

Source Type

☒ Soil Source ☐ Groundwater Source

Level Number

☐ Level One

☐ Level Two

☒ Level Three

☐ Level Four

☐ Advanced

Parameter Values

☒ Deterministic ☐ Probabilistic

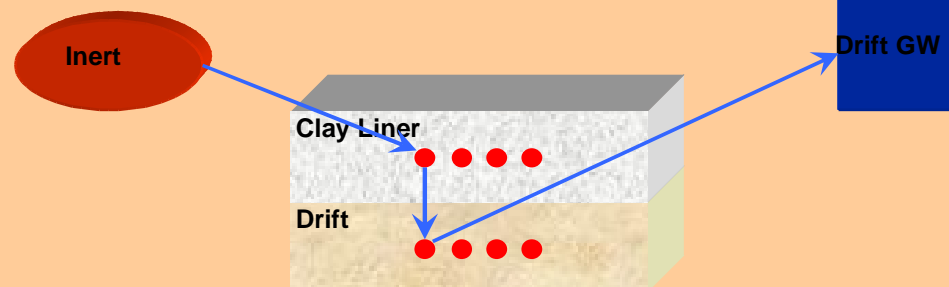
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by: Gavin Chaplin

Version: 3.00.00 Adv

Site: Cavenham Minor

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



SOURCE CONCENTRATIONS: Inert

Source Data Options

- ☒ Pore water concentrations
- ☐ Leaching test
- ☐ Soil contaminant concentrations

Source Geometry

Inert_Source_length	515	m
Inert_Source_width	90	m
Inert_Source_area	46350	m2
Inert_Source_thickness	2.25	m
Inert_Source_volume	104287.5	m3

General Source Properties

Inert_Source_field_capacity	[-]	0.3
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Source Contaminant Information

Source determinand names		Amm N	Cadmium	Chloide	Fluoride	Nickel	Potassium	Selenium
Inert_Pore_water_concentration	mg/L	0.53	0.02	460	2.5	0.12	20.605	0.04
Inert_Initial_inventory	kg	16.58171	0.625725	14391.68	78.21563	3.75435	644.6532	1.25145
Inert_Input_concentration	mg/L	0.53	0.02	460	2.5	0.12	20.605	0.04

SOIL SOURCE

Source Type

- ☐ Constant source
- ☒ Declining source

CONTAMINANT INFORMATION

		Species1	Species2	Species3	Species4	Species5	Species6	Species7
Source determinand names	<div><div></div><div></div></div>	7 Amm N	Cadmium	Chloide	Fluoride	Nickel	Potassium	Selenium

Receptor Target Concentrations

	Name	Values in mg/L						
Quality Standard 1	EAL	0.5	0.005	250	1.5	0.02	10	0.01
Quality Standard 2								
Quality Standard 3								
Quality Standard 4								

Generic Contaminant Properties

Contaminants_Organic_Carbon_Water_Partition_Coefficient_Koc	L/kg	
Contaminants_Free_Water_Diffusion_Coefficient	m2/s	

HYDROGEOLOGICAL UNITS

Hydrogeological Units		Clay Liner	Drift
Hydrogeology_Unit_Thickness	m	1	8.5
Hydrogeology_Log_Hydraulic_Conductivity	log(m/s)	-7	-4.2375
Hydrogeology_Hydraulic_Conductivity	m/s	1E-07	5.79E-05
Hydrogeology_Hydraulic_Gradient	[-]	10	0.00275
Hydrogeology_Porosity	[-]	0.4	0.42
Hydrogeology_Velocity	m/s	2.5E-06	3.79E-07
Hydrogeology_Tortuosity	[-]	10	10

ATTENUATION PARAMETERS

Hydrogeological Units	Clay Liner	Drift
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General properties

Attenuation_Dry_bulk_density	kg/m3	2000	1900
Attenuation_Fraction_organic_carbon	[-]	0.05	0.002

Contaminant specific parameters

Amm N

Attenuation_Partition_Coefficient_Kd_Species_1	L/kg	1.25	1.25
Attenuation_Retardation_Species_1	[-]	7.25	6.654761905
Attenuation_Half_Life_Species_1	days	No Decay	1300
Attenuation_Decay_Coefficient_Species_1	1/s	0	6.17118E-09

Cadmium

Attenuation_Partition_Coefficient_Kd_Species_2	L/kg	188.3	188.3
Attenuation_Retardation_Species_2	[-]	942.5	852.8333333
Attenuation_Half_Life_Species_2	days	No Decay	No Decay
Attenuation_Decay_Coefficient_Species_2	1/s	0	0

Chloide

Attenuation_Partition_Coefficient_Kd_Species_3	L/kg	1E-09	0.000000001
Attenuation_Retardation_Species_3	[-]	1	1.000000005
Attenuation_Half_Life_Species_3	days	No Decay	No Decay
Attenuation_Decay_Coefficient_Species_3	1/s	0	0

Fluoride

Attenuation_Partition_Coefficient_Kd_Species_4	L/kg	1E-09	0.000000001
Attenuation_Retardation_Species_4	[-]	1	1.000000005
Attenuation_Half_Life_Species_4	days	No Decay	No Decay
Attenuation_Decay_Coefficient_Species_4	1/s	0	0

Nickel

Attenuation_Partition_Coefficient_Kd_Species_5	L/kg	110	110
Attenuation_Retardation_Species_5	[-]	551	498.6190476
Attenuation_Half_Life_Species_5	days	No Decay	No Decay
Attenuation_Decay_Coefficient_Species_5	1/s	0	0

Potassium

Attenuation_Partition_Coefficient_Kd_Species_6	L/kg	1E-09	0.000000001
Attenuation_Retardation_Species_6	[-]	1	1.000000005
Attenuation_Half_Life_Species_6	days	No Decay	No Decay
Attenuation_Decay_Coefficient_Species_6	1/s	0	0

Selenium

Attenuation_Partition_Coefficient_Kd_Species_7	L/kg	50	50
Attenuation_Retardation_Species_7	[-]	251	227.1904762
Attenuation_Half_Life_Species_7	days	No Decay	No Decay
Attenuation_Decay_Coefficient_Species_7	1/s	0	0

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	46350	m2
Q_Infiltration	7.58E-05	m3/s

PATHWAY SUMMARY

Path 1
Path 1 Type
Path 1 Name
Path 1 Process
Path 1 Standards
Path 1 Parameter1
Path 1 Parameter2
Path 1 Parameter3
Path 1 Parameter4
Path 1 Parameter5
Path 1 Parameter6

Section 1		Section 2		Section 3		Section 4	
Source		Unit		Unit		Receptor	
Inert		Clay Liner: Node 1		Drift: Node 1		Drift GW	
Declining source		ADRD (1D)		ADRD (1D) + Dilution		Monitoring Borehole	
						Target Standard	
Q_managed [m3/s]		0.000E+00	Velocity [m/s]	2.500E-06	Velocity [m/s]	3.790E-07	
Managed time [years]		0.000E+00	Dispersivity [m]	0.1	Dispersivity [m]	25.0	
Q_path [m3/s]		7.579E-05	Travel Distance [m]	1.0	Travel Distance [m]	250.0	
Q_decline [m3/s]		7.579E-05			Mixing Depth [m]	8.5	
					Mixing Width [m]	100.0	
			Q_Dilute [m3/s]	0	Q_Dilute [m3/s]	1.353E-04	Q_dilute [m3/s]
							0.000E+00

SIMULATION PARAMETERS

Monte Carlo Analysis with Crystal Ball

Reported Percentile
Number of simulations

95
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

1000
2500
5000
10000
50000

BREAKTHROUGH RESULTS

Site Name: "Cavenham Minor"

Level 3

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

Concentrations in mg/L in Drift GW

Compared with EAL target concentration in mg/L

5.000E-01	5.000E-03	2.500E+02	1.500E+00	2.000E-02	1.000E+01	1.000E-02
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Time(years)	Species1 Amm N	Species2 Cadmium	Species3 Chloide	Species4 Fluoride	Species5 Nickel	Species6 Potassium	Species7 Selenium
1000	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.801E-13	0.000E+00	1.909E-07
2500	0.000E+00	1.444E-10	0.000E+00	0.000E+00	9.304E-07	0.000E+00	3.144E-05
5000	0.000E+00	3.029E-07	0.000E+00	0.000E+00	3.505E-05	0.000E+00	3.264E-05
10000	0.000E+00	4.719E-06	1.519E-09	8.258E-12	5.125E-05	6.802E-11	2.731E-06
50000	9.532E-18	5.513E-08	1.890E-09	1.027E-11	2.520E-09	8.467E-11	8.600E-15

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

Remedial Target Concentrations in mg/L in Inert

Time(years)	Species1 Amm N	Species2 Cadmium	Species3 Chloide	Species4 Fluoride	Species5 Nickel	Species6 Potassium	Species7 Selenium
1000	1.000E+40	1.000E+40	1.000E+40	1.000E+40	4.137E+09	1.000E+40	2.095E+03
2500	1.000E+40	6.925E+05	1.000E+40	1.000E+40	2.580E+03	1.000E+40	1.272E+01
5000	1.000E+40	3.302E+02	1.000E+40	1.000E+40	6.847E+01	1.000E+40	1.226E+01
10000	1.000E+40	2.119E+01	7.569E+13	4.541E+11	4.683E+01	3.029E+12	1.465E+02
50000	2.780E+16	1.814E+03	6.084E+13	3.651E+11	9.526E+05	2.434E+12	4.651E+10

Compared with source concentrations in mg/L

5.300E-01	2.000E-02	4.600E+02	2.500E+00	1.200E-01	2.061E+01	4.000E-02
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Pollutant Linkage: Inert, Clay Liner, Drift, Drift GW

Dilution Factor

2.785E+00	for all species and timeslices
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Pollutant Linkage: Inert, Clay Liner, Drift, Drift GW

Attenuation Factor

Time(years)	Species1 Amm N	Species2 Cadmium	Species3 Chloide	Species4 Fluoride	Species5 Nickel	Species6 Potassium	Species7 Selenium
1000	1.000E+40	1.000E+40	1.000E+40	1.000E+40	7.427E+10	1.000E+40	7.522E+04
2500	1.000E+40	4.973E+07	1.000E+40	1.000E+40	4.631E+04	1.000E+40	4.569E+02
5000	1.000E+40	2.371E+04	1.000E+40	1.000E+40	1.229E+03	1.000E+40	4.400E+02
10000	1.000E+40	1.522E+03	1.087E+11	1.087E+11	8.408E+02	1.088E+11	5.259E+03
50000	1.997E+16	1.303E+05	8.738E+10	8.740E+10	1.710E+07	8.738E+10	1.670E+12

