reports ^{*1} Please note that although iron is listed in the 2015 Direction as 1.000 µg/l, the EQS remains at 1mg/l in Scotland and it is assumed this is an error and should read either 1,000 or 1000µg/l. ^{*2} Please note that although Isodrin is not listed in name within the group of “Cyclodiene pesticides” in Table 1 of Schedule 3 Part 3 of the 2015 Direction⁽⁶⁾, the CAS number for Isodrin (465-73-6) <u>is</u> listed and therefore it is assumed that it has been missed off the named list of substances. ^{*3} Total petroleum hydrocarbons is used for consistency, but is an analytical method-defined measurement for a mixture of hydrocarbons subject to environmental analysis¹¹. “Bioavailable” in relation to copper, zinc, nickel and manganese (but not lead) is the generic EQSbioavailable^(6a) derived from the Metal Bioavailability Assessment Tool (M-BAT) developed by the Water Framework Directive UK Technical Advisory Group (WFDTAG). Exceedance of this value should prompt a site-specific assessment using the M-BAT with pH, DOC and Ca to derive a site-specific EQS termed the PNEC_{dissolved}. http://www.wfd.uk.org/resources/rivers-lakes-metal-bioavailability-assessment-tool-m-bat. For zinc, if there is an exceedance of the EQSbioavailable in an initial GQRA, Tier 2 required that the EQS for zinc should also have the ambient background concentration of zinc added as well						

Table 2: World Health Organization (WHO) guide values for TPH CWG fractions in drinking water⁽¹³⁾ (as referenced in CL:AIRE, 2017⁽¹¹⁾)

TPH CWG fraction	WHO guide value for drinking water ⁽¹³⁾ (µg/l)
Aliphatic fractions:	
Aliphatic EC5-EC6	15,000
Aliphatic >EC6-EC8	15,000
Aliphatic >EC8-EC10	300
Aliphatic >EC10-EC12	300
Aliphatic >EC12-EC16	300
Aliphatic >EC16-EC21	-
Aliphatic >EC21-EC35	-
Aromatic fractions:	
Aromatic EC5-EC6	10 (benzene)
Aromatic >EC6-EC8	700 (toluene)
Aromatic >EC8-EC10	300 (ethyl benzene) 500 (xylenes)
Aromatic >EC10-EC12	90
Aromatic >EC12-EC16	90
Aromatic >EC16-EC21	90
Aromatic >EC21-EC35	90
Reference: World Health Organisation (WHO), 2008. Petroleum products in drinking-water. Background document for development of WHO guidelines for drinking water quality. WHO/SDE/WSH/05.08/123. World Health Organisation, Geneva ⁽¹³⁾ .	

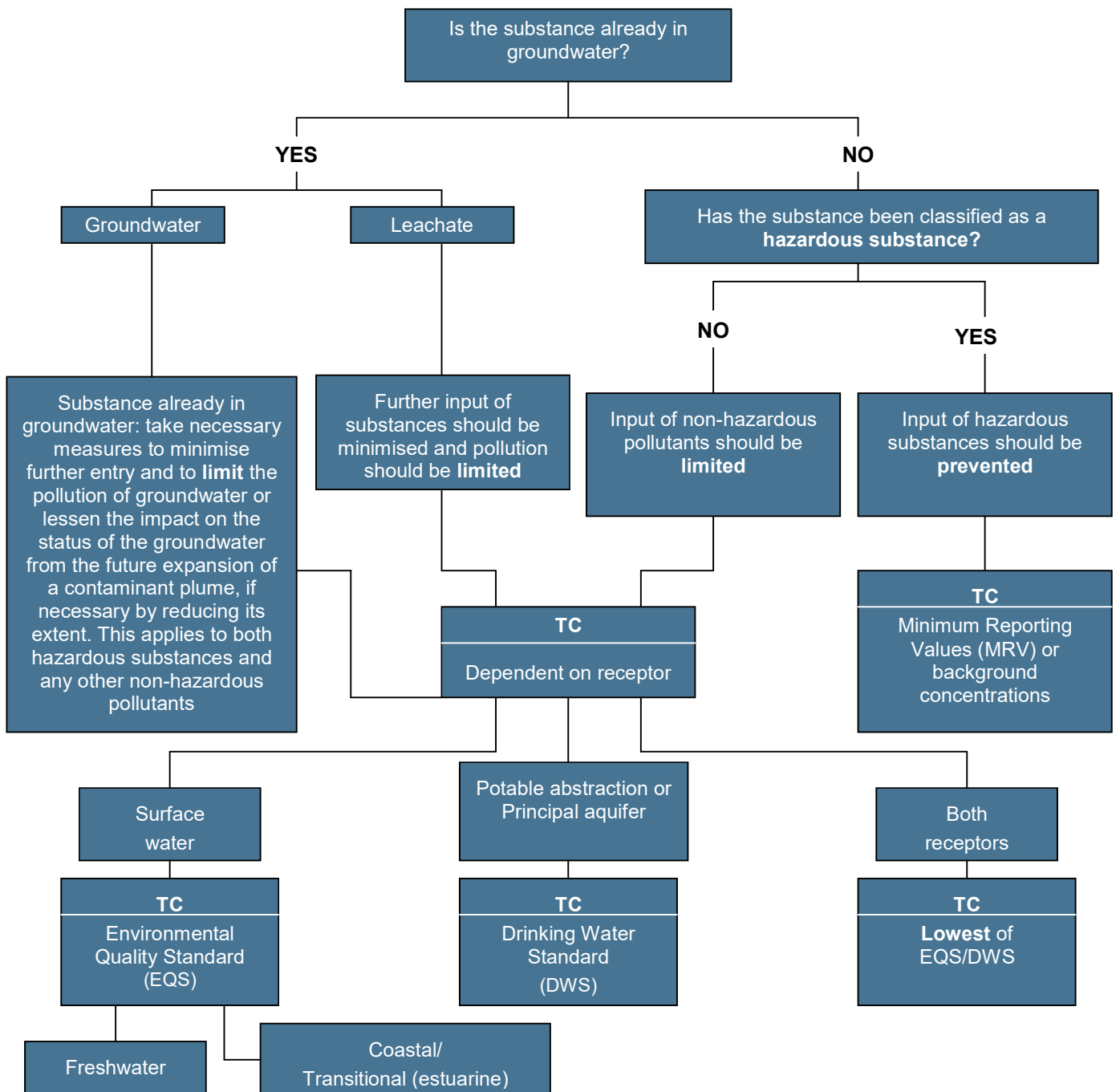
References

1. Environment Agency (2017), 'The Environment Agency's approach to groundwater protection', version 1.0, March 2017 (formerly contained within GP3) [accessed 29 March 2017].
<https://www.gov.uk/government/collections/groundwater-protection>
- 1a. Environment Agency (2017), 'Land contamination groundwater compliance points: quantitative risk assessments', March 2017 (formerly contained within GP3) [accessed 29 March 2017].
<https://www.gov.uk/government/collections/groundwater-protection>
2. The Water Supply (Water Quality) Regulations 2016 (SI 2016/619)
 - 2a. Sum of chloroform, bromoform, dibromochloromethane and bromodichloromethane
 - 2b. Standard applies to individual pesticides except aldrin, dieldrin, heptachlor and heptachlor epoxide, for which a separate standard is defined.
3. The Private Water Supplies (England) Regulations 2016. SI 2016 / 618
4. WHO (2011), *Guidelines for drinking-water quality*, 4th edn
5. JAGDAG hazard substance determinations: This list contains substances that are determined to be hazardous substances or non-hazardous pollutants for the purposes of the groundwater directive 2006/118/EC. The absence of an assessment or substance from the list means an assessment has not been done yet and is presented as 'Not yet determined'; if a substance has been assessed but does not fall into either category it is presented as 'None'. For further details on how substances are assessed, see the Joint Agencies Groundwater Directive Advisory Group (JAGDAG) 'Methodology for the determination of hazardous substances in groundwater for the purposes of the groundwater directive 2006/118/EC' which is available from the JAGDAG website. The methodology is a UK –wide framework that sets criteria for how to assess whether a substance is a hazardous substances in groundwater. The list of substances can be found at:
<https://www.wfduk.org/stakeholders/jagdag>
6. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.
 - 6a. The EQS for these substances are based on a "long term mean" or an "annual average (AA)" EQS.
 - 6b. For cadmium and its compounds the EQS values vary depending on the hardness of the water as specified in five class categories (Class 1: < 40 mg CaCO₃/l, Class 2: 40 to < 50 mg CaCO₃/l, Class 3: 50 to < 100 mg CaCO₃/l, Class 4: 100 to < 200 mg CaCO₃/l and Class 5: ≥ 200 mg CaCO₃/l).
 - 6c. The EQS for Mercury and hexachlorobutadiene are based on a "maximum acceptable concentration (MAC)" EQS in absence of an "annual average (AA)" EQS.
 - 6d. The EQS for chlorine in saltwater is based on the 95th percentile concentration of total residual oxidant, which refers to the sum of all oxidising agents existing in water, expressed as available chlorine.
 - 6e. The recommended saltwater standard is derived using a safety factor of 100. Where the standard is failed, it is recommended that supporting evidence of ecological damage should be obtained before committing to expensive action.
 - 6f. EQS for total ammonia is as per Schedule 3, Part 1, Table 7 of of the above directions. EQS applies to river types 1, 2 and 4 and 6 (namely upland and low alkalinity). The EQS for a lowland and high alkalinity rivers (types 3, 5 and 7) is 600µg/l (0.6mg/l).

Additional information on the Metal Bioavailability Assessment Tool (M-BAT) is available at <http://www.wfduk.org/resources/rivers-lakes-metal-bioavailability-assessment-tool-m-bat>

7. Minimum reporting values listed at <https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values> (updated 13 January 2017; accessed 29 March 2017). Note target concentration for xylenes is 3 µg/l each for o-xylene and m/p xylene as it may not be possible to separate m- and p-xylene; 135 tcb, 124 tcb, 123 tcb each to 0.01 µg/l)
8. The Surface Waters (Abstraction for Drinking Water) (Classification) Regulations 1996 (as amended). SI 1996 / 3001
9. Council Directive on the Quality of Fresh Waters Needing Protection or Improvement in Order to Support Fish Life (Freshwater Fish Directive) (78/659/EEC)
10. WRc plc (2002), R&D Technical Report P45.
11. CL:AIRE, 2017. Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies. V1.1.
12. Drinking Water Inspectorate (London, UK). Environmental Information Request on MTBE in drinking water. Ref. DWI 1/10/18; dated 28 November 2006. Value is based on the odour threshold for MTBE, which is lower than a health-based guideline value
13. World Health Organisation (WHO), 2008. Petroleum products in drinking-water. Background document for development of WHO guidelines for drinking water quality. WHO/SDE/WSH/05.08/123. World Health Organisation, Geneva. [accessed 29 March 2017] http://www.who.int/water_sanitation_health/dwg/chemicals/petroleumproducts_2add_june2008.pdf

FLOW CHART TO ASSIST WITH SELECTION OF TARGET CONCENTRATIONS



TC = Target concentration

When leachate is being assessed the 'compliance point' is the groundwater body. Therefore dilution within the groundwater body may be applied with caution before comparing with the TC.

When directly assessing a receptor, e.g., a river, the appropriate TC should be selected.

APPENDIX L

GENERIC ASSESSMENT CRITERIA FOR POTABLE WATER SUPPLY PIPES

A range of pipe materials is available and careful selection, design and installation is required to ensure that water supply pipes are satisfactorily installed and meet the requirements of the Water Supply (Water Fittings) Regulations 1999 in England and Wales, the Byelaws 2000 in Scotland and the Northern Ireland Water Regulations. The regulations include a requirement to use only suitable materials when laying water pipes and laying water pipes without protection is not permitted at contaminated sites. The water supply company has a statutory duty to enforce the regulations.

Contaminants in the ground can pose a risk to human health by permeating potable water supply pipes. To fulfil their statutory obligation, UK water supply companies require robust evidence from developers to demonstrate either that the ground in which new plastic supply pipes will be laid is free from specific contaminants, or that the proposed remedial strategy will mitigate any existing risk. If these requirements cannot be demonstrated to the satisfaction of the relevant water company, it becomes necessary to specify an alternative pipe material on the whole development or in specific zones.

In 2010, UK Water Industry Research (UKWIR) published *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (Report Ref. No. 10/WM/03/21). This report reviewed previously published industry guidelines and threshold concentrations adopted by individual water supply companies.

The focus of the UKWIR research project was to develop clear and concise procedures, which provide consistency in the pipe selection decision process. It was intended to provide guidance that can be used to ensure compliance with current regulations and to prevent water supply pipe failing prematurely due to the presence of contamination.

The report concluded that in most circumstances only organic contaminants pose a potential risk to plastic pipe materials and Table 3.1 of the report provides threshold concentrations for polyethylene (PE) and polyvinyl chloride (PVC) pipes for the organic contaminants of concern. The report also makes recommendations for the procedures to be adopted in the design of site investigations and sampling strategies, and the assessment of data, to ensure that the ground through which water supply pipes will be laid is adequately characterised.

Risks to water supply pipes have therefore been assessed against the threshold concentrations for PE and PVC pipe specified in Table 3.1 of Report 10/WM/03/21, which have been adopted as the GAC for this linkage and are reproduced in Table A3 below.

Since water supply pipes are typically laid at a minimum depth of 0.75m below finished ground levels, sample results from depths between 0.5m and 1.5m below finished level are generally considered suitable for assessing risks to water supply. Samples outside these depths can be used, providing the stratum is the same as that in which water supply pipes are likely to be located. The report specifies that sampling should characterise the ground conditions to a minimum of 0.5m below the proposed depth of the pipe.

It should be noted that the assessment provided in this report is a guide and the method of assessment and recommendations should be checked with the relevant water supply company.

Table A3: Generic assessment criteria for water supply pipes

		Pipe material	
		GAC (mg/kg)	
	Parameter group	PE	PVC
1	Extended VOC suite by purge and trap or head space and GC-MS with TIC (Not including compounds within group 1a)	0.5	0.125
1a	BTEX + MTBE	0.1	0.03
2	SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C ₅ –C ₁₀) (Not including compounds within group 2e and 2f)	2	1.4
2e	Phenols	2	0.4
2f	Cresols and chlorinated phenols	2	0.04
3	Mineral oil C ₁₁ –C ₂₀	10	Suitable
4	Mineral oil C ₂₁ –C ₄₀	500	Suitable
5	Corrosive (conductivity, redox and pH)	Suitable	Suitable
Specific suite identified as relevant following site investigation			
2a	Ethers	0.5	1
2b	Nitrobenzene	0.5	0.4
2c	Ketones	0.5	0.02
2d	Aldehydes	0.5	0.02
6	Amines	Not suitable	Suitable
Notes: where indicated as 'suitable', the material is considered resistant to permeation or degradation and no threshold concentration has been specified by UKWIR.			



APPENDIX M

COMPARISON OF SOIL AND WATER

LABORATORY DATA TO HUMAN HEALTH GAC



APPENDIX N EXISTING AND PROPOSED LOADING INFORMATION PROVIDED BY JOULE CONSULTING

RSK		Site:		Client:		Job Number:																					
		Talbot Mill		Capital & Centric		11264																					
Summary of Loadings and Re-use Factors																											
Ref.	Ground Level (mAOD)	Foundation Width Br (m)	Foundation Length Lf (m)	Foundation Base Depth Br (m)	Foundation Base Elevation (mAOD)	Existing Load Take Down (kN)			Existing Applied Pressure (kN/m ²)	New Loads (kN)			New Applied Pressure (kN/m ²)	Increase in Applied Pressure (kN/m ²)	% Increase	ULS Bearing Resistance (kN/m2)		Design Bearing Pressure (kN/m2)		Utilisation		Re-use Factor of Safety (Ultimate Resistance / New Pressure)	Estimated Settlement under Pressure Increase (mm)				
						DL				LL						Total			DA1-C1	DA1-C2	DA1-C1			DA1-C2			
						DL	LL	Total		DL	LL	Total				DL	LL	Total									
E2/JTP01	26.220	1.100	1.100	0.850	25.370	261	192	453	374	189	24	213	176	-198	-53%	1022	477	241	182	24%	38%	5.81	0				
E8/JTP02	26.160	1.140	1.180	1.300	24.860	313	203	516	384	473	112	585	435	51	13%	1370	652	600	460	44%	70%	3.15	3-5				
GL4/JTP05	26.170	0.930	1.000	0.530	25.640	195	45	240	258	268	25	293	315	57	22%	707	326	429	323	61%	99%	2.24	6-9				
GL9a/JTP06&07	26.150	1.000	1.000	0.720	25.430	69	15	84	84	75	5	80	80	-4	-5%	883	411	103	82	12%	20%	11.04	0				
GL11	26.150	1.000	1.000	0.530	25.620	285	17	302	302	310	14	324	324	22	7%	717	398	440	328	61%	83%	2.21	1-2				
GL G/JTP07	26.170	1.240	1.000	1.040	25.130	215	29	244	197	249	18	267	215	19	9%	1158	547	293	220	25%	40%	5.38	1-2				
JTP10	26.170	1.700	1.700	1.500	24.670	682	387	1069	370	825	197	1022	354	-16	-4%	1584	754	488	374	31%	50%	4.48	0				
JTP10A	26.170	1.540	1.590	1.630	24.540	682	387	1069	437	825	197	1022	417	-19	-4%	1664	796	576	442	35%	55%	3.99	0				
JTP11	26.170	0.910	0.930	0.600	25.570	682	387	1069	1263	825	197	1022	1208	-56	-4%	758	352	1665	1277	220%	363%	0.63	0				
JTP13	26.170	1.160	1.000	1.420	24.750	255	68	323	278	293	40	333	287	9	3%	1443	691	393	297	27%	43%	5.03	<1				
JTP14	26.170	1.120	1.000	1.880	24.290	275	40	315	281	327	19	346	309	28	10%	1786	865	420	314	23%	36%	5.78	1-2				
JTP23	26.270	0.920	1.000	0.700	25.570	255	68	323	351	293	40	333	362	11	3%	853	398	495	375	58%	94%	2.36	1-2				
JTP 24	26.340	0.920	1.000	0.700	25.640	255	68	323	351	293	40	333	362	11	3%	853	398	495	375	58%	94%	2.36	1-2				
Notes:								E2 - Reduced load on existing foundation due to some of the load being directed into new foundations GL 4, GL9a, GL11, GL G, JTP23 & JTP24 highlighted lengths indicate unit length, whereas minimum length of 20.00m assumed for derivation of shape factors for bearing capacity calculations GL11 blue highlighted indicate all levels and dimensions assumed in the absence of specific investigation data and location Green highlighted cells indicate strip widths provided by the Engineer																			