Table D1a and D1b
Source Zone Concentrations for Chemicals of Potential Concern (CoPC) and Source Zone Dimensions

TABLE D1a - JUSTIFICATION OF SOURCE CONCENTRATIONS

MODELLED RECEPTOR	Individual Source Area	Compound	Media	Source Concentration mg/l (leachate), mg/kg (soil)			Distribution Used	Justifications	
				Most Likely	Minimum	Maximum		Input contaminant value	Size of Source Area
Sandwith Beck	1	Copper (big source)	Soil leachate	0.034	-	-	single	US95 of all concentrations within determined source area	Large distribution of copper leachate exceedences across site so encorporated all exceedences and all area in between exceedences to be conservative. No exceedences in water samples.
	2	Copper (mini source)	Soil leachate	-	0.021	0.17	uniform	only two exceedences	Small separate source to the western side of south pond. This is considered separate to the main area of copper contamination, but CONSIM will consider the cumulative risk when assessing the risk to Sandwith Beck. No exceedences in water samples.
	3	Lead	Soil leachate	0.023	-	-	single	only one exceedence	Small area drawn around single leachate exceedence (A109). No exceedence in water samples.
	4	Selenium	Soil leachate	0.013	-	-	single	only one exceedence	Only a single leachate exceedence (A109). However one exceedence in water sample (BH702), so encorporated this in source zone to be conservative
	5	Vanadium	Soil leachate	0.024	-	-	single	US95 of all concentrations within determined source area	Four leachate exceedences across site so encorporated all exceedences and all area in between exceedences to be conservative. No exceedences in water samples.
	6	Barium	Soil leachate	0.757	-	-	single	only one exceedence	Small area drawn around single leachate exceedence (A117). No exceedence in water samples.
	7	Arsenic	Soil leachate	0.15	-	-	single	only one exceedence	Small area drawn around single leachate exceedence (A111). No exceedence in water samples.
	8	Chromium	Soil leachate	0.598	-	-	single	only one exceedence	Small area drawn around single leachate exceedence (TP511, old data set 0.598mg/l @0.3m). No exceedence in water samples.
	9	Zinc	Soil leachate	0.016	-	-	single	US95 of all concentrations within determined source area	Only a single leachate exceedence (TP511, old data set 0.109mg/L @0.3m). However four exceedences in water samples, so encorporated these in source zone to be conservative
	10	Anionic Surfactant	Soil leachate	0.771	-	-	single	US95 of all concentrations within determined source area	Three exceedences in leachate samples. However, a number of samples could not be analysed for surfactant due to the clay nature of the sample. In order to be conservative, the entire area was considered to be in
	11	m & p Xylene	Soil leachate	0.034	-	-	single	only one exceedence	Only a single leachate exceedence (A117 @3.2m). However two soil samples also exceedenced (A117 and BH702), so encorporated BH702 into source zone to be conservative
	12	o Xylene	Soil leachate	0.03	-	-	single	only one exceedence	Small area drawn around single leachate (and soil) exceedence (A117). No exceedence in water samples.
	13	Fluoranthene	Soil leachate	0.002	-	-	single	only one exceedence	Small area drawn around single leachate exceedence (A113). No exceedence in water samples.
	14	Naphthalene	Soil leachate	0.015	-	-	single	only one exceedence	Small area drawn around single leachate (and soil) (A117). No exceedence in water samples.
	15	Toluene (mg/kg)	Soil	0.387	-	-	single	only one exceedence	Small area drawn around single soil exceedence (A117). No exceedence in water samples
	16	Ethylbenzene (mg/kg)	Soil	1.274	-	-	single	only one exceedence	Small area drawn around single soil exceedence (A117). No exceedence in water samples
	17	1.2.4-Trimethylbenzene (mg/kg)	Soil	8.82	-	-	single	only one exceedence	Small area drawn around single soil exceedence (A117). No exceedence in water samples
	18	1.3.5-Trimethylbenzene (mg/kg)	Soil	2.42	-	-	single	only one exceedence	Small area drawn around single soil exceedence (A117). No exceedence in water samples
	19	TPH (Aliphatics and Aromatics C5-C35)	Soil leachate	0.813	-	-	single	only one exceedence	Only one sample returned TPH in the leachate sample (A117@3.2m), this was in exceedence of the Tier 1 value. Only one groundwater sample detected TPH (BH712), this was in exceedence of the Tier 1 values. However, the TPH detected in the water sample at BH712 was not detected in the leachate of a soil sample from taken at the water table. This meant that a degree of caution was placed on the *value* of the TPH leachate results received from the laboratory. Therefore, in order to be conservative, the source zone for TPH contamination was widened to encorporate the area containing the waters exceedence also.
		TPH (>EC6-7) aromatic	Soil leachate	0.017	-	-	single	see TPH total above	see TPH total above
		TPH (>EC8-10) aromatic	Soil leachate	0.14	-	-	single		
		TPH (>EC10-12) aromatic	Soil leachate	0.074	-	-	single		
		TPH (>EC12-16) aromatic	Soil leachate	0.096	-	-	single		
		TPH (>EC16-21) aromatic	Soil leachate	0.075	-	-	single		
		TPH (>EC21-35) aromatic	Soil leachate	0.053	-	-	single		
		TPH (>EC8-10) aliphatic	Soil leachate	0.05	-	-	single		
		TPH (>EC10-12) aliphatic	Soil leachate	0.05	-	-	single		
		TPH (>EC12-16) aliphatic	Soil leachate	0.04	-	-	single		
		TPH (>EC16-21) aliphatic	Soil leachate	0.152	-	-	single		
		TPH (>EC21-35) aliphatic	Soil leachate	0.066	-	-	single		
	20	Selenium	groundwater	0.034	-	-	single	only one exceedence	Only a single groundwater exceedence (BH702). However one exceedence in soil leachate (A109), so encorporated this in source zone to be conservative
	21	Anionic Surfactant	groundwater	0.326	-	-	single	US95 of all concentrations within determined source area	Two exceedences found in groundwater. However, due to the large number of leachate samples that were in exceedence, the entire area was encoporated as the groundwater source area.
50m Compliance Point within Deep Groundwater	22	Chromium	Soil leachate	0.598	-	-	single	only one exceedence	Small area drawn around single leachate exceedence (TP511, old data set 0.598mg/l @0.3m). No exceedence in water samples.
	23	TPH (>EC12-16) aliphatic	groundwater	0.047	-	-	single	only one exceedence	Small area drawn around single groundwater exceedence (BH712)
		TPH (>EC16-21) aliphatic	groundwater	0.096	-	-			
		TPH (>EC21-35) aliphatic	groundwater	0.067	-	-			

TABLE D1b - JUSTIFICATION OF SOURCE DIMENSIONS

MODELLED RECEPTOR	Individual Source Area	Compound	*Source Area (m^2)*	*Source Thickness (m)*				
			Defined on Plan	Most Likely	Min	Max	Distribution Used	Comment
Sandwith Beck	1	Copper (big source)	17000	-	*0.2*	*5*	Uniform	*source zone specific- Depth range representing the most significant zone of soil contamination. If it was not possible to prove that contamination did not extend to depth then the conservative assumption was made that all the made ground was contaminated.*
	2	Copper (mini source)	500	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	3	Lead	400	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	4	Selenium	3200	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	5	Vanadium	13000	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	6	Barium	225	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	7	Arsenic	100	-	*0.2*	*3.2*	Uniform	*Arsenic not detected in deeper sample taken from 3.2m in same trial pit (A117)*
	8	Chromium	100	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	9	Zinc	18000	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	10	Anionic Surfactant	40000	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	11	m & p Xylene	1800	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	12	o Xylene	100	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	13	Fluoranthene	100	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	14	Naphthalene	100	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	15	Toluene	100	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	16	Ethylbenzene	100	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	17	1.2.4-Trimethylbenzene	100	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	18	1.3.5-Trimethylbenzene	100	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	19	TPH (Aliphatics and Aromatics C5-C35)	4500	-	*0.2*	*7.8*	Uniform	*Contamination proved to depth of 7.8m, at water table*
		TPH (>EC6-7) aromatic	4500	-	*0.2*	*7.8*	Uniform	*Contamination proved to depth of 7.8m, at water table*
		TPH (>EC8-10) aromatic	4500	-	*0.2*	*7.8*	Uniform	*Contamination proved to depth of 7.8m, at water table*
		TPH (>EC10-12) aromatic	4500	-	*0.2*	*7.8*	Uniform	*Contamination proved to depth of 7.8m, at water table*
		TPH (>EC12-16) aromatic	4500	-	*0.2*	*7.8*	Uniform	*Contamination proved to depth of 7.8m, at water table*
		TPH (>EC16-21) aromatic	4500	-	*0.2*	*7.8*	Uniform	*Contamination proved to depth of 7.8m, at water table*
		TPH (>EC21-35) aromatic	4500	-	*0.2*	*7.8*	Uniform	*Contamination proved to depth of 7.8m, at water table*
		TPH (>EC8-10) aliphatic	4500	-	*0.2*	*7.8*	Uniform	*Contamination proved to depth of 7.8m, at water table*
		TPH (>EC10-12) aliphatic	4500	-	*0.2*	*7.8*	Uniform	*Contamination proved to depth of 7.8m, at water table*
		TPH (>EC12-16) aliphatic	4500	-	*0.2*	*7.8*	Uniform	*Contamination proved to depth of 7.8m, at water table*
		TPH (>EC16-21) aliphatic	4500	-	*0.2*	*7.8*	Uniform	*Contamination proved to depth of 7.8m, at water table*
		TPH (>EC21-35) aliphatic	4500	-	*0.2*	*7.8*	Uniform	*Contamination proved to depth of 7.8m, at water table*
	20	Selenium	3200	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	21	Anionic Surfactant	40000	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
50m Compliance Point within Deep Groundwater	22	Chromium	100	-	*0.2*	*5*	Uniform	*refer to comment for Copper (large source)*
	23	TPH (>EC12-16) aliphatic	100	*7*	-	-	Uniform	*Assumed entire evaporite sequence is saturarted. Utilised data from closeby well (BH101) screened within evaporite sequence*
		TPH (>EC16-21) aliphatic	100	*7*	-	-		*Assumed entire evaporite sequence is saturarted. Utilised data from closeby well (BH101) screened within evaporite sequence*
		TPH (>EC21-35) aliphatic	100	*7*	-	-		*Assumed entire evaporite sequence is saturarted. Utilised data from closeby well (BH101) screened within evaporite sequence*

Table D2
Source Zone, Unsaturated Zone, and Aquifer Characteristics

Table D2: Soil and groundwater pathway model parameters						
		Parameter Value				
Zone	Parameter (units)	Most Likely	Min	Max	Distribution Used	Comment
Source Zone - For risks to Sandwith Beck and Deep Groundwater	Total Organic Carbon (%)	0.482	0.07	1.52	Triangular	Average laboratory value taken from 8 soil samples collected between 0.2 and 2m bgl.
	Fraction of organic carbon	0.00482	0.0007	0.0152	Singular	fraction of organic carbon (1/100 of TOC value)
	Infiltration rate (mm/year)	-	54	241	Uniform	Based on impervious hardstanding and building structures, as well as the low permeability drift cover. Assumed to vary between 2 and 5% of long-term (1970-2000) average rainfall of approximately 1070mm (estimated from Meterological Office UK Rainfall Maps, retrieved via the internet).
	Air filled porosity (fraction)	-	0.1	0.15	Uniform	Adopted range of likely air filled porosities for clay dominated Made Ground. Assumed sandy clay from CONSIM manual.
	Water filled porosity (fraction)	-	0.15	0.35	Uniform	Adopted range of likely water filled porosities for clay dominated Made Ground. Assumed sandy clay from CONSIM manual.
	Dry bulk density (g/cm^3)	-	1.7	2.15	Uniform	Adopted range for Clay dominated Made Ground and Glacial Boulder Clay deposits. Assumed weathered glacial till and silt from CONSIM manual.

Note * Due to low permeability of geological strata beneath site, removal of remaining hard standing may not necessarily result in a significant increase in infiltration to the underlying aquifer; Surface run-off is likely to direct the majority of rainwater towards the drainage ponds.

Table D2: Soil and groundwater pathway model parameters						
		Parameter Value				
Zone	Parameter (units)	Most Likely	Min	Max	Distribution Used	Comment
Unsaturated Zone- For risks to Sandwith Beck and Deep Groundwater	Thickness (m) for risks to *Sandwith Beck*	*0*	-	-	Single	Source zone specific-Minimal thickness applied so that ConSim remains stable and insignificant attenuation is simulated. Soil contamination extends to groundwater table.
	Thickness (m) for risks to *Deep Groundwater*	*2.5*	-	-	Single	Source zone specific- An unsaturated zone of approximately 2.5m from the base of the source to the deep groundwater, allowing some attenuation to occur.
	Dry bulk density (g/cm3)	-	1.7	2.45	Uniform	Adopted range for weathered and unweathered Glacial Till from CONSIM manual.
	Hydraulic conductivity (m/s)	-	1.08E-08	1.74E-07	Uniform	Unsaturated permeability values taken to be 1/10th of calculated permeability derived from rising head tests.
	Air filled porosity (fraction)	-	0.1	0.15	Uniform	Adopted range of likely air filled porosities for clay dominated Made Ground. Assumed sandy clay from CONSIM manual.
	Water filled porosity (fraction)	-	0.15	0.35	Uniform	Adopted range of likely water filled porosities for clay dominated Made Ground. Assumed sandy clay from CONSIM manual.
	Vertical dispersivity (m)	0.001	-	-	Single	Assumed value of 1/10th of the unsaturated zone travel distance.
	Total Organic Carbon (Percentage)	0.28	0.17	1	Triangular	Adopted range for Glacial Till and Boulder Clay from CONSIM manual
	Fraction of organic carbon	0.0028	0.0017	0.01	Triangular	fraction of organic carbon (1/100 of TOC value)

Table D2: Soil and groundwater pathway model parameters						
		Parameter Value				
Zone	Parameter (units)	Most Likely	Min	Max	Distribution Used	Comment
Groundwater- For risks to Sandwith Beck	Hydraulic conductivity (m/s)	-	1.08E-07	1.74E-06	Uniform	Calculated permeability values derived from rising head test data from August 2006.
	Hydraulic gradient	0.011736	-	-	Single	Interpreted from on-site groundwater contour plot.
	Effective porosity (fraction)	-	0.05	0.25	Uniform	Adopted range of porosities for silt and more granular zones of Glacial Boulder Clay. Within range of parameters defined in CONSIM manual.
	Aquifer Bulk Density (g/cm^3)	-	1.7	2.45	Uniform	Adopted range for weathered and unweathered Glacial Till from CONSIM manual.
	Fraction of organic carbon	0.0028	0.0017	0.01	Triangular	Adopted range for Glacial Till and Boulder Clay from CONSIM manual
	Groundwater flow direction (degrees)	180	-	-	Single	Inferred groundwater flow direction based on measured groundwater elevations. (ConSim requirement). A southward flow from Plot C into Sandwith Beck
	Longitudinal Dispersivity (m)	refer to below	-	-	refer to below	see below
	Lateral Dispersivity (m)	refer to below	-	-	refer to below	see below
	Saturated Aquifer Thickness (m)	-	4.18	5.85	Uniform	Assumed to represent the shallow weathered Glacial Till deposits. Used deepest groundwater strike (2.72mbgl) and shallowest estimate to bedrock (6.9m) to calculate a minimum thickness of 4.18m. Used shallowest groundwater strike (1.75mbgl) and deepest estimate to bedrock (7.6m) to calculate a maximum estimated thickness of 5.85m (based on site investigation findings).
Active Processes	Retarded Travel in UZ	YES				
	Retarded Travel in Aquifer	YES			It is considered likely that retardation will occur	
	Biodegredation in UZ	YES				
	Blodegredation in Aquifer	YES			It is considered likely that biodegradation will occur, effecting the organic contamination only.	

Table D2: Soil and groundwater pathway model parameters						
		Parameter Value				
Zone	Parameter (units)	Most Likely	Min	Max	Distribution Used	Comment
Groundwater- For risks to Deep Groundwater	Hydraulic conductivity (m/s)	1.00E-05	-	-	Single	Estimated permeability values based on data from borehole hydraulic conductivity determinations from environmental pressure measurements over 50m length (REF: The Quarterly Journal of Engineering Geology, Volume 29, Supplement 1, May 1996.)
	Hydraulic gradient	0.025	-	-	Single	Interpreted from on-site groundwater contour plot.
	Effective porosity (fraction)	-	0.137	0.174	Uniform	Estimated porosity values for Magnesian Limestone based on data from REF: *The Physical Properties of major aquifers in England and Wales*, Hydrogeology Group Technical Report WD/97/34, Environment Agency R&D Publication 8.
	Aquifer Bulk Density (g/cm^3)	-	1.74	2.79	Uniform	Adopted range for limestone from CONSIM manual.
	Fraction of organic carbon	0.0001	-	-	Single	Adopted estimation from CONSIM manual, estimated to be low in foc content
	Groundwater flow direction (degrees)	180	-	-	Single	Inferred groundwater flow direction based on measured groundwater elevations. (ConSim requirement). A southward flow to a compliance point 50m away
	Longitudinal Dispersivity (m)	refer to below	-	-	refer to below	see below
	Lateral Dispersivity (m)	refer to below	-	-	refer to below	see below
	Saturated Aquifer Thickness (m)	8	-	-	Single	Assumed to represent the Evaporite Sequence. Groundwater strike at BH712C(7mbgl) and estimate to depth to base of Evaporite Sequence bedrock (15m) to calculate a thickness of 8m.
Active Processes	Retarded Travel in UZ	YES				
	Retarded Travel in Aquifer	YES			It is considered likely that retardation will occur	
	Biodegredation in UZ	YES				
	Blodegredation in Aquifer	YES			It is considered likely that biodegradation will occur, effecting the organic contamination only.	

Table D2: Soil and groundwater pathway model parameters					
Zone	Parameter (units)	Distance to Receptor (m)*	Longitudinal Dispersivity (m)**	Lateral Dispersivity (m)***	Comment
Pathway to Sandwith Beck	*Copper (large source)*	*170*	*17*	*5.7*	*Distance to receptor (m): This is the distance from the closest point of the source area to the receptor
	Copper (mini source)	*90*	*9*	*3.0*	
	Lead	*280*	*28*	*9.3*	
	Selenium	*130*	*13*	*4.3*	
	Vanadium	*200*	*20*	*6.7*	
	Barium	*250*	*25*	*8.3*	
	Arsenic	*250*	*25*	*8.3*	
	Chromium	*250*	*25*	*8.3*	**Longitudinal Dispersivity (m): Assumed 1/10th travel distance to receptor (this is the minimum distance between closest part of contaminant source and identified receptor) as defined in ConSim manual. This is different for each individual contaminant.
	Zinc	*90*	*9*	*3.0*	
	Anionic Surfactant	*90*	*9*	*3.0*	
	m & p Xylene	*90*	*9*	*3.0*	
	o Xylene	*250*	*25*	*8.3*	
	Fluoranthene	*250*	*25*	*8.3*	
	Naphthalene	*250*	*25*	*8.3*	***Lateral Dispersivity (m):Assumed 1/3rd longitudinal dispersivity: defined in ConSim manual. 1/3 of each individual compounds longitudinal dispersivity.
	Toluene	*250*	*25*	*8.3*	
	Ethylbenzene	*250*	*25*	*8.3*	
	1.2.4-Trimethylbenzene	*250*	*25*	*8.3*	
	1.3.5-Trimethylbenzene	*250*	*25*	*8.3*	
	TPH	*250*	*25*	*8.3*	
Pathway to Deep Groundwater Compliance Point	*Chromium*	*50*	*5*	*1.7*	
	TPH	*50*	*5*	*1.7*	

Table D3
Physical-Chemical and Half Life Parameters

Analytical Suite	Contaminant	Partition Coefficient, K_{oc} or K_d (ml/g)	Ref.	Maximum Solubility (mg/l)	Ref.	Henry's Law Constant, H (unitless)	Ref.	Half-life (years)			
								Most Likely	Minimum	Maximum	Ref.
Heavy Metals	Copper	3.50E+01	c	1.00E-02	f	n/a	n/a	n/a	n/a	n/a	n/a
	Lead	9.95E+01	c	5.00E-02	f	n/a	n/a	n/a	n/a	n/a	n/a
	Selenium	4.99E+00	c	9.00E+00	f	n/a	n/a	n/a	n/a	n/a	n/a
	Vanadium	1.00E+03	c	2.00E-01	f	n/a	n/a	n/a	n/a	n/a	n/a
	Barium	4.09E+01	c	1.40E-01	f	n/a	n/a	n/a	n/a	n/a	n/a
	Arsenic	2.00E+02	a	1.40E-01	f	n/a	n/a	n/a	n/a	n/a	n/a
	Chromium	1.81E+01	c	1.70E+01	f	n/a	n/a	n/a	n/a	n/a	n/a
	Zinc	3.60E+01	c	1.00E-02	f	n/a	n/a	n/a	n/a	n/a	n/a
Selected other analytes	m & p Xylene	4.48E+02	i	1.60E+02	i	2.82E-01	i	0.55	0.14	1.37	L
	o Xylene	4.24E+02	i	1.73E+02	i	2.16E-01	i	0.55	0.14	1.37	L
	Fluoranthene	1.07E+05	i	2.60E-01	i	4.20E-04	i	19.0	9.5	28.5	h
	Naphthalene	1.29E+03	i	3.10E+01	i	1.75E-02	i	0.82	0.27	2.74	L
	Anionic Surfactant	2.65E+02	m	1.00E+05	k	6.70E-04	o	19	9.5	28.5	h
	Toluene	1.40E+02	i	5.35E+02	i	0.221	i	0.55	0.14	0.82	L
	Ethylbenzene	4.32E+02	i	1.69E+02	i	0.273	i	0.55	0.14	2.19	L
	1,2,4-Trimethylbenzene	1.35E+03	d	5.70E+01	d	0.252	b	19	9.5	28.5	h
	1,3,5-Trimethylbenzene	1.35E+03	d	5.00E+01	d	0.241	b	19	9.5	28.5	h
TPH	AROMATIC										
	TPH (>EC6-7) aromatic	8.91E+02	d	2.16E+02	d	2.00E+00	d	1.9	1.0	2.8	h
	TPH (>EC8-10) aromatic	1.58E+03	d	6.50E+01	d	4.80E-01	d	3.8	1.9	5.7	h
	TPH (>EC10-12) aromatic	2.51E+03	d	2.50E+01	d	1.40E-01	d	9.5	4.8	14.3	h
	TPH (>EC12-16) aromatic	5.01E+03	d	5.80E+00	d	5.30E-02	d	19.0	9.5	28.5	h
	TPH (>EC16-21) aromatic	1.58E+04	d	6.50E-01	d	1.30E-02	d	38.1	19.0	57.1	h
	TPH (>EC21-35) aromatic	1.26E+05	d	6.60E-04	d	6.70E-04	d	75.0	37.5	112.5	h
	ALIPHATIC										
	TPH (>EC8-10) aliphatic	3.16E+04	d	4.30E+01	d	8.00E+01	d	1.9	1.0	2.8	h
	TPH (>EC10-12) aliphatic	2.51E+05	d	3.40E-02	d	1.20E+02	d	1.9	1.0	2.8	h
	TPH (>EC12-16) aliphatic	5.01E+06	d	7.60E-04	d	5.20E+02	d	1.9	1.0	2.8	h
	TPH (>EC16-21) aliphatic	6.31E+08	d	2.50E-06	d	4.90E+03	d	9.5	4.8	14.3	h
	TPH (>EC21-35) aliphatic	7.59E+09	d	8.91E-08	d	2.00E+04	d	19.0	9.5	28.5	h

Note: All heavy metals are K_d, all other contaminants are K_{oc}

n/a Not applicable (metals do not volatilise or degrade). No value was found for half life of Anionic Surfactant, so in order to be conservative, it was assumed that this substance does not degrade

Literature Sources:

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d TPH Criteria Working Group, Fate and Transport Technical Action Group. 1997. Selection of Representative TPH Fractions Based on Fate and Transport Considerations.
f Hem, J.D. 1989. Study and Interpretation of the Chemical Characteristics of Natural Water. USGS Water Supply Paper 2254. US Government Printing Office, Washington DC.
h URS derived conservative degradtion rates.
i Environment Agency (2003). Review of the Fate and Transport of Selected Contaminants in the Soil Enviroment, Draft Technical Report P5-079/TR1.
j values used in modelling (Appendix B)
k Inchem.org website
L Environment Agency (2002) The effects of contaminant concentration on the potential for natural attenuation. R&D Technical Report P2-228/TR
m Lowest value derived form internet search: Koc range 264.7 - 120,600 www.heraproject.com for Sodium Lauryl Sulphate
o In the absence of a published value, assumed lowest value of heavy end hydrocarbons in order to be conservative (lower values provide a higher calculated concentration, and hence a greater risk)

Table D4
Approximate Time for Simulated Contaminant Concentration to Exceed Controlled Waters EQS at 50th and 95th Percentile Concentrations at Receptor From Sources within Plot C

MODELLED RECEPTOR	Individual Source Area	Individual Compounds (Soil and Leachate Concentrations)	Tier 1 Controlled Waters Screening Criteria (ug/l)	Source	SIMULATED TIME TO EXCEED DWS	Maximum Simulated Concentrations at Receptor (Sandwith Beck)	
						50th PERCENTILE (Years)	95th PERCENTILE (Years)
Sandwith Beck	1	Copper (large source)	10	**	**5000**	IR	**10.1**
	2	Copper (mini source)	10	**	IR	IR	IR
	3	Lead	10	**	IR	IR	IR
	4	Selenium	10	UK DWS (2000)	IR	IR	IR
	5	Vanadium	20	**	IR	IR	IR
	6	Barium	700	WHO DWG	IR	IR	IR
	7	Arseric	50	*	IR	IR	IR
	8	Chromium	20	**	IR	IR	IR
	9	Zinc	75	**	IR	IR	IR
	10	Anionic Surfactant	200	UK DWS (2000)	**15000**	IR	**300.2**
	11	m & p Xylene	30	***	IR	IR	IR
	12	o Xylene	30	***	IR	IR	IR
	13	Fluoranthene	0.2	UK DWS (2000)	IR	IR	IR
	14	Naphthalene	10	****	IR	IR	IR
	15	Toluene	50	***	IR	IR	IR
	16	Ethylbenzene	300	WHO DWG	IR	IR	IR
	17	1.2.4-Trimethylbenzene	12	USEPA Region 9 (pathway specific)	IR	IR	IR
	18	1.3.5-Trimethylbenzene	12	USEPA Region 9 (pathway specific)	IR	IR	IR
		TPH (>EC6-7) aromatic	10	UK DWS (2000)	IR	IR	IR
		TPH (>EC8-10) aromatic	10	UK DWS (2000)	IR	IR	IR
		TPH (>EC10-12) aromatic	10	UK DWS (2000)	IR	IR	IR
		TPH (>EC12-16) aromatic	10	UK DWS (2000)	IR	IR	IR
		TPH (>EC16-21) aromatic	10	UK DWS (2000)	IR	IR	IR
		TPH (>EC21-35) aromatic	10	UK DWS (2000)	IR	IR	IR
		TPH (>EC8-10) aliphatic	10	UK DWS (2000)	IR	IR	IR
		TPH (>EC10-12) aliphatic	10	UK DWS (2000)	IR	IR	IR
		TPH (>EC12-16) aliphatic	10	UK DWS (2000)	IR	IR	IR
		TPH (>EC16-21) aliphatic	10	UK DWS (2000)	IR	IR	IR
	19	TPH (>EC21-35) aliphatic	10	UK DWS (2000)	IR	IR	IR

Key

IR Insignificant risks calculated
* UK Freshwater EQS Surface Waters (Dangerous Substances)(Classification) Regulations 1997 No 2560 (Water Resources, England & Wales)
** UK Freshwater EQS Surface Waters (Dangerous Substances)(Classification) Regulations 1989 No 2286 (Water Resources, England & Wales) 83/513/EEC
*** UK Freshwater EQS Surface Waters (Dangerous Substances)(Classification) Regulations 1998 No 389 (Water Resources, England & Wales)
**** UK Marine / Estuarine EQS Surface Waters (Dangerous Substances)(Classification) Regulations 1989 No 2286 (Water

MODELLED RECEPTOR	Individual Source Area	Cumulative Risk of Individual Compounds (Soil and Leachate Concentrations)	Tier 1 Controlled Waters Screening Criteria (ug/l)	Source	SIMULATED TIME TO EXCEED DWS	Concentrations at Receptor (Sandwith Beck)	
						50th PERCENTILE (Years)	95th PERCENTILE (Years)
Sandwith Beck	1+2	Copper [1]	10	**	**5000**	IR	**15.6**
	19	TPH Aliphatic and Aromatic Fractions [2]	10	UK DWS (2000)	IR	IR	IR

(1) Cumulative maximum simulated concentrations of Copper (large source) and Copper (mini source) at receptor
(2) Cumulative maximum simulated concentrations at receptor for all Aromatic and Aliphatic fractions

MODELLED RECEPTOR	Individual Source Area	Individual Compounds (Groundwater Concentrations)	Tier 1 Controlled Waters Screening Criteria (ug/l)	Source	SIMULATED TIME TO EXCEED DWS	Maximum Simulated Concentrations at Receptor	
						50th PERCENTILE (Years)	95th PERCENTILE (Years)
Sandwith Beck	20	Selenium	10	UK DWS (2000)	IR	IR	IR
	21	Anionic Surfactant	200	UK DWS (2000)	IR	IR	IR

MODELLED RECEPTOR	Individual Source Area	Individual Compounds (Groundwater Concentrations)	Tier 1 Controlled Waters Screening Criteria (ug/l)	Source	SIMULATED TIME TO EXCEED DWS	Maximum Simulated Concentrations at Receptor	
						50th PERCENTILE (Years)	95th PERCENTILE (Years)
50m Compliance Point within Deep Groundwater	22	Chromium	20	**	IR	IR	IR
	23	TPH Aliphatic Fractions [2]	10	UK DWS (2000)	IR	IR	IR

(2) Cumulative maximum simulated concentrations at receptor for Aliphatic fractions C12-C16, C16-C21, and C21-C35