Source Type

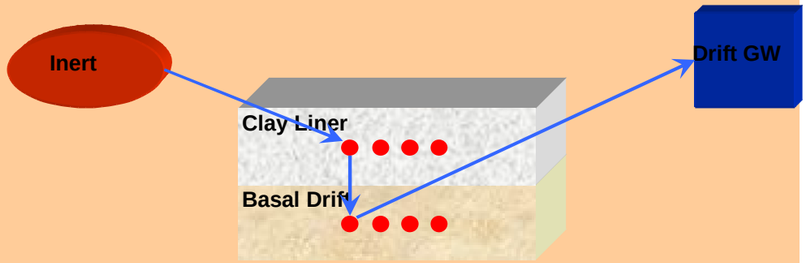
☑ Soil Source ☐ Groundwater Source

Level Number

- ○ Level One
- ○ Level Two
- ◉ Level Three
- ○ Level Four
- ○ Advanced

Parameter Values

◉ Deterministic ○ Probabilistic



Created: 02/04/2020 16:28:25

by: Gavin Chaplin

Version: 3.00.00 Adv

Site: Barham

Numerical value
Suggested formula
Probabilistic parameters
Data specified elsewhere
Suggested formula edited

SOURCE CONCENTRATIONS: Inert

SOIL SOURCE

Source Data Options

- ○ Pore water concentrations
- ○ Leaching test
- ◉ Soil contaminant concentrations

Source Type

- ○ Constant source
- ◉ Declining source

Source Geometry

Inert_Source_length	425	**m**
Inert_Source_width	360	**m**
Inert_Source_area	153000	**m2**
Inert_Source_thickness	6.1438	**m**
Inert_Source_volume	940001.4	**m3**

General Source Properties

Inert_Source_porosity_total	**[-]**	0.4
Inert_Source_porosity_water_filled	**[-]**	0.1
Inert_Source_porosity_air_filled	**[-]**	0.3
Inert_Source_dry_bulk_density	**kg/m3**	1600
Inert_Source_fraction_organic_carbon	**[-]**	0.02

Source Contaminant Information

Source determinand names		Benzene
Inert_Soil_contaminant_concentration	**mg/kg**	6
Inert_Source_solid_water_partitioning_coefficient_Kd	**L/kg**	2.682
Inert_Initial_inventory	**kg**	9024.013
Inert_Input_concentration	**mg/L**	2.159341

CONTAMINANT INFORMATION

		Species1
Source determinand names	1	Benzene

Receptor Target Concentrations

	Name	Values in mg/L
Quality Standard 1	MRV	0.001
Quality Standard 2		
Quality Standard 3		
Quality Standard 4		

Generic Contaminant Properties

Contaminants_Solubility	**mg/L**	1770
Contaminants_Henrys_Law_Constant	**[-]**	0.182
Contaminants_Organic_Carbon_Water_Partition_Coefficient_Koc	**L/kg**	134.1
Contaminants_Free_Water_Diffusion_Coefficient	**m2/s**	6.64E-10

HYDROGEOLOGICAL UNITS

Hydrogeological Units		Clay Liner	Basal Drift
Hydrogeology_Unit_Thickness	m	1	2
Hydrogeology_Log_Hydraulic_Conductivity	log(m/s)	-7	-4.9365
Hydrogeology_Hydraulic_Conductivity	m/s	1E-07	1.16E-05
Hydrogeology_Hydraulic_Gradient	[-]	10	0.004
Hydrogeology_Porosity	[-]	0.4	0.42
Hydrogeology_Velocity	m/s	2.5E-06	1.1E-07
Hydrogeology_Tortuosity	[-]	10	10

ATTENUATION PARAMETERS

Hydrogeological Units		Clay Liner	Basal Drift
General properties			
Attenuation_Dry_bulk_density	**kg/m3**	2000	1900
Attenuation_Fraction_organic_carbon	**[-]**	0.05	0.002
Contaminant specific parameters			
Benzene			
Attenuation_Partition_Coefficient_Kd_Species_1	**L/kg**	6.705	0.2682
Attenuation_Retardation_Species_1	**[-]**	34.525	2.213286
Attenuation_Half_Life_Species_1	**days**	No Decay	350
Attenuation_Decay_Coefficient_Species_1	**1/s**	0	2.29E-08

WATER BALANCE

Infiltration through the soil zone source

Source Name: Inert

Effective_Rainfall	86	**mm/year**
Infiltration_Factor	0.6	**[-]**
Infiltration_Rate	51.6	**mm/year**
Infiltration_Area	153000	**m2**
Q_Infiltration	0.00025	**m3/s**

PATHWAY SUMMARY

Path 1	**Section 1**		**Section 2**		**Section 3**		**Section 4**	
Path 1 Type	Source		Unit		Unit		Receptor	
Path 1 Name	**Inert**		**Clay Liner: Node 1**		**Basal Drift: Node 1**		**Drift GW**	
Path 1 Process	Declining source		ADRD (1D)		ADRD (1D) + Dilution		Monitoring Borehole	
Path 1 Standards							Target Standard	MRV
Path 1 Parameter1	**Q_managed [m3/s]**	0.000E+00	**Velocity [m/s]**	2.500E-06	**Velocity [m/s]**	1.102E-07		
Path 1 Parameter2	**Managed time [years]**	0.000E+00	**Dispersivity [m]**	0.1	**Dispersivity [m]**	21.3		
Path 1 Parameter3	**Q_path [m3/s]**	2.502E-04	**Travel Distance [m]**	1.0	**Travel Distance [m]**	212.5		
Path 1 Parameter4	**Q_decline [m3/s]**	2.502E-04			**Mixing Depth [m]**	2.0		
Path 1 Parameter5					**Mixing Width [m]**	360.0		
Path 1 Parameter6			**Q_Dilute [m3/s]**	0	**Q_Dilute [m3/s]**	3.333E-05	**Q_dilute [m3/s]**	0.000E+00

SIMULATION PARAMETERS

Monte Carlo Analysis with Crystal Ball

Reported Percentile	95
Number of simulations	10000

☐ Stop on calculation error

☐ Use same sequence of random numbers

Minimise while running:

◉ Nothing

○ All Spreadsheets (faster)

○ Microsoft Excel (fastest)

Named Constants

s_per_year	31557600
s_per_day	86400

Laplace Transform Solution Parameters

sigma	0
nu	1
nsum	16
omega	11

Reporting Options

☐ Include Remedial Targets and Attenuation Factors on the results sheets in Advanced level.

☐ Use the array form of the RAM function

☐ Include a set of timeslices for each contaminant in each pathway

Number of timeslices for breakthrough curves 5

The timeslices specified on the results sheets are saved below.

Path1 timeslices in years

TS_Path1
10
25
50
100
250

BREAKTHROUGH RESULTS

Site Name: "Barham"

Level 3

Pollutant Linkage: Inert, Clay Liner, Basal Drift, Drift GW

Concentrations in mg/L in Drift GW

Compared with MRV target concentration in mg/L

1.000E-03

Time(years)	Species1
	Benzene
10	1.333E-17
25	4.006E-12
50	4.725E-12
100	4.299E-12
250	3.239E-12

Pollutant Linkage: Inert, Clay Liner, Basal Drift, Drift GW

Remedial Target Concentrations in mg/kg in Inert

Time(years)	Species1
	Benzene
10	1.000E+40
25	1.000E+40
50	1.000E+40
100	1.000E+40
250	1.000E+40

Compared with source concentrations in mg/kg

6.000E+00

Pollutant Linkage: Inert, Clay Liner, Basal Drift, Drift GW

Dilution Factor

1.133E+00 *for all species and timeslices*

Pollutant Linkage: Inert, Clay Liner, Basal Drift, Drift GW

Attenuation Factor

Time(years)	Species1
	Benzene
10	1.430E+17
25	4.756E+11
50	4.032E+11
100	4.432E+11
250	5.884E+11