



TECHNICAL NOTE 1

DATE:	21 March 2025	CONFIDENTIALITY:	Confidential
SUBJECT:	Bridgend Site – Effect of revised infiltration values on maximum soil source concentrations		
PROJECT:	70116125-R09	AUTHOR:	James Dowle
CHECKED:	Rhys Evans	APPROVED:	Heather Di Lauro

Introduction and background

WSP UK Limited (WSP) was commissioned by Ford Motor Company (Ford) to undertake a hydrogeological risk assessment (HRA) of legacy land contamination to support remediation of the Bridgend Engine Plant (BEP), located at the Waterton Industrial Estate, Bridgend, Vale of Glamorgan, Wales, CF31 3PJ ('the Site').

A tiered assessment including a detailed quantitative risk assessment (DQRA) was undertaken by WSP (WSP,2024¹). One of the risk assessment conclusions was that soil contamination in the >EC10-EC12 and >EC12-EC16 aromatic hydrocarbon range at the boiler house, and in the >EC12-EC16 aromatic hydrocarbon range at the tank farm and effluent treatment plant ('ETP') presented an unacceptable risk to groundwater receptors. Ford intends to carry out remediation to break these contaminant linkages through source removal. To assist in implementing the remediation WSP (2024) provided calculations of the theoretical maximum hydrocarbon concentrations that could be left in the soil that would not present an unacceptable risk to groundwater at these three source areas.

The WSP (2024) risk assessment assumed the site was in its pre-demolition layout, comprising a mix of both hardstanding and soft landscaping cover. As part of its planned next use the site will be redeveloped, resulting in a change to the layout and ground cover. This will change the rate of infiltration through the source areas and therefore potentially the flux rate with which dissolved contaminants will be mobilised into groundwater. Ford has requested that WSP recalculate the maximum soil concentrations reported in WSP (2024) to reflect the proposed changes in ground cover that will be implemented at the boiler house, tank farm and ETP source areas.

WSP has completed the work in accordance with WSP proposal 70116125-P02-V.1 dated 21 November 2023, and under the Ford Motor Company global terms and conditions for non-production goods and services FGT30, Rev. 12/07 effective December 01, 2007.

Prior modelling work

The WSP (2024) DQRA was undertaken using ConSim. WSP (2024) concluded the output concentrations in groundwater calculated by the ConSim model represented an unacceptable risk from >EC10-EC12 and >EC12-EC16 aromatic hydrocarbons in soil at the boiler house, and >EC12-EC16 aromatic hydrocarbons in soil at the tank farm and ETP.

The same ConSim model was then used to determine the maximum concentrations of each of the above aromatic fractions in soil that would return an acceptable concentration in groundwater. The input concentration of each TPH fraction in soil was adjusted in the model in an iterative process. The process was repeated until an output concentration in groundwater at the compliance point (immediately

¹ WSP, 2024. Controlled Waters Detailed Quantitative Risk Assessment. 21476577.606/A.5. July 2024.



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downgradient of the source area) less than the water quality standard was returned by the model. These calculations are summarised in section 5.2 of the WSP (2024) DQRA.

Modelling approach

The approach adopted here is twofold:

- Select revised infiltration values appropriate to the new proposed ground cover at each source area based on the proposed layout provided (attached).
- Use the existing ConSim model of WSP (2024) to determine updated maximum acceptable soil concentrations based on the revised infiltration inputs.

As set out in WSP (2024), Ford intend to remove the mobile free phase hydrocarbon from each of the source areas. The modelling approach assumes these remedial works will have taken place. The calculation of maximum acceptable concentrations applies only to residual hydrocarbons in the soil that could potentially be leached by infiltrating rainwater. The calculations and modelling carried out here represent an update to section 5.2 of the WSP (2024) DQRA.

Selection of revised infiltration values for each source area based on proposed changes in ground cover

With the site in its pre-demolition condition the boiler house source was situated predominantly in an area of open ground comprising grassed and gravelled areas, whilst the ETP and tank farm source areas were overlain by hardstanding. Allowance was made within the WSP (2024) DQRA when selecting infiltration values for the degraded nature of the hardstanding arising from the heavy industrial use, including traffic movement, it was exposed to over several decades.

Figure 1 shows the proposed ground cover once redevelopment of the Site is complete. The soil contamination source areas as defined in WSP (2024) are included as blue dashed boxes for reference.

In summary, this shows that in the revised layout:

- The surface of the boiler house soil source area is proposed to comprise an electrical substation, lined surface water basin and control building. A strip of hard cover is proposed to the south of the substation border.
- The surface of the tank farm soil source area is proposed to comprise a building surrounded by a roadway with small areas of grass verge, settlement ponds and an electrical substation.
- The area of the ETP soil source area is proposed to comprise an electrical substation and a strip of soft landscaping to the east of the substation bordered on one side by a swale.

It is understood from Ford that the substations may have a granular cover at the surface but will be underlain by an impermeable layer.

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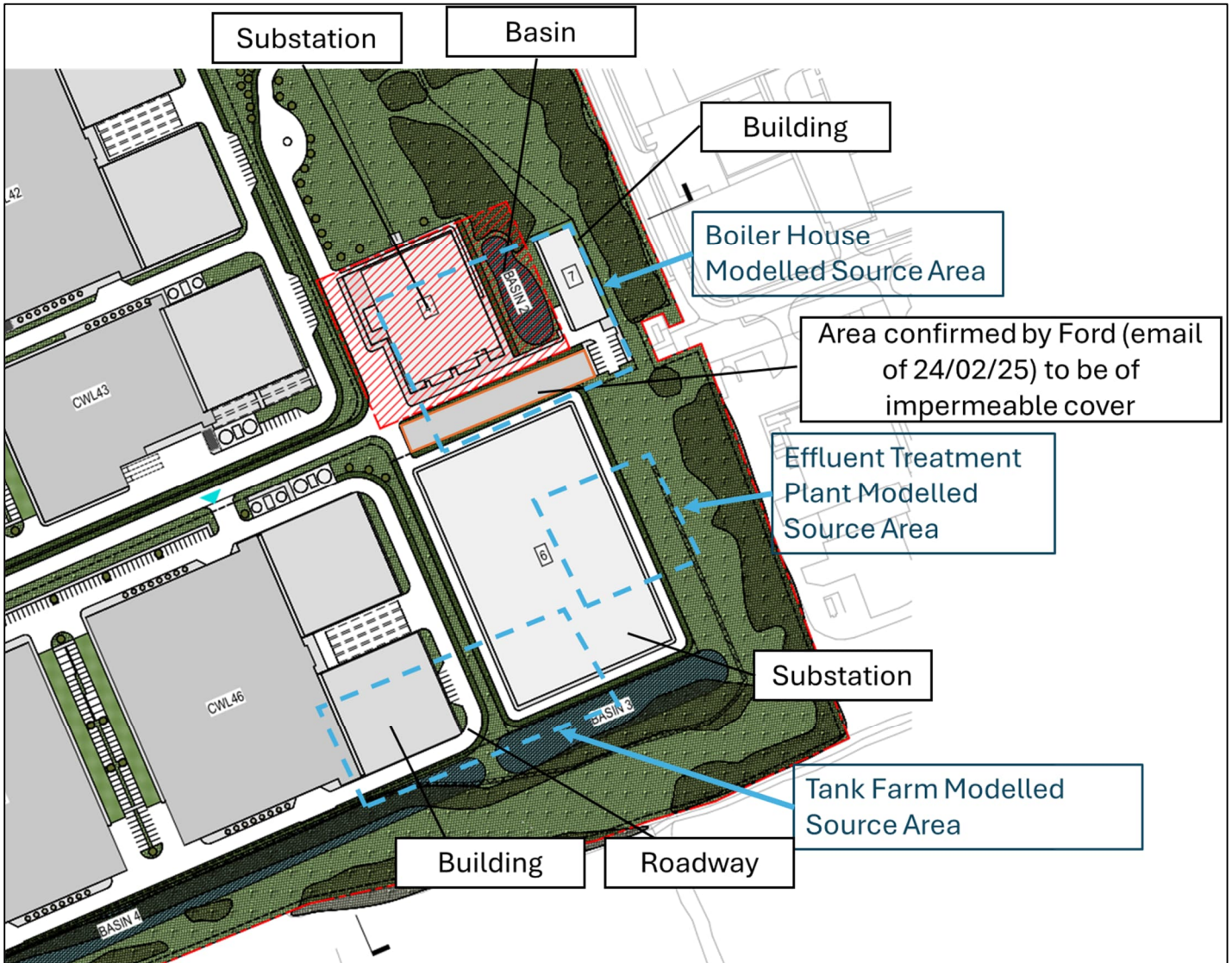


Figure 1 – Approximate location of source areas (dashed blue) on proposed site layout following redevelopment.
 Ref. CWL4-SNH-SI-SI-DR-A-011103_INDICATIVE CAMPUS MASTERPLAN

Based on the changes in ground cover revised infiltration values have been derived for each of the source areas. These are shown in Table 1.



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Table 1 – Revised input infiltration values for the assessment

Source Area	Derivation of Infiltration Rate	Revised Input Value (mm/yr) [^]
Boiler House	<p>Approximately 19% of the surface area comprises: (i) a building; or (ii) a basin excavated through the soil source down to the water table and lined. An infiltration rate of 0 mm/yr will be assumed for these areas</p> <p>Approximately 74.5% of the surface area comprises hard cover. This predominantly comprises a roadway and substation with low or zero traffic movements respectively and assumed to have engineered fall and drainage that diverts water to the adjacent swale from where it will be directed into the surface water basin. Infiltration is likely to be negligible; however, an infiltration rate of 25 mm/yr will be cautiously assumed to account for the low probability of minor defects in the hard cover.</p> <p>Approximately 6.5% of the surface area comprises open grassed areas bordering the surface water basin. The Infiltration rate will be cautiously assumed to be 300 mm/yr, i.e. 25% of total average annual rainfall, consistent with the natural catchment recharge value used in WSP (2024).</p>	38
Tank Farm	<p>Approximately 31% of the surface area comprises a building. An infiltration rate of 0 mm/yr will be assumed for this area. The minor area of zero infiltration associated with the southern basins has been cautiously disregarded.</p> <p>Approximately 64% of the surface area comprises hard cover. This predominantly comprises a roadway and substation with low or zero traffic movements and assumed to have engineered fall and drainage that diverts water to the adjacent swales from where it will be directed into the surface water basins. Infiltration is likely to be negligible; however, an infiltration rate of 25 mm/yr will be cautiously assumed to account for the low probability of minor defects in the hard cover.</p> <p>Approximately 5% of the surface area comprises open grassed areas bordered by swales and surface water drainage. An infiltration value equivalent to effective rainfall of 300 mm/yr will be cautiously assumed, consistent with the natural catchment recharge value used in WSP (2024).</p>	31
Effluent Treatment Plant	<p>Approximately 76% of the surface area comprises hard cover. This predominantly comprises a roadway and substation with low or zero traffic movements respectively and assumed to have engineered fall and drainage that diverts water to the adjacent swale from where it will be directed into the surface water basin. Infiltration is likely to be negligible; however, an infiltration rate of 25 mm/yr will be cautiously assumed to account for the low probability minor defects in the hard cover.</p> <p>Approximately 24% of the surface area comprises an open grassed area without trees and bordered on one side by a swale. An infiltration value equivalent to effective rainfall of 300 mm/yr will be cautiously assumed, consistent with the natural catchment recharge value used in WSP (2024).</p>	91

[^] Weighted average of assumed infiltration rate through areas of hard and soft ground cover



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Recalculation using ConSim of maximum soil source hydrocarbon concentrations based on revised infiltration values

The ConSim model used to calculate the maximum acceptable concentrations in WSP (2024) has been rerun with the revised infiltration values of Table 1. Calculating the maximum acceptable soil concentration involves a routine of increasing the input soil source concentration in the model and re-running it until the output groundwater concentration approaches (but remains below) the WQS. Other than the concentration and revised infiltration inputs all other model parameters remain unchanged.

The approach to determining the maximum soil concentration is cautious because it assumes a single maximum concentration value over the entire plan area and depth of the source. The sampling data demonstrates that parts of the source area exhibit soil contaminant concentrations less than this maximum value.

As described in WSP (2024); to support the remediation works it is more practicable to present the maximum acceptable concentration as a ‘total’ TPH value rather than the concentration of the individual TPH fraction. To facilitate this the specific ratio (expressed as a percentage) between each aromatic fraction and total TPH has been calculated for each source. In carrying out the ratio calculation the C5-C35 aliphatic/aromatic data that is available from the site analytical dataset has been used as a proxy for total TPH. Therefore, the definition of ‘total’ TPH for the purposes of this work is specifically the concentration of C5-C35 aliphatic/aromatic hydrocarbons. This should be borne in mind when scheduling any analysis during remediation validation works.

Table 2 presents, for each source, the maximum input soil concentration of each fraction from the ConSim model that renders an acceptable output dissolved concentration in groundwater at the compliance point and the corresponding scaled ‘total’ TPH value.

Table 2 – Revised maximum acceptable concentrations of ‘total’ TPH

Source Area	Aromatic Hydrocarbon Fraction Requiring Remediation	Modelled Maximum Acceptable Source Concentration of Fraction (mg/kg)	Calculated Peak Concentration in Groundwater (95%ile) (mg/l)	Water Quality Standard (mg/l)	% of Aromatic Fraction Comprising ‘Total’ TPH from Sampling Data ^{Note 1}	Equivalent Maximum Acceptable Source Concentration of ‘Total’ TPH (mg/kg)
Boiler House	>EC10-EC12 Aromatic	48	0.067	0.09	1.5	3,156
	>EC12-EC16 Aromatic	255	0.081	0.09	8.1	
	>EC10-EC16 Aromatic	303 (sum of above)	See above	See above	9.6 (sum of above)	



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Source Area	Aromatic Hydrocarbon Fraction Requiring Remediation	Modelled Maximum Acceptable Source Concentration of Fraction (mg/kg)	Calculated Peak Concentration in Groundwater (95%ile) (mg/l)	Water Quality Standard (mg/l)	% of Aromatic Fraction Comprising 'Total' TPH from Sampling Data ^{Note 1}	Equivalent Maximum Acceptable Source Concentration of 'Total' TPH (mg/kg)
ETP	>E12-EC16 Aromatic	44	0.086	0.09	0.86	5,116
Tank Farm	>E12-EC16 Aromatics	N/A ^{Note 2}	N/A	0.09	1.4	N/A ^{Note 2}

Note 1 – The calculation is based on available sampling data from each source area. It is the average concentration of each fraction from the data divided by the average C5-C35 aliphatic/aromatic concentration from the data and multiplied by 100 to give a percentage.

Note 2 - The modelling concludes for the Tank Farm that when the soil input concentration is continuously increased until the leached concentration of EC12-16 aromatics becomes solubility limited, the calculated (diluted) concentration in groundwater at the compliance point is still below the WQS. There is therefore no maximum limit of EC12-16 aromatics in soil with the significantly reduced infiltration value assumed for the revised ground cover.

*Note 3 – By way of example: 303 mg/kg * (100/9.6)% = 3,156 mg/kg as 'total' TPH*

In comparison with the values reported in Section 5.2 of the WSP (2024) DQRA, the results of Table 2 demonstrate an increase in the maximum acceptable soil hydrocarbon concentration at all three source areas as a result of the new proposed layout and revised input infiltration values.

We trust the above is of assistance to you; however, please do not hesitate to contact us if you like to discuss any aspect further.

[Attachments – ConSim model input and results]

Project: Ford Bridgend CWRA Soil Source Assessment

Project Number: 21476577

Project Details

Title: Ford Bridgend CWRA Soil Source Assessment

Project Number: 21476577

Prepared By: WSP

Date: 2025-02-28 10:04:09

Client Name: Ford Motor Company

Comments:

Soil source model. Remedial target derivation.

Consim version 2.05

Simulation Level

Level 3

Simulation Parameters

Iterations 1001

Timeslices:1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000

Water Quality Standard

User Defined

Source

Boiler House Aromatics

Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)

Moisture Content [%] UNIFORM(10.4,12.8)

Particle Density [g/cm³] SINGLE(2.65)

Thickness [m] SINGLE(2)

Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)

Contaminated Land

Constant Source Term

Overall Unsaturated Zone Thickness [m] SINGLE(0.001)

Infiltration

Infiltration [mm/year] SINGLE(38)

Source Inventory:

Naphthalene

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(7.108)

Organic

koc [ml/g] SINGLE(2500)

Calculate kd

Henry's Law Constant SINGLE(0.049)

Maximum Solubility [mg/l] SINGLE(32.9)

EC10-EC12 Aromatics

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(48)

Organic

koc [ml/g] SINGLE(2500)

Calculate kd

Henry's Law Constant SINGLE(0.49)

Maximum Solubility [mg/l] SINGLE(25)

EC12-EC16 Aromatics

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(255)

Organic

koc [ml/g] SINGLE(5000)

Calculate kd

Henry's Law Constant SINGLE(0.054)

Maximum Solubility [mg/l] SINGLE(5.8)

EC16-EC21 Aromatics

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(1101.42)

Organic

koc [ml/g] SINGLE(16000)

Calculate kd

Henry's Law Constant SINGLE(0.013)

Maximum Solubility [mg/l] SINGLE(0.65)

Unsaturated Pathway: Superficial

Active

Porous Medium

Thickness [m] UNIFORM(0.001,2)

Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)

Vertical Dispersivity [m] UNIFORM(0.0001,0.2)

Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)

Water Filled Porosity [fraction] UNIFORM(0.159,0.239)

Unsaturated Conductivity [m/s] UNIFORM(8e-005,0.0005)

Unsaturated Pathway Contaminants*Naphthalene*

koc [ml/g] SINGLE(2500)

Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] UNIFORM(1.096,3.29)

EC10-EC12 Aromatics

koc [ml/g] SINGLE(2500)

Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] UNIFORM(1.096,3.29)

EC12-EC16 Aromatics

koc [ml/g] SINGLE(5000)

Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] UNIFORM(17.6,34)

EC16-EC21 Aromatics

koc [ml/g] SINGLE(16000)

Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] UNIFORM(17.6,34)

Source

ETP Aromatics

Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)

Moisture Content [%] UNIFORM(10.4,12.8)

Particle Density [g/cm³] SINGLE(2.65)

Thickness [m] SINGLE(2)

Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)

Contaminated Land

Constant Source Term

Overall Unsaturated Zone Thickness [m] SINGLE(0.001)

Infiltration

Infiltration [mm/year] SINGLE(91)

Source Inventory:

EC10-EC12 Aromatics

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(14.9)

Organic

koc [ml/g] SINGLE(2500)

Calculate kd

Henry's Law Constant SINGLE(0.49)

Maximum Solubility [mg/l] SINGLE(25)

EC12-EC16 Aromatics

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(44)

Organic

koc [ml/g] SINGLE(5000)

Calculate kd

Henry's Law Constant SINGLE(0.054)

Maximum Solubility [mg/l] SINGLE(5.8)

EC16-EC21 Aromatics

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(372)

Organic

koc [ml/g] SINGLE(16000)

Calculate kd

Henry's Law Constant SINGLE(0.013)

Maximum Solubility [mg/l] SINGLE(0.65)

Unsaturated Pathway: Superficial

Active

Porous Medium

Thickness [m] UNIFORM(0.001,2)

Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)

Vertical Dispersivity [m] UNIFORM(0.0001,0.2)

Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)

Water Filled Porosity [fraction] UNIFORM(0.159,0.239)

Unsaturated Conductivity [m/s] UNIFORM(8e-005,0.0005)

Unsaturated Pathway Contaminants

EC10-EC12 Aromatics

koc [ml/g] SINGLE(2500) Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] UNIFORM(1.096,3.29)

EC12-EC16 Aromatics

koc [ml/g] SINGLE(5000) Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] UNIFORM(17.6,34)

EC16-EC21 Aromatics

koc [ml/g] SINGLE(16000) Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] UNIFORM(17.6,34)

Source

Tank Farm Aromatics

Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)

Moisture Content [%] UNIFORM(10.4,12.8)

Particle Density [g/cm³] SINGLE(2.65)

Thickness [m] SINGLE(2)

Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)

Contaminated Land

Constant Source Term

Overall Unsaturated Zone Thickness [m] SINGLE(0.001)

Infiltration

Infiltration [mm/year] SINGLE(31)

Source Inventory:

EC10-EC12 Aromatics

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(11.362)

Organic

koc [ml/g] SINGLE(2500)

Calculate kd

Henry's Law Constant SINGLE(0.49)

Maximum Solubility [mg/l] SINGLE(25)

EC12-EC16 Aromatics

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(10000)

Organic

koc [ml/g] SINGLE(5000)

Calculate kd

Henry's Law Constant SINGLE(0.054)

Maximum Solubility [mg/l] SINGLE(5.8)

EC16-EC21 Aromatics

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(97.354)

Organic

koc [ml/g] SINGLE(16000)

Calculate kd

Henry's Law Constant SINGLE(0.013)

Maximum Solubility [mg/l] SINGLE(0.65)

Unsaturated Pathway: Superficial

Active

Porous Medium

Thickness [m] UNIFORM(0.001,2)

Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)

Vertical Dispersivity [m] UNIFORM(0.0001,0.2)

Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)

Water Filled Porosity [fraction] UNIFORM(0.159,0.239)

Unsaturated Conductivity [m/s] UNIFORM(8e-005,0.0005)

Unsaturated Pathway Contaminants*EC10-EC12 Aromatics*

koc [ml/g] SINGLE(2500)

Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] UNIFORM(1.096,3.29)

EC12-EC16 Aromatics

koc [ml/g] SINGLE(5000)

Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] UNIFORM(17.6,34)

EC16-EC21 Aromatics

koc [ml/g] SINGLE(16000)

Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] UNIFORM(17.6,34)

Source

DCE Tank Farm Lagoon

Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)

Moisture Content [%] UNIFORM(10.4,12.8)

Particle Density [g/cm³] SINGLE(2.65)

Thickness [m] SINGLE(2)

Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)

Contaminated Land

Constant Source Term

Overall Unsaturated Zone Thickness [m] UNIFORM(0.001,2)

Infiltration

Infiltration [mm/year] UNIFORM(90,110)

Source Inventory:

1,2-Dichloroethene (1,2-DCE)

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(0.9768)

Organic

koc [ml/g] SINGLE(40)

Calculate kd

Henry's Law Constant SINGLE(0.0419)

Maximum Solubility [mg/l] SINGLE(500)

Unsaturated Pathway: Superficial

Active

Porous Medium

Thickness [m] UNIFORM(0.001,2)

Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)

Vertical Dispersivity [m] UNIFORM(0.0001,0.2)

Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)

Water Filled Porosity [fraction] UNIFORM(0.159,0.239)

Unsaturated Conductivity [m/s] UNIFORM(8e-005,0.0005)

Unsaturated Pathway Contaminants*1,2-Dichloroethene (1,2-DCE)*

koc [ml/g] SINGLE(40)

Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] SINGLE(1e+009)

Source

TCE Tank Farm Lagoon

Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)

Moisture Content [%] UNIFORM(10.4,12.8)

Particle Density [g/cm³] SINGLE(2.65)

Thickness [m] SINGLE(2)

Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)

Contaminated Land

Constant Source Term

Overall Unsaturated Zone Thickness [m] UNIFORM(0.001,2)

Infiltration

Infiltration [mm/year] UNIFORM(90,110)

Source Inventory:

Trichloroethene (TCE)

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(0.3)

Organic

koc [ml/g] UNIFORM(18,152)

Calculate kd

Henry's Law Constant SINGLE(0.417)

Maximum Solubility [mg/l] SINGLE(1100)

Unsaturated Pathway: Superficial

Active

Porous Medium

Thickness [m] UNIFORM(0.001,2)

Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)

Vertical Dispersivity [m] UNIFORM(0.0001,0.2)

Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)

Water Filled Porosity [fraction] UNIFORM(0.159,0.239)

Unsaturated Conductivity [m/s] UNIFORM(8e-005,0.0005)

Unsaturated Pathway Contaminants*Trichloroethene (TCE)*

koc [ml/g] UNIFORM(18,152)

Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] UNIFORM(0.27,2.74)

Source

TCE Waste Chip Plant

Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)

Moisture Content [%] UNIFORM(10.4,12.8)

Particle Density [g/cm³] SINGLE(2.65)

Thickness [m] SINGLE(2)

Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)

Contaminated Land

Constant Source Term

Overall Unsaturated Zone Thickness [m] UNIFORM(0.001,2)

Infiltration

Infiltration [mm/year] UNIFORM(90,110)

Source Inventory:

Trichloroethene (TCE)

Measured as Total Concentration in Soil

Concentration [mg/kg] SINGLE(0.3)

Organic

koc [ml/g] UNIFORM(18,152)

Calculate kd

Henry's Law Constant SINGLE(0.417)

Maximum Solubility [mg/l] SINGLE(1100)

Unsaturated Pathway: Superficial

Active

Porous Medium

Thickness [m] UNIFORM(0.001,2)

Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)

Vertical Dispersivity [m] UNIFORM(0.0001,0.2)

Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)

Water Filled Porosity [fraction] UNIFORM(0.159,0.239)

Unsaturated Conductivity [m/s] UNIFORM(8e-005,0.0005)

Unsaturated Pathway Contaminants*Trichloroethene (TCE)*

koc [ml/g] UNIFORM(18,152)

Calculate kd

Simulate Degradation in Dissolved and sorbed phases

Half-life [years] UNIFORM(0.27,2.74)

Aquifer Pathway

Thickness [m] UNIFORM(5,9)
 Dry Bulk Density [g/cm³] UNIFORM(1.53,1.87)
 Fraction of Organic Carbon [%] UNIFORM(0.21,0.26)
 Mixing Zone Thickness [m] SINGLE(5)
 Hydraulic Conductivity [m/s] UNIFORM(8e-005,0.0005)
 Effective Porosity [fraction] UNIFORM(0.159,0.239)
 Hydraulic Gradient UNIFORM(0.002,0.007)
 Groundwater Flow Direction (degrees), 337.00
 Longitudinal Dispersivity [m] SINGLE(46)
 Lateral Dispersivity [m] SINGLE(13.8)

Contaminant Inventory

1,2-Dichloroethene (1,2-DCE)

koc [ml/g] SINGLE(40) Calculate kd
 Simulate Degradation in Dissolved and sorbed phases
 Halflife [years] UNIFORM(0.22,0.47)

Naphthalene

koc [ml/g] SINGLE(2500) Calculate kd
 Simulate Degradation in Dissolved and sorbed phases
 Halflife [years] UNIFORM(1.096,3.29)

Trichloroethene (TCE)

koc [ml/g] UNIFORM(18,152) Calculate kd
 Simulate Degradation in Dissolved and sorbed phases
 Halflife [years] UNIFORM(0.27,2.74)

EC10-EC12 Aromatics

koc [ml/g] SINGLE(2500) Calculate kd
 Simulate Degradation in Dissolved and sorbed phases
 Halflife [years] UNIFORM(1.096,3.29)

EC12-EC16 Aromatics

koc [ml/g] SINGLE(5000) Calculate kd
 Simulate Degradation in Dissolved and sorbed phases
 Halflife [years] UNIFORM(17.6,34)

EC16-EC21 Aromatics

koc [ml/g] SINGLE(16000) Calculate kd
 Simulate Degradation in Dissolved and sorbed phases
 Halflife [years] UNIFORM(17.6,34)

Receptor

Boiler House Aromatics Receptor	X 293472.640286	Y 178424.050637
ETP Aromatics Receptor	X 293553.750982	Y 178327.201215
Tank Farm Aromatics Receptor	X 293444.036173	Y 178223.136600
DCE Tank Farm Lagoon Receptor	X 293463.491689	Y 178227.205234
TCE Tank Farm Lagoon Receptor	X 293412.593288	Y 178205.892135
TCE Waste Chip Plant Receptor	X 293213.024892	Y 178130.027975
Naphthalene Receptor	X 293305.967350	Y 178838.047340
DCE Receptor	X 293185.321656	Y 178785.564559

Input Correlations

porosity to K	1
K to i	-1

